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Catalogue of the free-living and arthropod-associated Laelapidae Canestrini (Acari: Mesostigmata), with revised generic concepts and a key to genera

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Abstract

The cosmopolitan mite family Laelapidae includes both free-living predatory species and species associated with arthropods, mammals or birds. This work presents a list of free-living and arthropod-associated species of laelapids, with corresponding taxonomic information and references. It includes 1088 species (in addition to three subspecies) assigned to 73 genera, 61 new combinations and two new synonymies at the generic level. *Laelaps* (*Apolaelaps*) Silvestri is raised to the generic level. Many of the species described before about 1950 are poorly characterised and cannot be classified with confidence at the family or generic level. Hence, ten genera, one subgenus, 121 species (*ca*. 70% of which were reported as *Hypoaspis* Canestrini or *Laelaps* (*Hypoaspis*) Canestrini) and one subspecies, are considered *incertae sedis*, because of their inadequate morphological characterisation in the literature. Some of these may not even belong to the Laelapidae or to the groups of interest for this publication. A total of 89 species, 30 genera, one subgenus, one tribe and one subfamily previously associated with genera treated in this catalogue are now placed in other families or, less commonly, in laelapid genera not considered here because they are considered essentially vertebrate parasites (taxa excluded). Twenty-six other species (one cited as a "variety") are cited as *nomina nuda*. An illustrated key to the 73 genera included in the catalogue along with revised generic diagnoses are provided.

Key words: arthropod-associated mites, free-living mites, predatory mites, taxonomy

Introduction

Mites in the cosmopolitan family Laelapidae Canestrini, 1891 occupy a wide variety of microhabitats. They may be free-living in soil and litter, or found in association with arthropods, birds or mammals. The free-living species have received considerable attention as predatory biological control agents of agricultural pests that spend at least part of their life in the soil. Some, *e.g*. *Gaeolaelaps aculeifer* (Canestrini) and *Stratiolaelaps scimitus* (Womersley), are commercially produced for this purpose (Moreira & Moraes, 2015; Knapp *et al*., 2018).

Some laelapid species are considered of medical or veterinary importance as parasites, although this subject has been little studied. For instance, *Laelaps echidninus* Berlese is capable of transmitting disease agents including *Rickettsia typhi*, the causal agent of murine typhus in wild rodents (Turk, 1950; Mullen & OConnor, 2002). Its potential as a vector of human pathogens remains uncertain. Some species such as *Androlaelaps fenilis* (Mégnin) and *Haemogamasus pontiger* (Berlese) have been implicated as a cause of dermatitis in humans (Hill & Gordon, 1945; Baker *et al*., 1956; Halliday, 2011).

Little information is available in the literature concerning the fossil record of laelapid mites and it appears to be limited to two species from Baltic amber. The oldest record was published by Presl (1822), as mentioned in Dunlop & Jekel (2008), of a species referred to as *Acarus resinosus* Presl, and later suggested by Oudemans (1936) to belong to *Hypoaspis* Canestrini. More recently, a species considered to belong to *Myrmozercon* Berlese was reported by Dunlop *et al*. (2014), without a reference to the species name because of the lack of discernible morphological details. The family Laelapidae is currently considered to include about 1300 species classified in 90 genera (Beaulieu *et al*., 2011), or 1520 species in 146 genera (Keum *et al*., 2017). These differences reflect the difficulty of defining the family and its constituent genera. Dowling & OConnor (2010) reported evidence that the Laelapidae as presently accepted is not monophyletic, clearly showing that the classification of the family is not yet fully understood.

A brief historical review of the name Laelapidae shows the complex path that was followed during the development of the family classification. The term "Laelaptidae", later emended to Laelapidae (Domrow, 1963a), was first proposed in the literature by Canestrini (1891). Canestrini classified all mites into six orders, one of which was Mesostigmata, which was in turn subdivided into the families Nicoletiellidae, Uropodidae, Zerconidae, Laelaptidae, Gamasidae and Dermanyssidae. He included nine genera in the Laelapidae, only one of which (*Laelaps*) is still considered to belong to this family. Additionally, he included *Haemogamasus* Berlese, *Holostaspis* Kolenati and *Hypoaspis* in the Gamasidae, but these three genera are now placed in Laelapidae.

A year later, Berlese (1892f), considered the Mesostigmata to consist of eight families. He added the families Antennophoridae, Celaenopsidae and Pteroptidae to the taxa included by Canestrini (1891) in Mesostigmata, and excluded the Nicoletiellidae. He included only six genera in the Laelapidae, of which three are still considered to belong to this family, namely *Iphiopsis* Berlese, *Laelaps* Koch and *Neoberlesia* Berlese. At the same time, he moved some genera from Laelapidae to Gamasidae.

Oudemans (1902d) considered Parasitidae to be the same as Gamasidae, and divided the Parasitidae into nine subfamilies, including the Laelapinae and Dermanyssinae. Trägårdh (1904b, 1908) also considered Laelapinae as a subfamily of the Parasitidae. Evans & Till (1966) placed the subfamily Laelapinae in the family Dermanyssidae, together with seven other subfamilies, four of which have been since considered at the family level by various authors: Dermanyssidae, Haemogamasidae and Macronyssidae (comprising mostly vertebrate parasites; Johnston, 1959; Evans & Till, 1979), and Pseudolaelapidae (free-living; Karg, 1993; Mašán, 2014). The family Laelapidae, largely equivalent to Laelapinae sensu Evans & Till (1966), is now considered as a member of the superfamily Dermanyssoidea, which also includes 15 other families, in the classification of Lindquist *et al*. (2009).

Evans & Till (1966) and Casanueva (1993) provided detailed historical reviews of the subfamilial division of Laelapidae. Disagreements between authors concerning the division of the family have been dramatic. Vitzthum (1942) considered the Dermanyssidae of Berlese (1892) as part of the Laelapidae. He divided the Dermanyssidae into two subfamilies (Dermanyssinae Kolenati and Liponyssinae Ewing), and the remainder of the Laelapidae into 11 subfamilies. The Hypoaspidinae and Laelapinae are still recognised as subfamilies of Laelapidae, but their composition varies widely. For example, *Androlaelaps* Berlese was placed in Hypoaspidinae by Vitzthum (1942) and Casanueva (1993), but in Laelapinae by Karg (1965) and Radovsky (1967), while *Varroa* Oudemans was placed in Hypoaspidinae by Vitzthum (1942), Varroidae by Delfinado & Baker (1974), and Melittiphinae (cited as Melittiphidinae) by Casanueva (1993). Based on a comprehensive analysis of relationships among the free-living and arthropod-associated Laelapidae, Casanueva (1993) proposed two subfamilies and five tribes, elevating Iphiopsidinae to family level, but this classification is not universally accepted (*e.g*. Lindquist *et al*., 2009; Moraza *et al*., 2009; Moraza & Kazemi, 2012; Seeman & Alberti, 2015). Radovsky (1994) considered Laelapidae to include nine subfamilies, six of which are essentially composed of obligate or facultative vertebrate parasites, leaving the Hypoaspidinae as free-living, and Iphiopsinae [sic] and Melittiphinae as arthropod associates. A few years later, Radovsky & Gettinger (1999) added a new subfamily to the list, Acanthochelinae, another group of vertebrate parasites. Available molecular analyses do not provide a clearly resolved subfamilial classification (Dowling & OConnor, 2010).

The disagreements reported above in terms of composition of Laelapidae reflect the difficulty in determining the limits of the family using clearly defined diagnostic features. Many of the species described before about 1950 are poorly characterised and cannot be classified with confidence at the family or generic level, which casts further doubt on the definitions of some genera. For simplicity, we have not used a subfamily classification in this work, arranging genera in alphabetical order, and species in alphabetical order within each genus, regardless of any prior subfamilial assignments.

The aim of this work was to elaborate a list of the free-living and arthropod-associated (some of which arthropod-parasitic) species of Laelapidae. However, it is not easy to sort genera into distinctly parasitic and non-parasitic groups, because vertebrate parasitism is supposed to have arisen several times within the family (Dowling & OConnor, 2010) and because the feeding habits of most species have not been studied and are known to vary significantly within some genera (*e.g*. Shaw, 2014b). Thus, we included in this work the vertebrate parasites *Haemolaelaps* Berlese and *Ulyxes* Shaw, because they are closely related to *Androlaelaps*. The latter is the largest genus, containing species of widely variable feeding habits, ranging from predators to parasites (Baker & Wharton, 1952; Strandtmann & Wharton, 1958; Radovsky, 1969; Furman, 1972; Lareschi & Mauri, 1998; Krantz, 2009; Lindquist *et al*., 2009). The genus *Ulyxes* is mostly composed of parasites of birds and mammals but also includes at least one species of nest-dwelling predators (Shaw, 2014b). Some other laelapid genera, as *Laelaps* Koch and *Haemogamasus*, are also known to contain predatory species (at least facultatively so) as well as parasitic species, but they were not included for being morphologically quite distinct from the free-living or arthropod-associated genera.

Hence, except for *Androlaelaps*, *Haemolaelaps*, *Nidilaelaps* Shaw and *Ulyxes*, genera that have been typically classified as Laelapinae, as well as those classified in Acanthochelinae, Alphalaelapinae, Haemogamasinae, Hirstionyssinae, Mesolaelapinae and Myonyssinae, considered vertebrate parasites, were not included in the present work.

Table 1 shows the laelapid genera that were not included in the catalogue for being considered to consist exclusively (or, in some cases, essentially) of vertebrate parasites. Selected references related to those genera are also cited in that table. The vertebrate parasitic laelapids will be the subject of a separate work.

TABLE 1. Genera of Laelapidae containing parasites of vertebrates and excluded from this study.

Genus	Synonyms	Additional references
Acanthochaela Ewing, 1933		Radovsky & Gettinger (1999)
Aetholaelaps Strandtmann & Camin, 1956		Domrow & Taufflieb (1963)
Alphalaelaps Radford, 1951		Strandtmann & Wharton (1958), Tipton (1960)
Ancoranyssus Evans & Fain, 1968		Tenorio & Radovsky (1979)
Andreacarus Radford, 1953		Fain (1991b), Dowling *et al*. (2007)
Bolivilaelaps Fonseca, 1940		-
Brevisterna Keegan, 1949	*Sternolaelaps* Zumpt & Patterson, 1951	Strandtmann & Allred (1956), Strandtmann & Wharton (1958)
Chalaza Domrow, 1990		-
Chirolaelaps Heath *et al*., 1987		-
Chrysochlorolaelaps Evans & Till, 1965b		-
Dipolaelaps Zemskaya & Piontkovskaya, 1960		Yin *et al*. (1963)
Domrownyssus Evans & Till, 1966		-
Echinonyssus Hirst, 1925b	*Hirstionyssus* Fonseca, 1948	Evans & Till (1966), Tenorio & Radovsky (1979)
Eulaelaps Berlese, 1903b	*Rhinolaelaps* Fonseca, 1960a	Bregetova (1956), Strandtmann & Wharton (1958), Evans & Till (1966)
Gnatholaelaps Till, 1972		-
Gigantolaelaps Fonseca, 1939		Lee & Strandtmann (1967), Furman (1972)
Haemogamasus Berlese, 1889a	*Euhaemogamasus* Ewing, 1933; *Groschaftella* Přívora & Samšiňák, 1957; *Terasterna* Zhou *et al*., 1995	Keegan (1951), Strandtmann & Wharton (1958), Williams *et al*. (1978)
Hymenolaelaps Furman, 1972		-
Hyperlaelaps Zakhvatkin, 1948		Evans & Till (1966, 1979), Deng *et al*. (1963)
Ischyropoda Keegan, 1951		Strandtmann & Wharton (1958)
Juxtalaelaps Dowling *et al*., 2007		-
Laelaps Koch, 1836	*Camerolaelaps* Fonseca, 1960a; *Dianolaelaps* Gu & Duan, 1990; *Echinolaelaps* Ewing, 1929; *Macrolaelaps* Ewing, 1929; *Microtilaelaps* Lange,1955b; *Myolaelaps* Lange, 1955b; *Rattilaelaps* Lange, 1955b; *Schistolaelaps* Fonseca, 1960b; *Schizolaelaps* Fonseca, 1958b	Tipton (1960), Evans & Till (1966)
Laelapsella Womersley, 1955		Shaw (2012)
Liponysella Hirst, 1925b	*Geneiadolaelaps* Ewing, 1929	Ewing (1925, 1929), Strandtmann & Wharton (1958)
Longolaelaps Vitzthum, 1926		Drummond & Baker (1960)

...Continued on the next page

TABLE 1. (Continued)

Genus	Synonyms	Additional references
Lukoschus Radovsky & Gettinger, 1999		-
Manisilaelaps Lavoipierre, 1956		Zumpt (1961)
Mesolaelaps Hirst, 1926	*Heterolaelaps* Hirst, 1926	Domrow (1958), Tenorio & Radovsky (1974)
Myonyssus Tiraboschi, 1904	*Tetragonyssus* Ewing, 1922	Furman & Tipton (1955), Strandtmann & Wharton (1958), Strandtmann & Garrett (1970)
Mysolaelaps Fonseca, 1936a		Strandtmann & Wharton (1958), Tipton (1960), Furman (1972)
Nakhoda Domrow & Nadchatram, 1975		-
Neolaelaps Hirst, 1926		Strandtmann & Garrett (1967), Shaw (2011)
Neoparalaelaps Fonseca, 1937b	*Paralaelaps* Fonseca, 1936b	Furman (1972)
Notolaelaps Womersley, 1957b		Radovsky (2010), Shaw (2011)
Ondatralaelaps Evans & Till, 1965a		Evans & Till (1966)
Ornitholaelaps Okereke, 1968		-
Oryctolaelaps Lange, 1955		Bregetova (1956), Strandtmann & Wharton (1958), Deng *et al*. (1993)
Patrinyssus Jameson, 1950c		Tenorio & Radovsky (1979)
Peramelaelaps Womersley, 1956a		-
Pseudancoranyssus Fain, 1991a		-
Radfordilaelaps Zumpt, 1950c		Zumpt (1961)
Rhodacantha Domrow, 1979c		Domrow (1990)
Rhyzolaelaps Bregetova & Grokhovskaya, 1961		Deng *et al*. (1993)
Sinolaelaps Gu & Wang, 1979b		Deng *et al*. (1993)
Steptolaelaps Furman, 1955b		Strandtmann & Wharton (1958)
Thadeua Domrow, 1977	*Australolaelaps* Womersley, 1956a	Tenorio & Radovsky (1979)
Trichosurolaelaps Womersley, 1956a		Mitchell & Strandtmann (1964), Tenorio & Radovsky (1973, 1979)
Tricholaelaps Vitzthum, 1926		-
Tur Baker & Wharton, 1952	*Protonyssus* Turk, 1946	Turk (1946), Furman & Tipton (1958), Tipton (1960), Dowling *et al*. (2007)
Tylolaelaps Gu & Wang, 1979a		Deng *et al*. (1993)
Tympanospinctus Berlese, 1918	*Mungosicola* Radford, 1942a	-
Ugandolaelaps Radford, 1942		-

The genera *Myonyssoides* Hirst, 1925b and *Pililaelaps* Radford, 1947 were considered vertebrate parasitic Laelapidae by some authors (*e.g*. Radford, 1950a) but they were not included in Table 1 because of their doubtful placement in this family in its present concept. Also not included in the catalogue are the genera of the following families (se*nsu* Lindquist *et al*., 2009): Dermanyssidae, Entonyssidae, Eviphididae (= Hyletastinae), Halarachnidae,

Phytoseiidae, Podocinidae and Rhinonyssidae (all cited as subfamilies of Laelapidae by Vitzthum, 1942); Macronyssidae (included in Liponyssinae, Laelapidae by Vitzthum, 1942, but cited as Macronyssidae by Radford, 1950a and Radovsky, 2010); Manitherionyssidae (included in Liponyssinae by Vitzthym, 1942 and in Laelapinae by Radford, 1950a); Ixodorhynchidae (some genera cited in Laelapinae by Radford, 1950a).

The taxa treated in this catalogue essentially represent those that have been variously included in the Hypoaspidinae, Melittiphinae and Iphiopsidinae. In addition, a few other small genera (*e.g*. *Cyclothorax* von Frauenfeld, *Dyscinetonyssus* Moss & Funk) included here were never assigned to a subfamily, and a few others have been treated in their own monotypic subfamily (*e.g*. *Suracarus* Flechtmann in Suracarinae). The inclusion of Iphiopsidinae as a subfamily of Laelapidae raises an important nomenclatural problem. Iphiopsidinae Kramer, 1886 (originally spelled Iphiopsidae) was established as a subfamily of Gamasidae, and pre-dates Laelaptidae Canestrini, 1891. Thus, according to the *International Code of Zoological Nomenclature* (ICZN), the name of the family should be Iphiopsididae, not Laelapidae. We have not adopted this change, for two reasons. First, the type genus of Iphiopsididae (*Iphiopsis*) is very poorly known and has never been adequately described. In a detailed discussion of Iphiopsididae, Lindquist *et al*. (2020) questioned the validity of the group, mentioning the inadequate set of synapomorphies used by different authors to characterise it. Second, for the sake of stability and taking into account the extensive use of the term Laelapidae, the latter is retained to refer to the family, but this may eventually require a ruling by the ICZN. This decision corroborates that of Radovsky (1967).

Apart from reviews of laelapids and relatives that are parasitic on vertebrates (*e.g*. Strandtmann & Wharton, 1958; Tipton, 1960; Furman, 1972; Domrow, 1987), the most extensive keys that include non-parasitic laelapid genera and species that we are aware of are those of Vitzthum (1929) and Karg (*e.g*. 1971, 1993) for central Europe, Evans & Till (1966, 1979) for the British Isles, Bregetova (1977) for soil-dwelling genera of the U.S.S.R., Krantz & Ainscough (1990) for soil-dwelling genera of North America, and Klimov *et al*. (2016) for bee-associated taxa of the world. Besides generic diagnoses scattered in the literature, Evans & Till (1966) present diagnoses for the equivalent of 13 genera that we include in the present work, although nine of them were diagnosed merely within a key to subgenera of *Hypoaspis sensu lato* included in a footnote (Evans & Till, 1966: 160). Bregetova (1977) provides diagnoses for the equivalent of 15 genera treated here. In addition to the annotated species list, we here provide a key to genera as well as revised diagnoses of the 73 genera of primarily free-living and arthropod-associated Laelapidae, including those traditionally classified as Iphiopsididae.

Materials and Methods

To compile information for this catalogue, we searched a variety of online databases for publications dealing with the family Laelapidae and its included genera. We searched books and papers in libraries held by the authors, and the references they cite. The doctorate theses of Freire (2007) and Moreira (2014) were the basis for the preparation of this publication, and they can be consulted for additional details. We considered publications up to December 2021 that contain descriptions of new taxa, and redescriptions or distribution records in primarily taxonomic publications. Information presented only in short abstracts from scientific conferences was not included. The catalogue includes the genera normally placed in the subfamilies Hypoaspidinae, Iphiopsidinae and Melittiphinae, and some non-parasitic genera from other subfamilies. It does not deal with genera that include only parasites of vertebrates (see introduction for more details).

The information provided in this publication begins with a morphological review of the Laelapidae, highlighting the features of the free-living and arthropod-associated species, based on information provided in the literature and examination of specimens of some genera that were available to us, including many of the larger, common genera and some less common ones, such as *Bisternalis* Hunter, *Conolaelaps* Womersley, *Dicrocheles* Krantz & Khot, *Gecarcinolaelaps* Casanueva & Johnston, *Iphiolaelaps* Womersley, *Laelaspisella* Marais & Loots, *Laelaspoides* Eickwort, *Melittiphis* Berlese, *Narceolaelaps* Kethley, *Neohypoaspis* Delfinado *et al*. and *Tropilaelaps* Delfinado & Baker. We then provide a diagnosis of each genus and a key for identification of the genera included in this catalogue. That is followed by the main part of the publication, consisting of a list of the genera and constituent species, in alphabetical order, in turn followed by lists of taxa whose taxonomic placement is uncertain (*incertae sedis*), taxa mentioned in the literature but whose names are not available for various reasons (*nomina nuda*), and taxa that have been excluded from the catalogue because they have been moved to other families or to subfamilies of Laelapidae not treated here. Each *incertae sedis* species is listed under the genus in which it was originally described

(if the genus has also been considered *incertae sedis*), or under the genus (subgenus) it was first cited among the genera considered in this publication as free-living or arthropod associate. Finally, we provide some discussion of our findings, and a comprehensive list of references. Given the existing disagreements in relation to the publisher and dates of publication of the works of C.L. Koch, the citation of those works used in this catalogue were based on the analysis of Nagel & Grieder (2019).

For each genus, the following information is provided:

- Valid name, with author and year of description;
- The generic name in its original form, with author, year, and page number of the description;
- Later references that provide redescriptions or mention the name within a taxonomic study;
- Synonyms, with the respective authors, years, and page numbers, followed by the reference in which the synonymy was established (in square brackets) and further references providing descriptive information about the synonymy (synonyms and other combinations are listed in chronological order based on the first mention of the name in the literature);
- Type species (following the first mention of the genus in its original form);
- Note including comments on subfamilial assignment(s) with author and year, and explanations regarding taxonomic or nomenclatural problems.

For each species, the following information is provided:

- Valid name, author, and year of the description;
- The species name followed by the author, year, and page of the species description; the specific name is always used in its original spelling;
- References to literature providing information about the morphology of the species, occurrence records and other combinations or variations of the name, including recognised misidentifications of the species;
- Synonyms, with the respective authors, years, and pages, followed by the reference in which the synonymy was established (in square brackets) and further references providing descriptive information about the synonymy (synonyms and other combinations are listed in chronological order based on the first mention of the name in the literature);
- Place of deposition of the holotype (type depository), followed by the specimen number (if available). We accepted the original statements about depositions and did not attempt to confirm them;
- Type locality, from the more specific to the more general geographic information, and habitat from which the species was collected, according to the original description, followed (in square brackets) by the new name of the locality and/or host (if applicable). For animal hosts, we added the names of the order and family, for Coleoptera, subfamilies were also added; for plants and fungi, we added the names of the kingdom, order, and family. If available, additional information about the type locality and substrate are also listed in square brackets; authorship of host animals and plants were not given, for simplicity;
- Note, including any complicated or unusual circumstances surrounding the name of the species or its taxonomic concept.

For generic diagnoses:

Terminology used in the diagnoses (Figs 1–2) generally follows Lindquist & Evans (1965), and secondarily Lindquist (1994) (for opisthogastric chaetotaxy), Lindquist *et al*. (2009), and the online mite glossary developed by Walter (2005). Terminology of leg chaetotaxy (Fig. 3) follows Evans (1963a). In addition, here are some aspects clarified and some definitions of terms that are commonly used in the generic diagnoses:

- Shape of dorsal shield (terms commonly used in italic): *oval*—elliptical in shape, *i.e*. more elongate than a circle; *suboval*—somewhat oval, but with lateral margins more or less parallel (in the middle third) and/or with "shoulders" near setae *r*2–3 (and therefore slightly tapered or concave anterolaterally) or with other discrepancies relative to an oval shape; *ovate*—egg-shaped; *obovate*—inversely egg-shaped.
- Shape of idiosoma. The idiosoma is typically similar in shape to the dorsal shield, therefore oval or suboval. The idiosomal shape is specified only when it differs from such pattern and from the shape of the dorsal

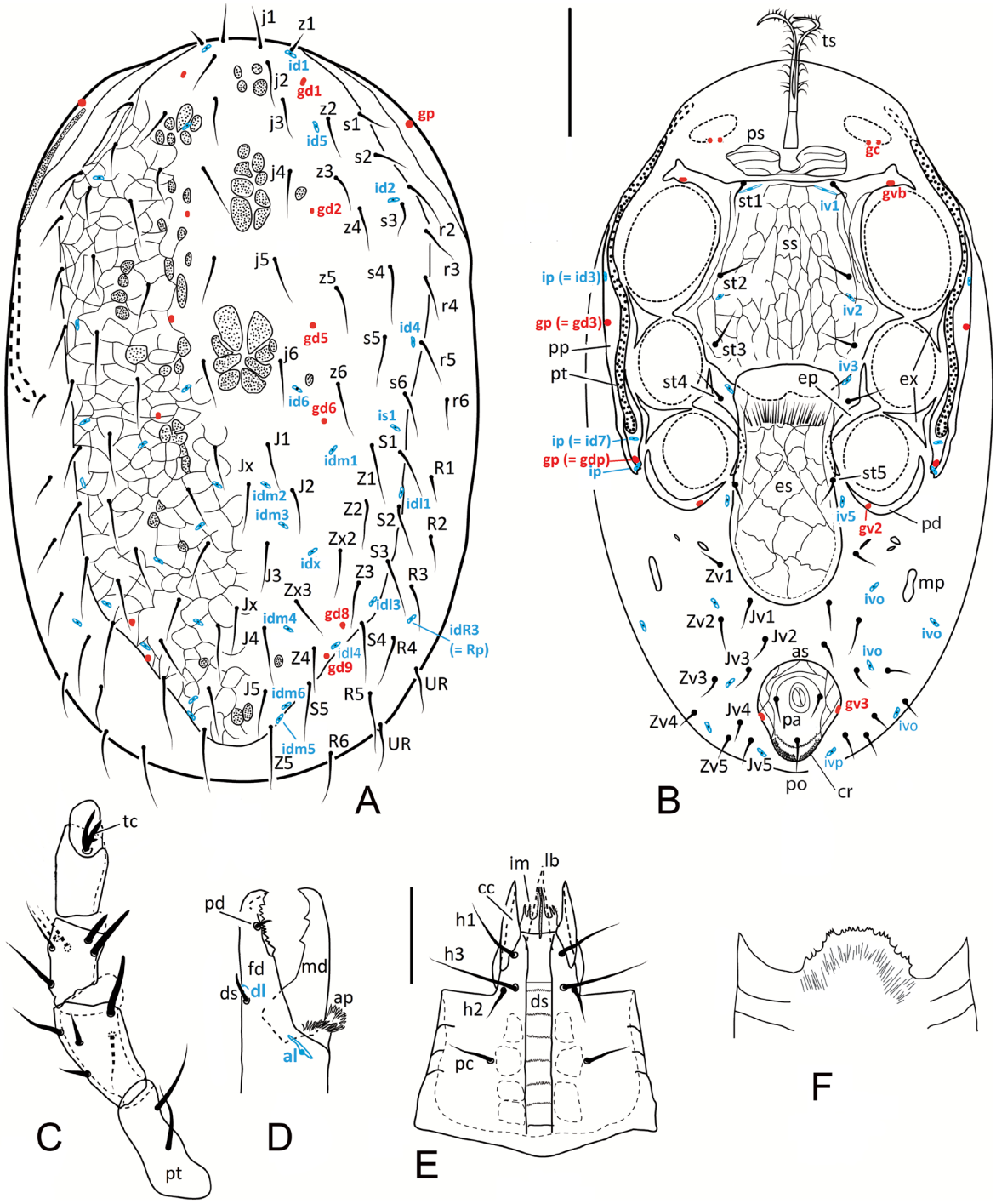


FIGURE 1. General morphology of female Laelapidae (*Gaeolaelaps* Evans & Till; modified from Beaulieu, 2009 and Kazemi *et al*., 2014). A, dorsal idiosoma; B, ventral idiosoma (as: anal shield; cr: cribrum; ep: endopodal plate; es: epigynal shield; ex: exopodal plate; mp: metapodal plates; pd: parapodal plate; pa: para-anal seta; po: post-anal seta; pp: peritrematal plate; ps: presternal plate; pt: peritreme; ss: sternal shield; st: stigma; ts: tritosternum); C, palp (pt: palp trochanter; tc: tarsal claw; tibial and tarsal setae not shown); D, chelicera (al: antiaxial lyrifissure; ap: arthrodial process; dl: dorsal lyrifissure; ds: dorsal seta; fd: fixed digit; md: movable digit; pd: pilus dentilis); E, ventral gnathosoma (cc: corniculus; ds: deutosternum; *h*1–*h*3: hypostomal setae; im: internal malae; lb: labrum; pc: palp coxal seta); F, epistome. Lyrifissures (poroids) shown in blue and gland pores (solenostomes) in red. Notation: idiosomal setae - Lindquist & Evans (1965) adapted by Evans & Till (1965, 1966) and Lindquist (1994); palp setae - Evans (1963b); idiosomal lyrifissures and gland pores - Athias-Henriot (1971, 1975), as interpreted by Kazemi *et al*. (2014). Scale bars = 100 μm for idiosoma, 50 μm for other structures.

shield. It should be noted that the shape of the idiosoma is more subject to variation associated with the slide-mounting process than the dorsal shield.

- Length of setae (terms commonly used): *minute*—inconspicuous, not much longer than its own insertion socket; *short*—much shorter than distance to nearest seta (*i.e.* distance between the two setal sockets); *long*—approximately as long as distance to nearest seta (most applicable to dorsal setae); *very long*—much longer than distance to nearest seta (sometimes called whip-like); *very short*—intermediate between minute and short; *mid-sized*—intermediate between short and long; *macroseta*—a leg seta much longer than surrounding setae.
- We generally used the term *spur-shaped* or *spur-like* for setae that are stout (very thick), short and apically blunt, whereas we used *spine-shaped* or *spine-like* to indicate stout but longer setae, either blunt or finely tapering.

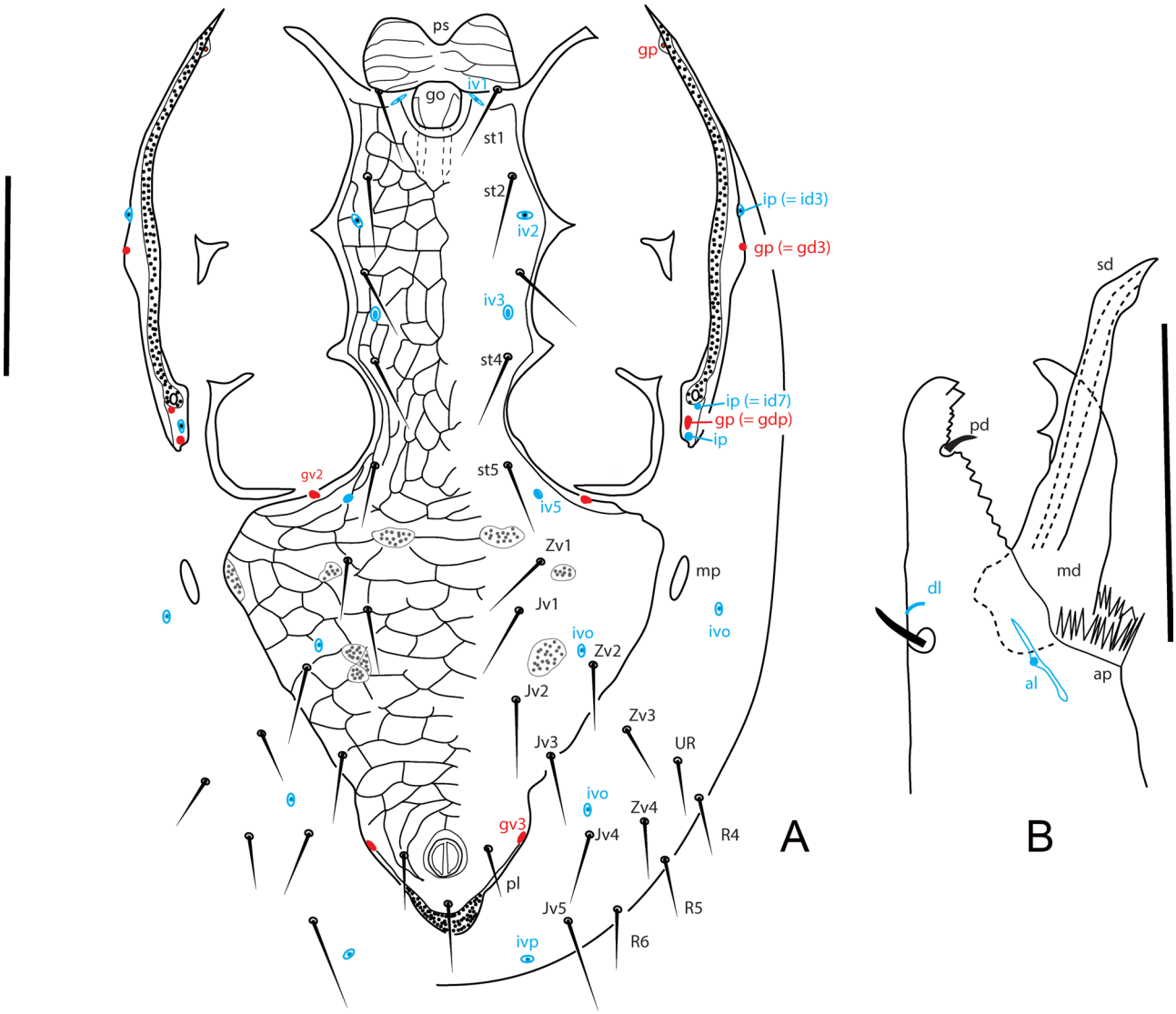


FIGURE 2. General morphology of male Laelapidae (*Gaeolaelaps* Evans & Till; modified from Beaulieu, 2009). A, ventral idiosoma (go: genital opening; hs: holoventral shield; mp: metapodal plate; ps: presternal plate); B, chelicera (al: antiaxial lyrifissure; ap: arthrodial process; dl: dorsal lyrifissure; ds: dorsal seta; fd: fixed digit; md: movable digit; pd: pilus dentilis; sd: spermatodactyl). Lyrifissures (poroids) shown in blue and gland pores (solenostomes) in red. Notation: idiosomal setae - Lindquist & Evans (1965) adapted by Evans & Till (1965, 1966) and Lindquist (1994); idiosomal lyrifissures and gland pores - Athias-Henriot (1971), as interpreted by Kazemi *et al*. (2014). Scale bar = 100 µm for idiosoma, 50 µm for chelicera.

FIGURE 3. General morphology of Laelapidae (*Cosmolaelaps* Berlese; modified from Moreira *et al*., 2014). Female. A. Leg I; B. Leg II; C. Leg III; D. Leg IV. Setal notation after Evans (1963a). Scale bar = 100 μm.

- Epigynal shield variously shaped posteriorly: *drop*-shaped (Fig. 4A): lateral margins expanded and broadly rounded posteriorly; *tongue*-shaped (Fig. 4B) more or less parallel-sided and rounded posteriorly; *bottle*-shaped (Fig. 4C): similar to drop-shaped but long and truncate posteriorly; *flask*-shaped (Fig. 4D): shaped

as an Erlenmyer flask; or *snake-head* shaped (Fig. 4E): narrowly or abruptly bulging near level of *st*5 and tapering posteriorly.

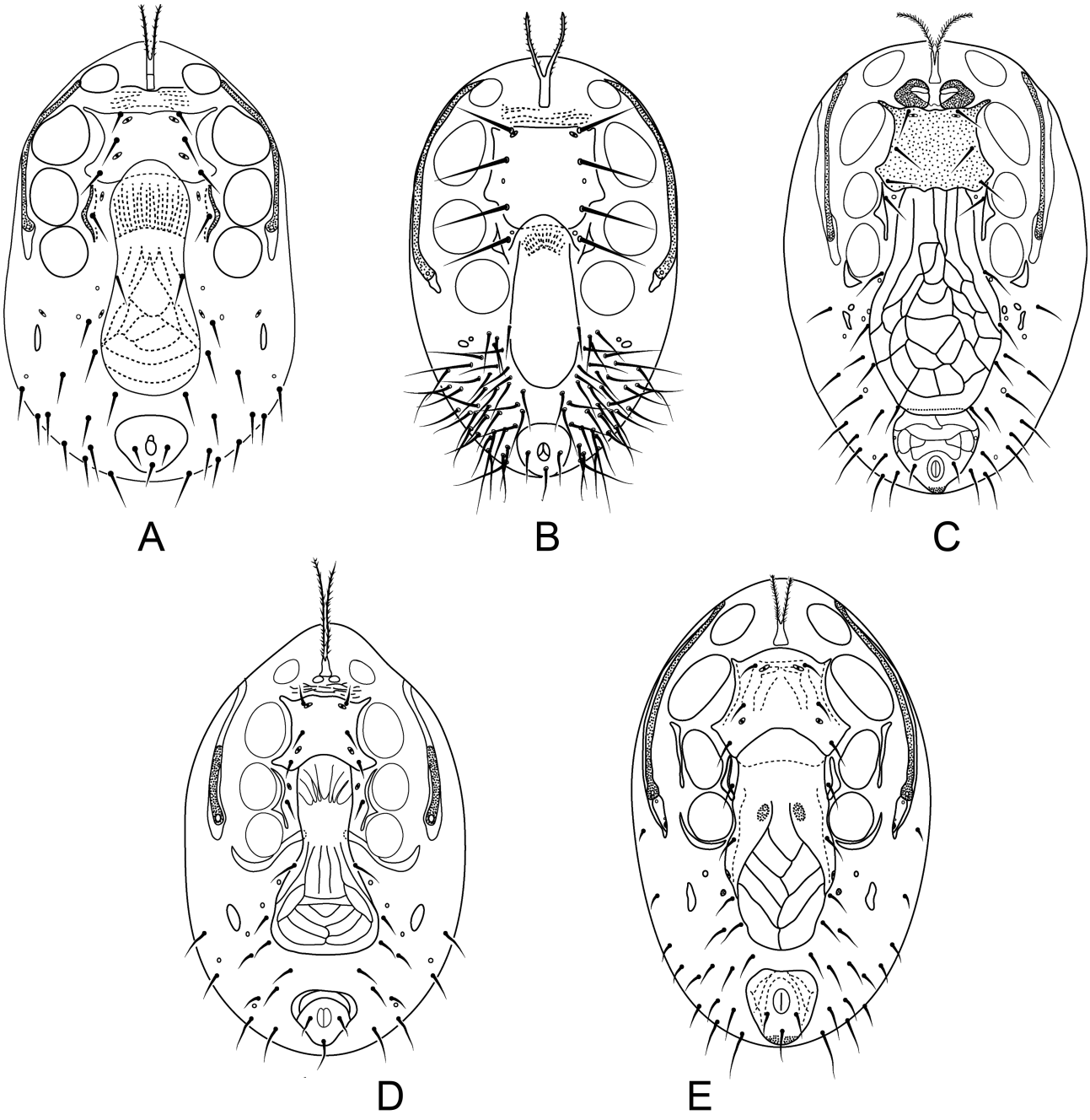


FIGURE 4. Types of epigynal shields of Laelapidae. A. Drop-shaped; B. Tongue-shaped; C. Bottle-shaped; D. Flask-shaped; E. Snake-head shaped.

- For simplicity, we usually pooled the number of setae *Jv* and *Zv* together, and *R* and *UR* setae together. Some setae laterad of *Zv*1–3 denoted *UR* in our diagnoses may include setae that are homologous to *Sv*2 as denoted by Lindquist & Evans (1965: 16) and Lindquist (1994: 324). We have not attempted to distinguish *Sv* from *UR* setae and simply included them in our *R–UR* counts or in a total number of setae in addition to *Jv–Zv* setae.
- The subapical laterally-offset tooth of the fixed cheliceral digit near the apex of the digit is included in the count of teeth, but the apical hook of the digits is not.
- Idiosomal poroids (stress receptors) are relatively stable in Dermanyssina (Athias-Henriot, 1971, 1975; Kazemi *et al*., 2014) and have rarely been used to distinguish species or genera. Gland openings vary more

significantly in presence and location and may be useful, but we mentioned them only a few times in diagnoses when relevant, because overall they have not been sufficiently studied.

- For femur II (Fig. 3), we used *av* to indicate the seta that is positioned most anteriorly among the three ventral setae, and in intermediate position along the main axis of the femur (= *v*1 *sensu* Evans, 1963a: 291). For setae of tarsi II–IV, we maintained the traditional notation of Evans (1963a) and called the unpaired median setae *md* and *mv*, although they have been respectively called *ad*2 and *av*3 by other authors (*e.g.* Klompen & Austin, 2007; Moreira *et al*., 2014).

All illustrations presented were made by line drawing and based on previously published illustrations of species selected as to adequately represent each genus (although some features may not always represent trends in a given genus). For simplicity, illustrations are primarily restricted to the idiosomal dorsum and venter, occasionally including gnathosomal or leg features.

Morphology of free-living and arthropod-associated Laelapidae

In this section, we expand on the previous concepts of Laelapidae of Evans & Till (1965a, 1966, 1979; as "Laelapinae"), Casanueva & Johnston (1993), and Lindquist *et al*. (2009), by including many arthropod-associated taxa that have been considered by some authors in a separate family, the Iphiopsididae. This broader concept of Laelapidae follows the perspectives of Moraza & Kazemi (2012: 12), Seeman & Alberti (2015: 719) and Lindquist *et al*. (2020: 49). Genera that are free-living and those associated with arthropods together present such a diversity of character states that it seems useful to present a review of the morphological range of the group, and mention deviations from any suite of normal (most frequent) character states. Below is a general diagnosis for the family, followed by a more detailed morphological overview, focussing on the adults of free-living and arthropod-associated genera. The diagnosis and the review are based primarily on the literature, including the many taxa described since those earlier concepts were published, as well as on our examination of specimens representing a limited number of genera (see Materials and Methods). Most of the structures used to describe the group and the genera are illustrated in Figures 1–75.

This family diagnosis may appear artificial because it does not formally include taxa parasitic on vertebrates, and also because in its current concept, Laelapidae may not be monophyletic. The diagnosis may nevertheless be useful. We have not included immature stages in this review, because they are seldom described and hence poorly understood. Despite the limited knowledge about them, the larvae of all laelapids are presumably non-feeding and do not have a pygidial shield, protonymphs have a podonotal shield and typically a mid-sized pygidial shield bearing at most eight pairs of setae, and deutonymphs have a holodorsal shield, typically incised laterally (Evans & Till, 1965a; Lindquist *et al*., 2009). Exceptionally, both the protonymph and deutonymph of some *Jacobsonia* Berlese have a small pygidial shield narrowly separated from a schizodorsal (laterally-incised) shield covering the rest of the idiosoma (Casanueva & Johnston, 1992b).

We followed Lindquist *et al*. (2009) in considering the bee-parasitic genera *Varroa* and *Euvarroa* Delfinado & Baker in a separate family (Varroidae). These mites are characterised by many derived attributes, including a strongly flattened, hypertrichous idiosoma, with extra setae also present on the epigynal shield, and peritremes looped and shifted to a position lateral to the stigmata.

Diagnosis

Podospermous gamasines, with laelapid-type sperm access system. Idiosoma with holodorsal shield, typically bearing 39 pairs of setae (Figs 1, 2), including *Zx*2–3 (sometimes absent), and commonly 1–5 unpaired *Jx* setae (sometimes more); occasionally, mild to substantial dorsal hypotrichy or hypertrichy, mostly in arthropod associates; seta *Z*5 usually inserted more posteriorly than laterally to *J*5. Presternal area (Fig. 1) typically weakly sclerotised, lineate-reticulate, sometimes sclerotised into a pair of discrete platelets. Sternal shield usually entire, bearing setae *st*1–3 and poroids *iv*1–2; variously modified in many taxa, *e.g*. shortened (and much wider than long), desclerotised or eroded marginally (and leaving *st*1 or *st*3 on unsclerotised cuticle), or fused posterolaterally to endopodal plates (and bearing *st*1–4). Seta *st*4 and poroid *iv*3 usually on unsclerotised cuticle; *st*4 occasionally on endopodal plate or absent; *iv*3

rarely on posterior margin of sternal shield, never both *st*4 and *iv*3 on discrete metasternal platelet. Epigynal shield typically drop- or tongue-shaped, extending posteriorly well beyond coxae IV, usually bearing *st*5 (occasionally on adjacent unsclerotised cuticle or absent); sometimes enlarged, *e.g*. snake-head shaped or broadly flask-shaped and abutting anal shield or fused to it (forming a hologastric shield), and bearing one or more pairs of opisthogastric (*Jv*, *Zv*) setae; shield with anterior hyaline flap usually overlapping the sternal shield posteromedially. Anal shield usually small and inversely subtriangular or pear-shaped; sometimes obovate, triangular, concave anteriorly, or variously enlarged, rarely capturing opisthogastric setae; rarely in terminal position. Peritrematal plate usually narrow, and free or fused anteriorly with dorsal shield, posteriorly free and tapered (rarely fused to parapodal or exopodal plate next to coxa IV, or free and broadened apically). Peritreme variously reduced in arthropod symbionts. Parapodal plate sometimes enlarged. Unsclerotised (soft) lateral and opisthogastric cuticle sometimes hypertrichous, mostly in symbiotic taxa. Chelicera with chelate-dentate digits, including a usually bidentate movable digit; arthrodial envelope with a simple fringed corona (rarely without it, or with elongate simple processes instead); teeth and apical hooks of digits variously reduced in arthropod or vertebrate associates (including parasites). Epistome typically a subtriangular or convex lobe, occasionally pointed apically (rarely truncate or with elongate median tine), with denticulate or smooth margin. Deutosternum typically with six transverse rows of denticles (but ranging from 4–21 rows; exceptionally without denticles) delimited by lateral margins. Palp tarsal claw usually 2-tined, occasionally 3-tined. Pretarsi normally with claws, which are sometimes reduced or absent on leg I, or on all legs (in some arthropod associates). Leg chaetotaxy (Fig. 3), when holotrichous, including: femora I with 13, of which four ventrals (2–5/4–2); genu I and tibia I each with 13 setae (2–3/2, 3/1–2); genu III with nine setae (2–2/1, 2/1–1); genu IV with nine setae (2–2/1, 3/0–1), occasionally ten, including *pv* or two *pl*; tibia III with eight setae (2–1/1, 2/1–1); and tibia IV with ten setae (2–1/1, 3/1–2). Legs of males usually without sexually dimorphic apophyses or spur-shaped setae. Structures variously reduced in arthropod associates, such as the extent and degree of sclerotisation of dorsal, sternal and epigynal shields; dorsal, palp and leg setation, chelicerae, hypostomal structures (setae, corniculi, internal malae), deutosternum and tritosternum; or in contrast, with occasional hypertrichy of the idiosomal dorsum or opisthogaster, or of the legs.

Males with genital aperture (Fig. 2) on anterior margin of a (*i*) holoventral shield, free of exopodal, peritrematal (rarely fused to them) and dorsal shields, sometimes on (*ii*) a sternogenital shield (in some arthropod associates) or (*iii*) sternogenitiventral shield, variously eroded posteriorly and usually well separated from anal shield (almost never with a well-developed ventrianal shield, never with a distinct line of fusion between sternogenital and ventrianal or ventral elements). Male chelicerae with movable digit usually unidentate and with spermatodactyl fused basally with external (ventral or ventrolateral) face of digit and oriented anteriad (not bent basally), mostly simple, finger-like, of various lengths; fixed and movable digits (excluding spermatodactyl) of chelicerae variously regressed in some associates of arthropods or of vertebrates.

This combination of attributes, including the holodorsal shield, especially if bearing *Zx*2–3 or *Jx* setae, tongue-shaped epigynal shield, often expanded posteriorly, small subtriangular or pyriform anal shield, *st*4 on unsclerotised cuticle, peritrematal shield narrow and free posteriorly, convex epistome, six rows of deutosternal denticles, chelicera with bidentate movable digit, and leg I with the above-mentioned chaetotaxy for femur, genu and tibia should distinguish most laelapids from other families of Mesostigmata. Difficulties may arise with arthropod symbionts having regressive morphological attributes. This diagnosis embraces some genera that comprise at least some facultative or obligate parasites, such as those that we included in this work (*e.g*. *Androlaelaps*, *Haemolaelaps*). The females of those as well as other parasitic laelapid genera are relatively similar morphologically to free-living forms. An attempt to separate the parasitic from the non-parasitic laelapids was done by Strandtmann & Wharton (1958). The parasitic forms generally have chelicerae more weakly chelate-dentate and hypertrophied pilus dentilis, but more strikingly the male chelicerae have regressed digits contrasting with a highly developed spermatodactyl. Such male chelicerae, specialised for reproduction and nonfunctional for feeding, may be the evolutionary consequence of living in spatially restricted habitats, *e.g*. nests, where females are readily found for mating, alleviating the need for feeding during a long-term quest for a reproductive partner (Lindquist *et al*., 2020: 61). There are also genera that include both parasitic and predatory species, some of the latter having strongly chelate-dentate chelicerae (*e.g*. *Ulyxes*), and genera that may represent an intermediate position, both ecologically and phylogenetically, between free-living predators and nest-dwelling parasites (*Nidilaelaps*, also included in this catalogue; Radovsky, 1985 and Shaw, 2012). Such taxa appear to blur the boundary between the concepts of Hypoaspidinae and Laelapinae. In any case, the family diagnosis above would require some expansion to accommodate all of the facultative/obligate

parasites of vertebrates. For instance, in addition to female chelicerae variously modified for parasitism (*e.g*. some with attenuate digits for insertion into host tissues to extract blood or lymph; Radovsky, 1985), many laelapid taxa parasitic on vertebrates have distinctive cuticular (non-setigerous) spurs on the coxae (Strandtmann & Wharton, 1958) (*e.g*. in many Laelapinae, Hirstionyssinae, Myonyssinae, and Haemogamasinae or Haemogamasidae of authors) as well as spur-shaped coxal setae and palp coxal (*pc*) seta (*e.g*. some *Neolaelaps* Hirst, *Tur* Baker & Wharton), probably representing adaptations to facilitate the adherence of these mites to their hosts (Radovsky, 1985). Hypertrichy is common, including on unsclerotised idiosomal cuticle, but also on the entire dorsal shield and even the sternal, epigynal and/or anal shields, which may bear unpaired extra setae (*e.g*. Haemogamasinae, Acantholaelapinae) (Evans & Till, 1966; Radovsky & Gettinger, 1999). In some taxa, there is also a tendency for the epigynal shield to capture opisthogastric (*Jv*, *Zv*) setae (*e.g*. three pairs in *Laelaps* and relatives), more so than free-living forms or arthropod associates with shields of similar size, and for the idiosomal setae to be thicker, more spine-shaped, including the post-anal seta. In other cases, idiosomal setae are barbed (Domrow, 1980; Tenorio & Radovsky, 1974). Others have the cheliceral dorsal seta elongate and positioned laterally or an elongate and fimbriate epistome (*e.g*. Haemogamasinae, Mesolaelapinae).

Other dermanyssoid families may be confused with laelapids, and understandably so, given that all other dermanyssoid groups are believed to have originally evolved from some laelapid ancestral stock (Radovsky, 1969, 1985). Dermanyssidae and Macronyssidae can be distinguished from laelapids, and most readily from those that are not parasitic on vertebrates, by having: (*i*) dorsal shield tapering posteriorly (sometimes fragmented in two or more plates in Macronyssidae); (*ii*) epigynal shield usually tapering posteriorly; (*iii*) sternal shield typically very short and much wider than long; (*iv*) tritosternum often with denticulate, hyaline lateral margins basally; (*v*) deutosternum with denticles in a single file (rarely with transverse rows of 2–5 denticles in Macronyssidae); (*vi*) corniculi membranous, typically lobate; (*vii*) peritrematal plate extending into exopodal plate flanking coxa IV. Specifically, macronyssids also have coxa II usually with a coxal spur anteriorly; soft idiosomal cuticle hypertrichous; cheliceral digits edentate, often with hyaline lobes or denticulate processes, without pilus dentilis; and palp trochanter usually with a medioventral keel. Dermanyssidae have the cheliceral shaft (second segment) extremely long and slender, stylet-like, with minute digits. Other dermanyssoid families, including those that are endoparasitic in the respiratory tracts of vertebrates, tend to have strongly derived attributes that make them easily recognisable (Evans & Till, 1979, Lindquist *et al*., 2009).

Members of several gamasine families outside the Dermanyssoidea may be confused with laelapids, primarily because they also have a holodorsal shield and an epigynal shield rounded posteriorly, accompanied by a more or less subtriangular anal shield. The discrimination between laelapids and these families may sometimes be difficult given the morphological diversity of laelapids, especially arthropod symbionts. Eviphididae differ from Laelapidae by having most or all of the following character states (see Mašán & Halliday, 2010): (*i*) *st*4 and *iv*3 usually borne on a metasternal platelet; (*ii*) epistome usually with a narrow lance-like median projection, barbed or plumose; (*iii*) anal shield relatively large, wider than epigynal shield; (*iv*) dorsal shield usually bearing 30 pairs of setae (at most 33); (*v*) cheliceral digits short, stout, with cheliceral movable digit bearing 1–2 teeth, without arthrodial corona; (*vi*) reduced leg chaetotaxy, especially genu I and tibia I, each bearing at most 11 setae, including one *al*, 4–5 dorsals and 2–3 ventrals, but also genu III with 7–8 setae (only one *al*), genu IV with 7–8 setae (only one *al* and four dorsals), tibiae III–IV each with seven setae (1–3/2–1); males with (*vii*) spermatodactyl originating from apical portion of movable cheliceral digit.

Many Pachylaelapidae have large epigynal (genitiventral) shields abutting the anal shield, and other Pachylaelapidae and some Parholaspididae have hologastric shields, thereby superficially resembling laelapids (*e.g*. *Pseudoparasitus* Oudemans, *Ololaelaps* Berlese). However, such members of these two eviphidoid families usually have (*i*) hypotrichous dorsal shield bearing 29–30 pairs of setae; (*ii*) *st*4 and *iv*3 borne on a discrete plate or more often on a sternal-metasternal-endopodal complex, fused to expanded parapodal plates, in turn fused to the peritrematal-exopodal shields. Pachylaelapids usually have reduced leg chaetotaxy, with tibia I typically bearing 12 setae, including five dorsals (2–3/2, 2/1–2) and tibia III seven setae, including one *al* (1–3/2–1); and males have chelicerae with the spermatodactyl originating mostly apically on the movable digit, and often oriented ventrally (not anteriorly as in laelapids) (Mašán, 2007; Mašán & Halliday, 2014). Parholaspidids also have (*iii*) chelicerae with an arthrodial brush-like process; males with (*iv*) spermatodactyl basally recurved, oriented dorsally; (*v*) sternal shield with very broad anterolateral (endopodal) arms; and (*vi*) reduced leg chaetotaxy, genu I and tibia I each typically with 12 setae, including at most five dorsals (2–3/2, 2/1–2). Other pachylaelapids and parholaspidids

have ventrianal shields. Some members of the Leptolaelapidae, a family with possibly mixed affinities (Lindquist *et al*., 2009: 147), resemble laelapids but differ from them by some of the same distinctions of parholaspidids or pachylaelapids, including *st*4 and *iv*3 on a metasternal platelet, sternal shield with broad anterolateral arms, or male with spermatodactyl bent basally. In addition, the males of parholaspidids, pachylaelapids and leptolaelapids typically have strong ventral apophyses on leg II.

Pseudolaelapidae are reminiscent of laelapids that have an expanded epigynal shield. They differ from laelapids most notably by having (*i*) dorsal shield hypotrichous, bearing only 24–25 pairs of setae; (*ii*) *st*4 and *iv*3 on a metasternal platelet; (*iii*) peritrematal shield broadly fused with enlarged parapodal plate; and (*iv*) epistome trispinate (Mašán, 2014).

Some Ascidae resemble laelapids, but differ from them by having: (*i*) anal shield usually suboval (rarely subtriangular) and typically wider than epigynal shield; (*ii*) poroid *iv*3 usually inserted on sternal shield margin (uncommon in laelapids); (*iii*) peritrematal shield fused to exopodal plate beside coxa IV; (*iv*) dorsal shield with *Z*5 generally inserted lateral to *J*5; (*v*) deutosternum usually with seven transverse rows of denticles; (*vi*) femur I with only 12 setae, genu I often with 11–12 setae (sometimes 13) including only five dorsal or only two ventrals, genu III often with 7–8 setae only, lacking *pv*; (*vii*) males with sternogenital and large, well-defined ventrianal shields (Lindquist & Evans, 1965; Lindquist & Moraza, 2009).

Similarly to Ascidae, many laelapid-like Melicharidae have a more (*i*) oval anal shield, rarely subtriangular; (*ii*) pilus dentilis of chelicera usually modified into a hyaline flap (if not, vestigial or absent; setiform in *Orthadenella* Athias-Henriot); (*iii*) movable digit usually with ventral mucro near base; (*iv*) deutosternum with 1–2 of the posteriormost rows of denticles often widened beyond lateral margins; (*v*) dorsal shield with *Z*5 generally inserted lateral to *J*5; (*vi*) femur I with only 12 setae; (*vii*) males with sternogenital shield and usually with well-developed ventrianal shields (Moraza & Lindquist, 2015). Interestingly, a few ascids (some *Antennoseius* Berlese) and melicharids (*Spadiseius* Lindquist & Moraza) have some unpaired *Jx* setae, as do many laelapids.

The females of a few Ameroseiidae have an anal shield accompanying a somewhat tongue-shaped epigynal shield, but usually the (*i*) anal shield is oval and wider than the epigynal shield. In addition, they have (*ii*) a dorsal shield bearing at most 30 pairs of setae, lacking *J*1 and *J*5; (*iii*) sternal shield usually abbreviated, with *st*3 on unsclerotised cuticle or discrete platelets (shield with *st*1–3 in *Brontispalaelaps* Womersley and *Sinoseius* Bai & Gu); (*iv*) deutosternal groove usually with basal row of denticles widened beyond its lateral margins, or with one or more discrete pairs of rows of denticles flanking the groove; (*v*) chelicerae without arthrodial corona; (*vi*) legs hypotrichous: femur I bearing 12 setae, including three ventrals, and genu and tibia I each at most with 12 setae, including only five dorsals (Mašán, 2017).

Arctacaridae and some Epicriidae have drop- or tongue-shaped epigynal shields and an anal shield, but differ from laelapids in many aspects. Most importantly, they are not podospermous, and therefore males have a mid-intercoxal genital opening and lack spermatodactyls. They also have legs relatively hypertrichous, including genu III with ten setae (2–4/2–2) and tibia III with nine setae (2–3/2–2), each including two *pl*, and tibia I with 14 setae (including four ventrals).

Morphological overview

Dorsal idiosoma. A single dorsal shield, usually covering most of the idiosomal dorsum, ranging from: (*i*) broadly oval (rarely subcircular as in *Cyclothorax*, *Melittiphis*, some *Chapalania* Hoffmann & López-Campos and *Sphaeroseius* Berlese), with little to no unsclerotised cuticle exposed dorsomarginally, occasionally extending onto the ventral margins of the idiosoma (*e.g*. some *Gymnolaelaps* Berlese, *Ololaelaps*, *Oloopticus* Karg), to (*ii*) suboval, parallel-sided in its mid-portion and sometimes with distinct "shoulders" in the area of *r*3, or (*iii*) progressively tapered (*e.g*. *Stratiolaelaps*, *Raymentia* Womersley; some *Cosmolaelaps* Berlese, *Dinogamasus* Kramer, *Gaeolaelaps* Evans & Till, *Ljunghia* Oudemans) or about evenly narrowed in posterior half (*Dyscinetonyssus*, most *Coleolaelaps* Berlese); (*iv*) shield margins occasionally (irregularly) eroded (*e.g*. *Acantholaelaps* Joharchi *et al*., *Berlesia* Canestrini, *Narceolaelaps*; many *Coleolaelaps*, some *Dinogamasus*); (*v*) rarely with lateral incisions between podonotal and opisthonotal regions (some *Berlesia* and *Dinogamasus*, most *Coleolaelaps*); (*vi*) shield highly reduced in size in some arthropod-associated taxa (including parasites, *e.g*. *Dicrocheles*) and sometimes moderately (*Apolaelaps*, *Spatholaelaps* Silvestri, many *Myrmozercon*) to significantly truncated/abbreviated posteriorly (*e.g*. *Conolaelaps*,

Dynatochela Keegan, *Iphiolaelaps*, some *Jacobsonia* and *Julolaelaps* Berlese), leaving an extensive area of soft cuticle exposed posteriorly, sometimes also anteriorly (*Katydiseius* Fain & Lukoschus), even with setae (*e.g*. *j*1, *z*1) on soft cuticle (*Berlesia*). Unusual shapes occur in isolated cases, such as the monotypic *Scorpionyssus* Fain & Rack having a dorsal shield with lateral and posterior margins gently concave, and the male of one species of *Sphaeroseius* (*S. ecitophilus* (Mello-Leitão)) with the idiosoma and dorsal shield 8-shaped, constricted medially. Degree of shield sclerotisation varying from heavy (*e.g*. most *Ololaelaps*, *Oloopticus*) to weak, sometimes making it hard to distinguish from adjacent unsclerotised, plicate cuticle (*e.g*. *Conolaelaps*, *Iphiolaelaps*). Exceptionally, the only known male of *Narceolaelaps* has separate podonotal and opisthonotal shields.

Typical free-living forms have 37 pairs of setae on the shield (*j*1–6, *J*1–5, *z*1–6, *Z*1–5, *s*1–6, *S*1–5, *r*2–5) or more often 39 pairs, including two pairs of extra opisthonotal setae *Zx*2–3 (= *px*2–3 of authors; rarely also *Zx*1) (*e.g*. most *Androlaelaps*, *Alloparasitus* Berlese, *Cosmolaelaps*, *Euandrolaelaps* Bregetova, *Gaeolaelaps*, *Gymnolaelaps*, *Haemolaelaps*, *Holostaspis*, *Hypoaspisella* Bernhard, *Laelaspis* Berlese, *Laelaspoides*, *Nidilaelaps*, *Ololaelaps*, *Persicolaelaps* Kazemi & Beaulieu, *Pseudoparasitus*, *Ulyxes*, some *Pneumolaelaps* Berlese, *Stratiolaelaps*); shield also commonly bearing 1–5 unpaired setae (*Jx*) medially between standard *J* setae (at least 25 genera include species with *Jx* setae). These *Jx* setae are usually irregularly scattered between pairs of *J*2–4; certain taxa are characterised by the restriction of *Jx* setae near *J*4, never present anteriorly to *J*3 (*Nidilaelaps*, *Ulyxes*). In some cases, the dorsal shield has fewer than 39 or 37 (without *Zx*2–3) pairs of setae merely because some peripheral setae are not captured by the shield (due to a lateral shift in positions or to shield reduction), such as *r*2–3 (in some *Hypoaspis*, rare *Gaeolaelaps*). In other cases, mild hypotrichy (*e.g*. without *z*1, *z*3, or *z*6) is compounded by some setae being inserted off the shield, including some *r*, *s* and/or *S* setae, resulting in a dorsal shield bearing even fewer setae (*e.g*. scarabaeoid associates *Acantholaelaps*, *Coleolaelaps*, *Dynastaspis* Costa, *Lucanaspis* Costa, *Mumulaelaps* Clark, *Promacrolaelaps* Costa, some *Hypoaspis*). This may also be the case for more severely hypotrichous taxa, exhibiting 22–26 pairs of setae on the dorsal shield (*Blaberolaelaps* Costa, *Conolaelaps*, *Dyscinetonyssus*, *Narceolaelaps*, *Scolopendracarus* Evans) or as few as 8–20 pairs (*Berlesia*, *Chapalaelaps* Gwiazdowicz *et al*., *Dynatochela*, *Iphiolaelaps*, *Katydiseius*, *Scorpionyssus*, most *Ljunghia*, some *Jacobsonia* and *Julolaelaps*), many of which have the dorsal shield reduced in size (relative to the entire idiosoma) and all of which have associations, whether parasitic or not, with arthropods. Setal loss may affect any podonotal and opisthonotal series; quite often, determination of the missing setae is difficult, because of the parallel reduction of shield size, slight change in neighbouring setal positions, or inadequate knowledge of immature stages (which would help track which setae have been lost). Seta *J*5, an otherwise stable seta, is exceptionally lost in *Berlesia*, *Katydiseius* and a species of *Ljunghia*. Setae *Zx*2–3 are usually and *Jx* are nearly always lacking in moderately to strongly hypotrichous species.

Mild hypertrichy, with *ca*. 40–41 pairs of setae on the dorsal shield, occasionally occurs, with the expression of *Zx*1 and/or 1–2 extra pairs in the area between *s* and *r* setae, denoted *ax* by Costa (1961: 5) (*e.g*. some *Androlaelaps*, *Gymnolaelaps*, *Pneumolaelaps*; *ax* may also be present in some *Hypoaceus* Nemati *et al*.). The posteromedian region of the dorsal shield is commonly affected by hypertrichy. Up to 8–12 *Jx* setae occur in some *Androlaelaps*, *Gymnolaelaps*, *Hunteria* Delfinado-Baker *et al*., *Hypoaspisella*, *Ulyxes*, or 10–25 "*Jx*" in some *Cosmolaelaps* and *Pneumolaelaps*; such a larger cluster of unpaired setae (some that may appear paired) may encompass the region of *Z* setae, and the notation *Jx* would therefore not be appropriate for all those setae. A few unpaired podonotal setae may also be expressed between the *j* setae (*jx*), but these generally occur in species showing more substantial hypertrichy (some *Androlaelaps*, *Eumellitiphis* Turk, *Reticulolaelaps* Costa, *Urozercon* Berlese); the same applies to *Jx* setae, *i.e*. many hypertrichous taxa having ranges of 45–60 pairs (*Pogonolaelaps* Nemati & Gwiazdowicz, most *Eumellitiphis* and *Reticulolaelaps*), or 60–80 pairs (*Angosomaspis* Costa, *Laelaspisella*, *Melittiphis*, *Neoberlesia*, most *Urozercon*) of setae on the shield also have many unpaired *Jx* setae. More extreme cases of hypertrichy (*Neohypoaspis*, *Sphaeroseius*, *Suracarus*, *Tropilaelaps*, some *Dinogamasus* and *Myrmozercon*), some with more than 200 irregular "pairs" of setae on the dorsal shield, completely obscure the identity of primary setae. The large majority of these hypertrichous species are variously symbiotic with arthropods. Few genera include both hypotrichous and hypertrichous species, such as *Chapalania* (dorsal shield with 24–46 pairs of setae), but more contrasting cases are found in *Myrmozercon* (from 23 to more than 400 "pairs") and *Scissuralaelaps* Womersley (32–125 pairs). Despite the loss of a few specific dorsal setae in some species, *Dinogamasus* are overall hypertrichous and quite variably so, with *ca*. 46 to more than 250 irregular pairs of setae on the dorsal shield. Considerable variability also occurs in *Jacobsonia* (dorsal shields with 13–40 pairs of setae) and *Julolaelaps* (9–40 pairs), in part due to the dorsal shield being reduced in some species.

Idiosomal setae are typically (*i*) simple, *i.e*. smooth, relatively slender, and most often short to mid-sized (more or less acicular), and subequal (*i.e*. more or less uniform in length). Marked shortening or lengthening of setae occur most often in arthropod-associated taxa, with (*ii*) minute setae, particularly on the dorsal shield (most or all setae on dorsal shield of the myriapod associates *Conolaelaps*, *Iphiolaelaps*, *Narceolaelaps*, *Jacobsonia*, and scarab and bee associates *Angosomaspis* and *Neohypoaspis*), or (*iii*) very long, whip-like setae (*e.g*. beetle or ant associates *Coleolaelaps*, *Laelaspis*, and some species of spider-associated *Ljunghia*), sometimes with a few specific dorsal setae distinctly longer than others, some often having shifted to more marginal positions (*e.g*. *z*4, *s*4–5). Most notably, "marginal" setae *j*3, *z*4, *Z*4, *s*4–5 and/or S5, and often *Jv5* are variously elongate in scarabaeoid associates *Acantholaelaps*, *Dynastaspis*, *Hypoaspis*, *Lucanaspis*, *Mumulaelaps* and the cockroach associate *Blaberolaelaps*. Sometimes, the longer marginal setae contrast strikingly with the minute central setae (*Blaberolaelaps*, *Chapalaelaps*, *Chapalania*, *Scorpionyssus*, some *Berlesia*, and rare *Androlaelaps*, *Hypoaspis* and *Julolaelaps*). In other taxa, the setae are progressively longer in anterior (*Raymentia*, some *Pneumolaelaps*), posterior or latero-marginal regions of the shield (*Bisternalis*, *Urozercon*, some *Holostaspis*, *Laelaspis*, *Pogonolaelaps*, *Pneumolaelaps* and *Ulyxes*). The elongation of the dorsomarginal setae tends to co-occur with that of insertion of the marginal setae on unsclerotised ventral and lateral cuticle (*e.g*. *R*, *UR*, *Jv*4–5). Seta *Z5* is distinctly longer than the surrounding setae in various taxa (*e.g*. some *Androlaelaps*, many *Haemolaelaps*, *Holostaspis*, *Hyposternus* Joharchi & Halliday, *Jacobsonia*, *Julolaelaps*, *Narceolaelaps*, *Stigmatolaelaps* Krantz, *Xylocolaelaps* Royce & Krantz, and rarely *Pseudoparasitus*); sometimes, *j*1 is also longer (*e.g*. *Laelaspoides*, some *Julolaelaps*; and *Hyposternus*, but less so). Otherwise, setae *j*1, *z*1 and *J*5 are typically shorter, and *Jv*5 longer, than the surrounding setae. Occasionally, posteriormost setae *J*4–5 and *Z*5 are inconspicuously barbed in contrast to other setae being smooth; occasionally other posteromarginal setae are barbed, including *S*4–5 and some *Jv*, *Zv* and *R* setae (*Laelaspis*, *Laelaspoides*, *Pogonolaelaps*), or even most dorsal setae (some *Haemolaelaps*, *Holostaspis*, *Laelaspis*, *Myrmozercon*, rare *Gaeolaelaps*, *Reticulolaelaps*). In some groups (*Cosmolaelaps*, *Laelaspis*, *Pogonolaelaps*), dorsal setae have an asymmetric lobe near the base; this lobe may be present but less conspicuous in other taxa (*e.g*. *Stratiolaelaps*). In various taxa, some dorsal setae are thickened into stout spurs (central setae in *Dyscinetonyssus*), short spines (*e.g*. dorsomarginal setae in *Melittiphis*), bulbous (most dorsal setae in *Scolopendracarus*), or stout, capitate or spatulate (dorsomarginal setae in *Eumellitiphis* and *Neohypoaspis*, respectively) setae. More unusually, species of *Cosmolaelaps* and *Stratiolaelaps* have most dorsal and opisthogastric setae spatulate-tricarinate or leaf-like; some *Cosmolaelaps* have scimitar-like setae. Some *Cyclothorax* species have corkscrew-shaped setae along the posterior margin of the dorsal shield, some *Reticulolaelaps* have the dorsal setae falcate or curly, and one *Myrmozercon* species (*M. cyrusi* Ghafarian & Joharchi) has setae inconspicuously clubbed apically.

Ventral idiosoma. The tritosternum is typically well developed, with conspicuously pilose laciniae and with an elongate, flattened base delimited distally from the laciniae in free-living laelapids. Laciniae are entirely free from each other or fused together for a short basal portion. In some arthropod associates, the tritosternum, including laciniae, is variously reduced in size (*Conolaelaps*, *Gecarcinolaelaps*, *Scolopendracarus*, *Suracarus*) or laciniae smooth or with reduced, inconspicuous pilosity (*Bisternalis*, *Conolaelaps*, *Dicrocheles*, *Dyscinetonyssus*, *Iphiolaelaps*, *Jacobsonia*, *Myrmozercon*, *Narceolaelaps*, *Stevelus* Hunter, *Tropilaelaps*, apparently also *Spatholaelaps*). Occasionally, laciniae are fused for a quarter or more of their length (*Bisternalis*, *Laelaspisella*, *Reticulolaelaps*). Remarkably, the lateral margins of the tritosternal base of *Haemolaelaps* species are barbed.

The presternal area is typically (*i*) weakly sclerotised, lineate-reticulate and often granulate/microtuberculate (*e.g*. *Androlaelaps*, *Gaeolaelaps*, *Haemolaelaps*, *Hypoaspis* and many related genera). The (weakly) sclerotised area is sometimes divided in two discrete zones or most often medially coalesced; (*ii*) sometimes more heavily sclerotised into a pair of presternal platelets (*Gymnolaelaps*, *Hypoaceus*, *Laelaspisella*, *Ololaelaps*, *Persicolaelaps*, *Pseudoparasitus*; some *Alloparasitus*, *Hypoaspisella* and *Pneumolaelaps*), these sometimes bordered by weakly sclerotised, lineate-granulate surfaces; (*iii*) the presternal area of most *Stratiolaelaps* has a series of sclerotised ridges; (*iv*) presternal platelets are presumably fused to the sternal shield when the latter has a bilobed anterior margin (some *Holostaspis*, *Laelaspis*, *Myrmozercon*); or (*v*) presternal area is unsclerotised and undifferentiated from soft plicate cuticle in many arthropod associates. More remarkably, (*vi*) the presternal area of *Melittiphis* has an elongate plate that bears a keel-like ridge medially. It should be noted that weakly sclerotised presternal areas may sometimes have been overlooked and not always described accurately in the literature, and that weakly sclerotised surfaces versus well-sclerotised platelets might be part of a continuum.

The sternal shield is (*i*) usually well-developed and entire, bearing setae *st*1–3 (exceptionally, *Chapalania*

erichi Gwiazdowicz & Nemati has no setae, only with setal alveoli) and poroids *iv*1–2, and incorporating endopodal elements that extend between coxae I–II and coxae II–III as endopodal arms, which are usually short, tapered; anterior endopodal arm between coxae I–II occasionally long and narrow or moderately broad (*e.g*. *Cyclothorax*, some *Gaeolaelaps*), rarely (*ii*) markedly broad (in *Stratiolaelaps*, *Hunteria*); the endopodal arm between coxae II–III is also broad in *Meliponaspis* Vitzthum, with the shield anteriorly expanded and overlapping the base of the subcapitulum. When entire (bearing *st*1–3), shield typically extending posteriorly to mid-level of coxae III; ranging from (*iii*) short and much wider than long (*e.g*. many *Ljunghia*, some *Androlaelaps*, *Pneumolaelaps*, *Stigmatolaelaps*, *Sphaeroseius*); to (*iv*) much longer than wide (*e.g*. some *Gaeolaelaps*), with extremes exhibited by *Jacobsonia* with shield extending to level of posterior edge of coxae III (apparently correlated with their elongate idiosoma), or further in *Oloopticus* (in which the shield is fused to endopodal plate). Shield with (*v*) some or all endopodal fragments separate from shield and/or shield margins eroded (in *Acantholaelaps*, *Dyscinetonyssus*, *Gecarcinolaelaps*, *Mumulaelaps*, most *Coleolaelaps*); (*vi*) shield eroded or desclerotised anteriorly, so that *st*1 is on a weakly sclerotised area (*Acantholaelaps*, *Mumulaelaps*, *Cyclothorax*, and some *Androlaelaps*, *Coleolaelaps*, *Dinogamasus*, *Gaeolaelaps*, *Hypoaspisella*, *Nidilaelaps*); (*vii*) shield reduced posteriorly, with *st*3 (*Berlesia*, most *Dinogamasus*, some *Cyclothorax* and *Dicrocheles*), or *st*2 and *st*3 (*Katydiseius*, *Scorpionyssus*, and some *Dinogamasus*) inserted on unsclerotised cuticle; shield deeply eroded posteromedially in *Raymentia* and some *Myrmozercon*, although bearing all sternal setae. Shield (*viii*) largely desclerotised centrally in *Hyposternus* (leaving only anterior and lateral sclerotised strips) and *Myrmozercon sternalis* Babaeian *et al.* (leaving posterior and lateral strips), and entirely desclerotised in *Scolopendracarus*, with the area occupied by transversely striate cuticle; (*ix*) divided longitudinally in *Iphiolaelaps* and *Scissuralaelaps*; (*x*) setae *st*1 borne on a distinct platelet adhered to the main shield portion in *Melittiphisoides* Delfinado-Baker *et al*. or partly or entirely detached from the rest of the shield in *Bisternalis* (and apparently also in *"Hypoaspis*" *favosus* Turk); shield (*xi*) widened posteriorly and markedly concave in several genera (*Laelaspisella*, *Persicolaelaps*, *Pogonolaelaps*, *Reticulolaelaps*, *Urozercon*, most *Bisternalis*, many *Myrmozercon*), apparently to accommodate a large epigynal shield that is expanded anteriorly, often resulting in setae *st*3 being 2–3 times as far apart as setae *st*1. Shield exceptionally (*xii*) bearing a few extra, unpaired setae in some *Dinogamasus*. Setae *st*1–5 are nearly always simple; *st*2 with a strongly bulbous base in *Melittiphisoides*.

The metasternal seta (*st*4) is typically (*i*) inserted on unsclerotised cuticle, along with companion poroid *iv*3; *st*4 occasionally (*ii*) inserted on or at least situated over the endopodal plate (*e.g*. in *Laelaspis*, and some *Bisternalis*, *Eumellitiphis*, *Melittiphis* and *Pneumolaelaps*); exceptionally, (*iii*) on the posterolateral margin of the sternal shield (some *Ololaelaps*); *st*4 (*iv*) absent in some taxa (*Dicrocheles*, *Gecarcinolaelaps*, *Hypoaceus*, *Laelaspisella*, *Persicolaelaps*, *Pogonolaelaps*, *Reticulolaelaps*, *Urozercon*; some *Dinogamasus*, *Ljunghia*, *Myrmozercon*, *Scorpionyssus*; rarely *Jacobsonia* and *Narceolaelaps*), and with setal alveoli modified as circular pits (without setae) in *Oloopticus*. Poroid *iv*3 is borne on the sternal shield near the posterolateral margin in a few taxa (*e.g*. *Melittiphis*, *Pogonolaelaps*, *Reticulolaelaps*, some *Gaeolaelaps* and *Myrmozercon*; not to be confused with vestigial gland openings *gv*1, which are more medially positioned on the shield margin when present). Rarely, sternal shield fused posteriorly to endopodal plate, bearing *st*1–4 (*Melittiphisoides*, *Oloopticus*, *Spatholaelaps*; some *Myrmozercon*; also in some *Reticulolaelaps* although bearing only *st*1–3, with *st*4 absent). Posterior endopodal plate usually (*i*) well-developed, arching between coxae III–IV; sometimes (*ii*) reduced or absent, especially in less sclerotised mites, or (*iii*) fused to sternal shield (see above). Endopodal plate sometimes narrowly abutting sternal shield or (at least appearing to be) narrowly fused to it.

The epigynal shield is usually posteriorly rounded, hence drop- or tongue-shaped, and nearly always (*i*) extending well beyond posterior margin of coxa IV; (*ii*) shield not extending or barely extending past level of coxa IV in some taxa with markedly reduced shields, with *st*5 borne on or near posterolateral corners of shield (*Dynatochela*, *Iphiolaelaps*, most *Jacobsonia*, and to a lesser degree *Gecarcinolaelaps*, *Katydiseius* and some *Berlesia*). Shield typically (*i*) distant from the anal shield; sometimes (*ii*) longer and reaching the anal shield, whether narrowly if shield is acuminate and snake-head shaped (some *Bisternalis*, rare *Laelaspis*) or subtriangular (*Urozercon*; some *Tropilaelaps*); or (*iii*) broadly abutting the anal shield if the shield is truncate, and flask- or bottle-shaped (*Gymnolaelaps*, *Melittiphisoides*, *Nidilaelaps*, *Pseudoparasitus*, *Reticulolaelaps*; some *Alloparasitus*, *Eumellitiphis* and *Ulyxes*), long and rectangular (some *Tropilaelaps*) or broadly rounded (most *Laelaspis*; some *Pogonolaelaps*). In such cases, the shield is variously expanded posterolaterally, sometimes reaching the level of lateral edges of acetabula IV. Rarely, (*iv*) an expansive epigynal shield covers most of the opisthogaster but without reaching the

anal shield (*Sphaeroseius*, *Jacobsonia tertia* Vitzthum). Relatively large, snake-head shaped epigynal shields often do not reach the anal shield (some *Bisternalis*, most *Holostaspis*, *Myrmozercon*). The epigynal shield is (*v*) fused to the anal shield and therefore hologastric (genitiventrianal) in three genera (*Neoberlesia*, *Ololaelaps*, *Oloopticus*). From our knowledge, no females have a discrete "ventral" shield between epigynal and anal shields (but see below for rare male cases). The epigynal shield is somewhat shaped like an axe head in a few taxa (*e.g*. *Persicolaelaps*, some *Eumellitiphis*). It is remarkably broad anteriorly and occupies most of the area between coxae III–IV in some taxa (some *Laelaspis*, *Ololaelaps* and *Pogonolaelaps*, *Pseudoparasitus hajiqanbari* Kazemi and apparently also in *Apolaelaps*), sometimes distinctly reaching level of coxae II (*Laelaspisella*, *Persicolaelaps*, some *Bisternalis*, *Holostaspis*, *Myrmozercon*). Anteriorly, the epigynal shield has a hyaline flap that is broadly rounded (more rarely tapered), covering the ovipore and typically overlapping the posterior portion of the sternal shield; occasionally not overlapping the sternal shield, mostly in cases of overall reduction in size of the epigynal shield (*e.g*. *Dinogamasus*, *Gecarcinolaelaps*; some *Jacobsonia* and *Julolaelaps*), but also in taxa with mid-sized epigynal shield (*e.g*. some *Gaeolaelaps*). The epigynal shield typically (*i*) bears only (genital) setae *st*5; occasionally, *st*5 (*ii*) is on adjacent unsclerotised cuticle in cases where the shield is small or narrowed (*Dinogamasus*, *Dyscinetonyssus*, *Scorpionyssus*, some *Coleolaelaps* and *Raymentia*) or of moderate size (*e.g*. *Mumulaelaps*); *st*5 is still on the shield in several cases where the shield is small or narrow (*e.g*. *Conolaelaps*, some *Jacobsonia*, *Julolaelaps* and *Scissuralaelaps*). When the epigynal shield is expanded posterolaterally, (*iii*) it bears 1–5 additional pairs of setae (among *Jv*1–3, *Zv*1–2), exceptionally more in cases of hypertrichy (in *Sphaeroseius*). Seta *st*5 is rarely absent (some *Myrmozercon* and *Ljunghia*, rare *Jacobsonia*, and in some individuals of the monotypic *Dyscinetonyssus*). Extraordinarily, the epigynal shield is absent (*i.e*. unsclerotised) and the ovipore exposed between coxae IV in the peculiar genus *Suracarus*. The epigynal shield varies from essentially smooth to variously reticulate, lineate or granulate. Typically, it has two diagonal lines or ridges converging anteriorly and more or less reaching each other medially near level of *st*5, somewhat forming an inverted-V or -U shaped ridge; in more expansive shields, there may be an additional, parallel inverted-V or -U ridge (*Laelaspis*). Inverted-V or -U ridge frequently enclosing posteriorly a series of transverse striae (*e.g*. *Androlaelaps*, *Gromphadorholaelaps* Till, *Haemolaelaps*, *Nidilaelaps*, *Ulyxes*), additional (not inverted) U- or V-shaped striae (*Bisternalis*, *Holostaspis*, some *Myrmozercon*), or reticulation (in species across many genera), resulting in variously shaped cells, from few large to many small or narrow cells, the pattern of which may be characteristic of genera or sibling species.

The anal shield is usually (*i*) small and inversely subtriangular or pear-shaped, sometimes (*ii*) drop-shaped, (*iii*) obovate or oval, (*iv*) distinctly triangular (some *Haemolaelaps*, *Hypoaceus*, *Laelaspis*, *Myrmozercon*, *Nidilaelaps*, *Pogonolaelaps*, *Scissuralaelaps*, *Ulyxes*), (*v*) concave anteriorly (*Urozercon*, some *Holostaspis*, *Laelaspis* and *Myrmozercon*; slightly in *Hunteria*) or crescent-shaped (some *Bisternalis*), often in combination with a snake-head shaped epigynal shield; rarely (*vi*) somewhat diamond-shaped (*e.g*. *Berlesia*, some *Stratiolaelaps*). It bears three circum-anal setae, rarely with one (*Persicolaelaps*, *Urozercon*, *Myrmozercon chapmani* Baker & Strandtmann, some *Sphaeroseius*) or 2–3 (most *Dicrocheles*) additional pairs of setae, in which case the shield is technically a ventrianal shield, although not necessarily larger than typical anal shields (*e.g*. *Persicolaelaps*). The anal shield is (*vii*) enlarged in a few genera, bowl-shaped (*Melittiphisoides*, *Reticulolaelaps*), kidney-shaped (*Neohypoaspis*) or much broader than long (*Eumellitiphis*), broadly oval (*Narceolaelaps*, *Melittiphis*, *Scolopendracarus*), or mostly elongate and subrectangular (some *Dinogamasus*, *Tropilaelaps*). The anal shield is seldom in a terminal position (most *Dicrocheles*; *Dyscinetonyssus*, *Scorpionyssus*, some *Ljunghia*, *Myrmozercon*, *Narceolaelaps*, *Sphaeroseius*). The anal opening is typically near the centre of the anal shield, sometimes in anterior (*Dinogamasus*, *Dynatochela*, *Gecarcinolaelaps*, *Hyposternus*, *Neohypoaspis*; some *Bisternalis*) or posterior portion (*e.g*. *Melittiphis*, some *Gaeolaelaps*, *Gymnolaelaps*, *Narceolaelaps* and *Pseudoparasitus*; *Myrmozercon beardae* Shaw & Seeman); this may be correlated with an anterior or posterior expansion of the shield. Also sometimes correlated with these changes are the position of para-anal setae, which are usually inserted at the level of the anal opening, occasionally posterior (*e.g*. *Berlesia*, *Ljunghia*, some *Bisternalis*) or anterior to it (*Narceolaelaps*, *Melittiphis*, some *Myrmozercon*). The anal shield is apparently desclerotised around the anal opening in some arthropod associates (some *Jacobsonia*, *Neohypoaspis*, *Scissuralaelaps*; perhaps also in *Cyclothorax*). Circum-anal setae of various size, with post-anal seta often (*i*) subequal to para-anal setae, with relative lengths variable within genera; sometimes (*ii*) distinctly longer and/or thicker than para-anal setae (*Apolaelaps*, *Blaberolaelaps*, *Chapalania*, *Cyclothorax*, *Haemolaelaps*, *Holostaspis*, *Hyposternus*, *Stevelus*, *Xylocolaelaps*, many *Coleolaelaps* and *Laelaspis*, some *Ulyxes*); or (*iii*) distinctly shorter than para-anal setae in a few taxa (*Dyscinetonyssus*, *Scorpionyssus*). Circum-anal setae are very

long and spine-shaped in *Urozercon*, most notably para-anal setae; they are stout in *Melittiphisoides*. Post-anal seta is absent in some *Jacobsonia*, in ant associate *Gaeolaelaps invictianus* Walter & Moser, and apparently also in *Dynatochela*. The anal shield is absent in *Suracarus*. The anal shield of *Melittiphis* bears a unique non-setigerous spur anterior to the anus.

The exopodal plate is either a broad strip (in highly sclerotised mites, *e.g*. *Ololaelaps*, *Oloopticus*, *Persicolaelaps*) or more typically a narrow strip alongside coxae I–IV, or reduced to small triangular remnants between coxae, or entirely absent. The parapodal plate (section of exopodal plate behind coxa IV) is typically narrow and inconspicuous, absent, or variously enlarged (in *Gymnolaelaps*, *Hypoaceus*, *Ololaelaps*, *Oloopticus*, *Pogonolaelaps*, *Pseudoparasitus*; some *Bisternalis*, *Eumellitiphis* and *Laelaspis*; to a lesser degree in *Blaberolaelaps*, *Laelaspisella*, *Persicolaelaps*, *Spatholaelaps*, and some *Julolaelaps*, *Melittiphis*, *Nidilaelaps*, *Reticulolaelaps*, *Scissuralaelaps*, *Tropilaelaps*, *Ulyxes*). Rarely, the parapodal plate is narrowly fused to hologastric shield, via the metapodal plate (some *Ololaelaps*). One or two pairs of small metapodal plates usually present behind coxa IV; rarely enlarged (*Neohypoaspis*, some *Eumellitiphis*, *Ulyxes*), or partly or entirely integrated into an expansive epigynal shield (*Hypoaceus*, *Ololaelaps*); entirely absent in some of the less sclerotised taxa (*e.g*. *Conolaelaps*, *Dinogamasus*, *Iphiolaelaps*, *Jacobsonia*, *Scolopendracarus*). It should be noted that exopodal and parapodal plates are sometimes difficult to discern, being often obscured by basal leg segments, hence details about these structures may require verification, especially for older publications.

The peritreme is usually (*i*) long (reaching level of coxa I, or level between setae *s*1 and *z*1) in most genera, but (*ii*) strongly reduced (reaching at most level of coxa III) or absent in many arthropod associates (*Berlesia*, *Conolaelaps*, *Dicrocheles*, *Dinogamasus*, *Dynatochela*, *Iphiolaelaps*, *Iphiopsis*, *Jacobsonia*, *Katydiseius*, *Narceolaelaps*, *Neoberlesia*, *Scolopendracarus*, *Suracarus*; some *Julolaelaps*, *Myrmozercon* and *Urozercon*), and few beetle-associated *Gaeolaelaps*; (*iii*) moderately reduced in some species of various taxa, reaching level of coxa II (*e.g*. *Apolaelaps* (seemingly), *Chapalania*, *Spatholaelaps*, *Stevelus*, *Xylocolaelaps*, some *Blaberolaelaps*, *Coleolaelaps*, *Euandrolaelaps*, *Eumellitiphis*, *Gaeolaelaps*, *Gromphadorholaelaps*, *Pseudoparasitus*, *Raymentia* and *Scissuralaelaps*); barely reaching coxa II in *Dyscinetonyssus*. The peritreme is (*iv*) conspicuously broader in a few genera (*e.g*. *Pneumolaelaps*, *Stevelus* and apparently in *Blaberolaelaps*). The stigma is typically about as wide as the peritreme, but distinctly enlarged in *Raymentia*, *Stigmatolaelaps* and *Dinogamasus*. Construction of the peritreme is typically gamasine in form, rarely embellished with internal cellular structures (some *Berlesia*). The peritrematal plate is usually (*i*) narrowly developed dorsolaterad of the peritreme, including a portion bearing poroid *id*3 and gland opening *gd*3 at level between coxae III–IV; sometimes (*ii*) minimally developed (with barely any bordering cuticle) or entirely absent; the plate is (*iii*) broad in *Stratiolaelaps* Berlese, *Reticulolaelaps*, and some *Ololaelaps*. In some cases, it is (*iv*) strongly reticulate (*Stratiolaelaps*). Anteriorly, the peritrematal plate is either (*i*) narrowly fused to dorsal shield (typically in free-living forms), (*ii*) broadly fused to shield, including laterally (*e.g*. *Oloopticus*; males of some *Ololaelaps*), or (*iii*) free, especially in arthropod associates with less sclerotised idiosoma and/or reduced peritremes. Exceptionally, *Suracarus* has short peritremes on a plate entirely coalesced with the dorsal shield. Posteriorly to stigma, the peritrematal plate is usually (*i*) free, tapering to about mid-level or posterior edge of coxa IV; occasionally (*ii*) extending beyond coxa IV (*Melittiphis*, *Urozercon*, some *Laelaspis*, *Ololaelaps*, *Reticulolaelaps*, *Holostaspis iranicus* (Babaeian & Nemati), *Pseudoparasitus hajiqanbari* and rare *Gaeolaelaps*); rarely expanded apically (*Alloparasitus oblongus* (Halbert)); occasionally (*iii*) narrowly fused to exopodal plate alongside coxa IV (some *Hypoaspisella*, *Nidilaelaps*, *Ulyxes*; rare *Coleolaelaps* and *Gaeolaelaps*) or entirely fused to exopodal strip (some *Scissuralaelaps*); or curving posteriad of coxa IV and coalesced with parapodal plate (*Gecarcinolaelaps*, *Scorpionyssus*, and some *Berlesia*, *Dicrocheles*, *Jacobsonia*, *Neohypoaspis* and rare *Ljunghia* and *Myrmozercon*) or fused to enlarged parapodal plate (some *Ololaelaps*, rare *Gymnolaelaps*); rarely (*iv*) fused to hologastric shield (some *Ololaelaps*). Post-stigmatic region of shield typically bearing two or three pore-like structures, including 1–2 poroids ("*ip"*, the closest to stigma being specifically *id*7) and one gland opening ("*gp"* or *gdp*).

The opisthogaster usually bears (*i*) 8–10 pairs of *Jv* and *Zv* setae on unsclerotised cuticle (except those captured by enlarged epigynal shields or, rarely, by small ventrianal shields), including five *Jv* and 3–5 *Zv*, being flanked by some *R* and/or *UR* setae. Unsclerotised lateral cuticle bordering the dorsal shield typically bears 7–10 setae on each side, including *r*6, *R*1–6 and 0–3 *UR* setae (other than setae that shifted from the dorsal shield to unsclerotised cuticle, as mentioned previously). Unsclerotised cuticle occasionally (*ii*) hypotrichous, with as few as five pairs of *Jv-Zv* setae, and *r*6 and *R* setae absent, or only *r*6 or *R*1 present; (*iii*) moderately hypertrichous

(some *Berlesia*, *Chapalania*, *Dicrocheles*, *Gaeolaelaps*, *Haemolaelaps*, *Ljunghia*, *Melittiphisoides*, *Mumulaelaps*, *Scissuralaelaps* and *Stigmatolaelaps*) or (*iv*) markedly hypertrichous, especially in the region of *R*-*UR* setae but also often in the region of *Jv*-*Zv* setae, in taxa associated with arthropods or vertebrates (*Acantholaelaps*, *Angosomaspis*, *Melittiphis*, *Sphaeroseius*, *Suracarus*, *Tropilaelaps*; some *Androlaelaps*, *Cyclothorax*, *Dinogamasus*, *Myrmozercon*, *Narceolaelaps*, *Pneumolaelaps* and *Ulyxes*). The unsclerotised dorsolateral cuticle of *Neohypoaspis* has a hypertrichous marginal series of tightly spaced (spatulate) setae; *Eumellitiphis* has a similar series of (capitate) setae, but which is only slightly hypertrichous. Setae on unsclerotised cuticle are *tylochorous* (*i.e*. setae borne on individual minute sclerites; Athias-Henriot 1969) in several taxa (*Bisternalis*, *Hunteria*, *Melittiphis*, *Pogonolaelaps*, *Tropilaelaps*; some *Holostaspis*, *Laelaspis*, *Myrmozercon* and *Gaeolaelaps*).

Males typically have a (*i*) holoventral shield, covering all the intercoxal region and most of the opisthogastric region, somewhat triangular posteriorly, without merging with exopodal or peritrematal plates, typically bearing *st*1–5 and 4–5 pairs of opisthogastric (*Jv*-*Zv*) setae. Occasionally, males have a holoventral shield (*ii*) fused with parapodal-exopodal plate (*Eumellitiphis*, *Hypoaceus*, *Oloopticus*, and some *Pseudoparasitus*), sometimes also to peritrematal shield (some *Nidilaelaps*, *Ololaelaps*). This basic form of the holoventral shield is subject to various reductions in the opisthogastric region, starting with the shield being narrowed laterally, thereby bearing fewer opisthogastric setae (in many taxa, *e.g*. *Androlaelaps* and *Gaeolaelaps*). More reductions result in males having a (*iii*) sternogenitiventral shield, bearing 3–5 pairs of opisthogastric setae, relatively distant from the anal shield (some *Gaeolaelaps*, *Hypoaspis*, *Myrmozercon*, and *Holostaspis flexuosa* (Michael)), or shield eroded and weakly expanded in the opisthogastric region, and bearing only 1–3 pairs of opisthogastric setae (*Blaberolaelaps*, *Dynatochela*, *Mumulaelaps*, *Pogonolaelaps termitophilus* Joharchi *et al*., some *Androlaelaps*, *Cosmolaelaps*, *Laelaspoides*, *Myrmozercon* and *Scissuralaelaps*), or not capturing any opisthogastric setae (*Neohypoaspis*, *Tropilaelaps* and some *Coleolaelaps*); or a (*iv*) sternogenital shield, not extending posteriorly beyond coxa IV, bearing *st*1–5, usually eroded posteriorly, sometimes resulting in *st*5 (rarely other setae) being off the shield (*Berlesia*, *Dicrocheles*, *Dinogamasus*, *Gecarcinolaelaps*, *Jacobsonia*, *Narceolaelaps*, *Scorpionyssus*, *Suracarus*; some *Julolaelaps*, *Ljunghia* and *Scissuralaelaps*), rarely not more developed than the sternal shield of females, bearing only *st*1–3 (*Dyscinetonyssus*), or so eroded that it is present as 2–3 shield fragments bearing only 2–3 pairs of sternal setae, other setae being on soft cuticle (some *Coleolaelaps*). In some taxa, variable desclerotisation may result in narrowly separated sternogenitiventral and anal shields (*e.g*. few *Gaeolaelaps*) or in an irregularly formed ventral shield between sternogenital and anal shields (*Acantholaelaps*; and *Cyclothorax*, with a very reduced, discrete posterior fragment overlapping intercoxal and opisthogastric regions). Sometimes, males have (*v*) a broadly expanded sternogenitiventral shield abutting the anal shield (*Reticulolaelaps*, *Sphaeroseius*, some *Androlaelaps* and *Pogonolaelaps*), and exceptionally a (*vi*) sternogenital shield approximately abutting a well-developed ventrianal shield (*Cosmolaelaps rectangularis* Sheals). Rarely, the anal shield is moderately expanded anteriorly into a small ventrianal shield, capturing a pair of opisthogastric setae (*e.g*. some *Scissuralaelaps*) or into a larger shield bearing many pairs of setae (*Melittiphis*); in such cases, the ventrianal shield has irregular margins and is not abutting the sternogenital shield. Exceptionally, the male of *Melittiphis* has the genital aperture on a (large) presternal plate instead of the anterior portion of (or directly anterior to) the holoventral (or sternogenital or sternogenitiventral) shield.

Gnathosoma. In several arthropod symbionts, the entire gnathosoma is reduced in size with a significant portion of it hidden ventrally under the dorsal shield (*e.g*. *Bisternalis*, *Cyclothorax*, *Holostaspis*, *Iphiolaelaps*, *Iphiopsis*, *Meliponaspis*, *Melittiphisoides*, *Neoberlesia*, *Sphaeroseius*, *Stevelus*, *Tropilaelaps*, *Urozercon*), in contrast to free-living forms and other arthropod associates, in which most or all of the gnathosoma is visible dorsally. The chelicera usually has well-developed fixed and movable digits, subequal in length (i.e. their apices reaching a similar level), and is chelate (*i.e*. pincer-like, each digit apically hooked). The movable digit usually has two teeth, rarely only one (*e.g*. *Dynatochela*, some *Jacobsonia* and *Laelaspis*) or more than two (*e.g*. *Mumulaelaps*, some *Reticulolaelaps*, *Gaeolaelaps angustiscutatus* (Willmann) in normally chelate chelicerae (see below for more significantly modified chelicerae of symbionts). The fixed digit usually has 1–3 teeth distal to the pilus dentilis, including a laterally-offset tooth ("Gabelzhan" of Hirschmann, 1956) near the terminal hook of the digit. In some taxa, the fixed digit only bears these 1–3 subapical teeth (*e.g*. *Bisternalis*, *Blaberolaelaps*, *Eumellitiphis*, *Hunteria*, *Hyposternus*, *Narceolaelaps*, *Stigmatolaelaps*, and some *Pneumolaelaps*). Species in other genera tend to have more teeth, including one often transversely aligned with the pilus dentilis or more proximal to it. Some species have a serrated row of many small teeth proximal to the pilus dentilis and often flanked by two larger teeth (*Acantholaelaps*, *Angosomaspis*,

Promacrolaelaps; some *Coleolaelaps*, *Cosmolaelaps*, *Euandrolaelaps*, *Gaeolaelaps*, *Hypoaspis*, *Hypoaspisella*, *Lucanaspis*, *Mumulaelaps*, *Pseudoparasitus*, *Scissuralaelaps*, *Stratiolaelaps*); in some *Gymnolaelaps*, this serration is mostly distal to the pilus dentilis. Cheliceral digits are robust and markedly elongate in *Stratiolaelaps*, as well as in *Sphaeroseius*, but with digits more slender and strongly hooked apically. *Raymentia* also has the digits strongly chelate, including a peculiar molar-like crown of small teeth on the fixed digit. Many *Jacobsonia* species have a fixed digit with a long and slender apical process.

A reduction in size and number of teeth, and of apical hooks, has occurred in many arthropod- and some vertebrate-associated taxa, including parasites and other forms of symbionts (*e.g*. commensals), resulting in weakly dentate and weakly hooked digits, sometimes entirely edentate and without apical hooks for one (especially the fixed digit) or both digits (*Dyscinetonyssus*, *Haemolaelaps*, *Holostaspis*, *Iphiolaelaps*, *Melittiphis*, *Myrmozercon*, *Scolopendracarus*, *Stevelus*, *Suracarus*; some *Androlaelaps*, *Laelaspis*, *Ljunghia*, *Ulyxes*); the fixed digit may be considerably reduced in size (*e.g*. *Scorpionyssus*) and in some cases it is absent or vestigial (*e.g*. some *Dinogamasus*, *Myrmozercon*). In other taxa, chelicerae have slender, finger-like digits (*Apolaelaps*, *Cyclothorax*, *Neoberlesia*, *Spatholaelaps*, *Urozercon*), most likely for parasitic feeding on their arthropod hosts. Other parasitic taxa have chelicerae with a robust movable digit bearing one or more strong teeth, and a fixed digit reduced to one (*Berlesia*, *Katydiseius*) or two blunt lobes (*Dicrocheles*). Species of *Dinogamasus* are unusual in having a strong, claw-like movable digit opposed to a most often reduced fixed digit. In nearly all taxa, the movable digit is ventral to the fixed digit except in *Berlesia* and *Katydiseius* where it has shifted to a lateral position relative to the fixed digit, bearing 2–4 large teeth, facing and moving outward. In addition, these two genera, as well as *Iphiolaelaps*, have a cheliceral shaft swollen basally and abruptly narrowed in its apical half or two thirds, in contrast to virtually all other taxa that have shafts of even or slightly tapering width.

The pilus dentilis is usually (*i*) simple, *i.e*. short and setiform. It is moderately thicker or larger than usual in some taxa (*e.g*. *Stigmatolaelaps*, *Xylocolaelaps*), but (*ii*) distinctly inflated in *Androlaelaps* and markedly elongate in *Haemolaelaps*; or (*iii*) vestigial (*Berlesia*) or absent in some taxa with a modified or reduced fixed digit (*Cyclothorax*, *Dicrocheles*, *Dyscinetonyssus*, *Katydiseius*, *Tropilaelaps*, *Urozercon*, and some *Myrmozercon*); it is (*iv*) minute in *Narceolaelaps*. The pilus dentilis is still well-developed in some taxa with reduced fixed digits (*e.g*. *Dinogamasus*). The arthrodial membrane at the base of the movable digit usually (*i*) has a simple corona of short filaments, and no elongate brush-like process (as present in *e.g*. Macrochelidae, Parholaspididae); the corona varies in length and is occasionally distinctly elongate (*e.g*. some *Scissuralaelaps*); occasionally (*ii*) the corona is absent in arthropod associates (*e.g*. *Iphiolaelaps*, *Narceolaelaps*, and females of *Berlesia* but not males); exceptionally, the arthrodial envelope of *Hunteria* lacks a corona but instead (*iii*) bears an elongate and a short, smooth processes. The dorsal cheliceral seta is usually short, but markedly elongate in *Suracarus* and at least some *Urozercon*.

The epistome is typically (*i*) developed as a subtriangular or rounded lobe; sometimes (*ii*) distinctly triangular (*e.g*. *Persicolaelaps*, *Scolopendracarus*, some *Chapalania*, *Laelaspis*, *Pogonolaelaps*), with a (*iii*) short tongue-like median prominence (*Acantholaelaps*, *Dynastaspis*, *Lucanaspis*, *Promacrolaelaps*, most *Coleolaelaps* and *Hypoaspis*), (*iv*) somewhat more elongate, apically rounded (some *Reticulolaelaps*), (*v*) moderately elongate and tapered, acuminate (*e.g*. *Laelaspisella*, *Stevelus*, some *Berlesia*, *Gaeolaelaps* and *Myrmozercon*), (*vi*) with an elongate slender tine (some *Berlesia*, *Ulyxes*), or (*vii*) somewhat truncate, with a median and sometimes lateral tines (*Oloopticus*, *Stratiolaelaps*). The epistome margin varies from smooth to variously denticulate. In *Blaberolaelaps*, the margin appears more fimbriate than denticulate.

The subcapitulum bears a pair of palp coxal (*pc*) setae, and anteriorly, the hypostome bears three pairs of setae (*h*1–3) arranged in a triangular pattern. One pair of *h* setae is lost in *Dicrocheles* (*h*3 usually absent) and some *Jacobsonia* (putatively also *h*3). Seta *pc* is inflated basally in *Berlesia* and some *Dinogamasus*, spine-shaped in *Pneumolaelaps fuscicolens* (Oudemans), and absent in *Scolopendracarus* and some *Myrmozercon*. Usually, *h*3 is very long and the longest, *h*1 mid-sized to long, *h*2 and *pc* short to mid-sized, *h*2 being typically the shortest. All hypostomal setae and seta *pc* are very short in some arthropod associates (*Conolaelaps*, *Dynatochela*, *Iphiolaelaps*, *Jacobsonia*, *Narceolaelaps*, *Stevelus*, most *Julolaelaps*, some *Scissuralaelaps* and *Myrmozercon*), or more rarely all very short except one seta, such as *h*1 (long in *Scorpionyssus*) and *h*3 (long in *Katydiseius* and *Scolopendracarus*). In a few taxa, *h*3 remains mid-sized or long, although contrasting with a distinctly longer *h*1 (*e.g*. some *Coleolaelaps*, *Stratiolaelaps*). Exceptionally, the three hypostomal setae are almost aligned in *Suracarus*.

The deutosternum varies from narrow to moderately wide, typically with (*i*) six, less often (*ii*) five or seven transverse rows of few to numerous denticles, usually ranging from two to more than 30 per row. Several arthropod-

associated taxa have (*iii*) a greater number of transverse rows of denticles, with ranges of 7–8 rows (*Raymentia*, some *Jacobsonia*), 9–16 rows (*Berlesia*, *Dicrocheles*, *Dyscinetonyssus*, *Katydiseius*, *Neohypoaspis*, *Stigmatolaelaps*, *Xylocolaelaps*, and some *Bisternalis*, *Jacobsonia* and *Ljunghia*), and up to 19–21 rows, in *Myrmozercon patagonicus* Trach & Khaustov. Both *Melittiphis* and *Myrmozercon brevipes* Berlese have a very narrow deutosternum, with a single file of about eight denticles (one denticle per row), and many other arthropod or vertebrate associates have rows of mostly 1–2 denticles (*Berlesia*, *Narceolaelaps*, *Scorpionyssus*, *Stigmatolaelaps*, *Tropilaelaps*, *Xylocolaelaps*, and some *Ljunghia*, *Julolaelaps*, *Ulyxes*). *Reticulolaelaps* species have only four rows of denticles. Rarely, the deutosternum has no distinct denticles (*e.g*. *Dinogamasus*, *Suracarus*, some *Urozercon*), or a basal row of denticles widened beyond lateral margins or additional rows flanking deutosternal groove (*e.g*. rare *Gaeolaelaps*). A smooth ridge nearly always precedes the denticulate rows and, sometimes, a smooth ridge follows the denticulate rows posteriorly.

The corniculi are typically (*i*) strongly sclerotised, horn-shaped and undivided apically; distant from each other and subparallel. In taxa comprising mostly vertebrate associates, corniculi are (*ii*) often relatively small (some *Androlaelaps*, *Haemolaelaps*, *Ulyxes*); and (*iii*) markedly shorter and blunt in many arthropod associates (*Dinogamasus*, *Stevelus*, *Suracarus*; some *Holostaspis*, *Ljunghia* and *Myrmozercon*; males of *Berlesia*), notched apically (*Iphiolaelaps*; some *Dicrocheles*, *Holostaspis*, *Ljunghia* and *Myrmozercon*), and/or hyaline, weakly sclerotised (*e.g*. *Melittiphis*, *Reticulolaelaps*; females of *Berlesia*). They may be approximate (*Dinogamasus*, *Dynatochela*) or convergent (*Melittiphis* and *Spatholaelaps*), and they are highly reduced or absent in *Urozercon* and some *Dinogamasus*. Salivary styli typically extend closely beneath the corniculi and reach approximately to the apex of the corniculi, but are longer and/or project laterally to the corniculi in some parasites of arthropods (*e.g*. *Berlesia*, *Cyclothorax*, *Dicrocheles*, *Iphiolaelaps*, *Katydiseius*). The internal malae are usually (*i*) well developed, as two contiguous arms, variably fimbriate, extending approximately as far as or slightly beyond the apex of the corniculi; the latero-basal margins between median arms and the base of corniculi are also fimbriate. There is one (or more rarely two) additional pair(s) of shorter lateral arms, also fimbriate in many taxa (*e.g*. *Gaeolaelaps aculeifer*, *Raymentia*); occasionally the (*ii*) lateral arms are more developed, with a broad, fleshy base and strong fimbriae (*e.g*. *Laelaspoides*) or branching into narrower arms (*Neohypoaspis*). Internal malae are particularly developed in other taxa, with (*iii*) fimbriae of long threads, either very fine (*Laelaspisella*, *Pogonolaelaps*) or thicker, fleshy (*e.g*. *Cosmolaelaps cuneifer* (Michael), *Laelaspis astronomicus* (Koch), *Persicolaelaps*). Several species of *Ulyxes* have some fimbriae with inflated tips, and *Reticulolaelaps* species have complex internal malae, including horn-shaped outer lobes. In contrast, the internal malae are variously (*iv*) reduced in size or fimbriation in many arthropod associates (*e.g*. *Dinogamasus*, *Dyscinetonyssus*, *Gecarcinolaelaps*, *Iphiolaelaps*, *Scolopendracarus*, *Scorpionyssus*, *Stevelus*, *Myrmozercon*).

Palps usually have chaetotaxy typical for Gamasina, with trochanter-femur-genu-tibia-tarsus having 2-5-6-14-15 setae. Deviations from the normal chaetotaxy have been observed in many taxa of arthropod symbionts, with one or more segments affected between trochanter and tibia (tarsus being understudied), each segment bearing respectively fewer than 2-5-6-14 setae, including species of *Conolaelaps*, *Dicrocheles*, *Dinogamasus*, *Dyscinetonyssus*, *Gecarcinolaelaps*, *Iphiolaelaps*, *Jacobsonia*, *Katydiseius*, *Myrmozercon*, *Narceolaelaps*, *Scorpionyssus* and *Urozercon*. In some cases, the palp tibia is fused to the tarsus (some *Myrmozercon*, *Urozercon*). In contrast, *Suracarus* has hypertrichous palps, each segment from trochanter to genu bearing 9–14 setae. The palp trochanter has (inner) seta *v*2 flattened and elongate in *Blaberolaelaps*, and also broadened, foliate in some *Ulyxes*. The palp tarsal claw (apotele) usually has two tines, occasionally three (*Gymnolaelaps*, *Ololaelaps*, *Pogonolaelaps*, *Sphaeroseius*; most *Pseudoparasitus*, and some *Euandrolaelaps*, *Gaeolaelaps*, *Pneumolaelaps*, *Stratiolaelaps*) with the third tine often reduced; and it is exceptionally entire, undivided in *Tropilaelaps* and absent in *Dyscinetonyssus*. In *Laelaspisella*, the palp tarsal claw is associated with an adjacent hyaline lobe. The palp trochanter of *Reticulolaelaps* bears a large paraxial membranous lobe.

In males of free-living forms and many arthropod associates, the chelicerae are chelate-dentate, and include a unidentate movable digit, which bears a spermatodactyl that arises from the external (ventral or ventrolateral) surface of the digit, with the entire apical hook of the digit usually distinct and free from the spermatodactyl. Exceptionally, the spermatodactyl appears to arise from the internal (dorsal) surface of the digit in *Chapalania cifuentesi* Hoffmann & López-Campos and in the monotypic genera *Dynatochela* and *Suracarus*. The spermatodactyl is oriented forward from its junction with the movable digit, not recurved basally or projecting dorsally (as in some Eviphidoidea), ranging from short and not reaching the tip of the movable digit (rarely; *e.g*. *Ulyxes laertes* (Domrow)), to very long (*e.g*. *Berlesia*, *Tropilaelaps*); in its free, apical portion, it is straight or variously curved or bent. In facultative

parasites of vertebrates or nest associates (*Androlaelaps*, *Haemolaelaps*, some *Ulyxes*), the male fixed digit and/or movable digit show various degrees of regression, lacking teeth and apical hooks. A similar tendency occurs in some groups of arthropod symbionts, even in cases where females have relatively normal, chelate-dentate chelicerae (*Conolaelaps*, *Gromphadorholaelaps*, *Hunteria*; some *Julolaelaps*, *Ljunghia*). In taxa parasitic on arthropods (*e.g*. *Berlesia*, *Dicrocheles*, *Neoberlesia*, *Scorpionyssus*, *Tropilaelaps*) or with females having the fixed digit or both cheliceral digits edentate and relatively blunt (*Dinogamasus*, *Dyscinetonyssus*, *Iphiolaelaps*, *Melittiphis*, *Myrmozercon*, some *Holostaspis*), males generally have more reduced or attenuate fixed digits than the female, and the movable digit is largely represented by the spermatodactyl fused to a reduced or vestigial movable digit. In contrast, the males of *Blaberolaelaps* have more robust cheliceral digits than the females (which have digits tapering apically). In *Hunteria*, the spermatodactyl appears to emerge from the apex of the movable digit instead of along the ventral face of the digit.

Legs. Legs I–IV are generally similar in shape and length, although legs I and IV are typically longer. Leg I is sometimes more slender, and this is evident in certain arthropod-associated taxa (*e.g*. *Meliponaspis*, *Melittiphisoides*, *Suracarus*, *Tropilaelaps*) but also in some free-living ones (*e.g*. *Gaeolaelaps aculeifer*). The relative lengths of the legs differ between genera and between species in a given genus, but there are trends in some genera, *e.g*. leg I is markedly longer than legs II–IV in *Neoberlesia*, whereas it is the shortest of all legs in *Coleolaelaps*, *Iphiolaelaps*, *Narceolaelaps* and *Urozercon*; in *Coleolaelaps*, legs III–IV are longer than usual for laelapids. Legs I–II are distinctly shorter than legs III–IV in *Dyscinetonyssus* and *Dinogamasus*, with the respective tarsi markedly shortened. Legs I–II are more robust than legs III–IV in *Dinogamasus* and *Neohypoaspis*, and leg I is the most robust in *Stevelus*. All legs are shortened relative to the idiosoma in some arthropod associates (*Conolaelaps*, *Dynatochela*, *Scorpionyssus*, and some *Myrmozercon*), whereas they are much longer than the idiosoma in *Sphaeroseius*. Femur II in *Chapalania* is unique in being strongly constricted medially.

Pretarsi usually (*i*) have well-developed pulvilli and claws. In many arthropod associates, (*ii*) claws of all pretarsi are reduced (*Berlesia*, *Dicrocheles*, *Katydiseius*, *Meliponaspis*, *Tropilaelaps*, some *Julolaelaps*) or absent/vestigial (*Iphiolaelaps*, *Jacobsonia*, *Spatholaelaps*, *Urozercon*), and pulvilli are sometimes hypertrophied, in the absence of functional claws (*Conolaelaps*, *Narceolaelaps*, *Scolopendracarus*, *Stevelus*, some *Myrmozercon*; claws poorly sclerotised in *Scorpionyssus*); in *Urozercon*, only the pulvillus of leg I is enlarged. In other genera, (*iii*) only the claws of pretarsus I are distinctly reduced (*e.g*. *Chapalaelaps*, *Cyclothorax*, *Ljunghia*, *Melittiphisoides*) or absent (*Iphiopsis*, some *Scissuralaelaps*), sometimes also the pulvillus (*e.g*. *Gecarcinolaelaps*, *Suracarus*).

Leg chaetotaxy and the shape of the setae are highly variable, particularly in symbiotic taxa. Markedly elongate setae (macrosetae) are found on one or more segments of the legs of several related genera associated with scarabaeoid beetles (*Acantholaelaps*, *Angosomaspis*, *Chapalaelaps*, *Chapalania*, *Coleolaelaps*, *Dynastaspis*, *Hypoaspis*, *Lucanaspis*, *Mumulaelaps*, *Promacrolaelaps*). Setae mostly affected are the apicodorsal setae (*ad*1 or *pd*1) of femora (nearly always including femur IV) and genua of legs I–IV, as well as the dorsal setae of tarsus IV and more rarely of tibia IV. Similar macrosetae or a tendency for elongation may occur on the legs of species in other, primarily free-living hypoaspidine genera (*e.g*. *Hyposternus*, some *Gaeolaelaps*, *Pseudoparasitus*), of the cockroach associate *Blaberolaelaps*, and of more distant arthropod symbionts (*e.g*. *Berlesia*, *Dinogamasus*). In other cases, some leg setae are instead thickened into stout spur- or spine-shaped setae. This is often the case of setae in the distal portion of tarsi II–IV (*av*1–2, *pv*1–2, *mv*, *al*1, *pl*1, *md*) of many of the above-mentioned hypoaspidine genera (including some of the scarab associates), as well as some *Alloparasitus*, *Androlaelaps*, *Euandrolaelaps*, *Gymnolaelaps*, *Hypoaceus*, *Persicolaelaps* and *Pneumolaelaps*. Similarly, more derived groups (*Cyclothorax*, *Dinogamasus*, *Dynatochela*, *Dyscinetonyssus*, *Gecarcinolaelaps*) have various bulbous, cone- or spur-shaped setae on tarsi. Coxal setae have evolved into strong retrorse spurs in *Dyscinetonyssus* and *Pneumolaelaps fuscicolens*, or into bulbous shapes in *Berlesia*, *Scolopendracarus* and many *Dinogamasus* (along with some dorsal setae on the genua and tibiae in the last two genera). Some of those modified setae, especially on the coxae and tarsi, are probably adaptations for clinging onto their arthropod hosts. Seta *av* on femur II and ventral setae of genu and tibia of legs II–IV are thickened in many species (*e.g*. some *Alloparasitus*, *Androlaelaps*, *Euandrolaelaps*, *Gaeolaelaps*). The apicodorsal setae of femora II–IV, and to a lesser degree of the genua, also have a tendency to become thickened or spine-shaped (*e.g*. *Bisternalis*, *Blaberolaelaps*, *Conolaelaps*, *Melittiphis*, *Stevelus*, *Stigmatolaelaps*, *Tropilaelaps*, *Urozercon*; some *Gaeolaelaps* and *Myrmozercon*). The identity and degree of thickening or elongation of setae vary significantly between species. Exceptionally, the legs of the mammal associates *Haemolaelaps* and *Ulyxes* typically have many setae respectively barbed and bifid, especially the apicodorsal setae of femora. The legs of *Cosmolaelaps*

and *Stratiolaelaps* have many dorsal setae spatulate-tricarinate, or variously scimitar-like (for some *Cosmolaelaps*), similarly to their dorsal shield setae. Similarly, the related *Eumellitiphis* and *Neohypoaspis* have many leg setae capitate or spatulate, similar to marginal setae of their idiosoma.

The chaetotactic pattern of leg segments presented in Evans & Till (1965a) as normal for Dermanyssoidea (Dermanyssidae sensu Evans & Till, 1965a: 282) was used as a benchmark for preparing diagnoses of genera as well as the brief review that follows. The latter is mostly based on the literature, from which we compiled the leg chaetotaxy patterns of species in order to discern coarse trends between genera. It is far from exhaustive, and the exact homology of setae (that are added or lost) is often not specified because published information is overall limited and determining homologies of setae across so many genera, some exhibiting surprising variability (*e.g*. *Myrmozercon*), is beyond the scope of this publication. It should be noted, however, that hypotrichy tends to involve setae that appear latest during ontogeny (*e.g*. at the deutonymphal stage) first, and secondarily other setae, based on the general knowledge of the Gamasina (Evans, 1963). The normal segmental chaetotaxy of legs I–IV of adults is as follows: coxae 2-2-2-1 setae; trochanters 6-5-5-5; femora 13-11-6-6, or I (2–3/1, 2/3–2) (as *al–ad*/*av*, *pd*/*pv–pl*), II (2–3/1, 2/2–1), III and IV (1–2/1, 1/0–1); genua 13-11-9-9, or I (2–3/2, 3/1–2), II (2–3/1, 2/1–2), III (2–2/1, 2/1–1), IV (2–2/1, 3/0–1); tibiae 13-10-8-10, or I (2–3/2, 3/1–2), II (2–2/1, 2/1–2), III (2–1/1, 2/1–1), IV (2–1/1, 3/1–2); tarsi II–IV 18-18-18, with *ad1* and *pd1* as fine, apical processes. Rarely, the dorsoapical processes (setae *ad*1 and *pd*1) of tarsi II–IV are lacking, as in *Melittiphis*, or poorly developed (*e.g*. in some *Julolaelaps*, Uppstrom & Klompen, 2005). Exceptionally, tarsi II–IV of *Suracarus* have a peripodomeric suture in the distal third, instead of proximal third as usual.

Most taxa with species having hypotrichous or hypertrichous leg segments relative to the normal laelapid pattern are arthropod associates. Genera of species primarily found in soil or associated with the nests of vertebrates, usually have normal chaetotaxy or with few deviations from it; however, several taxa of arthropod symbionts, traditionally classified as Hypoaspidinae (*e.g*. *Pneumolaelaps*), also have relatively normal chaetotaxy. Femora I–II, all genua and tibiae, and trochanter I are frequently hypotrichous, although genua III–IV and tibia III are more commonly hypertrichous. Femora III–IV are also occasionally hypertrichous. Hypertrichy of segments usually involves the addition of one seta, more rarely two setae, whereas hypotrichy often involves the loss of more than two setae.

Coxa I bears a single seta in most *Dicrocheles* species. Coxa IV bears two setae in some *Narceolaelaps* and most *Dicrocheles*, and occasionally has two setae or no setae at all in *Myrmozercon*. Exceptionally, *Myrmozercon iainkayi* Walter has coxae I–IV with 6-6-6-4 setae. Trochanter I has only four setae (lacking two setae) in *Iphiolaelaps*, *Jacobsonia*, *Narceolaelaps*, *Scorpionyssus*; five setae in *Dyscinetonyssus*, *Urozercon* and rare *Gaeolaelaps*; 4–5 setae in *Dicrocheles* and many *Myrmozercon*; and sometimes bears an extra seta, bearing seven setae in total, in the monotypic *Gecarcinolaelaps* (intraspecific variation) and *Myrmozercon* (*M. crinitus* Joharchi). Trochanters II–III have only four setae in *Iphiolaelaps* and *Katydiseius*. Any of trochanters II–IV may have only four setae in some *Dicrocheles* and *Myrmozercon*, and trochanters III–IV of *Jacobsonia* have four setae; six setae are found on trochanter II of *Dyscinetonyssus* and trochanter IV of *Persicolaelaps*, *Gecarcinolaelaps* (intraspecific variation) and some *Dinogamasus*, rarely on trochanters II–IV of *Myrmozercon*.

Femur I bears as few as eight setae (1–2/1, 2/1–1) in several *Myrmozercon*, nine setae in most *Narceolaelaps* (2–2/1, 2/0–2) and ten setae (2–2/1, 2/1–2) in *Conolaelaps*, *Iphiolaelaps* and apparently *Jacobsonia*; ten setae also in *Urozercon* (1–5/3–1) and *Scorpionyssus* (formula uncertain); 11 setae in *Katydiseius* (formula uncertain). Femur I has 12 setae, lacking one *pv*, in many genera including *Berlesia* (usually), *Dicrocheles*, *Dyscinetonyssus*, *Gecarcinolaelaps*, and some species of *Julolaelaps*, *Laelaspisella* (formula uncertain), *Ljunghia*, *Scissuralaelaps*, and rare *Gaeolaelaps*. Femur I is hypertrichous, bearing 14 setae in most *Dinogamasus* (including *ad*3) and in some *Myrmozercon*, *Tropilaelaps*, and *H. flexuosa* (one extra *av*), and apparently 15 setae in *Raymentia* (two extra *av*).

Femur II has eight setae (1–2/1, 2/1–1), having retained the protonymphal setal complement, in *Jacobsonia*, *Scorpionyssus*, and some *Myrmozercon*. It has nine setae (typically lacking one *ad* and one *al*) in *Conolaelaps*, *Katydiseius*, and in rare *Gaeolaelaps* and *Reticulolaelaps*; 8–9 in *Urozercon*; ten setae in *Dyscinetonyssus* (lacking one *ad*), *Iphiolaelaps*, *H. iranicus* and some *Chapalania* (lacking one *al*), *Dicrocheles*, *Narceolaelaps* (lacking one *ad* or one *al*), and some *Chapalaelaps* (lacking *pv*2). Other *Myrmozercon* have 9–10, rarely 12, setae on femur II.

Femur III bears only five setae (lacking *pl*) in *Dicrocheles*, *Dyscinetonyssus*, *Katydiseius*, some *Myrmozercon* and rare *Ljunghia*; seven setae in *Gecarcinolaelaps* and some *Sphaeroseius*. Femur IV has only five setae (typically lacking *pl*) in some *Dicrocheles*, some *Myrmozercon*, and it has 5–8 setae in *Narceolaelaps*. Both femora III–IV are hypertrichous in several genera, having seven setae in *Dinogamasus*, *Stigmatolaelaps*, *Xylocolaelaps* (and seemingly also *Eumellitiphis*), 7–8 setae in *Urozercon*, and 7–9 in *Myrmozercon*. Most cases of hypertrichy in femora III–IV involve one or more extra ventral setae.

Genua I–IV of (adults of) *Jacobsonia* for which legs have been studied have fewer setae than the setal complement of gamasine larvae and protonymphs (*i.e*. 8-6-6-5), with 6-4-4-4 setae, respectively, each genu lacking one *ad* and one *pd* relative to the normal larval/protonymphal complement, and genu IV having acquired one *pl*. Genua I–III of *Conolaelaps*, *Iphiolaelaps*, *Katydiseius* and most *Dicrocheles* have a chaetotaxy essentially identical to that of the setal complement of gamasine larvae, with 8-6-6 setae, respectively, except for *Conolaelaps* having genu I with six setae, lacking both ventrals, and *Iphiolaelaps* having seven setae in genu III, including *av*.

Genu I has fewer than the normal 13 setae in several other taxa, bearing eight setae (= basic larval complement, 1–2/1, 2/1–1) in *Narceolaelaps*, *Scorpionyssus* and some *Myrmozercon*; nine setae in *Urozercon* (2–2/1, 2/1–1); 10–12 in *Berlesia* (mostly lacking *av*2 or *pd*3); 9–12 setae in some *Julolaelaps* (lacking at least one *av*); 11 setae in *Dyscinetonyssus* (lacking one *ad*, one *av*) and *Gecarcinolaelaps* (lacking *ad*3, *pd*3); 12 in *Laelaspisella* (lacking one *pd*) and some *Scissuralaelaps* (lacking one *av*); 11–12 in some *Ljunghia* (lacking one *av*, or more rarely one *ad* and one *pd*); and 10–14 (exceptionally 16) in other *Myrmozercon*.

Genu II bears only nine setae (lacking one *ad*, one *pl*) in *Dyscinetonyssus*; ten setae (lacking one *ad*) in *Gecarcinolaelaps* and *Narceolaelaps*; 9–10 setae (at least lacking one *ad*) in *Urozercon*; ten setae (lacking one *pl*) in some *Julolaelaps*; ten setae (lacking *ad*3) in rare *Ljunghia*; and eight or ten setae (exceptionally 12) in some *Myrmozercon*.

Genu III has eight setae (lacking *pv*) in *Reticulolaelaps*, rare *Gaeolaelaps* and *Julolaelaps*, as well as in some *Myrmozercon* but in this genus lacking one *al* instead. It bears ten setae, including one extra *pl*, in *Dinogamasus*, *Gecarcinolaelaps*, *Holostaspis* (*H. flexuosa*, *H. michaeli* (Joharchi)), *Hunteria*, *Raymentia* and some *Scissuralaelaps*, *Tropilaelaps* and apparently also in rare *Ljunghia*; and 10–11 in some *Myrmozercon*, sometimes also having an extra dorsal seta.

Genu IV is hypotrichous in many taxa (in addition to *Jacobsonia*). It bears only seven setae (lacking one *pd* and one *al*) in *Conolaelaps*, *Iphiolaelaps* and most *Dicrocheles* (rarely with six setae, lacking also *av*); eight setae in *Dyscinetonyssus* (lacking one *pd*), some *Ljunghia* and *Ulyxes* (lacking *pd*3), some *Alloparasitus* (lacking one *al*), some *Julolaelaps* (lacking *av* or one *pd*), in rare *Gaeolaelaps* and *Laelaspis* (lacking *pl*), and in *Katydiseius* (homologies uncertain). Genu IV is hypertrichous in even more genera, having ten setae, including *pv*, in *Berlesia*, *Blaberolaelaps*, *Laelaspisella*, *Melittiphis*, *Neohypoaspis*, *Persicolaelaps*, *Pneumolaelaps*, *Pogonolaelaps*, *Promacrolaelaps*, *Reticulolaelaps*, *Stigmatolaelaps*, some *Hypoaspisella*, and rare *Hypoaspis* and *Ljunghia*. It bears ten setae, including two *pl*, in *Androlaelaps*, *Gecarcinolaelaps*, *Gromphadorholaelaps*, *Hunteria*, and some *Coleolaelaps*, *Euandrolaelaps*, *Holostaspis* (*H. flexuosa*, *H. michaeli*), *Ulyxes*, and rare *Cosmolaelaps*, *Gymnolaelaps* and *Laelaspis*. Genu IV in some *Bisternalis* appears to have ten setae, either including *pv* or two *pl*. Still, genu IV bears 11 setae, including *pv* and two *pl* in *Dinogamasus*, *Raymentia* and some *Scissuralaelaps* and *Tropilaelaps*, and 7–11 in *Myrmozercon*. Genu IV of *Urozercon* has nine setae, bearing *pv* but lacking one *pd*.

Tibiae I–IV of adults of *Jacobsonia* have fewer setae than typical gamasine larvae and protonymphs (*i.e*. 8-7-7-7 setae), with 6-5-5-5 setae, respectively, each tibia lacking one *ad* and one *pd* relative to the larval/protonymphal complement, similarly to the situation for the genua. Adults of several genera have essentially retained the chaetotaxy of larval/protonymphal stages for the tibiae, with 8-7-7-7 setae: *Conolaelaps*, *Dicrocheles*, *Iphiolaelaps*, *Katydiseius*, *Scorpionyssus*, and many *Myrmozercon*. Exceptions include tibia I of *Iphiolaelaps*, sometimes bearing only seven setae (lacking one *ad* relative to the larval condition), tibia IV of *Scorpionyssus* with six setae (lacking one *pd* relative to the larval condition), and 7–8 setae in *Katydiseius* (differing from the larval condition at least by having two *pl*).

In addition to the strongly hypotrichous taxa mentioned above, tibia I has eight setae in *Narceolaelaps* (1–2/1, 2/1–1, *i.e*. larval complement) and is moderately hypotrichous in other taxa, bearing only nine setae in *Urozercon* (2–2/1, 2/1–1); ten in *Dyscinetonyssus* (2–2/1, 2/1–2), 11 in *Gecarcinolaelaps* (lacking *ad*3, *pd*3); 10–11 in some *Myrmozercon* (lacking one *av*, one *pd* and/or one *ad*); 10–12 in *Berlesia* (lacking *pd*3 and often also *av*2) and some *Julolaelaps* (lacking *av*2 and often one *pl*, rarely also one *pd*); 12 (lacking one *av*) in some *Ljunghia* (rarely 11) and *Scissuralaelaps*. Rarely, *Ljunghia* and *Androlaelaps* have an extra *pv* on tibia I, bearing 14 setae in total; *Tropilaelaps* also has 14 setae on tibia I, but the homology of the extra seta is uncertain.

Fewer setae than normal occur on tibia II, bearing eight setae in *Dyscinetonyssus* (lacking one *ad* and one *pl*) and nine in *Gecarcinolaelaps*, *Narceolaelaps* and some *Myrmozercon* (lacking one *ad*), and in most *Julolaelaps*, *Ljunghia* and *Urozercon* (lacking one *pl*).

Tibia III has only seven setae (lacking one *al*, corresponding to the larval complement, 1–1/1, 2/1–1) in

Melittiphisoides and rare *Julolaelaps* and rare *Ljunghia*. Tibia III is otherwise hypertrichous in several taxa, bearing nine setae (including two *pl*) in *Gecarcinolaelaps*, *Melittiphis*, *Hunteria* and some *Androlaelaps*, *Coleolaelaps*, *Dynastaspis*, *Euandrolaelaps*, *Holostaspis* (*H. flexuosa*, *H. michaeli*), *Myrmozercon*, *Neohypoaspis*, *Raymentia*, *Scissuralaelaps* and *Tropilaelaps*.

Tibia IV lacks two setae in a few taxa, bearing eight setae in *Dyscinetonyssus*, *Urozercon* (lacking one *pd* and one *pl*), nine in *Narceolaelaps* and a few *Myrmozercon* (lacking one *pd*), *Gecarcinolaelaps* (lacking one *al*), and rare *Gaeolaelaps* (lacking one *pl*). It has 8–9 setae in some *Julolaelaps* (lacking *pd*3, or also one *pl*) and *Ljunghia* (lacking *pd*3, or one *al* and one *pl*). More rare cases of hypertrichy on tibiae, other than tibia I rarely with 14 setae and tibia III sometimes with nine setae (see above), are exhibited by a few species of *Myrmozercon*, which have tibiae I–IV respectively with 16 (in *M. crinitus*, with an extra *pv*, *al* and *pl*), 11 (one extra *pd*), ten (extra *pl*, and *pd* or *ad*), and 11 setae (one extra *ad*). Tibiae of at least some *Sphaeroseius* are very hypertrichous, bearing 16-14-14 setae on tibiae I–III, respectively.

Leg segments rarely have conspicuous cuticular, non-setigerous outgrowths. The female or both sexes (when males are known) of a few taxa have relatively small, rounded or pointed spurs ventrally on coxae I–IV (*Narceolaelaps*, some *Jacobsonia* and *Scissuralaelaps*) or on the anterior margin of coxa II (*Melittiphis*). More notable is the female of *Neoberlesia*, whose femur II has a strong ventral apophysis bearing a seta. In contrast to other families (*e.g.* Ologamasidae, Parasitidae) whose males frequently have leg II with ventral protuberances and modified setae, few known males of free-living or arthropod-associated laelapids are known to have sexually dimorphic leg features. The males of a few scattered taxa have ventral apophyses or tubercles on femur II (*e.g. Cosmolaelaps rectangularis*, *Euandrolaelaps pavlovskii* (Bregetova)) and also on genu II (some *Chapalania*) or on one or more segments of legs II–IV (some *Ololaelaps*); femur IV of the male of M. *crinitus* has a ventral apophysis bearing a seta. The same males also tend to have ventral spur-shaped setae that are absent in the female, including on tarsus II (some *Chapalania*, *Jacobsonia* and *Ololaelaps*). More remarkably, the male of *E. pavlovskii* has a ventral spur-shaped seta borne on a long protuberance on tibia IV, and the male of *Dynatochela* has leg II enlarged, bearing ventral spur-shaped setae.

Spermathecal apparatus. Almost invariably of the laelapid type (Alberti & Coons 1999: 1117). It should be noted, however, that the spermathecal system is hard to discern in laelapids and rarely included in descriptions.

Morphological diagnoses of genera

This section presents diagnoses for each of the 73 genera, primarily based on information available in the literature. In some cases, we complemented the diagnosis with information from direct observations of specimens, and this was most useful for a few monotypic genera that were previously poorly studied, in particular *Conolaelaps* and *Iphiolaelaps*. More information is available in the selected references listed at the end of each diagnosis, or those presented in the catalogue under each generic name.

For each genus, we tried to describe the variability of morphological features as practically as possible, including an estimated frequency (common vs rare) of each character state, while also highlighting the most diagnostic features of the genus at the end of each diagnosis, and comparing with the most similar genera when possible. In some cases, we specified character states of the type species when they differ from most species included in the genus. The diagnoses are primarily based on adult females, although relevant sexually dimorphic features of males are included when available and when they differ from normal (see below). Morphological features of immature stages have not been included in the diagnoses, in part because of the lack of knowledge. Even for relatively well-studied genera, information on nymphs and larvae are rare; *e.g.* out of 37 species of *Dinogamasus*, a diverse laelapid genus studied by Lundqvist (1999), the deutonymph was known for a single species and the male for two species. It should be noted that the study of larvae, protonymphs and deutonymphs will probably help find supra-specific apomorphies and strengthen generic boundaries, for example hypertrichy and hypertrophied setae of the idiosoma in protonymphs of *Gecarcinolaelaps* (Casanueva & Johnston, 1992), and opisthonotal setae elongate but *J* series absent in *Gromphadorholaelaps* larvae (Gerdeman *et al*., 1998), as well as helping to determine setal homologies in hypotrichous taxa or in which many setae have shifted positions. Given the magnitude of this work, there are certainly some omissions or mistakes in the diagnoses, and virtually all generic diagnoses will benefit from more detailed morphological studies and supporting molecular data.

To keep each diagnosis as concise as possible, we did not repeat character states that are most common across genera, but rather focused on deviations from those. For each genus, *unless otherwise specified*, these default states can be considered characteristic of the genus treated (except for genera indicated as unsatisfactorily known):

- Dorsal shield covering most of the idiosoma dorsally, leaving a moderately narrow strip of unsclerotised (soft) cuticle exposed around the shield.
- Setae are *simple*, *i.e*. relatively slender, smooth (without barbs).
- Legs without macrosetae (however, the legs are often understudied).
- Setae *Jx* and *Zx* absent; when present, setae *Jx* include at least one seta anteriad of setae *J3*.
- Tritosternum with pilose laciniae entirely free or at most fused for a short portion basally (however, the tritosternum is understudied).
- Sternal shield bearing *st*1–3 and including anterior endopodal elements between coxae I–II and between coxae II–III.
- *st*4 inserted on soft (unsclerotised) cuticle.
- Epigynal shield of moderate size, extending posteriorly beyond coxae IV, although distant from the anal shield.
- Anal shield inversely subtriangular or pear-shaped (these two shapes represent subtle variations), relatively small.
- Para-anal setae flanking anal opening, inserted between its anterior and posterior margins.
- Males with holoventral shield, free of parapodal-exopodal plates (if males known).
- Endopodal plate next to coxae III–IV well-developed, free from sternal shield (although it may be narrowly abutting it).
- Parapodal element a narrow, inconspicuous sclerite bordering coxa IV posteriorly, or absent.
- Peritreme long, *i.e*. reaching at least mid-level of coxa I; otherwise, it is specified as *short*—reaching more or less coxa II; or *very short*—not reaching beyond coxa III.
- Peritrematal shield narrowly developed (dorso-) laterally to peritreme, anteriorly fused to dorsal shield, and free posteriorly, moderately extending posteriorly to stigma, at most reaching posterior edge of coxa IV.
- Metapodal platelet(s) present, small.
- Pretarsi of all legs with well-developed pulvillus and paired claws.
- Female chelicerae chelate-dentate, with digits subequal, movable digit bidentate; pilus dentilis simple (short, slender); arthrodial membrane with a corona of short filaments.
- Male chelicerae chelate-dentate, movable digit unidentate.
- Palp trochanter–tibia with respectively 2-5-6-14 setae.
- Palp tarsal claw 2-tined.
- Deutosternum with six transverse rows of denticles.
- Corniculi well-developed, horn-like and subparallel to each other.
- All hypostomal setae (*h*1–3) and seta *pc* present, generally mid-sized or long, *h*3 typically longest.

See also the last section of Methods for the definitions of terms that are commonly used.

Acantholaelaps **Joharchi** (Fig. 5)

Idiosoma 1000–1200 µm long. Dorsal shield oval, usually bearing only 28 pairs of setae, most setae of *z*-*Z* series and *s*4 inserted near shield margin, and *s*2–3, *r*2–5, *S*3–4 inserted off shield (dorsum holotrichous except for lacking *z*3; without *Zx*2–3); some of the latter (*s*2, *S*3) sometimes captured by shield, resulting in 29–30 pairs of setae on shield. Setae *S*5 and *Jv*5 extremely long; *j*3, *z*4, *s*4 and *Z*5 long to very long (*z*3 putatively absent, alternatively to notation in Joharchi *et al*., 2019); *st*1–5 long; other setae mostly mid-sized. Sternal shield irregularly eroded marginally, with some endopodal elements often free from it; *st*1 off shield, on weakly sclerotised (lineate) presternal area. Epigynal shield tongue-shaped, relatively small, bearing *st*5. Post-anal seta much shorter than para-anal setae. Endopodal plate absent. Peritrematal shield minimally developed, narrowly fused to dorsal shield. Dorsolateral and especially opisthogastric unsclerotised cuticle strongly hypertrichous, with over 90 “pairs” of setae. Male with sternogenital

and anal shields, and between them a discrete ventral shield, eroded marginally and bearing 15–16 setae of the hypertrichous opisthogaster.

Cheliceral fixed digit with four teeth distal to pilus dentilis, including a large subapical offset tooth, followed by a series of minute teeth. Epistome somewhat tongue-shaped (and mostly smooth) medially, with margin serrated latero-basally. Deutosternum with rows of 12–20 denticles each. Internal malae with a pair of short lateral arms in addition to median arms.

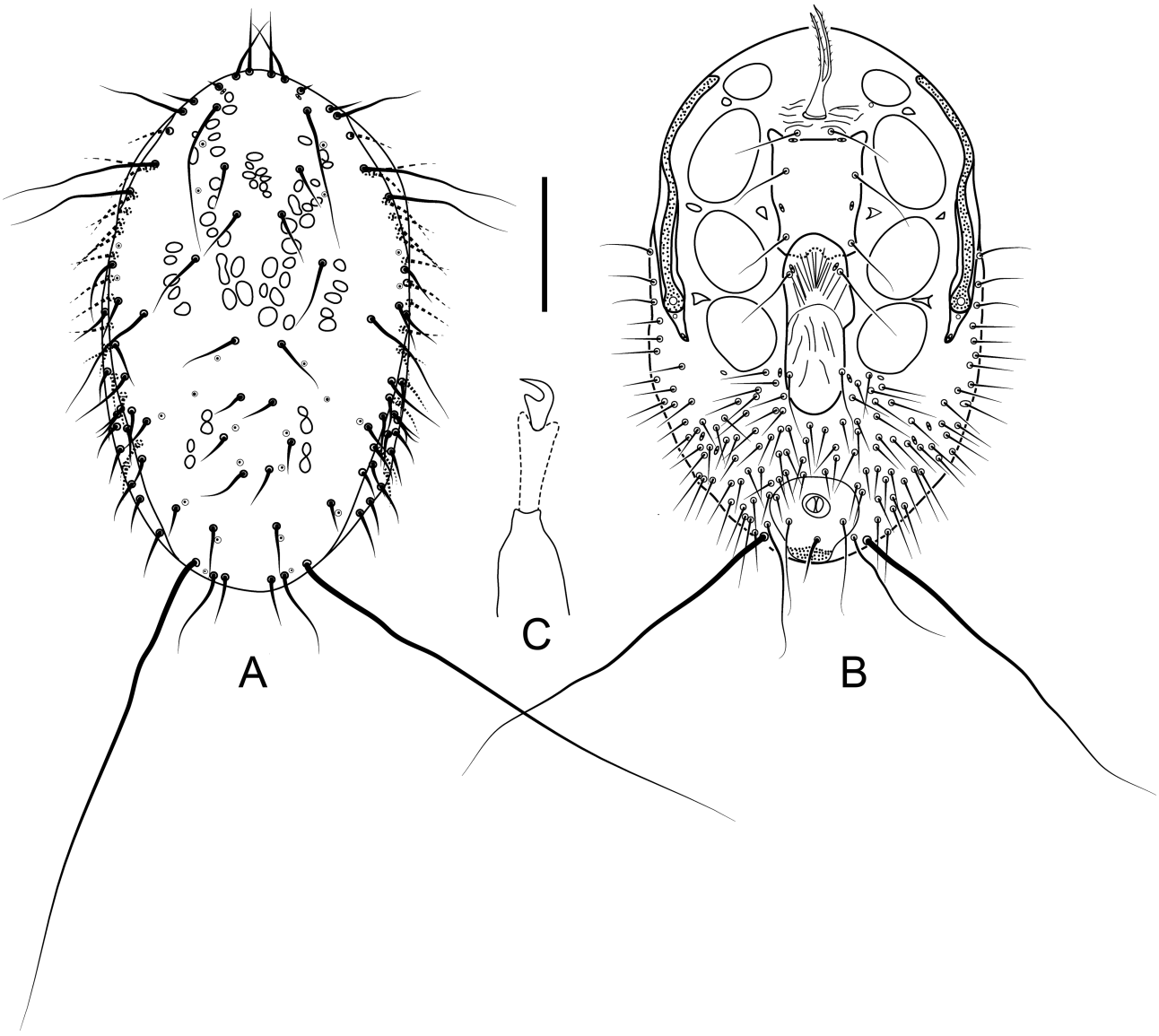


FIGURE 5. Female. *Acantholaelaps* Joharchi *et al*. (modified from Joharchi *et al*., 2019): A, dorsal idiosoma; B, ventral idiosoma; C, a distal section of tarsus showing a pretarsal claw with basoventral spur. Scale bar = 200 µm for dorsum and venter; tarsus not in scale.

Legs with dorsal macrosetae on femora I–II and genu I (*pd*1), femora and genua III–IV (*ad*1) and tarsus IV (*ad*2, *pd*2); tarsi II–IV with *al*1, *pl*1 spur-shaped, and claws II–IV each with a peculiar ventral spur basally. Leg chaetotaxy normal.

The monotypic genus *Acantholaelaps* shares several features with most of the following genera associated with scarab beetles or relatives (lucanids, passalids): *Angosomaspis*, *Chapalaelaps*, *Chapalania*, *Coleolaelaps*, *Dynastaspis*, *Hypoaspis*, *Lucanaspis*, *Mumulaelaps*, *Promacrolaelaps*, including: (*i*) an epistome with a tongue-like apex (sometimes more simply triangular) with serration mostly restricted to lateral margins, (*ii*) legs with dorsal macrosetae, (*iii*) dorsal setae *Zx* usually absent (*Zx*2–3 present in *Hypoaspis*, *Zx*2 in *Lucanaspis* and *Mumulaelaps*, and uncertain for hypertrichous *Angosomaspis*), (*iv*) *Jx* setae absent (except in *Chapalania*); (*v*) *z*4, *s*4–5 and most *Z* setae inserted more marginally than usual, (*vi*) some setae of the *r*-series, sometimes also of *s*-*S* series (as in

Acantholaelaps and *Coleolaelaps*), off shield (except *Chapalania*), (*vii*) a few setae elongate, typically *j*3, *z4–5* and *Z*4, but *S5* instead of *Z*4 in the case of *Acantholaelaps* (all setae tend to be long in *Coleolaelaps*, and the longest setae in *Angosomaspis* are mid-sized), and (*viii*) a minimally developed peritrematal shield. In addition, in contrast to most other of these genera, *Acantholaelaps* has the sternal shield eroded marginally, with *st*1 often off the shield, a feature shared with *Mumulaelaps* and many *Coleolaelaps* species. It also has strongly hypertrichous soft cuticle, a feature shared mostly with *Angosomaspis*, but the latter has the dorsal shield hypertrichous with mostly very short setae. *Chapalania cifuentesi* is also hypertrichous ventrally, but most of its idiosomal setae are very short and its post-anal seta is extremely long. The post-anal seta of *Acantholaelaps* is short whereas the para-anal setae are long, and most other idiosomal setae are mid-sized, other than some very long dorsal setae and *Jv*5. The spur-shaped setae *al*1, *pl*1 on tarsi II–IV are variously shared with several scarab-associated genera. The baso-ventral spur of claws of *Acantholaelaps* appears to be a unique distinction. Selected reference: Joharchi *et al*. (2019).

Alloparasitus **Berlese** (Fig. 6)

Idiosoma 500–700 μm long. Dorsal shield suboval, with 39 pairs of setae, including *Zx*2–3 (there may be fewer or more pairs in some species), with 0–4 unpaired *Jx* setae; setae generally mid-sized, subequal in length. Presternal area with a pair of discrete platelets in at least some species (including the type species, *A. oblongus* as redescribed by Evans & Till 1966), but apparently weakly sclerotised (lineate-reticulate) or platelets fused to sternal shield in other species. Epigynal shield relatively large and long, ranging from flask-shaped (including in type species) to more drop-shaped, abutting anal shield or reaching close to it; with 1–2 pair of opisthogastric setae (*Jv*1 and/or *Zv*1) inserted on its margins in addition to *st*5 (occasionally 1–2 *Jv-Zv* on unsclerotised cuticle instead, closely flanking shield). Anal shield subtriangular or triangular. Parapodal plate moderately thick in the type species. Peritrematal plate expanded posteriorly in the type species, bordering parapodal plate and reaching metapodal plate posteriorly; plate narrower in other species, reaching slightly beyond coxa IV or not reaching it. Unsclerotised lateral and opisthogastric cuticle usually including five or more pairs of setae (*r*6, *R* setae) in addition to *Jv-Zv* setae.

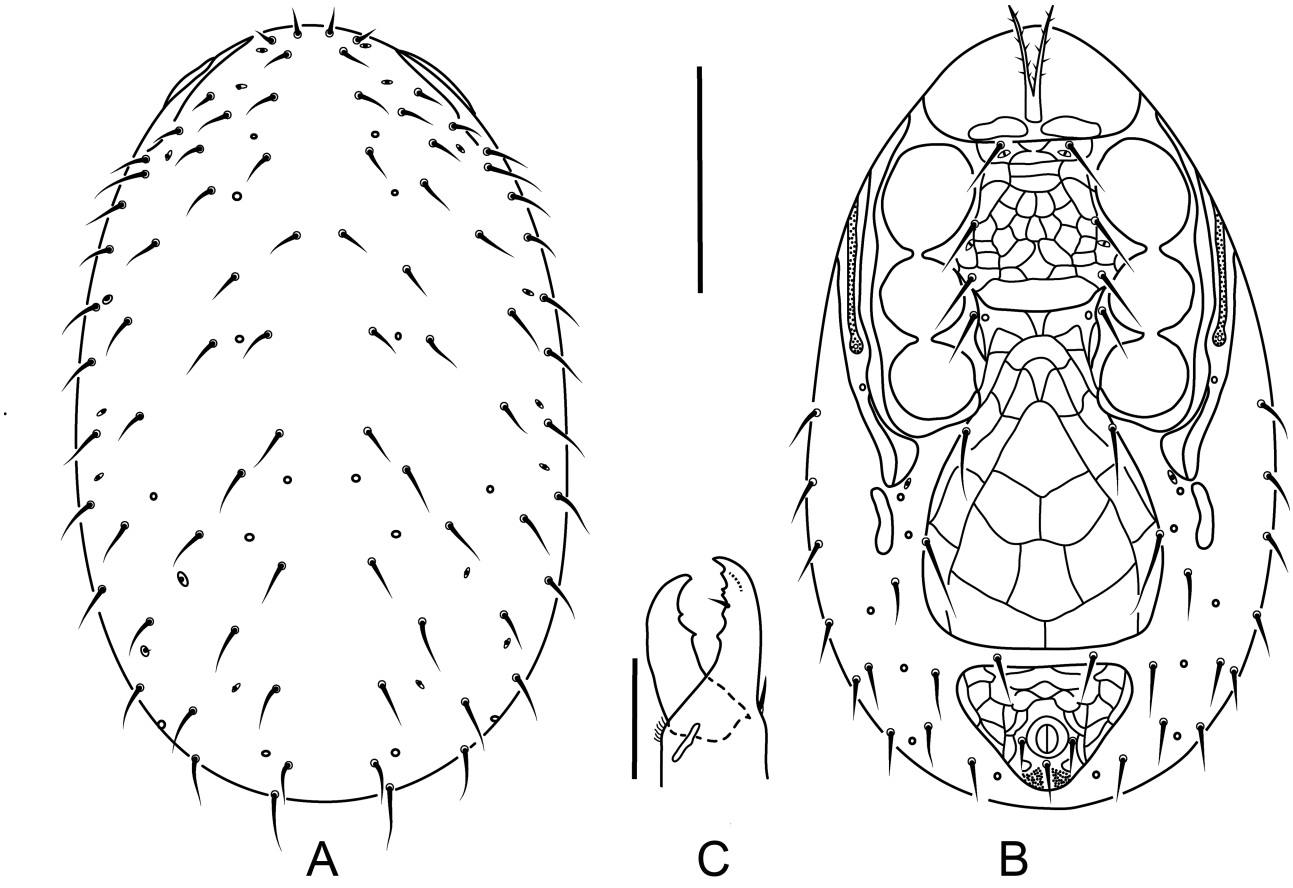


FIGURE 6. Female. *Alloparasitus* Berlese (modified from Evans & Till, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

Cheliceral fixed digit usually with 3–6 teeth (and with a series of minute teeth in *A. femorata* (Karg)). Epistome mostly subtriangular, with margin serrate. Deutosternum relatively narrow, with rows of 4–6 denticles each in the type species (unknown for other species).

Legs poorly studied. The type species has normal chaetotaxy except for genu IV bearing only eight setae, including one *al* (1–2/1, 3/0–1).

The genus *Alloparasitus* is weakly defined, with no clear synapomorphy among species currently assigned to it. Constituent species should be compared against the character states of the type species, which include presternal platelets, peritrematal shields expanded posteriorly and a flask-shaped epigynal shield bearing *Zv1* on its margin. It may have affinities with *Gymnolaelaps* and *Pseudoparasitus*, both having, in contrast to *Alloparasitus*, 3-tined palp tarsal claws and generally more developed parapodal plates. *Euandrolaelaps* may be distinguished from *Alloparasitus* by having ventral spur-like setae on leg II and an epigynal shield more typically drop-shaped and with a neck narrower than in *Alloparasitus*. Selected references: Evans & Till (1966), Huhta & Karg (2010).

Androlaelaps **Berlese** (Fig. 7)

Idiosoma 400–1600 µm long. Dorsal shield suboval to broadly oval or ovate, usually with 39 pairs of setae, including *Zx*2–3; occasionally 40–41 pairs including *Zx*1 and/or an extra seta near the *r*-series; sometimes fewer pairs (34–38), lacking *Zx*2–3 or *z*3 (rarely other setae) and/or one or more *r* setae off shield; often with 1–4 *Jx*, sometimes more (8–10); occasionally with 1–3 unpaired podonotal *jx* setae, or with moderate to strong hypertrichy spread across all series (*e.g. A. taterae* (Zumpt & Patterson), *A. walkerae* Till). Setae very short to long (rarely very long), usually subequal except sometimes longer anteriorly or marginally, sometimes only *Z*5 long. Sternal shield at least as wide as long, usually slightly to much wider than long; shield occasionally eroded anteriorly, with *st*1 inserted on weakly sclerotised (lineate-reticulate) presternal region. Epigynal shield tongue- to drop-shaped (rarely flask-shaped), ranging from short and well separated from anal shield to long and (occasionally) reaching anal shield (including in the type species, *A. hermaphrodita* (Berlese)); bearing only *st*5 (exceptionally with *Zv*1 or *Jv*1 inserted on margin); typically with 4–5 main transverse striae posteriorly to the inverted-V ridge. Post-anal seta subequal to moderately longer than para-anal setae. Peritrematal plate anteriorly free or fused with dorsal shield. Lateral and opisthogastric unsclerotised cuticle mostly with 5–15 *R-UR* setae in addition to *Jv-Zv* setae, sometimes more, exhibiting various degrees of hypertrichy (bearing up to over 80 "pairs"). Males with holoventral shield or with sternogenitiventral shield, moderately expanded in the opisthogastric region, well separated from anal shield, or expansive and abutting anal shield (in *A. hirstionyssoides* (Costa)).

Cheliceral fixed digit mostly with 1–3 teeth, sometimes edentate; pilus dentilis usually inflated to various degrees, if not inflated, at least longer than usual for laelapids. Male fixed digit regressed (*i.e.* shortened, narrowed, and without apical hook), edentate, with pilus dentilis inserted in basal half (or more rarely near halfway of digit), and movable digit usually also lacking teeth and apical hook, with typically broad, elongate spermatodactyl. Epistome margin rounded and smooth. Corniculi sometimes reduced. Internal malae sometimes more heavily fimbriate, or with thick threads (*e.g. A. walkerae*). Deutosternum with rows of mostly 2–5 denticles each.

Some leg setae sometimes stout, in particular *av* of femur, genu and tibia II, and also ventral/subapical setae on tarsus II. Leg chaetotaxy normal except genu IV nearly always with ten setae, including two *pl* (only one in *A. spatuliformis* (Lavoipierre)); sometimes also tibia III with nine setae (including two *pl*), and more rarely genu III with ten setae (including two *pl*) or tibia I with 14 setae (including two *pv*).

The related genus *Haemolaelaps* was recently re-erected and demarcated from *Androlaelaps* by Shaw (2014a) (see remarks within the diagnosis section of *Haemolaelaps* below). *Androlaelaps* could also be confused with other genera such as *Euandrolaelaps*, *Gaeolaelaps*, *Hypoaspis* and *Hypoaspisella*. The chaetotaxy of genu IV, the hypertrophied pilus dentilis and the smooth margin of the epistome (also in *Hypoaspisella*) of *Androlaelaps* are useful distinctions from these genera, as well as the frequently more numerous setae on the soft idiosomal cuticle. *Gaeolaelaps* and *Hypoaspis* also usually have a deutosternum with more than five denticles per row. Selected references: Till (1963), Shaw (2014a).

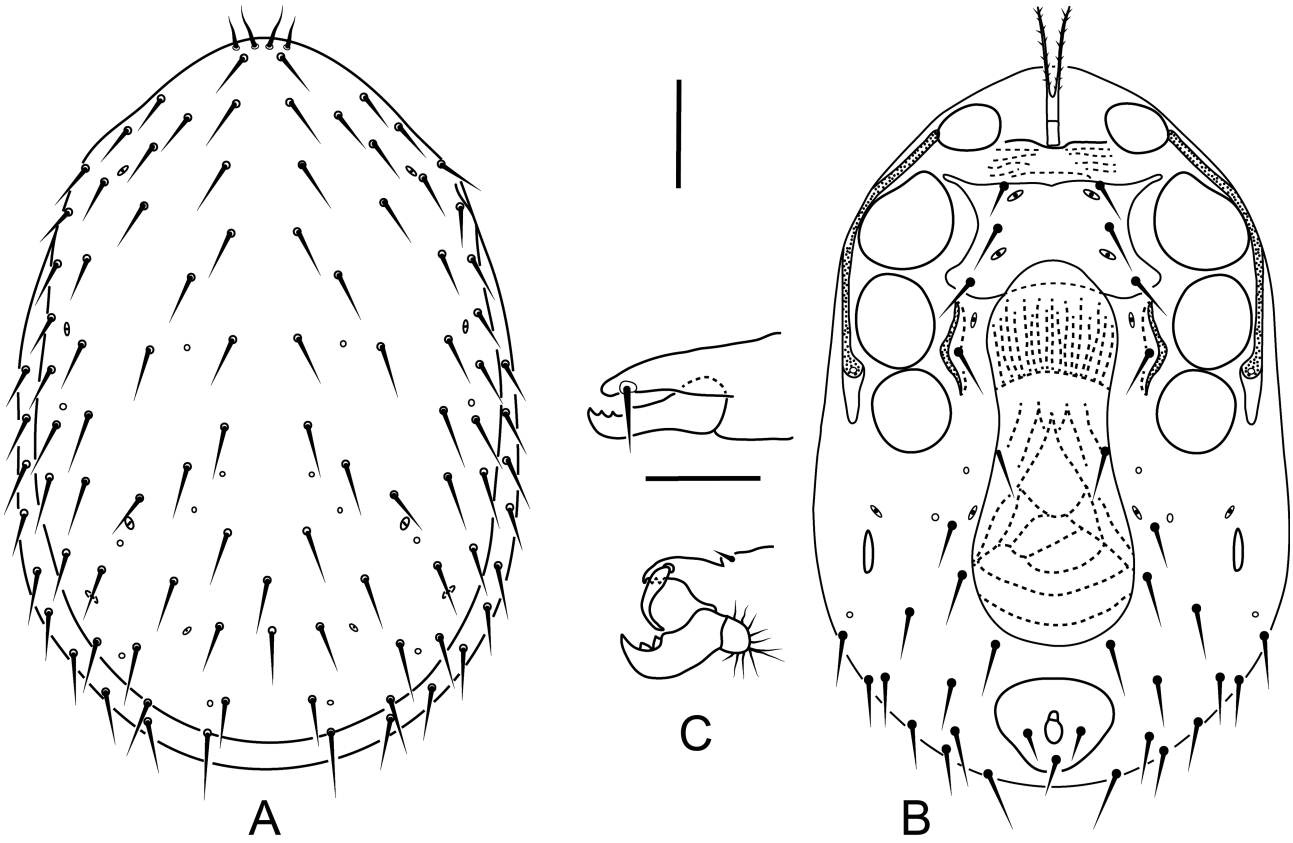


FIGURE 7. Female. *Androlaelaps* Berlese (modified from Evans & Till, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera with different forms of pilus dentilis. Scale bars = 150 μm for dorsum and venter, 25 μm for chelicera.

Angosomaspis **Costa** (Fig. 8)

Idiosoma about 900 μm long. Dorsal shield oval, markedly hypertrichous with about 150 setae, including 60–65 pairs and 25–30 (*jx* and *Jx*) setae mostly unpaired medially; most setae minute or very short, some longer, including (putatively) *j*1–4, *z*2, *z*4, and *s*4 short to mid-sized, *Z*5 long; *z*1 and *z*3 apparently absent. Unsclerotised cuticle also hypertrichous, dorsolateral margins with 32–35 pairs of mostly short setae, longer near posterior margin; opisthogaster with 37–40 pairs of long to very long setae. Presternal area weakly sclerotised, lineate. Setae *st*1–5 very long. Sternal shield subquadrate, with endopodal extensions poorly developed. Circum-anal setae moderately long, subequal. Epigynal shield tongue-shaped, rather large and reaching not far from anal shield, bearing *st*5. Peritrematal plate minimally developed, with very short poststigmatal extension; free anteriorly.

Cheliceral fixed digit with two mid-sized subapical teeth distal to pilus dentilis, followed by a series of about 12 small teeth. Epistome triangular, with margin basally serrate and medially/apically smooth. Deutosternum with rows of numerous minute denticles. Internal malae with a pair of short fimbriate lateral arms in addition to main, medial arms.

Legs with one macroseta on each of femora II–IV (apicodorsally), and on tarsus IV (*pd*2). Tarsus II with two subapical (*al*1, *pl*1) spur-shaped setae. Leg chaetotaxy normal.

This monotypic genus shares similarities with other scarab-associated genera (see note in diagnosis of *Acantholaelaps*) but can be distinguished from them by its hypertrichous idiosoma, with mostly minute setae on dorsal shield, mid-sized setae on marginal soft cuticle and very long opisthogastric setae. Selected reference: Costa (1971).

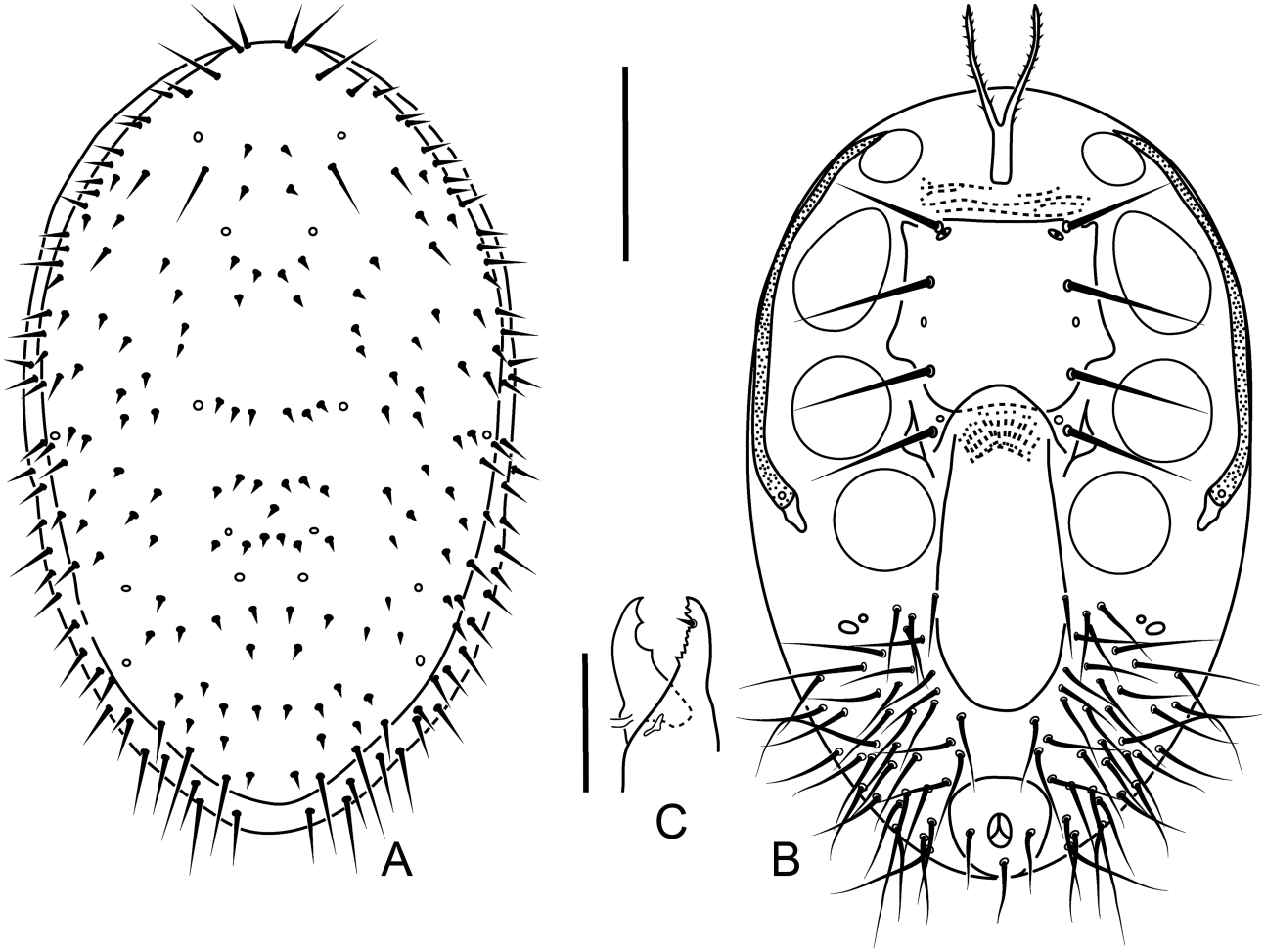


FIGURE 8. Female. *Angosomaspis* Costa (modified from Costa, 1971): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

***Apolaelaps* Silvestri** (Fig. 9)

Idiosoma 650 μm long. Dorsal shield truncate posteriorly, with about 33–35 pairs of setae (there is asymmetry in the position and number of setae), apparently including *Zx*2–3; setae relatively long, longest posteriorly. Seta *st*4 seemingly inserted on endopodal plate. Epigynal shield somewhat drop-shaped, very large, as broad as the sternal shield and occupying nearly all the region between coxae III–IV; bearing *st*5. Post-anal seta thick, very long; para-anal setae short. Unsclerotised cuticle with seven pairs of long setae behind dorsal shield, laterally with two pairs of *R* setae and *r*2–3 anteriorly (on left side of Silvestri's (1911) illustration; it is not entirely clear where is the boundary between shield margins and soft lateral cuticle). Opisthogaster with seven pairs of mid-sized (*Jv*, *Zv*) setae, *Jv*5 long. Peritreme seemingly extending to coxa II, with peritrematal plate minimally developed, with a relatively long extension behind stigma.

Cheliceral digits slender and edentate; without apparent pilus dentilis. Deutosternum seemingly without rows of denticles.

Genus unsatisfactorily known, including leg chaetotaxy. The edentate chelicerae, long post-anal seta, broad epigynal shield and truncate dorsal shield are its most distinctive features. Selected reference: Silvestri (1911b).

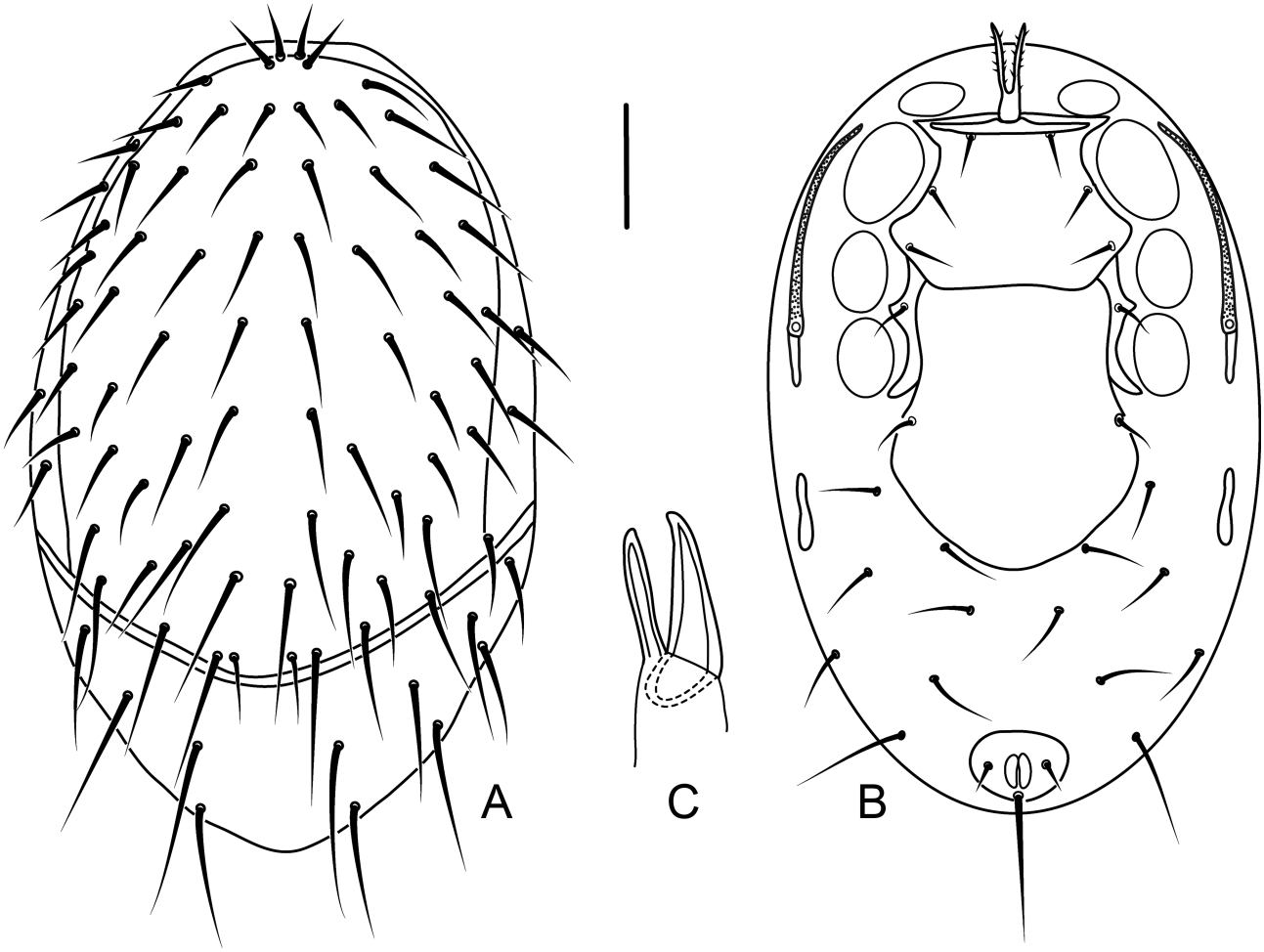


FIGURE 9. Female. *Apolaelaps* Silvestri (modified from Silvestri, 1911b): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 100 μm for dorsum and venter; chelicera not in scale.

***Berlesia* Canestrini** (Fig. 10)

Idiosoma 500–800 μm long. Dorsal shield weakly sclerotised, eroded marginally, sometimes incised laterally between podonotal and opisthonotal regions, bearing only 9–14 pairs of setae, including setae of *j-J* series, *z*5, and a few setae barely captured by the shield margin (*e.g*. *z*4, *s*4); lacking 5–15 pairs of setae (relative to holotrichy) including *J*5; *j-J* setae and *z5* short to minute (subequal within a species), other dorsal and ventral setae mostly mid-sized; *j*1 usually on soft cuticle; unsclerotised dorsolateral cuticle with setae of *r* series, *s*6 and many of *z-Z* and *S* series not captured by shield, and a cluster of sigilla anterolateral to shield. Presternal area weakly sclerotised, lineate-granulate or undifferentiated, or with a pair of small platelets in males. Sternal shield abbreviated posteriorly, so as to bear only *st*1–2, seta *st*3 on unsclerotised cuticle. Epigynal shield small, more or less rounded posteriorly, bearing *st*5; anterior hyaline section wide. Anal shield diamond-shaped, anal opening in anterior half of shield, post-anal seta 1.5–2 times as long as para-anal setae, the latter inserted slightly behind, or at level of, hind margin of anus. Endopodal plate reduced or absent. Peritreme very short (reaching coxa III at most); peritrematal plate almost limited to poststigmatal region, tapered and curving posterolaterad of coxa IV. Opisthogaster with only 6–7 *Jv-Zv* setae to moderately hypertrichous, including area between epigynal and anal shields; unsclerotised dorsolateral cuticle with only four to more than 20 pairs of setae (including *s-S* and *r-R* series). Male with a sternogenital shield, bearing *st*1–4 or *st*1–5, with posterior margin irregular or rounded.

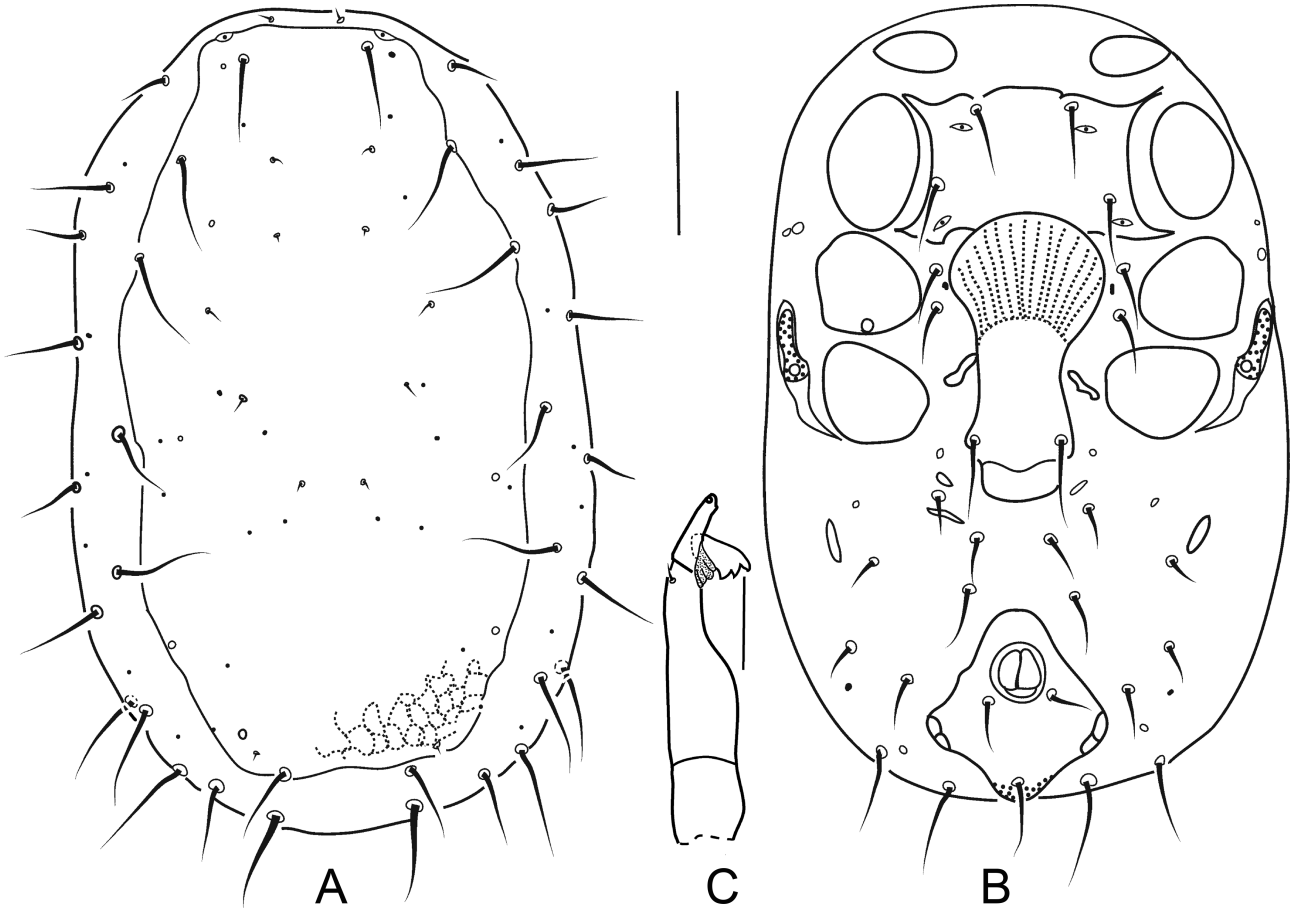


FIGURE 10. Female. *Berlesia* Canestrini (modified from Lindquist *et al*., 2020): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 μm for dorsum and venter, 30 μm for chelicera.

Cheliceral shaft swollen basally, tapered in distal half to two-thirds of length; movable digit laterad of (and not apposed to) fixed digit, flaring outwards, with 2–3 large retrorse teeth (in addition to similarly shaped apical hook); fixed digit essentially edentate, blunt, pilus dentilis vestigial; arthrodial corona absent in females (present in males). Male chelicerae edentate, with regressed, attenuate fixed digit (slenderer than in female), movable digit reduced, with at most a blunt apex, otherwise largely coalesced with a very long, sinuous spermatodactyl. Epistome ranging from short and subtriangular to elongate, narrow and acuminate; margin smooth or with sparse denticles. Corniculi somewhat hyaline, rounded apically; salivary styli sometimes very long (but always so in males), projecting well beyond corniculi. Internal malae much longer than corniculi. Deutosternum with 10–13 rows of mostly 1–2 denticles each. Seta *pc* as well as one seta of each of coxae I–III (sometimes IV) with bulbous base.

Legs with some of the apicodorsal setae of femora, genua and tibiae thickened and elongate (macrosetae). A few leg segments with reduced chaetotaxy relative to normal, mostly femur I with 11–12 setae (including at most three ventrals), and both genu and tibia I with 10–12 setae (at most with five dorsals, and often with only two ventrals); in contrast, genu IV with ten setae (including two ventrals). All pretarsal claws reduced.

The remarkably modified chelicera of *Berlesia* is the most diagnostic feature of the genus. The very short peritremes, short sternal shield, eroded and hypotrichous dorsal shield, diamond-shaped anal shield, and deutosternum with many rows of 1–2 denticles can further reinforce its identification. *Berlesia* is closely related to *Katydiseius* (see main differences in key of Katydiseiinae in Lindquist *et al*., 2020: 44). Selected reference: Lindquist *et al*. (2020).

***Bisternalis* Hunter** (Fig. 11)

Idiosoma 500–1000 μm long. Dorsal shield broadly oval, covering all dorsum of idiosoma, mostly with 39 pairs (usually including *Zx*2–3) of short to long setae, always longer (and thicker) in posterior region or posterolateral margins, and sometimes barbed; with 1–2 *Jx* setae between *J*2–4 setae. Laciniae of tritosternum with reduced pilosity and fused for a significant portion basally. Presternal area usually weakly sclerotised, lineate; setae *st*1 close to each other and on a single platelet, which may be partially fused with sternal shield (except in *B*. *camargoi* Baker *et al.*, *st*1 farther apart and on weakly sclerotised area), or divided medially. Sternal shield broad and usually strongly concave posteriorly (barely concave in *B*. *camargoi*), setae *st*3 2.5–3 times as far apart as setae *st*1; *st*4 borne on endopodal plate or on unsclerotised cuticle. Epigynal shield large, snake-head shaped, typically acuminate posteriorly (may be blunt or bilobed), more or less reaching anal shield; distinctly ornamented with 2–4 rounded, U- or V-shaped striae; bearing *st*5, occasionally inserted quite mesad, away from lateral shield margins. Anal shield crescentic to subtriangular, always concave anteriorly; anus often close to anterior shield margin, with para-anal setae aligned with or posterior to hind margin of anus; post-anal seta subequal to para-anal setae. Parapodal plate typically enlarged. Peritrematal shield minimally developed, except for a short extension behind stigma, and apparently fused anteriorly with dorsal shield in at least some species. Dorsolateral and opisthogastric unsclerotised cuticle with 4–8 *R*-*UR* setae in addition to *Jv*-*Zv* series, setae usually spine-shaped and tylochorous.

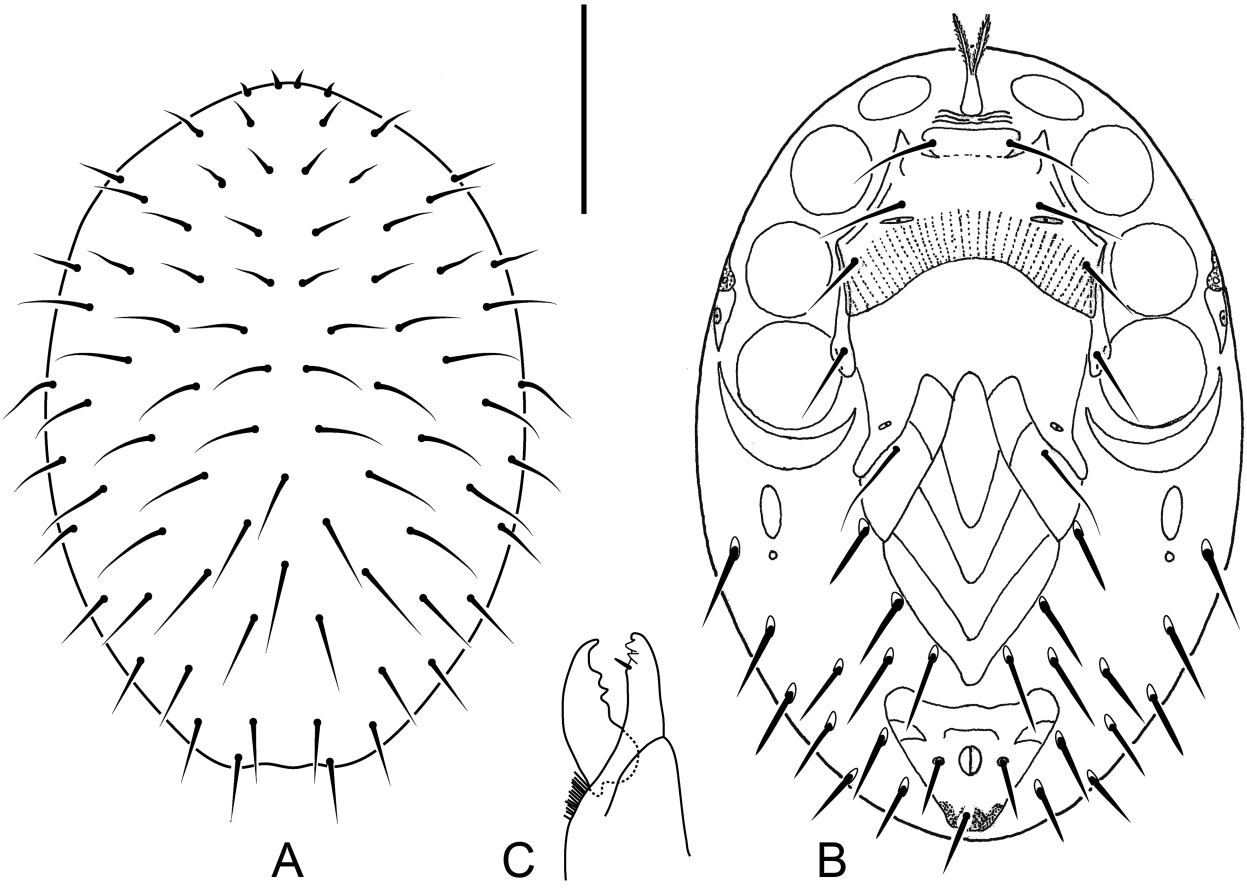


FIGURE 11. Female. *Bisternalis* Hunter (modified from Baker *et al*., 1984): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 μm; chelicera not in scale.

Gnathosoma small, positioned ventrally, partly hidden by idiosoma in dorsal view. Cheliceral fixed digit with 1–2 teeth distal to pilus dentilis. Male movable and fixed digits sometimes edentate (although with apical hooks as in female). Epistome margin smooth. Deutosternum with rows of 1–7 denticles each (except: 9–10 rows of 7–10 denticles in *B*. *mexicanus* Baker *et al.*). Corniculi small.

Legs with a few to several setae spine-shaped, often including apicodorsal setae of femora. Leg chaetotaxy with

a few discrepancies from the norm in at least some species, including genu IV with ten setae, including two *pl* or two ventrals.

Bisternalis may resemble several *Holostaspis* or *Myrmozercon* species due to their large snake-head shaped epigynal shield combined with an anteriorly concave anal shield, small gnathosoma, a smooth epistome and weak corniculi, and posterodorsal and opisthogastric setae long and thick. It also has an epigynal shield almost reaching the anal shield, like most *Holostaspis*, as well as tylochorous setae, like at least some *Holostaspis*. It has a sternal shield broadened and almost U-shaped, similar to many *Myrmozercon*, but differs from them and other laelapid genera by setae *st*1 borne on a platelet partly or entirely detached from the sternal shield. Selected references: Hunter (1963), Baker *et al*. (1984).

***Blaberolaelaps* Costa** (Fig. 12)

Idiosoma about 900 μm long. Dorsal shield broadly ovate, truncate posteriorly, with significant area of unsclerotised cuticle exposed laterally and posteriorly; shield bearing 24–26 pairs of setae, with central setae (*j*4–6, *z*5, *J* setae) minute; most other setae short to elongate, inserted near shield margin; at least *z*4, *s*4 and *Z*4 long to very long; lacking at least nine pairs of setae (including *j*2, *z*1, *z*3, *z*6, and 1–2 setae of the *J* series); few setae shifted off shield (*e.g*. *s*6). Sternal shield moderately wider than long. Epigynal shield drop-shaped, mid-sized, bearing *st*5. Anal shield obovate; post-anal seta much thicker and at least twice as long as para-anal setae. Parapodal-exopodal platelet moderately thick, posterolaterad of coxa IV. Peritreme relatively broad and sometimes shortened (reaching only level of anterior margin of coxa II); peritrematal plate minimally or narrowly developed, free anteriorly, with very short extension behind stigma. Soft opisthogastric and dorsolateral cuticle with 4–11 pairs of setae in addition to *Jv*-*Zv* setae, *Jv5* elongate. Male with sternogenitiventral shield, irregularly rounded posteriorly, bearing *st*1–5 and 2–3 opisthogastric pairs of setae, not expanded laterally behind coxae IV, and distant from anal shield.

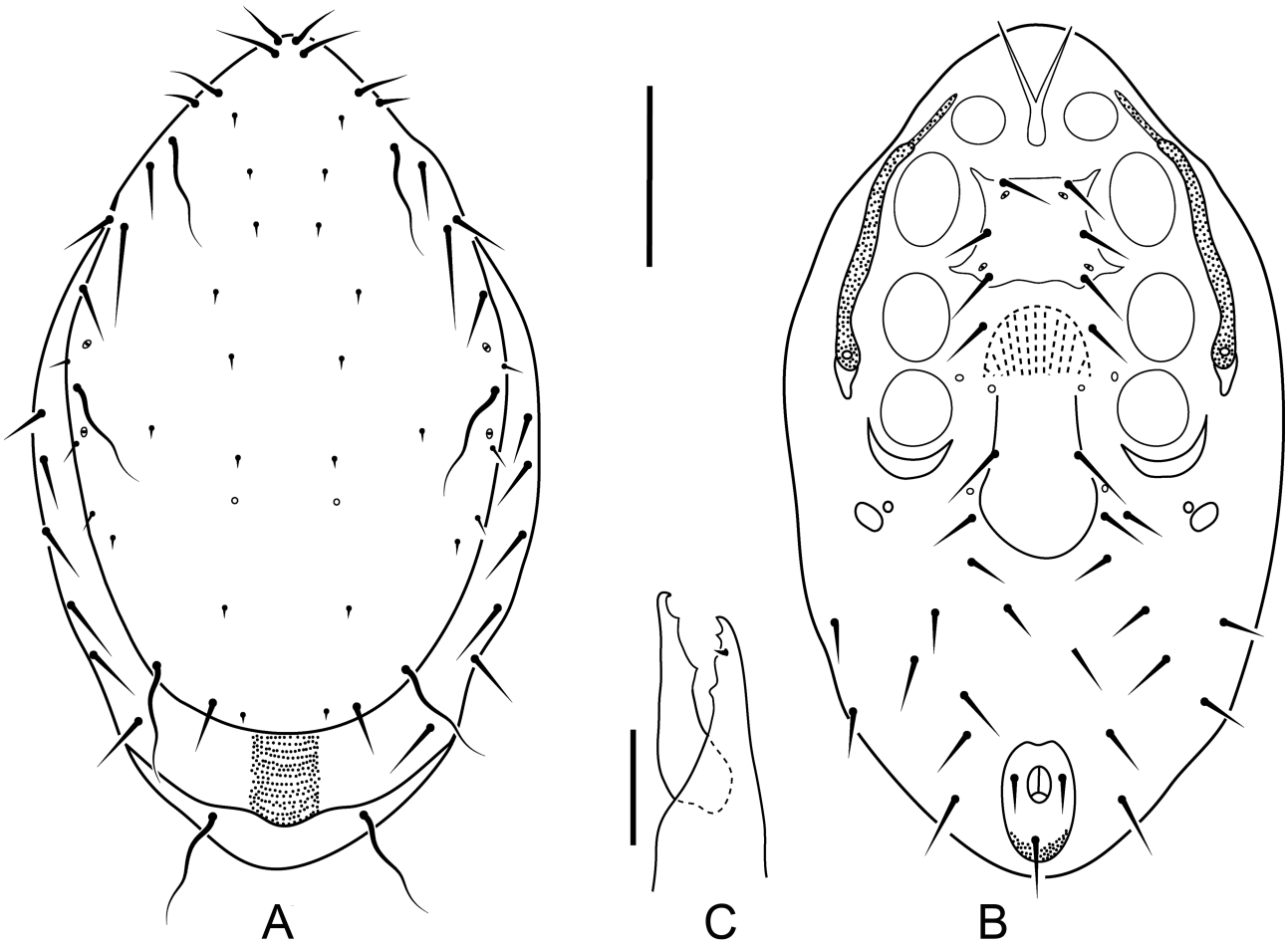


FIGURE 12. Female. *Blaberolaelaps* Costa (modified from Costa, 1980): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 25 μm for chelicera.

Both cheliceral digits narrow, tapered, especially movable digit, which is longer than fixed digit; apical hooks weakly developed; fixed digit with a small subapical tooth. Male cheliceral digits normal, more strongly chelate-dentate than in female. Epistome triangular, with a well-developed fringe of blunt denticles. Deutosternum with rows of 4–7 denticles each. Palp trochanter with seta *v*2 (inner seta) elongate (reaching apex of femur), unusually flattened and lightly sclerotised, hyaline.

Legs may have elongate and thickened setae, such as *ad*1 of femora and genua III–IV. Leg chaetotaxy normal except for genu IV, which bears ten setae, including two ventrals.

The dorsal shield of *Blaberolaelaps* has long marginal setae and elongate *Jv*5, which are reminiscent of *Hypoaspis* and related scarab associates (see remarks in diagnosis of *Acantholaelaps*). It can be distinguished from them by the combination of its broad, truncate dorsal shield with minute central setae, generally more pronounced hypotrichy (*Chapalaelaps* and some *Chapalania* also very hypotrichous), long, thick post-anal seta, fimbriate epistome, weakly dentate chelicerae with long, tapered movable digit, and genu IV bearing two ventral setae. Selected references: Costa (1980), Hunter *et al*. (1988).

Chapalaelaps **Gwiazdowicz *et al*.** (Fig. 13)

Idiosoma about 800 μm long. Dorsal shield suboval to broadly oval, with only 17–19 pairs of setae, lacking 14–15 setae such as *j2* and many setae of *z*-*Z*, *S* and sometimes also *J* series; at least *r*-series off shield, on unsclerotised cuticle (along with 5–7 *R* setae); 2–3 pairs of setae very long (and wavy), including marginally-inserted *s*4 or *s*5 and *Z*4; other setae also inserted near shield margin, mid-sized to long, except more central *j*-*J* series and *z*5–6, which are very short or minute, except *j*4 occasionally long. Sternal shield wider than long, partly or entirely granular, lightly sclerotised, with anterior margin sometimes indistinct with *st*1 on weakly sclerotised area; posterior margin often concave; setae *st*1–3 relatively long. Seta *st*4 apparently minute in *C. secretumsternalis* Gwiazdowicz *et al*. Epigynal shield mid-sized, tongue-shaped to somewhat snake-head shaped (as it is slightly bulging behind *st*5 in one species), bearing *st*5. Anal shield obovate to subtriangular; circum-anal setae mid-sized, subequal. Peritrematal plate minimally or narrowly developed, with or without a short extension behind stigma; fused anteriorly with dorsal shield at least in some species. Unsclerotised opisthogastric cuticle with 8–9 *Jv*-*Zv* setae, *Jv*5 very long.

Cheliceral fixed digit with 4–7 teeth, mostly small and distal to pilus dentilis. Epistome subtriangular, slightly projecting medially into a more or less tongue-shaped process, densely denticulate. Deutosternum with rows of 10–15 denticles each.

Femur IV with a strong macroseta (*ad*1), sometimes femur II with *pd*1–2 also elongate. Ventral setae of genua to tarsi II–IV often moderately thickened, as well as *al*1, *pl*1 of tarsus II. Leg chaetotaxy normal, except for one undescribed species with femur II bearing only two ventral setae (*pv*2 absent, or *v*3 *sensu* Evans, 1963: 291). Pretarsus I with greatly reduced claws.

Chapalaelaps has similarities with *Hypoaspis* and other scarab-associated genera (see diagnosis section of *Acantholaelaps*), particularly with *Chapalania*, both genera having sternal shields granular and dorsal shields with a few very long marginal setae and very short central setae. However, *Chapalaelaps* is more hypotrichous dorsally and has a strong macroseta on femur IV, whereas *Chapalania* has macrosetae on genua III–IV, very long post-anal seta, and femur II strongly constricted medially. Selected reference: Gwiazdowicz *et al*. (2020b).

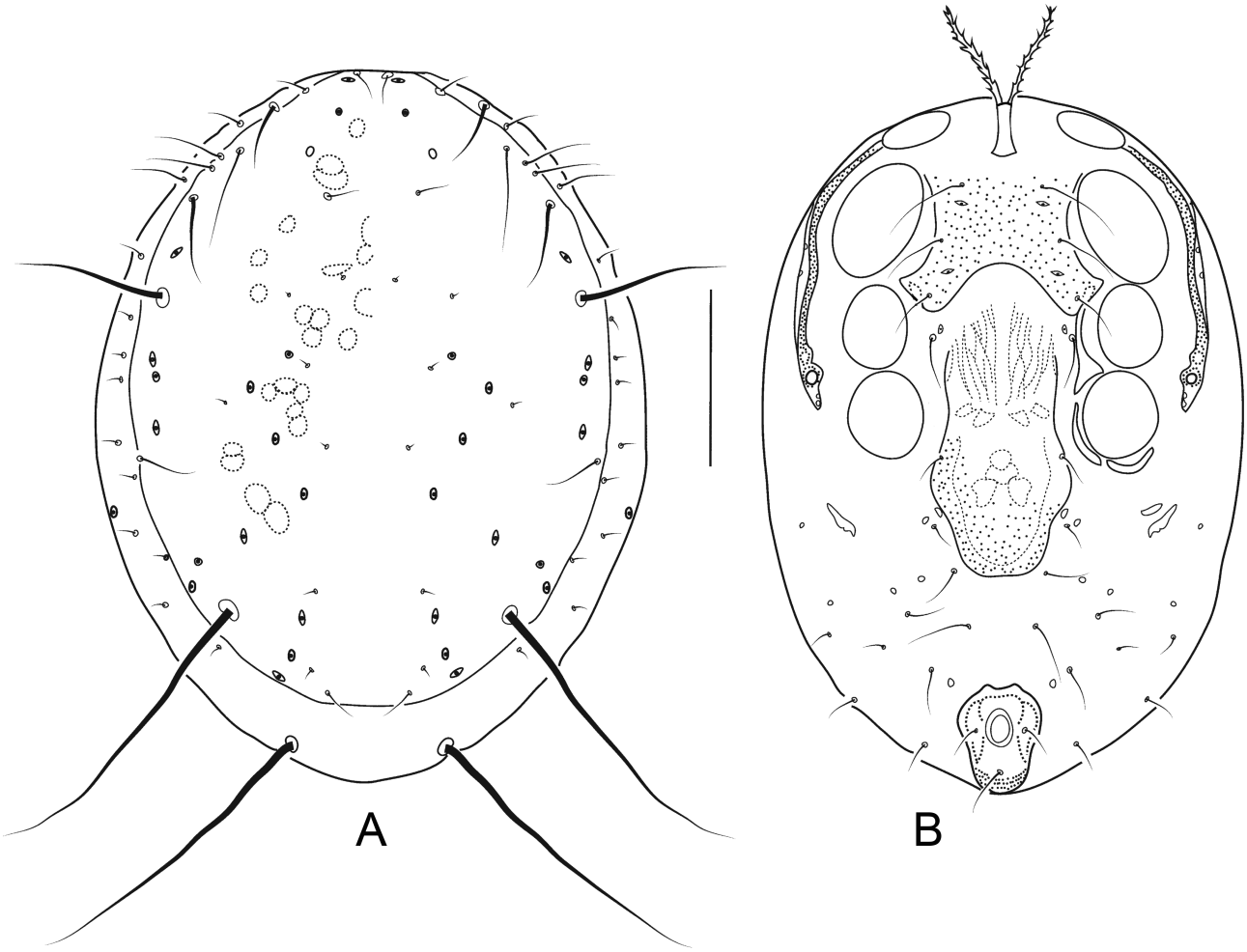


FIGURE 13. Female. *Chapalaelaps* Gwiazdowicz *et al*. (modified from Gwiazdowicz *et al*., 2020b): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 200 µm.

Chapalania **Hoffmann & López-Campos** (Fig. 14)

Idiosoma 800–900 µm long. Dorsal shield broadly oval to subcircular, with unsclerotised cuticle exposed mostly posteriorly, varying from hypotrichous to hypertrichous; with four pairs of greatly elongate setae marginally (some possibly as long as the dorsal shield), three on shield margin (including *s*4 and *Z*4 in one species; difficult to identify in the other species) and one (putatively *R* seta) inserted on soft cuticle exposed posterodorsally; other setae vary from minute to moderately long; shield lacking some setae (*j*3 and 2–3 *z* setae apparently lost; nine setae of the *Z*-, *s*-*S* and *r*-series also lost in *C. erichi*, having only 24 pairs on shield) but with notable hypertrichy in the region of *s*- and *r*-series in one species (*C. cifuentesi*, with about 46 pairs on shield); one *Jx* seta present in one species (between *J*3–4). Sternal shield microtuberculate, slightly wider than long; devoid of setae in one species (*C. erichi*, with only traces of *st*2–3 sockets). Epigynal shield tongue-shaped, although sharply bulging at level of *st*5 in *C. erichi*. Anal shield relatively elongate posteriorly; post-anal seta far from anus and very long, about twice as long as anal shield; para-anal setae short. Unsclerotised dorsolateral and opisthogastric cuticle hypertrichous or not, with setae varying from minute to long. Peritreme moderately short (not reaching coxa I), peritrematal plate minimally developed, with a very narrow extension posterior to stigma, and free anteriorly.

Cheliceral fixed digit with four teeth, three of them apical to pilus dentilis. Chelicera of known male (of *C. cifuentesi*) with movable digit without teeth, and with spermatodactyl apparently originating from internal (dorsal) surface of digit. Epistome variable, either truncate and serrate, or triangular and serrate only in latero-basal portions. Deutosternum with rows of 4–9 denticles each.

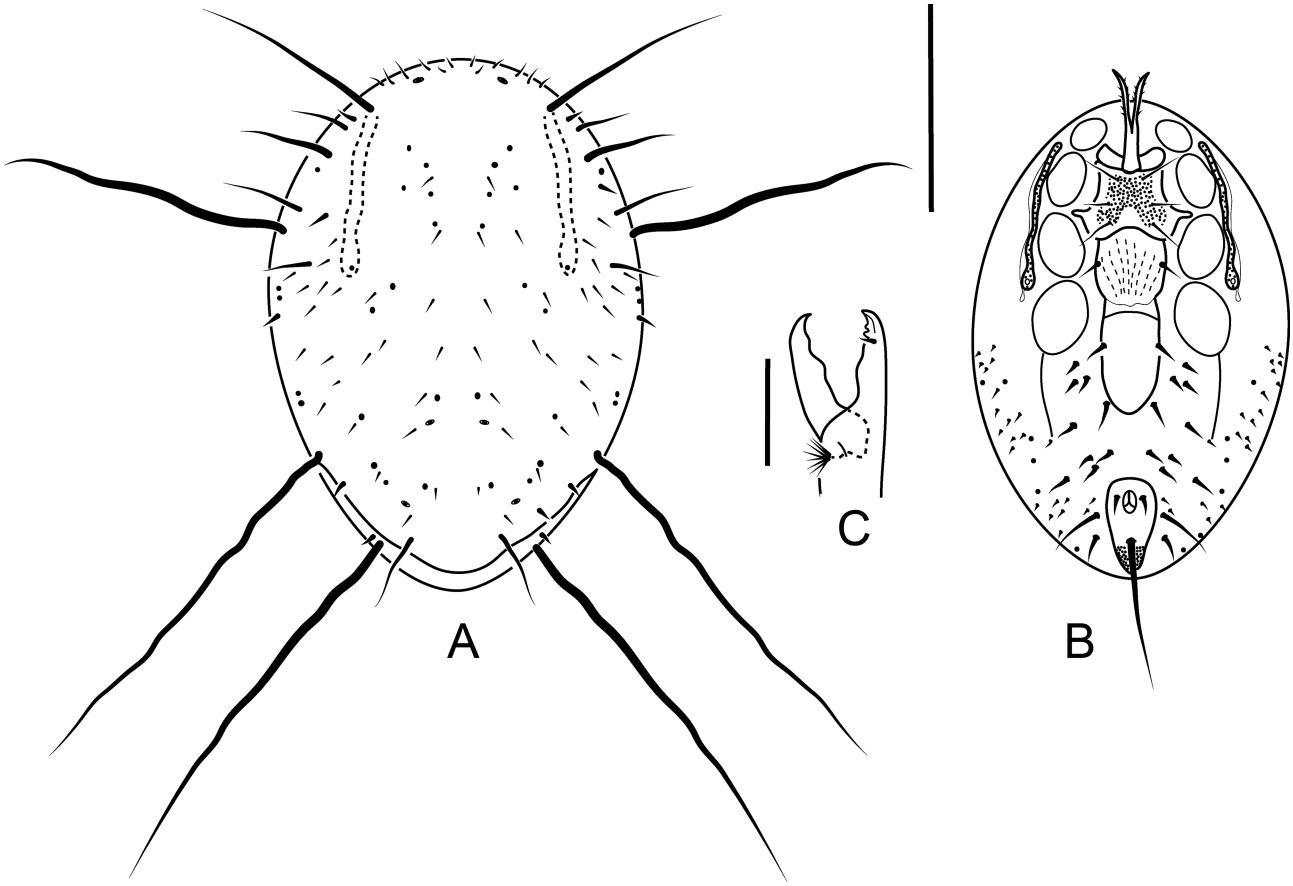


FIGURE 14. Female. *Chapalania* Hoffmann & López-Campos (modified from Hoffmann & López-Campos, 1995): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 300 μm for dorsum and venter, 100 μm for chelicera.

Femur II strongly constricted medially. Genua III–IV with at least *ad*1 very long (macroseta); a few other setae are longer than others on genu I–II and on femora of *C. erichi*, but not as markedly as *ad*1 of genua III–IV. Leg chaetotaxy normal except for femur II having only ten setae (lacking *al*1) in *C. erichi*. Leg II of male bearing non-setigerous spurs on femur and genu, and stout ventral setae on tibia and tarsi.

This small genus exhibits heterogeneity for several characters, but the medially constricted femur II is a strong apomorphy for the genus, with the diagnosis further reinforced by the granular sternal shield, the four whip-like dorsal setae, strong macrosetae on genua III–IV, much longer than setae on respective femora, very long post-anal seta and relatively short peritreme. It is most similar to *Chapalaelaps* (see above). Selected references: Hoffmann & López-Campos (1995), Gwiazdowicz & Nemati (2018).

***Coleolaelaps* Berlese** (Fig. 15)

Idiosoma 800–1200 μm long. Dorsal shield usually with lateral incisions between podonotal and opisthonotal regions, which vary in extent even intraspecifically; opisthonotal region nearly always narrower (rarely the shield is oval, with lateral margins entire, *e.g. C. abnormalis* Costa & Hunter); shield with at most 28 pairs of setae, usually 21–25 pairs; *z*3 often absent, sometimes also *z*6; many setae not captured by shield, but on soft cuticle, typically *s*1–3, s6, all *r* setae, and most or all *S* setae (along with 6–16 pairs of *R* and *UR* setae, occasionally more). Most idiosomal setae long to very long (and sometimes wavy), the longest typically along shield margin and posteriorly, including *Jv*5. Sternal shield usually eroded, endopodal fragments free or partly fused to shield (occasionally shield entire, normal); anterior shield margin often indistinct, with *st*1 inserted on shield edge or on weakly sclerotised (lineate-reticulate) presternal area; shield densely reticulate. Epigynal shield typically drop-shaped, particularly narrow at level of coxa IV; *st*5 on or off shield; shield typically ornamented with many narrow, elongate cells.

Endopodal plate usually narrow, sometimes absent. Anal shield pear-shaped, drop-shaped or obovate. Post-anal seta usually distinctly longer than para-anal setae, the latter usually inserted close to level of hind margin of anus. Peritreme occasionally slightly shortened, not reaching coxa I; peritrematal plate minimally developed except for (usually short) extension behind stigma (rarely fused to exopodal IV), free anteriorly. The few known males have a sternogenitiventral shield, eroded marginally, barely extending into opisthogastric region, or shield fragmented, with anterior fragment bearing 2–3 pairs of sternal setae.

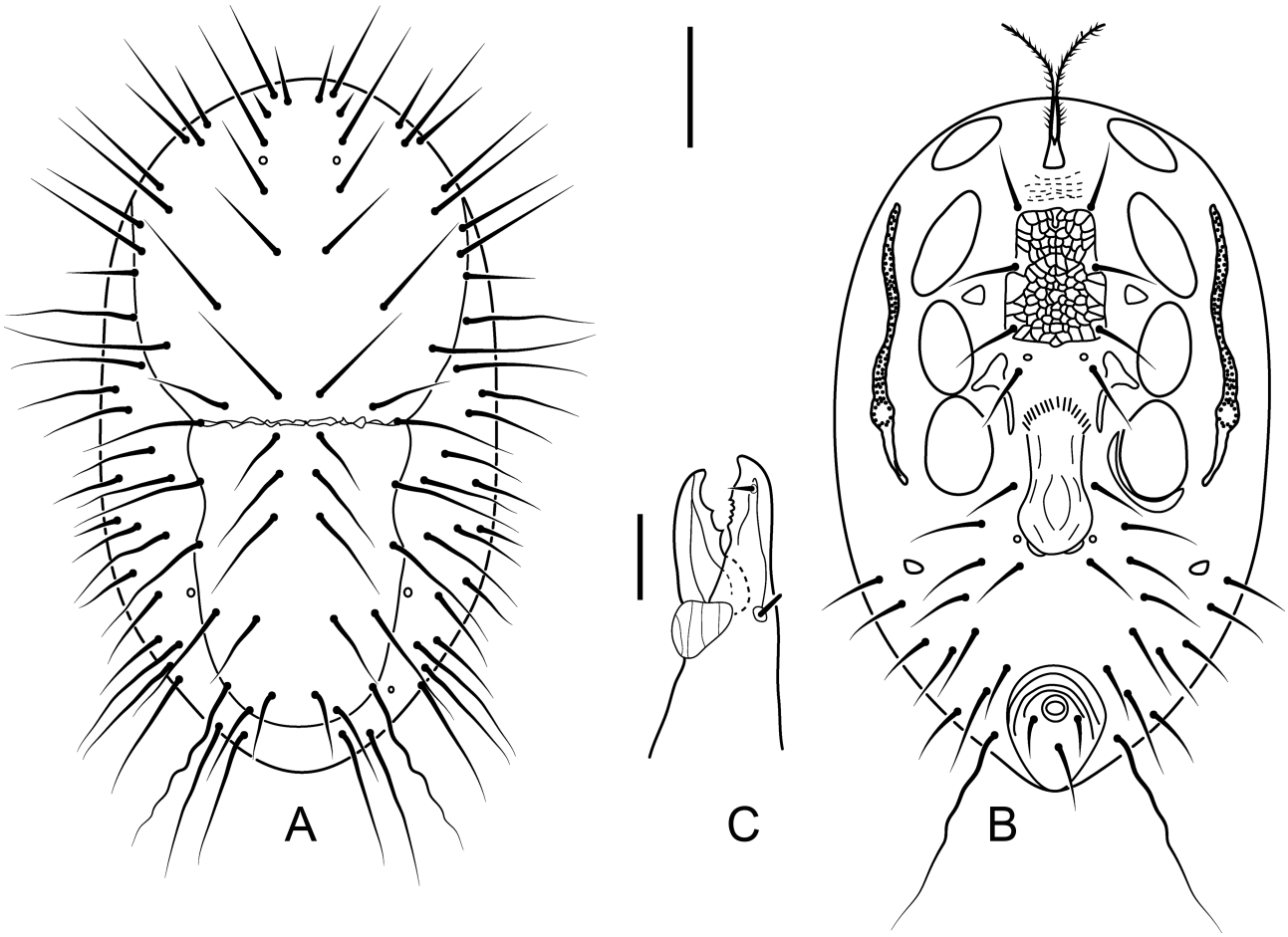


FIGURE 15. Female. *Coleolaelaps* Berlese (modified from Joharchi & Halliday 2011): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 50 μm for chelicera.

Cheliceral fixed digit usually with 2–3 teeth (small or mid-sized) apical to pilus dentilis, followed by a series of 6–12 very small to minute teeth. Internal malae occasionally with a pair of lateral fimbriate arms, in addition to main, medial arms. Epistome variously subtriangular, usually distinctly serrate, at least on latero-basal margins (rarely mostly smooth). Deutosternum relatively broad, with ten or more denticles per row. Internal malae often with a pair of short fimbriate arms laterad of the median pair. Hypostomal setae *h*3 generally mid-sized, subequal to, or not distinctly longer, than *h*1–2.

Legs III–IV longer than usual; leg I never longer, usually quite shorter, than leg III. Leg IV nearly always with dorsal macrosetae, especially on femur (*ad*1), genu (at least *ad*1), tarsus (at least *ad*3, *pd*3) and often tibia (one or more dorsals). Some leg setae are occasionally thickened or spine-shaped, including on tarsus II (although usually not apically blunt, spur-shaped). Leg chaetotaxy mostly normal, except genu IV with 9–10 setae, often including two *pl*; tibia III of type species, *C. agrestis* (Berlese) with nine setae (including two *pl*), and exhibiting variations at least on femur III, sometimes with seven setae (including two *pl*), and genu I, sometimes with 11–12 setae (one or both *av* lost).

Coleolaelaps has many of the distinctive features of other scarab associates (see remarks at the end of *Acantholaelaps* diagnosis), but differs from them and other laelapids by the combination of: a dorsal shield attenuated posteriorly, often laterally incised, bearing 21–28 long setae; eroded, densely reticulate sternal shield; relatively

narrow epigynal shield; long legs, including leg I shorter than leg III, and genu IV often with two *pl*; post-anal seta longer than para-anals, and *h*3 not distinctly longer than *h*1–2. Selected references: Costa & Hunter (1971), Joharchi & Halliday (2011).

***Conolaelaps* Womersley** (Fig. 16)

Idiosoma about 500–700 long. Dorsal shield thinly sclerotised, strongly truncate posteriorly, leaving a considerable area of soft cuticle exposed laterally and even more posteriorly; with only 23 pairs of setae, lacking at least ten pairs; all setae minute. Dorsal and opisthogastric unsclerotised cuticle with 24–26 pairs of minute to very short setae mostly distributed posterior to shield; an isolated platelet flanking dorsal shield anterolaterally. Tritosternum with laciniae very short, smooth except apically. Presternal area with two small, rounded platelets, distant from each other; sternal shield with *st*1 minute, on shield edge. Epigynal shield small, narrow, more or less tongue-shaped, bearing *st*5, not or barely overlapping sternal shield anteriorly. Setae *st*2–5 and 3–4 (pairs of) *Jv*-*Zv* setae stout, bulbous. Anal shield oval, anus in posterior half of shield, circum-anal setae very short. Metapodal plate absent. Peritreme extremely short or virtually absent; peritrematal plate small, tapered and free on both ends.

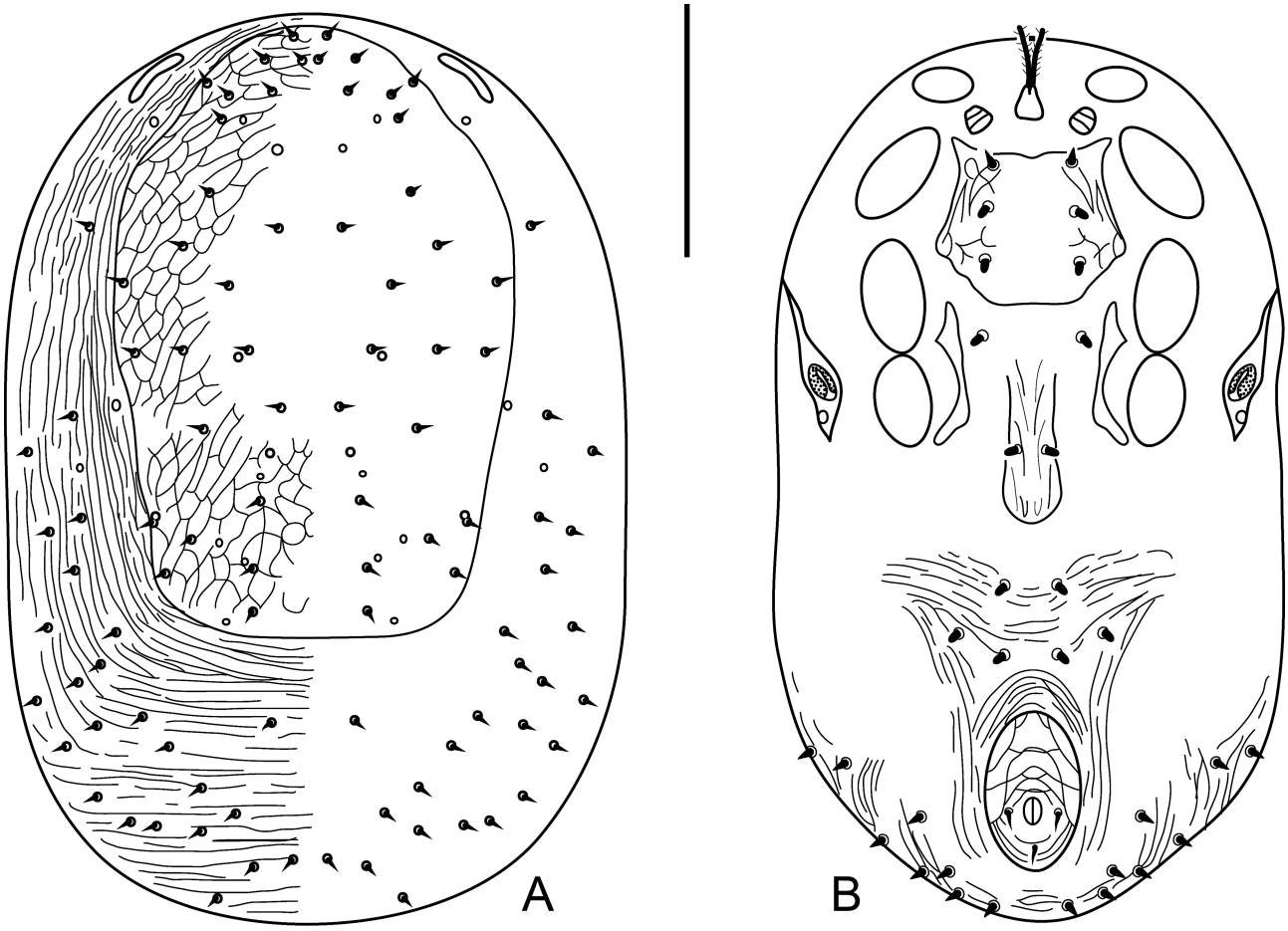


FIGURE 16. Female. *Conolaelaps* Womersley (based on originals by D.E. Walter, with permission): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 200 µm.

Cheliceral fixed digit with 1–2 teeth; male chelicerae apparently edentate, without fixed digit and with long spermatodactyl. Epistome somewhat elongate, with margin apparently denticulate. Deutosternum tapering posteriorly, with rows of 4–7 denticles. Internal malae without fimbriae. Hypostomal setae *h*1–3 and seta *pc* very short. Palp chaetotaxy reduced, with femur–tibia seemingly bearing as few as 4-4-12 setae, respectively.

Legs short. Most setae very short; femora I–IV with *ad*1 and genua II–IV with some dorsals thickened or cone-

shaped. Legs with reduced chaetotaxy, including femur I with ten setae (2–4/2–2), femur II with nine setae (1–2/1, 2/2–1), genua I–III with six setae (1–2/0, 2/0–1), genu IV with seven setae (1–2/0, 2/1–1), tibia I with eight setae (1–2/1, 2/1–1), tibiae II–IV with seven setae (1–1/1, 2/1–1). All pretarsal claws absent or vestigial, pulvilli relatively large.

A monotypic genus recognisable by its reduced dorsal and epigynal shields, minute setae except for 7–8 pairs of bulbous setae ventrally, and strongly reduced peritreme, hypostomal setae, claws, palp and leg chaetotaxy. Selected reference: Womersley (1959).

Cosmolaelaps **Berlese** (Fig. 17)

Idiosoma 400–1000 µm long. Dorsal shield broadly oval to suboval, occasionally tapered posteriorly; usually with 39 pairs of setae, including *Zx*2–3, as well as 1–5 unpaired *Jx* setae; occasional (apparent) departure from this pattern includes: 0–1 *Zx* only; no *Jx* setae, or in contrast, 9–20 additional setae (exceptionally more) between or among the standard *J* (or even *Z*) series; rarely one or more primary setae lost. Dorsal setae variously modified in shape, always involving some thickening of the setal shaft, either mostly apically, resulting in spatulate or leaf-like setae (and often tricarinate and mucronate); or thickening mostly basally, with the seta bulging asymmetrically near base, the bulge extending and tapering along the shaft, resulting in lanceolate, knife- or scimitar-like setae; basal lobe present in most species, and varying from gently, narrowly to strongly rounded, which is sometimes the only setal modification, with setae otherwise appearing simple; setae occasionally apically barbed. Presternal area typically weakly sclerotised, lineate-granulate, occasionally with discrete platelets or fused with sternal shield; *st*1 off shield, on weakly sclerotised area, in a few species. Epigynal shield variously tongue-, drop- or nearly flask-shaped, bearing only *st*5, enlarged in some species (rarely shield greatly enlarged and bearing 1–3 additional pairs of setae). Post-anal seta usually subequal to, or slightly longer than para-anal setae. Unsclerotised opisthogastric and dorsolateral cuticle with normal chaetotaxy, rarely with more than ten (including *R*-*UR*) setae other than *Jv*-*Zv* setae; posteriormost setae often similarly modified as dorsal setae.

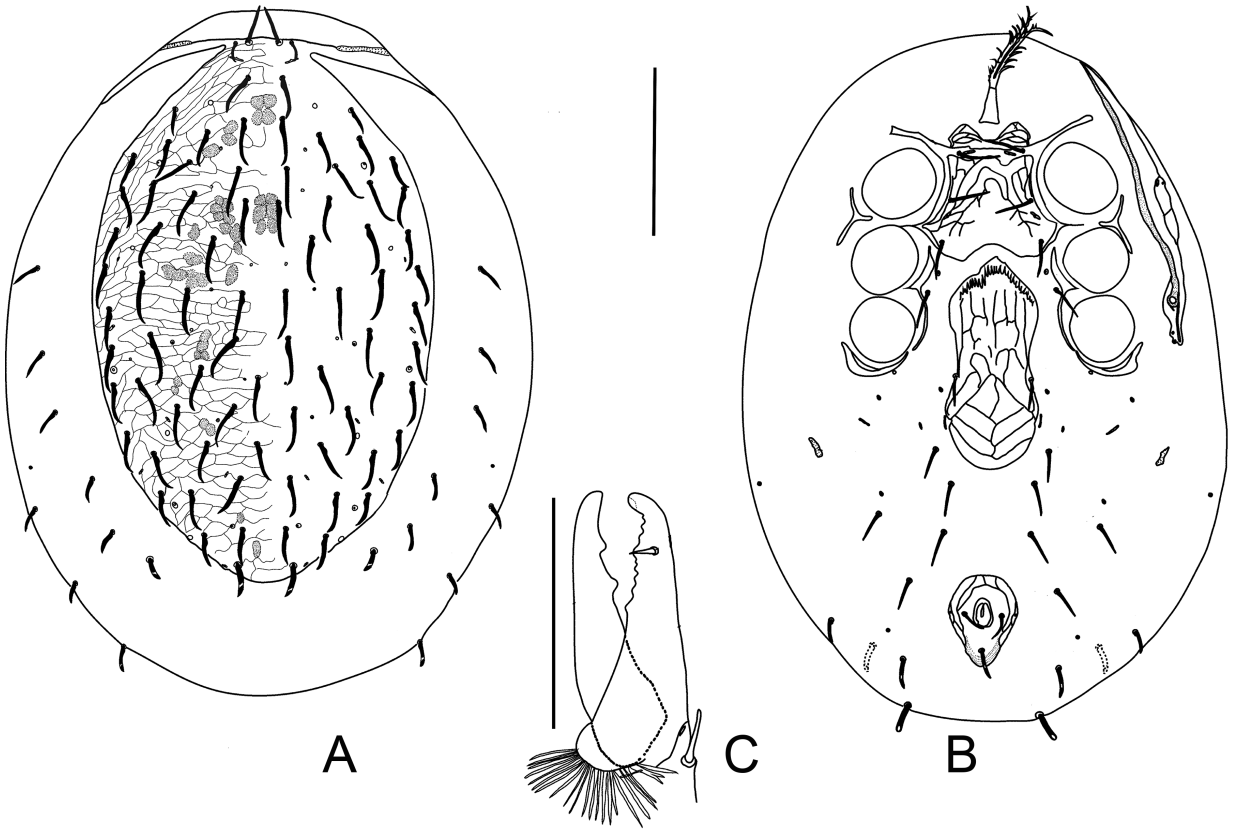


FIGURE 17. Female. *Cosmolaelaps* Berlese (modified from Moreira *et al*., 2014): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 µm for dorsum and venter, 10 µm for chelicera.

Cheliceral fixed digit with a wide-ranging number of teeth (2–14), sometimes including a series of many small teeth. Epistome convex, occasionally acuminate; with margin serrate. Deutosternum typically broad, with over ten denticles per row, occasionally fewer. Internal malae sometimes with a pair of short lateral fimbriate arms in addition to median ones, or with long thick threads.

Legs often with some stout or spatulate setae (variably similar to dorsal shield setae). Leg chaetotaxy normal, with rare exceptions (*e.g*. genu IV with two *pl* in *C*. *cuneifer*).

In its current concept, which essentially follows that of Berlese (1903b) and Evans & Till (1996), *Cosmolaelaps* represents a diverse assemblage of taxa. Some species (*e.g*. *C*. *cuneifer* and relatives) share a key feature with *Stratiolaelaps*, namely the spatulate-tricarinate setae of the dorsal shield and opisthogaster, but *Cosmolaelaps* species can be distinguished from *Stratiolaelaps* by their shorter chelicerae and corniculi, narrower peritrematal shield and sternal shield not strongly developed anterolaterally. Selected reference: Moreira *et al*. (2014).

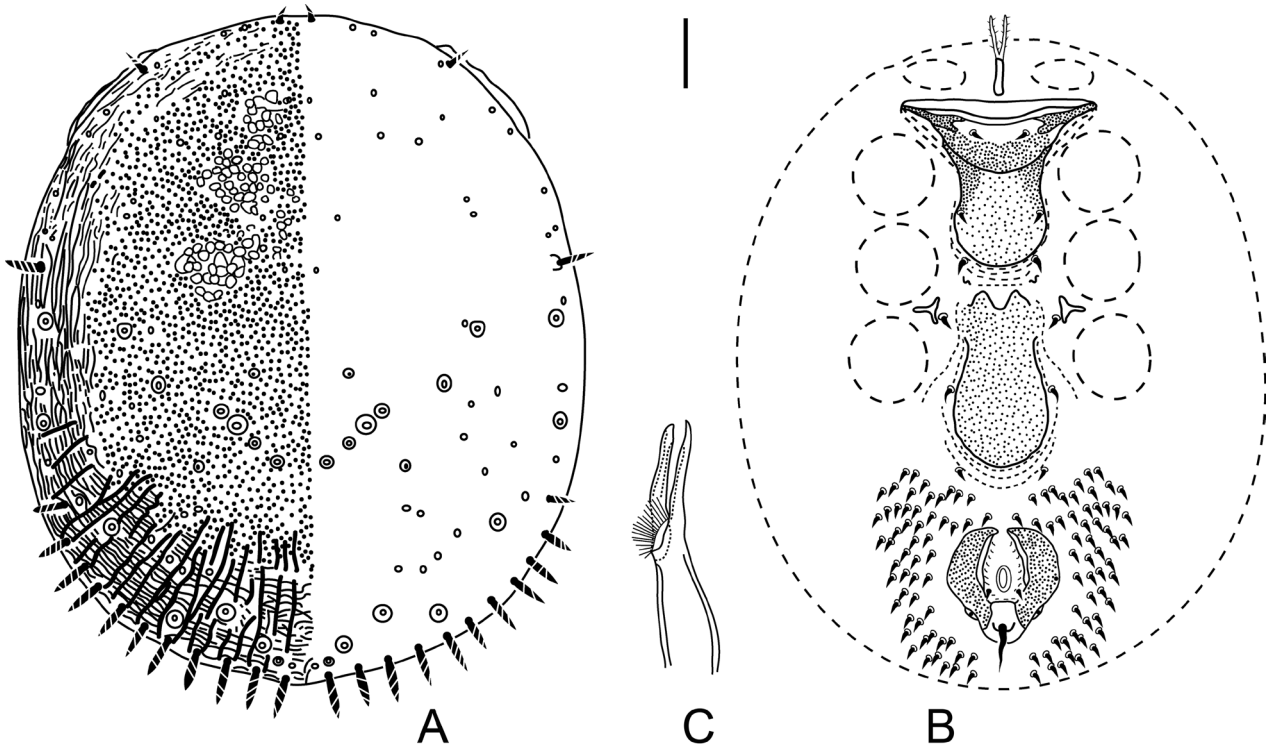


FIGURE 18. Female. *Cyclothorax* von Frauenfeld (modified from Trägårdh, 1949): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 µm; chelicera not in scale.

Cyclothorax **von Frauenfeld** (Fig. 18)

Idiosoma 1400–2000 µm long. Dorsal shield subcircular, flattened, highly sclerotised and sculptured, covering all idiosoma dorsally, apparently hypotrichous, bearing a row of 6–11 pairs of relatively short, stout setae, corkscrew-shaped in at least one species (*C*. *mirabilis* (Trägårdh); in contrast, Johnston (1960) show relatively long, spine-like setae for the male of *C*. *pagurophilus* (André)) along posterior shield margin; at least three other pairs of thick setae scattered along anterolateral margins (including *j1*); other setae inconspicuous or very short, including eight pairs centrally and several more submarginally (based on André's (1937) description of *C*. *pagurophilus*). Sternal shield somewhat funnel-shaped, strongly sclerotised anteriorly, including well-developed, straight, anterolateral arms between coxae I–II; more thinly sclerotised and tongue-shaped posteriorly; *st*1 inserted on lightly sclerotised cuticle anteriorly; *st*3 on shield edge or on unsclerotised cuticle. Epigynal shield drop-shaped, *st*5 on unsclerotised cuticle. Anal shield relatively large, obovate to pear-shaped, strongly sclerotised either along its entire margin (presenting as a dark strip) or in its outer lateral margins (as two dark marginal bands flanking the softer central area); post-anal seta stout, moderately longer than para-anal setae. Opisthogaster mildly to highly hypertrichous, with setae (all very short) mostly clustered in region surrounding anal shield. Peritreme long, almost devoid of surrounding plate.

The only known male with genital opening removed anteriorly from a sternal shield that is considerably eroded posteriorly, and with a separate irregular fragment between coxae IV, barely reaching opisthogastric region; and separate anal shield.

Gnathosoma small, positioned ventrally. Cheliceral digits slender, styliform, edentate, apparently without pilus dentilis. Chelicerae of the only known male edentate, but movable digit apically hooked and fixed digit bent apically. Epistome serrate. Deutosternum with 12 rows of many denticles each (based on *C. pagurophilus*). Salivary styli elongate (at least in male).

Leg I particularly small, slender (less so in males). Legs with many stout setae, including conical or bulbous setae subapically on tarsi II–IV; and corkscrew-shaped setae on trochanter I and near apex of tarsus II in at least *C. mirabilis*. Leg chaetotaxy poorly studied. Pretarsus I with minute claws.

Although unsatisfactorily known, *Cyclothorax* can be most easily recognised by its small gnathosoma hidden under the nearly circular, strongly sculptured dorsal shield with thick posteromarginal setae, funnel-shaped sternal shield, anal shield more sclerotised marginally, legs with bulbous setae, and finger-like cheliceral digits. Selected references: André (1937), Trägårdh (1949), Johnston (1960).

Dicrocheles Krantz & Khot (Fig. 19)

Idiosoma 500–700 µm long. Weakly sclerotised mites. Idiosomal setae very short to mid-sized, generally subequal within a species. Dorsal shield reduced in size, so as to bear only 5–11 pairs of setae, and leaving most of the idiosoma exposed; strongly hypotrichous, lacking setae in all series, including *J* series. Unsclerotised cuticle around shield with 20–35 pairs of setae, usually including at least two pairs near anterior margin, not captured by the shield; soft opisthogastric cuticle with 10–20 pairs of setae. Tritosternum base very short, laciniae with reduced pilosity. Sternal shield with endopodal extension weakly developed, especially posteriorly, with *st*3 on shield edge or on unsclerotised cuticle. Seta *st*4 always absent. Epigynal shield relatively short, varying from subrectangular to somewhat drop-shaped; anterior hyaline portion well-developed, tapering, typically reaching beyond *st*2 level; *st*5 on soft cuticle, near level of posterior margin of epigynal shield. Anal shield usually terminal or nearly so, bearing circum-anal setae and usually also 2–3 extra pairs of setae on anterior shield margin (technically a ventrianal shield, although shield remains small, suboval or obovate); rarely only with circum-anal setae. Endopodal plate reduced or absent. Peritreme very short; peritrematal plate shortened and free anteriorly, and posteriorly curving inward to merge with podal strip behind coxa IV (or apparently absent in one species). Males with sternogenital shield, irregular posteriorly, capturing *st*5 or not.

Fixed cheliceral digit reduced to two tapered, blunt lobes flanking movable digit; pilus dentilis absent; movable digit claw-like, with a single strong tooth; lacking arthrodial corona. Male chelicera entirely edentate, with fixed digit a single blunt lobe and movable digit vestigial or largely fused with the relatively short spermatodactyl. Epistome a short rounded lobe (possibly longer in males), with smooth margin. Seta *h*3 usually absent. Corniculi approximate, blunt, usually notched apically; salivary styli elongate, extending beyond tip of corniculi or projecting laterally. Internal malae reduced, without fimbriae. Deutosternum with 12–16 rows of 4–8 denticles each. Palp chaetotaxy variously reduced, including trochanter, femur and genu with 0–2, 3–4, and 4–5 setae, respectively.

Leg setae short. Major reduction in leg chaetotaxy, with virtually all leg segments having one to several setae lost relatively to normal pattern; coxa I often with one seta; trochanters with 4–5 setae; femora I–IV respectively with 12 (lacking one *pv*), 10–11 (sometimes lacking one *ad* or one *al*), five (lacking *pl*), 5–6 setae (usually lacking *pl*); genu I with 8–9 setae (1 or 2–2/1, 2/1–1), genua II–III with 6–7 setae (1 or 2–2/0, 2/0–1), genu IV with 6–7 setae (1–2/0 or 1, 2/0–1), and tibia I with usually eight setae (1–2/1, 2/1–1), tibiae II–IV with seven setae (1–1/1, 2/1–1). Setal loss varies between and within species for certain leg segments. All pretarsi with reduced claws.

This highly distinctive genus shares several features with *Berlesia*, notably the general morphology of chelicerae and corniculi, and having deutosternum with over ten rows of denticles, but even more so with *Katydiseius*, which also has significantly reduced leg and palp chaetotaxy. *Dicrocheles* differs from these two genera by its dorsal shield with fewer setae, (small) ventrianal shield, and the absence of *st*4. Selected references: Krantz & Khot (1962), Treat (1970), Lindquist *et al*. (2020: 41).

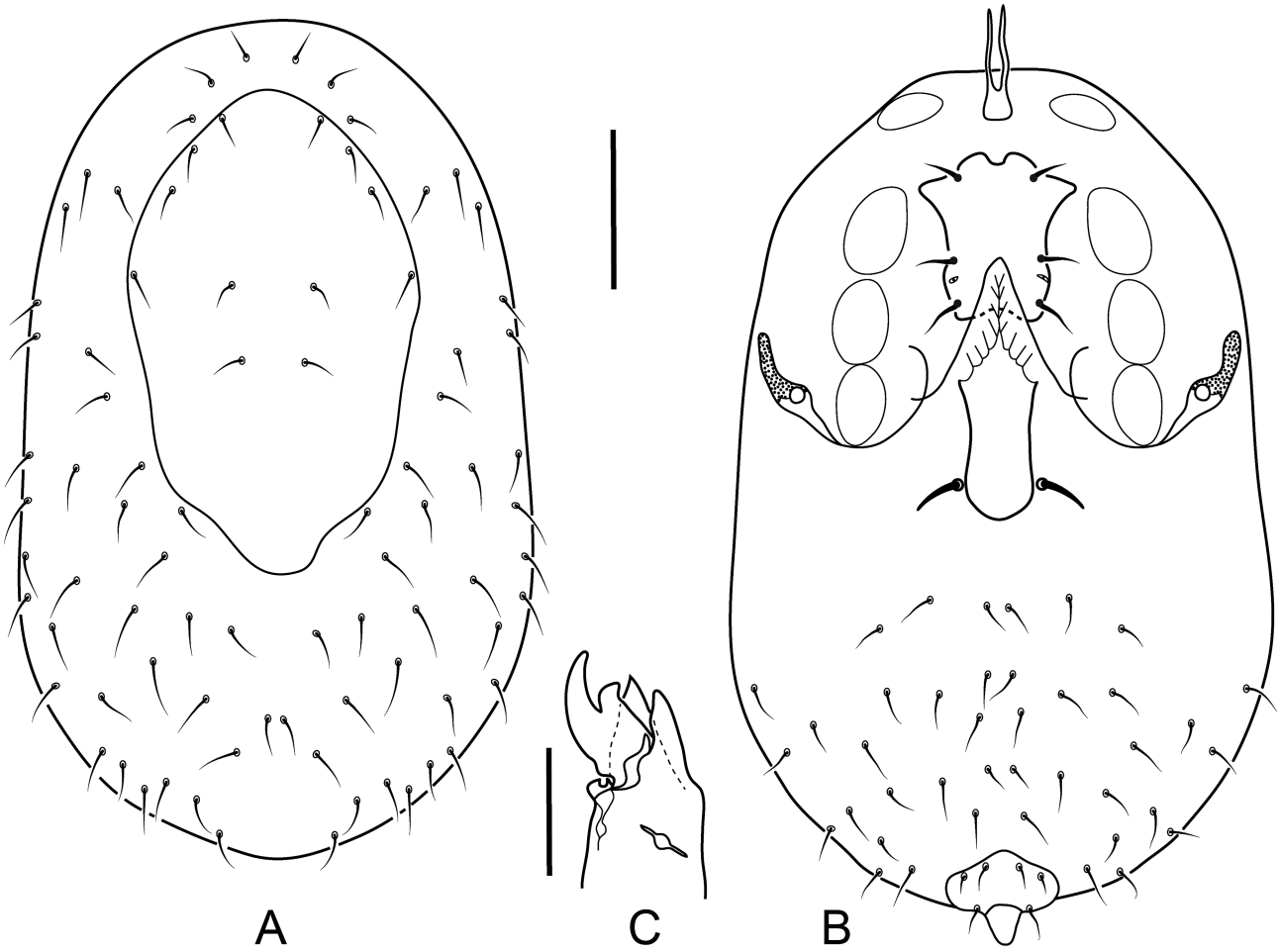


FIGURE 19. Female. *Dicrocheles* Krantz & Khot (modified from Treat, 1970): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 µm for dorsum and venter, 15 µm for chelicera.

Dinogamasus **Kramer** (Fig. 20)

Idiosoma dorsoventrally flattened, 900–3500 µm long. Dorsal shield suboval to variously tapered posteriorly; lateral margins often irregular or with incisions (slightly posterior to midway); dorsum hypertrichous, ranging from mild to extreme hypertrichy (with *ca*. 46 to more than 250 irregular pairs of setae on dorsal shield), including dorsolateral unsclerotised cuticle; level of dorsal hypertrichy reflected on the opisthogaster; hypertrichy sometimes localised (*e.g*. *j*-series often not, or less, hypertrichous), and, setae other than dorsocentrals (*j-J*) often inserted more marginally than normal, resulting in overall median area relatively bare compared to hypertrichous margins. Idiosomal setae most often short or very short, sometimes mid-sized, usually subequal within species except, occasionally, for (*i*) long marginal setae, especially on anterodorsal shield margin and on unsclerotised lateral and opisthogastric cuticle, or (*ii*) a few scattered dorsal setae distinctly longer; *st*1–5 usually long. Sternal shield usually eroded along (poorly defined) margins, subquadrate, bearing only 1–2 pairs of setae, with *st*3 always and *st*2 seldom off the shield; *st*1 sometimes on anterior desclerotised portion of shield; occasionally with a few unpaired extra setae medially on shield; poroid *iv*2 frequently on unsclerotised cuticle. Seta *st*4 absent in some species. Epigynal shield small, narrow, flask-shaped to subrectangular; *st*5 on unsclerotised cuticle; shield distant from (not overlapping anteriorly) sternal shield. Anal shield relatively large, variously elongate posteriorly, ranging from pear-shaped with posterior half (normally) tapered, to subrectangular with posterior margin broad, appearing truncate; cuticle desclerotised around anus in some species; post-anal seta subequal to, or moderately longer than para-anal setae. Endopodal and metapodal plates absent. Peritreme absent (if present, rarely: very short); stigma enlarged, surrounded by a fimbriate frame, typically with a lightly sclerotised peritrematal plate narrow and free anteriorly, or sometimes fused to dorsal

shield; plate may be indiscernible or absent. Known male with anal shield, and a sternogenital shield with margins eroded.

Chelicera with movable digit robust, strongly curved, hook-shaped; fixed digit narrower, usually reduced, ranging from almost as long as movable digit to absent; digits with 0–2 (usually small) teeth. Epistome a simple arch. Deutosternum with inconspicuous transverse ridges, without denticles. Corniculi approximate, typically very short and blunt or truncate, but ranging from small, horn-shaped to vestigial. Seta *pc* sometimes with base inflated. Palp tibia with only 12 setae.

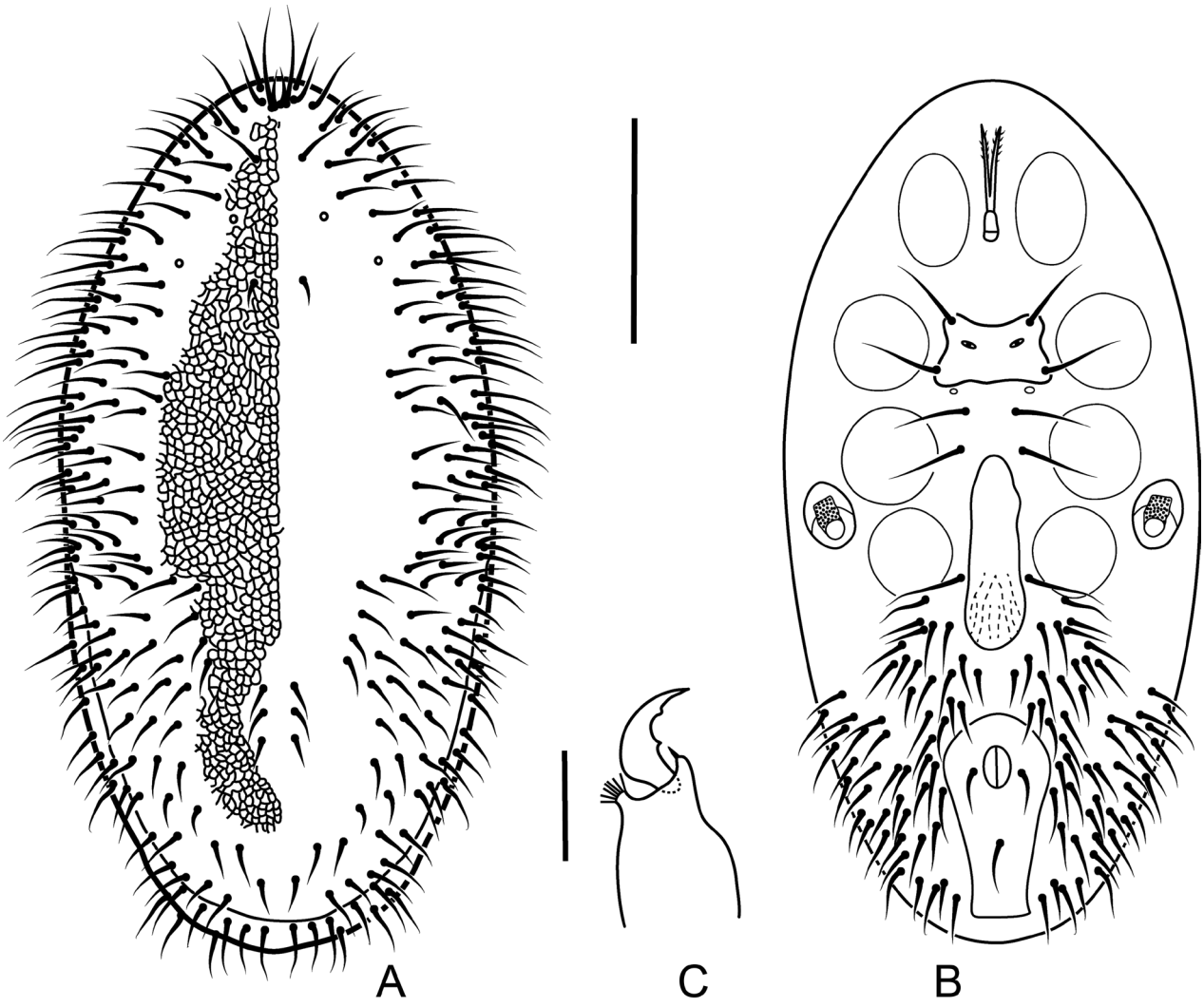


FIGURE 20. Female. *Dinogamasus* Kramer (modified from Joharchi *et al*., 2016): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 400 μm for dorsum and venter, 100 μm for chelicera.

Legs I–II robust, subequal, legs III–IV narrower and longer. Many leg setae variously modified in shape, most strikingly on legs I–II, typically including dorsal macrosetae on femora I–II; bulbous, cone- or spur-shaped setae mostly on genua and tibiae I–II (dorsal and *pl* setae), tarsi I–II (mostly ventrals) and coxae I–III. Pattern of setal modifications highly variable between species. Leg chaetotaxy with more setae than normal for laelapids, primarily: femur I usually with 14 setae (including six dorsals); femora III–IV with seven setae (including two ventrals); genu III with ten setae (including two *pl*), genu IV with 11 setae (including two *pl* and two ventrals). Trochanter IV sometimes with six setae, including a *pl* seta.

This monotypic genus can be easily distinguished by its enlarged stigmata without peritreme, generally hypertrichous idiosoma, reduced fixed digit opposed to a hook-like movable digit, small sternal and epigynal shields, *st*3 and *st*5 on unsclerotised cuticle, subrectangular anal shield, reduced corniculi, and augmented leg chaetotaxy. Selected reference: Lundqvist (1999).

***Dynastaspis* Costa** (Fig. 21)

Idiosoma 1000–1100 µm long. Dorsal shield suboval, with 31–32 pairs of setae; *z*4, *s*4–5 and most *Z* setae inserted closer to shield margin than usual; lacking *z*3 and/or z6, and *r*2–4 and *s*6 off shield; 4–5 pairs of very long, whip-like setae (some wavy), including at least *z*4, *s4*–5 and *Z*4 (*j*3 also usually long); other marginal setae at least mid-sized, central setae short. Presternal area weakly sclerotised, lineate-reticulate and granulate; sternal shield about as long as wide, densely reticulate; eroded in posterolateral corners in one species. Epigynal shield tongue- or drop-shaped, relatively large, ornamented with many narrow, elongate cells; bearing *st*5. Post-anal seta mid-sized, subequal or slightly shorter than para-anal setae. Peritrematal plate nearly completely absent, almost devoid of extension behind stigma. Unsclerotised dorsolateral and opisthogastric cuticle mildly hypertrichous, including 13–17 pairs of *R-UR* setae in addition to *Jv-Zv* setae (and *r* and *s* setae above-mentioned); all ventral setae long, *Jv*5 very long.

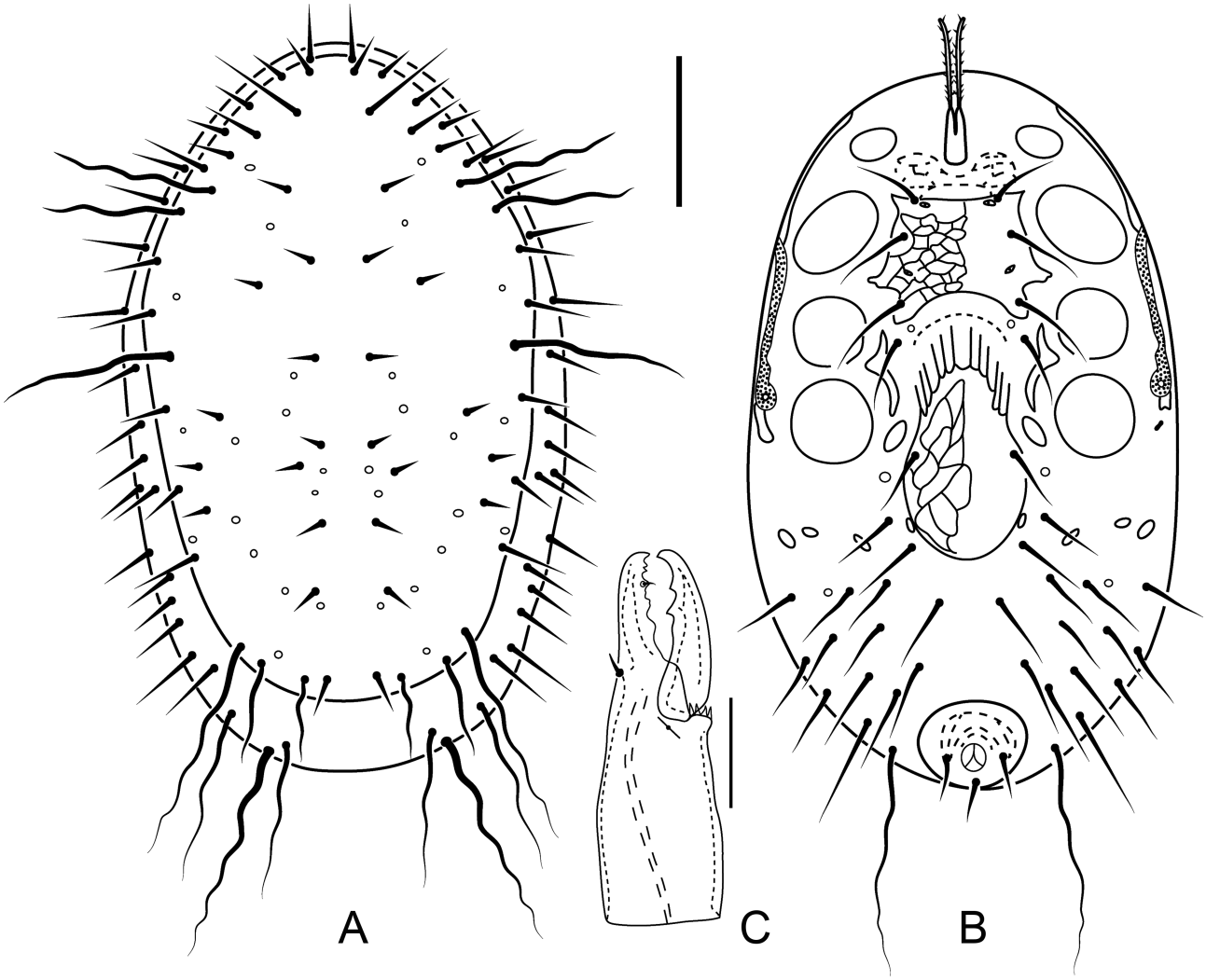


FIGURE 21. Female. *Dynastaspis* Costa (modified from Costa, 1971): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 µm for dorsum and venter, 100 µm for chelicera.

Cheliceral fixed digit with 5–8 teeth of variable size, including two small teeth distal to pilus dentilis. Epistome subtriangular, rounded apically, with a few denticles on lateral margins or none. Deutosternum with rows of 10–18 denticles each. Internal malae with a pair of short lateral fimbriate arms in addition to the median, contiguous pair.

Legs with a very strong macroseta on femur IV (*ad*1), and 1–4 moderately strong macrosetae on tarsus IV (at least *pd*2), and sometimes on femora II–III (*ad*1 or *pd*1). Tarsus II with stout ventral/subapical setae, including *al*1, *pl*1. Leg chaetotaxy normal, except that tibia III occasionally with nine setae, including an additional *pl* seta.

Dynastaspis shares features with other scarab associates (see remarks at the end of diagnosis for *Acantholaelaps*).

Like *Coleolaelaps*, it has densely reticulate sternal and epigynal shields. In contrast, *Dynastaspis* has short central setae, and *Coleolaelaps* has many distinctive features absent in *Dynastaspis* (see end remarks for *Coleolaelaps*). Selected references: Costa (1971, 1976).

***Dynatochela* Keegan** (Fig. 22)

Idiosomal dimensions not available. Dorsal shield thinly sclerotised, hypotrichous, and strongly truncate posteriorly (at least based on male description), so as to bear only 8–9 pairs of setae, and leaving at least posterior third of idiosoma exposed dorsally. All idiosomal setae very short. Sternal shield relatively narrow, with indistinct margins; setae *st*1–3 thickened. Epigynal shield somewhat tongue-shape, truncate posteriorly, not extending beyond coxa IV posteriorly, bearing thick *st*5 near posterior margin. Anal shield with anus in anterior half; post-anal seta apparently absent. Endopodal and metapodal plates absent. Peritreme very short, peritrematal plate minimally developed, without posterior extension. Dorsal unsclerotised cuticle with 15–17 pairs of setae posterior to the dorsal shield, and opisthogaster with about 15 pairs of setae. Male with sternogenitiventral shield, eroded marginally and rounded posteriorly, scarcely expanded posterolaterally and distant from anal shield.

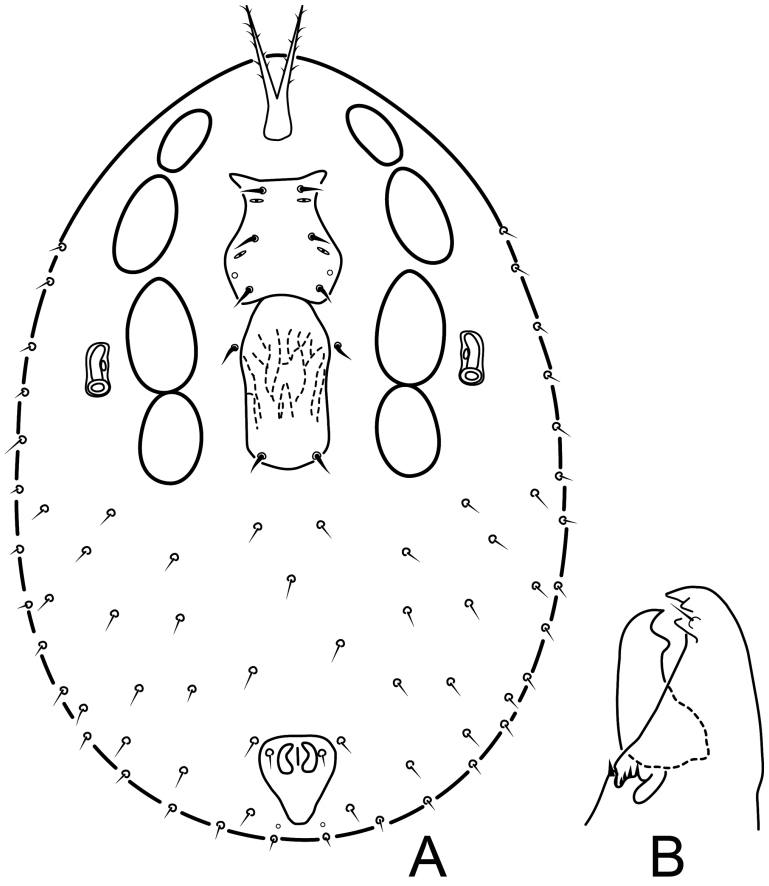


FIGURE 22. Female. *Dynatochela* Keegan (modified from Keegan, 1950): A, ventral idiosoma; B, chelicera.

Chelicerae stout; movable digit with a single large tooth; fixed digit with two teeth, including subapical offset tooth and a larger tooth near pilus dentilis. Male spermatodactyl apparently originating from internal (dorsal) face of movable digit. Corniculi very short, convergent, narrowly separated (and those of the male seemingly notched laterally); internal malae slender, much longer than corniculi. Setae *h*1–3 and *pc* short.

Legs short. Some ventral setae spur-shaped, especially on coxae and tarsi, and a spine-shaped dorsal seta on femur I. Male with enlarged leg II, and with ventral spur-shaped setae on femur, genu and tibia II, and tibia IV that are simple in female.

This poorly known monotypic genus is reminiscent of *Conolaelaps*, both having faintly sclerotised, truncate and hypotrichous dorsal shields, a reduced epigynal shield, very short setae and peritremes, and short legs. In contrast, *Conolaelaps* has many bulbous setae ventrally, more (23) pairs of setae on the dorsal shield, and no pretarsal claws. *Dynatochela* has no post-anal seta. Selected reference: Keegan (1950).

***Dyscinetonyssus* Moss & Funk** (Fig. 23)

Idiosoma 1000 µm long. Dorsal shield broad anteriorly, abruptly narrowed posteriorly to *J*1 and *Z*1 setae, leaving a broad band of unsclerotised cuticle exposed, and with margins irregular; shield with 25–26 pairs of setae; nine pairs of central setae strongly spur-shaped (and longitudinally ribbed) (*j*4–6, *J*1, *z*5–6, *Z*1, *s*5–6; thinner, longer in male), other setae normal (slender), several of which are very long, wavy (including at least *z*4, *s*4, *Z*4); shield lacking nine setae (most notably *J*3–4 and *Z*2–3), and *S*3–5 off shield. Tritosternum with laciniae weakly pilose. Sternal shield subrectangular, wider than long, margins irregular, with *st*1–3 spur-shaped; shield anterior margin extending close to tritosternal base, with setae *st*1 distant from margin and close to each other. Endopodal plate absent. Epigynal shield narrow, tapering, with irregular margins; seta *st*5 off shield, very short, sometimes absent on one or both sides. Anal shield terminal, somewhat diamond-shaped; post-anal seta distinctly shorter than para-anal setae. Peritreme short, barely reaching coxa II, comma-shaped, without peritrematal plate. Unsclerotised dorsolateral and opisthogastric cuticle with seven *Jv*-*Zv* setae and five *R* setae, all short except very long, wavy *Jv*5 (and mid-sized *S*3–5). Male with a short sternogenital shield, similar in extent to that of female, bearing *st*1–3, and a terminal anal shield.

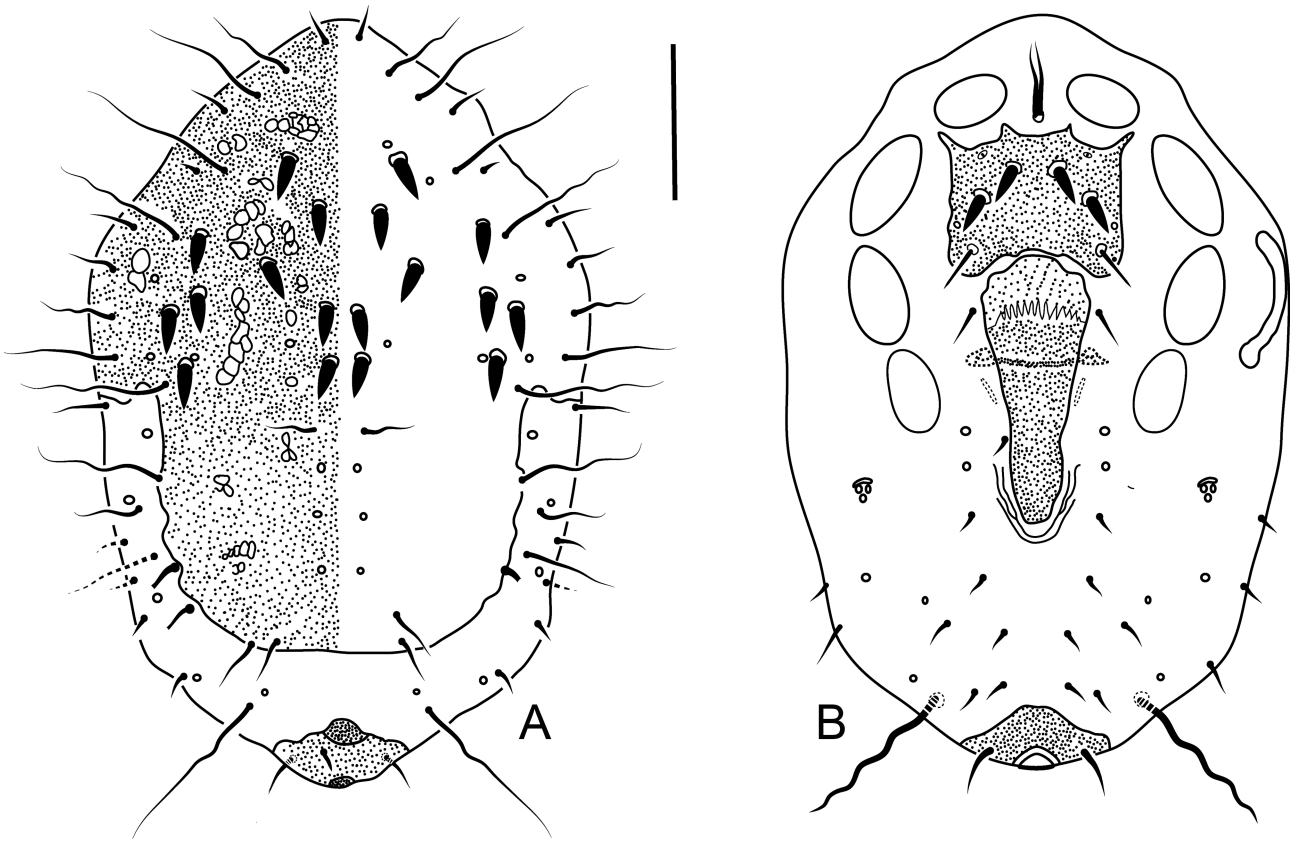


FIGURE 23. Female. *Dyscinetonyssus* Moss & Funk (modified from Moss & Funk, 1965): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 200 µm.

Gnathosoma small (not wider than coxa I); chelicerae almost edentate: fixed digit about straight (without apical hook), with 1–2 small, blunt teeth subapically, without pilus dentilis; movable digit considerably stouter, with 0–1 tooth. Male cheliceral fixed digit highly regressed and movable digit essentially represented by a thick spermatodactyl. Epistome subtriangular, sometimes acuminate; margin slightly denticulate. Deutosternum narrow,

with 12–14 transverse rows of mostly 3–5 denticles each; corniculi membranous; internal malae short. Palp chaetotaxy reduced on femur–tibia, with 4-3-10 or 11 setae, respectively; palp tarsal claw apparently absent.

Legs I–II distinctly shorter than legs III–IV; tarsi I–II particularly short, not more than twice as long as wide. Most coxal setae strongly spur-shaped, as well as apicoventral setae on tarsi II–IV; leg segments from femora to tarsi I–IV with at least one very long, whip-like seta. Legs hypotrichous, with most leg segments lacking setae: trochanter I with five setae; trochanter II hypertrichous, with six setae (including *ad*); femora I–III with 12-10-5 setae; genu I with 11 setae (2–2/1, 3/1–2), genu II with nine setae (2–2/1, 2/1–1) and genu IV with eight setae (only two *pd*); tibia I with ten setae (2–2/1, 2/1–2), tibiae II and IV with eight setae (2–1/1, 2/1–1).

A highly distinctive monotypic genus, with strongly spur-shaped setae on dorsal and sternal shields and coxae; legs with numerous whip-like setae; reduced dorsal and epigynal shields with irregular margins; short peritreme; terminal anal shield; deutosternum with many rows of few denticles, palp tarsal claw apparently absent, and weakly chelate-dentate chelicerae. Selected reference: Moss & Funk (1965).

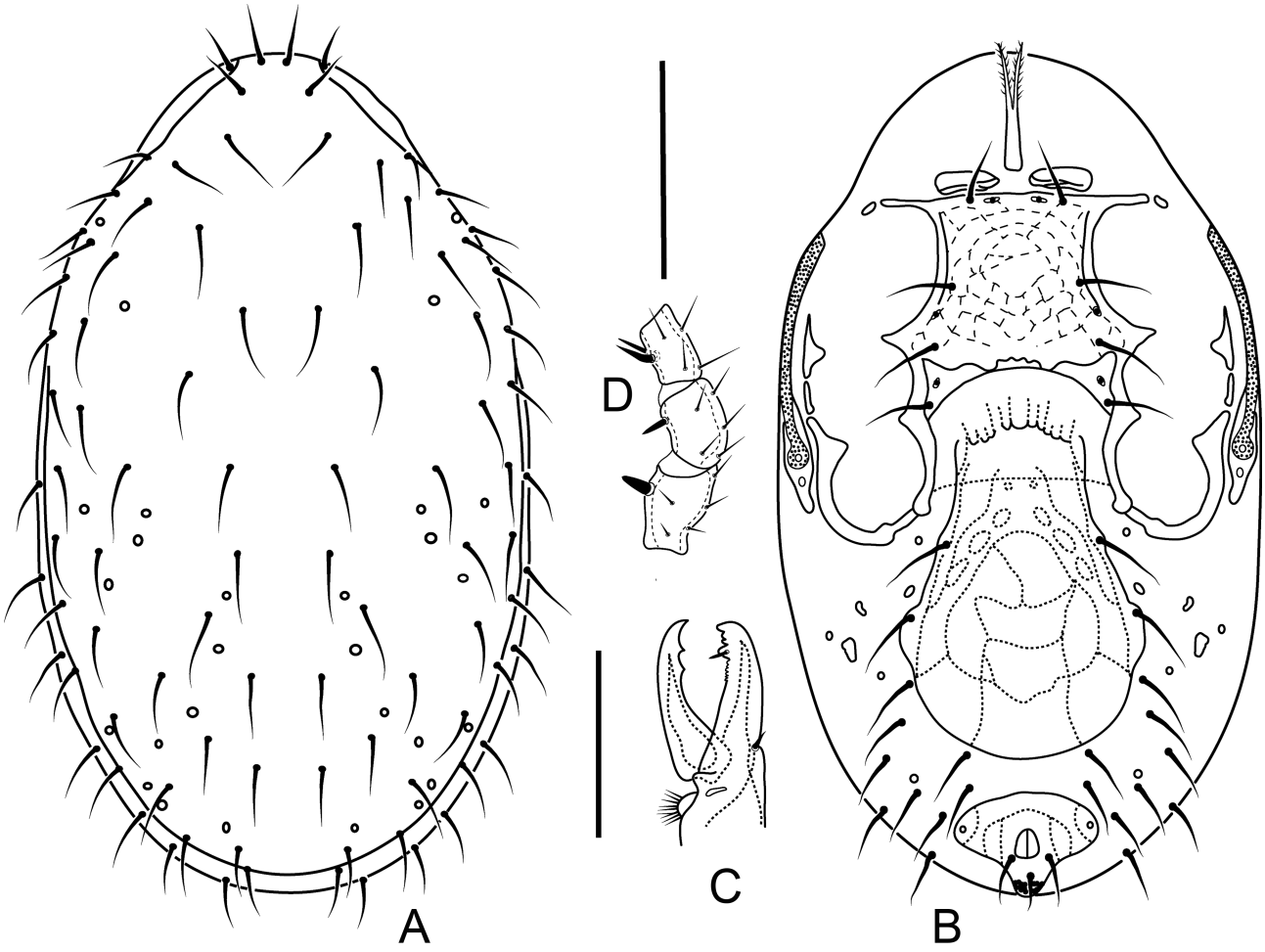


FIGURE 24. Female. *Euandrolaelaps* Bregetova (modified from Evans & Till, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera; D, femur, genu and tíbia of leg II. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera; leg not in scale.

Euandrolaelaps **Bregetova** (Fig. 24)

Idiosoma 400–1000 μm long. Dorsal shield suboval, with 37–39 pairs of setae, with 0–2 *Z*x. Idiosomal setae mid-sized, generally subequal in length. Presternal region weakly sclerotised (lineate-reticulate) in most species, including in *E. sardous* (Berlese) (the type species); it appears as discrete platelets in *E. karawaiewi* (Berlese); sternal shield as long as wide or longer than wide. Epigynal shield enlarged, drop- or almost flask-shaped, with the widest, bulging part (at level of *Zv*1 or slightly posterior to it) markedly broader (1.7–2.3 times) than its narrow neck between coxae IV; bearing *st*5 and *Zv*1 on margins (except *E. karawaiewi*, with a shield not as broad, not capturing

*Zv*1); extending relatively close to anal shield (usually separated from it by about half length of anal shield or less). Post-anal seta usually distinctly shorter than para-anal setae. Peritreme relatively long (reaching coxa I or anterior margin of coxa II). Unsclerotised dorsolateral and opisthogastric cuticle with up to seven pairs of setae (*r*6, *R*1–6) in addition to 7–9 pairs of *Jv*-*Zv* setae (other than *Zv*1, on epigynal shield).

Cheliceral fixed digit generally with three teeth distal to pilus dentilis, followed by a series of about 7–9 smaller teeth. Epistome slightly convex, subtriangular or almost truncate, with margin serrate. Deutosternum with rows of 4–21 denticles each. Palp tarsal claw 2-tined (including in the type species) or 3-tined (at least in *E. yamauchii* (Ishikawa)).

Legs with many ventral setae thickened, spur- or spine-shaped, especially on leg II, including on femur (*av*), genu (*av*), tibia (*av* or both ventrals), and tarsus (most ventrals), but occasionally also ventral setae on genua to tarsi III–IV. In at least the type species and some undescribed species, genu IV and tibia III bear ten and nine setae, respectively, each having two *pl* instead of one.

Euandrolaelaps is generally similar to *Alloparasitus* and *Gaeolaelaps*. The strongly drop-shaped epigynal shield, including a narrow neck and bearing also *Zv*1, appears as the primary diagnostic feature of this genus. The hypertrophied ventral setae on leg II, and leg chaetotaxy, may reinforce its identification for at least some species. Selected reference: Bregetova (1977).

Eumellitiphis **Turk** (Fig. 25)

Idiosoma 1000–1400 μm long. Dorsal shield oval to ovate, lightly sclerotised; shield hypertrichous, with either long or very short, needle-like setae (intraspecifically subequal in length); hypertrichy moderate (with about 17 mostly unpaired extra setae, in addition to basic complement of 37 pairs) to substantial (with 60–70 extra setae, including at least many unpaired), most pronounced posteromedially (in region of *J* and *Z* series). Unsclerotised dorsolateral cuticle with a (putatively *R*) series of 9–11 stout capitate setae, interspersed with several needle-like or spine-like setae; *j1* (sometimes also *z*1) capitate. Sternal shield broad, strongly convex anteriorly, concave posteriorly; *st*4 on soft cuticle or on short endopodal platelet abutting sternal shield (or in *E. mellitus* Turk, *st*4 seemingly on metasternal portion of a sterno-metasternal shield). Epigynal shield ranging from large and drop-shaped, to massive, somewhat axe-shaped, strongly projecting laterally behind coxae IV and more or less abutting anal shield (in which case some *Jv* or *Zv* setae tightly inserted between epigynal and anal shields); bearing only *st*5. Anal shield very large, either pentagonal, triangular or crescent-shaped, its width at least half of idiosomal width. Metapodal plate ranging from absent to massive and abutting anal and epigynal shields. Exopodal-parapodal plate sometimes strongly developed posterolaterad of coxa IV. Peritreme reaching level of coxa I or II; peritrematal plate poorly developed, apparently free posteriorly. Unsclerotised opisthogastric cuticle with 5–9 pairs of short setae. Males with holoventral shield fused to parapodal and exopodal plates.

Cheliceral digits with 2–3 subapical teeth. Epistome with margin smooth or serrate. The rest of the gnathosoma is poorly known.

All legs robust, with many stout, capitate setae and needle-shaped or stronger, spine-shaped setae. Leg chaetotaxy appears to differ significantly from the main laelapid pattern, including, for instance, femora III and IV with seven setae each.

The three known species of *Eumellitiphis* differ widely in the degree of ventral sclerotisation, with two species (*E. inouei* Delfinado-Baker & Baker, *E. philippinensis* Delfinado-Baker & Baker) having their opisthogaster largely covered by shields, including a massive, uniquely shaped epigynal shield. *Eumellitiphis* resembles another bee-associated genus, *Neohypoaspis*, in having similar, stout setae along body margin and on legs, as well as enlarged anal and metapodal shields, but not abutting epigynal shield like some *Eumellitiphis*. The stout marginal and leg setae of *Eumellitiphis* taper along their axis, forming a neck before bulging into a rounded apex, whereas the setae in *Neohypoaspis* are more parallel-sided and flattened, without a neck or with a slight neck, rounded or truncate apically. *Neohypoaspis* is also significantly more hypertrichous, with the dorsal shield bearing over 400 minute setae. Selected references: Turk (1948), Delfinado-Baker & Baker (1988).

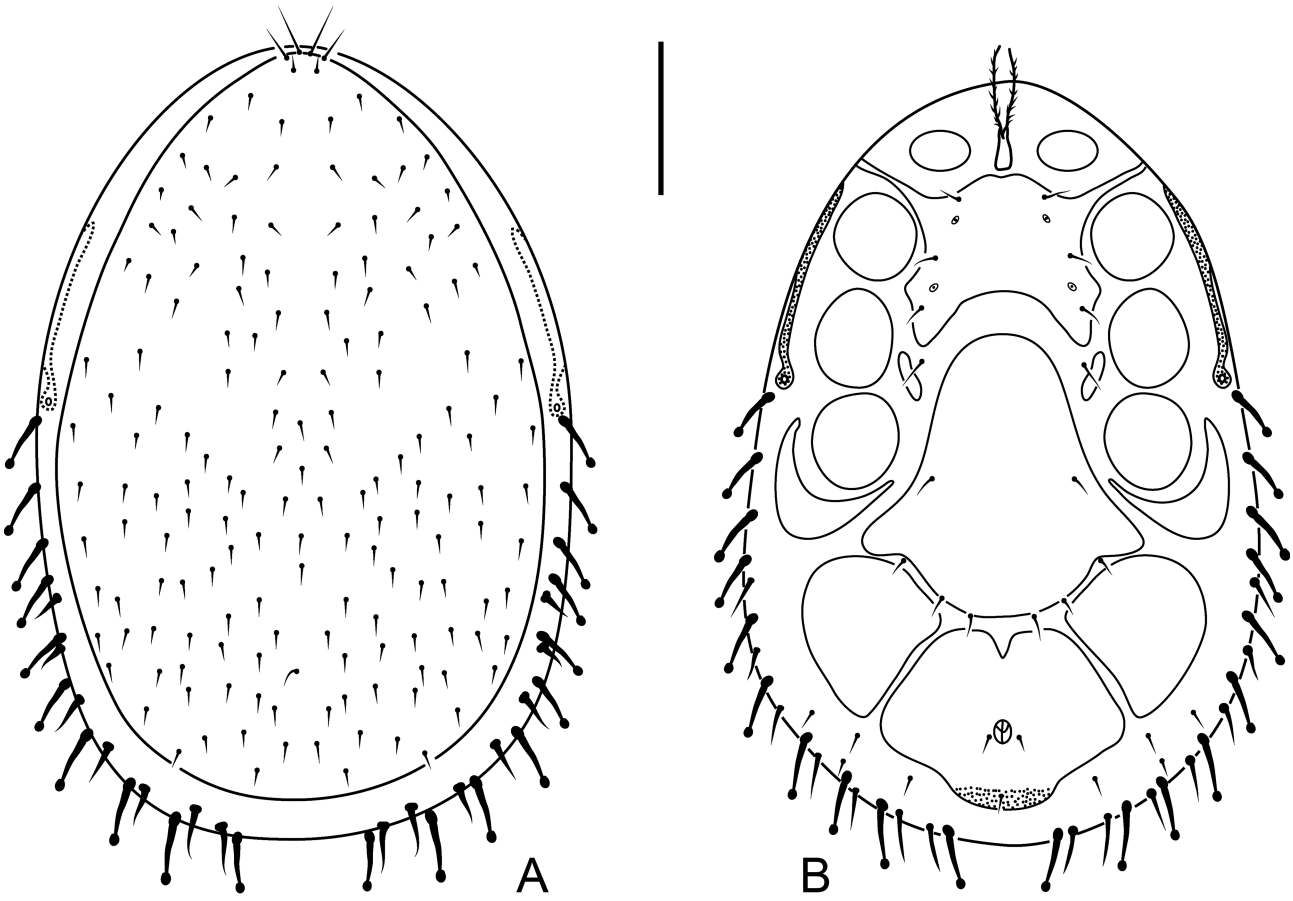


FIGURE 25. Female. *Eumellitiphis* Turk (modified from Delfinado-Baker & Baker, 1988): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 200 μm.

***Gaeolaelaps* Evans & Till** (Figs 1–2)

Idiosoma 500–1300 μm long. Dorsal shield variously suboval (rarely broadly oval) to tapered posteriorly; usually with 39 pairs of setae, usually including *Zx*2–3 (*z*3 occasionally absent, rarely other setae); 0–3 *Jx* setae; rarely a few setae (*e.g*. *r*2–3) off shield. Idiosomal setae short to mid-sized (rarely long), subequal in length, occasionally with some setae longer than others (*e.g*. anterior setae in *G*. *aculeifer*). Presternal area weakly sclerotised, lineate-granulate, rarely with two sclerotised platelets; sternal shield nearly always longer than wide (rarely wider than long); *st*1 occasionally on weakly sclerotised area; *st*4 on unsclerotised cuticle (rarely on endopodal plate). Epigynal shield drop- to tongue-shaped, *st*5 on margin. Post-anal seta subequal or slightly longer than para-anal setae. Peritreme usually long, occasionally short and reaching only coxa II (rarely very short in some beetle associates, with peritrematal plate free anteriorly and/or fused to exopodal plate, *e.g*. *G*. *heteroceri* Trach); peritrematal plate rarely broad or extending posteriad of coxa IV (*e.g*. *G*. *zanzibarensis* Joharchi *et al*.). Parapodal plate rarely well-developed (as in *G*. *zanzibarensis*). Dorsolateral and opisthogastric unsclerotised cuticle with 1–8 pairs of *r*-*R* setae (and sometimes a few *UR*) in addition to *Jv*-*Zv* setae (rarely hypertrichous, with up to 33 pairs of setae in addition to *Jv*-*Zv* setae). Males with a holoventral shield, rarely with separate (not abutting) anal shield and sternogenitiventral shield, the latter eroded or rounded posteriorly.

Cheliceral fixed digit with a variable number of teeth, sometimes including a series of small teeth proximal to pilus dentilis. Epistome broadly rounded to subtriangular (rarely truncate or acuminate), serrate. Deutosternum with six (rarely five or seven) rows of five to over 30 denticles each (exceptionally fewer than five denticles per row) (exceptionally with rows of denticles lateral to deutosternal groove, as in *G*. *angustiscutatus* and *G*. *olszanowskii* Joharchi *et al.*); palp tarsal claw 2-tined, rarely 3-tined. Internal malae sometimes with 1–2 additional pairs of fimbriate arms, laterally to the median paired arms.

Moderately developed macrosetae occasionally present on femur IV (*ad*1) and tarsus IV (dorsal setae). Legs II–IV, from genua to tarsi, with ventral setae usually thickened, sometimes spine- or spur-shaped, especially on tarsi II and IV, but also on femur II (*av*) or IV (dorsal setae). Leg chaetotaxy normal, with few exceptions in insect-associated species (*e.g*. Trach, 2016) or free-living species (*G*. *olszanowksii*).

As currently defined, *Gaeolaelaps* is a large, probably non-monophyletic assemblage of species that exhibits the combination of most putatively plesiomorphic character states for Laelapidae. See remarks at the end of *Hypoaspis* and *Hypoaspisella* for morphological differences with *Gaeolaelaps*. Selected references: Beaulieu (2009), Kazemi *et al*. (2014).

Gecarcinolaelaps **Casanueva & Johnston** (Fig. 26)

Idiosoma 1600–2000 μm long. Dorsal shield suboval, surrounded by extensive area of soft cuticle (less so in male). Dorsum of idiosoma slightly hypertrichous, with shield bearing about 42–45 putative pairs of setae, many of which are irregular and asymmetric, more densely distributed in podonotal region. Dorsolateral soft cuticle also slightly hypertrichous. Idiosomal setae generally very short. Tritosternum extremely reduced in size. Sternal shield eroded marginally, with endopodal element between coxae II–III partly, irregularly fused to shield. Seta *st*4 absent. Epigynal shield short, somewhat flask-shaped, truncate posteriorly, extending only slightly behind level of coxa IV and *st*5 (on shield margin). Anal shield drop-shaped, anus in anterior third; circum-anal setae very short, subequal in length. Peritrematal plate free anteriorly, posteriorly extending behind stigma, curving mesad and fused to parapodal strip. Male with sternogenital (not extending beyond coxa IV) shield, eroded posterolaterally, and anal shield.

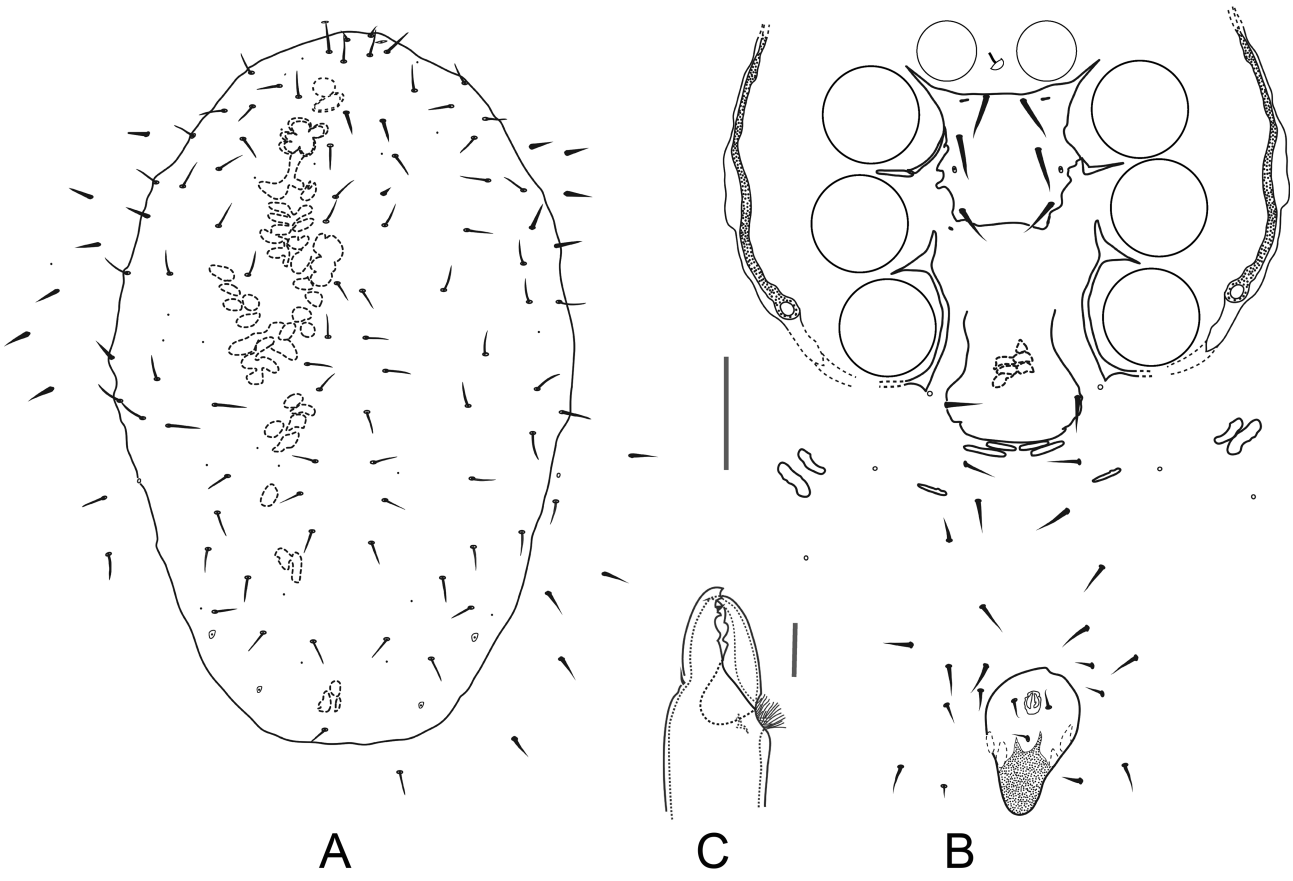


FIGURE 26. Female. *Gecarcinolaelaps* Casanueva & Johnston (chelicera modified from Casanueva & Johnston, 1992a; others, our drawings): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

Gnathosoma partly covered by idiosoma. Fixed cheliceral digit with three teeth, including one small tooth distal to pilus dentilis. Male digits apparently shortened, especially fixed digit, and spermatodactyl enlarged basally. Epistome margin with three weak lobes, smooth. Deutosternum with 5–6 rows (seven in the male) of several irregularly-sized denticles, and weakly defined lateral margins; corniculi slightly convergent; salivary stylets longer than corniculi. Palp tibia with only 12 setae. Internal malae reduced, much shorter than corniculi, and without fimbriae.

Leg I narrower than other legs. Tarsi II–IV with setae *av*1 and *pv*1 stout, bulbous, with longitudinal ribs. Leg chaetotaxy with a few reductions and additions relative to the normal pattern, notably femur I with 12 setae (including only three ventrals) and femur III with seven setae; genua I–IV with 11-10-10-10 setae, and tibiae I–IV with 11-9-9-9 setae; genu and tibia I each with lacking *ad*3 and *pd*3, tibia II lacking *ad*2, and genu IV having two *pl*. Pretarsus I, including claws, reduced.

Gecarcinolaelaps is a monotypic genus that may be superficially reminiscent of other arthropod-associated genera (*e.g*. *Conolaelaps*, *Iphiolaelaps*) with poorly sclerotised idiosoma, small epigynal shield and very short setae, but *Gecarcinolaelaps* can be distinguished from them and other taxa by the combination of its slightly hypertrichous dorsum, long peritreme (as opposed to some taxa), marginally eroded sternal shield, the absence of *st*4, peritrematal shield fused to parapodal plate, a regressed tritosternum, and bulbous *av*1, *pv*1 setae on tarsi. Selected reference: Casanueva & Johnston (1992a).

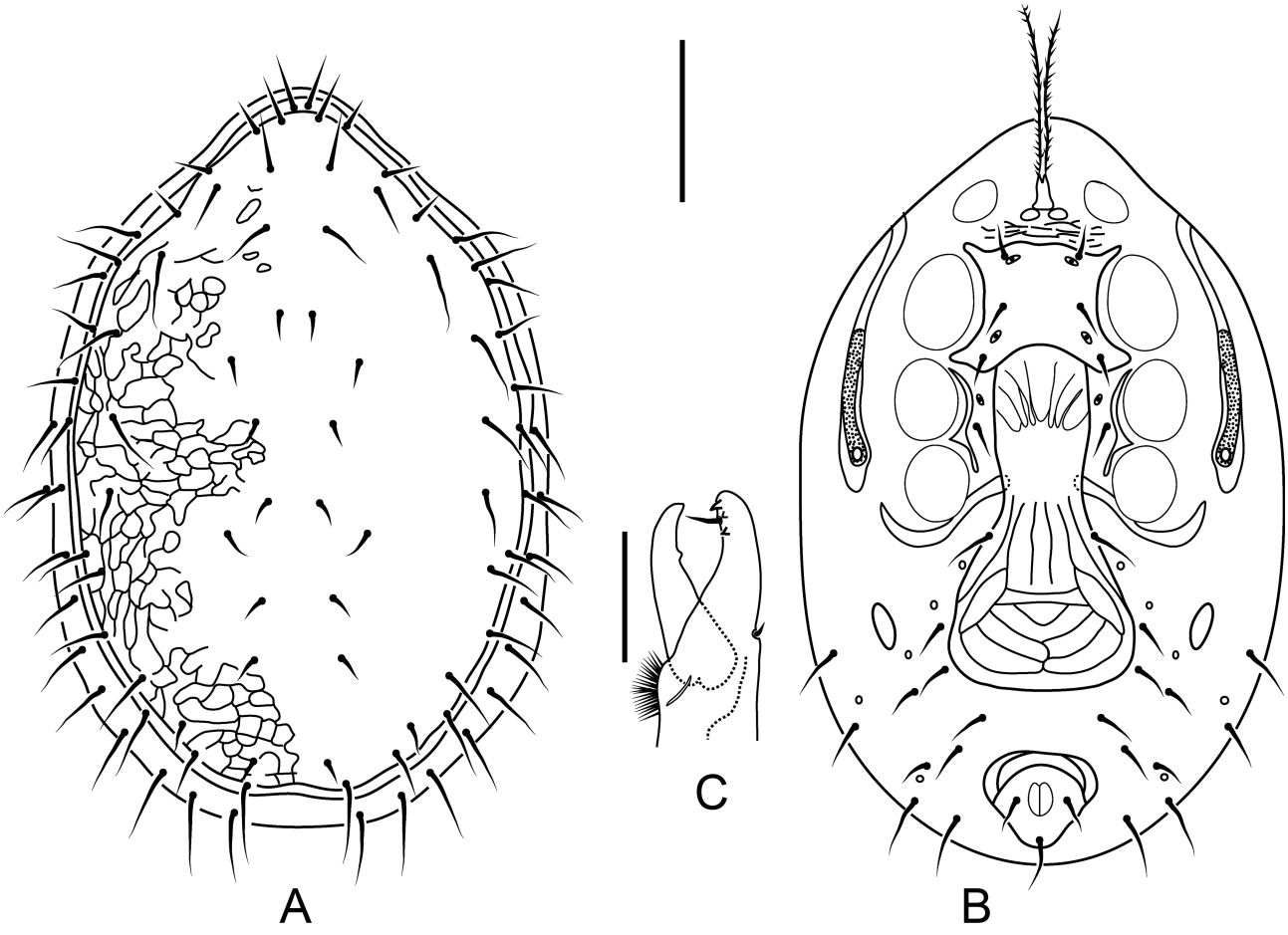


FIGURE 27. Female. *Gromphadorholaelaps* Till (modified from Till, 1969): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 µm for dorsum and venter, 50 µm for chelicera.

***Gromphadorholaelaps* Till** (Fig. 27)

Idiosoma about 1000 µm long. Dorsal shield broadly suboval, with 35 pairs of setae (lacking *z*3 and *z*6), most median setae (from *j*5 to *J*5, and *z*5) short, other setae mid-sized and inserted closer to shield margin than usual.

Presternal area weakly sclerotised, lineate; sternal shield somewhat wider than long. Epigynal shield elongate, flask-shaped with narrow neck between coxae IV, moderately close to anal shield; bearing *st*5 and ornamented posteriorly with 4–5 transverse striae. Post-anal seta mid-sized, moderately longer than para-anal setae. Peritreme short (not reaching mid-level of coxa II); peritrematal plate very narrow, with a short posterior extension, free anteriorly, extending to level of *z*1. Unsclerotised dorsolateral and opisthogastric cuticle with *r*6 and 10–12 pairs of *R*-*UR* setae in addition to *Jv*-*Zv* setae.

Cheliceral movable digit with a single tiny tooth; fixed digit with a bifid apical hook and two tiny teeth flanking the pilus dentilis, which is relatively long and moderately inflated basally. Male chelicerae edentate; fixed digit a long slender process (as long as the spermatodactyl), with pilus dentilis on basal third of digit, movable digit essentially composed of a thick spermatodactyl. Epistome broadly rounded, with margin smooth. Deutosternum narrow, bearing 2–3 denticles per row; corniculi relatively close, slightly convergent.

Leg chaetotaxy normal except for genu IV with two *pl*.

This monotypic genus shares key features with *Androlaelaps*, including the weakly dentate chelicerae with a pilus dentilis moderately swollen basally, the modified male chelicerae, including a basally inserted pilus dentilis, and genu IV with two *pl* setae. However, it differs by its short peritreme and the male chelicera with elongate fixed digit. In addition, the flask-shaped epigynal shield differs from most *Androlaelaps*, and is more reminiscent of *Ulyxes*, although the epigynal shield of the latter reaches the anal shield. Selected reference: Till (1969).

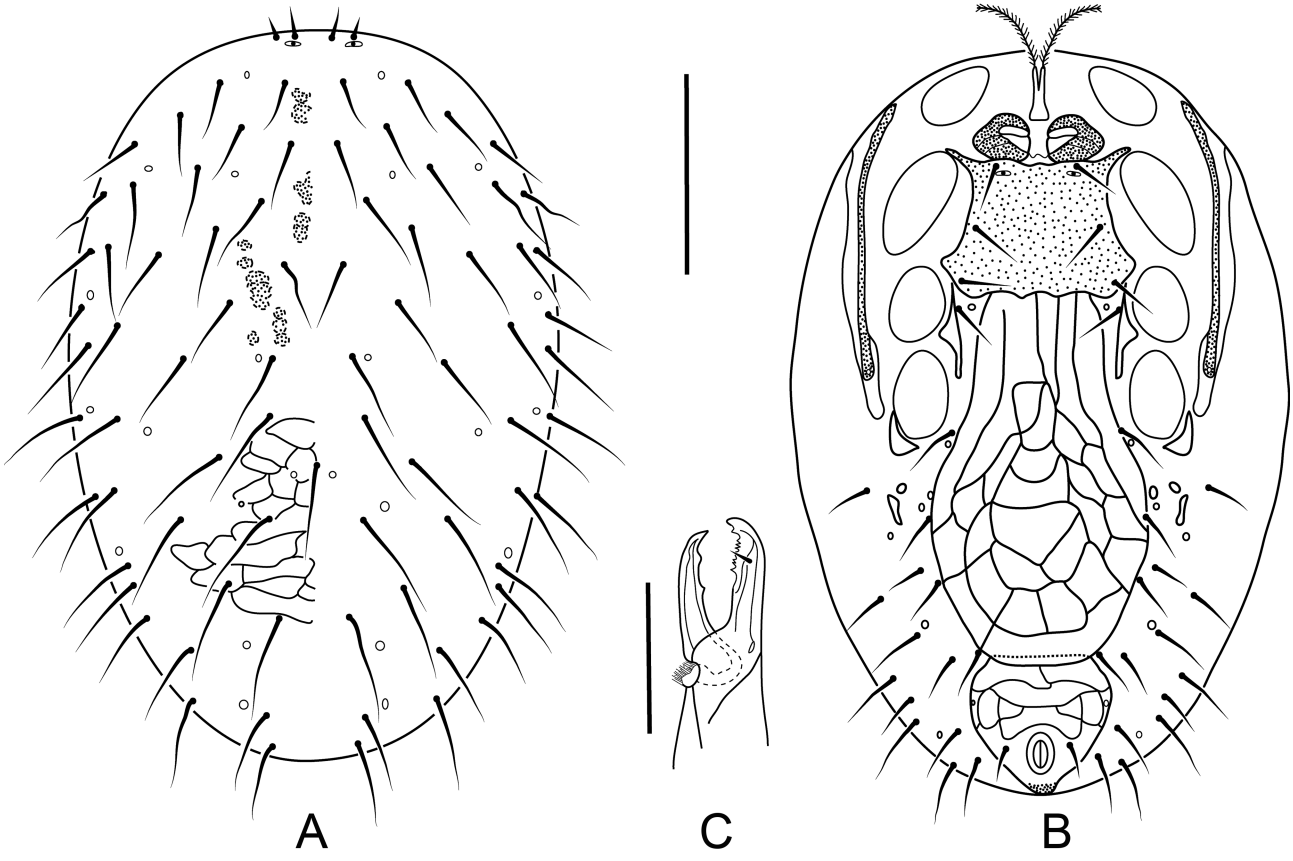
Gymnolaelaps **Berlese** (Fig. 28)

Idiosoma 500–1000 μm long. Dorsal shield suboval to broadly oval, covering all idiosoma dorsally and often extending slightly onto the venter; typically with 39–41 pairs of setae, including *Zx*2–3, sometimes also *Zx*1 and/or an extra pair between *r* and *s* series, and often with one or more unpaired *Jx* setae (as many as 5–8 in some species); setae usually relatively short and subequal in length, sometimes long. Two discrete presternal platelets; sternal shield about as long as wide or distinctly wider than long. Epigynal shield typically bottle-shaped, posteriorly truncate and abutting anal shield; shield typically not expanded laterally beyond mid-level of coxa IV; in some species, exceptionally, the shield is wider than that, or the shield only reaches close to anal shield without abutting it (*e.g. G. shealsi* Hunter & Costa, with a more snake-head shaped shield); shield bearing *st*5 as well as 1–3 additional pairs of setae (*Zv*1, *Jv*1–2) on its margin; if only *st*5 on shield (rarely), then at least one pair of *Jv* or *Zv* tightly flanking shield. Anal shield subtriangular, with anterior margin generally flat, anus generally in posterior half of shield; post-anal seta subequal or shorter than para-anal setae. Parapodal plate moderately developed, as a subtriangular or rounded lobe. Peritrematal shield normal, except in *G. tilli* (Costa) with fused peritrematal and parapodal plates. Unsclerotised opisthogastric cuticle generally with 9–10 pairs of *Jv*-*Zv* setae and at most a few *R* setae.

Cheliceral digits typically slender, with 3–4 prominent (mid-sized) teeth and a serration (or row) of 4–7 small, regular teeth flanked by two of the mid-sized teeth; the serration mostly distal to the pilus dentilis. Epistome rounded, subtriangular, or somewhat truncate, with margin serrate. Deutosternum with rows of usually 3–10 denticles each. Internal male sometimes with 1–2 lateral fimbriate arms in addition to median arms. Palp tarsal claw with three subequal tines, sometimes third tine reduced.

Leg setae generally simple, some may be thickened (*e.g.* dorsals of femur IV, ventrals of genua and tibiae). Leg chaetotaxy normal, except genu IV with ten setae, including two *pl*, in some cases (*e.g. G. laevis* (Michael)).

The concept of *Gymnolaelaps* adopted here is primarily based on species that are most similar to the type species (*G. myrmecophilus* (Berlese)) and to the two other species that Evans & Till (1966: 159) included in this group. The main features of *Gymnolaelaps* are the discrete presternal platelets, parapodal plates, 3-tined palp tarsal claw and bottle-shaped epigynal shield with opisthogastric setae on margins. Some species classified as *Gymnolaelaps* in the current treatment exhibit significant discrepancies from the typical features described above. More morphology- and molecular-based research should clarify the boundaries of the genus. Selected references: Joharchi *et al*. (2011), Joharchi & Halliday (2013), Nemati & Gwiazdowicz (2016b).



FIGURES 28. Female. *Gymnolaelaps* Berlese (modified from Joharchi & Halliday, 2013): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

***Haemolaelaps* Berlese** (Fig. 29)

Idiosoma 600–1000 μm long. Dorsal shield usually broadly oval, occasionally narrower with some anterolateral setae not captured by shield; usually with 39 pairs of setae, including *Zx*2–3; as few as 32 pairs in *H. quartus* Domrow (without *Zx*2–3, and *r* series off shield); 40 pairs in *H. cleptusa* Domrow (including an extra pair near *j*6); setae short to long, central setae typically shorter, and *Z*5 often markedly longer. Soft dorsolateral and opisthogastric cuticle hypertrichous, with at least 20 pairs of setae (including *R-UR*) other than *Jv-Zv* setae. Usually many dorsal and opisthogastric setae barbed (dorsal setae smooth in *H. quartus*). Tritosternal base strongly barbed laterally. Presternal area weakly sclerotised, lineate-reticulate; sternal shield usually wider than long. Seta *st*4 sometimes apparently on endopodal plate. Epigynal shield drop- or tongue-shaped, usually large, ranging from distant to very close to anal shield, with 0–2 pairs of opisthogastric setae (sometimes *Jv*1 and *Zv*1) on margin in addition to *st*5; posteriorly with usually 6–8 transverse striae. Anal shield pear-shaped (normal) to distinctly triangular; post-anal seta distinctly longer than para-anal setae, sometimes barbed. Post-stigmatic extension of peritrematal shield with gland opening (*gp*) relatively large.

Fixed cheliceral digit mostly edentate, usually without or with a weak apical hook, bearing a very long, slender pilus dentilis (about as long as movable digit); male fixed digit regressed, edentate, with pilus dentilis inserted subapically or apically, and movable digit typically with a tooth and apical hook, spermatodactyl relatively short and bent upward apically. Epistome a rounded lobe, with margin sparsely to densely denticulate. Corniculi relatively small, sometimes convergent. Deutosternum with 5–6 rows of 2–5 denticles each.

Many leg setae barbed, notably one or more dorsals of each of femora I–IV (*e.g. ad*1). Leg chaetotaxy normal.

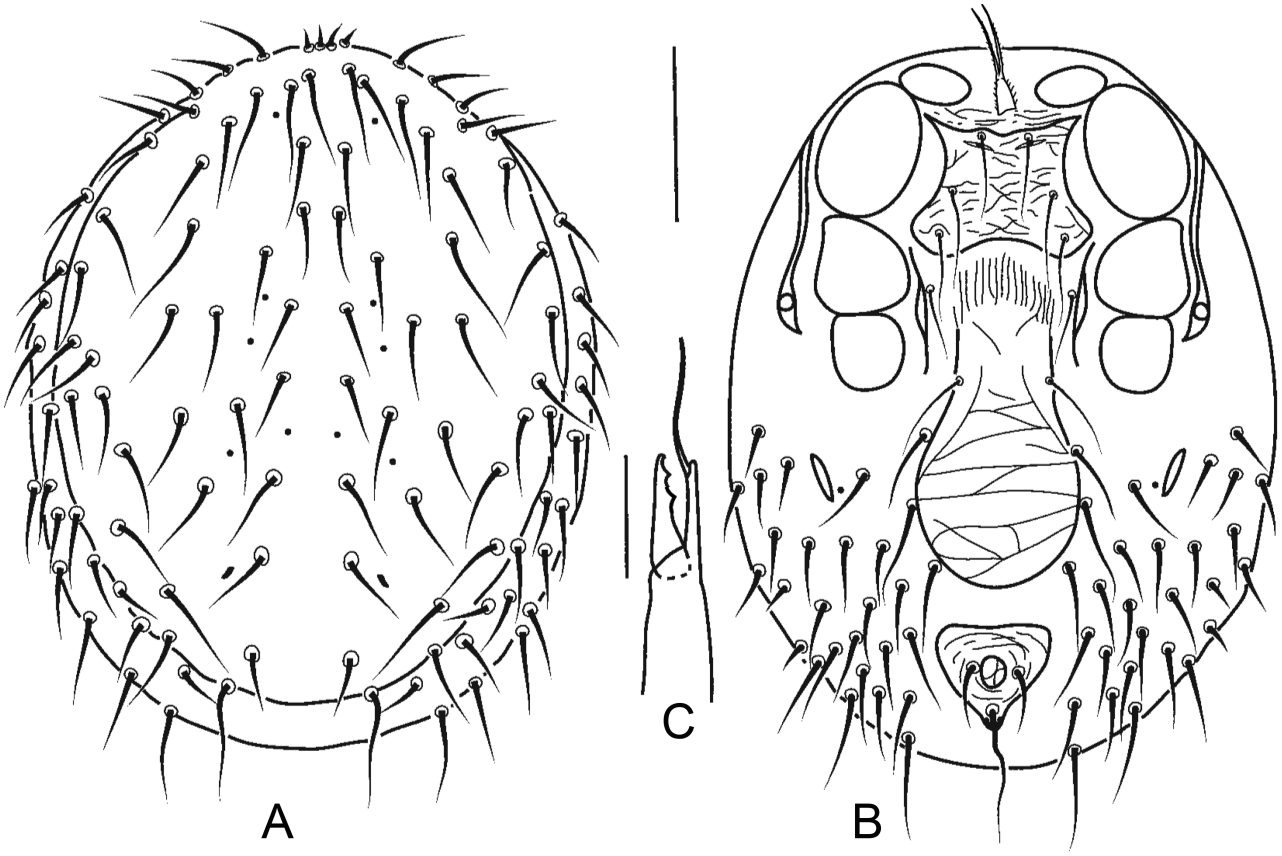


FIGURE 29. Female. *Haemolaelaps* Berlese (modified from Womersley, 1957a): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 40 μm for chelicera.

Attributes of *Haemolaelaps* distinguishing it from other genera, especially *Androlaelaps*, include the whip-like pilus dentilis, the strongly barbed tritosternum base, many barbed idiosomal and leg setae, and a typically long post-anal seta. In contrast to *Haemolaelaps* species, *Androlaelaps* species have genu IV with two *pl*, usually some *Jx* setae, an inflated pilus dentilis, which is inserted on the proximal half in males (as opposed to near the apex in *Haemolaelaps* males), as well as an epigynal shield with only 4–5 transverse striae. More superficially similar genera (*e.g*. *Gaeolaelaps*) can further be distinguished by the mostly edentate fixed digit of *Haemolaelaps* and deutosternum with few denticles (see also note for *Ulyxes*). Selected reference: Shaw (2014a).

***Holostaspis* Kolenati** (Fig. 30)

Idiosoma 500–700 μm long. Dorsal shield oval to broadly obovate and slightly narrower (and angled) posteriorly, usually with no or little soft cuticle exposed, sometimes only caudally, or, when shield (occasionally) abbreviated, with much soft cuticle exposed posterolaterally (in *H. flexuosa*, *H. iranicus*); with 39 pairs of setae, including *Zx*2–3, and usually 1–5 unpaired *Jx*; setae typically short or mid-sized, but with a tendency for elongation posteriorly; *z*1 very short, *Z*5 usually long; usually a few to many posterior dorsal setae (sometimes all dorsal setae) and opisthogastric setae barbed apically. Unsclerotised lateral and opisthogastric cuticle typically including 4–6 *R* and one *UR* setae in addition to *Jv*-*Zv* setae, sometimes tylochorous. Presternal area sometimes weakly sclerotised, lineate-reticulate; sternal shield usually convex or bilobed anteriorly), wider than long or about as wide as long. Epigynal shield large, snake-head shaped (sometimes almost drop- or tongue-shaped), bulging between *st*5 and *Zv*1, bearing only *st*5; shield usually close to anal shield, separated by less than half the length of the anal shield; posteromesally with characteristic 2–5 V-shaped striae, more or less separated by a longitudinal striae along midline, and delimited anterolaterally by a pair of diagonal striae that converge anteriorly (and sometimes meet to form an inverted-V).

Anal shield subtriangular, occasionally concave anteriorly or with acuminate anterolateral corners; post-anal seta moderately thicker and longer than para-anal setae. Parapodal plate well developed in *H. flexuosa*. Peritreme usually long (shortened to mid-level of coxa II in *H. acuminatus* (Berlese), *H. michaeli*); peritrematal plate narrow, post-stigmatic extension short except elongate in *H. iranicus*, reaching well beyond coxa IV. Males with a holoventral shield, or, for *H. flexuosa*, a sternogenitiventral shield fused to parapodal plate and relatively close to anal shield.

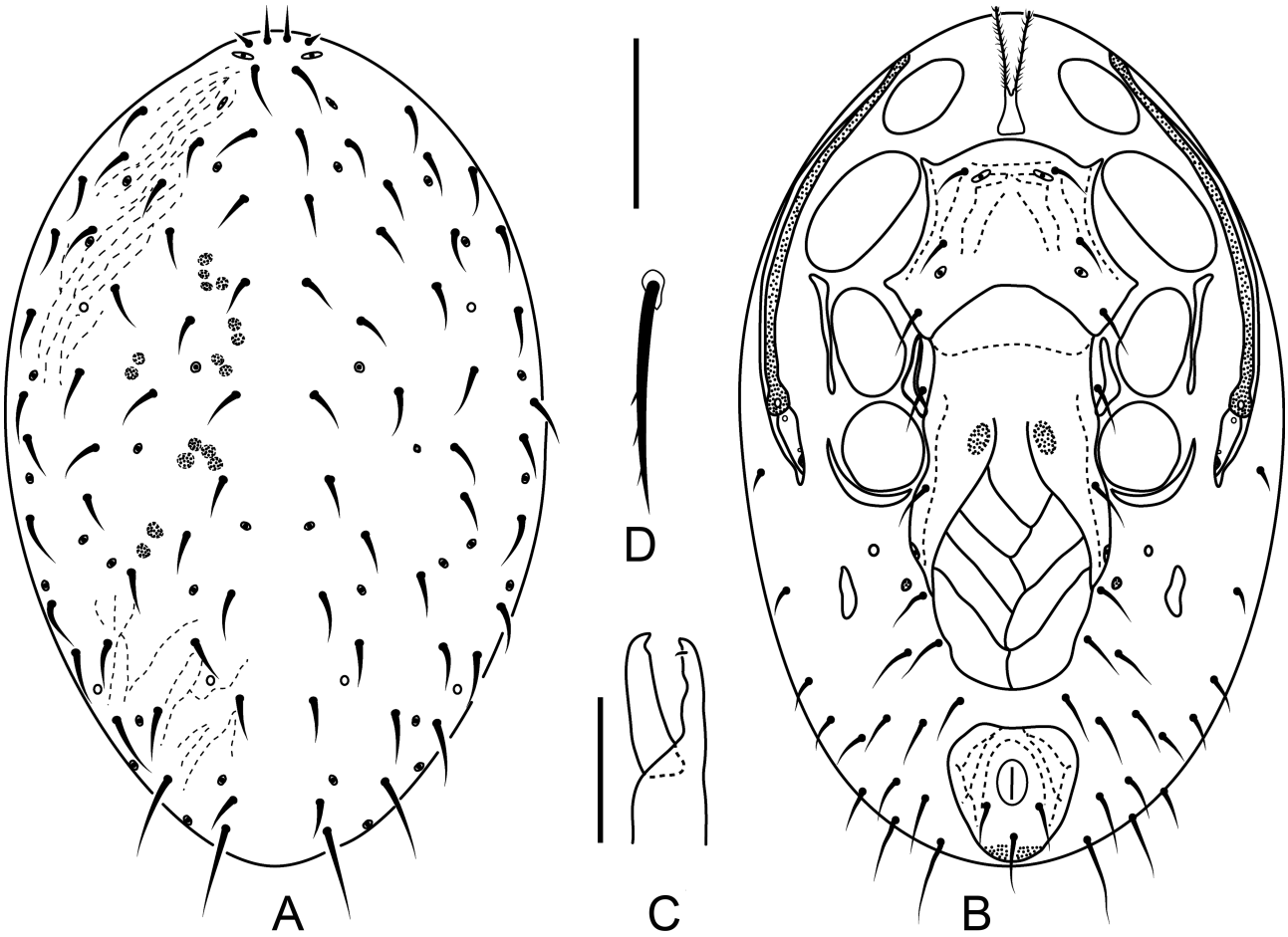


FIGURE 30. Female. *Holostaspis* Kolenati (modified from Babaeian *et al*., 2019): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera; D, tylochorous opisthogastric seta. Scale bars = 150 μm for dorsum and venter, 25 μm for chelicera; tylochorous seta not in scale.

Gnathosoma generally small, partly hidden under idiosoma. Cheliceral digits short, stumpy (17–30 μm long), with apical hooks weakly developed; fixed digit with at most two small subapical teeth (fixed digit regressed, truncate in *H. iranicus*); movable digit usually edentate, rarely with 1–2 small teeth; arthrodial corona sometimes reduced or absent. Male chelicera may have the fixed digit reduced, edentate (*H. montanus* (Berlese)), or movable digit absent (*H. flexuosa*); spermatodactyl broad, elongate. Epistome a mid-sized triangle or rounded projection, with margin smooth. Deutosternum with rows of 5–16 denticles each (seven rows in *H. michaeli*). Corniculi short, often blunt, notched at or near apex, and/or converging; internal malae may have well-developed, fimbriate lateral arms.

Legs typically with a few setae thickened, especially dorsal setae (*e.g. ad*1) on femora. Leg chaetotaxy normal except for: *H. iranicus* having femur II with ten setae (including only one *al*); *H. flexuosa* and *H. michaeli* having tibia III with nine setae (including two *pl*) and genua III–IV with ten setae each (including two *pl*), and *H. flexuosa* also having femur I with 14 setae (including five ventrals).

It should be noted that the four species with morphological exceptions mentioned above (*H. flexuosa*, *H. iranicus*, and the closely related *H. acuminatus* and *H. michaeli*) were provisionally placed in *Holostaspis* by Babaeian *et al*. (2019) because their previous placement in *Myrmozercon* was deemed problematic. *Holostaspis* species are

most recognisable by their (*i*) small gnathosoma; (*ii*) stumpy, weakly dentate-chelate chelicerae; (*iii*) small, weak corniculi; (*iv*) smooth epistome; (*v*) large, snake-head shaped epigynal shields nearly abutting variously triangular anal shields (sometimes concave anteriorly); (*vi*) post-anal seta longer than para-anals; (*vii*) sternal shield bilobed anteriorly; (*viii*) a broad dorsal shield with setae often apically barbed, and posteromarginal setae often longer; (*ix*) soft cuticle sometimes with tylochorous setae. These features largely apply to *Bisternalis* and *Myrmozercon* (although not commonly for attributes (*vi*) and (*ix*) for *Myrmozercon*). In contrast to *Holostaspis*, these two genera usually have sternal shields broadened posteriorly and deeply concave (relatively normal in *Holostaspis*, at most moderately concave posteriorly). In addition, *Bisternalis* typically have setae *st*1 borne on a single platelet, more or less free from the sternal shield, have more chelate-dentate chelicerae, including a bidentate movable digit, and subequal circum-anal setae. *Myrmozercon* have several other derived features such as shortened peritremes and reduced claws, and atypical palp and leg chaetotaxy (see note at the end of *Myrmozercon* diagnosis for more details). Selected reference: Babaeian *et al*. (2019a).

Hunteria **Delfinado-Baker *et al*.** (Fig. 31)

Idiosoma about 1000 µm long. Dorsal shield ovate, tapered anteriorly, surrounded by a strip of soft cuticle; slightly hypertrichous in opisthonotal region, with 10–12 additional (unpaired *Jx*) setae mixed with *J* series in addition to a basic complement of 39 pairs (seemingly so in figure of Delfinado-Baker *et al*., 1984), including putatively *Zx*2–3 (*r*3 off shield on one side in the original illustration). Idiosomal setae short. Sternal shield heavily sclerotised, with remarkably broad anterolateral arms extending between, and widely separating, coxae I–II (arms broader than coxae) (arms narrower in male); anterior margin strongly convex, with *st*1 distant from margin. Epigynal shield relatively large, more or less drop-shaped, bearing *st*5. Anal shield subtriangular, wider than long; circum-anal setae short, post-anal seta slightly longer than para-anal setae. Peritrematal plate essentially absent, except for very short extension posterior to stigma. Opisthogaster with 6–7 pairs of *Jv*-*Zv* setae; male also with a few *R*-*UR* setae, apparently tylochorous; unsclerotised dorsolateral cuticle with one pair of setae (*R*1).

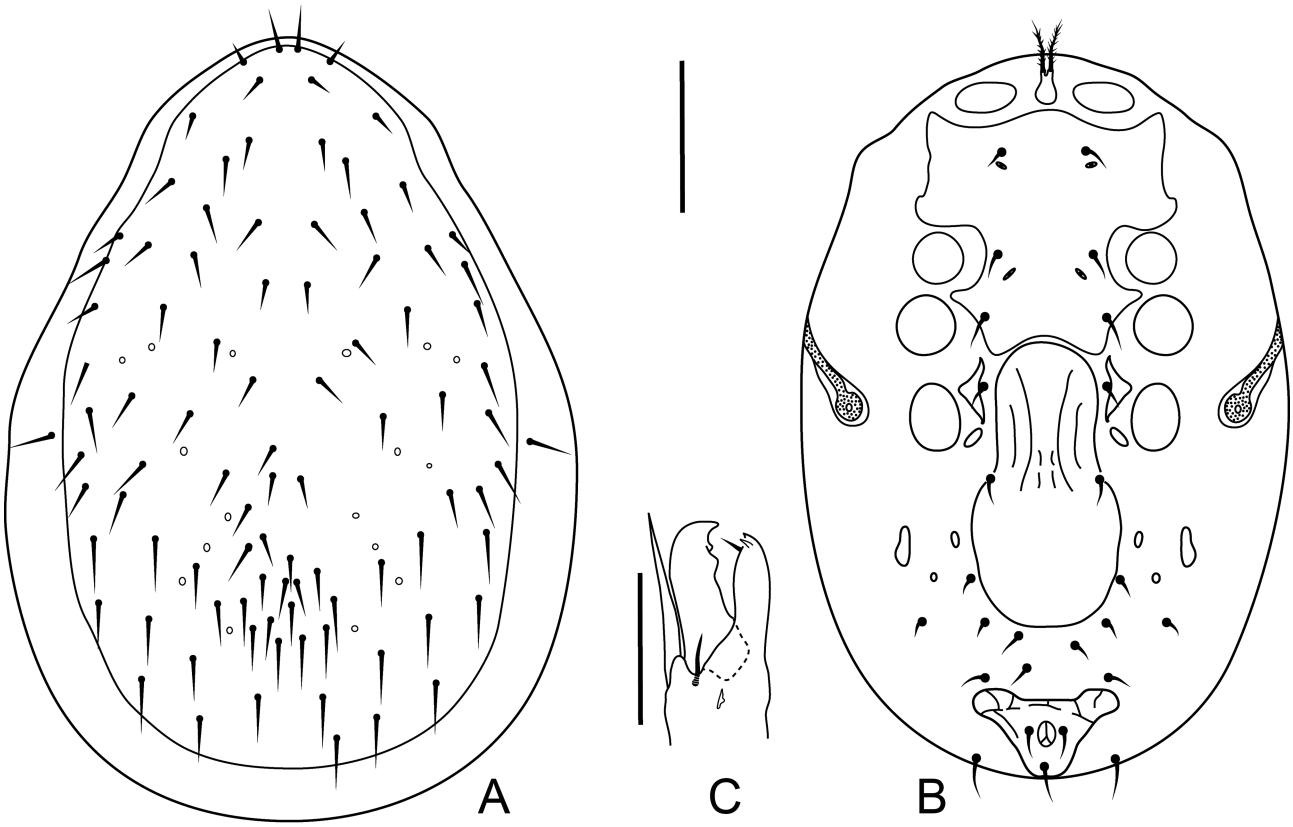


FIGURE 31. Female. *Hunteria* Delfinado-Baker *et al*. (modified from Delfinado-Baker *et al*., 1984): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 µm for dorsum and venter, 50 µm for chelicera.

Cheliceral digits short; fixed digit with a single subterminal tooth; pilus dentilis relatively long, subapical; with two distinctive cheliceral arthrodial processes (instead of a corona), one stout and longer than movable digit, the other much shorter. Male fixed digit significantly reduced, and spermatodactyl inserted apically on movable digit, which has a normal arthrodial corona. Epistome smooth. Deutosternum with only five rows of mostly 1–5 denticles each.

Genua III–IV and tibia III with two *pl* setae instead of one, therefore with ten, ten and nine setae, respectively.

This monotypic genus may be distinguished from other laelapids by its enlarged sternal shield, dorsal shield hypertrichous posteriomedially, weakly dentate chelicera and with unique arthrodial processes. *Stratiolaelaps* also has a sternal shield with strong anterolateral arms, but not as broad, and has several other distinctive features including spatulate-tricarinate dorsal setae. Selected references: Delfinado-Baker *et al*. (1984), Klimov *et al*. (2016).

Hypoaceus **Nemati *et al*.** (Fig. 32)

Idiosoma about 900 μm long. Dorsal shield broadly oval, covering all idiosoma dorsally and also ventrally along margins; with 38–39 pairs of setae, including an extra podonotal pair (*zx* in Nemati *et al*., 2021, in distinct position in the two constituent species), and 0–1 pair of *Zx*; setae varying from short to long (especially near posterolateral margins in *H. eugenitalis* (Karg), where setae are wavy); with a conspicuous gland opening, midway on lateral shield margin. Two discrete presternal platelets; sternal shield slightly wider than long, moderately concave posteriorly. Seta *st*4 absent. Epigynal shield massive, covering most of opisthogaster, broadly rounded posteriorly, reaching anal shield; bulging (with an inflexion point) laterally at *Zv*1 level; bearing *st*5, and 2–3 other pairs of setae (at least *Jv*1, *Zv*1) inserted away from shield margin; shield with an atypically high number of pore-like structures. Metapodal element partly or entirely fused to epigynal shield. Anal shield wide, triangular; post-anal seta distinctly shorter than para-anal setae. Parapodal plate well-developed as a subtriangular lobe, more or less abutting epigynal shield. Unsclerotised cuticle with seta *r*6, in addition to 4–5 pairs of *Jv-Zv* setae. Males with holoventral shield fused to parapodal-exopodal plate.

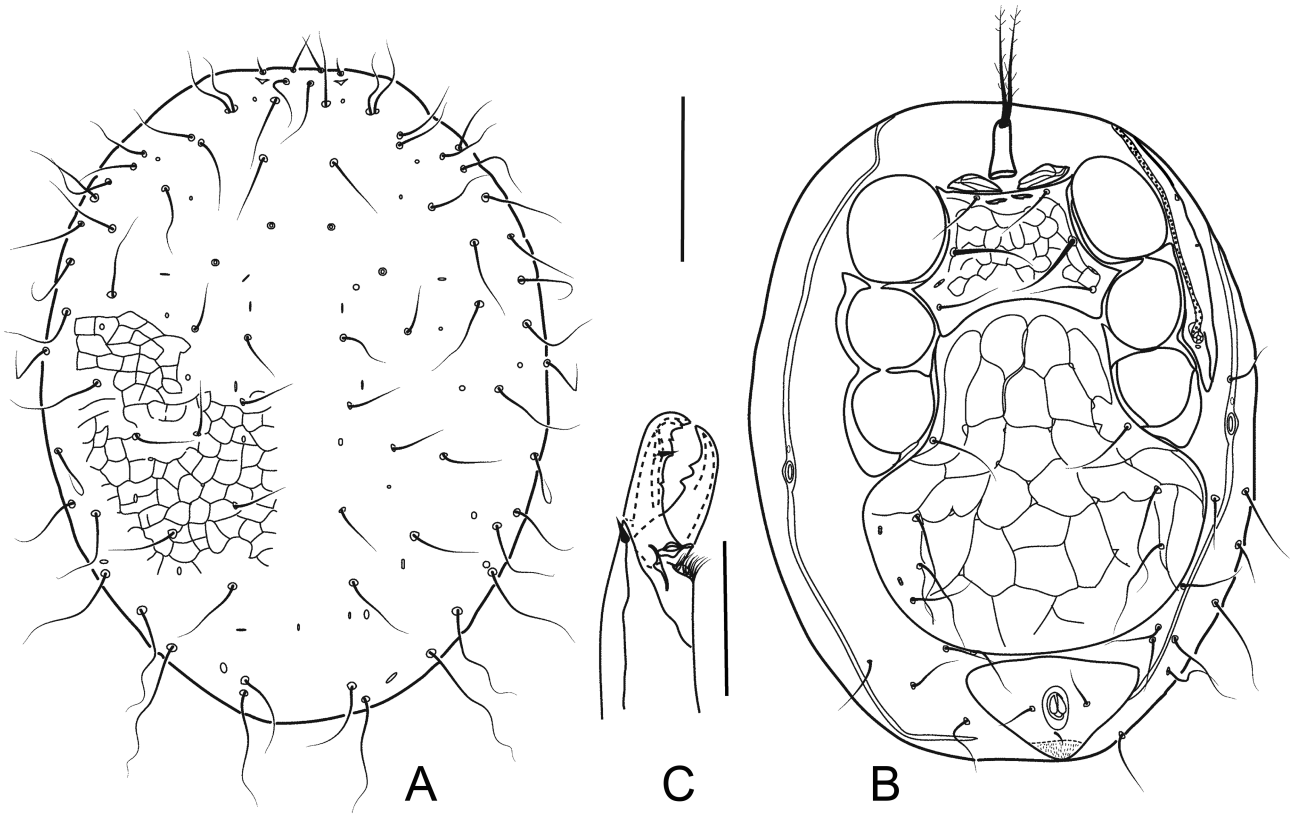


FIGURE 32. Female. *Hypoaceus* Nemati *et al*. (modified from Nemati *et al*., 2021): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

Cheliceral fixed digit with 3–4 teeth, mostly distal to pilus dentilis. Epistome a more or less rounded lobe, denticulate. Deutosternum with 6–7 rows of ten or more denticles each.

Tarsus II with *av*1 and *pv*1 spur-shaped. Leg chaetotaxy normal.

These well-sclerotised mites, with their broad dorsal shields extending ventrally, presternal platelets and well-developed parapodal plates, are reminiscent of *Pseudoparasitus* and *Ololaelaps*. These two genera are distinguished from *Hypoaceus* by having *st*4 and a 3-tined palp tarsal claw, and *Ololaelaps* has a hologastric shield, whereas *Pseudoparasitus* has an epigynal shield truncate posteriorly. The massive, broadly rounded epigynal shield, bearing 3–4 pairs of setae, resemble most that of *Laelaspis*, but differs from the latter by lacking *st*4, having discrete presternal plates, and epigynal shield with multiple pores and with 2–3 pairs of setae more medially inserted, distant from margin. Selected reference: Nemati *et al*. (2021).

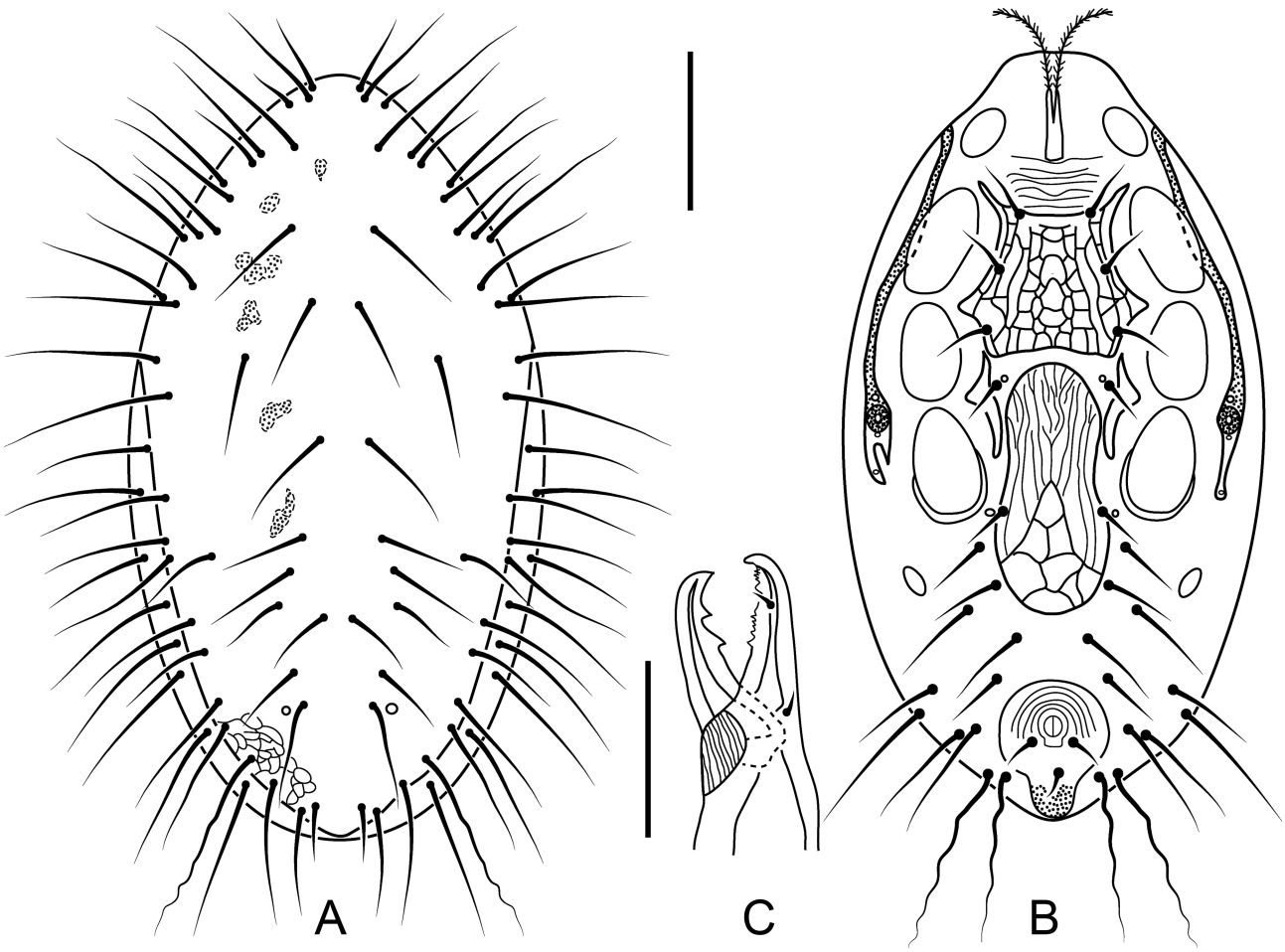


FIGURE 33. Female. *Hypoaspis* Canestrini (modified from Joharchi & Halliday, 2011): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 µm for dorsum and venter, 100 µm for chelicera.

***Hypoaspis* Canestrini** (Fig. 33)

Idiosoma 700–1000 µm long. Dorsal shield suboval, occasionally moderately tapering posteriorly; usually with 36–37 pairs of setae, including *Zx*2–3, with *r*2–3 on soft cuticle (or apparently absent or on the shield in some cases) and *z*3 or *z*6 occasionally missing; rarely more (38–39 pairs) or fewer setae on shield (*e.g*. a *S* seta off shield). Setae *z*4 and *s*4–5 inserted more laterally than normal, resulting in more exposed area laterad of *j*4–5 and *z*5; setae usually long or mid-sized (occasionally short, especially central setae), with *j*3, *z*4, *s*4–5 very long and *Z*4 longest, whip-like (often wavy). Unsclerotised dorsolateral cuticle usually with *r*6, 6–8 *R* and 1–2 *UR* setae on each side, rarely more; typically, *Jv*5 and often the posteriormost *R* seta whip-like. Sternal shield about as long as wide or slightly longer than wide. Epigynal shield mid-sized, tongue-shaped or drop-shaped, at most only moderately wider posteriorly than at level between coxae IV; bearing *st*5. Post-anal seta subequal or slightly shorter than para-anal

setae. Peritrematal plate minimally developed, narrowly extending posterior to stigma, free anteriorly. Some males have a sternogenitiventral shield, well removed from anal shield.

Cheliceral fixed digit usually with 2–3 small subapical teeth, a mid-sized tooth level with pilus dentilis followed by a serrated row of *ca*. 6–10 minute teeth. Epistome broadly subtriangular, typically more rounded apically resulting in a somewhat tongue-shaped apex, which is often less denticulate than the baso-lateral margins. Deutosternum with rows of mostly 8–18 denticles each.

Legs II–IV with several conspicuous macrosetae, notably on femur IV (*ad*1) and tarsus IV (3–4 dorsals), and usually also including apicodorsal setae (*ad*1 or *pd*1) of femora II–III or genua II–IV. Tarsus II with subapical setae *al*1, *pl*1 spur-shaped and ventral setae usually also spur- or spine-shaped. Leg chaetotaxy normal, with rare exceptions (*e.g*. genu IV with two ventrals in *H. melolonthae* Joharchi & Halliday).

Hypoaspis is similar to *Gaeolaelaps*, but has several dorsal setae shifted laterally, some of which are whip-like, *r*2–3 off the shield, *Jv*5 whip-like, macrosetae on legs (rare in *Gaeolaelaps* or not as pronounced), epistome tongue-like median process that is weakly serrate, and with peritrematal shield barely developed and free anteriorly (fused to dorsal shield in *Gaeolaelaps*). Most of these features are shared with other genera of scarab symbionts (see remarks for *Acantholaelaps*), but *Hypoaspis* is the only genus having *Zx*2–3 setae; the single known species of *Lucanaspis* and (apparently) of *Mumulaelaps*, have only *Zx*2. The other genera have additional apomorphies such as substantial dorsal hypotrichy (*Chapalaelaps*, some *Chapalania*), dorsal or opisthogastric hypertrichy (*e.g*. *Acantholaelaps*, *Angosomaspis*) or eroded sternal shields (*Mumulaelaps*, most *Coleolaelaps*). Selected references: Costa (1971), Joharchi & Halliday (2011), Joharchi *et al*. (2013).

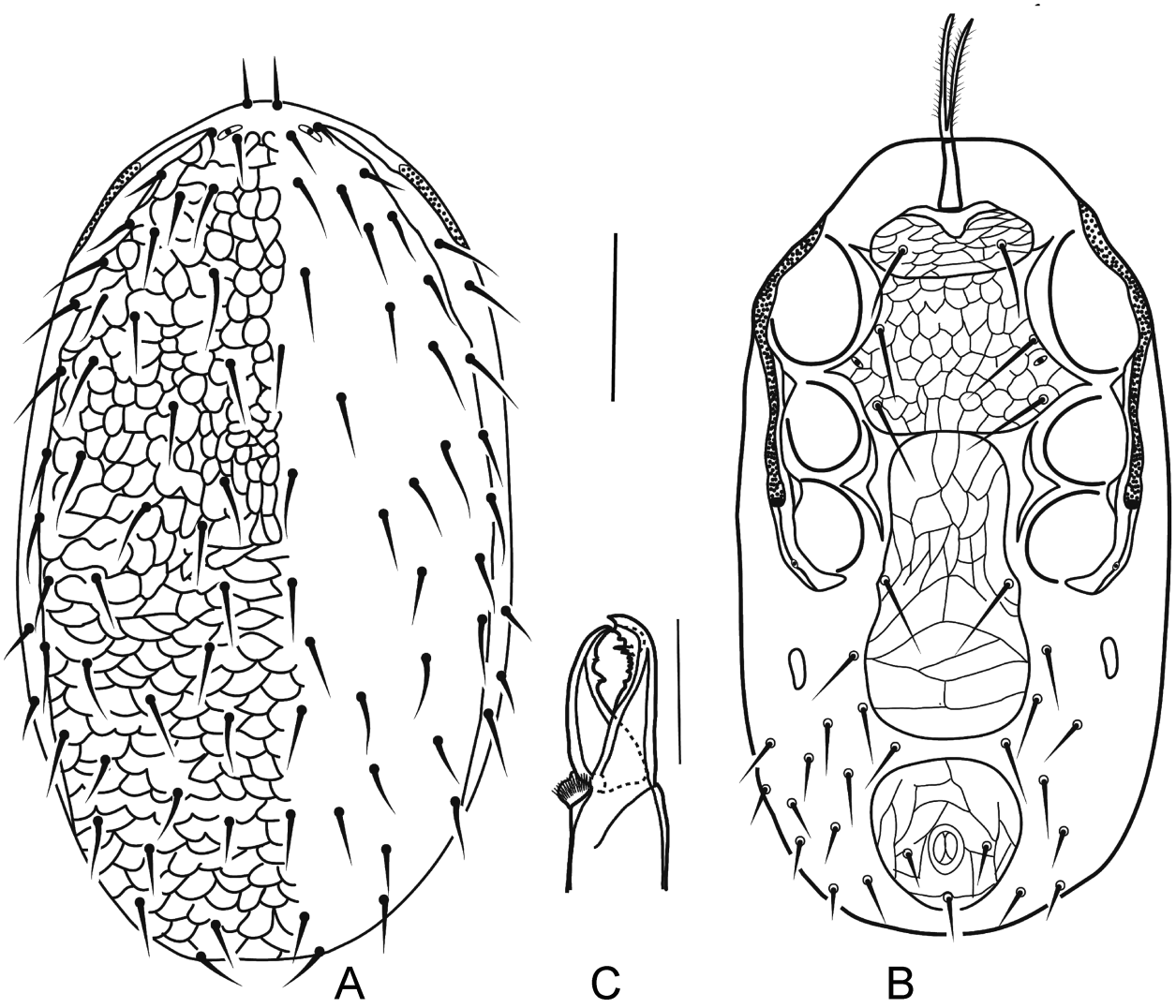
Hypoaspisella **Bernhard** (Fig. 34)

Idiosoma 400–600 µm long. Dorsal shield suboval to more broadly oval, with 39 pairs of setae, including *Zx*2–3, and sometimes with 2–9 *Jx* setae (some that may appear paired); sometimes 38 pairs (*z*3 missing, or rarely another seta), rarely fewer or with 40 pairs (including an extra *r*); setae relatively short to mid-sized (rarely long), subequal. Presternal area weakly sclerotised (lineate-reticulate), sometimes with sclerotised platelets, bordered or not by weakly sclerotised, lineate zones; setae *st*1 commonly off shield, on adjacent weakly sclerotised area; sternal shield at least as long as wide. Epigynal shield relatively large, tongue- or drop-shaped, usually close to the anal shield, separated from it by more or less half the length of anal shield (or closer in type species, *H. heyi* (Karg)), bearing *st*5. Anal shield subtriangular to broadly obovate. Peritrematal plate sometimes posteriorly fused to exopodal plate (including in type species). Unsclerotised lateral and opisthogastric cuticle usually with 6–10 pairs of setae (*r*6, *R* or *UR*) in addition to *Jv*-*Zv* setae, rarely more (15 pairs in *H. lubrica* (Oudemans & Voigts)).

Cheliceral fixed digit with 3–6 teeth, rarely also with a series of small teeth proximal to pilus dentilis (in type species). Epistome subtriangular or rounded, with margin essentially smooth, at most with a few denticles apically. Deutosternal groove relatively narrow, with six (rarely five) rows of 2–10 denticles each (rarely 10–15), including at least some rows of four or more denticles. Internal malae sometimes with short arms laterally to main, median fimbriate arms.

Leg setae generally simple, some occasionally thickened (*e.g*. ventral setae of genua to tarsi II–IV). Leg chaetotaxy poorly studied, putatively normal with few exceptions, notably *H. lubrica* having genu IV with two ventral setae, including *pv*.

As it stands, it is unclear whether the current concept of *Hypoaspisella* is monophyletic. It is morphologically similar to *Gaeolaelaps* and can be generally distinguished from the latter by species having smooth epistome, narrow deutosternum with few denticles, epigynal shield that is typically larger and closer to the anal shield than in *Gaeolaelaps*, and peritrematal shield sometimes fused posteriorly with the exopodal plate. Selected references: Hirschmann *et al*. (1969), Joharchi *et al*. (2018).



FIGURES 34. Female. *Hypoaspisella* Bernhard (modified from Karg, 1962): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 µm for dorsum and venter, 50 µm for chelicera.

***Hyposternus* Joharchi & Halliday** (Fig. 35)

Idiosoma 700–800 µm long. Dorsal shield oval, with 38 pairs of setae (lacking *z*3), including *Zx*2–3, plus one *Jx* seta; setae short, except *Z*5 mid-sized. Sternal shield desclerotised medially, essentially reduced to its lateral and anterior margins, bearing *st*1–3 and the two usual poroids (*iv*1–2). Epigynal shield between tongue- and drop-shaped, close to anal shield, bearing *st*5. Anal shield elongate posteriorly, with anal opening on anterior half of shield; post-anal seta spine-shaped, distinctly longer than para-anal setae. Unsclerotised cuticle with *r*6, and five *R*-*UR* pairs of setae flanking cluster of *Jv*-*Zv* setae; posteriormost setae long, spine-shaped (including *Jv*4–5, *Zv*4–5).

Cheliceral fixed digit with two small subapical teeth; movable digit with weak apical hook and slightly longer than fixed digit. Epistome subrectangular, denticulate. Deutosternum with 10–20 denticles per row, two posterior rows narrower. Corniculi relatively long. Internal malae with long fimbriate arms laterad of main, medial arms. Hypostomal seta *h*3 long but shorter than *h*1.

Leg setae relatively long; *ad*1 on femora II–IV distinctly longer than surrounding setae. Leg chaetotaxy normal.

This monotypic genus is most recognisable by its sternal shield reduced to a marginal strip, short dorsal setae, except mid-sized *j*1 and longer, thick *Z*5, long anal shield and posterior opisthogastric setae spine-like. Selected reference: Joharchi & Halliday (2021).

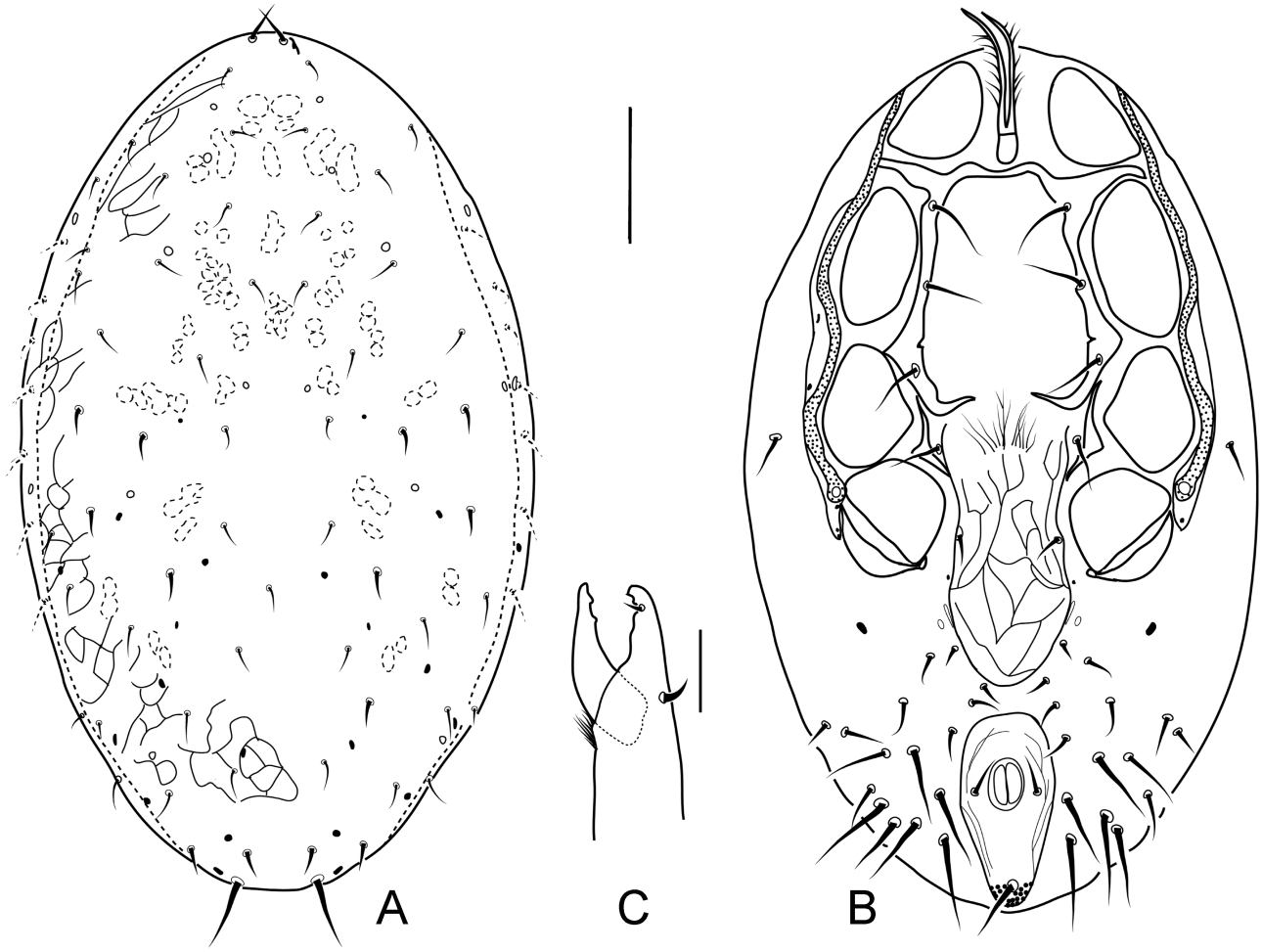


FIGURE 35. Female. *Hyposternus* Joharchi & Halliday (modified from Joharchi & Halliday, 2021): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 μm for dorsum and venter, 25 μm for chelicera.

Iphiolaelaps **Womersley** (Fig. 36)

Idiosoma subcircular, 750–1000 μm long. Dorsal shield poorly sclerotised, about as wide as long, truncate posteriorly, with extensive area of soft cuticle exposed around shield; with *ca*. 18 pairs of setae; most setae minute or very short, except (putatively) *z*2 distinctly longer (still short). Tritosternum with fleshy, broad laciniae, without pilosity. Sternal shield divided in two longitudinal halves, well separate from each other, each bearing *st*1–3 (*st*1 on weakly defined anterior margin). Epigynal small, flask-shaped, with a very narrow neck, anterior hyaline portion about as broad as posteriorly, not overlapping sternal shield but may be reaching between the split halves of the shield; posteriorly not extending beyond coxae IV; with *st*5 on margins. A somewhat drop-shaped platelet mesad of coxae IV and posterior to endopodal plate. Metapodal plates absent. Peritreme very short, at most four times as long as stigma or peritreme diameter; peritrematal plate absent. Unsclerotised opisthogaster with 8–9 pairs of *Jv*-*Zv* setae and 14–16 pairs posterior and lateral to dorsal shield.

Gnathosoma small, partly hidden by idiosoma in dorsal view. Cheliceral shaft swollen basally, narrowed in distal two thirds; both cheliceral digits small, slender, movable digit with a single, strong retrorse subapical tooth, lacking arthrodial corona, fixed digit shortened, edentate, finger-like, with minute pilus dentilis in basal half. Male fixed digit also reduced, slender, movable digit apparently lacking tooth and apical hook, with a long, curved spermatodactyl. Epistome barely convex, with smooth margin. Deutosternum narrow (anteriorly) to very narrow (posteriorly), with rows of five or fewer denticles each. Corniculi notched apically; salivary stylets abruptly narrowed in portion (moderately) extending beyond corniculi; internal malae simple, without fimbriae. Setae *h*1–3 and *pc* very short. Palp tibia apparently with only 11 setae.

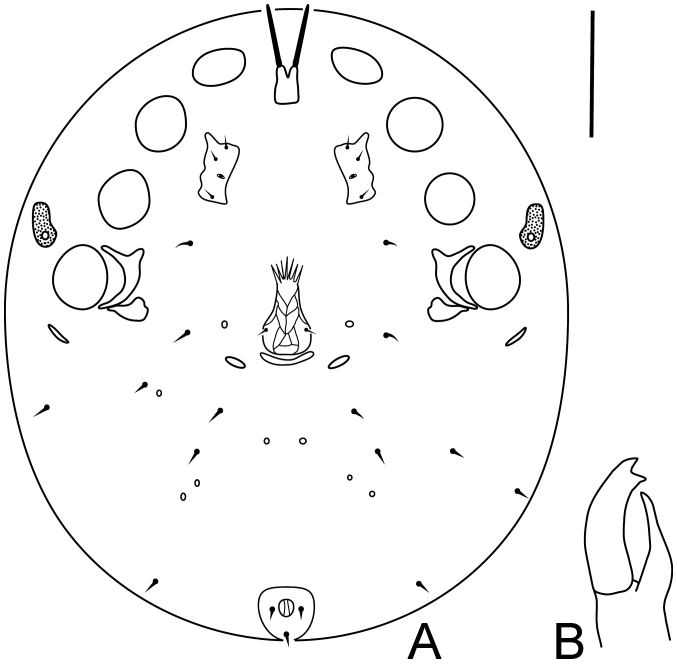


FIGURE 36. Female. *Iphiolaelaps* Womersley (modified from Womersley, 1956a): A, ventral idiosoma; B, chelicera. Scale bar = 150 μm for idiosoma; chelicera not in scale.

Leg I shorter than other legs. Leg setae short, slender except apicodorsal setae (*ad*1, *pd*1) on femora and genua longer, spine-shaped; tarsus I with a relatively long dorsal seta, mid-way on segment. Legs with major reduction, including trochanters I–III with only four setae each; femur I with ten setae (2–2/1, 2/1–2), femur II with ten (only one *al*); genu I with eight setae (1–2/1, 2/1–1), genu II with six (1–2/0, 2/0–1), genua III–IV with seven (1–2/1, 2/0–1), tibiae I–IV each with seven setae (1–1/1, 2/1–1) except tibia I sometimes with eight setae, including two *ad*; each genu and tibia with only one *al* and one *pl*. Pretarsal claws absent or vestigial.

Iphiolaelaps is a monotypic genus particularly distinguished by its poorly sclerotised idiosoma, very short idiosomal setae, a truncate, strongly hypotrichous dorsal shield, very short peritremes, longitudinally divided sternal shield, very small epigynal shield, highly reduced leg chaetotaxy, and small, slender chelicerae including a finger-like fixed digit. A divided sternal shield is also found in *Scissuralaelaps* but the latter lacks most of the features above-mentioned for *Iphiolaelaps*. Selected reference: Womersley (1956a).

Iphiopsis Berlese

Idiosoma about 800 μm long, suboval, posteriorly truncate, based on illustration of type species (*I. mirabilis* (Berlese)); obovate in *I. obesus* Banks. Dorsum (or dorsal shield, putatively covering all idiosoma) with many mid-sized setae, at least along lateral margins, in *I. mirabilis*, based on Berlese's (1882) illustration, or with a few scattered minute setae in *I. obesus*, based on Banks' (1917) text. Epigynal shield more or less tongue-shaped, short. Peritreme absent; stigma enlarged, oval, without peritrematal plate. Sternal shield bearing *st*4 in addition to *st*1–3, and opisthogaster with short, stout setae in *I. obesus* (sternal and opisthogastric setae not described for *I. mirabilis*). Anal shield of the type species apparently elongate, narrow, acuminate anteriorly, bearing anus in its anterior half; in contrast, anal shield enlarged in *I. obesus*, with the anus located in posterior third.

Gnathosoma small, positioned ventrally under idiosoma. Cheliceral digits small, fixed digit putatively with a single tooth. Epistome slightly convex, serrate. Legs short, especially for *I. obesus*. All pretarsi well-developed, with large pulvilli; pretarsus I without claws (notes on cheliceral dentition, epistome and pretarsus based on type species only).

This genus is inadequately known, with only two species described, each with limited information, some of which may be conflicting, especially the idiosomal shape (truncate vs obovate) and the anal shield (size, anus position).

The large stigmata devoid of peritremes, small gnathosoma, and large pulvilli appear as the main distinctive features of this group. Selected references: Berlese (1882c), Banks (1917).

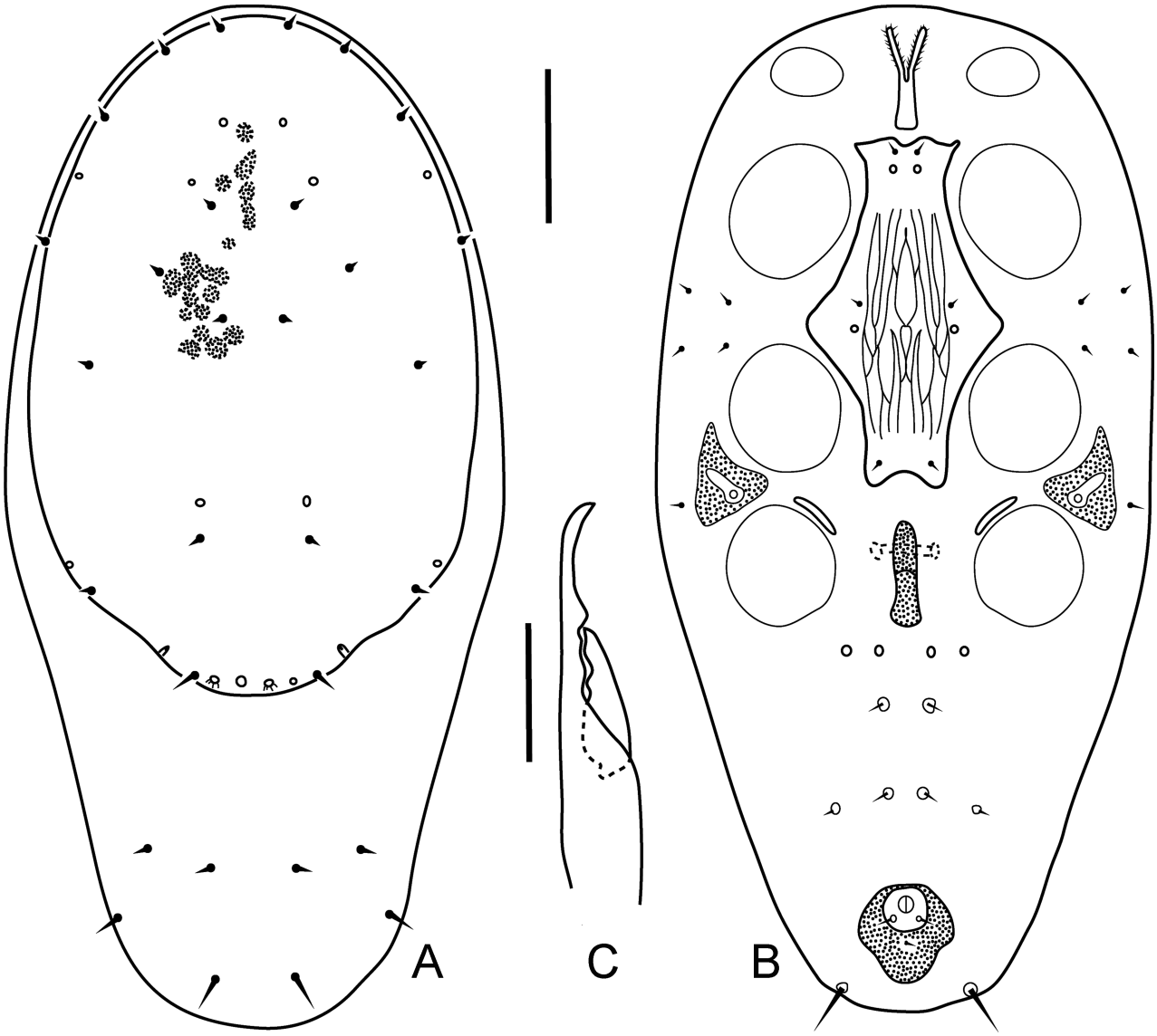


FIGURE 37. Female. *Jacobsonia* Berlese (modified from Fain, 1994): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 150 μm for dorsum and venter, 30 μm long for chelicera.

Jacobsonia **Berlese** (Fig. 37)

Idiosoma relatively elongate, 600–800 μm long. Dorsal shield typically abbreviated and covering slightly more than anterior half of idiosoma, sometimes covering most of idiosoma; shield usually with 13–25 pairs of setae, or more (30–40 pairs) in species with larger shields (homology of setae impossible to determine for most species described); setae very short or minute, except occasionally 1–2 posterior setae (*e.g*. *Z*5) short to mid-sized (*J*5 somewhat star-shaped in *J. andrei* Fain); some males may have larger dorsal shields or longer setae. Other idiosomal setae usually short to minute (some opisthogastric setae thickened in *J. andrei*). Unsclerotised dorsal cuticle with about 8–11 pairs of setae and opisthogaster with only 4–7 pairs of setae. Tritosternum with laciniae smooth or with short pilosity. Sternal shield well-developed, much longer than wide, more or less reaching level of posterior margin of coxa III, often with strong endopodal extension between coxae II–III. Seta *st*4 absent in one species. Epigynal shield moderately to extremely small, and short, barely extending beyond posterior margin of coxae IV (exceptionally larger in *J. tertia*, covering most of opisthogaster), posteriorly truncate or rounded; *st*5 on the shield's posterolateral

corners (or in anterior part of enlarged shield in *J. tertia*), rarely off shield or absent; anterior hyaline portion never overlapping sternal shield. Endopodal plate reduced or absent; metapodal plates absent. Anal shield variously pear-shaped or subtriangular; cuticle apparently desclerotised around anus in some species; circum-anal setae usually very short, post-anal seta even shorter, or absent. Stigma extending into a very short peritreme (maximum three times as long as wide) or without peritreme, surrounded by a small suboval or subtriangular (peritrematal) plate, or plate finely tapered at both ends and sometimes fused to parapodal plate. Known males with sternogenital shield truncate or narrowly tapered posteriorly, distant from anal shield.

Fixed cheliceral digit with 2–3 teeth and usually extending apically into a long, weakly sclerotised slender process, about as long as the main part of digit; movable digit with 1–2 teeth. Male fixed digit without apical process; spermatodactyl often distinctly divided into three segments, and with fixed digit reduced in some cases. Epistome subtriangular, rounded, truncate or somewhat three-pronged, with margin generally denticulate. Hypostomal setae *h*1–3 and seta *pc* very short; one pair of *h* setae sometimes absent (putatively *h*3). Deutosternum with 6–10 rows (usually more than six) of mostly 2–10 denticles each (rarely more). Palp genu and tibia with only five and ten setae, respectively.

Legs with short setae. Males with leg setae sometimes longer or thicker than in females, *e.g*. tarsus II with spur-like setae (and/or cuticular spurs). Coxae apparently with rounded spurs in a few species. Leg chaetotaxy extremely reduced, including (based on few species studied): trochanters I, III and IV with only four setae each; femora I and II with ten and eight setae; genu I with six setae (1–1/1, 1/1–1), genua II–IV with four setae (1–1/0, 1/0–1); tibia I with six (1–1/1, 1/1–1), and tibiae II–IV with five setae (1–0/1, 1/1–1). Pretarsal claws absent or vestigial, pulvilli well-developed.

Jacobsonia has many strong diagnostic features, notably the reduction of the peritremes, dorsal shield (and usually hypotrichous), epigynal shield and claws, and very short idiosomal and gnathosomal setae. Many of these features are shared with symbionts of insects (*Berlesia*, *Katydiseius*) or myriapods (*Conolaelaps*, *Iphiolaelaps*, *Narceolaelaps*, some *Julolaelaps*), but the leg chaetotaxy is more strongly reduced, the palp chaetotaxy is reduced (also in *Conolaelaps* and *Iphiolaelaps*), the sternal shield is unusually elongate, and the fixed digit often has a long apical process in *Jacobsonia* species. Selected references: Evans (1955), Casanueva & Johnston (1992b), Fain (1994).

Julolaelaps **Berlese** (Fig. 38)

Idiosoma 500–1500 μm long. Dorsal shield ranging from broadly oval, covering most of the idiosoma dorsally, to very reduced and leaving most of the idiosoma exposed; with 9–40 pairs of setae; usually a few setae are lacking from more than one podonotal or opisthonotal series; *Zx*2–3 rarely present. Idiosomal setae usually short or very short; occasionally some setae longer, especially marginally, including *j*1 or *Z*5. Unsclerotised dorsolateral cuticle occasionally hypertrichous (region of setae *R-UR*), opisthogaster *sensu stricto* (region of setae *Jv-Zv*) normal or hypotrichous (with as few as five pairs of setae). Sternal shield usually slightly to moderately wider than long, occasionally longer than wide; occasionally distinctly concave posteriorly. Epigynal shield drop-shaped (rarely tongue-shaped), either moderately large (rarely enlarged as to almost reach anal shield), or very narrow (about half as wide as anal shield) and shortened, barely extending beyond level of *st*5 (borne on margins, rarely off shield); shield usually with an obvious (narrow) neck at level of coxae IV. Opisthogastric region with semi-sclerotised zone posterior to epigynal shield in some species (*J. celestiae* Uppstrom & Klompen, *J. idjwiensis* Fain). Anal shield apparently absent in a few species, with circum-anal setae on unsclerotised cuticle surrounding anus (*J. cameroonensis* Maes, *J. serratus* Maes); post-anal seta subequal or moderately longer (rarely shorter) than para-anal setae. Parapodal plate usually moderately to broadly thickened (sometimes narrow or not developed). Peritreme usually short (reaching coxa II) or very short (coxa III), occasionally relatively long (reaching coxa I), and rather broad in some species; peritrematal plate narrow, free anteriorly, usually barely developed posteriorly to stigma. Males with holoventral shield, with opisthogastric portion entire (subtriangular) or more frequently reduced and rounded or eroded laterally; rarely with separate sternogenital and anal shields.

Cheliceral fixed digit with 2–4 teeth, or 5–8 teeth in a group of species from Japan (including two large teeth flanking 2–4 smaller teeth posteriorly to pilus dentilis); male chelicerae either chelate-dentate, with enlarged movable digit (coalesced with spermatodactyl), or with edentate digits including a regressed fixed digit and a stylet-

like movable digit bordered by a long spermatodactyl. Epistome ranging from slightly convex to strongly produced, rounded or acuminate, with margin smooth or denticulate. Deutosternum varying between species, with rows of only 1–2 denticles each, to rows of 12–17 denticles; hypostomal setae and *pc* mostly very short.

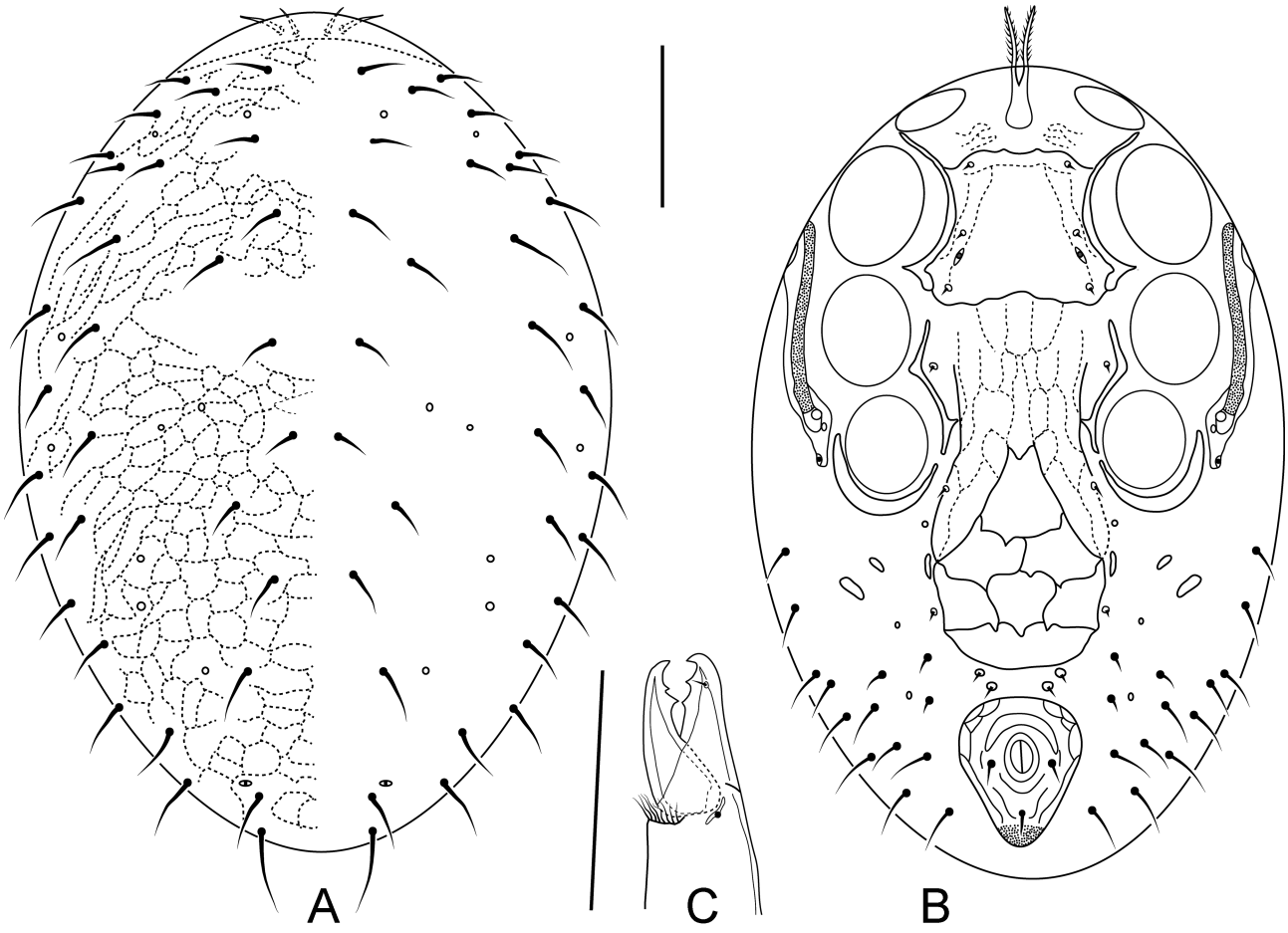


FIGURE 38. Female. *Julolaelaps* Berlese (modified from Nemati *et al*., 2015): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for idiosoma, 50 μm for chelicera; enlarged idiosomal seta not in scale.

Leg setae generally short, with a few setae thicker than others, especially apicodorsal setae of femora II–IV. Leg chaetotaxy varies within the genus and even intraspecifically, with the following deviations, mostly reductions, from normal: femur I usually with 12 setae (including only three ventrals); genu I often with 12 setae, lacking one *av* (9 and 13 setae in other species); genu II often with ten setae (lacking one *pl*), genu IV with 8–10 setae; tibia I with 10–12 setae (lacking at least an *av* and/or a *pl* seta), rarely 13; tibia II usually with nine setae (lacking one *pl*); tibiae III–IV usually normal, sometimes with seven and 8–9 setae, respectively. Pretarsal claws sometimes reduced.

This genus exhibits particularly high morphological diversity, notably for its dorsal chaetotaxy and development of dorsal and epigynal shields and of peritremes. This variability makes it difficult to diagnose, but usual features include an epigynal shield with a narrow neck, very short *pc* and hypostomal setae, thick parapodal plates, peritremes short, and legs hypotrichous. Other myriapod symbionts for which legs have been scrutinized have more heavily reduced leg chaetotaxy, especially on femur, genu and tibia of leg I, except for *Scissuralaelaps* (see remarks at the end of the diagnosis of that genus). Selected references: Fain (1987), Uppstrom & Klompen (2005), Moraza & Kazemi (2012).

Katydiseius **Fain & Lukoschus** (Fig. 39)

Idiosoma about 850 μm long. Dorsal shield reduced, bearing only 11–12 pairs of setae; dorsum lacking at least 18 pairs of setae, most notably *j*1 (not to be confused with *j3*, occupying the position typical for *j*1 on the shield), *J*1–3

and *J*5; unsclerotised dorsolateral cuticle with a few setae not captured by shield (*r* and *S* setae) and a cluster of sigilla anterolaterad of shield; setae varying from short (especially in podonotal region) to mid-sized. Sternal shield highly reduced, irregularly shaped, bearing only *st*1; *st*2–3 on unsclerotised cuticle. Epigynal shield short, more or less drop-shaped; *st*5 on shield or on unsclerotised cuticle. Setae *st*1–5 long. Anal shield oval, circum-anal setae mid-sized, post-anal shortest. Peritreme very short, about twice as long as wide; peritrematal plate mostly restricted to a short, tapered extension posterior to stigma, free anteriorly. Opisthogaster hypotrichous, with only 3–4 pairs of mid-sized *Jv*-*Zv* setae.

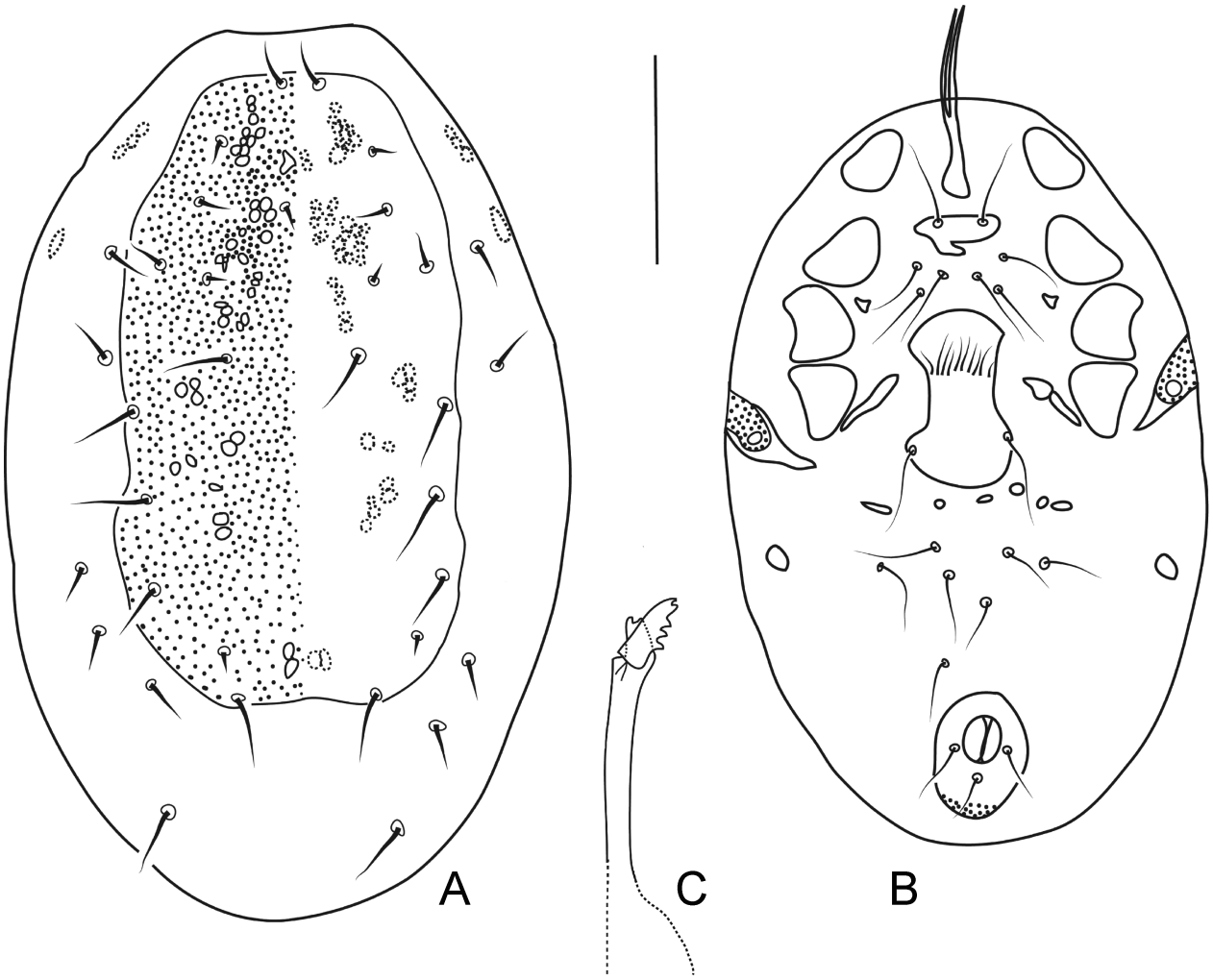


FIGURE 39. Female. *Katydiseius* Fain & Lukoschus (modified from Fain & Lukoschus, 1983): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 μm for idiosoma; chelicera not in scale.

Cheliceral shaft swollen basally and tapered in apical two-thirds, movable digit strongly sclerotised, flaring laterad of fixed digit, with four coarse teeth directed outward; fixed digit truncate, bifid; without pilus dentilis. Epistome triangular, with margin smooth. Deutosternum with ten rows of mostly 2–4 denticles each. Hypostome with a pair of very long processes (putatively corniculi) reaching palp tibia. Seta *h*1–2 very short, *h*3 very long. salivary styli very long, reaching apex of palp genu. Palp femur and genu with only four and five setae, respectively.

Leg chaetotaxy greatly reduced, including trochanters II–III with only four setae; femora I–III with 11-9-5, genua I–IV with 8-6-6-8 and tibiae I–IV with 8-7-7-7 or 8 setae, respectively. All pretarsal claws reduced.

Katydiseius is a monotypic genus closely related to the other katydiseiine genus, *Berlesia*, both characterised by uniquely modified chelicerae and highly hypotrichous dorsal shields. *Katydiseius* differs from *Berlesia* by a sternal shield bearing only *st*1, the lack of *j*1 (*j*3 isolated anteriorly on shield), and its greatly reduced leg chaetotaxy. Selected references: Fain & Lukoschus (1983), Lindquist *et al*. (2020).

***Laelaspis* Berlese** (Fig. 40)

Idiosoma 400–700 µm long. Dorsal shield broadly oval or ovate, rarely narrowly oval or almost circular; covering all idiosoma dorsally; usually with 39 pairs of setae (including *Zx*2–3), sometimes fewer (35–38 pairs, with *e.g. z*3, *S*5 missing), rarely 40 pairs (including an extra pair near *J*4 in *L. morazae* Kazemi), and usually three unpaired median (*Jx*) setae (occasionally 0–2 and exceptionally six in *L. equitans* (Michael), including one between *j*6 setae); setae generally long, with a tendency for elongation posteriorly or marginally (rarely all short and subequal), often with setae very long, whip-like; setae often moderately to heavily barbed, especially marginal ones, which are often also thickened; setae typically with an asymmetrical bulge near base (sometimes barely distinct or absent), sometimes resulting in scimitar-like setae when setae thick enough. Unsclerotised lateral and opisthogastric cuticle usually including *r*6 and 5–6 *R* setae and a few *UR* setae on each side; setae often elongate, barbed and tylochorous. Sternal shield usually bilobed anteriorly (apparently incorporating presternal elements) and about as long as wide, although often broader posteriorly (at level of *st*3). Seta *st*4 inserted on endopodal plate. Epigynal shield massive: broadly rounded posteriorly (sometimes slightly tapering, and rarely acuminate; when tapered, shield forming a "snake head"), narrowly to broadly abutting anal shield (rarely not reaching it); usually strongly bulging (and angled) laterally between *st*5 and *Zv*1 and nearly abutting parapodal plate; sometimes only gently rounded (hence, broadly drop-shaped); shield bearing *st*5 and *Zv*1 on its margins (rarely *Zv*1 on soft cuticle, tightly flanking shield), sometimes also *Jv*1, and *Jv*2 on soft cuticle closely flanking shield margin; shield characteristically ornamented with two elongate, parallel inverted-V-shaped ridges (the outer ridge often less distinct) enclosing medially 8–9 cells, with cells either subquadrate and oriented transversally/diagonally, or strongly tapering and curving posteriad along midline (few exceptions to those two patterns); shield usually flanked by elongate, narrow metapodal plate. Anal shield triangular to subtriangular, occasionally slightly concave anteriorly; post-anal seta usually distinctly longer and thicker than para-anal setae, occasionally barbed. Parapodal plate thickened, usually developed as a subtriangular lobe. Peritrematal plate well-developed, including posteriorly to stigma, often reaching well beyond coxa IV.

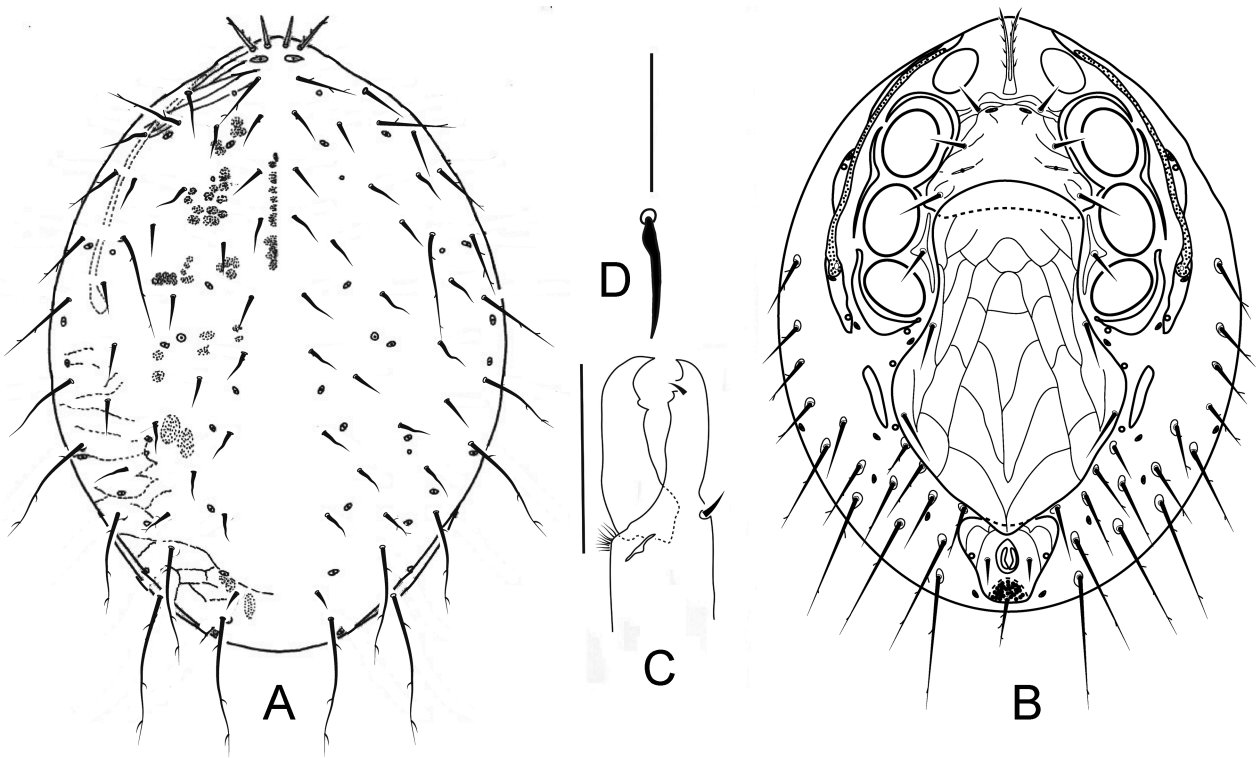


FIGURE 40. Female. *Laelaspis* Berlese (modified from Kazemi, 2015): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera; D, detail of an idiosomal seta. Scale bars = 100 µm for dorsum and venter, 20 µm for chelicera; enlarged idiosomal seta not in scale.

Cheliceral digits relatively short; fixed digit with at most six teeth; movable digit sometimes edentate or with a single tooth. Epistome subtriangular and more or less pointed, or a rounded lobe, with margin essentially smooth. Deutosternum with rows of 3–15 denticles each, usually 5–10. Internal malae occasionally with lateral arms, in addition to median arms; lateral arms may bear thick, elongate filaments (*e.g. L. astronomicus*).

Leg setae generally slender; a few setae sometimes thickened, especially *ad*1 on femora II–IV. Leg chaetotaxy normal, with rare exceptions (genu IV with no *pl* or with two *pl*).

This genus is one of the easiest genera to identify, thanks to its distinctively shaped and ornamented epigynal shield, bearing *st*5 and 1–2 pairs of opisthogastric setae on its margins. Other diagnostic features include frequently elongate dorsal and opisthogastric (the latter also tylochorous) setae, sternal shield bilobed anteriorly, *st*4 situated over endopodal plate, parapodal plate thick, peritrematal shield elongate posterior to stigma, and epistome smooth-margined. Selected references: Joharchi *et al*. (2012a), Kazemi (2015).

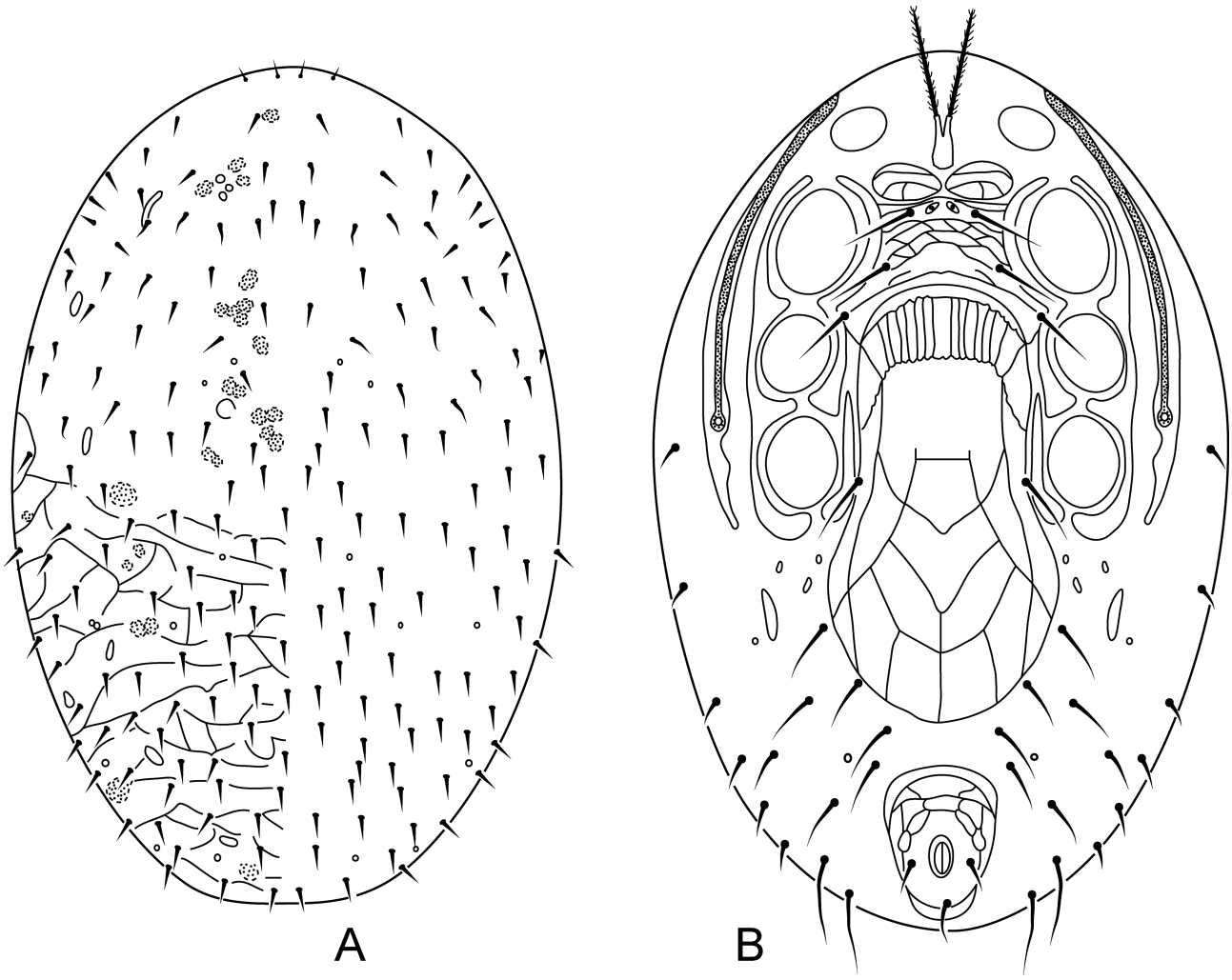


FIGURE 41. Female. *Laelaspisella* Marais & Loots (modified from Marais & Loots, 1969): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 100 µm.

Laelaspisella Marais & Loots (Fig. 41)

Idiosoma 500–600 µm long. Dorsal shield broadly oval, covering all of idiosoma dorsally; apparently hypertrichous in all series of setae, representing the equivalent of about 90 irregular "pairs" of setae, and several unpaired posteromedian (*Jx*) setae; all setae very short. Ventral setae mid-sized, with 1–2 posterior setae (including *Jv*5) barbed or pilose apically; unsclerotised cuticle with 8–9 pairs of *Jv*-*Zv* and 0–6 pairs of *r*-*R* setae. Laciniae apparently fused for about a quarter of their length. Presternal area apparently with sclerotised, discrete platelets; sternal shield

broad posteriorly, with setae *st*3 at least twice as far apart as setae *st*1; posterior margin concave. Seta *st*4 absent. Endopodal plate apparently narrowly fused to sternal shield. Epigynal shield enlarged, tongue- or drop-shaped (or mildly snake-head shaped), broad throughout, slightly widening posteriorly, and reaching relatively close to anal shield; bearing *st*5. Post-anal seta apparently subequal or longer than para-anal setae. Parapodal plate well developed. Peritrematal plate extending at least to posterior margin of coxa IV.

Cheliceral fixed digit with about three teeth; movable digit apparently with three teeth in the type species; dorsal seta apparently absent. Epistome triangular, with margin smooth. Deutosternal groove relatively broad, each row with many denticles. Palp tarsus bearing a scale-like hyaline lobe near base of palp tarsal claw. Median projections of internal malae with elongate fimbriae along margins.

Some leg setae thickened, including ventrals of tarsus II. Leg chaetotaxy normal except for femur I apparently having only 12 setae, genu I only 12 setae (including two *pd*), and genu IV ten setae (including two ventrals).

The most obvious diagnostic features of *Laelaspisella*, notably a strongly hypertrichous dorsal shield, bulky epigynal shield, posteriorly broadened, concave sternal shield, *st*4 absent, strongly fimbriate internal malae, and a triangular, smooth-margined epistome are shared with *Pogonolaelaps*. The latter differs from *Laelaspisella* at least by having only moderate hypertrichy restricted to the opisthonotal region, a 3-tined palp tarsal claw, tylochorous opisthogastric setae and poroid *iv*3 on sternal shield. In addition, *Laelaspisella* has a hyaline scale associated with the palp tarsal claw. Selected references: Marais & Loots (1969a), Nemati & Gwiazdowicz (2016b), Joharchi *et al*. (2020).

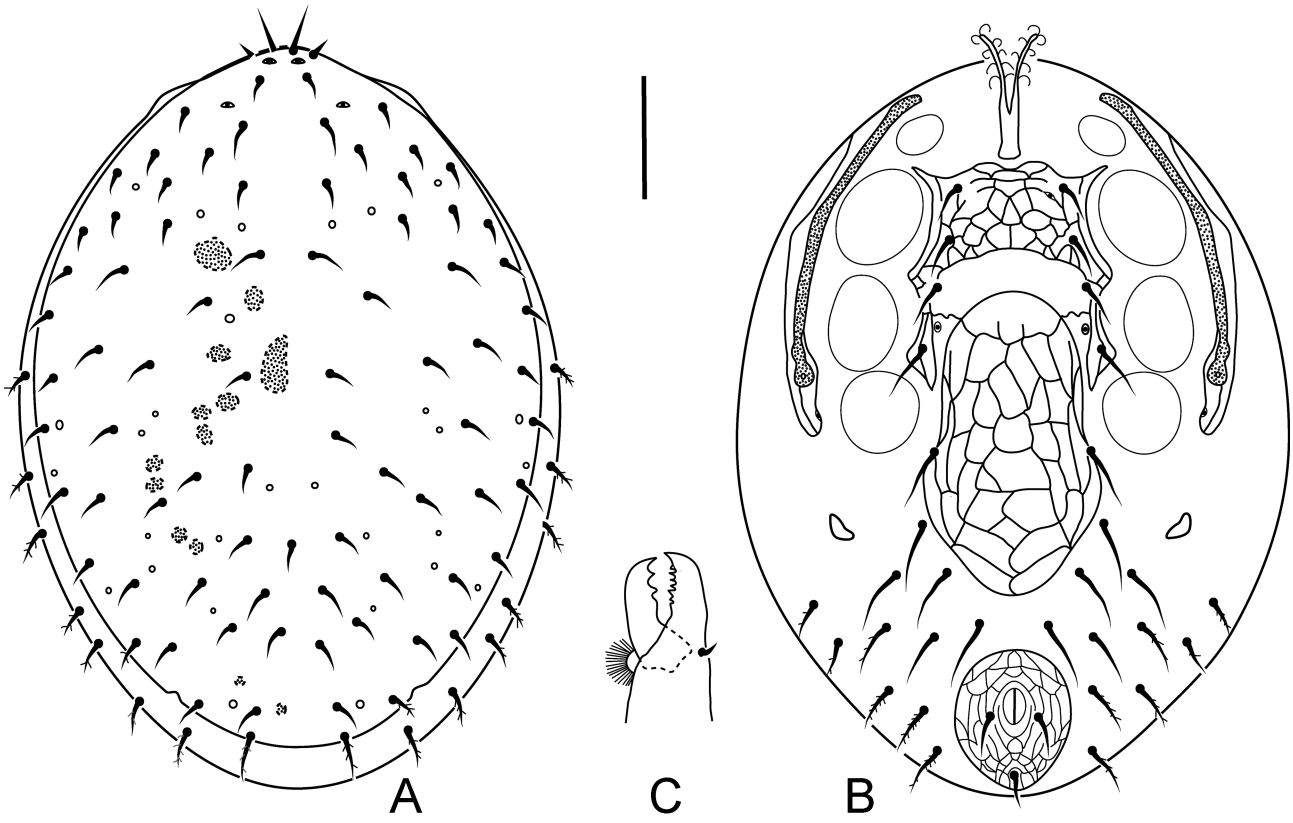


FIGURE 42. Female. *Laelaspoides* Eickwort (modified from Eickwort, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 100 µm for idiosoma; chelicera not in scale.

Laelaspoides **Eickwort** (Fig. 42)

Idiosoma 650 µm long. Dorsal shield broadly oval, bearing 39 pairs of setae including *Zx*2–3, and 5–6 *Jx* setae mostly between *J*3 and past *J*4 setae, sometimes also anterior to *J*3; most setae short, *j*1 (stout) and *Z*5 mid-sized; *S*4–5 and *Z*5 barbed. Sternal shield bilobed anteriorly (fused to presternal platelets), slightly wider than long. Seta *st*4 on endopodal plate ("on poorly defined plate" in Eickwort, 1966) or on unsclerotised cuticle. Epigynal shield

robust, drop-shaped or snake-head shaped. Anal shield broadly obovate or drop-shaped. Setae of ventral idiosoma mid-sized, except circum-anal setae relatively short; post-anal seta subequal to but thicker than para-anal setae. Unsclerotised cuticle with most of dorsomarginal (*r*6, *R*1–6) and opisthogastric setae (nine pairs of *Jv*-*Zv* and two of *UR*) barbed. Male with sternogenitiventral shield, moderately expanded posterolaterally or not, with irregular margins, well removed from anal shield.

Cheliceral fixed digit with 6–7 mid-sized closely spaced teeth. Epistome subtriangular, with margin weakly serrate; deutosternum with rows of 10–15 denticles each. Internal malae with a pair of lateral arms broadly developed and strongly fimbriate, more so than slender median arms.

Leg setae relatively thick, especially *ad*1 on femora II–IV and *pd*2 on femora II. Chaetotaxy normal.

A monotypic genus with only few distinctive features, including 5–6 *Jx* setae, a broad dorsal shield with short setae except *j*1 and *Z*5, a broadly drop- or snake-head shaped epigynal shield, opisthogastric and dorsomarginal setae barbed, and internal malae with lateral arms strongly fimbriate. Selected reference: Eickwort (1966).

Ljunghia **Oudemans** (Fig. 43)

Idiosoma 500–900 µm long. Dorsal shield usually suboval or tapered posteriorly, with extensive area of unsclerotised cuticle exposed, occasionally broadly oval and covering most of idiosoma dorsally; with 15–36 pairs of setae, lacking in particular 2–5 setae of the *J*-series (rarely all present); most species with only 15–18 pairs on shield, including only 2–5 pairs of opisthonotal setae more or less restricted to margins, leaving the shield bare posteromedially. Idiosomal setae generally long or very long; a few dorsal setae typically short (*e.g*. *j*1, *z*1 or *J*5 when present), sometimes also central setae (*e.g*. *j*5–6), or *Jv*-*Zv* setae. Sternal shield nearly always much wider than long and deeply concave posteriorly, rarely only slightly concave (exceptionally, shield quadrate in *L*. *rainbowi* Domrow, without endopodal extensions); anterior margin either bilobed (and *st*1 inserted on shield, away from margin) or more or less straight (and *st*1 on margin); setae *st*3 usually 1.7–3 times as far apart as setae *st*1. Seta *st*4 usually absent. Epigynal shield more or less tongue-shaped, moderately to more often very distant from anal shield; seta *st*5 usually on shield margin, occasionally on unsclerotised cuticle or even absent. Anal shield obovate, always longer than wide; circum-anal setae relatively long, post-anal subequal or moderately shorter than para-anal setae, the latter inserted distinctly (and directly) behind anal opening or near level of its posterior margin; shield occasionally terminal (with cribrum seen dorsally). Lateral and opisthogastric unsclerotised cuticle usually including at least seven pairs of *Jv*-*Zv* setae and several pairs of *R* setae, seldom hypertrichous (with up to a dozen extra "pairs" in each of the region of *Jv*-*Zv* setae and *R*-*UR* setae). Peritrematal plate minimally developed, with or without a short extension posterior to stigma, typically free anteriorly, occasionally fused to dorsal shield (fused to exopodal-parapodal plate in *L*. *guangxiensis* (Ma)). Males with a sternogenital shield, rounded or tapered posteriorly, or with a holoventral shield narrowed posteriorly.

Fixed cheliceral digit either normal in size with 1–2 (rarely three) teeth, or reduced (much shorter than movable digit), edentate and with or without apical hook (in the latter case, fixed digit finger-like); movable digit usually with two teeth, occasionally with one tooth or more or less edentate and finger-like. Male cheliceral digits sometimes edentate, finger-like, with fixed digit reduced, despite normal chelicerae in conspecific female. Epistome variously subtriangular or rounded, sometimes acuminate or with two or three lobes; margin serrate. Deutosternal groove typically with 5–7 rows of 4–10 denticles (rarely fewer, 1–3 denticles, or more, 10–20 denticles), occasionally with 9–10 rows. Corniculi short, and usually blunt and notched apically (corniculi obscured by large lobe-like hypostomal projections in *L*. *pulleinei* Womersley). Internal malae occasionally with slender lateral arms, in addition to median arms. Palp setation sometimes reduced, most notably genu with five setae and tibia with 9–13 setae in some species, with intraspecific variation.

Leg chaetotaxy varies between species, and usually differs by one or more losses of setae from the norm, including notably: femur I often with 12 setae (including only three ventrals); tibia II with 8–10 setae, usually nine setae (including only one *pl*); genu and tibia I sometimes each with 12 setae (only two ventrals) (each rarely with 11 setae, or tibia I with 14 setae). More sporadic deviations include: genu II rarely with ten setae (only two *ad*); genu IV with 8–9, rarely ten setae (sometimes with only two *pd*, and/or with *pv* present); tibiae III–IV occasionally with only seven and 8–9 setae, respectively. Pretarsal claws often small or weakly sclerotised (and modified in J-shaped structures in some species), pretarsus I sometimes vestigial.

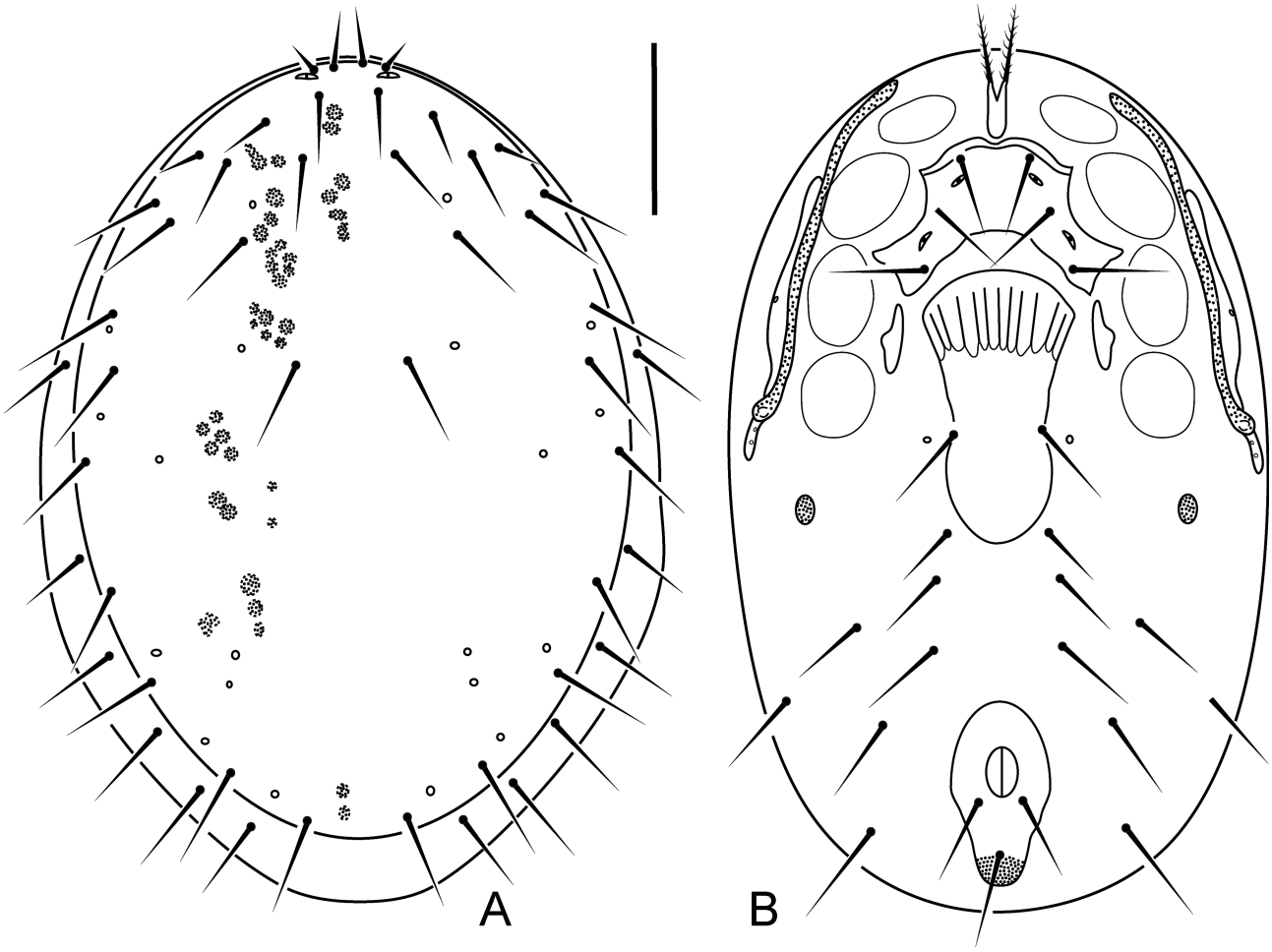


FIGURE 43. Female. *Ljunghia* Oudemans (modified from Halliday & Juvara-Bals, 2016): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 150 µm.

Despite the strong morphological variation between species, *Ljunghia* can be distinguished from other genera by (*i*) their relatively long dorsal setae; (*ii*) the usually highly reduced dorsal setation especially in the opisthonotal region; (*iii*) *st*4 usually absent; (*iv*) anal shield obovate with para-anal setae inserted behind anus; (*v*) short sternal shield, deeply concave posteriorly; (*vi*) claws often weak; (*vii*) blunt or bifid corniculi; and (*viii*) the often reduced cheliceral fixed digit. The normal, long peritremes of *Ljunghia* species further distinguish them from other arthropod associates. Selected references: Moraza *et al*. (2009), Mašán *et al*. (2012), Halliday & Juvara-Bals (2016).

***Lucanaspis* Costa** (Fig. 44)

Idiosoma about 600 µm long. Dorsal shield oval, bearing 33 pairs of setae, including *Zx*2; lacking *z*1, *z*3, and *z*6, and *r*2–3 off shield; setae *z*4, *s*4–5 and most *Z* setae inserted more marginally than usual; most setae very short, seven pairs longer, including *j*1–2 and *s*4–5 mid-sized, *j*3 and *z*4 long, *Z*4 very long (and wavy). Presternal area weakly sclerotised, lineate-reticulate. Sternal shield distinctly wider than long, posterolateral corners slightly eroded. Epigynal shield moderately large, between tongue- and drop-shaped, reaching close to anal shield. Post-anal seta slightly shorter than para-anal setae. Peritrematal plate minimally developed except for short extension posterior to stigma; free anteriorly. Unsclerotised opisthogastric cuticle with short setae including 2–4 pairs of *R* or *UR* flanking *Jv*-*Zv* setae; unsclerotised lateral cuticle anteriad level of metapodals with no setae.

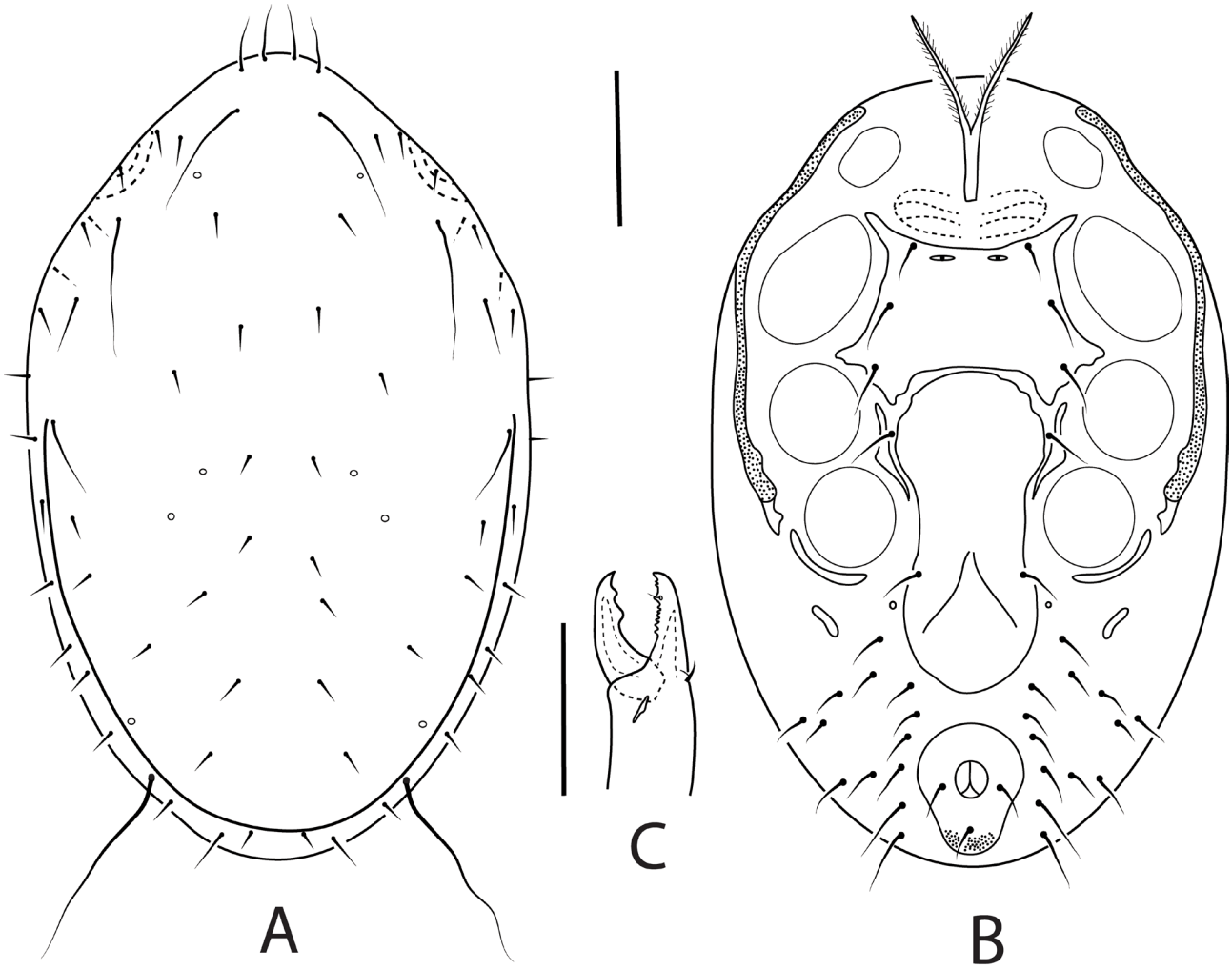


FIGURE 44. Female. *Lucanaspis* Costa (modified from Costa, 1971): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 μm for dorsum and venter, 100 μm for chelicera.

Cheliceral fixed digit with two subapical teeth, a mid-sized tooth level with pilus dentilis, following by a serrated row of about seven minute teeth. Epistome subtriangular, somewhat tongue-shaped, with margin serrate; deutosternum with rows of ten or more denticles each. Internal malae with a pair of short fimbriate arms in addition to median arms.

At least one dorsal macroseta on each of femora II–IV and tarsus IV; other leg setae simple except for tarsus II with *al*1 and *pl*1 stout. Leg chaetotaxy normal.

Lucanaspis is a monotypic genus similar to *Hypoaspis* and other relatives, *e.g*. *Dynastaspis*, *Promacrolaelaps* (see note in *Acantholaelaps* diagnosis). It differs from them mainly by most dorsal setae being very short, including along margin (*Dynastaspis* and some *Hypoaspis* species have short setae but not along margin), only *Zx*2 present (*Zx*2–3 present in *Hypoaspis*; *Zx*2 may be present in *Mumulaelaps*, but *Zx*2–3 are absent in other genera), sternal shield wider than long, epigynal shield close to anal shield, and soft cuticle without setae anteriorly. Selected reference: Costa (1971).

Meliponaspis **Vitzthum** (Fig. 45)

Idiosoma about 1100 μm long. Dorsal shield obovate, somewhat truncate anteriorly, with unsclerotised cuticle exposed posteriorly; with only 32 pairs of mostly short setae, mid-sized along shield margin. Setae on dorso- and

ventromarginal unsclerotised cuticle (7–8 pairs of *R*, three pairs of *UR*) also longer and thicker. Sternal shield unusually shaped and enlarged; endopodal extensions strongly developed between coxae I–II but even more so between coxae II–III, crossing entirely area between coxae; shield extending anteriorly over most of tritosternum and base of subcapitulum; anteriormost portion represented by a transverse plate, distinct (delimited by a suture) from main part of shield; laterally covering proximal parts of coxae I–III; posterior margin with a rounded notch medially. Seta *st*4 apparently on endopodal plate. Setae *st*1–5 short. Epigynal shield enlarged, somewhat drop-shaped, broadly expanded behind *st*5 level (nearly twice as wide as distance between coxae IV); anterior portion acuminate; bearing *st*5. Anal shield small, pear-shaped, post-anal seta longer than para-anal setae. Stigma enlarged, peritreme relatively long (almost reaching coxa I), apparently devoid of plate. Opisthogaster with six short *Jv*-*Zv* setae (flanked by three mid-sized *UR* setae).

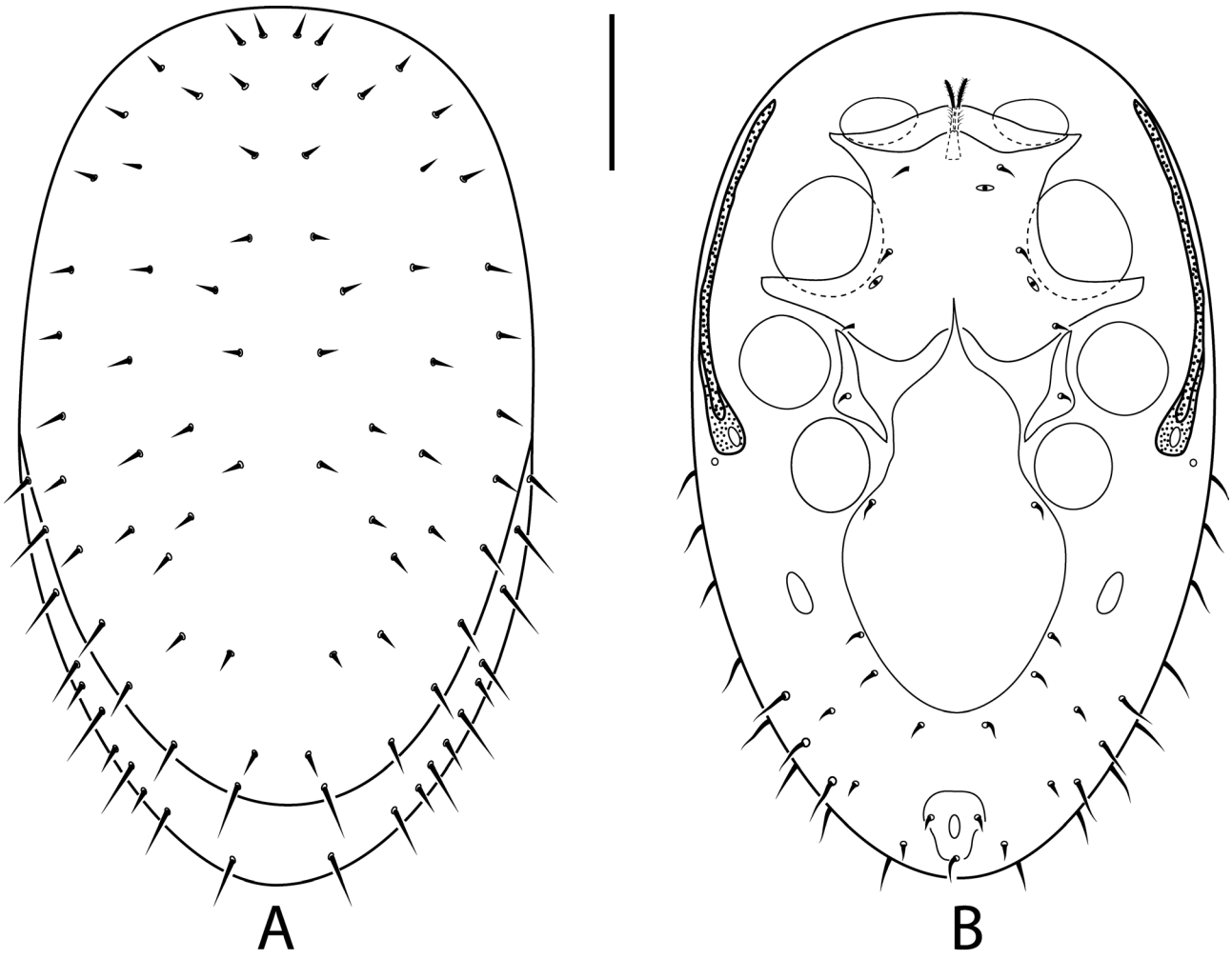


FIGURE 45. Female. *Meliponaspis* Vitzthum (modified from Vitzthum, 1930): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 200 μm.

Gnathosoma, including palps, very small, positioned ventrally under idiosoma.

Leg I very slender, except coxa I which has a width similar to segments of other legs. Leg setae generally short, a few mid-sized and thickened. Pretarsal claws small, especially of leg I. Although the illustrations of Vitzthum (1930a) are well presented for the time, leg chaetotaxy is difficult to interpret; genu IV, for instance, has an unusual chaetotaxy (illustration showing 2–2/1, 2/1–2).

This monotypic genus is inadequately known. The large, unusually shaped sternal shield covering the base of a reduced gnathosoma, a large epigynal shield contrasting with a small anal shield, and slender front legs are its most distinctive features. Selected reference: Vitzthum (1930a).

***Melittiphis* Berlese** (Fig. 46)

Idiosoma about 800 µm long. Dorsal shield subcircular, covering all idiosoma dorsally; markedly hypertrichous (with *ca*. 77 pairs of setae), especially near opisthonotal lateral margins; several unpaired (*Jx*) setae posteromedially, including a few near *J*5; most setae very short, slightly longer near posterolateral margins and stout, spine-like; Z5 mid-sized. Presternal area with an elongate sclerotised plate, subhexagonal, with a keel-like ridge medially; sternal shield strongly concave anteriorly and posteriorly, with endopodal extensions between coxae I–II and II–III well-developed; seta *st*4 on well-developed endopodal plate or on unsclerotised cuticle; *iv*3 on sternal shield, just mesad of *st*3; *st*1–5 long. Epigynal shield broad, somewhat drop-shaped. Anal shield large, suboval (appearing truncate or concave posteriorly due to apex bent dorsally); anus small, in posterior third of shield, preceded by a cuticular spur; post-anal slightly longer than para-anal setae, the latter anteriad of anal opening. Exopodal-parapodal strip flanking coxae II–IV thick. Peritrematal plate distinctly curved alongside coxae, narrowly fused to dorsal shield anteriorly, and extending slightly beyond coxa IV. Unsclerotised lateral and opisthogastric cuticle highly hypertrichous, including in regions of *Jv-Zv* and of *R-UR* setae; most setae inflated basally and tylochorous. Male with sternogenital shield, narrowly separated from a ventrianal shield bearing *ca*. ten pairs of setae, with irregular margins; genital opening on anterior portion of the presternal plate.

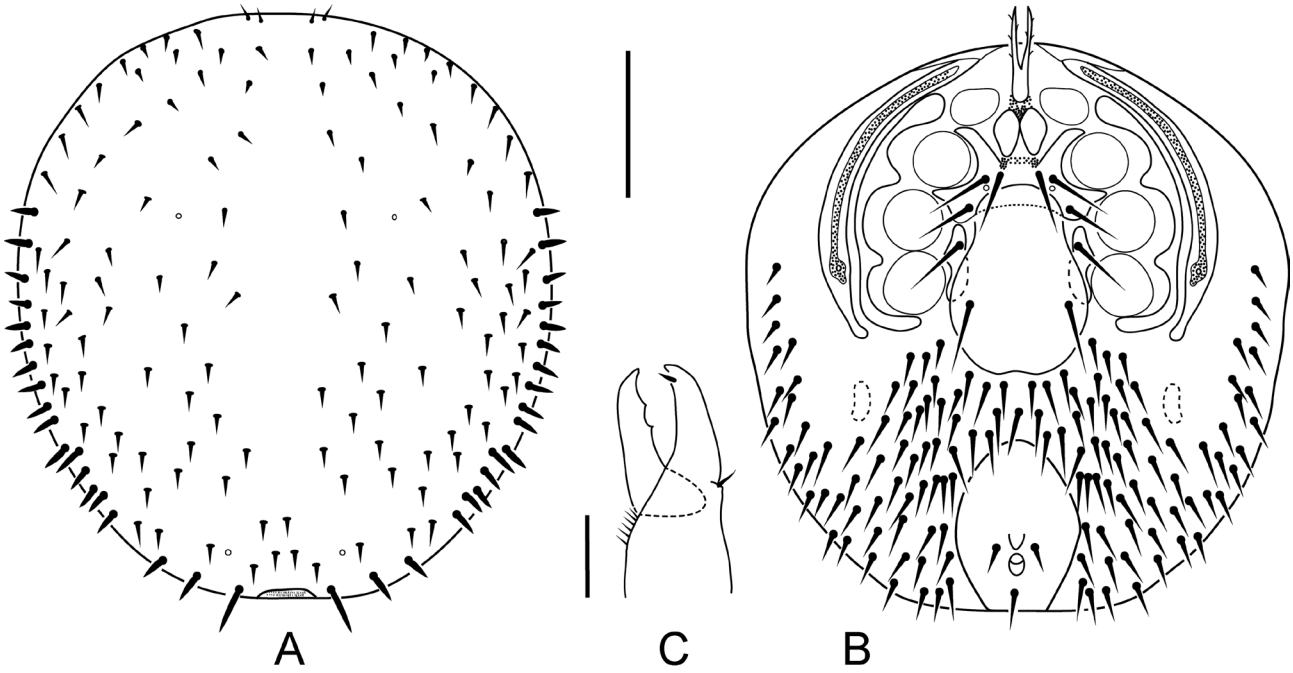


FIGURE 46. Female. *Melittiphis* Berlese (modified from Evans & Till, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 µm for dorsum and venter, 25 µm for chelicera.

Cheliceral digits weakly hooked apically; fixed digit edentate, pilus dentilis inserted near digit apex; movable digit with two weak teeth. Epistome strongly convex, rounded, with margin smooth. Deutosternum with 8–9 denticles arranged in a single longitudinal file. Corniculi weakly sclerotised, convergent.

Genua and tibiae II–IV with most apicodorsal setae spine-shaped, as well as dorsal setae on trochanters III–IV. Coxa II with a complex non-setigerous spine on anterior margin. Leg chaetotaxy normal except for tibia III having nine setae, including two *pl* (2–1/1, 2/1–2) and genu IV with ten setae, including two ventrals (2–2/1, 3/1–1). Tarsi II–IV without dorsoapical processes (*ad*1, *pd*1).

A highly distinct monotypic genus, which was originally the sole representative of the subfamily Melittiphinae erected by Evans & Till (1966), recognised by its subcircular dorsal shield bearing many short setae, spine-like marginally, hypertrichous opisthogaster, large suboval anal shield with a spur anterior to anus, almost edentate chelicerae, a peculiar presternal plate anterior to a short, concave sternal shield, a very narrow deutosternum and hyaline, slender corniculi. Selected reference: Evans & Till (1966).

***Melittiphisoides* Delfinado-Baker *et al*.** (Fig. 47)

Idiosoma about 500 μm long. Dorsal shield strongly convex, putatively holotrichous, setae very short, some marginal setae spine-like. Sternal shield inverted U-shaped, fused to metasternal and (posterior) endopodal elements, bearing *st*1–4; setae *st*1 close to each other, on a small distinct platelet (attached to rest of shield); *st*2 distinctly bulbous basally, inserted on rounded processes. Epigynal shield rounded and broadest anteriorly, including hyaline region, constricted at level of *st*5, then bulging laterally, tapering to a truncate posterior margin, abutting anal shield; bearing only *st*5. Anal shield large, subtriangular or bowl-shaped, much broader than posterior margin of epigynal shield, bearing stout circum-anal setae; post-anal slightly shorter than para-anal setae. Unsclerotised opisthogastric cuticle hypertrichous, with long, thickened setae.

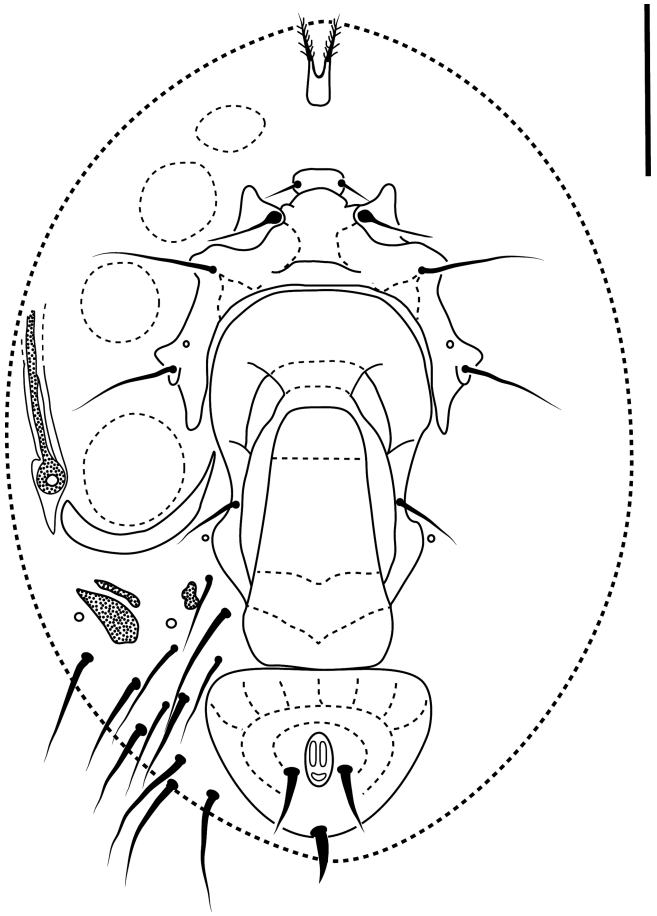


FIGURE 47. Female. *Melittiphisoides* Delfinado-Baker *et al*. (modified from Delfinado-Baker *et al*., 1984): ventral idiosoma. Scale bar = 100 μm.

Gnathosoma almost entirely hidden by idiosoma in dorsal view. Cheliceral fixed digit with three teeth, including two subapically; dorsal seta apparently absent. Epistome smooth; hypostome elongate, corniculi relatively close; deutosternum narrow, with only five rows of 1–5 denticles each.

Leg I slender, legs II–IV robust; most setae of legs II–IV short, spine-shaped. Pretarsal claw I small. Leg chaetotaxy seemingly with some differences from the norm (*e.g*., tibia III with only seven setae, lacking one *al*), but needs to be re-assessed.

The peculiar arrangement of the epigynal shield, broad anal shield with stout setae, the horseshoe-shaped sternal shield complex, including *st*2 basally inflated, and the many spine-shaped leg setae appear as the most diagnostic features for this monotypic genus. Selected reference: Delfinado-Baker *et al*. (1984).

***Mumulaelaps* Clark** (Fig. 48)

Idiosoma about 1200 μm long. Dorsal shield slightly tapering on both ends, and bluntly acuminate posteriorly, leaving a substantial area of unsclerotised cuticle exposed posterolaterally; bearing only 22–24 pairs of setae, at least *z*4 and *s*4–5 inserted more marginally than usual (and *j*2 closely flanking *j*1); lacking at least *z*1, *z*3, *s*2–3; seta *Zx*2 sometimes present (apparent at least on right side of illustration in the original description); about ten pairs (*s*6, *r*- and *S*-series) not captured by dorsal shield, on soft cuticle; *j*3, *z*2, *z*4, *s*4–5, *Z*4–5 very long, other setae short. Presternal area weakly sclerotised, transversely lineate; sternal shield slightly longer than wide, free of endopodal fragments, densely reticulate; posterior margin concave, anterior margin indistinct, with seta *st*1 on weakly sclerotised area. Epigynal shield drop-shaped, relatively broad posteriorly; *st*5 on soft cuticle. Post-anal seta slightly longer than para-anal setae. Peritrematal plate free anteriorly. Unsclerotised laterodorsal and opisthogastric cuticle slightly hypertrichous, including 17–18 pairs of *R*-*UR* setae; setae very long, except some *Jv*-*Zv* setae short or mid-sized. Male with sternogenitiventral shield strongly eroded marginally, bearing *st*1–5 and 1–2 opisthogastric pairs of setae and distant anal shield.

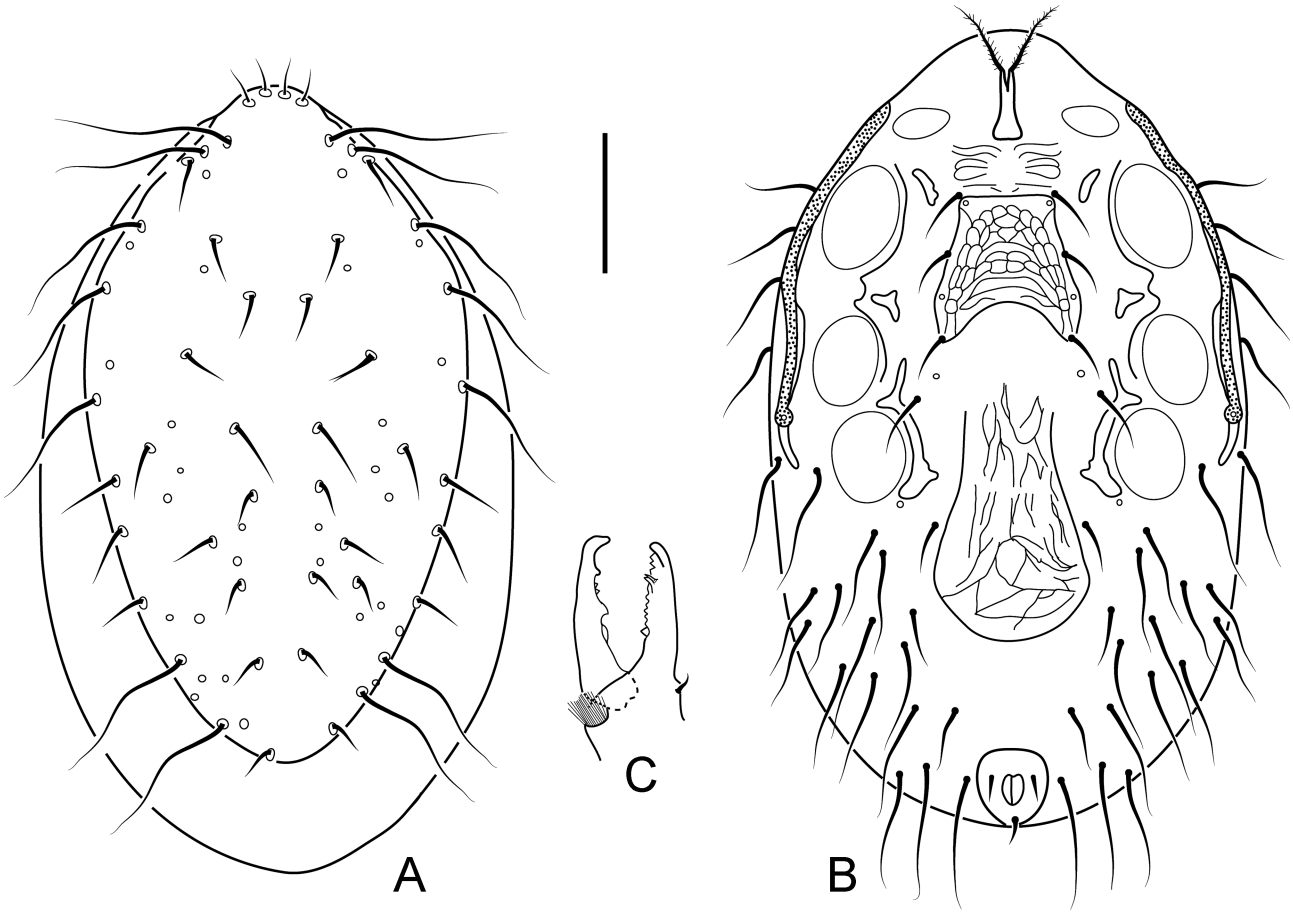


FIGURE 48. Female. *Mumulaelaps* Clark (modified from Clark & Hawke, 2012): A, dorsal idiosoma; B, ventral idiosoma (a composite of figures 5 and 6 of Clark & Hawke, 2012); C, chelicera. Scale bars = 200 μm for dorsum and venter, 50 μm for chelicera.

Cheliceral fixed digit with three subapical teeth, one aligned with pilus dentilis, followed by a regular row of 8–9 small teeth; movable digit with a few small teeth (two in illustration) between the two main large teeth. Male cheliceral movable digit with very strong tooth close to (also strong) apical hook, fixed digit with a serrated ridge, seemingly raised from rest of digit, proximal to pilus dentilis. Epistome strongly convex, subtriangular, serrate. Deutosternum with rows of 10–20 denticles each, basal row narrower, and flanked by a pair of strong denticle outside of groove.

Leg I barely longer than leg III. Many dorsal macrosetae on femora I–II (*pd*1), femora III–IV (*ad*1), and all genua (mostly 1–2 apicodorsal setae), as well as tibia (*ad*1) and tarsus IV (four dorsals); some macrosetae may be absent, based on an undescribed species mentioned by Clark & Hawke (2012). Tarsi II–IV with several spur-shaped setae, including *al*1, *pl*1 but also *av*2, *pv*2 and sometimes *mv*. Leg chaetotaxy normal.

Mumulaelaps is a monotypic genus closely related to *Coleolaelaps*, both having a reduced number of setae on the dorsal shield, many not captured by the shield including the *S*-series; eroded, densely reticulate sternal shields; epigynal shield with a narrow neck; and leg I subequal in length to leg III (or in *Coleolaelaps*, shorter than leg III). *Mumulaelaps* can be distinguished from *Coleolaelaps* by its gently tapered dorsal shield with margins entire (usually narrowed posteriorly and often incised laterally in *Coleolaelaps*), most dorsocentral setae shorter (setae usually long in *Coleolaelaps*), seta *h*3 distinctly longer than *h*1–2, spur-like setae on tarsi, and perhaps also by the distinctive dentition of male chelicerae, which is reminiscent of *Raymentia*. Selected reference: Clark & Hawke (2012).

Myrmozercon **Berlese** (Fig. 49)

Idiosoma 600–1300 µm long. Dorsal shield suboval to subcircular, usually truncate posteriorly (and posterior margin occasionally irregular), typically leaving a short portion of unsclerotised cuticle exposed at the apex, sometimes also laterally; often slightly hypotrichous in either or both podonotal (*e.g*. lacking *z*3, *z*6, *s*1–2 or *r*2) and opisthonotal (*e.g*. lacking *J*1, *S*1) regions, resulting in 23–37 pairs on shield; sometimes moderately (ca. 50 pairs) or extremely hypertrichous (with 300–800 setae, including in the type species, *M. brevipes*); often with some setae asymmetrically positioned or unpaired (*i.e*. lacking on the other side); setae *Jx* and *Zx* rarely accounted for; podonotal setae often occupying more than anterior half of shield, and opisthonotal setae more restricted in space. Setae uniformly short or mid-sized, occasionally very short (such reduction in setal lengths often associated with hypertrichy); sometimes, setae progressively longer posteriorly, or posterior (or all) setae with barbs apically. Other idiosomal (ventral and dorsomarginal) setae generally subequal to dorsal setae. Soft (dorso- or ventro-) lateral and opisthogastric cuticle respectively with one to several pairs of (mostly) *R*-*UR* setae, and 8–10 pairs of *Jv*-*Zv* setae, occasionally hypertrichous with 30–80 irregular "pairs" of setae, either or both near posterolateral margins and in the area between epigynal and anal shields; setae tylochorous in a few cases. Tritosternum typically with short base and smooth laciniae (rarely with normally developed pilosity). Sternal shield typically bilobed anteriorly, as if fused to presternal elements (resulting in *st*1 being away from shield margin), often widened posteriorly (with setae *st*3 about twice as far apart as setae *st*1) and/or broadly or narrowly fused to endopodal plate; concave or variously eroded posteromedially, often resulting in an inversely U-shaped shield (sometimes shield normally shaped; exceptionally desclerotised anteromedially in *M. sternalis*, resulting in a horseshoe-shaped shield). Seta *st*4 often absent (inserted on posterior endopodal extension in *M. brevipes*). Epigynal shield usually large and snake-head shaped, more or less acuminate apically and bulging laterally near *st*5 (sharply so in *M. brevipes*), occasionally more drop-shaped; distant from the anal shield, occasionally reaching close to it; bearing *st*5 (absent in at least one species); when snake-head shaped, shield often occupying most of intercoxal region between coxae III–IV; ornamentation variable, sometimes posteriorly with serial inverted-V ridges or with dense reticulation. Anal shield variously triangular, often with anterior margin concave, sometimes suboval, or terminal in position; circum-anal setae generally short and subequal, sometimes mid-sized, or post-anal setae slightly shorter or longer (exceptionally, *M. brevipes* with long para-anals and short post-anal seta); para-anal setae sometimes distinctly anterior to anus (*Jv*3 captured by shield in *M. chapmani*). Peritreme short (reaching mid-coxa II) or very short (mid-coxa III) (only exceptionally longer); peritrematal plate usually minimally developed around peritreme, sometimes with a short post-stigmatic extension; plate rarely broad (as in *M. crinitus*, where it is also fused to parapodal plate) or narrowly extending anteriorly and fused to dorsal shield. Male with holoventral shield or sternogenitiventral shield, narrow or expanded laterally, moderately distant from anal shield.

Gnathosoma typically small and partly hidden ventrally. Cheliceral digits edentate, apically blunt, rarely with weak teeth or with an apical hook (*e.g*. movable digit with apical hook and one tooth in *M. clarus* (Hunter & Hunter) and *M. spinosus* (Hunter & Hunter)); fixed digit moderately reduced to vestigial; pilus dentilis rarely present; arthrodial corona typically absent or with reduced filaments; dorsal cheliceral seta occasionally absent. Male chelicerae without movable digit except for broad spermatodactyl. Epistome a subtriangular or rounded lobe, sometimes acuminate, with margin smooth (rarely with few or many denticles). Deutosternum highly variable, with

5–21 rows of denticles, ranging from a broad groove of 20–30 denticles per row, to a narrow groove with a single large denticle per row (in *M. brevipes*). Corniculi usually weakly sclerotised, often variously modified in shape (*e.g.* blunt, bifid, lobe-like) or highly convergent; internal malae usually reduced or absent, with inconspicuous or no fimbriation. Palp coxal and hypostomal setae sometimes short, including *h*3; *pc* absent in some species. Palp chaetotaxy nearly always reduced, with most species having two or more segments with fewer setae than normal, including trochanter (typically with a single seta, sometimes two), femur (4–5 setae), genu (4–6 setae), and tibia usually with 11–12 setae (although in some species, tibia and tarsus appear fused and bear 23–24 setae; Joharchi & Halliday, 2020: 36); palp femur sometimes with an apicodorsal bulge.

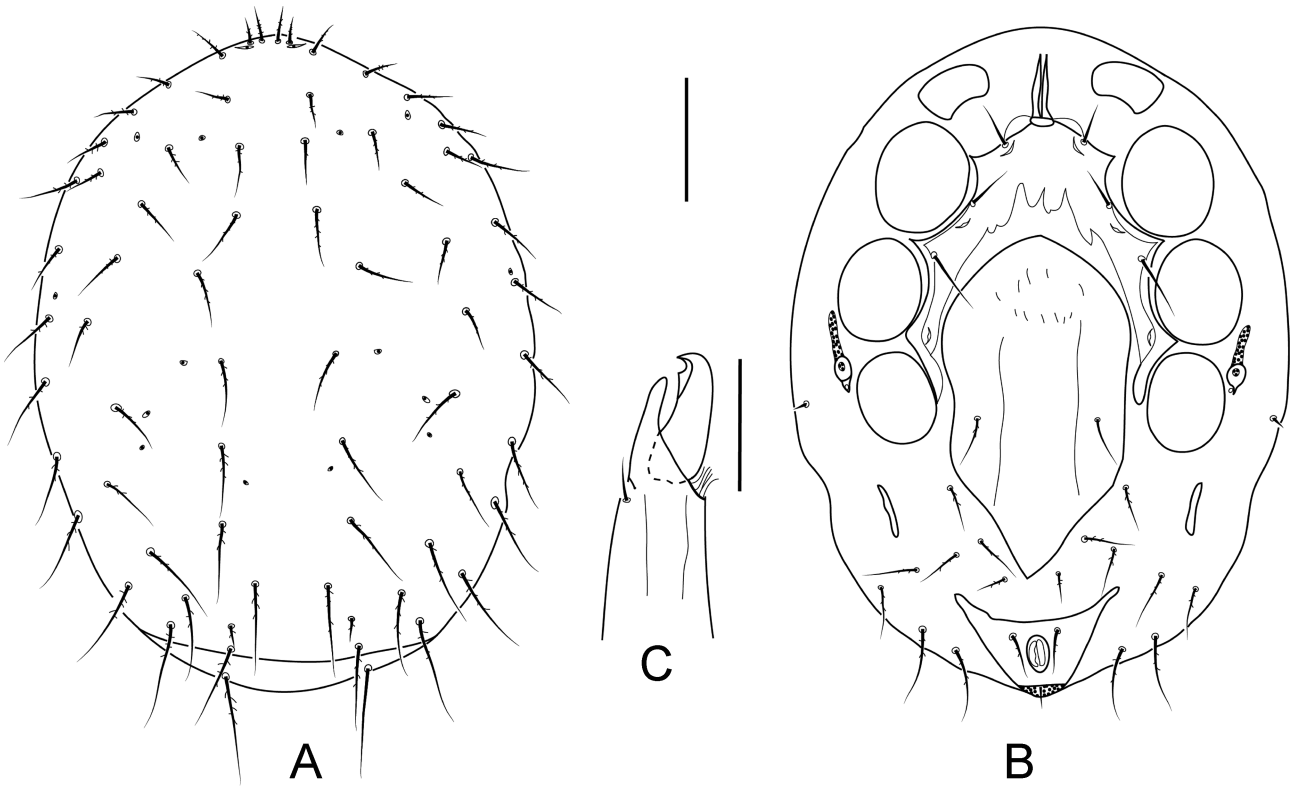


FIGURE 49. Female. *Myrmozercon* Berlese (modified from Joharchi & Moradi, 2013): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 150 µm for dorsum and venter, 25 µm for chelicera.

Legs significantly shorter than idiosoma in some species, subequal to idiosoma in others. Legs with setae variously thickened in some species, especially apicodorsal setae on femora (most leg setae apically blunt or slightly capitate in *M. hunteri* Joharchi *et al*.). Leg chaetotaxy highly variable, ranging from one extreme with species having most leg segments hypotrichous, to another extreme with several segments hypertrichous; sometimes legs show both hypo- and hypertrichy. Nearly all segments can be affected, including coxa IV (with 0–2 setae) and all trochanters (each with 4–6 setae); femora I–IV ranging from 8–14 (most often 8 or 14), 8–12, 5–9 and 5–9 setae, respectively (femora I–II rarely normal); genua with 8–14, 8–11, 8–11, 7–11 setae (genua I, III–IV rarely normal, and genu IV usually with two ventrals and two *pl*); and tibiae with 8–13, 7–11, 7–10, 7–10 setae (tibia III rarely normal). More exceptional hypertrichy are exhibited by *M. iainkayi*, whose coxae I–IV have 6-6-6-4 setae, and *M. crinitus*, having femur II with 12 setae, genua I–II with 16 and 12 setae and tibiae I and IV with 16 and 11 setae, respectively. All pretarsi with claws absent or attenuate, pulvilli sometimes hypertrophied.

Despite its highly variable morphology, *Myrmozercon* can be identified by having many of the distinctive features of another ant-associated genus, *Holostaspis* (see note at the end of diagnosis of that genus), as well as several or all of the following derived attributes absent in *Holostaspis*: (*i*) dorsal shield hypotrichous or hypertrichous, more often truncate posteriorly, (*ii*) sternal shield inversely U-shaped or eroded posteromedially, (*iii*) short peritremes, (*iv*) *st*4 absent, (*v*) cheliceral digits generally more reduced, without apical hooks and fixed digit often reduced, (*vi*) deutosternum with seven or more rows of denticles, (*vii*) laciniae smooth, (*viii*) palp setation reduced, especially trochanter (often with one seta), which is uncommon elsewhere, (*ix*) many leg segments hypotrichous or

hypertrichous, and (*x*) claws reduced or absent. *Myrmozercon* sensu stricto was delimited by Joharchi *et al*. (2015) and comprises species that share several features, including particularly short and very hypotrichous legs, bearing the minimal number of setae on most or all segments. Selected references: Shaw & Seeman (2009), Joharchi & Moradi (2013), Joharchi *et al*. (2015).

Narceolaelaps **Kethley** (Fig. 50)

Idiosoma 600–800 µm long. Dorsal shield broad anteriorly, tapering posteriorly (almost inversely subtriangular or pear-shaped), typically leaving extensive area of unsclerotised cuticle exposed posterolaterally; posterior apex rounded, lateral margins usually irregular; with 22–34 pairs of minute setae, except *Z*5 usually mid-sized. Other idiosomal setae usually very short (and often thick) or minute; in one species (*N*. *americanus* Kethley), setae along posteroventral and dorsolateral shield margins are thick, mid-sized. Unsclerotised dorsolateral and opisthogastric cuticle ranging from slightly hypotrichous to markedly hypertrichous, with 5–45 pairs of setae in addition to *Jv*-*Zv* setae. Laciniae of tritosternum with reduced pilosity. Sternal shield with margins sometimes eroded/irregular; sometimes distinctly concave posteriorly; shield much longer than wide in one species. Seta *st*4 absent in one species. Epigynal shield somewhat drop-shaped but with barely any neck and with posterior margin rounded or almost truncate, broad compared to its length, not overlapping sternal shield; *st*5 inserted medially, away from margin. Anal shield usually large, obovate and terminal (with cribrum visible dorsally); anus usually on posterior half of shield and para-anal setae inserted considerably anteriad of anus; setae very short, subequal in length. Idiosomal shields typically with scale-like ornamentation. Peritreme and peritrematic plate extremely reduced. Known males have separate podonotal and opisthonotal shields, and a sternogenital shield, sometimes eroded posteriorly.

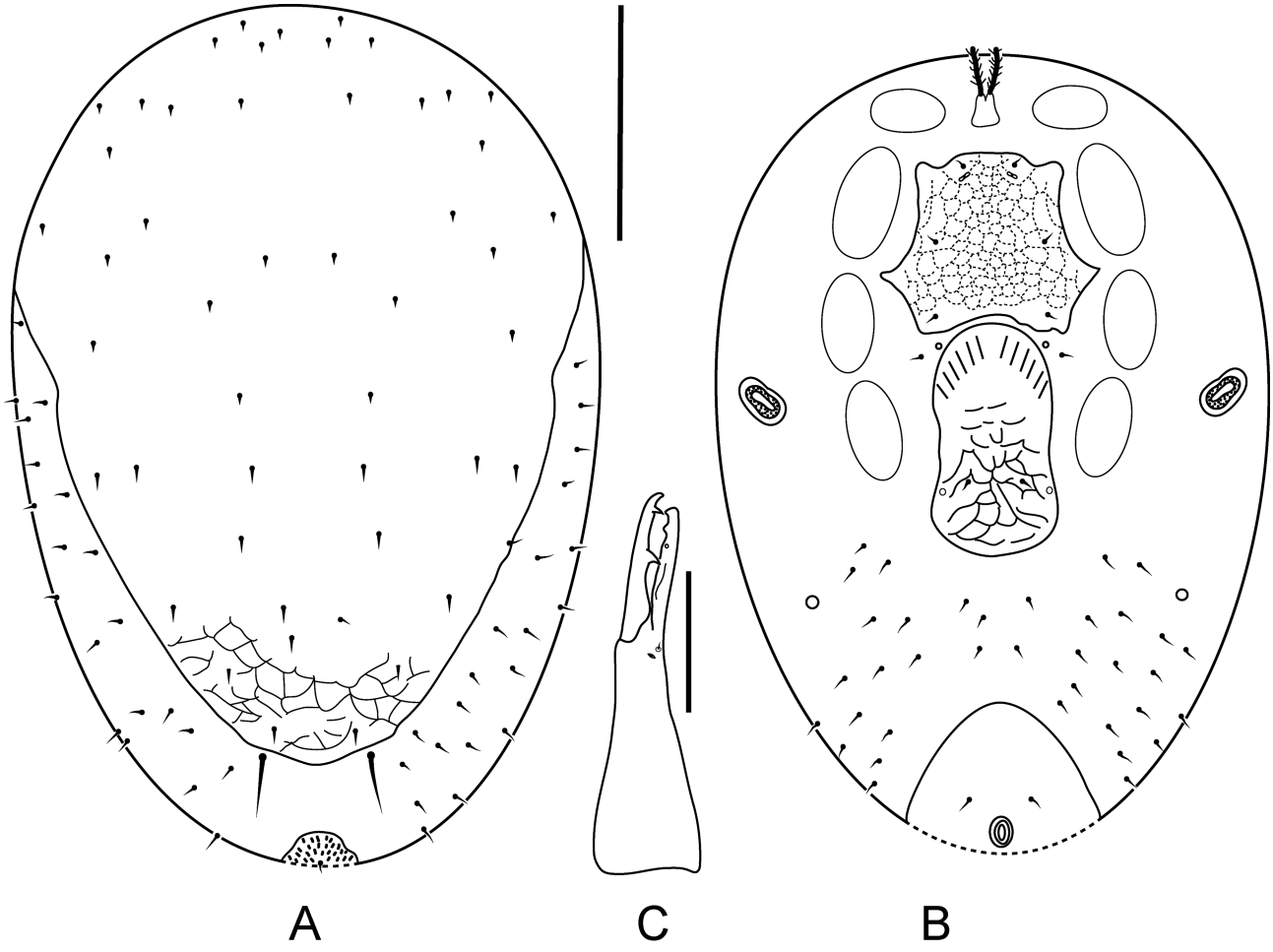


FIGURE 50. Female. *Narceolaelaps* Kethley (modified from Kethley, 1978): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 µm for dorsum, 50 µm for chelicera.

Gnathosoma small. Cheliceral digits small, slender; fixed digit with 1–2 usually weak subapical teeth, sometimes moderately shorter than movable digit; pilus dentilis minute; movable digit with (2) retrorse teeth, lacking arthrodial corona. Epistome subtriangular, with margin sparsely denticulate. Deutosternum with rows of 1–2 denticles each; seta *h*1 short and relatively thick, *h2*–3 and *pc* very short. Palp genu with only 4–5 setae.

Legs II–IV relatively robust, leg I shorter and slender. Most leg setae short, slender, a few setae spur-shaped. Coxae I–IV each with a ventral, posteriorly-directed and rounded spur. Leg chaetotaxy with many (mostly) reductions relative to normal: coxa IV with 1–2 setae; trochanter I with four setae; femur I with usually nine setae (2–2/1, 2/0–2) or sometimes 11 setae (2–3/1, 2/1–2); femur II sometimes with ten setae only (lacking one *al* or one *ad*); femur IV with 5–8 setae; genu and tibia I each with only eight setae (1–2/1, 2/1–1); genu II with ten setae (only two *ad*); tibia II with nine setae (only one *ad*); and tibia IV with nine setae (only two *pd*). Pretarsi I–IV with enlarged pulvilli and greatly reduced claws.

Narceolaelaps has many reductive attributes also characteristic of other genera of myriapod associates (*Conolaelaps*, *Iphiolaelaps*, *Jacobsonia*, some *Julolaelaps*), such as very short peritremes, reduced hypostomal setae, reduced dorsal, palp and leg chaetotaxy, and claws. It differs from them and other laelapid genera by its tapering dorsal shield, epigynal shield compact, almost as wide as sternal shield and somewhat purse-shaped (and *st*5 medially inserted), both shields with colliculate ornamentation, large oval anal shield with para-anal setae inserted anteriad of anus, deutosternum with only 1–2 denticles per row, and slender chelicerae with retrorse teeth. Selected reference: Kethley (1978).

Neoberlesia **Berlese** (Fig. 51)

Idiosoma 700 µm long. Dorsal shield broadly ovate, covering nearly all idiosoma dorsally; hypertrichous, with more than 160 short setae, or the equivalent of *ca*. 80 pairs and several unpaired (*jx*, *Jx*) setae medially. Sternal shield concave posteriorly. Epigynal shield expanded posteriorly and fused to anal shield, resulting in a hologastric shield, only moderately expanded laterally and tapering posteriorly; bearing at least five pairs of (*Jv-Zv*) setae in addition to *st*5. Post-anal seta subequal to para-anal setae. Peritreme absent or extremely short and narrow; peritrematal plate long, seemingly fused anteriorly with dorsal shield (and posteriorly curving behind coxa IV, fused to parapodal plate, at least based on Berlese, 1892). Unsclerotised cuticle with *ca*. 20 pairs of setae.

Gnathosoma, including palps, small, partly hidden ventrally under idiosoma. Cheliceral digits small, slender, edentate, somewhat finger-like; apical hooks weak. Male fixed digit shortened, nearly edentate and movable digit largely fused to broad and short spermatodactyl. Epistome tongue-shaped, with smooth margin (based on Berlese, 1904).

Leg I much longer than other legs and about twice as long as idiosoma. Legs with short setae; femur IV with a ventral seta set on a strong spur-like protuberance. Leg chaetotaxy unstudied.

Genus inadequately known. This diagnosis is based on Berlese's (1892a: 62) original description of *Neoberlesia* and its only constituent species, *N. equitans* Berlese, as well as on complementary (and slightly conflicting) illustrations of Berlese (1904c: 443). This mite exhibits an exceptional combination of features, notably very long forelegs, femur IV with setigerous spur-like protuberance, tapered hologastric shield (*Ololaelaps* and *Oloopticus* have broader hologastric shields), highly reduced peritremes, small and edentate chelicerae, and hypertrichous dorsal shield. Selected references: Berlese (1892a, 1904c).

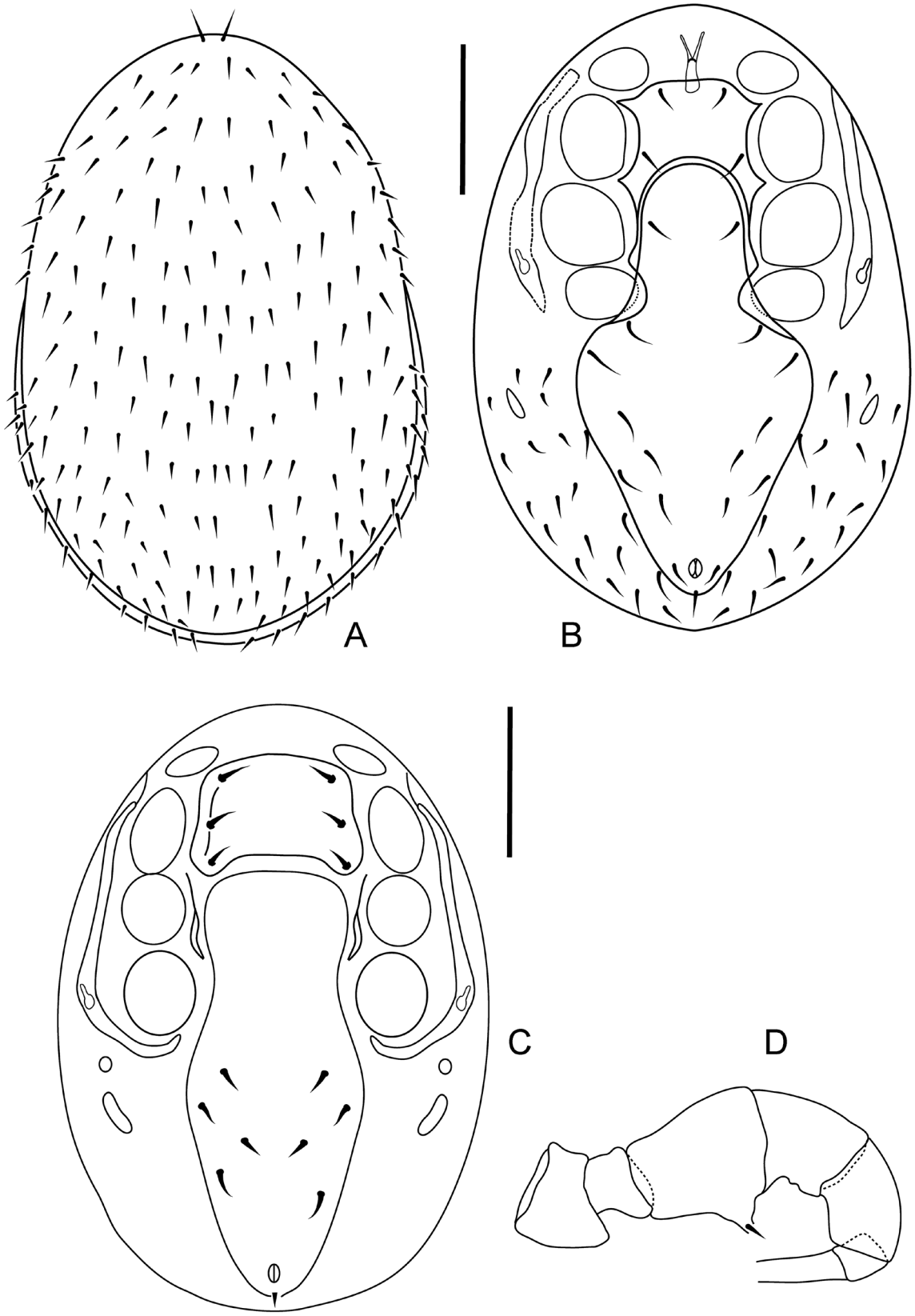


FIGURE 51. Female. *Neoberlesia* Berlese: A, dorsal idiosoma, and B, ventral idiosoma, both modified from Berlese, 1904c; C, ventral idiosoma, and D, part of leg IV, both modified from Berlese, 1892a. Scale bar = 200 μm for dorsum and venter; leg IV not in scale.

***Neohypoaspis* Delfinado *et al*.** (Fig. 52)

Idiosoma broadly 1000–1300 μm long. Dorsal shield broadly oval, but covering only a portion of idiosoma, leaving a wide band of soft cuticle posterolaterally; dorsum of idiosoma highly hypertrichous, including the shield, which bear more than 400 minute setae, and near anterior margin three or more pairs of stout setae, flattened and truncate or rounded apically, including at least *j*1 and *z*1; unsclerotised dorsolateral cuticle also hypertrichous, bearing 33–40 pairs of similarly stout, flattened setae tightly spaced along lateral and posterior margin of idiosoma, more widely spaced anterolaterally. Sternal shield strongly bilobed anteriorly, deeply concave posteriorly. Seta *st*4 on soft cuticle or appearing to be on endopodal plate. Epigynal shield drop-shaped; a large area of soft cuticle posteriad of epigynal shield semi-sclerotised and granulate, and distinct from the rest of unsclerotised opisthogastric cuticle (a band of similar semi-sclerotised, granulate cuticle borders the dorsal shield in an undescribed species). Anal shield broad, kidney-shaped (heart-shaped in the male); anus small, in anterior half of shield, and post-anal seta moderately longer than para-anal setae and inserted far behind anus, near cribrum; anal shield sometimes desclerotised posterior to anus. Metapodal plates enlarged, with a central granulate area. Peritrematal plate narrowly developed around peritreme and stigma, posteriorly abutting well-developed exopodal-parapodal plate posterolateral to coxa IV. Male with sternogenitiventral shield, not expanded laterally and moderately separated from anal shield.

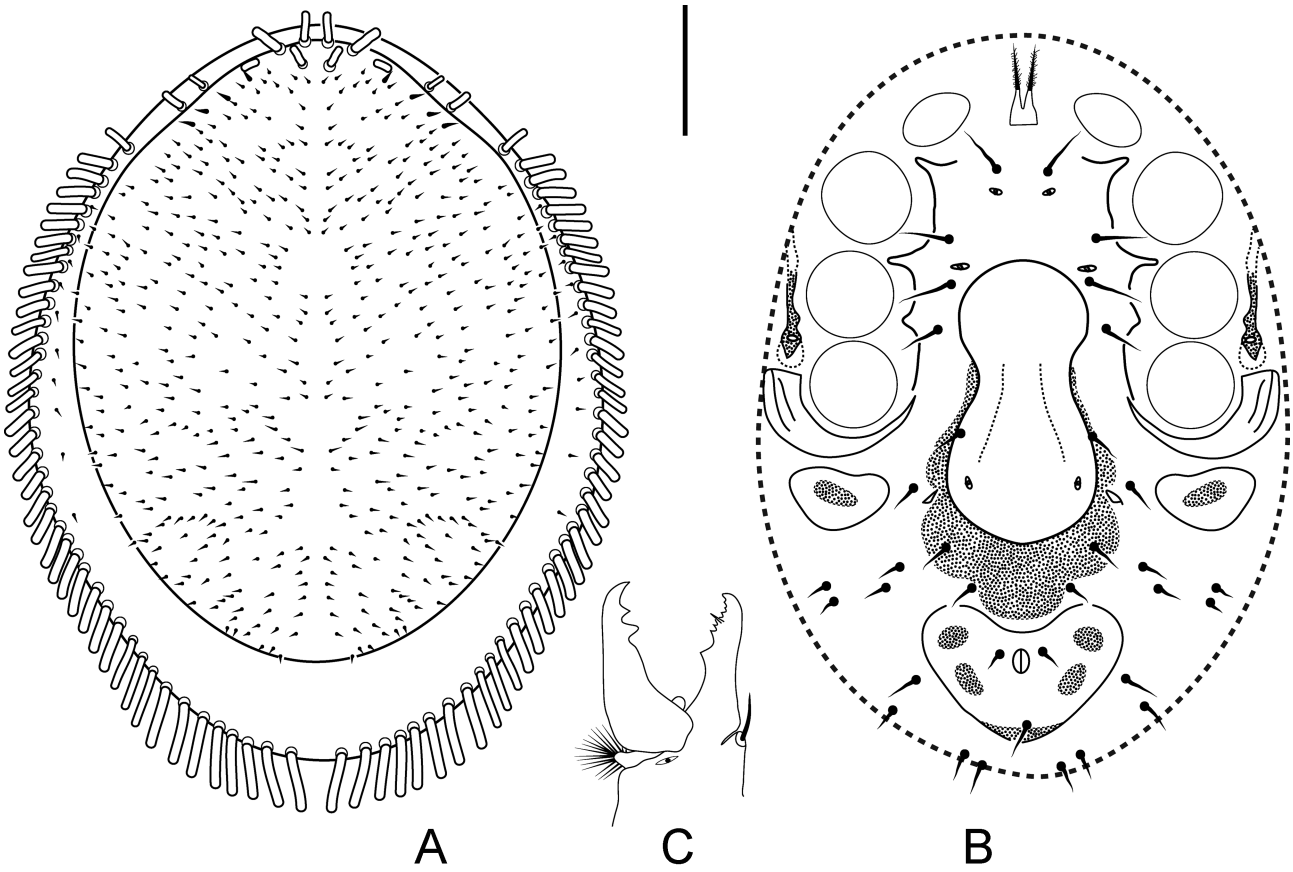


FIGURE 52. Female. *Neohypoaspis* Delfinado-Baker *et al*. (modified from Delfinado-Baker *et al*., 1983): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 μm for dorsum and venter; chelicera not in scale.

Cheliceral fixed digit with 6–8 teeth, most in apical third of digit. Epistome slightly convex, irregular, with a few small and large, coarse denticles. Deutosternum with 9–13 rows of 4–16 denticles per row, sometimes wider anteriorly, hence with more denticles; internal malae well-developed, projecting laterally and branching into 2–3 arms on each side in addition to median arms, all fimbriate.

Legs I–II slightly more robust than III–IV. Most leg setae similar to marginal setae of idiosoma, spatulate. Leg chaetotaxy normal except for genu IV with ten setae, including two ventrals; and tibia III with nine setae, including two *pl*.

This monotypic genus is easily distinguished from other genera by its numerous spatulate, blunt setae along

the idiosomal margin and on (robust) legs, dorsal shield with numerous tiny setae, deutosternum with extra rows of denticles, large metapodal plates, kidney-shaped anal shield, and peculiar semi-sclerotised granulate zone between epigynal and anal shields. It shares similarities with *Eumellitiphis* (see comparative note at the end of the diagnosis section of that genus). Selected reference: Delfinado-Baker *et al*. (1983).

***Nidilaelaps* Shaw** (Fig. 53)

Idiosoma 660–800 μm long. Dorsal shield suboval, covering all idiosoma dorsally, with 39 pairs of setae (including *Zx*2–3), and 1–3 (rarely four) median unpaired *Jx* setae near level of *J*4. Idiosomal setae moderately long. Presternal area weakly sclerotised, lineate. Sternal shield about as wide as long; anterior edge of shield desclerotised in one species (with *st*1 appearing off shield). Epigynal shield bottle-shaped, long, broadly abutting anal shield; bearing *st*5 and three additional pairs of setae (*Zv*1, *Jv*1–2) on its margins, or at least closely flanking shield (in *N. holdsworthi* Shaw, with the shield bearing *st*5 and rarely *Zv*1); posterior section of shield ornamented with 6–9 broad, transverse striae. Anal shield subtriangular to distinctly triangular; post-anal seta slightly longer than para-anal setae. Parapodal plate relatively thick in some species. Peritrematal shield relatively broad, sometimes fused to parapodal strip behind coxa IV. Soft lateral and opisthogastric cuticle with 5–8 pairs of setae representing *r*6 and several *R* setae (plus 4–5 pairs of *UR* in one species) in addition to *Jv-Zv* setae. Males with holoventral shield sometimes fused to peritrematal and exopodal plates.

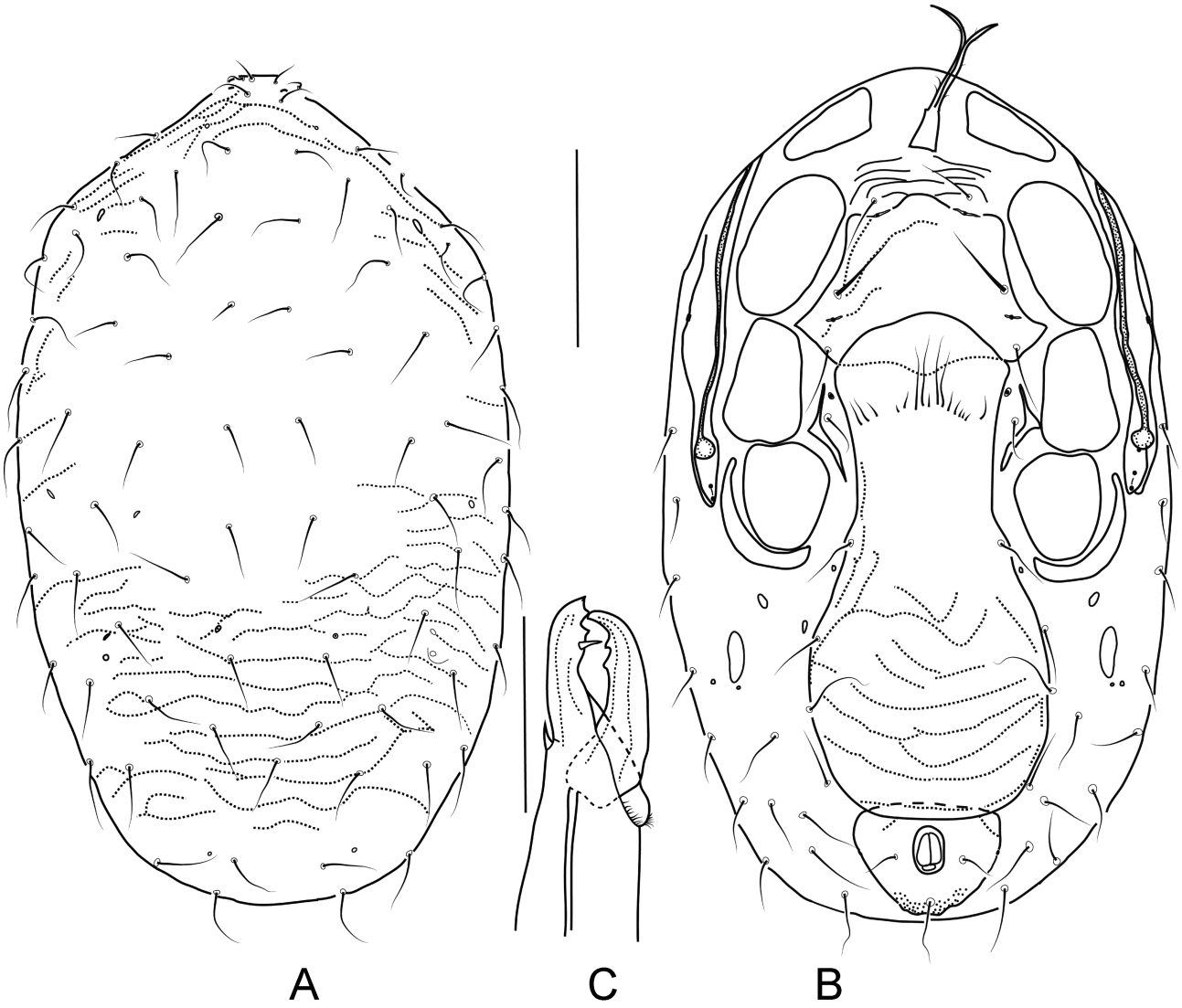


FIGURE 53. Female. *Nidilaelaps* Shaw (modified from Shaw, 2012): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 150 μm for dorsum and venter, 50 μm for chelicera.

Cheliceral fixed digit with two subapical teeth (including one near apex, associated with the apical hook), and 0–2 teeth proximal to pilus dentilis. Epistome relatively short, blunt, with margin smooth. Deutosternum groove relatively narrow, with rows of 5–14 denticles each. Internal malae sometimes with an additional pair of short fimbriate arms, laterally to the median projections.

Leg setae generally simple except a few ventral setae that may be thickened, notably on femur, genu and tibia II. Leg chaetotaxy normal.

This genus was recently erected to accommodate three species, including one (*N. annectans*, the type species) that had previously been placed either in *Pseudoparasitus* or *Gymnolaelaps*. *Nidilaelaps* can be distinguished from these genera by having weakly sclerotised presternal area, without well-defined platelets; smooth epistome; 2-tined palp tarsal claw; 1–3 *Jx* setae restricted to area near *J*4; much less developed parapodal plates, and epigynal shield with broad, transverse striae, bearing setae inserted on or near the shield margins (not far inwards as in *Pseudoparasitus*). See also the remarks in the diagnosis section of the related genus *Ulyxes*. Selected reference: Shaw (2012).

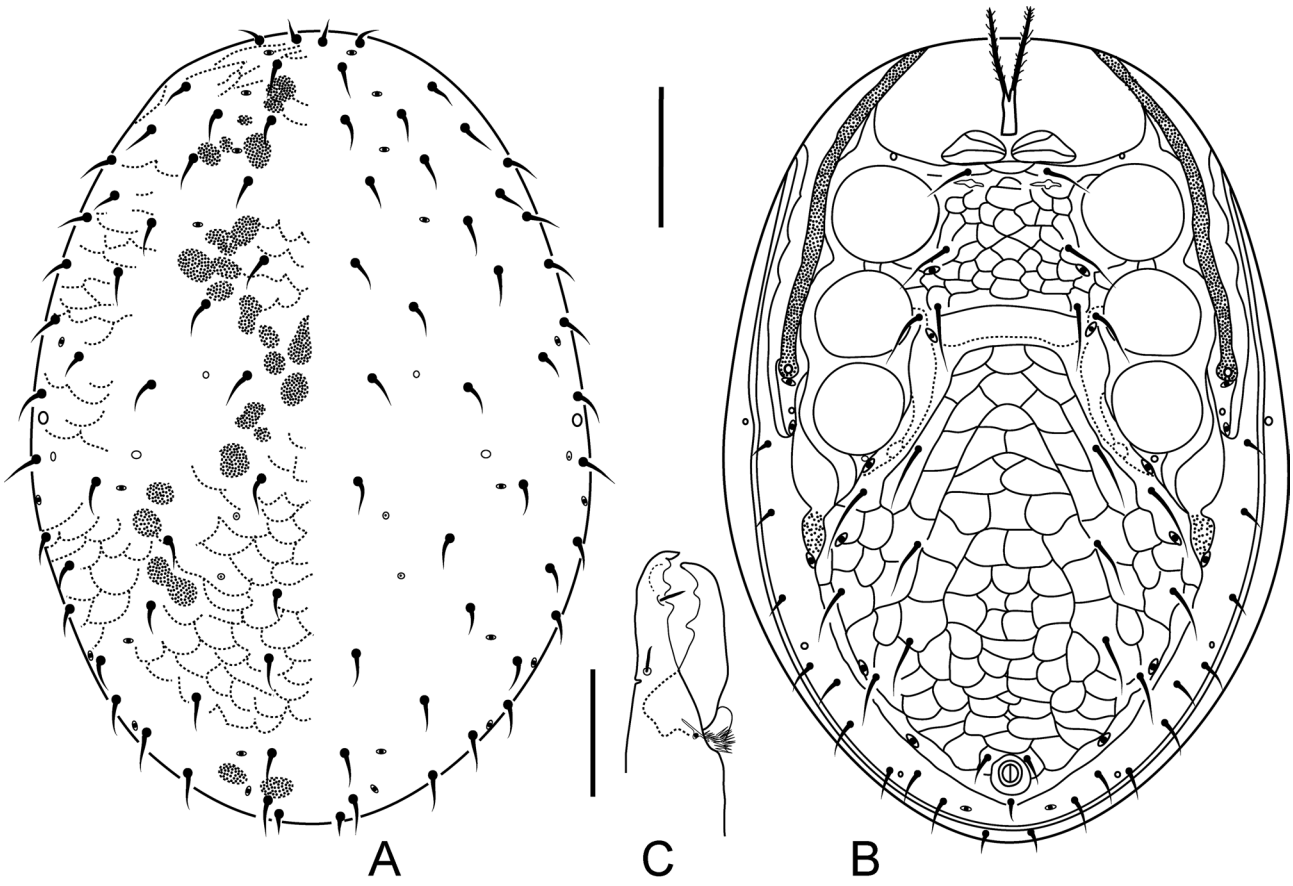


FIGURE 54. Female. *Ololaelaps* Berlese (modified from Beaulieu *et al*., 2019): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 150 µm for dorsum and venter, 50 µm for chelicera.

Ololaelaps **Berlese** (Fig. 54)

Idiosoma 500–1000 µm long. Dorsal shield suboval to broadly oval, covering all dorsum and often extending moderately onto venter of idiosoma; with 39 pairs of setae (or slightly fewer), including *Zx*2–3, and often with an unpaired *Jx* seta; setae short to mid-sized, subequal within a species. Paired presternal platelets present; sternal shield at least as long as wide; *st*4 on unsclerotised cuticle or on posterolateral edge of sternal shield. Endopodal plate strongly developed, often abutting sternal shield. Hologastric shield covering most of opisthogaster, bearing usually five pairs of opisthogastric setae (*Jv*1–3, *Zv*1–2), sometimes only three (*Jv*3 and *Zv*2 may be off shield) in addition to *st*5; *Jv*1–2 inserted medially, distantly from shield margin. Setae of ventral idiosoma usually mid-sized, circum-

anal setae short, post-anal seta often the shortest. Parapodal plate well-developed, subtriangular. Rarely, peritreme shortened, barely reaching coxa I. Peritrematal plate relatively broad, free or narrowly fused to hologastric shield and/or parapodal plate; metapodal plate free or fused to hologastric and/or parapodal shields. Unsclerotised lateral and opisthogastric cuticle with 5–10 pairs of setae. Males with holoventral shield fused to parapodal-exopodal, and/or peritrematal shield.

Cheliceral fixed digit usually with only 3–5 teeth. Epistome relatively short, subtriangular, with margin slightly to moderately denticulate. Deutosternum groove relatively narrow, with rows of fewer than ten denticles each. Internal malae with a pair of lateral arms in addition to main, median arms. Palp tarsal claw 3-tined, third tine short.

Leg setae generally slender, leg chaetotaxy normal. Males of some species have a few spine-shaped setae or non-setigerous tubercles on one or more segments of legs II–IV, which are absent in females.

Species of this genus are strongly sclerotised, in terms of shield thickness (indicated by the darkness) but also the extent of their shields, including a broad hologastric shield, which is the most distinctive feature of the genus, but other diagnostic features include strong parapodal plates, presternal platelets and 3-tined palp tarsal claw. Selected references: Bregetova & Koroleva (1964), Beaulieu *et al*. (2019).

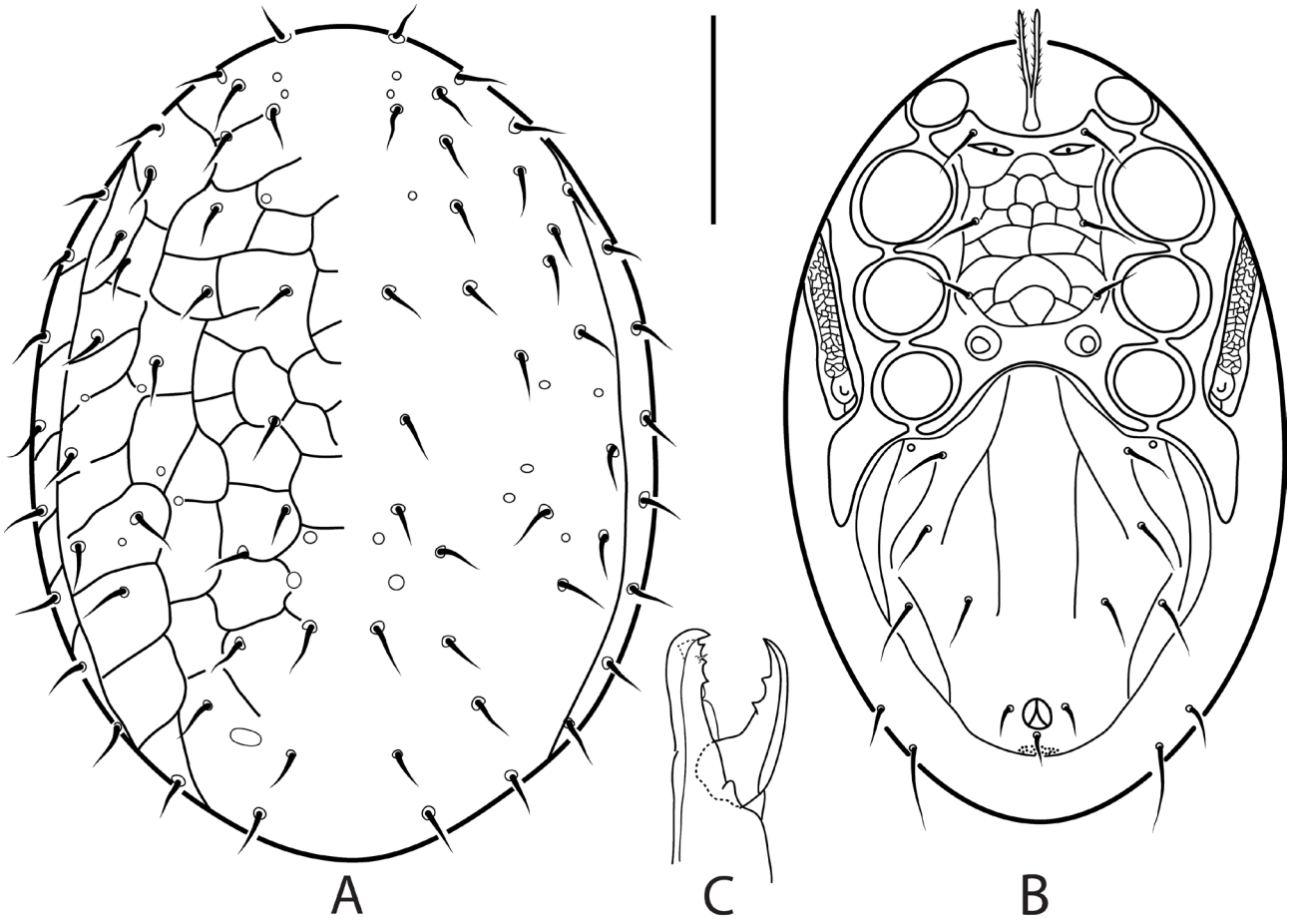


FIGURE 55. Female. *Oloopticus* Karg (modified from Karg & Schorlemmer, 2013): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 150 μm for dorsum and venter; chelicera not in scale.

Oloopticus **Karg** (Fig. 55)

Idiosoma 400–650 μm long. Dorsal shield strongly convex, suboval and parallel-sided to more broadly oval, often narrowly extending laterally onto venter, with 35–38 pairs of setae (exceptionally more), apparently including *Zx*2–3; and typically lacking *z*1 and often 1–3 other pairs of podonotal or opisthonotal setae. Idiosomal setae short to moderately long. Sternal shield long, occupying nearly all of intercoxal region, incorporating presternal and all endopodal elements; bearing *st*1–3 and a conspicuous oval or circular pit that probably represents the socket of

*st*4 (which is absent). Broad hologastric shield, bearing *st*5 (shifted laterally, behind coxa IV) and three pairs of opisthogastric setae (hypothetically *Jv*1–2, *Zv*2); shield abbreviated anteriorly, not reaching level of coxa III, narrowly overlapping sternal shield; this anterior regression typically gives the shield an overall subcircular or subtriangular shape. Circum-anal setae short, post-anal usually slightly shorter than para-anal setae. Exopodal-parapodal plate (posterolaterad of coxa IV) enlarged, sometimes long and acuminate, flanking epigynal shield; usually continuous with the rest of the relatively broad exopodal strip flanking coxae II–IV (other times only abutting it, at mid-level of coxa IV). Peritrematal shield fused anteriorly with dorsal shield, in some cases broadly fused, from as proximally as level of coxa II or III. Unsclerotised opisthogastric cuticle narrowly bordering shield posterolaterally, bearing only 2–3 pairs of setae (of *Jv* and *Zv* setae). Males with holoventral shield fused to exopodal strip.

Cheliceral fixed digit with 3–5 teeth. Epistome usually ending in three main prongs (the two lateral ones sometimes indistinct), usually also with (secondary, smaller) denticles along margin; prongs sometimes indistinct, in which case epistome appears truncate and irregularly denticulate. Deutosternal groove mostly broad, with rows of at least ten denticles each, one or two posteriormost rows narrow, with fewer denticles.

Legs poorly studied. Tarsus II with stout setae in at least some species.

The genus *Oloopticus* shares many key features with *Ololaelaps*, namely an expansive hologastric shield, strongly developed parapodals (abutting epigynal shield), and a broad dorsal shield typically extending ventrally. It differs from *Ololaelaps* by having only four pairs of setae on the epigynal shield (*Ololaelaps* usually have six pairs on shield, occasionally 4–5 pairs) in addition to circum-anal setae, *st*4 modified as pits, presternal platelets fused to sternal shield (discrete in *Ololaelaps*) and a mostly three-pronged epistome (more finely denticulate in *Ololaelaps*). The taxonomic affinities of *Oloopticus* are otherwise unclear. Selected references: Karg (1978, 2006), Karg & Schorlemmer (2013).

***Persicolaelaps* Kazemi & Beaulieu** (Fig. 56)

Idiosoma about 1000 µm long. Dorsal shield broadly oval, strongly convex, entirely covering idiosoma dorsally; with 39 pairs of setae (including *Zx*2–3), and 2–3 unpaired *Jx* setae; all idiosomal setae short, except sternal setae, long. Paired presternal platelets present; sternal shield broad, especially posteriorly, with concave margin; anterolateral arms (endopodal) fused to exopodal strip. Seta *st*4 absent. Epigynal shield massive, broadly overlapping sternal shield anteriorly and endopodals laterally, shaped as an axe-head, with posterior margin broadly rounded, bearing *st*5. Anal shield capturing setae *Jv*3 on its anterior margin (technically a ventrianal shield); circum-anal setae short, subequal. Endopodal plate strong. Exopodal strip well-developed, continuous, ending in a thick parapodal plate. Peritrematal plate relatively broad, extending to posterior edge of coxa IV. Unsclerotised cuticle bearing only five *Jv* and four *Zv* setae, without *r-R* setae.

Fixed cheliceral digit with 4–6 small teeth. Epistome a mid-sized triangle, slightly serrate. Deutosternum narrow, with rows of 2–6 denticles each. Internal malae with several thick, elongate tentacle-like projections.

Leg setae generally thick, with many spine-shaped setae, especially on tarsi II–IV and femur I. Chaetotaxy normal except for genu IV, bearing ten setae including two ventrals, and trochanter IV, with six setae, including a small *pd*.

This monotypic genus has features shared with *Laelaspisella* and some *Pogonolaelaps*, namely a broad dorsal shield, a massive epigynal shield covering all the area between coxae III–IV and overlapping a broad, concave sternal shield, thick exopodal-parapodal strip, lacking *st*4, and internal malae with long fimbriae. However, *Persicolaelaps* has a holotrichous, more convex dorsal shield (hypertrichous in *Laelaspisella* and *Pogonolaelaps*), broader peritrematal shields (although similar to some *Pogonolaelaps*), and internal malae with thicker threads. Selected reference: Kazemi & Beaulieu (2016).

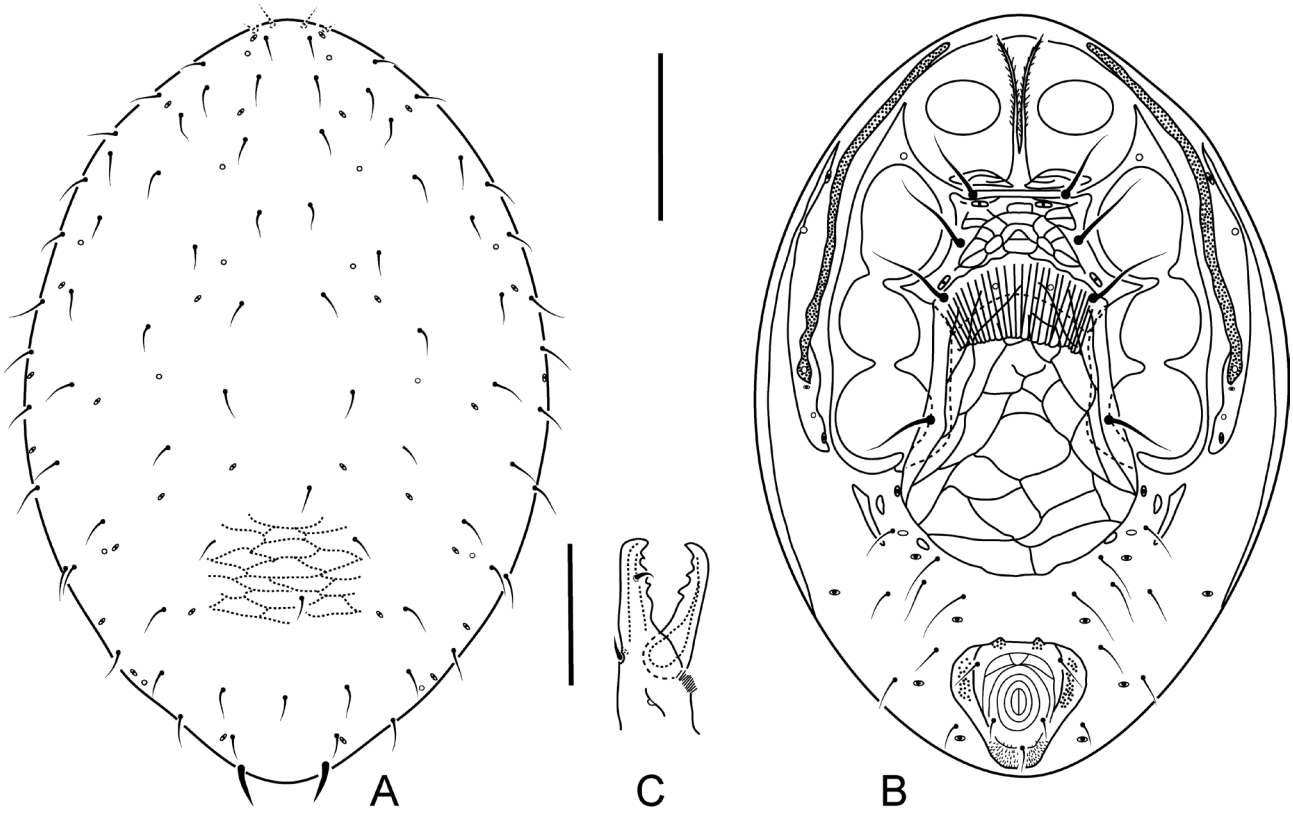


FIGURE 56. Female. *Persicolaelaps* Kazemi & Beaulieu (modified from Kazemi & Beaulieu, 2016): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 50 μm for chelicera.

***Pneumolaelaps* Berlese** (Fig. 57)

Idiosoma 500–800 μm long. Dorsal shield suboval or more often broadly oval or ovate/obovate, covering all or nearly all idiosoma dorsally; with basic complement of 39–40 pairs, including *Zx*2–3 and also often *Zx*1, typically also with: a few to many unpaired "*Jx*" setae in the posteromedian region, as many as 13–25 in some species (some of these setae inserted as far laterally as the *Z* series) as well as 1–4 irregular setae (rarely more) added on (either or both sides of) the shield margin near the *r* or *S* series. Some species with only 39 pairs and no extra setae, and rarely with only 38 pairs (lacking *Zx*2); setae generally short, subequal, sometimes distinctly longer (and spine-shaped) in anterior third or near lateral margins. Presternal region weakly sclerotised (and lineate-reticulate) or with a pair of discrete platelets, sometimes fused medially; sternal shield slightly to markedly wider than long (rarely slightly longer than wide), sometimes distinctly concave posteriorly. Seta *st*4 (and seemingly also poroid *iv*3) occasionally situated over endopodal plate. Epigynal shield relatively large, drop- or tongue-shaped, sometimes extending close to anal shield; bearing *st*5. Circum-anal setae short and subequal in length (rarely post-anal seta moderately longer). Peritreme relatively broad (sometimes as broad as base of tritosternum). Unsclerotised dorsolateral and opisthogastric cuticle slightly to strongly hypertrichous, usually with 25–55 pairs of setae (sometimes as few as 25 pairs, or over 100 pairs).

Cheliceral fixed digit with 2–4 teeth largely distal to pilus dentilis. Epistome subtriangular or rounded, with margin smooth. Deutosternum with six (rarely five or seven) rows of usually 2–6 denticles each (seldom 7–12) with typically 1–2 enlarged denticles in each row. Internal malae sometimes with well-developed lateral arms and strongly fimbriate. Palp tarsal claw usually 2-tined, occasionally 3-tined.

Legs sometimes with thickened or spine-shaped setae, notably on tarsi II and IV (ventral and/or lateral setae). Leg chaetotaxy normal except that genu IV has ten setae, including two ventrals. Pretarsus I sometimes with claws reduced.

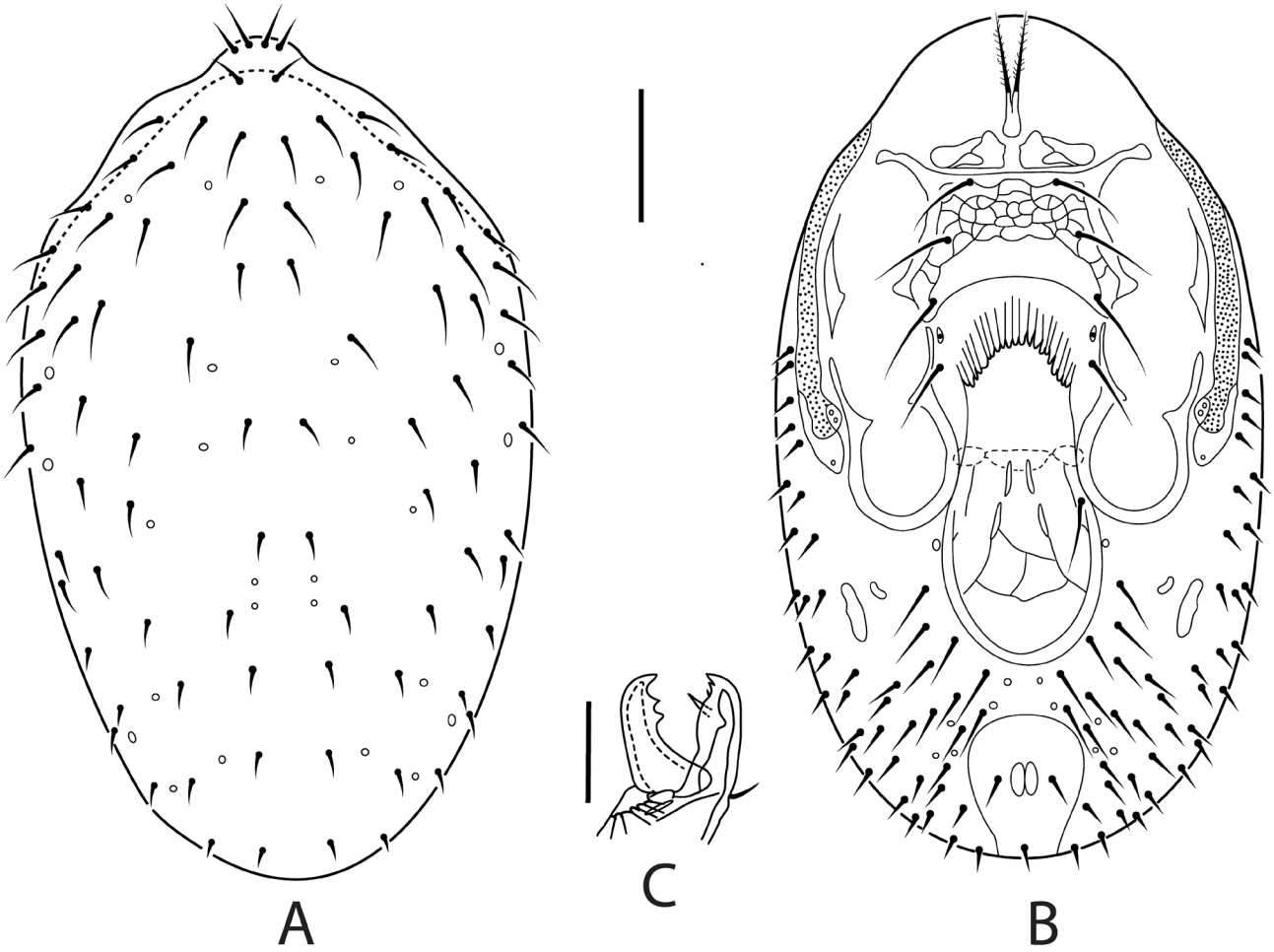


FIGURE 57. Female. *Pneumolaelaps* Berlese (modified from Evans & Till, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 μm for dorsum and venter, 25 μm for chelicera.

Broad peritremes, mild to marked hypertrichy on the dorsal shield (including *Zx*1) and especially on the opisthogaster, smooth epistome, deutosternum with few, enlarged denticles and genu IV with two ventral setae are indicative of *Pneumolaelaps*. Selected references: Evans & Till (1966), Hunter & Husband (1973), Fan *et al*. (2016).

***Pogonolaelaps* Nemati & Gwiazdowicz** (Fig. 58)

Idiosoma 600–800 μm long. Dorsal shield oval, completely covering idiosoma dorsally except in *P. termitophilus* with shield somewhat truncate, barely longer than wide and with soft cuticle exposed posteriorly; considerably hypertrichous, with a total of 30–40 extra setae (in addition to a fundamental set of 37 pairs) nearly all restricted to the opisthonotal area, mostly among the *J* and *Z* series, and representing possibly 6–12 pairs and about 7–15 unpaired median (*Jx*) setae; setae generally short, sometimes elongate posteriorly or marginally; setae with a small asymmetric bulge near base (distinct in at least some species), and posteromarginal setae barbed. Presternal area weakly sclerotised, lineate-reticulate; sternal shield broadened posteriorly, setae *st*3 more than twice as far apart as setae *st*1; anterior margin with a well-defined convex area medially, *st*1 inserted in this area (in *P. canestrinii* (Berlese), the convex area is flanked by a pair of incisions, somewhat giving the impression that *st*1 is on a separate platelet); posterior margin moderately to strongly concave; poroid *iv*3 borne on posterolateral corners. Seta *st*4 absent. Endopodal apparently narrowly fused to sternal shield. Epigynal shield large to massive, more or less drop-shaped, more or less abutting anal shield (except far from anal shield in *P. termitophilus*), bearing only *st*5 (*Zv*1

and *Jv*1 closely flanking shield in two species). Anal shield triangular; post-anal seta usually distinctly longer than para-anal setae. Parapodal plate strongly developed. Lateral and opisthogastric unsclerotised cuticle with 9–12 pairs of tylochorous setae (including 1–3 *r*-*R* setae), barbed, and elongate in at least two (out of three known) species. Males with either a broad sternogenitiventral shield abutting an anal shield, or with the sternogenitiventral shield posteriorly drop-shaped and well removed from the anal shield.

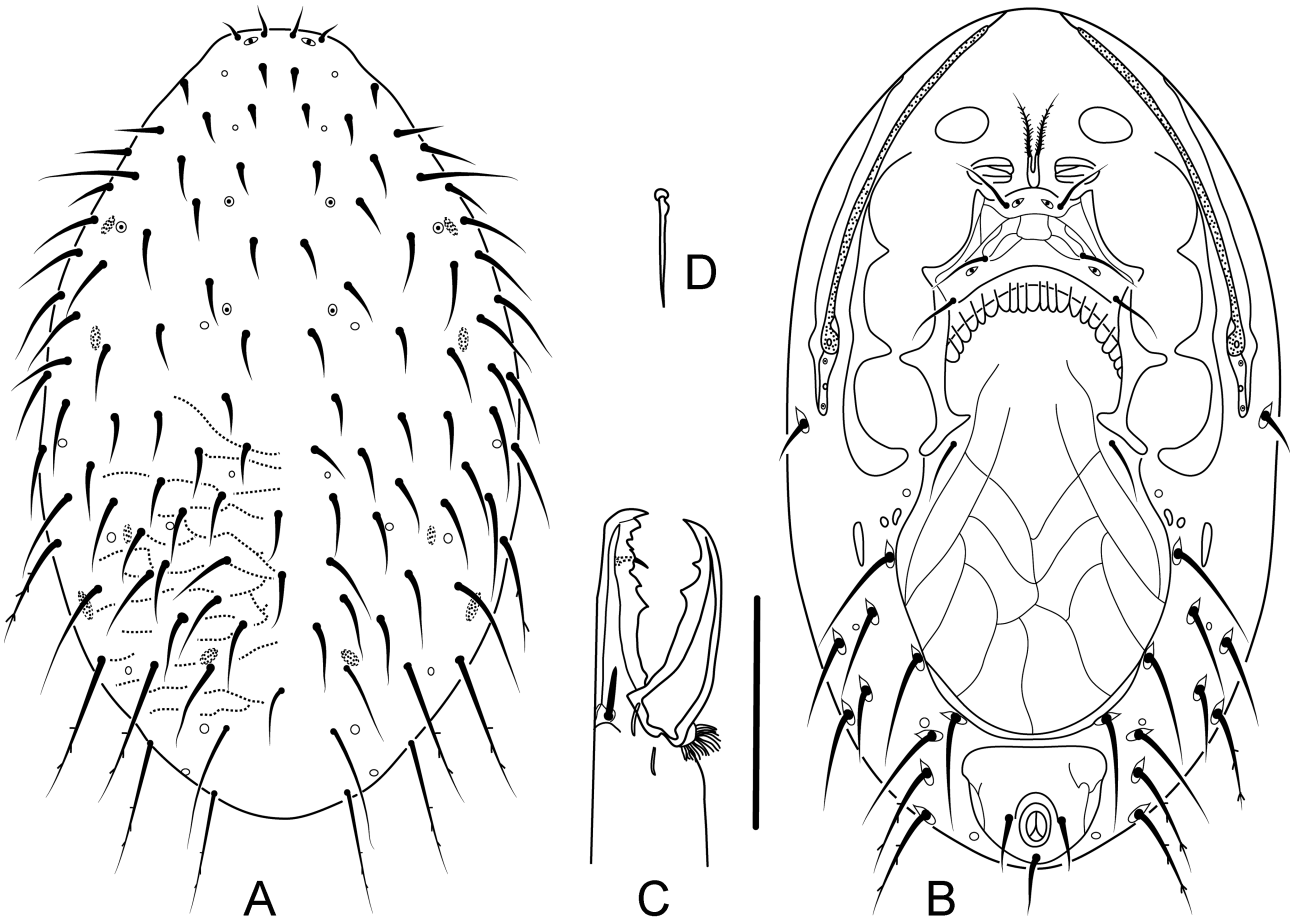


FIGURE 58. Female. *Pogonolaelaps* Nemati & Gwiazdowicz (modified from Nemati & Gwiazdowicz, 2016): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera; D, detail of idiosomal seta. Scale bars = 200 μm, 50 μm for chelicera; enlarged idiosomal seta not in scale.

Cheliceral fixed digit with 4–7 teeth of variable size. Epistome triangular, with margin smooth. Deutosternum with rows of mostly 6–11 denticles each. Internal malae with both median (main) pair and lateral pair of projections with long, dense fimbriae. Palp tarsal claw 3-tined.

Leg setae simple. Leg chaetotaxy normal, except that genu IV has ten setae, including two ventrals.

See notes at the end of the diagnosis of *Laelaspisella*, a morphologically similar genus. Selected references: Nemati & Gwiazdowicz (2016b), Joharchi *et al*. (2020b).

***Promacrolaelaps* Costa** (Fig. 59)

Idiosoma 1100–1300 μm long. Dorsal shield oval, covering all or nearly all idiosoma dorsally, with 30–31 pairs of setae, *z*3 absent (and sometimes also *z*1 and *z*6), without *Zx* setae; *z*4, *s*4–5 and most *Z* setae inserted more laterally than usual; most setae long, marginal ones generally longer, *Z*4 very long (and may appear wavy, as *S*5, *Z*5). Unsclerotised anterolateral cuticle with 3–5 setae otherwise normally on shield, including at least *r*2–3; unsclerotised posterolateral and opisthogastric cuticle with 7–11 *R*-*UR* setae in addition to *Jv*-*Zv* setae; *Jv*5 very long (and wavy). Presternal area weakly sclerotised, lineate. Sternal shield moderately wider than long, more or

less eroded in posterolateral corners, densely reticulate. Epigynal shield drop-shaped, reticulate, including 9–11 cells posterior to the V-inverted ridge; bearing *st*5. Anal shield obovate; post-anal seta slightly longer than para-anal setae. Peritrematal plate narrowly or minimally developed laterally, with short, narrow extension posterior to stigma, free anteriorly.

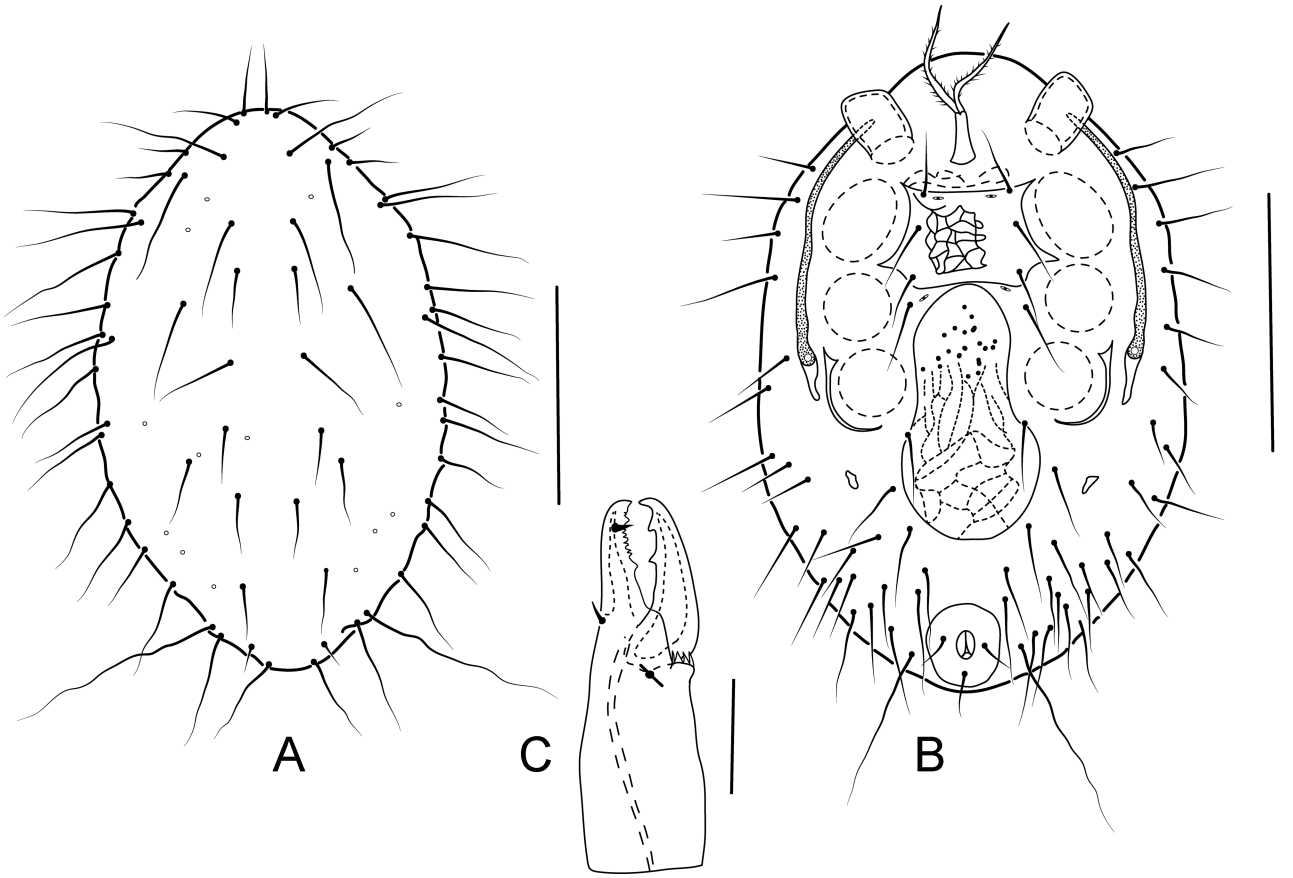


FIGURE 59. Female. *Promacrolaelaps* Costa (modified from Costa, 1971): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 500 µm for dorsum and venter, 50 µm for chelicera.

Cheliceral fixed digit with a subapical tooth, followed by a series of about six mid-sized teeth flanked by two larger teeth (one basally and the other aligned with pilus dentilis). Epistome with a somewhat tongue-shaped projection, with scattered denticles, flanked by baso-lateral margins more densely denticulate. Deutosternum with 6–7 rows of 10–20 denticles each. Internal malae with fimbriate arms laterad of main, median arms.

Long dorsal macrosetae on femora I–II (*pd*1) and III–IV (*ad*1), genua III–IV (mostly *ad1*) and tarsus IV (mostly *pd*2). Leg chaetotaxy normal except for genu IV having ten setae, including two ventrals.

Promacrolaelaps shares many features of *Hypoaspis* and other genera of scarab associates (see note for *Acantholaelaps*) but can be distinguished from them mainly by the wide (wide also in *Lucanaspis*), densely reticulate sternal shield (also densely reticulate in *Coleolaelaps*, *Dynastaspis* and *Mumulaelaps*, but less so in other genera), epigynal shield distinctly drop-shaped, more bulging posteriorly, and genu IV with two ventral setae. Selected references: Costa (1971), Joharchi *et al*. (2013).

Pseudoparasitus **Oudemans** (Fig. 60)

Idiosoma 500–1000 µm. Dorsal shield ranging from suboval and parallel-sided (in middle third) to broadly oval, covering entirely dorsum of idiosoma and sometimes extending narrowly onto venter; usually with 39 pairs of setae, sometimes 38 (usually due to absence of *z*3, or of *r*4, *S*1) including *Zx*2–3 (rarely 40 pairs, including *Zx*1); rarely fewer setae, with *Zx*2–3 or other setae absent; often 1–3 *Jx*, mostly near area between *J*2 setae; setae relatively short

and subequal, exceptionally some (*Z*5, *S*5) or all setae long. Ventral setae of similar length, sometimes moderately longer. Discrete presternal platelets present (may be partially fused medially; fused to sternal shield in *P. hajiqanbari*); sternal shield usually longer than wide. Epigynal shield bottle-shaped, broad, expanded laterally at least to mid-level of acetabulum IV, sometimes as far as to its lateral edge; posteriorly truncate, broadly abutting anal shield; bearing *st*5, as well as three pairs of opisthogastric (*Jv*1–2, *Zv*1) setae on shield (rarely four, including *Zv*2), including 2–3 (*Jv*1, nearly always *Jv*2, and sometimes also *Zv*1) that are inserted medially, distant from shield margin. Anal shield triangular, broad, sometimes nearly as much as epigynal shield; anus often located in posterior half of shield; post-anal seta about as long or slightly shorter than para-anal setae. Parapodal platelet strongly developed, more or less subtriangular, typically with the enlarged, central portion window-like, appearing more lightly sclerotised compared to anterior and paraxial edges; sometimes only moderately developed (rarely narrowly developed). Peritreme usually long, sometimes slightly shorter (not reaching coxa I); peritrematal shield exceptionally extending beyond coxa IV in *P. hajiqanbari*. Unsclerotised cuticle with 0–6 pairs of *r-R* setae in addition to *Jv-Zv* setae not captured by the epigynal shield. At least some males with holoventral shield fused to parapodal-exopodal plate.

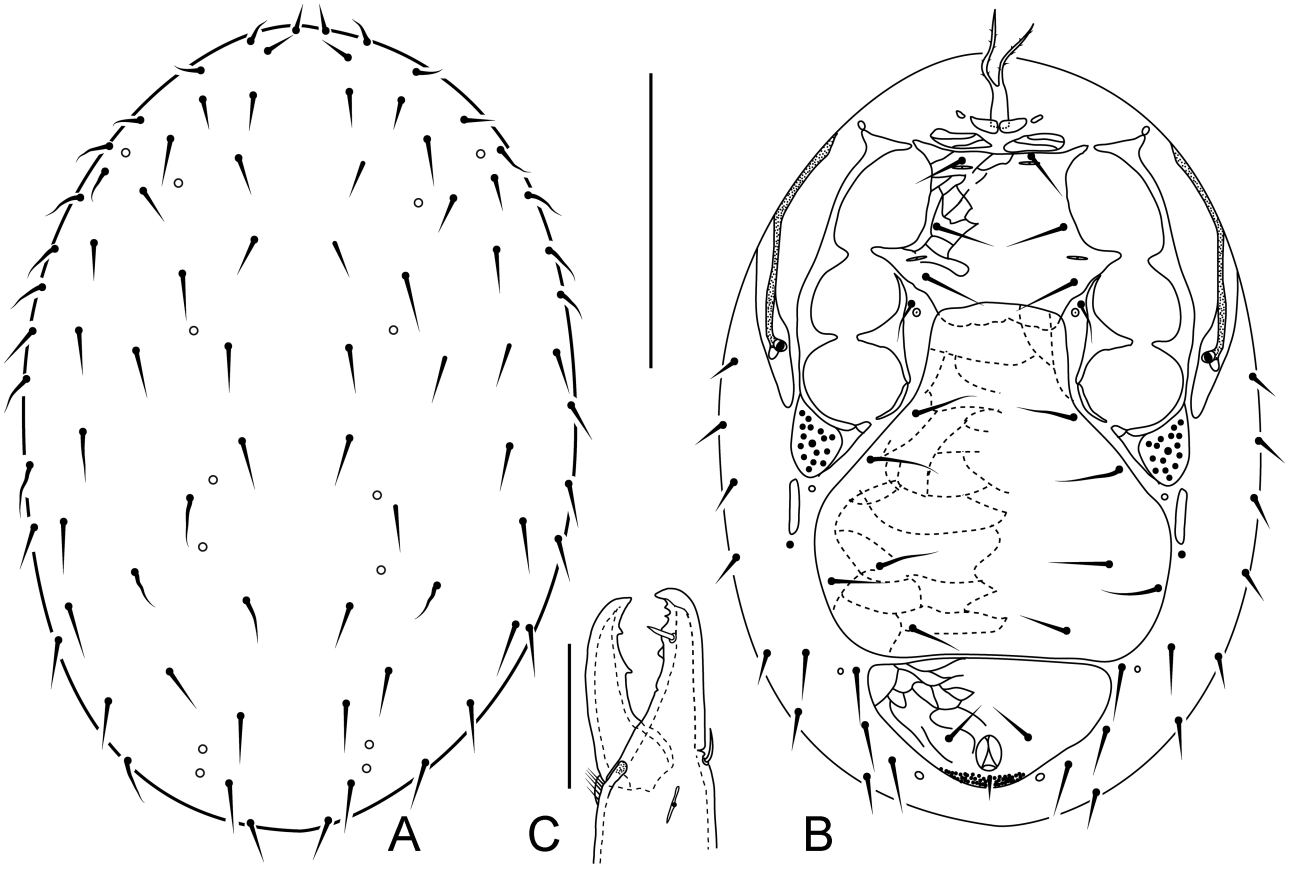


FIGURE 60. Female. *Pseudoparasitus* Oudemans (modified from Evans & Till, 1966): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 100 μm for dorsum and venter, 50 μm for chelicera.

Cheliceral fixed digit with 2–5 teeth, occasionally with a serrated row of smaller teeth mostly distal to pilus dentilis. Epistome rounded or subtriangular, with margin densely or weakly denticulate (rarely smooth). Deutosternum with six rows of usually 3–7 denticles each, occasionally 1–3 (exceptionally with four rows in *P. ennsi* Hunter, and eight rows of 5–11 denticles in *P. hajiqanbari*). Internal male sometimes with 1–2 lateral fimbriate arms in addition to median arms. Palp tarsal claw usually 3-tined, with third, proximal tine small; occasionally 2-tined.

Leg setae generally simple, some stouter, notably *av* of femur II (which may be spur-shaped) and ventral setae of tarsi II–IV, especially tarsus II (exceptionally *P. thatcheri* Hunter & Moser has macrosetae on genua, tibiae and tarsi III–IV). Leg chaetotaxy normal.

Pseudoparasitus is fundamentally similar to *Gymnolaelaps*—having a large bottle-shaped epigynal shield, presternal platelets, strong parapodals and palp tarsal claw usually 3-tined—but it differs mainly by its epigynal

shield having 2–3 pairs of setae inserted far from its margin. The shield also tends to be broader than in *Gymnolaelaps* species, an aspect in part correlated with the setae being inserted more mesally on the shield. Selected references: Hunter (1966a), Joharchi *et al*. (2011, 2019), Kazemi (2014).

***Raymentia* Womersley** (Fig. 61)

Idiosoma 900–1300 μm long. Dorsal shield tapering in posterior half or two-thirds, with posterior margin truncate or narrowly rounded, densely reticulate; with 35–36 pairs of setae (lacking *z*6 and putatively *r*4), including *Zx*3 in one species; setae generally short, longer in podonotal region or in anteriormost area. Sternal shield deeply and irregularly eroded posteromedially (occasionally so eroded that *st*3 is inserted on soft or weakly sclerotised cuticle). Epigynal shield narrow tongue-shaped and nude (*st*5 off shield), or drop-shaped and moderately broad posteriorly, bearing *st*5. Anal shield subtriangular to elongate, drop-shaped; post-anal setae slightly shorter than para-anal setae. Unsclerotised lateral and opisthogastric cuticle slightly hypertrichous, with 25–28 pairs of short to mid-sized setae. Stigma relatively large, peritreme relatively short, barely reaching level of coxa I or only mid-level of coxa II; peritrematal plate free anteriorly.

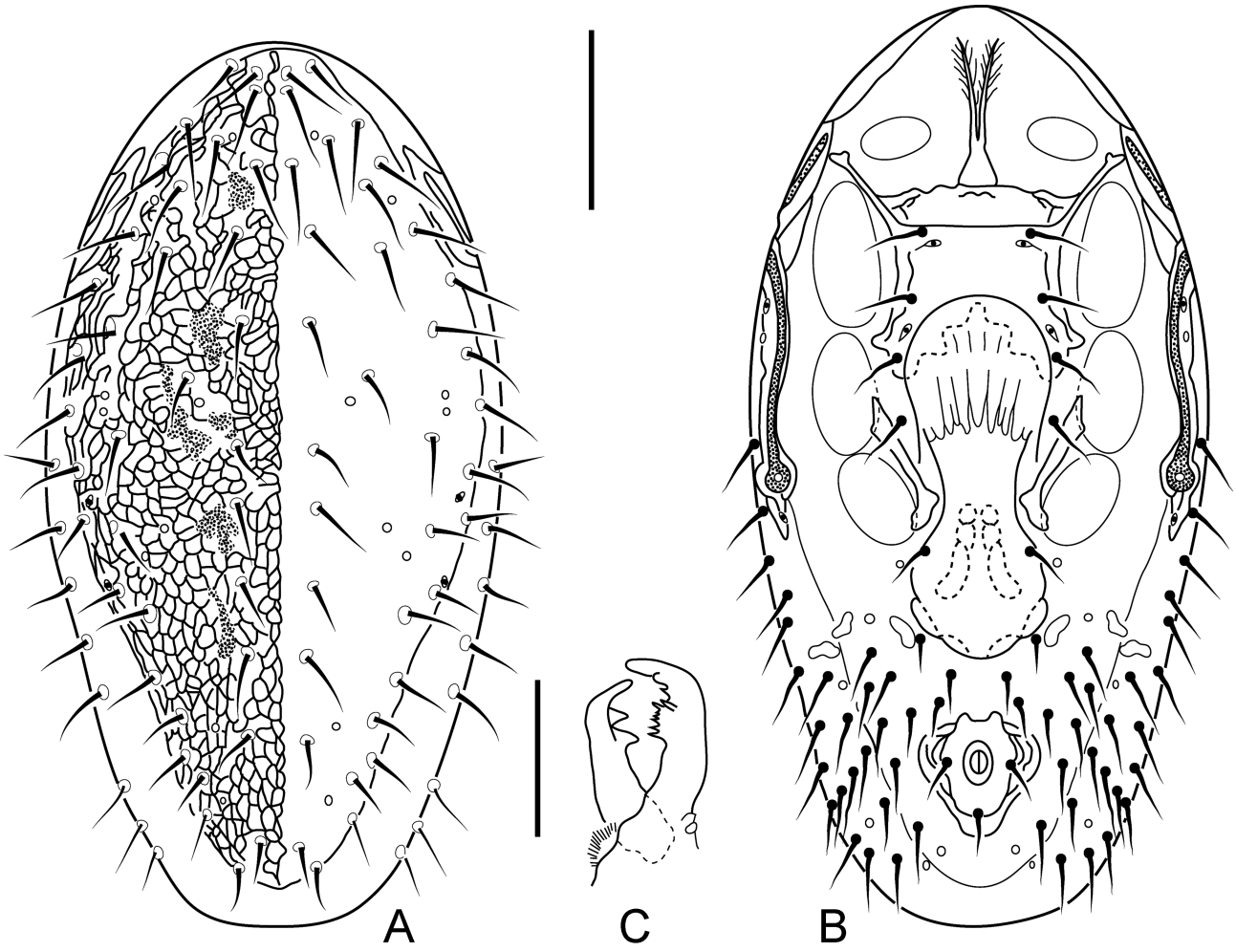


FIGURE 61. Female. *Raymentia* Womersley (modified from Walter *et al*., 2002): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

Cheliceral digits large, each with a very strong terminal hook; movable digit with two large adjacent teeth, directly opposed to a raised, multidenticulate (molar-like) crown on the fixed digit. Epistome with margin smooth.

Deutosternal groove broad, with 7–8 rows of 20 or more denticles each. Internal malae with two pairs of well-developed arms with short fimbriae, longer than corniculi.

Legs with simple setae; with several additional setae relatively to normal: femur I with 15 setae (including six ventrals), genu III with ten setae (two *pl*), genu IV with 11 setae (two *pl* and two ventrals) and tibia III with nine setae (two *pl*).

Raymentia can be identified by its highly distinctive chelicerae, narrow, tapering dorsal shields, deeply eroded sternal shield and augmented leg chaetotaxy. Selected reference: Walter *et al*. (2002).

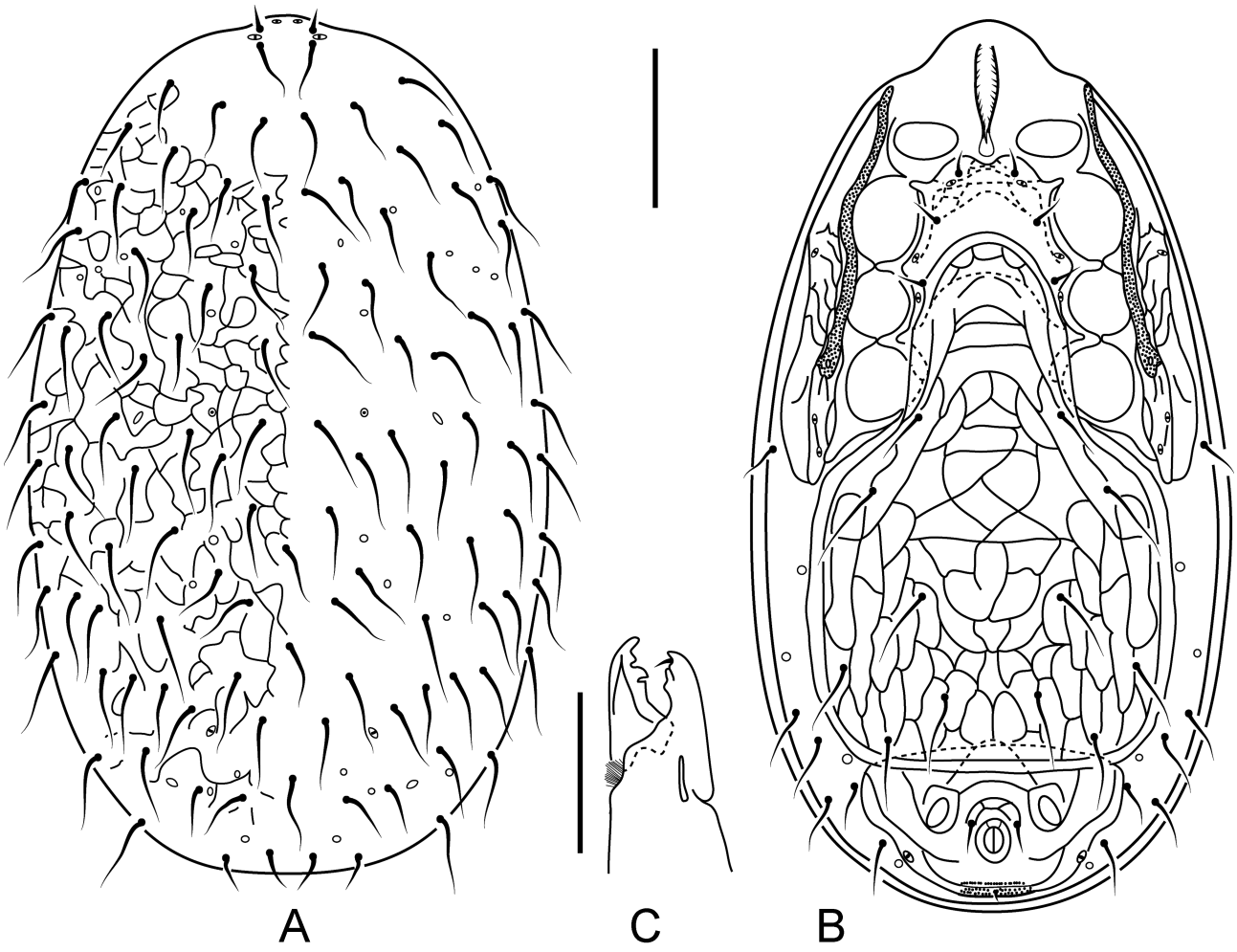


FIGURE 62. Female. *Reticulolaelaps* Costa (modified from Nemati *et al*., 2013): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 µm for dorsum and venter, 20 µm for chelicera.

Reticulolaelaps **Costa** (Fig. 62)

Idiosoma 400–700 µm long. Dorsal shield strongly convex and sclerotised, suboval to broadly oval, densely reticulate, completely covering dorsum of idiosoma; hypertrichous, usually with 10–17 extra pairs of setae, including about 3–4 in podonotal and 7–14 in opisthonotal region (possibly including several *R* setae captured by shield), and six or more unpaired median setae (*Jx*) setae in addition to a basic complement of 37 pairs (hypertrichy limited to *Jx* setae in *R*. *lativentris* Karg); setae of moderate lengths, subequal and slender, or modified as thickened, falcate or curly and barbed. Setae of idiosomal venter simple, of similar length to dorsal shield setae. Laciniae fused for their proximal half in at least some species. Ventral shields massive, densely reticulate and covering most idiosomal venter. Sternal shield strongly concave and broadened posteriorly (and setae *st*3 far apart), broadly abutting or fused to posterior endopodal element; anterior margin often bilobed (discrete presternal platelets in *R*. *lativentris*); poroid *iv*3 on posterolateral corners of shield; seta *st*4 absent. Epigynal shield massive, somewhat bottle-shaped, laterally

expanding beyond lateral edges of acetabula IV, broadly abutting or overlapping anal shield, bearing *st*5 and usually also five pairs of opisthogastric setae (*Jv*1–3, *Zv*1–2) (shield posteriorly rounded and with only *Jv*1 and *Zv*1 in *R. elsae* Joharchi *et al*.). Anal shield very broad, bowl-shaped (suboval in *R. elsae*); post-anal seta subequal to para-anal setae. Parapodal plate moderately produced (thin in *R. elsae*), triangular, pointed posterolaterally, more or less abutting epigynal and peritrematal shields. Peritrematal shield broad, usually lineate-reticulate and extending well beyond coxa IV (only to coxa IV in *R. elsae*). Unsclerotised opisthogastric cuticle bearing remaining *Jv-Zv* setae, and *r*6 isolated anteriorly. Known male with broad sternogenitiventral abutting anal shield.

Cheliceral digits small; fixed digit with 2–3 teeth; movable digit with 2–4 teeth typically separated by deep notches and including one large retrorse tooth aligned with pilus dentilis. Epistome elongate, more or less subtriangular and rounded apically, with margin smooth and lineate ornamentation in basal half. Deutosternal groove narrow, with only four rows of 2–5 denticles each, restricted to distal half of deutosternum (basal portion nude). Corniculi poorly sclerotised. Internal malae complex, including horn-shaped outer lobes. Palp trochanter with a large paraxial membranous lobe, which broadly covers apical portion of hypostome, including corniculi.

Leg segments lineate-reticulate. Most leg setae simple, various setae thickened in some species. Leg chaetotaxy normal except genu III with only eight setae (only one ventral, *pv* lost) and genu IV with ten setae (including two ventrals).

Reticulolaelaps is a highly distinctive genus, due at least to its dorsal hypertrichy, its expansive, posteriorly quadrate epigynal shield bearing six pairs of setae, a large bowl-shaped anal shield, the absence of *st*4, hypertrophied peritrematal shields, a palp trochanter with a large paraxial lobe and a narrow deutosternum with only four denticulate rows. Selected references: Nemati *et al*. (2013), Joharchi & Babaeian (2015), Moraza (2019).

Scissuralaelaps **Womersley** (Fig. 63)

Idiosoma 700–1500 μm long. Dorsal shield suboval, usually relatively broad, sometimes small, with a narrow strip to extensive area of unsclerotised cuticle exposed posterolaterally; ranging from slightly hypotrichous with 32–35 pairs of setae to very hypertrichous, with 60–125 pairs of setae. Idiosomal setae usually uniformly minute or very short; a few mid-sized setae on shield margin and venter of *S. innotensis* Halliday, and most setae mid-sized or long in *S. queenslandica* Womersley. Presternal area usually weakly sclerotised (apparently occasionally undifferentiated); sternal shield completely or almost completely divided longitudinally in two halves (sometimes narrowly joined anteriorly), each bearing *st*1–3 (each half fused to posterior endopodal element in *S. joliveti* Fain). Epigynal shield drop-shaped, with a narrow neck between coxae IV, or tongue-shaped and often very narrow (narrowest shield width about half to a quarter of the distance between coxae IV); bearing *st*5 on lateral margins. Anal shield subtriangular to distinctly triangular, and apparently desclerotised in area directly surrounding anus in some species; post-anal seta usually subequal to or shorter than para-anal setae. Parapodal platelet moderately well-developed in some species. Peritreme usually long, occasionally short and reaching about mid-level of coxa II; peritrematal plate free anteriorly or fused to dorsal shield, and sometimes fused to exopodal plate near coxae III–IV or entirely fused to exopodal strip. Unsclerotised dorsolateral and opisthogastric cuticle sometimes moderately hypertrichous, with 32–35 pairs of *R-UR* setae in addition to *Jv-Zv* setae; sometimes hypotrichous (*e.g*. only five *Jv-Zv* setae and no *R* setae). Male with (*i*) holoventral shield (narrow in the opisthogastric region), with (*ii*) sternogenital shield tapered posteriorly, or with (*iii*) sternogenitiventral shield, truncate posteriorly and extending slightly into the opisthogastric region, capturing *Jv*1 and *Zv*1; the male anal (or small ventrianal) shield may be expanded anteriorly, in some cases capturing a pair of opisthogastric setae. The males of some species with posteriorly expanded peritrematal shields and enlarged metapodal plates.

Fixed digit typically with 2–3 subapical teeth, followed by a serrated row of 4–6 small teeth flanked by two mid-sized teeth; sometimes without such serrated row. Epistome broadly convex or variously (sub)triangular, short or acuminate, with margin smooth, or more denticulate, at least laterally. Deutosternum with 5–6 rows of usually 4–15 denticles each (occasionally more, 20–25), groove typically broadest anteriorly and with more denticles, and tapering posteriorly. Setae *h*1–3 and *pc* usually short or very short, *h*3 subequal or shorter than *h*2 and *pc*, *h*1 often longest.

Leg setae short, some setae may be thickened; femur II of male often with a strong ventral spur-shaped seta (*pv*1). Coxae with distinctive non-setigerous spurs in some species. Chaetotaxy with many reductions and a few

additions: femur I with 12 setae (only two *pv*), genu I usually with 12 setae (only two ventrals, *av*2 lost), genu III usually with ten setae (two *pl*) and genu IV usually with 11 setae (two ventrals and two *pl*), tibia I with 12 setae (two ventrals, *av*2 lost), tibia III often with nine setae (two *pl*). Pretarsus I lacking claws in one species.

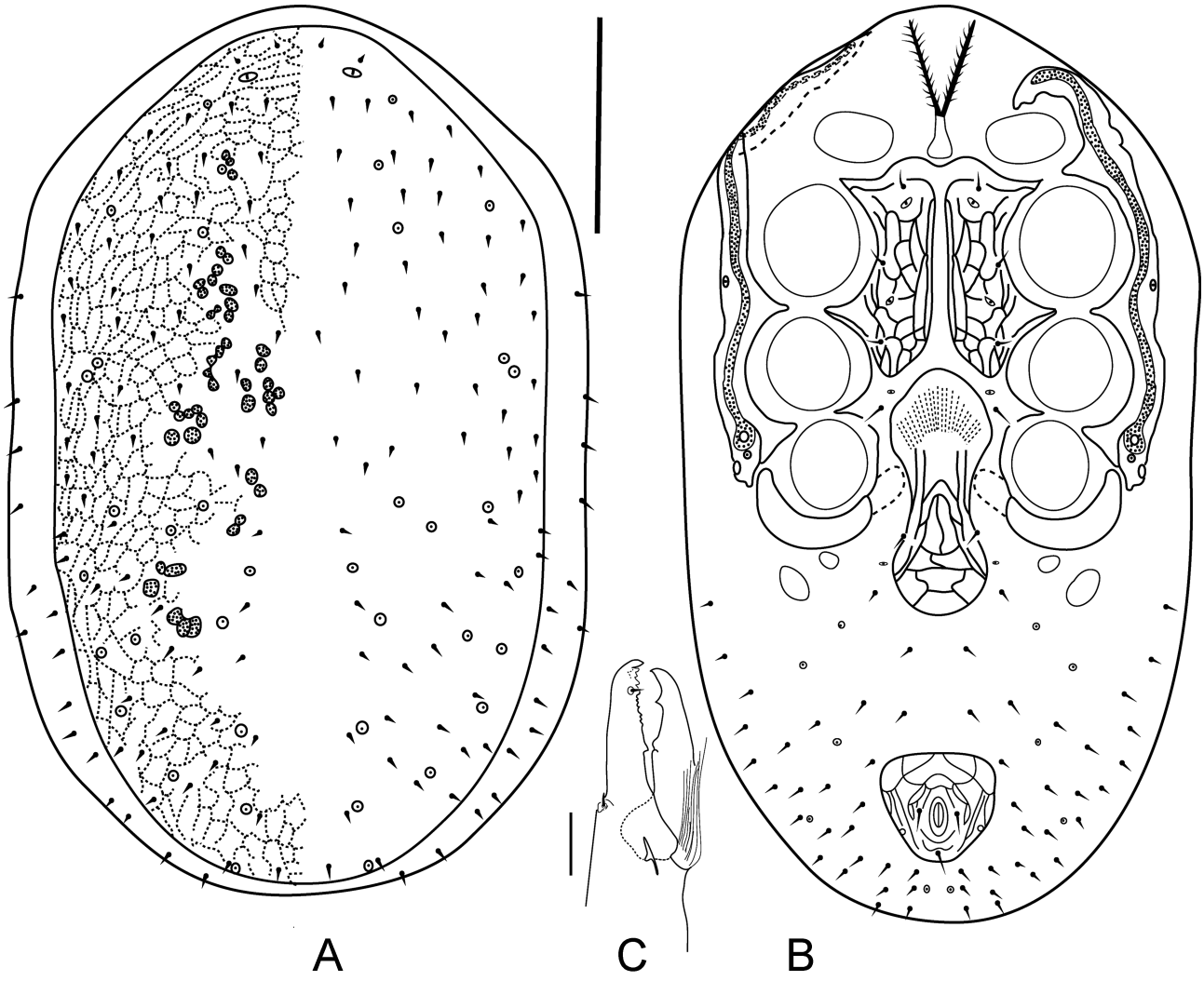


FIGURE 63. Female. *Scissuralaelaps* Womersley (modified from Seeman & Alberti, 2015): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 300 µm for dorsum and venter, 20 µm for chelicera.

The longitudinally split sternal shield is a key feature for *Scissuralaelaps* and compensates for the complex morphological variation between species. *Iphiolaelaps* has a similarly split sternal shield, but also has greatly reduced leg chaetotaxy and very short peritremes, two traits otherwise shared with some other myriapod associates (*Conolaelaps*, *Jacobsonia*, *Narceolaelaps*). Other diagnostic features of *Scissuralaelaps* include the typically very short idiosomal setae, a narrow epigynal shield (at least between coxae IV), and the modified leg chaetotaxy, including both hypotrichous (leg I) and hypertrichous segments (genua II–IV, tibia III). Some species of *Myrmozercon* also have both hypotrichous and leg segments, but have several distinctive attributes, including typically a large epigynal shield and reduced palp chaetotaxy. In the key, *Scissuralaelaps* could be misidentified as *Julolaelaps*, but the latter have entire sternal shields, usually shorter peritremes and a more reduced leg chaetotaxy (*e.g.* tibia II usually with fewer than ten setae) and genua III–IV never with as many as ten and 11 setae, respectively, in contrast with most *Scissuralaelaps*. Selected references: Halliday (1993), Seeman & Alberti (2015).

***Scolopendracarus* Evans** (Fig. 64)

Idiosoma 400–500 µm long. Dorsal shield relatively broad, truncate posteriorly (although with very little unsclerotised cuticle exposed dorsally); with 24 pairs of very short setae, lacking 13 pairs of setae (from all series, especially *J*, *S* and *r* series); most setae stout, bulbous, except *j*1 and setae near posterior margin simple. Tritosternum with laciniae regressed, very short, sometimes fused together. Sternal region apparently without shield, transversely striate (although the region appears distinct from unsclerotised, plicate cuticle elsewhere); seta *st*1 inserted anterior to striate area, setae *st*2–4 clustered behind transversely striate area. Epigynal shield drop-shaped, short, extending only slightly beyond coxa IV; bearing *st*5 not far from posterior margin. Anal shield large, subcircular, about as long as wide, and projecting beyond posterior margin of idiosoma; post-anal setae apparently very short, shorter than para-anal setae. Peritreme very short, barely reaching coxa III; peritrematal plate minimally developed around peritreme, except posteriorly apparently fused to exopodal plate besides coxa IV. Unsclerotised dorsolateral cuticle with a single pair of setae near posterolateral corners of shield; opisthogaster hypotrichous, with only 4–5 pairs of short setae.

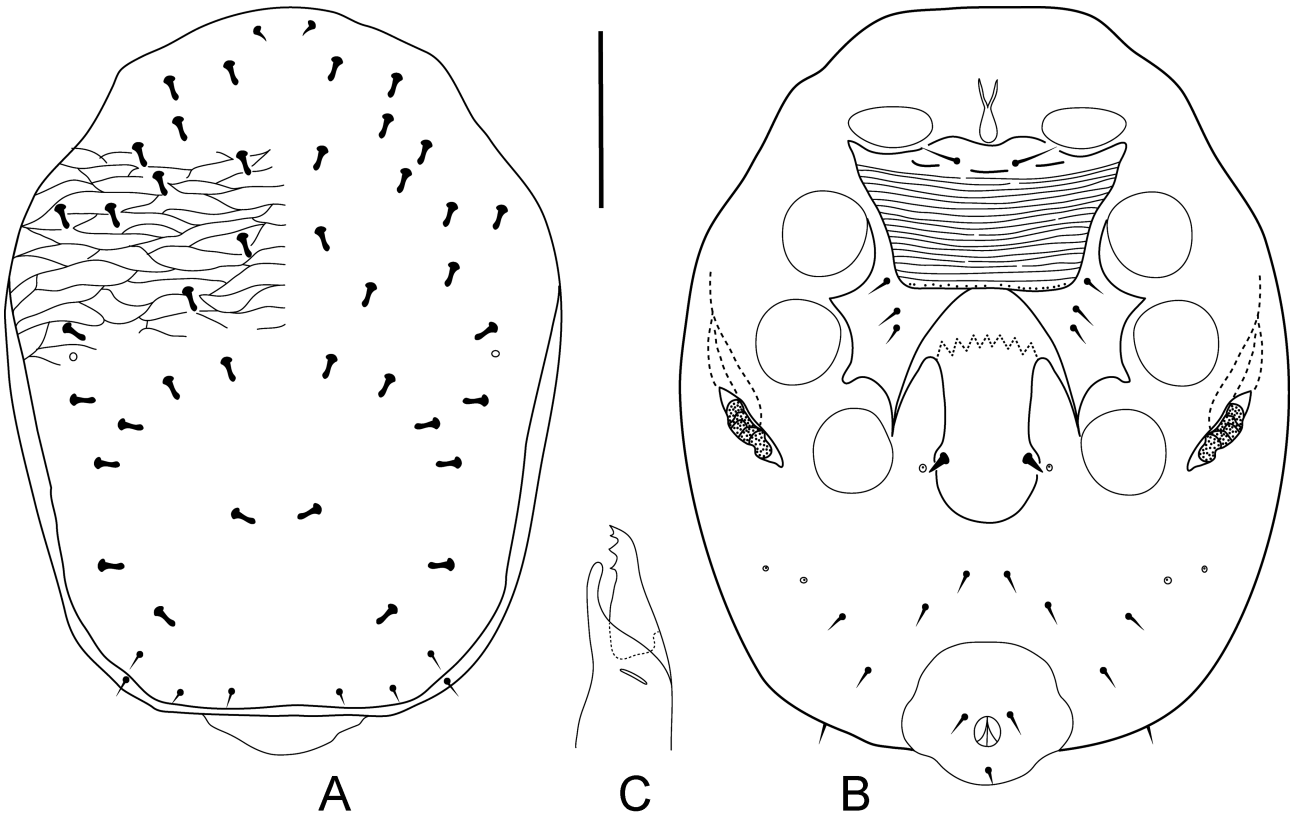


FIGURE 64. Female. *Scolopendracarus* Evans (modified from Evans, 1955): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 100 µm; chelicera not in scale.

Fixed cheliceral digit slender, edentate and much shorter than movable digit, which has three teeth. Epistome triangular, acuminate, with margin smooth. Deutosternum with a few denticles per row; corniculi with apices curved ventrad; internal malae short. Subcapitulum with *pc* absent; *h*1–2 very short, *h*3 long.

Legs stout; leg setae mostly short and bulbous, including coxal setae. Leg chaetotaxy apparently reduced (*e.g.* at least for leg I). Pretarsi with enlarged pulvilli and without claws.

The truncate hypotrichous dorsal shield, short bulbous setae of dorsal shield and legs, the peculiarly striate sternal region, nearly terminal anal shield and highly reduced peritreme and tritosternum are the most distinctive traits of this poorly known monotypic genus. Selected reference: Evans (1955).

***Scorpionyssus* Fain & Rack** (Fig. 65)

Idiosoma about 800 μm long. Dorsal shield slightly wider posteriorly, with lateral and posterior margins slightly concave; with 18–20 pairs of setae, lacking at least *J*1–2, *s*2–3; some setae off shield including at least *z*1, *s*6, *r*2–3, *r*5 and some *S* setae; marginal setae long (including on soft cuticle), central ones (most *j*-*J* setae, *z*5) minute. Sternal shield highly reduced, eroded, bearing only *st*1; three pairs of endopodal fragments small, discrete. Setae *st*2–3 on soft cuticle, *st*4 occasionally absent. Epigynal shield very narrow, somewhat drop-shaped, *st*5 on soft cuticle. Anal shield relatively large, oval and nearly terminal (cribrum visible dorsally); para-anal setae long, post-anal seta minute. Peritrematal plate narrow, curving inward behind stigma to border coxa IV posteriorly (fused to exopodal-parapodal plate). Metapodal plate long and narrow. Unsclerotised dorsolateral and opisthogastric cuticle more or less holotrichous. Setae *st*1–5, *Jv*1–2, *Zv*1 very short, more posterior setae (other *Jv*-*Zv* setae and about six *R*-*UR*) moderately long and spine-shaped. Male with anal shield, and sternogenital shield eroded marginally, bearing *st*1–3 and *st*5 (*st*5 not captured on one side in the only known male specimen); *st*4 absent.

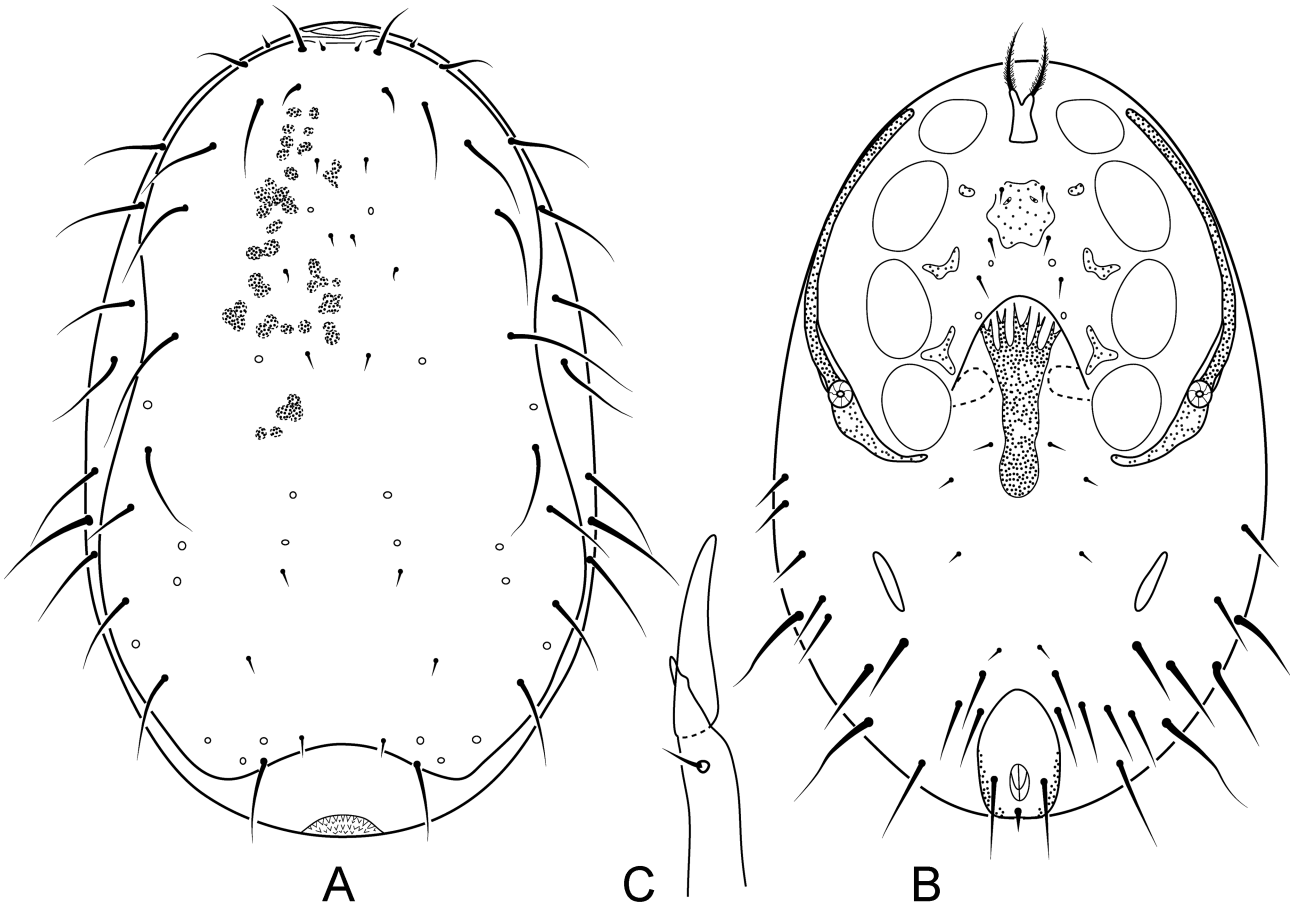


FIGURE 65. Female. *Scorpionyssus* Fain & Rack (modified from Fain & Rack, 1988): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 μm; chelicera not in scale.

Cheliceral digits edentate, without apical hooks; fixed digit short, regressed, movable digit elongate, flattened, blunt apically. Male fixed digit also regressed, movable digit broadly fused to spermatodactyl. Epistome strongly convex, with margin essentially smooth. Deutosternal groove narrow, with rows of 1–2 denticles each. Corniculi slender; internal malae apparently reduced. Seta *h*1 long, *h*2–3 very short. Palp chaetotaxy reduced for trochanter–tibia as 1-4-4-12 setae, respectively.

Legs very short and stout; setae generally short. Leg chaetotaxy heavily reduced, *e.g.* genua with at most eight setae each, and tibiae I–IV apparently with 8-7-7-6 setae, respectively; femora III–IV apparently hypertrichous, with eight setae each. Pretarsi with enlarged pulvilli and poorly sclerotised claws.

This monotypic genus can be recognised by its regressed sternal and narrow epigynal shields, the minute

central setae combined with long and thick setae along dorsal and posteroventral margins, reduced dorsal and leg chaetotaxy, stumpy legs, edentate chelicerae, attenuated corniculi and internal malae, and deutosternum with mostly one denticle per row. Selected reference: Fain & Rack (1988).

***Spatholaelaps* Silvestri** (Fig. 66)

Idiosoma 800 µm long. Dorsal shield truncate posteriorly, leaving posterior soft cuticle exposed; with at least 30 pairs of setae. Idiosomal setae relatively short. Tritosternum apparently with smooth laciniae. Sternal shield apparently fused to posterior endopodal plate, bearing *st*1–4; setae *st*3 about twice as far apart as setae *st*1. Epigynal shield large, snake-head shaped, bearing only *st*5, broadly overlapping sternal shield anteriorly, reaching level of *st*2; with dense colliculate (scale-like) ornamentation. Parapodal plate moderately thick. Anal shield small, diamond-shaped, close to posterior margin of idiosoma; circum-anal setae mid-sized, subequal in length. Peritreme short (seemingly extending to mid-coxa II), peritrematal plate minimally developed, with short, tapered extension posterior to stigma. Unsclerotized soft dorsal and opisthogastric cuticle with ca. 12–14 pairs of setae.

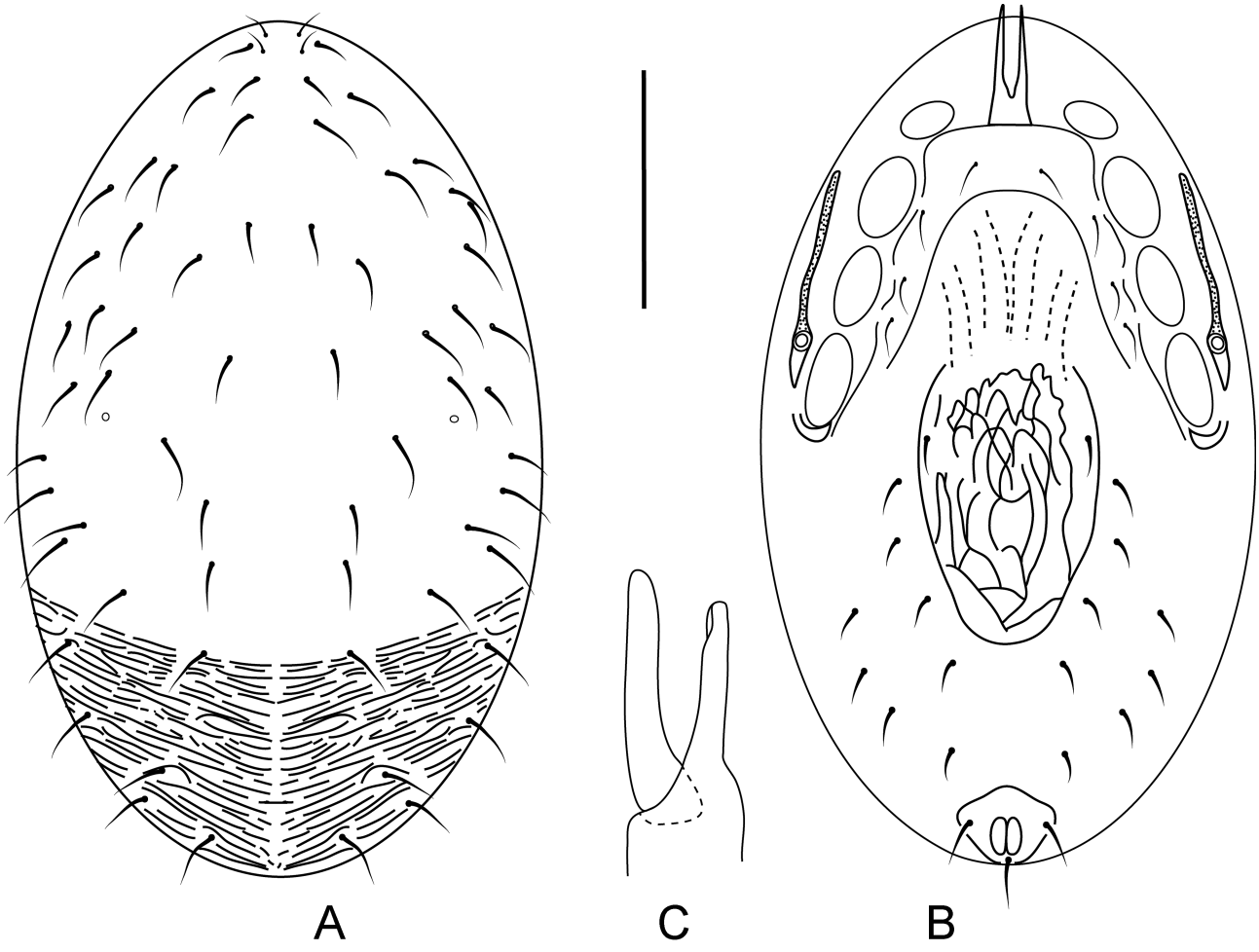


FIGURE 66. Female. *Spatholaelaps* Silvestri (modified from Silvestri, 1917): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 250 µm; chelicera not in scale.

Cheliceral digits slender, edentate, apically blunt; fixed digit slightly shorter than movable digit, and apparently bifid apically. Deutosternum apparently very narrow (without denticles on the illustration of Silvestri, 1917). Corniculi close and convergent.

Legs with some setae thickened, such as apicodorsal setae on femur I. Pretarsi of all legs without claws.

Spatholaelaps is a poorly known genus that may be mostly recognised by its large epigynal shield with

dense reticulation, horseshoe-shaped sternal shield bearing *st*1–4, finger-like cheliceral digits and approximate or convergent corniculi. Selected references: Silvestri (1917).

Sphaeroseius **Berlese** (Fig. 67)

Idiosoma 1100–1600 long. Dorsal shield broadly oval or subcircular (except the male of at least one species with an elongate, 8-shaped idiosoma and dorsal shield, both constricted at midlevel), usually highly hypertrichous (*ca*. 80–90 irregular "pairs" of setae, extrapolated from published illustrations), rarely slightly hypertrichous (possibly *ca*. 40–45 pairs in *S. ecitonis sensu* Berlese, 1904), with many distinctive gland openings; also with two contiguous gland-like structures on each lateral margin at level just posterior to coxa IV; at least some species with pectinate or distinctly barbed setae. Sternal shield short, remarkably broader than long, trapezoidal, bearing *st*1–3 and sometimes also *st*4 (*st*4 possibly absent in *S. ecitonis* Wasmann). Epigynal shield massive, strongly expanded behind coxae IV and broadly rounded posteriorly, slightly concave posteromedially in *S. comes* (Moniez); hypertrichous, bearing at least 20 "pairs" of setae (irregularly distributed in at least some species). Anal shield ventral or terminal, sometimes bearing an extra pair of setae; para-anal setae inserted more or less behind posterior margin of anal opening, and slightly longer than post-anal seta. Peritreme long (reaching coxa I) or short (reaching mid-level of coxa II in the male of *S. ecitophilus*); peritrematal plate narrow, extension posterior to stigma very short or apparently absent in some species. Known male with a sternogenitiventral shield abutting anal shield. Unsclerotised lateral and opisthogastric cuticle markedly hypertrichous.

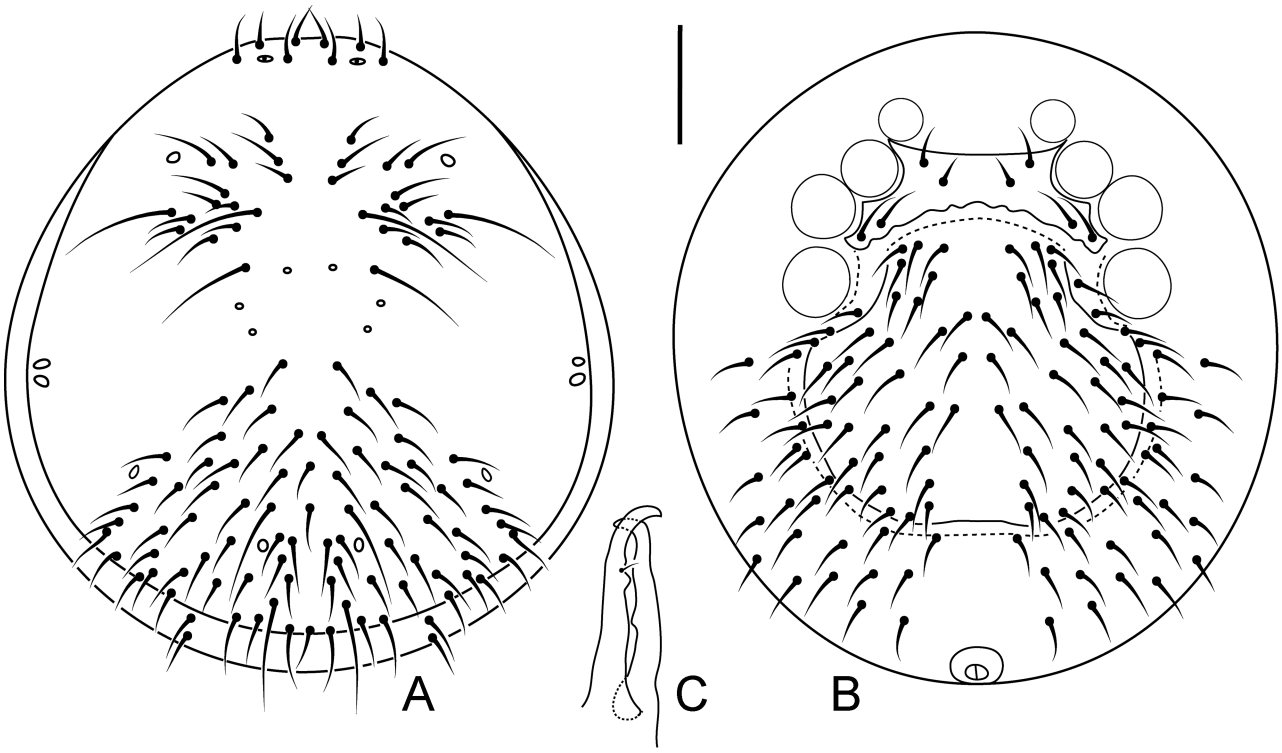


FIGURE 67. Female. *Sphaeroseius* Berlese (modified from Sellnick, 1925): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bar = 200 μm; chelicera not in scale.

Gnathosoma located ventrally under idiosoma. Cheliceral digits long and narrow, with strong apical hooks, fixed digit with one blunt tooth. Known male with fixed cheliceral digit significantly longer than movable digit, and pilus dentilis on basal half of digit. Epistome subtriangular, tapering to a blunt point, with margin smooth. Palp tarsal claw 3-tined.

Legs much longer than idiosoma (giving the resemblance to a spider). The only leg chaetotaxy studied (for the male of *S. ecitophilus*) indicates strong discrepancies with the normal pattern, including hypertrichous genua II–III (each with 14 setae), tibia I (16 setae) and tibiae II–III (each 14 setae), and only four setae on trochanter III.

Sphaeroseius is a highly distinctive group of mites of uncertain affinities. It can be recognised by its hypertrichous idiosoma, a massive, hypertrichous epigynal shield, a transversally stretched sternal shield and long, dorsal shield with two contiguous gland-like structures (possibly gland openings) on each lateral margin, hypertrichous spider-like legs and long, snapping chelicerae. Selected references: Sellnick (1925), Krantz & Platnick (1995).

***Stevelus* Hunter** (Fig. 68)

Idiosoma about 600 µm long. Dorsal shield narrowly suboval, moderately tapering anteriorly and posteriorly, with a broad band of soft cuticle exposed posterolaterally; with 35–36 pairs of mostly short setae, a few (some *z* setae and *Z*5) mid-sized and spine-like; podonotal region lacking at least *z*1 and some *r* and *s* setae, and opisthonotal region slightly hypertrichous, with at least 3–4 extra pairs of setae in the area of *S* and *Z* series. Tritosternum with laciniae thick basally and abruptly tapered, and smooth except for a few barbs apically. Epigynal shield tongue-shaped, relatively narrow and short, *st*5 on margins. Anal shield oval, post-anal seta thicker and distinctly longer than para-anal setae. Peritreme broad, relatively short, not reaching beyond coxa II; peritrematal plate minimally developed, without extension behind stigma, and free anteriorly. Unsclerotised dorsolateral and opisthogastric cuticle with about 6–8 pairs of short *Jv*-*Zv* setae and 7–11 pairs of *R*-*UR* setae.

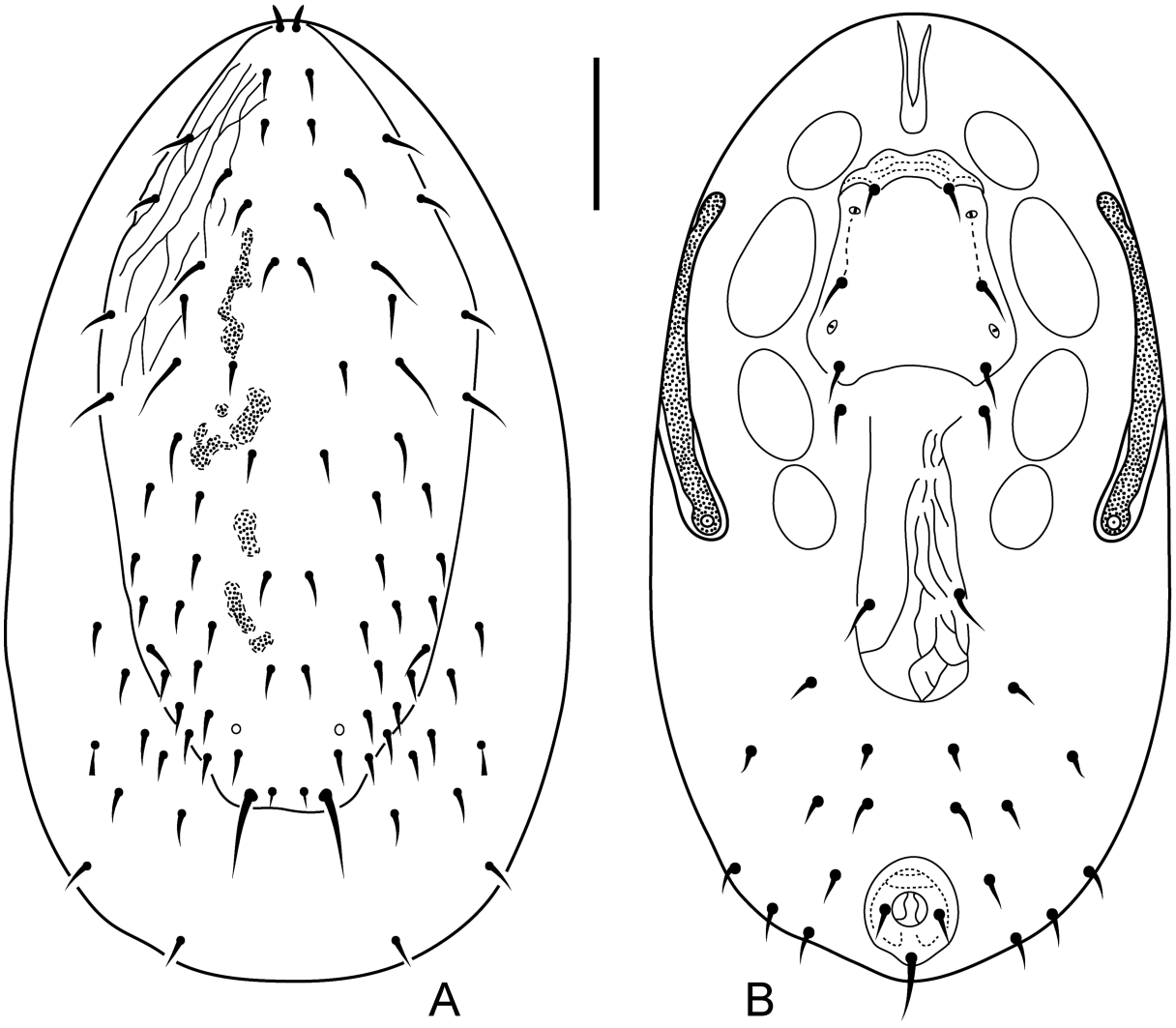


FIGURE 68. Female. *Stevelus* Hunter (modified from Hunter, 1963): A, dorsal idiosoma; B, ventral idiosoma. Scale bar = 100 µm.

Gnathosoma small, mostly not visible from above; cheliceral digits very short, edentate. Epistome elongate, narrowly tapering, with margin smooth. Deutosternum groove narrow, with seven rows of 2–3 denticles each; corniculi reduced, rounded and membranous; internal malae apparently reduced; Seta *pc* and hypostomal setae (*h*1–3) very short, thick.

Legs relatively short (and subequal in length) and stout, leg I slightly thicker than others. Most leg setae short and generally thick, a few setae longer, spine-shaped on all femora (apicodorsal setae) and genua (some dorsals). Leg chaetotaxy seems generally normal. Pretarsi with pulvilli enlarged, longer as wide; claws absent or indistinct.

The monotypic genus *Stevelus* can be distinguished by its generally thick, short setae, stumpy edentate chelicerae, tapered dorsal shield with hypotrichous podonotal and hypertrichous opisthonotal region, broad peritreme, mostly smooth laciniae, its small gnathosoma, reduced hypostomal structures, thick leg I and elongate pulvilli. Selected references: Hunter (1963), Klimov *et al*. (2016).

Stigmatolaelaps **Krantz** (Fig. 69)

Idiosoma 600–800 µm long. Dorsal shield oval or obovate, bearing 39 or more often 40 pairs of setae, including *Zx*2–3 as well as putatively *Zx*1 (or another unidentified seta), and usually 2–4 unpaired *Jx* setae mostly in area of *J4*; setae generally short, *Z*5 and sometimes also anterolateral or posterolateral setae mid-sized. Presternal area weakly sclerotised, lineate-reticulate, sometimes reaching far laterally; sternal shield moderately to strongly wider than long. Epigynal shield large, drop-shaped, generally close to the small, pear-shaped anal shield; post-anal seta subequal to para-anal setae or slightly shorter. Setae *st*1–5 mid-sized. Stigma greatly enlarged (over twice as large as tritosternal base); peritrematal plate narrowly developed around peritreme, and not extended behind stigma. Unsclerotised lateral and opisthogastric cuticle moderately hypertrichous, with up to 20–30 pairs of short setae in addition to *Jv*-*Zv* setae.

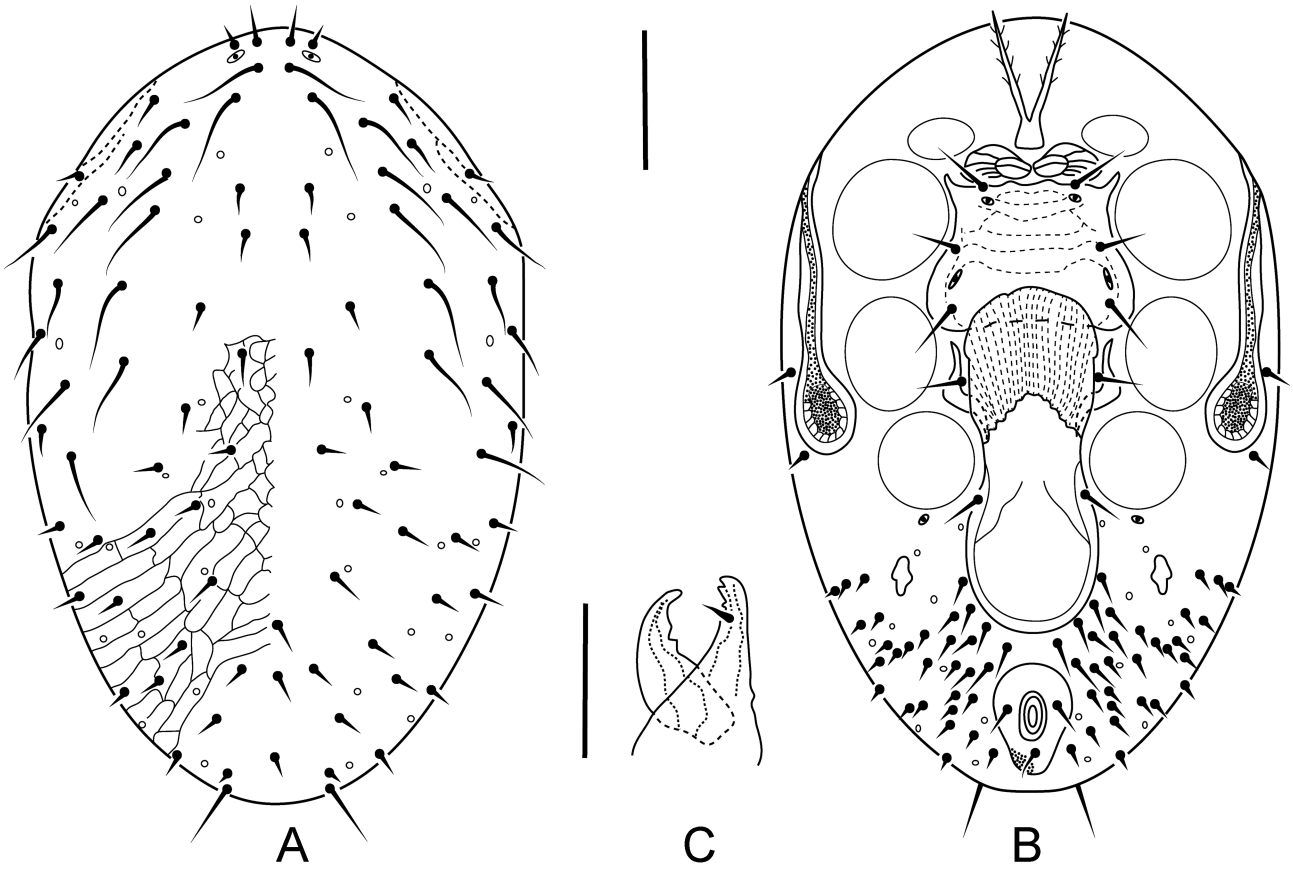


FIGURE 69. Female. *Stigmatolaelaps* Krantz (modified from Krantz, 1998b): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 µm for dorsum and venter, 50 µm for chelicera.

Cheliceral fixed digit with 1–2 small subapical teeth and a stout pilus dentilis. Epistome triangular, with margin smooth. Deutosternal groove narrow, with 9–11 rows of 1–2 large denticles each except 2–5 in most basal rows.

Leg setae mostly needle-like, some stouter, spine-shaped (*e.g. ad*1 on femora III–IV). Leg chaetotaxy differs from the norm by having femora III and IV with seven setae each, including two ventrals (1–3/2–1) and genu IV also with two ventrals (based on *S. greeni* (Oudemans)).

Stigmatolaelaps shares with *Pneumolaelaps*, another bee-associated genus, the presence of *Jx* setae (near *J*4 in *Stigmatolaelaps*), narrow deutosternum with few denticles, genu IV with ten setae, including two ventrals, and a moderately hypertrichous opisthogaster. *Stigmatolaelaps* differs from it by the enlarged stigma, as opposed to relatively broad peritreme in *Pneumolaelaps*, as well as by two features shared with a putatively close relative, *Xylocolaelaps*: deutosternum with 10–11 rows (9–10 in *Xylocolaelaps*) of mostly 1–2 denticles (vs 5–7 rows of 2–6 denticles in *Pneumolaelaps*), and femora III–IV with seven setae. *Xylocolaelaps*, however, does not have *Jx* setae, has genu IV with nine setae and normally developed stigmata. Femora III–IV bearing seven setae is a trait shared with two other bee-associated genera, *Dinogamasus* and *Eumellitiphis*, but each of those have their own suite of apomorphies (see their diagnoses above). Selected reference: Krantz (1998b).

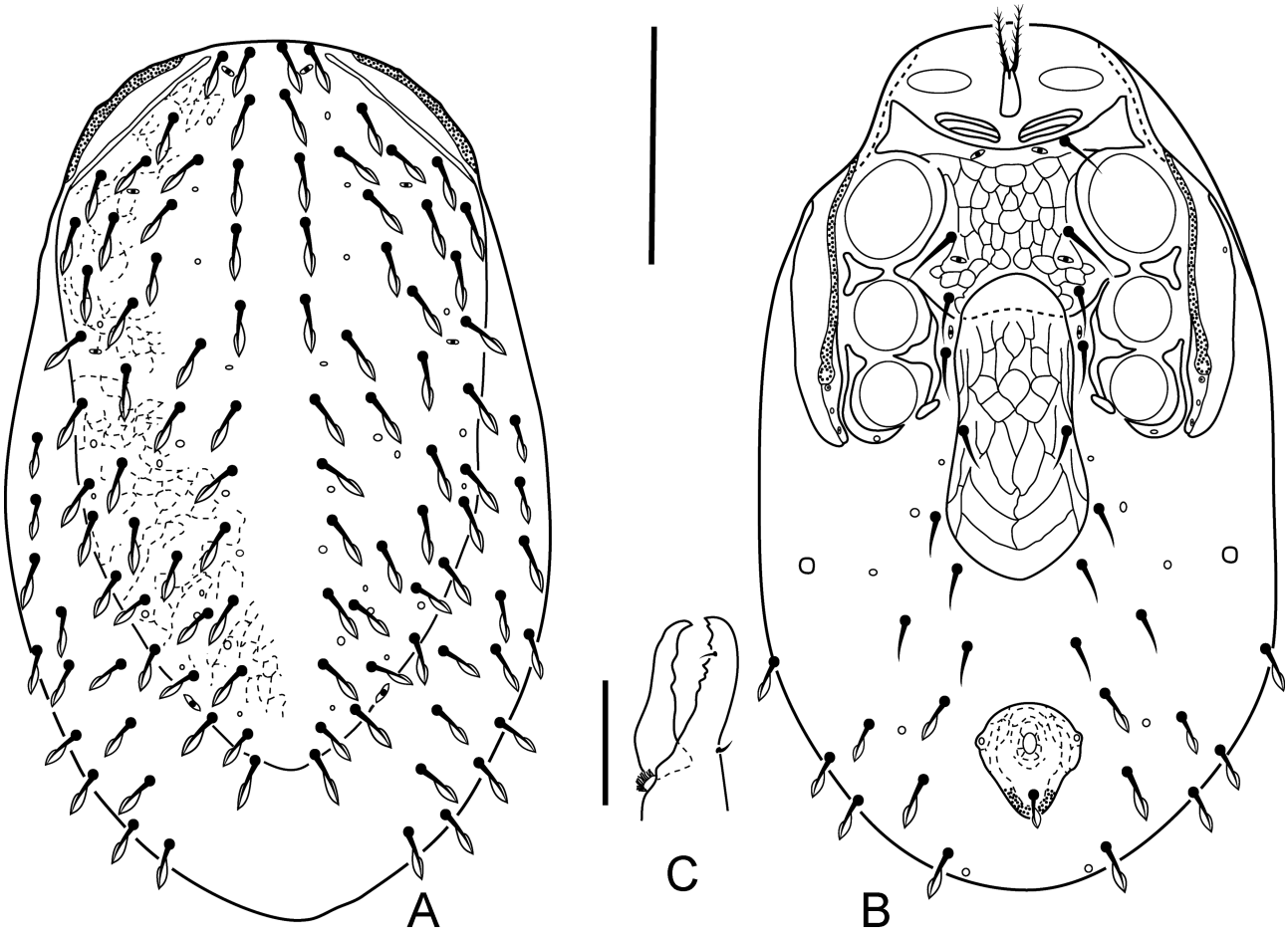


FIGURE 70. Female. *Stratiolaelaps* Berlese (modified from Walter & Campbell, 2003): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 200 μm for dorsum and venter, 100 μm for chelicera.

Stratiolaelaps **Berlese** (Fig. 70)

Idiosoma 600–900 μm. Dorsal shield gently or abruptly tapering in posterior third, strongly reticulate; with 37–39 pairs of setae, sometimes including *Zx*2–3; setae spatulate-tricarinate and mucronate. Presternal area with 3–4 pairs of weakly to well sclerotised ridges (or very narrow platelets), often anastomosed; sternal shield slightly longer than wide, with broad (endopodal) arms extending well between coxae I–II. Epigynal shield tongue- or drop-shaped. Anal shield more or less pear-shaped, sometimes almost diamond-shaped; post-anal seta generally subequal to para-

anal setae. Unsclerotised dorsolateral and opisthogastric cuticle holotrichous, including *r*6, 6–7 *R* and 3–6 *UR* setae (rarely more) on each side. Peritrematal shield broad and reticulate.

Cheliceral digits elongate, over 100 µm long; fixed digit with three mid-sized teeth, including two subapically and one just proximal to pilus dentilis; sometimes followed proximally by a series of 3–4 small teeth. Epistome truncate, denticulate, with a sharp, triangular tine medially, sometimes with similar tines laterally (one on each side). Deutosternum with rows of mostly 7–20 denticles. Corniculi elongate, at least 80 µm long, reaching about the distal end of palp femur; internal malae with 1–2 pairs of lateral arms in addition to long median arms. Hypostomal seta *h*1 usually moderately longer than *h*3. Palp tarsal claw 2-tined, sometimes with a minute third tine.

Leg segments covered with ridges or wrinkles. Many dorsal setae spatulate-tricarinate or lanceolate. Leg chaetotaxy normal.

Stratiolaelaps is readily identified by the elongate chelicerae and corniculi, accompanied by the spatulate-tricarinate setae on the dorsal shield and opisthogaster. The anastomosed presternal ridges, the strong anterolateral arms of the sternal shield and the broad reticulate peritrematal shield are also diagnostic. Selected reference: Walter & Campbell (2003).

***Suracarus* Flechtmann** (Fig. 71)

Idiosoma globose, about 3000 µm in diameter. Legs and idiosoma, dorsally and ventrally, highly hypertrichous, densely covered with short setae. Dorsal shield uniquely saddle-shaped, with a dorsomedian depression, bearing both simple and lanceolate (or leaf-like) setae. Tritosternum with very short laciniae. Sternal shield normal, and the only sclerotised region of venter; shield slightly longer than wide, densely reticulate; seta *st*3 on shield margin or nearby soft cuticle. Epigynal and anal shields absent; genital opening discernible as a transverse slit between coxae IV, and anal opening near posterior margin of idiosoma. Peritreme very short and very narrow compared to stigma, borne on the lateral lobes of the saddle-shaped dorsal shield. Male with sternogenital shield, bearing *st*1–3 or *st*1–4, eroded posteriorly.

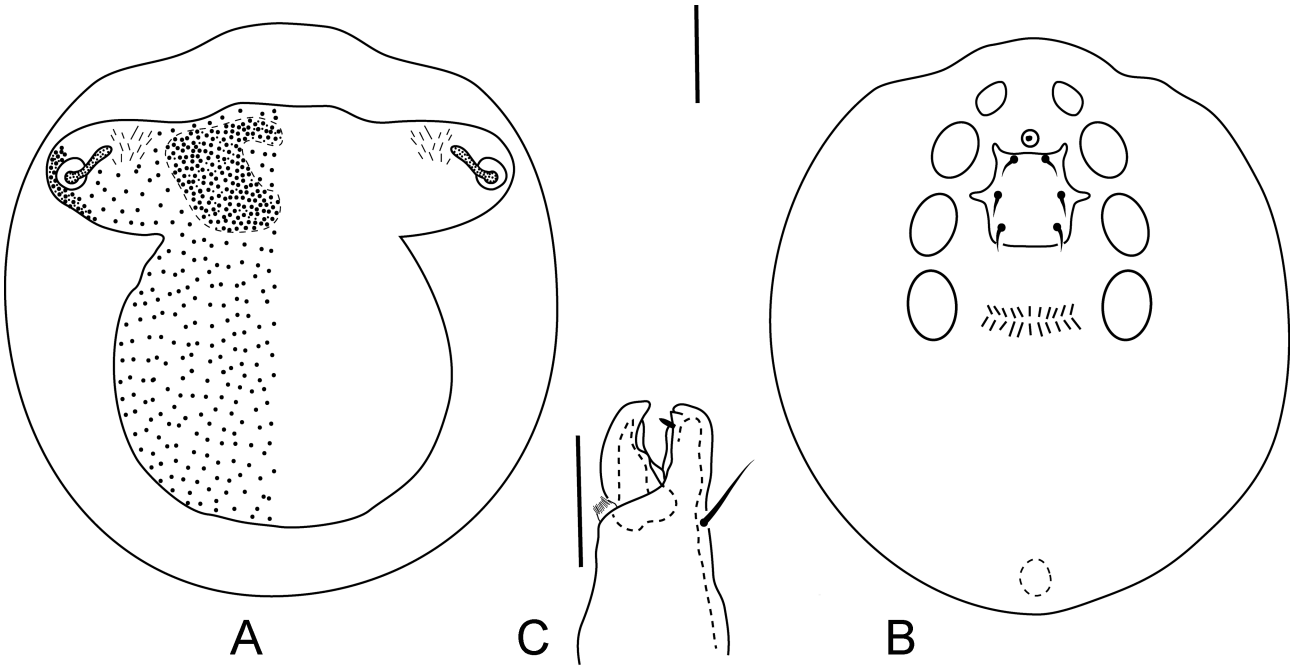


FIGURE 71. Female. *Suracarus* Flechtmann (modified from Flechtmann, 2005): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 500 µm for dorsum and venter, 200 µm for chelicera.

Cheliceral digits stout, essentially edentate; movable digit with a small lobe on its antiaxial edge; pilus dentilis stout basally; dorsal cheliceral seta very long, prominent. Male cheliceral digits apparently regressed compared to

female, apically blunt, without apical hooks; spermatodactyl long, apparently arising from dorsal surface of movable digit. Epistome a short lobe, apparently bearing several setae, irregularly distributed. Corniculi short (relative to idiosomal size) and blunt apically; seta *h*3 inserted quite anteriad, almost aligned (diagonally) with *h*1–*h*2; without distinct deutosternum. Palp hypertrichous from trochanter to genu, each segment with 9–14 setae (chaetotaxy varies between specimens). Palp tarsal claw 2-tined in female and with a small third tine in male.

Leg I antenniform, slenderer and moderately longer than other legs, without ambulacrum. Tarsi II–IV with a peripodomeric suture in their distal third (and not in proximal third as usual). Legs apparently extremely hypertrichous.

Suracarus is an enigmatic monotypic genus of large, hypertrichous mites exhibiting many regressions (deutosternum, tritosternum, corniculi, peritreme; epigynal and anal shields absent) and other apomorphies (*e.g.* epistome bearing setae; suture of tarsi more distal than normal) and needs further study. Selected reference: Flechtmann (2005).

Tropilaelaps **Delfinado & Baker** (Fig. 72)

Idiosoma 700–800 μm long, greatly hypertrichous dorsally and ventrally, densely covered by short, needle-like setae. Dorsal shield suboval, elongate, truncate posteriorly although covering all idiosomal dorsum; with more than 250 irregular "pairs" of setae. Tritosternal base short, laciniae smooth proximally, with pilosity mostly restricted to distal half. Presternal element fused to sternal shield or weakly sclerotised and adjoining shield; sternal shield deeply concave posteriorly, and with inner sclerotised area including a transverse band mid-way between *st*1 and *st*2. Epigynal shield very long, narrow, subrectangular and with posterior end truncate, or tapering and narrowly rounded, and with median, longitudinal inner sclerotised band; bearing *st*5, abutting or overlapping anal shield; anteriorly reaching level of setae *st*2, but not overlapping sternal shield or barely so. Anal shield enlarged, subrectangular, sometimes pear-shaped, tapered anteriorly; post-anal seta moderately longer than para-anal setae. Sternal shield, anal shield and anterior portion of epigynal shield ornamented with colliculate reticulation; epigynal shield with elongate cells on posterior portion. Setae *st*1–5 long. Parapodal-exopodal plate moderately developed posterolaterad of coxa IV. Peritrematal plate minimally developed laterally, narrowly fused to dorsal shield anteriorly, and freely extending to posterior margin coxa IV. Unsclerotised opisthogastric cuticle hypertrichous, each side of opisthogaster bearing more than 100 "pairs" of tylochorous setae, with each sclerite elongate, tapered on both ends. Male with sternogenitiventral shield, narrowly extending in the opisthogastric region, and reaching not far from anal shield.

Gnathosoma small, positioned ventrally under idiosoma. Cheliceral digits short; fixed cheliceral digit with a subapical tooth only; movable digit with strong, apical hook L-shaped, usually with one tooth, sometimes edentate, and with a small ventral mucro near angle of apical hook. Male fixed digit highly regressed; movable digit with tooth and apical hook small, inconspicuous, digit strongly fused to very long, whip- or spiral-shaped spermatodactyl. Epistome a short, rounded lobe, with margin smooth. Deutosternum with 5–7 rows of of 1–2 long denticles each (1–4 in males); corniculi small; internal malae elongate, extending well beyond corniculi. Setae *h*1–2 short, attenuate, *h*3 and *pc* mid-sized. Palp tarsal claw undivided distally, somewhat spine-shaped; palp tarsus elongate, twice as long as wide.

Leg I much slenderer than legs II–IV. Leg setae generally long, with a few thicker, spine-shaped setae, *e.g. ad*1 on trochanter I and apicodorsal setae on femur I. Leg chaetotaxy differing from normal in at least some species, including for femur I with 14 setae, including five ventrals; genu III with ten setae, including two *pl*; genu IV with 11 setae, including two *pl* and two ventral setae; tibia I with 14 setae, putatively including one extra ventral seta (this seta is positioned next to putative *al*2, both being close and aligned longitudinally, and positioned between ventral and anterolateral aspects); and tibia III with nine setae, including two *pl*. Pretarsal claws reduced.

The very hypertrichous idiosoma, opisthogaster with tylochorous needle-like setae, the very elongate, narrow epigynal shield abutting a subquadrate anal shield and the spine-like palp tarsal claw are strongly distinctive features of *Tropilaelaps*. Selected references: Delfinado & Baker (1961), Delfinado-Baker & Baker (1982).

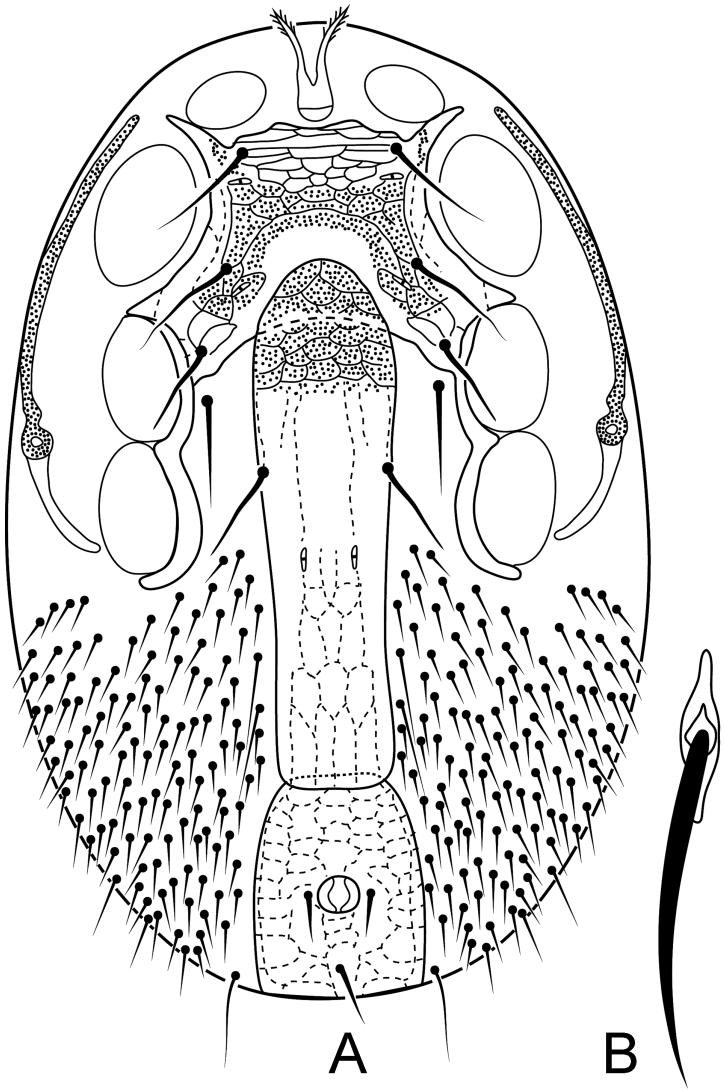


FIGURE 72. Female. *Tropilaelaps* Delfinado & Baker (modified from Delfinado & Baker, 1961): A, ventral idiosoma; B, enlarged opisthogastric seta. Scale bar = 200 μm for venter; enlarged seta not in scale.

***Ulyxes* Shaw** (Fig. 73)

Idiosoma 700–1300 μm long. Dorsal shield broadly oval to ovate, typically with 39 pairs of setae including *Zx*2–3, as well as 2–9 unpaired median setae ("*Jx*"; some of which may appear paired) near region of *J*4; occasionally with 38 pairs (*z*3 lost) or without *Jx*, more rarely fewer setae (*e.g*. without *Zx*2–3); setae usually short, occasionally long (such as along margins or posteriorly), rarely minute. Presternal area weakly sclerotised, lineate-reticulate; sternal shield at least slightly wider than long. Epigynal shield flask to bottle-shaped, long and posteriorly broader than intercoxal region, flat posteriorly, more or less abutting anal shield; bearing *st*5, occasionally also *Zv*1 and rarely *Jv*1, otherwise these setae closely flanking the shield; shield posteriorly usually with 6–8 transverse striae. Anal shield triangular and typically large; as broad as, or broader than long; post-anal seta slightly, or more often significantly, longer than para-anal setae. Parapodal-exopodal plate moderately developed around coxa IV. Peritrematal plate usually minimally developed, anteriorly free in some species (narrowly fused anteriorly to dorsal shield in others); rarely, posteriorly fused to exopodal-parapodal plate. Metapodal plates usually normal (small), exceptionally enlarged, subcircular in *U. laertes*. Soft dorsolateral and opisthogastric cuticle slightly to strongly hypertrichous, ranging from nine to more than 40 pairs of setae in addition to *Jv-Zv* setae. Ventral setae short to mid-sized, occasionally stout (and *st*1–5 exceptionally spine-shaped, in *U. calypso* (Domrow)).

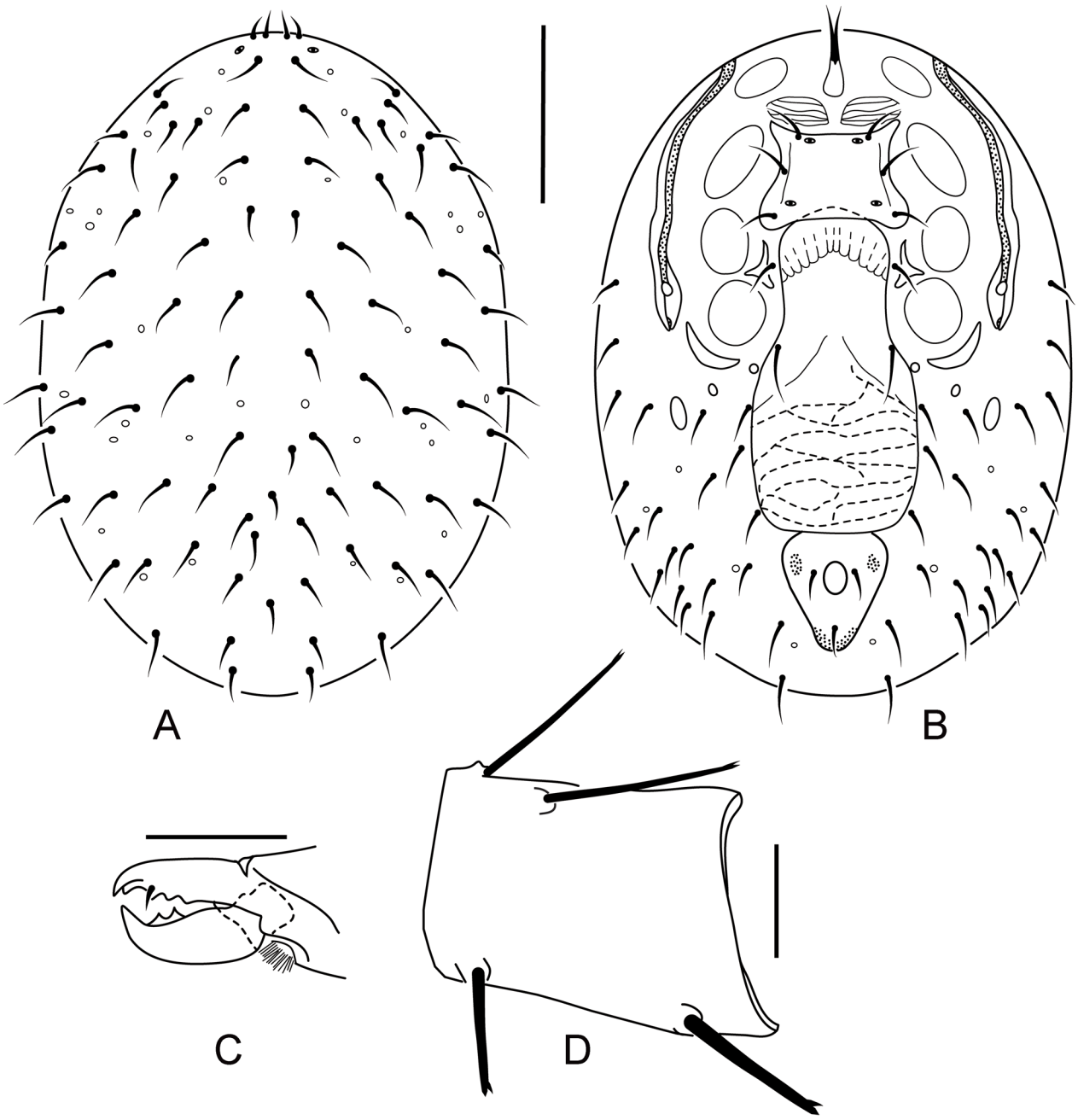


FIGURE 73. Female. *Ulyxes* Shaw (modified from Shaw, 2014b): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera; D, bifid antero-dorsal setae of femur IV. Scale bars = 300 µm for dorsum and venter, 50 µm for chelicera, 25 µm for femur IV.

Cheliceral digits ranging from small to very large; fixed digit usually with 1–5 teeth (including subapical offset tooth, even if reduced); exceptionally, *U. theoclymenus* Shaw has teeth distributed on both (paraxial and antiaxial) edges of fixed digit, and movable digit with three teeth, including one on paraxial edge. Male chelicerae varying from normally chelate-dentate to edentate with the fixed digit reduced and with or without apical hook; spermatodactyl abruptly bent upward apically; pilus dentilis in basal half of digit. Epistome varying from subtriangular to somewhat truncate with a median tine, with margin smooth or denticulate. Deutosternum varying between species from 1–2 denticles per row to 10–14 or more denticles per row. Corniculi usually short (long in *U. laertes*); fimbriae of lateral arms of internal malae usually with inflated tips. Palp trochanter with (inner) seta *v*2 sometimes broadened or foliate.

Certain leg setae flattened and bifid apically, including nearly always on femora I–II (*ad*1, *pd*2), III (*ad*1) and IV (*ad*1–2), and sometimes on trochanters I and IV. Leg chaetotaxy usually normal except mostly for genu IV, varying from 8–10 setae, including 1–2 *pl* and 4–5 dorsals (*pd*3 sometimes lost).

Traits distinguishing *Ulyxes* from the related *Nidilaelaps* and *Haemolaelaps*, and from other similar genera having epigynal shields abutting a broad anal shield, include: *Jx* setae near *J*4 when present (like *Nidilaelaps* only), bifid leg setae, foliate palp trochanter seta and spatulate fimbriae of internal malae. In contrast, *Haemolaelaps* also has a very long pilus dentilis and many barbed idiosomal and leg setae. Furthermore, *Alloparasitus* and *Gymnolaelaps* typically have sclerotised presternal platelets, always serrate epistome, and *Jx* setae, when present, including at least one anteriad of *J3* level. *Gymnolaelaps* also has a 3-tined palp tarsal claw and thick parapodal plates. Selected reference: Shaw (2014b).

Urozercon **Berlese** (Fig. 74)

Idiosoma 300–600 µm long. Dorsal shield suboval to broadly oval or obovate, usually truncate and leaving a short portion of soft cuticle exposed posteriorly; markedly hypertrichous, especially in the opisthonotal region, with totals of 60–80 pairs of setae (therefore putatively 22–43 extra pairs, in addition to basic set of 37 pairs) and about 4–20 unpaired posteromedian (*Jx*) setae, but also sometimes anteriorly (4–10 *jx* setae) (exceptionally, *U. paradoxus* Berlese only slightly hypertrichous); setae varying from short to mid-sized for a given species, subequal, except for several elongate setae posteromarginally; typically thickened or spine-like. Other idiosomal (ventral) setae also generally thick and stiff. Sternal shield strongly developed, expanded anteriorly beyond posterior edge of coxa I (resulting in *st*1 being relatively distant from anterior margin), broadly concave posteriorly and fused to posterior endopodal plate (except for a free remnant of endopodal element in *U. milleri* Halliday); setae *st*3 well over twice as far apart as setae *st*1. Seta *st*4 absent. Epigynal shield long, not expanded laterally past coxa IV edge, strongly to gently tapering into a pointed or rounded apex, triangular or tongue-shaped, more or less abutting anal shield; bearing *st*5 and 2–3 pairs of opisthogastric setae (*Jv*1, *Zv*1, usually also *Jv*2). Small ventrianal shield trapezoidal or subquadrate, with concave anterior margin, bearing *Jv*3 on its anterolateral corners in addition to the three long, spine-shaped circum-anal setae; para-anal setae usually twice as long as post-anal setae, occasionally of same length; para-anal setae inserted behind anal opening, almost aligned with post-anal seta, on posterior margin of idiosoma. Unsclerotised cuticle usually with two pairs of setae on posteroventral margin (putatively *Jv*5, *Zv*2) and 1–2 pairs on posterodorsal margin. Peritreme long (*e.g. U. robustisetae* (Rosario & Hunter)) or absent (*U. milleri*, *U. watsoni* (Halliday)); peritrematal plate free anteriorly (but reaching coxa I, even when peritreme is absent), posteriorly extending beyond coxa IV. Males either with sternogenitiventral shield narrowly separated from small ventrianal shield, or with holoventral shield, narrowest in the opisthogastric area anterior to level of fusion with ventrianal shield.

Gnathosoma relatively small, mostly hidden ventrally under dorsal shield. Cheliceral digits slender, edentate, stylet-like or finger-like, variously flattened or with lobes; dorsal cheliceral seta typically very long (short or absent in male), pilus dentilis absent. Male chelicera similarly edentate, sometimes with fixed digit significantly shorter than in female. Deutosternum without denticles or with eight broad rows of 14–22 denticles per row. Corniculi very small or absent. Occasionally, all hypostomal setae short, including *h*3. Palp tibia and tarsus fused; palp chaetotaxy reduced: trochanter, femur, genu with 1, 4, 4–5 setae, respectively.

Leg I shorter than other legs, tarsus I short and stout compared to long, narrowly tapered tarsi II–IV. Many leg setae stout, including apicodorsal setae of femora and genua, which are often longer and spine-shaped. Leg chaetotaxy reduced for several segments, including trochanter I with only five setae; femur I with only ten setae (1–5/3–1), femur II with 8–9 setae (including only four dorsals and only one *al*); femora III–IV each with 7–8 setae, with one or two extra ventrals; genu I with only nine (typically 2–2/1, 2/1–1); genu II with 9–10 setae (including four dorsals and two ventrals); genu IV with nine setae (but with only two *pd* and with two ventrals; 2–2/1, 2/1–1); tibia I with nine setae (2–2/1, 2/1–1); tibia II with 8–9 setae (lacking one *pl*) and tibia IV with eight setae (2–1/1, 2/1–1). Pretarsus I with enlarged pulvillus; all pretarsi without claws.

Urozercon is a very distinctive genus, due to its hypertrichous dorsal shield, its long, strongly spine-like circum-anal setae protruding posteriorly, ventrianal shield bearing *Jv*3, a long tapered epigynal shield, edentate, finger-shaped cheliceral digits, and stout tarsus I and tapered tarsi II–IV. Selected references: Silvestri (1917), Rosario & Hunter (1988), Halliday (2006).

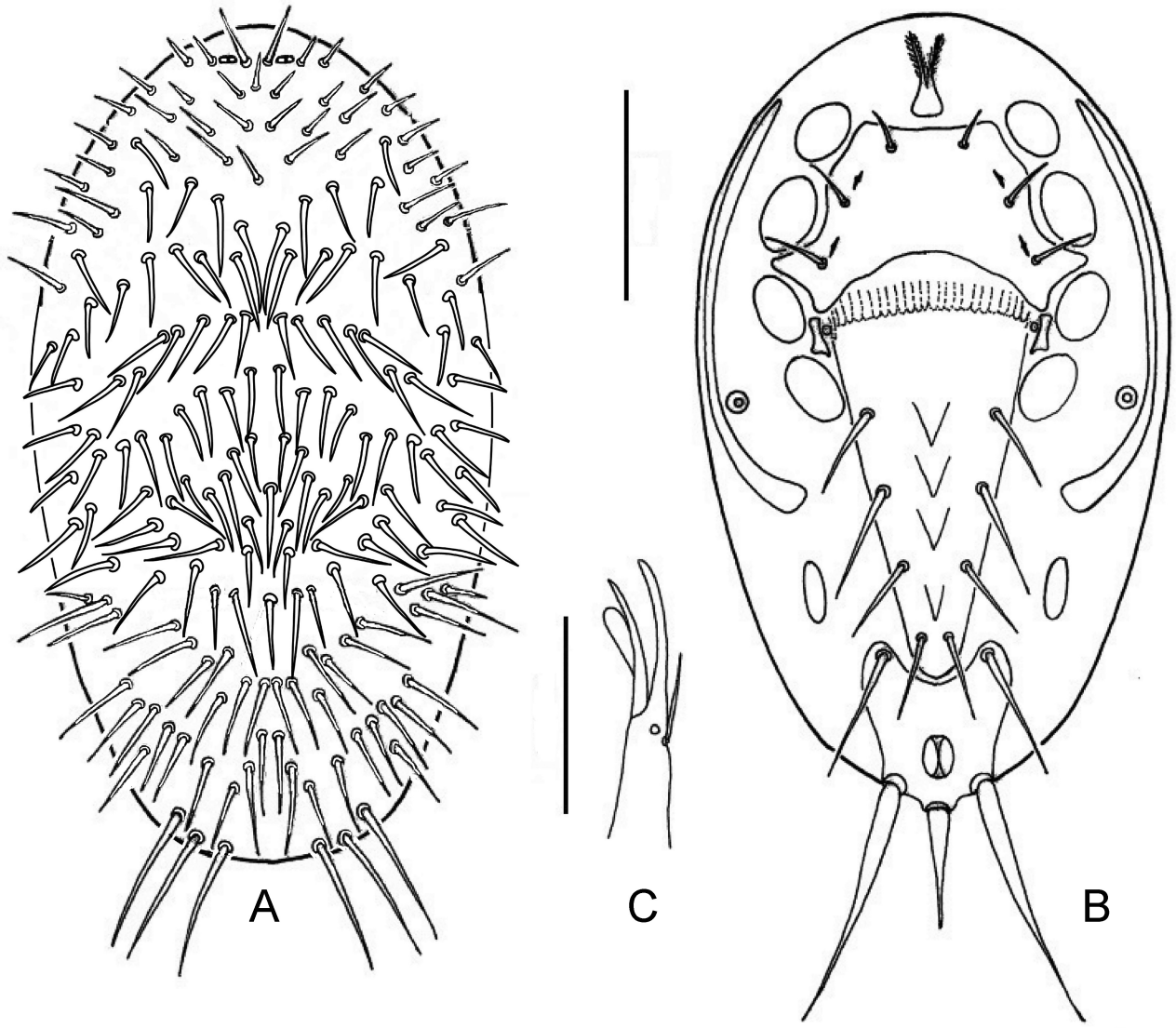


FIGURE 74. Female. *Urozercon* Berlese (modified from Halliday, 2006): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 μm for dorsum and venter, 50 μm for chelicera.

Xylocolaelaps **Royce & Krantz** (Fig. 75)

Idiosoma about 400 μm long. Dorsal shield suboval, with strong shoulders (bulging) at *r*2–3 level; with 36 pairs of setae, lacking *z*3, *z*6, *Zx*2–3 but apparently with an extra pair near margin at mid-level of shield; central setae short, more marginal setae mid-sized, *Z*5 moderately longer. Presternal area weakly sclerotised, lineate-reticulate; sternal shield slightly wider than long. Epigynal shield moderately large, drop-shaped. Post-anal seta mid-sized, slightly longer than para-anal and opisthogastric setae. Peritreme relatively short (not extending beyond coxa II); peritrematal plate minimally developed, free anteriorly, and without post-stigmatic extension. Unsclerotised dorsolateral and opisthogastric cuticle with about 12–17 *R-UR* setae in addition to *Jv-Zv* setae.

Cheliceral fixed digit with four teeth (including subapical offset tooth) mostly apical to the well-developed pilus dentilis. Epistome triangular, with margin smooth; deutosternal groove narrow, with 9–10 rows of 1–3 denticles each; corniculi relatively short.

Legs with thick setae. Leg chaetotaxy normal except for femora III and IV having seven setae, including two ventrals.

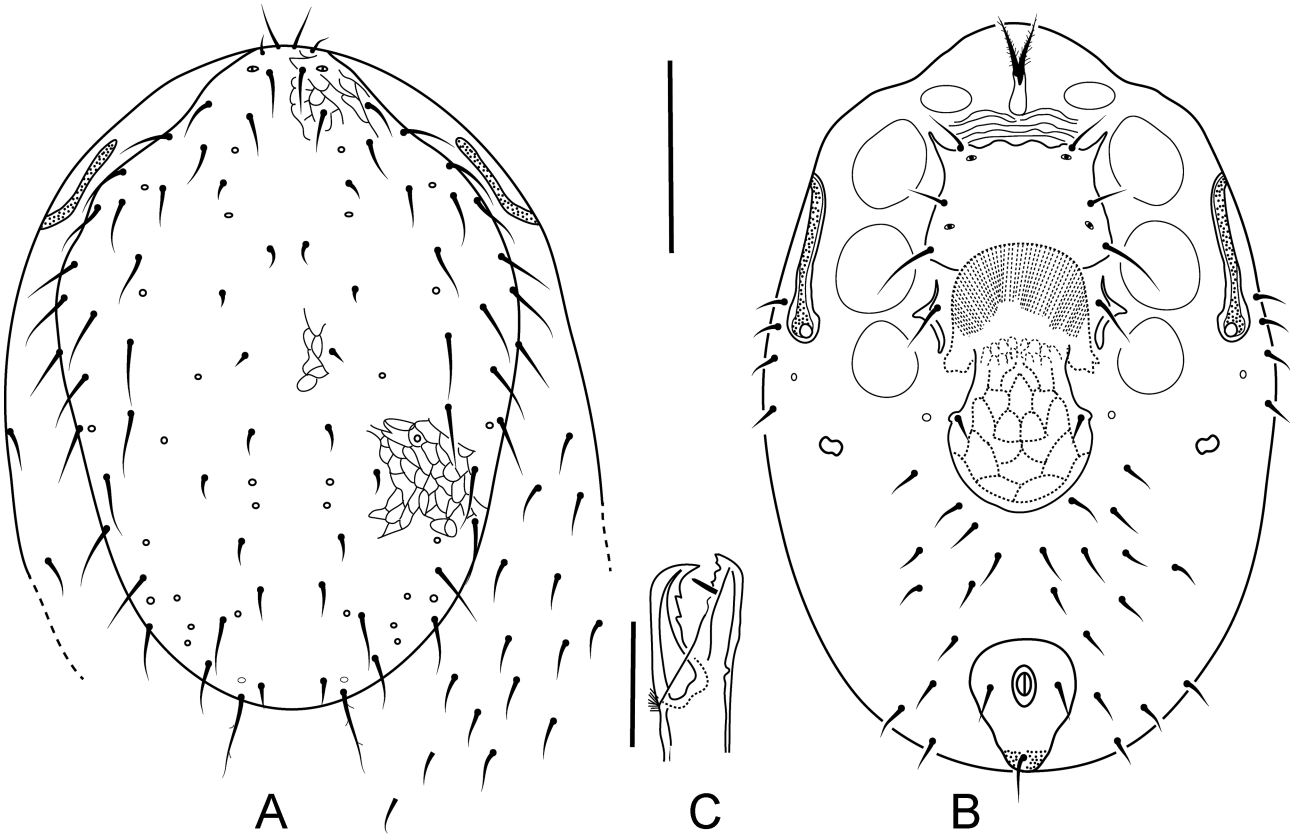


FIGURE 75. Female. *Xylocolaelaps* Royce & Krantz (modified from Royce & Krantz, 2003): A, dorsal idiosoma; B, ventral idiosoma; C, chelicera. Scale bars = 100 μm for dorsum and venter, 100 μm for chelicera.

An epistome with smooth margin, deutosternum with many rows of mostly 1–2 denticles, peritrematal shield not extending behind stigma, and femora III and IV bearing seven setae are shared with *Stigmatolaelaps* (see its diagnosis above for differences). Selected reference: Royce & Krantz (2003).

Key to genera of free-living and arthropod-associated laelapids, based on adult females

We included in the key all genera except *Iphiopsis* because of insufficient morphological information in the literature and the unavailability of specimens to examine. As this work is not a revision of the Laelapidae, we did not examine the validity (*i.e*. monophyly) of genera in detail, although it is apparent that the boundaries of many if not most genera are still unclear. Thus, we attempted to construct the key in the most practical and informative way as possible given the limits of taxonomic knowledge of currently accepted genera.

As in any other groups of organisms, placement of species into their respective genera may pose problems when genera are known from a single or few species, given the uncertainty about the expected variations of each character within each of them. Such problems are most serious when available descriptions of the genera or constituent species are inadequate (*e.g*. *Apolaelaps* and *Spatholaelaps*). Navigation through the key may also be unavoidably complex when dealing with hypervariable genera such as *Androlaelaps*, *Jacobsonia*, *Julolaelaps*, *Myrmozercon* and *Scissuralaelaps*. The genus *Myrmozercon* is found in three places in the key, because of its variability in dorsal setation and the length of the peritreme. Consultation of the generic diagnosis section above should increase confidence in identifications done using the key.

1. Peritreme very short or absent, not reaching beyond coxa III, if extending to coxa I or II (rarely) then either circum-anal setae very long, spine-shaped, borne on a ventrianal shield (some *Urozercon*), or all hypostomal setae (*h*1–3) short and leg chaetotaxy usually reduced (femur I, tibiae I–II with fewer than 13, 13 and ten setae, respectively; some *Julolaelaps*); dorsal shield *often* hypotrichous

(*e.g.* with 5–25 pairs of setae) and with very short setae, sometimes hypertrichous, rarely with normal chaetotaxy (37–39 pairs of setae); dorsal shield often reduced in size or truncate posteriorly; legs usually hypotrichous, sometimes hypertrichous, rarely with normal chaetotaxy; palps often hypotrichous; corniculi, seta *pc* and hypostomal setae often very short; pretarsi often without or with reduced claws (arthropod associates) 2

- Peritreme longer, reaching at least coxa II, most often coxa I; if shorter and not even reaching coxa II, then dorsal shield with 37–39 pairs of setae (and sometimes unpaired *Jx* setae) and leg chaetotaxy normal or nearly so (including tibiae I–II) (*e.g.* some beetle-associated *Gaeolaelaps*), or with many stout, spur-shaped dorsal setae (*Dyscinetonyssus*); dorsal shield usually well-developed, with variable chaetotaxy; palps usually holotrichous (trochanter–tibia with 2-5-6-14 setae); corniculi, seta *pc* and hypostomal setae typically well-developed; pretarsi usually with normally developed claws (free-living forms and arthropod associates; eventually, vertebrate associates) 16

2. Sternal shield reduced (or absent) so that one (*st*3), two (*st*2–3) or all three pairs (*st*1–3) of setae are inserted on unsclerotised cuticle; if shield entire, bearing *st*1–3, then *st*4 absent and with ventrianal shield (bearing 2–3 pairs of setae in addition to circum-anal setae; most *Dicrocheles*); epigynal shield small or mid-sized, never large and snake-head shaped; shield bearing at most one pair of setae (*st*5); movable digit usually strongly claw-like and/or modified as to face laterad of fixed digit and bearing 1–4 coarse teeth, fixed digit often edentate and apically blunt, never both digits edentate and apically blunt (*i.e.* without apical hooks), and seldom both in normal chelate-dentate form (some *Dinogamasus*) 3

- Sternal shield relatively well-developed, bearing *st*1–3 (occasionally *st*1–4), or sternal shield split longitudinally in halves, each bearing three setae; *st*4 usually present; if *st*4 absent (uncertain for *Neoberlesia*), then epigynal shield either fused to anal shield (*Neoberlesia*), bearing 2–3 pairs of opisthogastric setae (*Urozercon*) or large and snake-head shaped (most *Myrmozercon*), and/or with anal shield (bearing only circum-anals); epigynal shield otherwise variable in size; both cheliceral digits edentate (and without or with weak apical hooks) or in normal chelate-dentate form (although *Jacobsonia* may have fixed digit with a finger-like projection apically), movable digit not strongly claw-like, and rarely a normally-hooked, dentate movable digit opposing an edentate fixed digit (*Iphiolaelaps*, few *Myrmozercon*) 7

3. Dorsal shield truncate posteriorly (although covering most of idiosoma), with 24 pairs of very short setae; most dorsal shield setae and many leg setae stout, bulbous; sternal region apparently without shield, transversely striate, *st*1 and *st*2–4 inserted anteriorly and posterolaterally to striate area, respectively; subcapitulum with *pc* absent . . . . . ***Scolopendracarus*** (Fig. 64)

- Dorsal shield shape and chaetotaxy variable; idiosoma without bulbous setae, legs sometimes with bulbous setae; sternal shield usually bearing *st*1–2 or *st*1–3, sometimes only *st*1; seta *pc* present 4

4. Dorsal shield mildly to extremely hypertrichous; cheliceral movable digit usually strongly curved, claw-shaped, facing a normal or variously reduced fixed digit, with pilus dentilis, both digits with 0–2 small teeth; deutosternum without distinct denticles; stigma enlarged; legs with many bulbous and spur-shaped setae; some leg segments hypertrichous: femur I usually with 14 setae (six dorsals, four ventrals), femora III–IV with seven setae (two ventrals), genu III with ten setae (two *pl*), genu IV with 11 setae (two *pl*, two ventrals) . . . . . ***Dinogamasus*** (Fig. 20)

- Dorsal shield bearing only 5–14 pairs of setae; cheliceral movable digit flared laterally (not facing fixed digit) or positioned between two lobes (= modified fixed digit), with 1–4 coarse teeth; fixed digit edentate, blunt, with pilus dentilis vestigial or absent; deutosternum with 10–16 rows of one or more denticles each; stigma of normal size; legs without bulbous or spur-shaped setae (except sometimes coxal setae with bulbous base); some leg segments holotrichous to hypotrichous: femur I with 10–12 setae (including 4–5 dorsals, 2–4 ventrals), femora III–IV with 5–6 setae (at most one ventral seta), genu III with 6–9 setae (only one *pl*), genu IV with 6–10 setae 5

5. Dorsal shield with 5–11 (usually 6–9) pairs of setae; cheliceral shaft not abruptly tapering, fixed digit reduced to two blunt lobes flanking movable digit, the latter with a single coarse tooth; sternal shield usually bearing *st*1–3, occasionally only *st*1–2; *st*4 absent; anal (or small ventrianal) shield usually terminal, bearing circum-anal setae and usually 2–3 extra pairs of setae on anterior margin (rarely only with circum-anal setae) . . . . . ***Dicrocheles*** (Fig. 19)

- Dorsal shield with 9–14 pairs of setae; cheliceral shaft swollen basally, tapering abruptly in distal half or so, fixed digit blunt, movable digit with 2–4 coarse teeth; sternal shield bearing only *st*1 or *st*1–2; *st*4 present; anal shield ventrally positioned, bearing only circum-anal setae 6

6. Seta *j*1 usually on soft cuticle, *j*3 near *j*1 but on dorsal shield; sternal shield well-developed, bearing *st*1–2; seta *pc* and one seta on each of coxae I–III bulbous basally; genua I–IV with 11 or 12-11-9-10 setae, respectively . . . . . ***Berlesia*** (Fig. 10)

- Seta *j*1 absent, *j*3 isolated anteriorly, on shield margin; sternal shield very reduced, bearing only *st*1; seta *pc* and coxal setae all normal, slender; genua I–IV with 8-6-6-8 setae, respectively . . . . . ***Katydiseius*** (Fig. 39)

7. Dorsal shield hypertrichous (45 to more than 400 "pairs" of setae), or if moderately hypotrichous (as few as 23–25 pairs; some *Myrmozercon*) then palp trochanter with only one seta, and/or epigynal shield large and snake-head shaped, and/or sternal shield strongly concave or eroded posteromedially; dorsal shield sometimes abbreviated/truncate posteriorly but rarely for a significant portion; epigynal shield otherwise either long and abutting a ventrianal shield, fused to anal shield, or entirely absent; epigynal shield rarely mid-sized and drop- or tongue-shaped; cheliceral digits usually edentate 8

- Dorsal shield usually very hypotrichous (8–25 pairs), at most with 40 pairs of setae; shield often strongly abbreviated posteriorly; palp trochanter with two setae; epigynal shield drop-, tongue- or flask-shaped, mid-sized or more often small (except in *Jacobsonia tertia*, with an expansive shield), never snake-head shaped; sternal shield rarely strongly concave or eroded posteriorly; chelicerae usually chelate-dentate, movable digit with two, occasionally one, teeth 11

8. Epigynal shield either fused to anal shield (into a hologastric shield) or epigynal and anal shields absent. 10

- Epigynal shield distinct from anal shield 9

9. Epigynal shield bearing only *st*5 (if present), usually large and snake-head shaped, only occasionally reaching close to anal shield; circum-anal setae short or mid-sized, not strongly spine-shaped (stout, cylindrical in *M. hunteri*). . . . . ***Myrmozercon*** (part) (Fig. 49)

- Epigynal shield bearing *st*5 and 2–3 pairs of opisthogastric setae, long, strongly to gently tapering into a pointed or rounded apex, abutting a ventrianal shield (bearing *Jv*3 on its anterolateral corners); circum-anal setae very long (para-anals typically longest) and strongly spine-shaped, protruding posteriorly . . . . . ***Urozercon*** (Fig. 74)

10. Epigynal and anal shields absent; idiosoma, dorsally and ventrally, highly hypertrichous; dorsal shield uniquely saddle-shaped, with anterolateral lobes of shield bearing stigmata and short peritremes; tarsi II–IV with a peripodomeric suture in distal third; cheliceral digits stout; leg I only moderately longer than legs II–IV, without ambulacrum. . . . . ***Suracarus*** (Fig. 71)
- Epigynal shield expanded posteriorly and fused to anal shield into a hologastric shield, tapered posteriorly; dorsal shield and opisthogaster only moderately hypertrichous; peritrematal shield normal, elongate, fused anteriorly with dorsal shield; tarsi II–IV with normal peripodomeric suture, in proximal fourth of segment; cheliceral digits slender; leg I much longer than legs II–IV, with ambulacrum (at least with stalk and pulvillus) . . . . . ***Neoberlesia*** (Fig. 51)

11. All idiosomal setae very short; dorsal shield putatively strongly truncate posteriorly (based on male description only), bearing only 8–9 pairs of setae; sternal shield relatively small, with indistinct margins, *st*1–3 thickened; epigynal shield somewhat tongue-shaped, truncate posteriorly, not extending beyond coxae IV posteriorly, bearing *st*5 near posterior margin; chelicerae stout, movable digit with a single coarse tooth; corniculi very short, convergent, narrowly separated; internal malae slender, much longer than corniculi (scarab associates) . . . . . ***Dynatochela*** (Fig. 22)
- Without such a combination of features, and in particular: dorsal shield never with fewer than 13 pairs of setae (except in one *Julolaelaps* species), movable digit infrequently with a single coarse tooth, corniculi usually well-developed and/or distant, internal malae at most moderately longer than corniculi (mostly myriapod associates) 12

12. Leg chaetotaxy heavily reduced, including genua I–IV with 6–8, 4–6, 4–7 and 4–7 setae, respectively; epigynal shield small to extremely small (except for *Jacobsonia tertia*) 13
- Leg chaetotaxy at most moderately reduced, with genua I–IV bearing 8–13, 10–11, 8–9 and 8–10 setae, respectively; epigynal shield small to moderately large 15

13. Idiosoma subcircular; sternal shield split longitudinally in halves, each bearing three setae; fixed cheliceral digit shortened, edentate, finger-like, movable digit with a single, strong subapical tooth before apical hook; genu I with eight setae . . . . . ***Iphiolaelaps*** (Fig. 36)
- Idiosoma suboval, more elongate; sternal shield normal, entire; chelicerae chelate-dentate, fixed digit with 1–3 teeth, movable digit with 1–2 teeth; genu I with six setae 14

14. Venter with stout, bulbous setae, including *st*2–5 and 3–4 pairs of opisthogastric (*Jv*-*Zv*) setae; sternal shield about as long as wide, not extending posteriorly beyond mid-level of coxae III; cheliceral fixed digit without apical process; genua I–IV with 6-6-6-7 setae, respectively, tibiae I–IV with 8-7-7-7 setae . . . . . ***Conolaelaps*** (Fig. 16)
- Venter with all setae simple or at most slightly thickened; sternal shield strongly developed, at least twice as long as wide, more or less reaching level of posterior edge of coxa III; fixed cheliceral digit often with a long slender apical process; genua I–IV with 6-4-4-4 setae, respectively, tibiae I–IV with 6-5-5-5 setae . . . . . ***Jacobsonia*** (Fig. 37)

15. Dorsal shield tapering posteriorly, somewhat inversely subtriangular or pear-shaped, margins often irregular; dorsal shield setae minute (except *Z*5 often mid-sized); epigynal shield almost as wide as sternal shield, with barely any neck and posterior margin almost truncate (somewhat purse-shaped), *st*5 inserted medially, away from margin; anal shield usually large, obovate, with para-anal setae distinctly anterior to anus; peritreme extremely short, barely longer than its width; cheliceral digits markedly elongate, slender; femur I with 9–11 setae, genu and tibia I each with eight setae . . . . . ***Narceolaelaps*** (Fig. 50)
- Dorsal shield oval or suboval, rarely tapering, margins smooth (not irregular); dorsal shield setae usually short or very short, rarely most setae minute; epigynal shield very narrow to mid-sized, usually with a narrow neck, *st*5 on margin (rarely off shield); anal shield mid-sized, usually subtriangular, para-anal setae usually level with anus, never significantly anterior to it; peritreme longer, reaching at least mid-level of coxa III; cheliceral digits not markedly elongate; leg chaetotaxy: femur I with 12–13 setae, genu I with 9–13 setae, tibia I with 10–13 setae . . . . . ***Julolaelaps*** (Fig. 38)

16. Epigynal shield large to extremely large, bearing *st*5 and at least one additional pair of (*Jv* or *Zv*) setae; if only bearing *st*5 (uncommon), shield at least broadly abutting anal shield (*e.g.* some *Nidilaelaps*, *Ulyxes*); few exceptions, with shield bearing only *st*5 and not reaching anal shield (rare *Alloparasitus*, *Euandrolaelaps* and some *Haemolaelaps*, the latter with whip-like pilus dentilis and tritosternal base barbed) 17
- Epigynal shield of various sizes, bearing at most *st*5 (except rare *Cosmolaelaps* with additional setae); epigynal shield rarely broadly abutting anal shield (as in *Eumellitiphis*: with many marginal setae stout, capitate; *Melittiphisoides*: *st*2 with bulbous base; some *Pogonolaelaps*: lacking *st*4, and *iv*3 on sternal shield; *Tropilaelaps*: epigynal shield remarkably long, narrow; and rare *Androlaelaps*: pilus dentilis hypertrophied but tritosternal base not barbed) 29

17. Epigynal shield with two or more pairs of setae other than *st*5 inserted medially, distant from shield margin; shield always strongly expanded laterally, usually reaching level of outer edge of coxae IV and abutting (or fused to) anal shield (distant from anal shield in *Sphaeroseius*) 18
- Epigynal shield with *st*5 and at most 2–3 pairs of *Jv*-*Zv* inserted on (or near) shield margin; shield variously shaped, typically not expanded laterally beyond mid-level of coxae IV (some exceptions, *e.g. Laelaspis*); free from anal shield, abutting it or not . . 23

18. Anal shield fused to a broadly expanded epigynal shield, forming a hologastric shield 19
- Anal shield discrete, but may be abutting an expanded epigynal (genitiventral) shield. 20

19. Presternal area with two discrete platelets; sternal shield separate from endopodal plate (at most abutting it); *st*4 normal, inserted on soft cuticle or on sternal shield margin; hologastric shield usually with five pairs of opisthogastric setae in addition to *st*5, sometimes only three; palp tarsal claw 3-tined. . . . . ***Ololaelaps*** (Fig. 54)
- Presternal area without discrete platelets; sternal shield broadly fused to metasternal and posterior endopodal elements; *st*4 absent, but with sockets modified as pits, on sternal-metasternal-endopodal shield complex; hologastric shield with only three pairs of opisthogastric setae in addition to *st*5; palp tarsal claw 2-tined . . . . . ***Oloopticus*** (Fig. 55)

20. Dorsal shield hypertrichous, ranging from *ca*. 45–55 pairs of setae to many more pairs (most *Sphaeroseius*); with six or more unpaired "*Jx*" setae (exception: one *Reticulolaelaps* species may have many *Jx* setae but no or few pairs in addition to basic complement of 37 pairs); without (or rarely with) discrete presternal platelets; sternal shield much wider than long or strongly concave posteriorly 21
- Dorsal shield more or less holotrichous, with 37–40 pairs of setae (including 0–2 pairs of *Zx* setae), and occasionally 1–3 *Jx* setae; with paired presternal platelets; sternal shield at most slightly wider than long and at most moderately concave posteriorly . . . 22
21. Epigynal shield usually subquadrate posteriorly and abutting large bowl-shaped anal shield, bearing six, sometimes only four, pairs of setae (*st*5, *Jv*-*Zv* setae); *st*4 absent; palp trochanter with a large paraxial lobe; cheliceral digits relatively small, with normal apical hooks; legs shorter than idiosoma . . . . . ***Reticulolaelaps*** (Fig. 62)
- Epigynal shield rounded posteriorly, hypertrichous, bearing 20 or more irregular "pairs" of setae, separate from small anal shield; *st*4 usually present, on or off sternal shield; palp trochanter without a paraxial lobe; cheliceral digits elongate, tong-like, with strong apical hooks; legs much longer than idiosoma . . . . . ***Sphaeroseius*** (Fig. 67)
22. Epigynal shield posteriorly truncate, broadly abutting anal shield; *st*4 present; palp tarsal claw 3-tined (occasionally 2-tined); dorsal shield without extra podonotal setae, usually with *Zx*2–3 and occasionally with 1–3 *Jx* setae. . . ***Pseudoparasitus*** (Fig. 60)
- Epigynal shield broadly rounded posteriorly (therefore touching anal shield only medially); *st*4 absent; palp tarsal claw 2-tined; dorsal shield with an extra pair of podonotal setae ("*zx*"), with 0–1 pair of *Zx* and without *Jx* setae . . . . . ***Hypoaceus*** (Fig. 32)
23. Epigynal shield massive, strongly expanded behind coxae IV, broadly rounded posteriorly (rarely acuminate), usually strongly bulging (angled) laterally between *st*5 and *Zv*1 (and typically reaching outer edge of coxae IV), and bearing 2–3 pairs (at least *st*5, *Zv*1) of setae on its margins; shield characteristically ornamented with two elongate, parallel inverted-V-shaped ridges (the outer ridge often less distinct) enclosing medially 8–9 cells; dorsal setae generally long (sometimes whip-like) and (often inconspicuously) barbed, especially marginally . . . . . ***Laelaspis*** (Fig. 40)
- Epigynal shield enlarged, but not so broadly expanded laterally, rarely reaching more than mid-level of coxa IV; ornamentation of shield different; dorsal setae usually mid-sized (long and barbed in *Gymnolaelaps artavilensis* Joharchi & Halliday and some *Haemolaelaps*) 24
24. Epistome denticulate; leg setae smooth; pilus dentilis normal, short; palp tarsal claw 2- or 3-tined; posteriorly (to inverted-V ridge, if discernible), epigynal shield typically with coarse reticulation, resulting in many subquadrate (*e.g*. 8–13) cells (or smooth), not with transverse striae; paired presternal platelets often present 25
- Epistome smooth, or if denticulate, then femora with some barbed or bifid setae, or pilus dentilis very long; palp tarsal claw 2-tined; posteriorly, epigynal shield usually with 5–8 transverse striae; presternal area weakly sclerotised, lineate-reticulate, without well-sclerotised platelets 27
25. Palp tarsal claw 3-tined; parapodal plate usually well-developed, moderately broad; epigynal shield bottle-shaped, broadly abutting anal shield, bearing 2–4 pairs of setae (including *st*5) on shield margins . . . . . ***Gymnolaelaps*** (Fig. 28)
- Palp tarsal claw usually 2-tined, rarely 3-tined; parapodal plate usually narrow; epigynal shield usually drop-shaped, sometimes flask-shaped, relatively close to anal shield but rarely abutting it, bearing 1–2 (rarely three) pairs of setae on shield margins . . 26
26. Epigynal shield drop-shaped, usually separated from anal shield by about half length of anal shield; shield with a narrow neck between coxae IV, leaving a substantial area of soft cuticle exposed between shield's neck and endopodal plates; bearing *st*5 and one additional pair (*Zv1*) of setae on margins (except *E. karawaiewi*, with a narrower shield bearing only *st*5); peritrematal shield not expanded past coxa IV; leg II typically with femur, genu and tibia with *av* seta spur- or spine-shaped . . . . . ***Euandrolaelaps*** (Fig. 24)
- Epigynal shield typically flask-shaped (in type species), almost abutting anal shield, sometimes more drop-shaped and modestly separated from anal shield (distance may be similar to that in *Euandrolaelaps*); shield's neck less narrow, with little or no soft cuticle exposed between neck and endopodal plates; bearing *st*5 and 1–2 additional pairs of setae on its margins (setae rarely only flanking shield); peritrematal shield sometimes posteriorly expanded beyond coxae IV (and flared out in type species); leg II with ventral setae seldom spur- or spine-shaped. . . . . ***Alloparasitus*** (Fig. 6)
27. Pilus dentilis very long (about as long as movable digit); dorsal shield without *Jx* setae; base of tritosternum distinctly barbed laterally; many leg setae barbed (*e.g*. dorsals on femora); epigynal shield drop- or tongue-shaped, usually not abutting anal shield . . . . . ***Haemolaelaps*** (Fig. 29)
- Pilus dentilis normal, short; dorsal shield with 1–9 unpaired *Jx* setae near area of *J*4; base of tritosternum smooth laterally; leg setae bifid or not, but not barbed; epigynal shield bottle- or flask-shaped, more or less abutting anal shield 28
28. Legs with bifid setae (especially dorsal setae on femora); fimbriae of internal malae often with inflated tips or palp trochanter with *v*2 foliate . . . . . ***Ulyxes*** (Fig. 73)
- Legs without bifid setae; fimbriae of internal malae and *v*2 of palp trochanter normal, not inflated. . . . . ***Nidilaelaps*** (Fig. 53)
29. Dorsal shield with several very long (whip-like, often wavy) setae near margin (typically *j*3, *z*4, *s*4, and *Z*4), sometimes in contrast with very short central setae; in other cases, central and other marginal setae mid-sized (*e.g*. some *Hypoaspis*) or long (*e.g*. some *Hypoaspis*; most *Coleolaelaps*, with most setae long to very long); if only *Z*4 is very long (*e.g*. *Blaberolaelaps*, *Lucanaspis*), then at least a few other setae (*e.g*. *j*3, *z*4) clearly longer than short central setae; dorsal shield almost never with more than 37 pairs of setae (except rare *Hypoaspis* species with 38–39 pairs, and one species of *Chapalania* with 46 pairs), often with 18–33 pairs of setae, with several setae lost or not captured by the shield (*e.g*. *r*2–3); *Jx* rarely present; *Jv*5 or a caudal *R* seta also often whip-like; legs nearly always with some macrosetae (usually distinctly longer than femur IV), most commonly on leg IV; epistome subtriangular (except truncate in a *Chapalania* species), with apex pointed or often somewhat tongue-shaped, medially (*i.e*. near apex) smooth or with fewer denticles, more densely denticulate laterally (except *Blaberolaelaps*, with fimbriate epistome) (mostly scarab associates) 30
- Dorsal shield with setae usually subequal in length, at most with moderately longer setae posteriorly or marginally (if dorsal shield with relatively long marginal setae contrasting with very short central setae, then pilus dentilis hypertrophied (some *Androlaelaps*)

or sternal shield very small, bearing only *st*1 (*Scorpionyssus*)); shield chaetotaxy variable, often with 37–39 or more pairs of setae and one or more *Jx*; seta *Jv*5 usually not whip-like; legs rarely with distinct macrosetae (exceptionally, *Angosomaspis* has macrosetae, but also a strongly hypertrichous dorsal shield); epistome variable, rarely with a tongue-shaped apex (free-living or associated with various arthropods, rarely scarabs) 40

30. Sternal shield usually eroded marginally, more or less separated from endopodal fragments (sometimes resulting in a quadrate shield), *st*1 often on weakly sclerotised area anterior to shield; and/or dorsal shield distinctly narrower or eroded in posterior half, and with 21–30 pairs of mid-sized to very long setae (or spur-shaped in *Dyscinetonyssus*), none or few setae very short (*e.g. z*1) 31
- Sternal shield usually entire, including endopodal extensions (may show sign of erosion posterolaterally, *e.g.* in *Dynastaspis*, which has dorsocentral setae very short), *st*1 usually on shield margin; dorsal shield normal, suboval to broadly oval, and with 18–39 pairs of setae (rarely more), usually including minute or very short central setae, if central setae mid-sized to long, then dorsal shield bearing 30–39 pairs of setae 34

31. Strong spur-shaped setae on dorsal and sternal shields and coxae; dorsal shield markedly broader anteriorly, bearing *r*2–5; peritreme shortened (barely reaching coxa II); deutosternum narrow, with 13–14 transverse rows of mostly 3–5 denticles each; anal shield terminal; palp chaetotaxy reduced on femur–tibia, with 4-3-10 or 11 setae; legs highly hypotrichous, *e.g.* genua I and II (respectively 11 and nine setae) and tibiae I and II (ten and eight setae), all these segments having lost at least one *ad* . . . . . ***Dyscinetonyssus*** (Fig. 23)
- All idiosomal setae relatively slender, none spur-shaped; dorsal shield not markedly broader anteriorly (although *Coleolaelaps* has shield moderately narrowed posteriorly), and *r*-series usually off shield; peritreme long (reaching coxa I or almost so); deutosternum broad, with six rows of ten or more denticles each; anal shield ventrally positioned; palp chaetotaxy normal, with 5-6-14 setae for femur–tibia; leg chaetotaxy mostly normal (few exceptions), including genua I (13, rarely fewer setae) and II (11 setae), and tibiae I and II (respectively 13 and ten setae) 32

32. Soft opisthogastric and lateral cuticle very hypertrichous, with about 90 "pairs" of setae; post-anal seta distinctly shorter than para-anal setae; claws of pretarsi II–IV each with a basoventral spur . . . . . ***Acantholaelaps*** (Fig. 5)
- Soft opisthogastric and lateral cuticle at most with *ca*. 40 pairs of setae; post-anal seta subequal to or longer than para-anal setae; claws normal, without basoventral spur 33

33. Dorsal shield usually narrower in opisthonotal region and with lateral incisions between podonotal and opisthonotal regions; seta *h*3 usually mid-sized, not distinctly longer than *h*1–2; tarsus II sometimes with thick or spine-shaped setae but not apically blunt . . . . . ***Coleolaelaps*** (Fig. 15)
- Dorsal shield only gently tapering posteriorly; *h*3 long, distinctly more so than *h*1–2; tarsi II–IV with blunt spur-shaped setae, especially subapical *al*1, *pl*1 . . . . . ***Mumulaelaps*** (Fig. 48)

34. Dorsal shield with most setae mid-sized to very long, other setae not very short (except *z*1, *j*5, typically very short, and *Hypoaspis remilleti* Costa with central setae minute); shield bearing 30–39 pairs of setae, usually 36–37 and including *Zx*2–3 35
- Dorsal shield with many minute or very short setae, especially centrally, in contrast to a few long to (usually) very long marginal setae; shield usually bearing fewer than 34 pairs of setae (except a *Chapalania* species with 46 pairs), including at most (rarely) one pair of *Zx* setae 36

35. Dorsal shield usually with 36–37 pairs of setae, including *Zx*2–3; genu IV nearly always with nine setae, including one ventral seta (*H. melolonthae* has ten setae, including two ventrals); tarsus II with stout setae, including spur-shaped *al*1, *pl*1; post-anal seta subequal or slightly shorter than para-anal setae . . . . . ***Hypoaspis*** (Fig. 33)
- Dorsal shield with 30–31 pairs of setae, lacking *Zx* setae; genu IV with ten setae, including two ventrals; tarsus II with setae mostly slender, including *al*1, *pl*1; post-anal setae slightly longer than para-anal setae . . . . . ***Promacrolaelaps*** (Fig. 59)

36. Palp trochanter with *v*2 (inner) seta unusually flattened and elongate, reaching tip of femur; dorsal shield distinctly truncate (straight) posteriorly, bearing 24–26 pairs of setae; post-anal seta much thicker and at least twice as long as para-anal setae; movable cheliceral digit tapered, only weakly hooked apically, and distinctly longer than fixed digit; genu IV with ten setae, including two ventrals . . . . . ***Blaberolaelaps*** (Fig. 12)
- Palp trochanter with seta *v*2 simple and short, usually reaching at most mid-level of femur; dorsal shield broadly rounded posteriorly (may be slightly truncate posteriorly in some *Dynastaspis*), bearing 17–33 pairs of setae (except about 46 in one *Chapalania* species); post-anal seta usually subequal to para-anal setae, rarely much longer (in *Chapalania*); movable cheliceral digit with normally developed apical hook, subequal to fixed digit; genu IV usually with nine setae, lacking *pv* 37

37. Femur II strongly constricted medially; post-anal seta whip-like, about twice as long as anal shield, para-anal setae short; femur IV at most with a relatively weak macroseta; genua III–IV with strong macrosetae, much longer than setae on femur IV . . . . . ***Chapalania*** (Fig. 14)
- Femur II normal, not constricted medially; post-anal seta short or mid-sized, subequal to para-anal setae; femur IV with a strong macroseta; genua III–IV at most with a relatively weak macroseta, much shorter than macroseta on femur IV 38

38. Dorsal shield with only 17–19 pairs of setae; sternal shield distinctly granular (partly or entirely) . . . . . ***Chapalaelaps*** (Fig. 13)
- Dorsal shield with 31–33 pairs of setae; sternal shield reticulate or smooth, not distinctly granular 39

39. Dorsal shield with 33 pairs of setae, including *Zx*2, with most setae very short including along margins, except mainly *j*3, *z*4 long and *Z*4 whip-like; dorsal, sternal and epigynal shields smooth; soft opisthogastric and lateral cuticle only with 12–14 pairs of short setae posteroventrally, and only *r*2–3 anteriorly . . . . . ***Lucanaspis*** (Fig. 44)
- Dorsal shield with 31–32 pairs of setae, without *Zx* setae, central setae very short, most marginal setae mid-sized or elongate (including *z*4, *s4*–5, *Z*4 whip-like); dorsal, sternal and epigynal shields densely reticulate; soft opisthogastric and dorsolateral cuticle moderately hypertrichous, with 27–33 pairs of relatively long setae, including whip-like *Jv5* . . . . . ***Dynastaspis*** (Fig. 21)

40. Dorsal shield strongly hypertrichous (*ca*. 150–800 setae), with extra setae distributed across most areas of the shield; if only moderately hypertrichous (*ca*. 100–120 setae or 50–60 "pairs", extra setae mostly in opisthonotal region), then *st*4 absent and

poroid *iv*3 on posterolateral corners of sternal shield (*Pogonolaelaps*), or soft dorsolateral cuticle with a series of nine or more pairs of stout capitate setae in contrast to simple setae on dorsal shield (*Eumellitiphis*); sternal shield entire, not split in halves; pilus dentilis not hypertrophied 41

- Dorsal shield usually with 37–41 pairs of setae, sometimes with 1–4 unpaired *Jx* setae (or more, *e.g*. 10–12 in *Hunteria* and 13–16 in some *Pneumolaelaps*), occasionally hypotrichous (15–36 pairs of setae) or with a few more pairs (*e.g*. 42–45 in *Gecarcinolaelaps*); exceptionally, shield may have *ca*. 25 extra setae encompassing both *J* and *Z* series (rare *Cosmolaelaps* and *Pneumolaelaps*); if dorsal shield strongly hypertrichous (uncommon), then sternal shield split longitudinally in halves (*Scissuralaelaps*) or pilus dentilis hypertrophied (*Androlaelaps*); *st*4 rarely absent; *iv*3 on soft cuticle, rarely on margin of sternal shield; never with stout, capitate setae along idiosomal margin contrasting with simple setae on dorsal shield 48

41. Soft dorsolateral cuticle of idiosoma bearing on each side a series of 9–40 stout and spatulate or rod-like, capitate setae; legs with many similar spatulate or rod-like, capitate setae; anal shield enlarged, distinctly wider than long, metapodal plates sometimes also enlarged. 42

- Soft dorsolateral cuticle and legs without stout and spatulate or rod-like, capitate setae; anal shield typically mid-sized, if large then distinctly longer than wide; metapodal plates never enlarged 43

42. Posterolateral margin of idiosoma with a series of over 30 pairs of stout, flattened setae, tightly spaced; dorsal shield extremely hypertrichous, bearing over 400 minute setae distributed more or less evenly across shield . . . . . ***Neohypoaspis*** (Fig. 52)

- Posterolateral margin of idiosoma with a series of 9–11 pairs of stout, apically bulbous setae, more widely spaced and partly interspersed with several needle-like setae; dorsal shield at most markedly (but not extremely) hypertrichous, mostly posteromedially, with 17–70 extra setae in addition to basic complement of 37 pairs of setae (therefore a total of *ca*. 90–145 setae) . . . . . ***Eumellitiphis*** (Fig. 25)

43. Anal shield large, distinctly longer than wide, 5–8 times as long as the length of anus, suboval or subquadrate; opisthogaster strongly hypertrichous, with setae tylochorous; deutosternum narrow, with 1–2 denticles per row (possibly more denticles in male) (honeybee associates) 44

- Anal shield mid-sized, not distinctly longer than wide, usually 3–4 times as long as the length of anus, subtriangular or suboval; opisthogaster variable, rarely both hypertrichous and with tylochorous setae; deutosternum with four or more denticles (except in *Myrmozercon brevipes*, with one denticle) per row (free-living, ant or beetle associates). 45

44. Idiosoma subcircular; corniculi mid-sized; presternal area with an elongate, subhexagonal plate bearing a keel-like ridge medially, sternal shield strongly concave anteriorly; epigynal shield compact, relatively short, well separated from anal shield; anal shield with anus in its posterior half, and with a spur anterior to anus . . . . . ***Melittiphis*** (Fig. 46)

- Idiosoma suboval, elongate; corniculi short; presternal area simple (fused to sternal shield or weakly sclerotised), without elongate subhexagonal plate, sternal shield anteriorly straight or convex; epigynal shield very long, narrow and abutting or overlapping anal shield; anal shield with anus near its centre, and without any spur . . . . . ***Tropilaelaps*** (Fig. 72)

45. Dorsal shield with some mid-sized setae (*e.g*. putatively *j*1–4, *Z*5) and some short setae (putative *z*2, *z*4, *s*4) contrasting with numerous minute setae; sternal shield normal (except for reduced endopodal extensions between coxae I–II and II–III), posterior margin straight; *st*4 present; each of femora II–IV and tarsus IV with a dorsal macroseta; opisthogastric and dorsolateral soft cuticle hypertrichous, with long and mid-sized setae, respectively . . . . . ***Angosomaspis*** (Fig. 8)

- Dorsal shield with all setae subequal (usually short, longer in some species), or at most with several posteromarginal setae longer; sternal shield usually moderately to strongly concave posteriorly or eroded posteromedially; *st*4 often absent; legs without distinct macrosetae; opisthogastric and dorsolateral soft cuticle usually not hypertrichous, if so then setae are short or mid-sized, not long 46

46. Dorsal shield usually truncate posteriorly, leaving some soft cuticle exposed; peritreme usually short, not extending past mid-coxa II; cheliceral digits usually edentate and without apical hooks; epigynal shield usually snake-head shaped, tapered posteriorly, or if drop-shaped (more rarely) then either opisthogaster hypertrichous or at least two segments of palp trochanter–tibia with fewer than the usual number of setae (2-5-6-14, respectively); internal malae usually reduced, with little or no fimbriae . . . . . ***Myrmozercon*** (part) (Fig. 49)

- Dorsal shield usually covering all idiosoma dorsally (truncate in one *Pogonolaelaps*); peritreme long; chelicerae chelate-dentate; epigynal shield large, drop- or tongue-shaped, rarely snake-head shaped, tapered posteriorly; opisthogaster not hypertrichous; palp chaetotaxy normal (not studied for *Laelaspisella*); internal malae strongly developed, with long, dense fimbriation 47

47. Dorsal shield with moderate hypertrichy mostly restricted to opisthonotal region, with *ca*. 45–50 pairs of setae and 7–15 unpaired *Jx*; presternal area weakly sclerotised, without discrete platelets; palp tarsal claw 3-tined, without adjacent hyaline scale; poroid *iv*3 on posterolateral corners of sternal shield. . . . . ***Pogonolaelaps*** (Fig. 58)

- Dorsal shield strongly hypertrichous, with extra setae distributed across most areas of the shield, resulting in the equivalent of about 90 irregular "pairs" of setae; presternal area apparently with two sclerotised platelets; palp tarsal claw 2-tined, and associated with a hyaline scale; poroid *iv*3 putatively on soft cuticle . . . . . ***Laelaspisella*** (Fig. 41)

48. Sternal shield normal, bearing *st*1–3 (*st*1 occasionally on weakly sclerotised presternal area, *e.g*. some *Cosmolaelaps*, *Gaeolaelaps*), including endopodal elements which at most narrowly extend between coxae I–II and II–III; shield not strongly broadened (but may be moderately wider than long, rarely much broader, *e.g*. some *Androlaelaps*, *Stigmatolaelaps*), posterior margin at most moderately concave (*e.g*. in some *Holostaspis* or *Pneumolaelaps*), and free of (and at most abutting) endopodal plate posteriorly; leg chaetotaxy usually normal, except mostly for variable genu IV (9–11 setae) and femora III–IV (6–7 setae); palp chaetotaxy usually normal, including trochanter with two setae 49

- Sternal shield with at least one unusual feature: endopodal extensions between coxae I–II or II–III hypertrophied, shield reduced, desclerotised or eroded marginally (sometimes as to bear only 1–2 pairs of setae), strongly broadened and deeply concave posteriorly (concavity at least as deep as half the median length of shield), fused to endopodal plate posteriorly, or longitudinally divided in halves; if shield normal (rarely), legs variously hypo- or hypertrichous and/or palps hypotrichous (*Ljunghia*: tibia II

with only 8–9 setae, lacking one *pl*; *Myrmozercon*: *e.g.* genu and tibia III: 8–11 and 7–10 setae, rarely normal with nine and eight, respectively, and palp trochanter often with one seta) 61

49. Chelicerae edentate or nearly so, digits at most with 1–2 small teeth each, and apical hooks at most weakly developed; if both digits have terminal hooks, then digits short, stumpy; corniculi short, often blunt or notched apically; post-anal seta moderately thicker and longer than para-anal setae. 50
- Chelicerae normal, chelate-dentate, rarely short and stumpy; if digits appear short or with weak teeth or terminal hooks, then pilus dentilis inflated basally or longer than usual (*Androlaelaps*, *Gromphadorholaelaps*); corniculi usually normal, well-developed, occasionally short but not blunt or notched; circum-anal setae variable in length. 52

50. Dorsal shield narrow; dorsal setae mostly short and simple except a few setae anteriorly (including putatively *z*4–6) and *Z5* spine-shaped, distinctly longer and thicker than surrounding setae; opisthogastric setae short; setae *pc* and *h*1–3 very short; tritosternum with laciniae mostly smooth except for a few barbs apically; pretarsi with pulvilli enlarged, longer than wide, claws absent or indistinct . . . . . ***Stevelus*** (Fig. 68)
- Dorsal shield oval to broadly obovate; dorsal setae generally longer posteriorly (including *Z*5), but without podonotal setae distinctly longer than surrounding setae; some opisthogastric setae often longer posteriorly; setae *pc* and *h*1–3 usually well-developed, mostly mid-sized, *h*3 often longest; tritosternum with laciniae with normal pilosity (uncertain for *Apolaelaps*); pretarsi with normally developed claws and pulvilli. 51

51. Post-anal seta very long, at least twice as long as anal shield and much longer than short para-anal setae; dorsal shield truncate posteriorly, with significant area of soft cuticle exposed; epigynal shield more or less drop-shaped, with unknown ornamentation (possibly smooth); anal shield apparently suboval; deutosternum seemingly without rows of denticles . . . . . ***Apolaelaps*** (Fig. 9)
- Post-anal seta only moderately longer than para-anal setae, usually shorter than half the length of anal shield, rarely almost as long as shield; dorsal shield rarely truncate posteriorly or with significant amount of soft cuticle exposed behind it; epigynal shield typically snake-head shaped and with 2–5 V-shaped striae posteromedially; anal shield subtriangular, sometimes concave anteriorly; deutosternum with rows of 5–16 denticles each . . . . . ***Holostaspis*** (Fig. 30)

52. Genu IV with nine setae, including one ventral and one *pl* (rarely with ten setae including two ventrals or two *pl*); femora III–IV with six setae, including one ventral seta; deutosternum typically with at least seven denticles per row, occasionally fewer (with at least four denticles in most rows); pilus dentilis normal, short, and peritreme not broadened 53
- Genu IV with 10 or 11 setae, including two ventrals or two *pl*, or if with nine setae, then femora III–IV with seven setae, including two ventrals (*Xylocolaelaps*); deutosternum with rows of 1–7 denticles each (rarely more in some *Pneumolaelaps*, which have broad peritremes); pilus dentilis normal or hypertrophied 56

53. Dorsal setae variously modified, spatulate, cuneiform, leaf-like, or at least with a distinct asymmetric lobe near setal base; posterior opisthogastric setae and some leg setae often similarly shaped . . . . . ***Cosmolaelaps*** (Figs 3, 17)
- Dorsal, opisthogastric and leg setae simple (except possibly thickened or barbed). 54

54. Dorsal shield broadly oval, with 5–6 unpaired *Jx* setae; setae short, except *j*1, *Z*5 distinctly longer, *j*1 also thicker; *S*4–5, *Z*5, *r*2–5, and most setae on soft cuticle, including *r*6, *R*1–6 and posteriormost *Jv-Zv* setae finely barbed; sternal shield bilobed anteriorly (fused to presternal elements); epigynal shield robust, somewhat drop-shaped; anal shield obovate or drop-shaped; deutosternum with 10–15 denticles per row; internal malae with a pair of lateral arms fleshy, broadly developed and strongly fimbriate, more so than slender median arms . . . . . ***Laelaspoides*** (Fig. 42)
- Dorsal shield variable, usually with 0–3 unpaired *Jx* setae, seldom 4–9 *Jx*; setae usually short to mid-sized and subequal in length, *Z*5 occasionally distinctly longer than surrounding setae, but *j*1 not longer or thicker; posterior setae (*e.g. J4–5*, *Z*5) sometimes barbed, but rarely *r-R* or *Jv-Zv* setae; sternal shield with anterior margin usually straight (and *st*1 on margin or weakly sclerotised cuticle), rarely bilobed; epigynal shield, anal shield and deutosternum variable; if internal malae with a pair of lateral arms, these not broad and fleshy, and less developed than median arms 55

55. Epistome with margin serrate; deutosternal groove usually relatively broad and with ten or more denticles per row, rarely fewer than five per row; epigynal shield typically mid-sized and distant from anal shield; peritrematal shield rarely fused posteriorly with exopodal plate. . . . . ***Gaeolaelaps*** (Figs 1, 2)
- Epistome with margin smooth, at most with few denticles apically; deutosternal groove narrow, with 2–10 denticles per row, rarely more (10–15); epigynal shield relatively large, typically close to anal shield, separated from it by about half length of anal shield; peritrematal shield occasionally fused posteriorly with exopodal plate. . . . . ***Hypoaspisella*** (Fig. 34)

56. Femora III–IV bearing seven setae, including two ventrals; peritrematal shield not extending behind stigma; deutosternum with 9–11 rows of 1–2 denticles each except 2–4 in most basal rows 57
- Femora III–IV bearing six setae, including one ventral seta; peritrematal shield usually moderately extending behind stigma; deutosternum with six (rarely five or seven) rows of usually 2–6 denticles each (rarely more, 7–12) 58

57. Stigma greatly enlarged (at least twice as wide as tritosternal base); dorsal shield with 39–40 pairs of setae, including *z*3, *z*6, *Zx*2–3 and 2–4 unpaired *Jx* near area of *J4* setae; peritreme long, reaching level of coxa I; genu IV with ten setae, including two ventrals (based on *S. greeni*). . . . . ***Stigmatolaelaps*** (Fig. 69)
- Stigma normal in size (not wider than tritosternal base); dorsal shield with only 36 pairs of setae (in the only known species), lacking *z*3, *z*6, *Zx*2–3 and *Jx* setae; peritreme relatively short (not extending beyond coxa II); genu IV with nine setae, including one ventral seta . . . . . ***Xylocolaelaps*** (Fig. 75)

58. Genu IV with two *pl* setae and a single ventral seta (*av*); chelicera with pilus dentilis usually inflated basally, if not, pilus dentilis longer than usual; males with cheliceral digits essentially edentate, fixed digit reduced and finger-like, with pilus dentilis inserted in basal half. 59
- Genu IV with a single *pl* seta and two ventral setae (*av*, *pv*); pilus dentilis normal, *i.e.* short and slender; known males with normal, chelate-dentate fixed digit, with pilus dentilis inserted in distal half 60

59. Epigynal shield flask-shaped (truncate posteriorly); peritreme short, not reaching mid-level of coxa II; male chelicera with fixed

digit elongate, much longer than movable digit (of which only apex is discernible) and about as long as spermatodactyl . . . . . ***Gromphadorholaelaps*** (Fig. 27)

- Epigynal shield tongue to drop-shaped (rarely flask-shaped); peritreme usually long, reaching coxa I; male chelicera with fixed digit at most as long as movable digit (if discernible from spermatodactyl) and distinctly shorter than spermatodactyl . . . . . ***Androlaelaps*** (Fig. 7)

60. Epigynal shield moderately large, drop- or tongue-shaped, usually only slightly overlapping sternal shield anteriorly; *st*4 present; dorsal shield bearing short to long setae, often with longer setae anteriorly and latero-marginally; presternal area with or without discrete platelets; *Jv3* on soft cuticle, not on anal shield; soft cuticle bearing a dozen to more than 70 pairs of setae in addition to *Jv*-*Zv* setae; peritreme broadened; deutosternum typically with 1–2 denticles distinctly larger than other denticles in each row . . . . . ***Pneumolaelaps*** (Fig. 57)
- Epigynal shield massive, broadly overlapping sternal shield anteriorly, shaped like an axe head; *st*4 absent; dorsal shield bearing short, subequal setae; presternal area with discrete platelets; *Jv3* captured by anal shield; soft cuticle bearing only nine *Jv*-*Zv* setae, without *R* or *UR* setae; peritreme normal, narrow; deutosternum without denticles distinctly larger than others . . . . . ***Persicolaelaps*** (Fig. 56)

61. Sternal shield with hypertrophied endopodal extensions strongly separating coxae I–II, and/or separating coxae II–III; otherwise normally developed, bearing *st*1–3, with posterior margin entire and slightly concave at most (or narrowly concave in *Meliponaspis*) 62
- Sternal shield with endopodal extensions short, or if long then also narrow; sternal shield with other modifications, *e.g.* strongly reduced, concave or eroded posteriorly 64

62. Dorsal shield with setae spatulate-tricarinate; legs with several dorsal setae similarly shaped; presternal area with anastomosed sclerotised ridges (may appear as two weakly sclerotised plates); peritrematal shield broad, reticulate; cheliceral digits and corniculi long, the latter reaching tip of palp femur . . . . . ***Stratiolaelaps*** (Fig. 70)
- Dorsal shield with simple, slender setae; leg setae generally simple, may be thickened but not spatulate-tricarinate; presternal elements fused to sternal shield; peritrematal shield essentially absent; cheliceral digits and corniculi short. 63

63. Dorsal shield with about 39 pairs of setae and 10–12 unpaired *Jx* setae; sternal shield with anterolateral (endopodal) extensions strongly separating coxae I–II, about as broad as the (transverse) width of shield between mid-level of coxae II, posterolateral extensions normal, not separating coxae II–III; shield anteriorly not (or barely) reaching base of tritosternum; epigynal shield of moderate size, only slightly expanded posterolaterally, not reaching beyond level of paraxial edges of coxae IV; arthrodial membrane at the base of movable digit with a long spine-shaped process, without corona . . . . . ***Hunteria*** (Fig. 31)
- Dorsal shield with 32 pairs of setae, without *Jx* setae; sternal shield with anterolateral extensions moderately separating coxae I–II, posterolateral extensions stronger, extending across entire area between coxae II–III and beyond; shield anteriorly strongly extending over most of tritosternum and base of subcapitulum; epigynal shield expanded posterolaterally, reaching about mid-level of coxae IV; chelicera not studied, arthrodial membrane most likely without long spine-shaped process . . . . . ***Meliponaspis*** (Fig. 45)

64. Sternal shield deeply concave or eroded posteromedially, often resulting in an inverted U-shaped sternal shield, occasionally fused to endopodal plate and then bearing *st*1–4; if not concave or eroded posteromedially (rarely), then deutosternum with seven or more rows of denticles (most *Myrmozercon*), tibia II with only 8–9 setae (one *pl*; most *Ljunghia*), or anal shield concave anteriorly (some *Bisternalis*, *Myrmozercon*); epigynal shield mid-sized and tongue- or drop-shaped to large and snake-head shaped 65
- Sternal shield not distinctly concave or eroded posteromedially, not inverted U-shaped or fused to endopodal plate; instead, shield either strongly reduced in size and bearing only *st*1 (*Scorpionyssus*), posteriorly tongue-shaped with *st*3 off shield (*Cyclothorax*), split longitudinally in two halves (*Scissuralaelaps*), or moderately eroded marginally (*Gecarcinolaelaps*); deutosternum usually with 5–6 rows of denticles (12 rows in *Cyclothorax*); anal shield not concave anteriorly; epigynal shield small to mid-sized, drop/tongue/flask-shaped 71

65. Epigynal shield tongue- or drop-shaped, relatively mid-sized; anal shield usually rounded anteriorly, never concave; dorsal shield oval to tapered posteriorly 66
- Epigynal shield usually large, either snake-head shaped, or truncate posteriorly and abutting anal shield, rarely somewhat drop- or tongue-shaped; anal shield usually with well-defined anterolateral angles and anterior margin flat (*i.e.* shield triangular or nearly so) or concave (except in *Spatholaelaps* and few *Myrmozercon* with shield convex anteriorly); dorsal shield relatively broad, sometimes truncate posteriorly but not distinctly tapering. 68

66. Sternal shield extensively desclerotised medially, reduced to its lateral and anterior margins (remaining strip bearing *st*1–3); dorsal setae short except *j*1 mid-sized, and *Z*5 longest, spine-shaped; anal shield narrow, elongate posteriorly, more than twice as long as wide, anus in anterior half of shield; post-anal setae and posterior opisthogastric setae relatively long, spine-shaped, para-anal setae short; movable digit somewhat tapered and with weak apical hook, bidentate. . . . . ***Hyposternus*** (Fig. 35)
- Sternal shield usually concave or eroded posteriorly, but shield more extensive than above, not reduced to a marginal strip; dorsal setae with at least many setae mid-sized or long, and *j*1 or *Z*5 not distinctly longer or thicker; anal shield subtriangular to obovate, if about twice as long as wide, then anus inserted near centre of shield (except in some *Raymentia* with anus anteriorly positioned); post-anal setae simple, not spine-shaped, and subequal or shorter than para-anal setae; opisthogastric setae generally simple, posterior ones not thicker or longer than anterior ones; movable digit usually with normal apical hook, if apical hook weak then digit edentate (some *Ljunghia*) 67

67. Cheliceral digits large, each with a very strong terminal hook, movable digit with two large adjacent teeth, directly opposed to a raised, multidenticulate (molar-like) crown on fixed digit; dorsal shield tapering posteriorly, truncate or narrowly rounded apically, with 35–36 pairs of setae (including all *J* setae); sternal shield deeply eroded posteromedially, with length (measured outside the midline, ignoring eroded portion) and width subequal; legs hypertrichous for: femur I with 15 setae (including six ventrals), genu III with ten setae (two *pl*), genu IV with 11 setae (two *pl*, two ventrals), tibia III with nine setae (two *pl*); tibia II normal (ten

setae) . . . . . ***Raymentia*** (Fig. 61)

- Cheliceral digits generally small, with 1–2 teeth each (rarely three on fixed digit), sometimes edentate and without apical hooks; dorsal shield ranging from broadly oval to tapered posteriorly, with 15–36 pairs of setae, usually lacking 2–5 pairs of *J* setae; sternal shield usually much wider than long and deeply concave posteriorly, margin smooth (not eroded); legs with various setal reductions (rare additions): femur I with 12–13 setae (including 3–4 ventrals), genu III with nine setae (rarely ten with two *pl*), genu IV with 8–9 setae (4–5 dorsals, one *pl*, 1–2 ventrals), tibia II with 8–9 setae (one *pl*; rarely ten setae with two *pl*), tibia III with 7–8 setae (one *pl*) . . . . . ***Ljunghia*** (Fig. 43)

68. Peritreme usually short, not extending beyond mid-coxa II; cheliceral digits edentate, apically blunt, rarely with weak teeth or with an apical hook, fixed digit often reduced; dorsal shield usually broad and truncate posteriorly, exposing soft cuticle caudally; setae *st*1 distant from each other, inserted on sternal shield as normal, not on a distinct platelet 69
- Peritreme long, reaching coxa I; chelicerae chelate-dentate; dorsal shield broadly oval, not truncate posteriorly, with little or no soft cuticle exposed posterolaterally (uncertain for *Melittiphisoides*); *st*1 usually inserted close to each other on a small distinct platelet, separate or attached to sternal shield (except *B. camargoi*, with *st*1 farther apart and set on weakly sclerotised presternal area). 70

69. Epigynal shield rounded or acuminate posteriorly; anal shield usually subtriangular, with anterior margin concave; *st*4 often absent; deutosternum usually with seven or more (up to 21) rows of denticles; corniculi weakly sclerotised, often modified (blunt, bifid, lobe-like, or highly convergent); palps often with two or more segments with fewer setae than normal; leg segments ranging from very hypotrichous to hypertrichous . . . . . ***Myrmozercon*** (part) (Fig. 49)
- Epigynal shield rounded posteriorly; anal shield small, convex anteriorly; *st*4 present; corniculi apparently well-developed, horn-like, approximate and convergent; deutosternum, palp and leg chaetotaxy poorly known . . . . . ***Spatholaelaps*** (Fig. 66)

70. Epigynal shield snake-head shaped, with posterior apex rounded or acuminate; anal shield with anterior margin concave; seta *st*2 normal, slender; *st*4 on (discrete) endopodal plate or soft cuticle . . . . . ***Bisternalis*** (Fig. 11)
- Epigynal shield with posterior margin truncate, abutting a large bowl-shaped (anteriorly flat) anal shield; *st*2 with bulbous base, sternal shield broadly fused to endopodal plate, bearing also *st*4. . . . . ***Melittiphisoides*** (Fig. 47)

71. Sternal shield split longitudinally in two halves (or almost, if halves are narrowly joined anteriorly); legs with setal reductions and additions, including genu IV with 11 setae (two ventrals and two *pl*) and tibia I with 12 setae (six dorsals, two ventrals) . . . . . ***Scissuralaelaps*** (Fig. 63)
- Sternal shield not split longitudinally; leg chaetotaxy generally more reduced (or unknown, in *Cyclothorax*), including genu IV at most with ten setae (only one ventral seta) and tibia I at most with 11 setae (four dorsals, 2–3 ventrals). 72

72. Sternal shield somewhat funnel-shaped, strongly sclerotised anteriorly, including well-developed, straight, anterolateral extensions between coxae I–II; more thinly sclerotised and tongue-shaped posteriorly; seta *st*1 off shield, on weakly sclerotised cuticle; *st*3 on shield edge or on soft cuticle; *st*4 present; post-anal seta stout, distinctly longer than para-anal setae; dorsal shield subcircular, strongly sculptured and with thick posteromarginal setae, spine- or corkscrew-shaped; cheliceral digits edentate, subequal in length, finger-like . . . . . ***Cyclothorax*** (Fig. 18)
- Sternal shield different, at most with short endopodal extensions; shield greatly reduced (with *st*2–3 off shield) or eroded marginally, not tongue-shaped posteriorly; *st*4 present or absent; post-anal seta very short or minute, never longer than para-anal setae; dorsal shield elongate, not subcircular, bearing only minute setae or also longer setae lateromarginally, none spine- or corkscrew-shaped; cheliceral digits chelate-dentate, or edentate with fixed digit strongly reduced. 73

73. Dorsal shield with only 18–20 pairs of minute setae (*e.g.* lacking *J*1–2), central setae minute, setae on shield margin and soft dorsolateral cuticle long; sternal shield highly reduced, bearing only *st*1; epigynal shield somewhat drop-shaped, narrow, *st*5 on soft cuticle; para-anal setae mid-sized, much longer than minute post-anal seta; chelicerae edentate, fixed digit regressed, movable digit elongate, blunt; palp chaetotaxy reduced, including trochanter–genu with 1-4-4 setae; tarsi II–IV with simple setae, including *av*1 and *pv*1; leg chaetotaxy heavily reduced, genua with at most eight setae each, and tibiae I–IV with 8-7-7-6 setae. . . . . ***Scorpionyssus*** (Fig. 65)
- Dorsal shield hypertrichous, with 42–45 (irregular) pairs of very short setae, without any long setae on shield or soft lateral cuticle; sternal shield eroded marginally, bearing *st*1–3; epigynal shield relatively broad and compact, somewhat flask-shaped, bearing *st*5; all three circum-anal setae very short, subequal; chelicerae chelate-dentate; palp chaetotaxy normal for trochanter–genu, with 2-5-6 setae; tarsi II–IV with setae *av*1 and *pv*1 bulbous, with longitudinal ribs; legs with few reduction and additions: genua I–IV with 11-10-10-10 setae, and tibiae I–IV with 11-9-9-9 setae . . . . . ***Gecarcinolaelaps*** (Fig. 26)

Catalogue

Laelapidae Canestrini

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Iphiopsidae Kramer, 1886: 254.
Laelaptidae Canestrini, 1891: 722 (in part).
Gamasidae.—Canestrini, 1891: 723 (in part); Berlese, 1892f: 53 (in part); Banks, 1904: 11 (in part).
Laelaptidae.—Berlese, 1892f: 30 (in part), 1904c: 401, 1906: 86 (in part), 1913b: 10; Vitzthum, 1929: 21 (in part), 1931c: 142 (in part), 1942: 761 (in part); Hughes, 1948: 129; Baker & Wharton, 1952: 91 (in part); Willmann, 1952b: 393; Bregetova, 1956: 70 (in part), 1977b: 483; Strandtmann & Wharton, 1958: 29; Schweizer, 1961: 145.
Parasitidae, Parasitinae (in part).—Oudemans, 1902d: 49; Trägårdh, 1908: 45; Banks, 1915a: 75 (in part); Ewing, 1929: 9 (in part).
Parasitidae, Laelaptinae (in part).—Oudemans, 1902d: 50; Trägårdh, 1904a: 151, 1908: 54; Ewing, 1933: 1.
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Laelaptini.—Berlese, 1906: 10 (in part).
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Parasitidae.—Banks, 1915a: 71 (in part); Vitzthum, 1931c: 142 (in part).
Parasitinae.—Banks, 1915a: 76 (in part).
Brucharachnidae Mello-Leitão, 1925: 233 [junior synonym of Laelapidae by Krantz & Platnick, 1995: 8].
Iphiopsidae.—Vitzthum, 1929: 16; Baker & Wharton, 1952: 90; Farrier & Hennessey, 1993: 63.
Parasitidae, Laelapinae.—Ewing, 1933: 1.
Laelapidae, Hypoaspidinae.—Vitzthum, 1942: 762 (in part) [junior synonym of Laelapidae, Laelapinae by Evans, 1957a: 230].
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Pseudoparasitidae.—Vitzthum, 1942: 757 (in part); Baker & Wharton, 1952: 74 (in part).
Laelapidae, Hyletastinae.—Vitzthum, 1942: 765 (in part); Radford, 1950b: 26 (in part).
Iphiopsinae.—Keegan, 1950: 511; Evans, 1955: 352.
Laelaptidae, Hypoaspidinae.—Radford, 1950b: 12; Zumpt & Patterson, 1951: 67; Baker & Wharton, 1952: 91 (in part); Turk, 1953: 11; Zhang *et al*., 1963: 185.
Laelapidae, Iphiopsinae.—Radford, 1950b: 27; Vitzthum, 1942: 766 (in part).
Laelaptidae, Laelaptinae.—Radford, 1950b: 30 (in part); Baker & Wharton, 1952: 93 (in part); Evans, 1957a: 230 (in part); Zumpt & Till, 1958: 263 (in part).
Laelaptidae, Hyletastinae.—Baker & Wharton, 1952: 93 (in part).
Otopheidomenidae Treat, 1955b: 556 (in part).
Eviphididae, Eviphidinae.—Evans, 1957a: 216 (in part).
Otopheidomenidae.—Krantz & Khot, 1962: 535 (in part).
Laelapidae.—Domrow, 1963a: 9; Evans & Till, 1966: 111; Krantz, 1978: 132; Zaher, 1986: 176 (in part); Casanueva, 1993: 23; Deng *et al*., 1993: 62; Farrier & Hennessey, 1993: 63; Hunter, 1993: 22; Lareschi & Mauri, 1998: 584; OConnor & Klimov, 2004: internet page; Beaulieu *et al*., 2011: 126.
Laelapidae, Hypoaspidinae.—Karg, 1965: 270; Rosario, 1981: 26; Tenorio, 1982: 259; Deng *et al*., 1993: 157.
Dermanyssidae.—Evans & Till, 1965a: 249 (in part), 1966: 109 (in part), Karg 1971: 157 (in part).
Dermanyssidae, Laelapinae.—Evans & Till, 1966: 124 (in part); Hughes, 1976: 286.
Dermanyssidae, Melittiphinae.—Evans & Till, 1966: 273.
Dermanyssidae, Hypoaspidinae.—Karg, 1971: 157.
Laelapidae, Laelapinae.—Evans & Till, 1979: 199.
Katydiseiinae Fain & Lukoschus, 1983: 173 (according to Lindquist *et al*., 2020: 51).
Trichoaspididae Gu, Wang & Li, 1991: 428 [junior synonym of Iphiopsididae, with inclusion of the type species of *Trichoaspis* under Iphiopsididae, by Farfan & Klompen, 2012: 72].
Iphiopsididae.—Casanueva, 1993: 32; Lindquist *et al*., 2009: 155; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 12; Nemati *et al*., 2015: 105; Seeman & Alberti, 2015: 719; Lindquist *et al*., 2020: 49.

Laelapidae, Melittiphidinae.—Casanueva, 1993: 39.
Hypoaspididae.—Karg, 1993a: 132, 2000: 244; Faraji *et al*., 2008: 205; Karg & Schorlemmer, 2013: 196.
Hypoaspididae, Hypoaspidinae.—Karg, 2000: 244, 2006: 147; Karg & Schorlemmer, 2013: 196.
Hypoaspididae, Pseudoparasitinae.—Karg, 2000: 245, 2006: 151; Karg & Schorlemmer, 2013: 196.
Suracarinae Flechtmann, 2005: 39.
Uronyssidae Halliday, 2006: 35 [junior synonym of Laelapidae, as a result of the synonymisation of *Uronyssus* under *Urozercon* by Lindquist *et al*., 2009: 155; OConnor & Klimov, 2012b: internet page].
Iphiopsidinae.—Seeman & Alberti, 2015: 719.
Katydiseiidae.—Prasad, 2019.

Note. The references given above concern only the free-living or arthropod-associated Laelapidae. As mentioned by Evans & Till (1966: 111), based on Domrow (1963a: 9), the genitive stem of *Laelaps* is Laelap- and thus, according to the International Code of Zoological Nomenclature, Articles 29a and 32a (iii), the family and subfamily taxa become respectively Laelapidae and Laelapinae. Seeman & Alberti (2015: 719) considered Iphiopsidinae a subfamily of Laelapidae, instead of considering it at the family level. That concept is also adopted in this publication. These authors discussed the use of Iphiopsinae and Iphiopsidae versus Iphiopsidinae and Iphiopsididae.

Acantholaelaps Joharchi *et al*., 2019

Acantholaelaps Joharchi, Halliday, Tolstikov & Trach, 2019d: 329 (type species: *Acantholaelaps strategus* Joharchi, Halliday, Tolstikov & Trach, 2019d: 329, by monotypy).

Note. This genus was originally described in Laelapidae.

Acantholaelaps strategus Joharchi *et al*., 2019

Acantholaelaps strategus Joharchi, Halliday, Tolstikov & Trach, 2019d: 331.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. North of Matanzas province, Cuba, on *Strategus sarpedon* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

Alloparasitus Berlese, 1920

Hypoaspis.—Hull, 1918: 66 (in part); Karg, 1979: 66 (in part), 1993a: 133 (in part).
Pseudoparasitus (*Alloparasitus*) Berlese, 1920: 169 [type species: *Pseudoparasitus angulatus* Berlese, 1916 (= *Laelaps* (*Hypoaspis*) *oblongus* Halbert, 1915), by original designation].
Alloparasitus.—Vitzthum, 1931c: 142; Evans, 1957a: 221; Schweizer, 1961: 87; Athias-Henriot, 1968: 239; Bregetova, 1977c: 549; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 63; Karg & Schorlemmer, 2013: 203.
Pseudoparasitus (*Alloparasitus*).—Vitzthum, 1942: 757; Baker & Wharton, 1952: 74.
Halbertia Hull, in Turk & Turk, 1952: 483 (type species: *Laelaps* (*Hypoaspis*) *oblongus* Halbert, 1915) [junior synonym of *Alloparasitus* by Evans, 1957a: 221; Bregetova, 1977c: 549; Farrier & Hennessey, 1993: 63; of *Hypoaspis* (*Alloparasitus*) by Evans & Till, 1966: 159].
Androlaelaps.—Bregetova, 1955: 233 (in part), 1956: 71 (in part)
Hypoaspis (*Alloparasitus*).—Evans & Till, 1966: 160; Aswegen & Loots, 1970: 210, Karg, 1971: 160 (in part), 1979: 74, 1982: 237, 1989a: 107, 1993a (in part): 136; Huhta & Karg, 2010: 328.
Hypoaspis s.l..—Evans & Till, 1979: 202 (in part).

Note. *Pseudoparasitus* (*Alloparasitus*) was not assigned to a family in the original description. It was later included in Pseudoparasitidae by Vitzthum (1942: 757) and in Laelapidae-Laelapinae by Evans & Till (1979: 202). Farrier & Hennessey (1993: 63) and Karg (1993a: 140) considered *Hypoaspis* (*Euandrolaelaps*) to be a junior synonym

of *Pseudoparasitus* (*Alloparasitus*). Except for the type species, the placement of most species in *Alloparasitus* is uncertain and provisional (see note under the genus diagnosis).

***Alloparasitus eupraedonis* (Karg, 1989)**
Hypoaspis (*Alloparasitus*) *eupraedonis* Karg, 1989c: 123.
Alloparasitus eupraedonis.—Moreira, 2014: 109.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Alloparasitus femorata* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *femorata* Karg, 1978b: 19.
Hypoaspis (*Alloparasitus*) *femorata*.—Karg, 1979: 76, 1982: 237, 1989c: 119; Huhta & Karg, 2010: 328.
Alloparasitus femorata.—Moreira, 2014: 109.

Type depository. Magyar Természettudományi Múzeum/Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 30 km east of Parinacota, Tarapaca, Chile, under rocks near the sea.

***Alloparasitus oblongus* (Halbert, 1915)**
Laelaps (*Hypoaspis*) *oblongus* Halbert, 1915: 70.
Pseudoparasitus angulatus Berlese, 1916b: 164 [junior synonym of *L.* (*H.*) *oblongus* by Evans & Till, 1966: 222; Karg, 1971: 178; Bregetova, 1977c: 552; Karg, 1993a: 140].
Hypoaspis oblongus.—Hull, 1918: 67; Falconer, 1923: 274; Kůrka, 2005: 25.
Pseudoparasitus (*Alloparasitus*) *angulatus*.—Berlese, 1920: 169; Castagnoli & Pegazzano, 1985: 18.
Halbertia oblongus.—Turk & Turk, 1952: 483; Turk, 1953: 11.
Gymnolaelaps oblongus.—Willmann, 1952b: 426.
Alloparasitus angulatus.—Schweizer, 1961: 87.
Hypoaspis oblonga.—Evans & Till, 1966: 222; Costa, 1968: 15; Lapinya, 1976: 36; Gwiazdowicz, 2002: 24.
Alloparasitus oblonga.—Athias-Henriot, 1968: 243.
Hypoaspis (*Hypoaspis*) *oblonga*.—Karg, 1971: 167.
Alloparasitus oblongus.—Bregetova, 1977c: 552; Bernini *et al*., 1995: 27; Kazemi & Rajaei, 2013: 78; Malekshahkoohi *et al*., 2014: 258.
Hypoaspis (*Alloparasitus*) *oblonga*.—Karg, 1979: 75, 1982: 237, 1989c: 119, 1993a: 140; Gwiazdowicz & Biernacik, 2000: 203; Gwiazdowicz & Gulvik, 2005: 119; Gabryś *et al*., 2008: 47; Huhta & Karg, 2010: 328; Skorupski *et al*., 2013: 9.
Hypoaspis (*Alloparasitus*) *oblongus*.—Luxton, 1998: 19.
Hypoaspis angulatus.—Kůrka, 2005: 24.
Pseudoparasitus oblongus.—Kazemi & Rajaei, 2013: 96.

Type depository. *L.* (*H.*) *oblongus*: National Museum, Dublin, Ireland; *P. angulatus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. *L.* (*H.*) *oblongus*: Westport, Clare Island, Ireland, under bark of decaying trees; *P. angulatus*: Castello city, Umbria, Italy, in moss [cited as "muscis"].

***Alloparasitus obscuroides* (Costa, 1968) new combination**
Hypoaspis obscuroides Costa, 1968: 14.
Hypoaspis (*Holostaspis*) *obscuroides*.—Karg, 1979: 98, 1982: 248.

Hypoaspis obscuroides.—Okáli 1991: 200.
Gymnolaelaps obscuroides.—Joharchi & Halliday, 2013: 45; Kazemi & Yazdanpanah, 2013: 270; Yazdanpanah & Kazemi, 2014: 333; Amani *et al*., 2015: 92; Kordeshami *et al*., 2015: 593; Nemati & Gwiazdowicz, 2016b: 43; Babaeian *et al*., 2019a: 331.
Hypoaspis s. l. *obscuroides*.—Hasanvand *et al*., 2014a: 96; Nemati *et al*., 2018b: 177.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Nahal Sha'ar, Galilee, Israel, in litter of *Laurus nobilis* [Plantae: Laurales: Lauraceae].
Note. This species is provisionally placed in the weakly defined genus *Alloparasitus*. Important characteristics shared by other species in this genus include the 2-tined palp tarsal claw, presence of presternal platelets, flask-shaped epigynal shield flanking the insertion of *Zv1*, narrow parapodal plates and absence of spur-like setae on leg II.

***Alloparasitus pratensis* (Huhta & Karg, 2010)**
Hypoaspis (*Alloparasitus*) *pratensis* Huhta & Karg: 2010: 326.
Alloparasitus pratensis.—Moreira, 2014: 110.

Type depository. Zoological Museum, University of Helsinki, Finland.
Type locality and habitat. Sipoo, 20 km east of Helsinki, Finland, in dry, rocky meadow.

***Alloparasitus subterraneus* (Willmann, 1952)**
Gymnolaelaps subterraneus Willmann, 1952b: 426.
Hypoaspis helianthi Samšiňák, 1958: 189 [junior synonym of *G. subterraneus* by Samšiňák, 1960: 280, Bregetova, 1977b: 501; Karg 1993a: 142].
Hypoaspis subterraneus.—Samšiňák, 1960: 280.
Hypoaspis (*Hypoaspis*) *subterranea*.—Karg, 1971: 167.
Hypoaspis (*Geolaelaps*) *subterraneus*.—Bregetova, 1977b: 500.
Hypoaspis (*Geolaelaps*) *helianthi*.—Bregetova, 1977b: 500; Karg, 1979: 82, 1982: 241, 1987: 298, 1989c: 118, 1993a: 142; Chelebiev, 1988: 11; Gwiazdowicz & Gulvik, 2005: 120.
Hypoaspis (*Alloparasitus*) *subterranea*.—Karg, 1979: 74, 1982: 237, 1989c: 119; Huhta & Karg, 2010: 328.
Hypoaspis helianthi.—Chelebiev, 1981: 185; Ma & Wang, 1998: 1.
Alloparasitus subterraneus.—Moreira, 2014: 112.
Gaeolaelaps subterraneus.—Gwiazdowicz *et al*., 2020a: 523.

Type depository. *G. subterraneus* and *H. helianthi*: unspecified.
Type locality and habitat. *G. subterraneus*: Glatz, Germany [Kłodzko, Poland], on *Pitymis subterraneus* [Animalia: Rodentia: Cricetidae]; *H. helianthi*: Prague, Czech Republic, in sunflower seeds.
Note. Bregetova (1977b: 501) and Karg (1993a: 142) inadvertently considered *G. subterraneus* a junior synonym of *H. helianthi*, instead of the opposite. Bregetova (1977b: 501) suspected *Hypoaspis lutegiensis* Shcherbak to be a junior synonym of *H. helianthi*.

***Alloparasitus tribina* (Karg, 1979)**
Hypoaspis (*Alloparasitus*) *tribina* Karg, 1979: 78.
Hypoaspis (*Alloparasitus*) *tribina*.—Karg, 1982: 237, 1989c: 119; Huhta & Karg, 2010: 328.
Alloparasitus tribina.—Moreira, 2014: 112.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 1170 m above sea level, Piltriquitron, near El Bolsón, [Rio Negro], Argentina, in moss growing on *Nothofagus pumilio* [Plantae: Fagales: Nothofagaceae] tree.

***Androlaelaps* Berlese, 1903**

Laelaps (*Androlaelaps*) Berlese, 1903b: 14 [type species: *Laelaps* (*Iphis*) *hermaphrodita* Berlese, 1887, by original designation].

Laelaps (*Androlaelaps*).—Berlese, 1904c: 432.

Androlaelaps.—Berlese, 1913b: 10; Vitzthum, 1929: 22, 1931c: 142; 1942: 762; Radford, 1950b: 19; Zumpt, 1950b: 299; Zumpt & Patterson, 1951: 69; Zumpt & Till, 1953a: 215; Furman, 1954: 119, 1972: 49; Bregetova, 1955a: 233 (in part), 1955b: 313 (in part), 1956: 79 (in part), 1977b: 533; Allred & Beck, 1956: 34; Keegan, 1956a: 226, Evans, 1957a: 230; Tipton, 1960: 249; Till, 1963: 4; Zhang *et al*., 1963: 186; Evans & Till, 1965a: 250, 1966: 150, 1979: 200; Athias-Henriot, 1968: 237; Marais & Loots, 1970: 2; Karg, 1971: 185 (in part); Hughes, 1976: 288; Hafez *et al*., 1982: 3; Radovsky, 1985: 454; Zaher, 1986: 180; Domrow, 1988: 825; Casanueva, 1993: 40; Deng *et al*., 1993: 116; Farrier & Hennessey, 1993: 64; Karg 1993a: 162 (in part); Botelho, 2002: 53; OConnor & Klimov, 2012a: internet page; Shaw, 2014a: 286; Zhou *et al*., 2015: 487 Klimov *et al*., 2016: internet page; Vinarski & Korallo-Vinarskaya, 2016: 232; Hajizadeh & Joharchi, 2018: 26; Halliday, 2019: internet page; Nemati *et al*., 2021: 185.

Atricholaelaps Ewing, 1929: 186 (type species: *Laelaps reithrodontis* Ewing, 1925 by original designation) [junior synonym of *Androlaelaps* by Zumpt & Patterson, 1951: 70; Till, 1963: 14; Evans & Till, 1966: 150, 1979: 200; Zaher, 1986: 180; Fain & Hart, 1988: 440; Farrier & Hennessey, 1993: 64; Shaw, 2014a: 290].

Eubrachylaelaps Ewing, 1929: 186 (type species: *Laelaps hollisteri* Ewing, 1925, by monotypy) [junior synonym of *Androlaelaps* by Zumpt & Patterson, 1951: 70; Zumpt & Till, 1958: 267; Till, 1963: 14; Evans & Till, 1966: 150, 1979: 200; Zaher, 1986: 180; Fain & Hart, 1988: 440; Farrier & Hennessey, 1993: 64].

Cyclolaelaps Ewing, 1933: 5 (type species: *Cyclolaelaps circularis* Ewing, 1933, by monotypy) [junior synonym of *Eubrachylaelaps* by Jameson, 1950a: 62; Furman, 1955a: 51; Tipton, 1960: 241; of *Androlaelaps* by Till, 1963: 14; Evans & Till, 1966: 150, 1979: 200; Zaher, 1986: 180; Fain & Hart, 1988: 440; Farrier & Hennessey, 1993: 64].

Ischnolaelaps Fonseca, 1936a: 19 (type species: *Ischnolaelaps reticulatus* Fonseca, 1936, by original designation) [junior synonym of *Atricholaelaps* by Strandtmann, 1946: 169; of *Androlaelaps* by Zumpt & Patterson, 1951: 70; Till, 1963: 14; Evans & Till, 1966: 150, 1979: 200; Fain & Hart, 1988: 440; Farrier & Hennessey, 1993: 64; Shaw, 2014a: 290].

Ischnolaelaps.—Fonseca, 1936b: 25, 1937a: 1599, 1958a: 46; Vitzthum, 1942: 769; Strandtmann, 1946: 168; Strandtmann & Wharton, 1958: 32.

Cavilaelaps Fonseca, 1936b: 25 (type species: *Cavilaelaps bresslaui* Fonseca, 1936a by monotypy) [junior synonym of *Androlaelaps* by Zumpt & Patterson, 1951: 70].

Ischnolaelaps.—Fonseca, 1937a: 1599, 1958a: 46; Vitzthum, 1942: 769; Strandtmann, 1946: 168.

Cavilaelaps.—Fonseca, 1937a: 1606; Vitzthum, 1942: 770; Radford, 1950b: 31; Strandtmann & Wharton, 1958: 31; Tipton, 1960: 240; Casanueva, 1993: 41.

Hypoaspis (*Androlaelaps*).—Vitzthum, 1942: 762; Zumpt, 1950b: 299; Baker & Wharton, 1952: 94.

Eubrachylaelaps.—Vitzthum, 1942: 769; Jameson, 1950a: 62; Radford, 1950b: 31; Baker & Wharton,1952: 96; Furman, 1955a: 51; Allred & Beck 1956: 34; Fonseca, 1958b: 162; Strandtmann & Wharton, 1958: 31; Tipton, 1960: 241; Furman & Tipton, 1961: 170.

Atricholaelaps.—Vitzthum, 1942: 770; Strandtmann, 1946: 168; Radford, 1950b: 31; Fonseca, 1958a: 46, 1958b: 169; Strandtmann & Wharton, 1958: 32.

Hypoaspis.—Hughes, 1948: 129 (in part).

Cyclolaelaps.—Radford, 1950b: 30; Zumpt, 1950b: 299; Zumpt & Patterson, 1951: 69.

Turkiella Zumpt & Till, 1953a: 215 (type species: *Androlaelaps theseus* Zumpt, 1950, by original designation) [junior synonym of *Androlaelaps* by Keegan, 1956a: 226; Evans, 1957a: 230; Tipton, 1960: 257; Till, 1963: 14; Evans & Till, 1966: 150, 1979: 200; Fain & Hart, 1988: 440; Farrier & Hennessey, 1993: 64].

Zygolaelaps Tipton, 1957: 367 (type species: *Zygolaelaps madagascariensis* Tipton, 1957, by monotypy) [junior synonym of *Androlaelaps* by Till, 1963: 14; Evans & Till, 1966: 150, 1979: 200; Zaher, 1986: 180; Fain & Hart, 1988: 440; Farrier & Hennessey, 1993: 64].

Turkiella.—Fonseca, 1958: 179.

Zygolaelaps.—Tipton, 1960: 247.

Eschnolaelaps [sic].—Zaher, 1986: 180.

Androlaelaps (*Eubrachylaelaps*).—Gettinger & Gardner, 2015: 245.

Note. *Laelaps* (*Androlaelaps*) and *Zygolaelaps* were described in Laelapidae, whereas *Atricholaelaps* and *Eubrachylaelaps* were described in Parasitidae, *Cyclolaelaps* in Parasitidae-Laelapinae, and *Cavilaelaps*, *Ischnolaelaps* and *Turkiella*, in Laelapidae-Hypoaspidinae. *Androlaelaps* was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 200). *Haemolaelaps* Berlese, 1910: 216 was considered junior synonym of *Androlaelaps* by Till (1963: 14), Hunter (1964b: 639), Karg (1971: 285), Evans & Till (1966: 150, 1979: 200), Bregetova (1977b: 533), Zaher (1986: 180), Fain & Hart (1988: 440) and Farrier & Hennessey (1993: 64). Botelho *et al*. (2002: 55) removed *Eubrachylaelaps* from synonymy with *Androlaelaps*, whereas Gettinger & Gardner (2015: 244) maintained *Eubrachylaelaps* as subgenus of *Androlaelaps*. Shaw (2014a: 285) removed *Haemolaelaps* from synonymy with *Androlaelaps* by determining that the type species of the former and five other species previously included in *Haemolaelaps* (*H. cleptusa*, *H. domrowi* Womersley, *H. flagellata* Womersley, *H. hattenae* Domrow and *H. quartus*) constituted a group consistently different from *Androlaelaps*, referring to them as the *Haemolaelaps marsupialis* group (Shaw, 2014a: 289). These species appear together in couplets 5–9 of the key of Domrow (1988: 828) to females of Australian species of *Haemolaelaps*, constituting an extension of the *H. marsupialis* complex of Womersley (1957: 297), comprised of *H. domrowi*, *H. flagellata* and *H. marsupialis*. That interpretation is adopted in this publication. *Androlaelaps* was considered a senior synonym of *Gnatholaelaps* Till by Fain & Hart (1988: 440), a concept not accepted by Casanueva (1993: 41) or in this publication. It was also considered a senior synonym of *Gromphadorholaelaps* Till, a concept not accepted by Karg (1991: 167), Vinarski & Korallo-Vinarskaya (2016: 232) or in this publication. Based on the generic synonymies listed above, we transfer in this publication several species to *Androlaelaps*; unless otherwise specified, these new combinations follow the suggestion by Shaw (2014a: 290), in that species which have been cited in the literature as *Androlaelaps* and *Haemolaelaps* should be regarded as *Androlaelaps* until further revision, except for the species included in *Haemolaelaps* by Shaw (2014a) and in *Ulyxes* Shaw by Shaw (2014b).

Androlaelaps abrothrix Gettinger & Lareschi, 2009

Androlaelaps abrothrix Gettinger & Lareschi, 2009: 162.

Type depository. División de Entomología, Museo de La Plata, La Plata, Argentina.
Type locality and habitat. 19 km north of La Angostura (40°37'13"S, 71°42'22"W), along national route 234, Aluminé, Neuquén, Argentina, on *Abrothrix longipilis* [Animalia: Rodentia: Cricetidae].

Androlaelaps aduncus Allred, 1969

Androlaelaps (*Haemolaelaps*) *aduncus* Allred, 1969: 219.
Androlaelaps aduncus.—Allred, 1975: 125; Halliday *et al*., 2018: 4.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number B-67765.
Type locality and habitat. Bari Doab Canal, Lahore, Pakistan [cited as West Pakistan], on *Tatera indica* [Animalia: Rodentia: Muridae].

Androlaelaps aegypticus Hafez *et al*., 1982

Androlaelaps aegypticus Hafez, Elbadry & Nasr, 1982: 4.
Androlaelaps aegypticus.—Zaher, 1986: 182; Basha & Yousef, 2001: 396; Kazemi & Rajaei, 2013: 78; Maleki *et al*., 2016: 188; Nemati *et al*., 2018b: 133.

Type depository. Unspecified.
Type locality and habitat. Faculty of Agriculture, Cairo University, Giza, Egypt, in manure.

***Androlaelaps aerosus* Lareschi & Velazco, 2013**
Androlaelaps aerosus Lareschi & Velazco, 2013: 189.
Androlaelaps aerosus.—Lareschi & Galliari, 2014: 486

Type depository. División de Entomología, Museo de La Plata, La Plata, Argentina; specimen number MLP203654–1.
Type locality and habitat. Tingana (05°54'38.4"S, 77°06'43.3"W), Moyobamba, San Martin department, Peru, on *Akodon aerosus* [Animalia: Rodentia: Cricetidae].

***Androlaelaps androgynus* (Bregetova, 1952)**
Haemolaelaps androgynus Bregetova, 1952: 867.
Haemolaelaps androgynus.—Bregetova, 1955b: 303, 1956: 89; Strandtmann & Wharton, 1958: 33; Tipton, 1960: 242; Costa, 1961a: 6; Reitblat, 1963: 71; Sheals, 1964: 15; Gadzhiev,1973: 417; Kazemi & Rajaei, 2013: 87.
Androlaelaps androgynus.—Costa, 1966a: 73; Bregetova, 1977b: 534; Ye & Ma, 1996: 297.
Haemolaelaps androgynms [sic].—Ren & Guo, 2008: 328, 2009: 100.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series, Armenia, on *Meriones persicus* and *Mus musculus* [Animalia: Rodentia: Muridae] and Astrakhan, Russia, on *Citellus pygmaeus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps androgynus caluri* (Costa, 1961)**
Haemolaelaps androgynus caluri Costa, 1961a: 9.
Androlaelaps androgynus caluri.—Costa, 1966a: 73.

Type depository. Natural History Museum, London, England.
Type locality and habitat. type series, Raman, Wadi Masri and Mezada, Israel, on *Sekeetamys calurus* [Animalia: Rodentia: Muridae].
Note. Costa (1961) described *Haemolaelaps androgynus caluri* for specimens that differed slightly from the original description of *Haemolaelaps androgynus* by Bregetova (1952). The relative taxonomic status of these populations cannot be determined on the basis of the available information.

***Androlaelaps angustiscutis* (Bregetova, 1952)**
Haemolaelaps angustiscutis Bregetova, 1952: 867.
Haemolaelaps angustiscutis.—Bregetova, 1955: 306, 1956: 92; Zemskaya, 1955: 298; Strandtmann & Wharton, 1958: 33; Gadzhiev,1973: 417; Ye & Ma, 1991: 99; Ma, 2006a: 23; Ren & Guo, 2008: 327, 2009: 100; Meng *et al*., 2021: 4.
Haemolaelaps angustiscutus [sic].—Tipton, 1960: 242.
Androlaelaps angustiscutis.—Bregetova, 1977b: 532; Senotrusova, 1987; 186; Vinarski & Korallo-Vinarskaya, 2016: 233.
Haemolaelaps fragilis Chen, Bai & Gu, 1995a: 228 [junior synonym of *H. angusticustis* by Ma, 2006a: 23; Vinarski & Korallo-Vinarskaya, 2016: 233; Meng *et al*., 2021: 4].
Androlaelaps fragilis.—Kůrka, 2005: 23.
Haemolaelaps fragilis.—Ren & Guo, 2008: 327, 2009: 100.

Type depository. *H. angustiscutis*: Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia; *H. fragilis*: Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. *H. angustiscutis*: Type series, Turkmenistan, on *Rhombomys opimus* [Animalia: Rodentia: Muridae] and in its nest, and Tajikistan, on *Meriones erythrourus* [Animalia: Rodentia: Muridae] and in its nest;

H. fragilis: Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, on *Allactaga sibirica* [Animalia: Rodentia: Dipodidae].

***Androlaelaps angustotactus* Karg, 1994**
Androlaelaps angustotactus Karg, 1994: 188.
Androlaelaps angustotactus.—Kůrka, 2005: 22.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 5 m above sea level, Charles Darwin Research Station, Puerto Ayora, Santa Cruz, Galapagos Islands, dry zone, in litter.

***Androlaelaps anomalis* (Wang *et al*., 1981)**
Haemolaelaps anomalis Wang, Liao & Lin, 1981: 105.
Androlaelaps anomalis.—Deng *et al*., 1993: 99; Wang & Liao, 2000: 23; Ma, 2006b: 554; Ren & Guo, 2008: 327, 2009: 100.

Type depository. Fujian Research Institute of Epidemic Diseases, Fujian, China.
Type locality and habitat. Fujian, China, on *Tamiops swinhoei monticolus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps anourosorecis* (Gu & Wang, 1981)**
Haemolaelaps anourosorecis Gu & Wang, 1981: 390.
Androlaelaps anourosorecis.—Kůrka, 2005: 22.

Type depository. Department of Parasitology, Guiyang Medical College, Guiyang, Guizhou, China.
Type locality and habitat. Guizhou, China, on *Anourosorex squamipes* [Animalia: Soricomorpha: Soricidae].

***Androlaelaps argentiventer* (Baker *et al*., 1962)**
Haemolaelaps argentiventer Baker, Traub & Evans, 1962: 96.
Haemolaelaps argentiventer.—Teng & Pan, 1964: 326.
Androlaelaps argentiventer.—Moreira, 2014: 118.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2472.
Type locality and habitat. Subang, Selangor, Malaysia (cited as Malaya), on *Rattus argentiventer* [Animalia: Rodentia: Muridae].

***Androlaelaps arvicanthis* Radford, 1944**
Androlaelaps arvicanthis Radford, 1944: 162.
Androlaelaps arvicanthis.—Radford, 1950a: 366; Zumpt & Patterson, 1951: 70; Eads, 1952: 239; Till, 1963: 17; Sheals, 1964: 15; Costa, 1969b: 193; Zumpt & Elliot, 1970: 346.
Atricholaelaps arvicanthis.—Radford, 1950a: 370.
Turkiella arvicanthis.—Zumpt & Till, 1953a: 221.
Androlaelaps equatoriensis Keegan, 1956a: 230 [junior synonym of *A. arvicanthis* by Till, 1963: 17; Zumpt & Elliot, 1970: 346].
Haemolaelaps arvicanthis.—Strandtmann & Wharton, 1958: 34.
Androlaelaps equatoriensis.—Oyoun & El Kady, 1995: 96.

Type depository. *A. arvicanthis*: Natural History Museum, London, England; *A. equatoriensis*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *A. arvicanthis*: Masindi, Bunyoro, Uganda, on *Arvicanthis abyssinicus rubescens* [Animalia: Rodentia: Muridae]; *A. equatoriensis*: Yei, Equatoria, South Sudan (cited as Anglo-Egyptian Sudan), on unidentified rodent [Animalia: Rodentia].

***Androlaelaps azarae* Lareschi & Savchenko, 2021**
Androlaelaps azarae Lareschi, 2020: 3 (*nomen nudum*; ICZN Article 8.5.3).
Androlaelaps azarae Lareschi & Savchenko, 2021: 298.

Type depository. Colección de Entomologia, Museo de La Plata, Argentina.
Type locality and habitat. Estación Álzaga, Buenos Aires province, Argentina (37º51'35.5"S, 59º58'20.5"W), on *Akodon azarae* (Animalia: Rodentia: Cricetidae).

***Androlaelaps barrerai* (Fonseca, 1960)**
Atricholaelaps (*Ischnolaelaps*) *barrerai* Fonseca, 1960a: 27.
Androlaelaps barrerai.—Moreira, 2014: 118.

Type depository. Instituto Butantan, São Paulo, São Paulo state, Brazil.
Type locality and habitat. Type series from Cascas Huancabamba, Tierra Amarilla, Canchaque, Jacocha Piura, Isla Matapalo, Tumbes, Llampa, Ancash, El Tambo, El Sauce, Platanal, Sauce Cahiquito, all in Peru, from *Akodon mollis*, *Oryzomys flavescens* (nest), *Oryzomys longicaudatus* (nest), *Oryzomys xanthaeolus*, *Phyllotis amicus* (nest), *Sigmodon peruanus* and *Thomasomys hudsoni* [cited as *hydsoni*] [Animalia: Rodentia: Cricetidae], *Mus musculus* and *Rattus norvegicus* [Animalia: Rodentia: Muridae], and wild rat.

***Androlaelaps bayoumi* Basha & Yousef, 2001**
Androlaelaps bayoumi Basha & Yousef, 2001: 396.
Androlaelaps bayoumi.—Kůrka, 2005: 23; Klimov *et al*., 2016: internet page.

Type depository. Plant Protection Department, Faculty of Agriculture, Zagazig University, Zagazig, Egypt.
Type locality and habitat. Kom-Hamada, Behira, Egypt, on *Apis mellifera* workers [Animalia: Hymenoptera: Apidae].

***Androlaelaps bellasoma* (Sakamoto *et al*., 1979)**
Haemolaelaps bellasoma Sakamoto, Jorgensen & Herrin, 1979: 43.
Androlaelaps bellasoma.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Fetekro, Ivory Coast, on *Lissonycteris angolensis* (cited as *Rousettus angolensis*) [Animalia: Chiroptera: Pteropodidae].

***Androlaelaps benedictae* Fain & Hart, 1988**
Androlaelaps benedictae Fain & Hart, 1988: 447.
Androlaelaps benedictae.—Kůrka, 2005: 23.

Type depository. Musée Royal de l'Afrique Centrale, Tervuren, Belgium.

Type locality and habitat. Bitale Bololo, Kivu, Democratic Republic of the Congo (cited as Zaire), on *Lophuromys woosnami* [Animalia: Rodentia: Muridae].

***Androlaelaps benoiti* Till, 1973**
Androlaelaps benoiti Till, 1973: 159.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium; specimen number M.T. 115665.
Type locality and habitat. Lubumbashi (cited as Elizabethville), Haut-Katanga (cited as Karavia), Democratic Republic of the Congo (cited as Zaire), on *Saccostomus campestris* [Animalia: Rodentia: Nesomyidae].

***Androlaelaps bergalloi* Gettinger *et al*., 2005**
Androlaelaps bergalloi Gettinger, Martins-Hatano, Lareschi & Malcolm, 2005: 45.
Androlaelaps jaymalcolmi.—Gettinger *et al*., 2005: 46 (*lapsus calami*).

Type depository. Instituto Nacional de Pesquisas da Amazônia, Manaus, Amazonas state, Brazil.
Type locality and habitat. Fazenda Esteio, *ca*. 80 km north of Manaus, near camp "Cidade Powell" (2°24'S, 59°53'W), Amazonas state, Brazil, on *Monodelphis brevicaudata* [Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps bibbyi* (Strandtmann & Hunt, 1950)**
Haemolaelaps bibbyi Strandtmann & Hunt, 1950: 85.
Haemolaelaps bibbyi.—Strandtmann & Wharton, 1958: 34; Delfinado, 1960: 103; Tipton, 1960: 242.
Androlaelaps bibbyi.—Moreira, 2014: 120.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Samar, Philippines, "on rats, probably *Rattus frugivorus*" [sic] [Animalia: Rodentia: Muridae].

***Androlaelaps bidens* (Domrow, 1979)**
Haemolaelaps bidens Domrow, 1979a: 246.
Androlaelaps bidens.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Ulu Trengganu, Kuala Brang, Malaysia, on *Sundasciurus hippurus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps boleensis* (Ye & Ma, 1996)**
Haemolaelaps boleensis Ye & Ma, 1996: 297.
Androlaelaps boleensis.—Kůrka, 2005: 22.
Haemolaelaps boleensis.—Ren & Guo, 2008: 327, 2009: 100.

Type depository. Xinjiang Institute for Endemic Disease Control and Research, Urumqi, China.
Type locality and habitat. Bole (44°50'N, 82°E), Xinjiang, China, on *Pygeretmus pumilio* (cited as *Alactagulus pumilio*) [Animalia: Rodentia: Dipodidae].

***Androlaelaps braziliensis* (Ewing, 1925) new combination**
Laelaps braziliensis Ewing, 1925: 3.
Cavilaelaps braziliensis.—Fonseca, 1958b: 114; Strandtmann & Wharton, 1958: 48.
braziliensis; *non-Laelaps* [sic].—Tipton, 1960: 289.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 902.
Type locality and habitat. Lamaras, Bahia, Brazil, on *Galea spixii* (cited as *Kerodon spiki*) [Animalia: Rodentia: Caviidae].
Note. The new combination is a consequence of the synonymy of *Cavilaelaps* under *Androlaelaps*.

***Androlaelaps bresslaui* (Fonseca, 1936) new combination**
Cavilaelaps bresslaui Fonseca, 1936b: 25.
Cavilaelaps bresslaui.—Fonseca, 1937a: 1606, 1960b: 93; Radford, 1950a: 368, 1950b: 31; Strandtmann & Wharton, 1958: 48; Mauri, 1965: 16, 1967a: 67; Barros-Battesti *et al*., 2015: 20.

Type depository. Unspecified.
Type locality and habitat. Jujuy, Argentina, on *Caviella australis* [Animalia: Rodentia: Caviidae].
Note. The new combination is a consequence of the synonymy of *Cavilaelaps* under *Androlaelaps*.

***Androlaelaps brevicaudae* Karg, 1990**
Androlaelaps brevicaudae Karg, 1990: 48.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Barneri [? Barueri, São Paulo state], Brazil, in upper soil layers.

***Androlaelaps brevitrematicus* Karg, 1990**
Androlaelaps brevitrematicus Karg, 1990: 47.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Vigie, near Castries, Saint Lucia, Lesser Antilles [Caribbean area], in upper soil layers.

***Androlaelaps callosus* (Berlese, 1916)**
Hypoaspis (*Haemolaelaps*) *callosus* Berlese, 1916b: 171.
Laelaps (*Haemolaelaps*) *callosus* Berlese, 1922: 96 (objective synonymy).
Cyclolaelaps lophuromius Radford, 1939: 243 [junior synonym of *H*. (*H*.) *callosus* by Till, 1963: 18; Fain & Hart, 1988: 440].
Haemolaelaps callosus.—Radford, 1943: 61; Zumpt & Patterson, 1951: 70; Tipton, 1960: 242.
Cyclolaelaps lophuromius.—Radford, 1943: 62, 1950: 369.
Haemolaelaps calosus [sic].—Radford, 1950a: 366; Zumpt & Till, 1953a: 237.
Hypoaspis (*Haemolaelaps*) *calosus* [sic].—Zumpt & Patterson, 1951: 70.
Hypoaspis (*Haemolaelaps*) *lophuromius*.—Zumpt & Patterson, 1951: 70.
Haemolaelaps lophuromius.—Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 238; Furman, 1955a: 59; Strandtmann & Wharton, 1958: 41; Tipton, 1960: 242.
Haemolaelaps sudanicus Zumpt & Till, 1954: 213 [junior synonym of *H*. (*H*.). *callosus* by Till, 1963: 19; Fain & Hart, 1988: 440].
Eubrachylaelaps lophuromius.—Furman, 1955a: 59.
Haemolaelaps sudanicus.—Keegan, 1956a: 237; Strandtmann & Wharton, 1958: 46; Tipton, 1960: 242.

callosus; *non-Laelaps* [sic].—Tipton, 1960: 290.
Androlaelaps callosus.—Till, 1963: 18; Dusbábek *et al*., 1982: 170; Fain & Hart, 1988: 440.
Androlaelaps sudanicus.—Okereke & Rack, 1983: 438.

Type depository. *H*. (*H*.) *callosus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *C*. *lophuromius*: unspecified [according to Till, 1963: 21, syntype in Natural History Museum, London, England]; *H*. *sudanicus*: South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. *H*. (*H*.) *callosus*: East Africa, on *Lophuromys zena* [Animalia: Rodentia: Muridae]; *C*. *lophuromius*: Kampala, Uganda, on *Lophuromys aquilus aquilus* [Animalia: Rodentia: Muridae]; *H*. *sudanicus*: near Torit, South Sudan (cited as Anglo-Egyptian Sudan), on *Lophuromys aquilus* [Animalia: Rodentia: Muridae].

***Androlaelaps capensis* (Hirst, 1916)**
Haemolaelaps ? *capensis* [sic] Hirst, 1916: 79.
Hypoaspis (*Haemolaelaps*) *spinitarsus* Berlese, 1918: 123 [junior synonym of *H*. *capensis* by Till, 1963: 21].
Hypoaspis (*Haemolaelaps*) *spinitarsus*.—Lombardini, 1936: 42; Zumpt & Patterson, 1951: 70; Castagnoli & Pegazzano, 1985: 392.
Haemolaelaps mystromys Radford, 1942b: 300 [junior synonym of *H*. *capensis* by Till, 1963: 21].
Haemolaelaps capensis.—Radford, 1943: 61, 1950: 366; Strandtmann, 1949: 331; Zumpt, 1950b: 299; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 239; Lavoipierre, 1956: 295; Strandtmann & Wharton, 1958: 34; Tipton, 1960: 242.
Haemolaelaps mystromys.—Radford, 1943: 61, 1950: 367; Keegan, 1946: 72; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 246; Strandtmann & Wharton, 1958: 42; Tipton, 1960: 242.
Haemolaelaps spinitarsus.—Radford, 1943: 61, 1950: 367; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 237; Keegan, 1956b: 317; Zumpt & Till, 1958: 267; Strandtmann & Wharton, 1958: 45.
Hypoaspis (*Haemolaelaps*) *capensis*.—Zumpt & Patterson, 1951: 72.
Hypoaspis (*Haemolaelaps*) *mystromys*.—Zumpt & Patterson, 1951: 72.
Androlaelaps capensis.—Till, 1963: 21.

Type depository. *H*. *capensis*: unspecified [according to Till (1963: 23), in Natural History Museum, London, England]; *H*. (*H*.) *spinitarsus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *H*. *mystromys*: Natural History Museum, London, England.
Type locality and habitat. *H*. *capensis*: Grahamstown, Cape [cited as Cape Colony], South Africa, on *Cryptomys* (cited as *Georychus*) *hottentotus* [Animalia: Rodentia: Bathyergidae]; *H*. (*H*.) *spinitarsus*: Mfongosi, Zululand [M'fongosi, KwaZulu-Natal], South Africa, on *Georychus* sp. [Animalia: Rodentia: Bathyergidae]; *H*. *mystromys*: Glen Craig, Albany, South Africa, on *Mystromys albicaudatus* [Animalia: Rodentia: Nesomyidae].
Note. Zumpt & Till (1958: 267) had suggested *H*. (*H*.) *spinitarsus* to be a junior synonym of *H*. *capensis*.

***Androlaelaps capillatus* Karg, 1993**
Androlaelaps capillatus Karg, 1993b: 271.
Androlaelaps capillatus.—Kůrka, 2005: 23.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Academy Bay, Santa Cruz, Galapagos Islands, in litter.

***Androlaelaps capromydis* de la Cruz, 1981**
Androlaelaps capromydis de la Cruz, 1981: 2.
Androlaelaps capromydis.—Cuervo *et al*., 1994: 17; Kůrka, 2005: 23.

Type depository. Instituto de Zoología, Academia de Ciencias de Cuba, Havana, Cuba.

Type locality and habitat. Alto de Topes de Collantes, Trinidad; Cienfuegos, Cuba, on *Capromys prehensilis prehensilis* [Animalia: Rodentia: Capromyidae].

***Androlaelaps casalis* (Berlese, 1887)**

Gamasus lagenarius Johnston, 1848: 305.

Iphis casalis Berlese, 1887a: 8.

Iphis casalis.—Berlese, 1892f: 35; Sheals, 1964: 15.

Laelaps casalis.—Berlese, 1892f: 42.

Hypoaspis oculatus Oudemans, 1915a: 183 [junior synonym of *I. casalis* by Strandtmann & Wharton, 1958: 34; McKinley, 1963: 65; Till, 1963: 23; Karg, 1971: 187, 1993a: 164; Fain & Hart, 1988: 440; Vinarski & Korallo-Vinarskaya, 2016: 233; of *Androlaelaps casalis casalis* by Evans & Till, 1966: 152; Farrier & Hennessey, 1993: 64].

Hypoaspis oculatus.—Oudemans, 1915b: 134, 1929d: 13.

Hypoaspis soarianus Hull, 1925: 209 [junior synonym of *I. casalis* by Karg, 1971: 187, 1993a: 164; of *A. casalis casalis* by Evans & Till, 1966: 152; Farrier & Hennessey, 1993: 64; Vinarski & Korallo-Vinarskaya, 2016: 233].

Haemolaelaps oculatus.—Oudemans, 1929c: 13; Sellnick, 1940: 28; Buitendijk, 1945: 299.

Haemolaelaps molestus Oudemans, 1929d: 13 [junior synonym of *I. casalis* by Strandtmann & Wharton, 1958: 34; McKinley, 1963: 65; Till, 1963: 23; Rack, 1986: 160; Domrow, 1988: 829; Fain & Hart, 1988: 440; Karg, 1991: 187, 1993a: 164; of *A. casalis casalis* by Evans & Till, 1966: 152; Farrier & Hennessey, 1993: 64; Vinarski & Korallo-Vinarskaya, 2016: 233; of *H. oculatus* by Strandtmann, 1963: 4].

Hypoaspis (*Haemolaelaps*) *casalis*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 66.

Hypoaspis? *ampullarius* [sic] Oudemans, 1936: 204 [replacement name for the existence of *Gamasus lagenarius* Dugès, 1834: 28; junior synonym of *H. soarianus* by Turk, 1953: 11].

Haemolaelaps molestus.—Willmann, 1939: 173; Radford, 1943: 61, 1950a: 367; Strandtmann, 1949: 337, 1963: 4; Sellnick, 1958: 24; Tipton, 1960: 242.

Atricholaelaps megaventralis Strandtmann, 1947: 112 [junior synonym of *I. casalis* by Allred & Beck, 1956: 40; Strandtmann & Wharton, 1958: 34; McKinley, 1963: 65; Till, 1963: 23; Domrow, 1988: 829; Fain & Hart, 1988: 441; Vinarski & Korallo-Vinarskaya, 2016: 233; of *A. casalis casalis* by Evans & Till, 1966: 152; Hughes, 1976: 288; Farrier & Hennessey, 1993: 64].

Hypoaspis freemani Hughes, 1948: 129 [junior synonym of *A. megaventralis* by Strandtmann, 1956: 138; Till, 1963: 23; Vinarski & Korallo-Vinarskaya, 2016: 233; of *I. casalis* by Strandtmann & Wharton, 1958: 34; McKinley, 1963: 65; Fain & Hart, 1988: 441; Karg, 1991, 1993a: 164; Deng *et al*., 1993: 101; Meng *et al*., 2021: 4; of *A. casalis casalis* by Evans & Till, 1966: 152; Hughes, 1976: 288; Farrier & Hennessey, 1993: 64].

Haemolaelaps megaventralis.—Strandtmann, 1949: 337; Zumpt & Patterson, 1951: 70; Bregetova, 1952: 872, 1955b: 302; Eads *et al*., 1952: 251; Asanuma, 1953: 11; Zumpt & Till, 1953a: 243; Womersley, 1956a: 563; Allred & Roscoe, 1957: 397; Howell *et al*., 1957: 84; Allred, 1958: 26; Tipton, 1960: 242; Meng *et al*., 2021: 4.

Atricholaelaps megaventralis.—Radford, 1950a: 370.

Hypoaspis (*Haemolaelaps*) *megaventralis*.—Zumpt & Patterson, 1951: 71.

Haemolaelaps haemorrhagicus Asanuma, 1952: 87 [junior synonym of *I. casalis* by Strandtmann & Wharton, 1958: 34; McKinley, 1963: 65; Till, 1963: 23; Fain & Hart, 1988: 441; Deng *et al*., 1993: 101; Vinarski & Korallo-Vinarskaya, 2016: 233; of *A. casalis casalis* by Evans & Till, 1966: 152; Farrier & Hennessey, 1993: 64].

Haemolaelaps freemani.—Asanuma, 1952: 89.

Haemolaelaps haemorrhagicus.—Asanuma, 1953: 10; Tipton, 1960: 242; Teng & Pan, 1964: 330.

Hypoaspis freemani.—Turk, 1953: 11.

Haemolaelaps casalis.—Allred & Beck, 1956: 40; Bregetova, 1956: 89; Strandtmann & Wharton, 1958: 34; Tipton, 1960: 242; Schweizer, 1961: 153; Violovich, 1961: 256; Piryanik, 1962: 83; McKinley, 1963: 65; Reitblat, 1963: 70; Wang, 1963: 201; Allred & Goates, 1964b: 171; Goncharova & Buyakova, 1964: 279; Teng

& Pan, 1964: 330; Karg, 1965: 312; Domrow, 1973: 64, 1980: 209, 1988: 829; Shcherbak, 1973: 446; Allred, 1975: 126; Sakamoto *et al*., 1979: 43; Deng *et al*., 1993: 101; Wang & Liao, 2000: 19; Ma *et al*., 2001: 119; Xin *et al*., 2010: 2; Ma & Yin, 2011: 119; Kazemi & Rajaei, 2013: 87; Ghasemi-Moghadam *et al*., 2014: 964; Khaleghabadian *et al*., 2015: 559; Nemati & Gwiazdowicz, 2016b: 44; Abbaspour *et al*., 2017: 747; Meng *et al*., 2021: 4.

casalis; *non-Laelaps* [sic].—Tipton, 1960: 290.

Androlaelaps casalis.—Till, 1963: 23; Makowski, 1965: 461; Costa, 1966a: 73; Wilson, 1967: 137; Athias-Henriot, 1968: 251; Allred, 1969: 243; Treat, 1969: 276, 1975: 64; Karg, 1971: 185, 1978b: 31, 1990: 49, 1993a: 164, 1993b: 272; Furman, 1972: 50; Beron, 1974: 173; Prasad, 1974: 150; Whitaker & Wilson, 1974: 4; Whitaker *et al*., 1976: 435, 2007: 13; Bregetova, 1977b: 533; Whitaker, 1977: 195; Haragsim *et al*., 1978: 60; Tenorio *et al*., 1985: 300; Rack, 1986: 160; Zaher, 1986: 181; Senotrusova, 1987; 181; Chelebiev, 1988: 10; Fain & Hart, 1988: 440; Bernini *et al*., 1995: 27; Halliday, 1998: 122, 2019: internet page; Basha & Yousef, 2001: 396; Sklyar, 2001: 101; Marchenko, 2002: 45; Fenďa & Schniererová, 2004; Gwiazdowicz & Klemt, 2004: 14; Gwiazdowicz & Gulvik, 2005: 119; Kůrka, 2005: 23; Arjomandi *et al*., 2013: 256; Tajmiri & Hajizadeh, 2013: 17; Granpayeh & Ostovan, 2014: 614; Shaw, 2014a: 290; Klimov *et al*., 2016: internet page; Vinarski & Korallo-Vinarskaya, 2016: 233; Kavianpour *et al*., 2017: 165; Hajizadeh & Joharchi, 2018: 26; Halliday *et al*., 2018: 49; Negm *et al*., 2018: 726; Nemati *et al*., 2018b: 133; Joharchi & Negm, 2020: 489.

Androlaelaps casalis casalis.—Evans & Till, 1966: 152; Treat, 1975: 64; Hughes, 1976: 288; Farrier & Hennessey, 1993: 64; Halliday, 1998: 122; Fouly & Al-Rehiayani, 2011: 142.

Androlaelaps megaventralis.—Athias-Henriot, 1968: 251; Spain & Luxton, 1971: 185; Halliday, 1998: 122.

Haemolaelaps fenilis.—McGraw & Farrier, 1969: 137 (misidentification of *A. casalis casalis*, according to Farrier & Hennessey, 1993: 64).

Androlaelaps (*Haemolaelaps*) *casalis*.—Barrera, 1979: 477; Bassols, 1981: 15; Estébanez-Gonzales & Cervantes, 2005: 26; Light *et al*., 2020: 84.

Haemolaelaps magaventralis [sic].—Deng *et al*., 1993: 101; Ren & Guo, 2008: 327, 2009: 100.

Type depository. *I. casalis*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *H. freemani*, *H. molestus* and *H. oculatus*: unspecified; *H. soarianus*: C.D. Soar's collection; *A. megaventralis*: National Museum of Natural History, Washington, District of Columbia, United States of America; *H. haemorrhagicus*: according to the author, the holotype was lost in a fire.

Type locality and habitat. *I. casalis*: Italy, in houses; *H. oculatus*: Ravensbosch, Valkenburg, The Netherlands, in an unspecified bird nest; *H. soarianus*: Great Britain, from unspecified substrate; *H. molestus*: Finhum (Friesland), Nes (Westdongeradeel, Friesland) and Schipborg (Drenthe), The Netherlands, in houses; *A. megaventralis*: Georgia, United States of America, on "gray squirrel" [Animalia: Rodentia: Sciuridae]; *H. freemani*: unspecified locality, in sieving from grain and debris; *H. haemorrhagicus*: Songo, northeast Manchuria, in nest of *Apodemus agrarius* [Animalia: Rodentia: Muridae].

Note. *Gamasus fenilis* Mégnin was considered senior synonym of *A. megaventralis* (Samšiňák, 1958: 186; Garret & Haramoto, 1967: 387; McGraw & Farrier, 1969: 137), *H. haemorrhagicus* (McGraw & Farrier, 1969: 138), *Haemolaelaps mohrae* Oudemans (Buitendijk, 1945: 299), *H. molestus* (Buitendijk, 1945: 299; Samšiňák, 1958: 186 and Strandtmann, 1963: 4), *H. freemani* (Samšiňák, 1958: 186 and McGraw & Farrier, 1969: 137) and *H. oculatus* (Buitendijk, 1945: 299 and McGraw & Farrier, 1969: 137). As summarised by Halliday (2011: 63), *G. fenilis* was considered a senior synonym of *I. casalis* by some authors (*e.g.* Samšiňák, 1958: 186; McGraw & Farrier, 1969: 137; Garrett & Haramoto, 1967: 387), but not by others (Domrow, 1980: 209; Farrier & Hennessey, 1993: 64). The synonymies remain unresolved because of the inadequate original descriptions of those species. Evans & Till (1966: 152) suspected *G. fenilis* to be a synonym of *A. casalis casalis*, stating that the identity of the former could not be ascertained because of the inadequate original description of *G. fenilis*.

***Androlaelaps casaloides* Karg, 1993**
Androlaelaps casaloides Karg, 1993b: 271.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Caseta, near Santa Rosa, Santa Cruz, Galapagos Islands, dry zone, on a dead turtle.

***Androlaelaps caurinus* (Sakamoto *et al*., 1979)**
Haemolaelaps caurinus Sakamoto, Jorgensen & Herrin, 1979: 45.
Androlaelaps caurinus.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Yama, Ivory Coast, on *Steatomys caurinus* [Animalia: Rodentia: Nesomyidae].

***Androlaelaps cehengensis* (Gu, 1983)**
Haemolaelaps cehengensis Gu, 1983: 157.
Haemolaelaps cehegensis.—Deng *et al*., 1993: 103; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps cehegensis.—Kůrka, 2005: 23.

Type depository. Department of Parasitology, Guiyang Medical College, Guiyang, China.
Type locality and habitat. Ceheng (24°58'N, 105°48'E), Guizhou, China, on *Petaurista alborufus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps centrocarpus* (Berlese, 1911)**
Laelaps (*Haemolaelaps*) *centrocarpus* Berlese, 1911b: 432.
Haemolaelaps mauritanicus Hirst, 1925a: 98 [junior synonym of *L*. (*H*.) *centrocarpus* by Till, 1963: 25].
Hypoaspis (*Haemolaelaps*) *centrocarpus*.—Lombardini, 1936: 42; Zumpt & Patterson, 1951: 70; Castagnoli & Pegazzano, 1985: 70.
Haemolaelaps mauritanicus.—Radford, 1943: 61, 1950: 366; Strandtmann & Wharton, 1958: 41; Tipton, 1960: 242.
Haemolaelaps centrocarpus.—Radford, 1943: 61, 1950: 366; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 237; Tipton, 1960: 242; Costa, 1961a: 27; Furman, 1966: 331; Domrow, 1977: 198; Sakamoto *et al*., 1979: 42.
centrocarpus; *non-Laelaps* [sic].—Tipton, 1960: 290.
Androlaelaps centrocarpus.—Till, 1963: 25; Costa, 1966a: 73.
Laelaps (*Haemolaelaps*) *centrocarpus*.—Sheals, 1964: 16.
Androlaelaps cenrocarpus [sic].—Nemati *et al*., 2019: 93.

Type depository. *L*. (*H*.) *centrocarpus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *H. mauritanicus*: unspecified.
Type locality and habitat. *L*. (*H*.) *centrocarpus*: Somalia [cited as Somalia inglese (sic)], on unidentified murids [Animalia: Rodentia: Muridae]; *H. mauritanicus*: dunes of Azeffal, Mauritania, on *Gerbillus hirtipes* [Animalia: Rodentia: Muridae].

***Androlaelaps chaetospinicus* (Sakamoto *et al*., 1979)**
Haemolaelaps chaetospinicus Sakamoto, Jorgensen & Herrin, 1979: 47.
Androlaelaps chaetospinicus.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 11.3 km north of Prince's Town, Ghana, on *Praomys tullbergi* [Animalia: Rodentia: Muridae].

***Androlaelaps chersonesi* (Domrow, 1979)**
Haemolaelaps chersonesi Domrow, 1979a: 248.
Androlaelaps chersonesi.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 3700 feet [1130 m] above sea level, Kedah, Gunong Jerai, Malaysia, on *Hylomys suillus* [Animalia: Erinaceomorpha: Erinaceidae].

***Androlaelaps chinchillulae* (Strandtmann, 1948)**
Atricholaelaps chinchillulae Strandtmann, 1948: 189.
Atricholaelaps chinchillulae.—Radford, 1950a: 370.
Haemolaelaps chinchillulae.—Strandtmann & Wharton, 1958: 35; Tipton, 1960: 242.
Atricholaelaps (*Ischnolaelaps*) *chinchillulae*.—Fonseca, 1960a: 1.
Androlaelaps chinchillulae.—Moreira, 2014: 128.

Type depository. Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, United States of America.
Type locality and habitat. 16000 feet [4880 m] above sea level, 50 miles southwest of Ilave, Caccachara, Peru, on *Chinchillula sahamae* [Animalia: Rodentia: Cricetidae].

***Androlaelaps chinensis* (Wang, 1963)**
Haemolaelaps chinensis Wang, 1963: 201.
Haemolaelaps chinensis.—Teng & Pan, 1964: 330; Gu, 1983: 160; Deng *et al*., 1993: 105; Wang & Liao, 2000: 21; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps chinensis.—Moreira, 2014: 129.

Type depository. Unspecified.
Type locality and habitat. Fujian, China, from unspecified substrate.

***Androlaelaps circularis* (Ewing, 1933)**
Cyclolaelaps circularis Ewing, 1933: 6.
Cyclolaelaps circularis.—Radford, 1943: 62, 1950a: 369, 1950b: 30.
Eubrachylaelaps circularis.—Jameson, 1950a: 63, 1951: 556; Keegan, 1953: 37; Furman, 1955a: 56; Allred & Beck, 1956: 38; Allred, 1957: 206, 1958: 17; Allred & Roscoe, 1957: 397; Howell *et al*., 1957: 84; Strandtmann & Wharton, 1958: 49; Tipton, 1960: 241; Furman & Tipton, 1961: 170; Allred & Goates, 1964a: 72; Whitaker & Wilson, 1974: 5; Estébanez-Gonzales & Cervantes, 2005: 27; Whitaker *et al*., 2007: 16; Light *et al*., 2020: 85.
Androlaelaps (*Eubrachylaelaps*) *circularis*.—Barrera, 1979: 477; Bassols, 1981: 12.
Androlaelaps circularis.—Farrier & Hennessey, 1993: 65; Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 1071.

Type locality and habitat. Salina, Utah, United States of America, on *Peromyscus truei truei* [Animalia: Rodentia: Cricetidae].

***Androlaelaps colii* Till, 1972**
Androlaelaps colii Till, 1972: 156.

Type depository. Unspecified.
Type locality and habitat. Johannesburg, South Africa, on *Colius indicus* [Animalia: Coliiformes: Coliidae].

***Androlaelaps comatus* Berlese, 1923**
Androlaelaps comatus Berlese, 1923a: 252.
Androlaelaps comatus.—Castagnoli & Pegazzano, 1985: 82.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.

***Androlaelaps concurrens* (Berlese, 1918)**
Hypoaspis (*Haemolaelaps*) *concurrens* Berlese, 1918: 126.
Hypoaspis (*Haemolaelaps*) *concurrens*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 84.
Haemolaelaps concurrens.—Radford, 1943: 61, 1950: 366; Strandtmann & Wharton, 1958: 35; Tipton, 1960: 242.
Androlaelaps concurrens.—Bernini *et al*., 1995: 27.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Bosa and Vallombrosa, Sardinia, Italy, in moss [cited as "muscis"].

***Androlaelaps congoensis* Till, 1963**
Androlaelaps congoensis Till, 1963: 28.
Androlaelaps congoensis.—Costa, 1968: 23; Allred, 1969: 242; Halliday *et al*., 2018: 49.
Haemolaelaps congoensis.—Allred, 1975: 126; Dusbábek *et al*., 1982: 175.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mulungu, Democratic Republic of the Congo (cited as Belgian Congo), in nests of *Lonchura cucullata* (cited as *Spermestes cucullatus*) [Animalia: Passeriformes: Estrildidae].

***Androlaelaps cordatus* (Teng & Pan, 1964)**
Haemolaelaps cordatus Teng & Pan, 1964: 327.
Haemolaelaps cordatus.—Bai *et al*., 1987: 388; Deng *et al*., 1993: 105; Ren & Guo, 2008: 327, 2009: 100; Ma & Lin, 2009: 36.
Androlaelaps cordatus.—Moreira, 2014: 131.

Type depository. Institute of Zoology, Academia Sinica, Beijing, China.
Type locality and habitat. Yunnan, China, on *Rattus losea celsus* [Animalia: Rodentia: Muridae].

***Androlaelaps cricetomydis* Till, 1963**
Androlaelaps cricetomydis Till, 1963: 29.

Type depository. Natural History Museum, London, England; specimen number 1962.6.12.1.
Type locality and habitat. Malengo Highlands, Tanzania (cited as Tanganyika), in food storage of *Cricetomys gambianus* [Animalia: Rodentia: Nesomyidae].

***Androlaelaps cricetomys* Zumpt & Elliott, 1970**
Androlaelaps cricetomys Zumpt & Elliott, 1970: 341.
Haemolaelaps cricetomys.—Sakamoto *et al*., 1979: 43.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Zaria, Nigeria, on *Cricetomys gambianus* [Animalia: Rodentia: Nesomyidae].

***Androlaelaps crispus* (Grokhovskaya & Huan-Hoe, 1961)**
Haemolaelaps crispus Grokhovskaya & Huan-Hoe, 1961: 1634.
Haemolaelaps crispus.—Wang, 1963: 207.
Androlaelaps crispus.—Moreira, 2014: 131.

Type depository. Unspecified.
Type locality and habitat. Kam-Dong, Lao Cai, Vietnam, in chicken house.

***Androlaelaps crocidura* (Sakamoto *et al*., 1979)**
Haemolaelaps crocidura Sakamoto, Jorgensen & Herrin, 1979: 48.
Androlaelaps crocidura.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Banco Forest, Ivory Coast, on *Crocidura* sp. [Animalia: Soricomorpha: Soricidae].

***Androlaelaps crowei* (Jameson, 1947)**
Eubrachylaelaps crowei Jameson, 1947: 391.
Eubrachylaelaps crowei.—Jameson, 1950a: 62, 1951: 556; Radford, 1950a: 370; Eads *et al*., 1952: 250; Keegan, 1953: 37; Furman, 1955a: 59; Allred & Beck, 1956: 37; Strandtmann & Wharton, 1958: 49; Tipton, 1960: 241; Whitaker & Wilson, 1974: 5; Whitaker *et al*., 2007: 17.
Androlaelaps crowei.—Farrier & Hennessey, 1993: 65; Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 1779.
Type locality and habitat. Rexroad Ranch, 13 miles southwest of Meade, Meade, Kansas, United States of America, on *Onychomys leucogaster arcticeps* [Animalia: Rodentia: Cricetidae].

***Androlaelaps cryptomius* (Radford, 1939)**
Ischnlolaelaps cryptomius Radford, 1939: 248.
Ischnolaelaps cryptomius.—Radford, 1943: 62.
Atricholaelaps cryptomius.—Radford, 1950a: 370.

Hypoaspis (*Haemolaelaps*) *cryptomius*.—Zumpt & Patterson, 1951: 71.
Haemolaelaps cryptomius.—Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 241; Strandtmann & Wharton, 1958: 35; Tipton, 1960: 242.
Liponyssus lawrencei Zumpt & Patterson, 1951: 89 [junior synonym of *I. cryptomius* by Till, 1963: 31].
Liponyssus lawrencei.—Zumpt & Till, 1953b: 8.
Haemolaelaps lawrencei.—Strandtmann & Wharton, 1958: 40.
Androlaelaps cryptomius.—Till, 1963: 31; Shaw, 2014a: 286.
Androlaelaps cryptomia.—Evans & Till, 1965a: 253.

Type depository. *I. cryptomius*: unspecified [according to Till (1963: 34), in C.D. Radford's collection and Koninklijk Museum voor Midden Afrika, Tervuren, Belgium]; *L. lawrencei*: Natal Museum, Pietermaritzburg, South Africa.
Type locality and habitat. *I. cryptomius*: Wynberg, Cape province, South Africa, on *Cryptomys capensis* [Animalia: Rodentia: Bathyergidae]; *L. lawrencei*: near Wynberg, Cape, South Africa, on *Georychus capensis* [Animalia: Rodentia: Bathyergidae].

***Androlaelaps cubicularis* (Berlese, 1887)**
Laelaps (*Iphis*) *cubicularis* Berlese, 1887a: 7.
Iphis cubicularis.—Berlese, 1892f: 35.
Laelaps cubicularis.—Berlese, 1892f: 42.
cubicularis; *non-Laelaps* [sic].—Tipton, 1960: 292.
Haemolaelaps cubicularis.—Schweizer, 1961: 154.
Androlaelaps cubicularis.—Bernini *et al*., 1995: 27; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Italy, on *Rattus norvegicus* (cited as *Mus decumanus*) [Animalia: Rodentia: Muridae] in stables.

***Androlaelaps cuicensis* Gettinger, 1997**
Androlaelaps cuicensis Gettinger, 1997: 346.
Androlaelaps cuicensis.—Gettinger & Martins-Hatano, 2003: 909; Kůrka, 2005: 23.

Type depository. Museu de Zoologia, Universidade de São Paulo, São Paulo, São Paulo state, Brazil.
Type locality and habitat. 1100 m above sea level, Fazenda Água Limpa, 12 km south of Brasilia, Distrito Federal, Brazil, on *Monodelphis rubida* [Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps cursor* Lareschi & Savchenko, 2021**
Androlaelaps cursor Lareschi, 2020: 7 (*nomen nudum*; ICZN Article 8.5.3).
Androlaelaps cursor Lareschi & Savchenko, 2021: 299.

Type depository. Colección de Entomologia, Museo de La Plata, Argentina.
Type locality and habitat. Mata do Paraíso Research Station, Viçosa, Minas Gerais, Brazil (20°46'S, 42°51'W), on *Akodon cursor* (Animalia: Rodentia: Cricetidae).

***Androlaelaps dasymys* (Radford, 1939)**
Ischnolaelaps dasymys Radford, 1939: 245.
Ischnolaelaps dasymys.—Radford, 1943: 62.
Atricholaelaps dasymys.—Radford, 1950a: 370.
Haemolaelaps dasymys.—Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 247; Strandtmann & Wharton, 1958: 35; Sakamoto *et al*., 1979: 43.

Hypoaspis (*Haemolaelaps*) *dasymys*.—Zumpt & Patterson, 1951: 72.
Hypoaspis (*Haemolaelaps*) *labuschagnei* Zumpt & Patterson, 1951: 85 [junior synonym of *I. dasymys* by Till, 1963: 34; Fain & Hart, 1988: 441].
Haemolaelaps labuschangnei [sic].—Zumpt & Till, 1953a: 245.
Haemolaelaps davisi Zumpt & Till, 1956: 287 [junior synonym of *I. dasymys* by Till, 1963: 34; Fain & Hart, 1988: 441].
Haemolaelaps davisi.—Strandtmann & Wharton, 1958: 36; Tipton, 1960: 242.
Haemolaelaps labuschagnei.—Strandtmann & Wharton, 1958: 40; Taufflieb & Mouchet, 1959: 352; Tipton, 1960: 242.
Haemolaelaps dasymus [sic].—Tipton, 1960: 242.
Androlaelaps dasymys s.l. [sic].—Till, 1963: 34.
Ischnolaelaps dasymus [sic].—Sheals, 1964: 16.
Androlaelaps dasymys.—Fain & Hart, 1988: 441; Matthee & Ueckermann, 2008: 189.

Type depository. *I. dasymys*: unspecified [according to Till (1963), in Natural History Museum, London, England]; *H.* (*H.*) *labuschagnei* and *H. davisi*: South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. *I. dasymys*: Kakumiro, Uganda, on *Dasymys helukus helukus* [Animalia: Rodentia: Muridae]; *H.* (*H.*) *labuschagnei*: Amersfort, Transvaal, South Africa, in nest of *Rattus rattus* [Animalia: Rodentia: Muridae]; *H. davisi*: north of the Mashai River, Kingdom of Lesotho (cited as Basutoland), on *Mystromys albicaudatus* [Animalia: Rodentia: Nesomyidae].

Androlaelaps debilis (Jameson, 1950)

Eubrachylaelaps debilis Jameson, 1950a: 64.
Eubrachylaelaps debilis.—Jameson, 1951: 556; Keegan, 1953: 37; Furman, 1955a: 58; Allred & Beck, 1956: 38; Allred, 1958: 18; Strandtmann & Wharton, 1958: 49; Tipton, 1960: 241; Allred & Goates, 1964a: 72; Whitaker & Wilson, 1974: 6; Whitaker *et al*., 2007: 17; Light *et al*., 2020: 85.
Androlaelaps (*Eubrachylaelaps*) *debilis*.—Barrera, 1979: 477; Bassols, 1981: 14.
Androlaelaps debilis.—Farrier & Hennessey, 1993: 65.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Quincy, Plumas, California, United States of America, on *Peromyscus maniculatus* [Animalia: Rodentia: Cricetidae].

Androlaelaps delomys Gettinger & Gardner, 2015

Androlaelaps (*Eubrachylaelaps*) *delomys* Gettinger & Gardner, 2015: 245.

Type depository. Fundação Instituto Oswaldo Cruz, Rio de Janeiro, Brazil; specimen number ACA-1758.
Type locality and habitat. Estação Biológica de Boraceia (23°37'59"S, 45°31'59"W), São Paulo, Brazil, on *Delomys dorsalis* [Animalia: Rodentia: Cricetidae].

Androlaelaps dendropicos Cort & Forbes, 1975

Androlaelaps dendropicos Cort & Forbes, 1975: 569.
Haemolaelaps dendropicos.—Domrow, 1981b: 118.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Kisanga, Lubumbashi (cited as Elizabethville), Democratic Republic of the Congo (cited as Congo, Zaire), on *Dendropicos elachus* [Animalia: Piciformes: Picidae].

***Androlaelaps dengi* (Ye & Ma, 1991)**
Haemolaelaps dengi Ye & Ma, 1991: 98.
Haemolaelaps dengisp [sic].—Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps dengi.—Moreira, 2014: 135.

Type depository. Xinjiang Institute for Endemic Disease Control and Research, Xinjiang, China.
Type locality and habitat. Mori, Xinjiang (43°48'N, 90°15'E), China, on *Lagurus lagurus* [Animalia: Rodentia: Cricetidae].

***Androlaelaps deomys* Fain & Hart, 1988**
Androlaelaps deomys Fain & Hart, 1988: 451.
Androlaelaps deomys.—Kůrka, 2005: 23.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Irangi, Kivu, Democratic Republic of the Congo (cited as Zaire), on *Deomys ferrurineus vandenberghei* [Animalia: Rodentia: Muridae].

***Androlaelaps desmodilliscus* (Sakamoto *et al*., 1979)**
Haemolaelaps desmodilliscus Sakamoto, Jorgensen & Herrin, 1979: 49.
Androlaelaps desmodilliscus.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 9 km northeast of Barga, Upper Volta, on *Desmodilliscus braueri* [Animalia: Rodentia: Muridae].

***Androlaelaps dissimilis* (Asanuma, 1953)**
Haemolaelaps dissimilis Asanuma, 1953: 12.
Haemolaelaps disimilis [sic].—Strandtmann & Wharton, 1958: 36.
Haemolaelaps dissimilis.—Tipton, 1960: 242.
Androlaelaps dissimilis.—Moreira, 2014: 135.

Type depository. Author's collection.
Type locality and habitat. Miyake Island, Izu Seven Islands, Japan, on *Emberiza rustica latifascia* [Animalia: Passeriformes: Emberizidae].

***Androlaelaps dogieli* (Schulman, 1957)**
Haemolaelaps dogieli Schulman, 1957: 95.
Haemolaelaps dogieli.—Ye & Ma, 1996: 296.
Androlaelaps dogieli.—Moreira, 2014: 136; Vinarski & Korallo-Vinarskaya, 2016: 234.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Karelia [region presently divided between Finland and Russia], on *Sicista betulina* [Animalia: Rodentia: Dipodidae].

***Androlaelaps domesticus* (Berlese, 1887)**
Laelaps (*Iphis*) *domesticus* Berlese, 1887a: 8.
Iphis domesticus.—Berlese, 1892f: 35.
Laelaps domesticus.—Berlese, 1892f: 42.
domesticus; *non-Laelaps* [sic].—Tipton, 1960: 292.
Hypoaspis (*Haemolaelaps*) *domesticus*.—Castagnoli & Pegazzano, 1985: 117.
Androlaelaps domesticus.—Bernini *et al*., 1995: 27; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Italy, in association with flour in houses.

***Androlaelaps ebsi* (Sakamoto *et al*., 1979)**
Haemolaelaps ebsi Sakamoto, Jorgensen & Herrin, 1979: 51.
Androlaelaps ebsi.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Tatarko, Upper Volta, on *Taterillus gracilis* [Animalia: Rodentia: Muridae].

***Androlaelaps elegantulus* (Berlese, 1903)**
Laelaps elegantulus Berlese, 1903a: 241.
Laelaps (*Hypoaspis*) *elegantulus*.—Berlese, 1904c: 414.
Hypoaspis elegantulus.—Vitzthum, 1921: 14; Castagnoli & Pegazzano, 1985: 124; Kůrka, 2005: 24.
Gymnolaelaps elegantulus.—Vitzthum, 1929: 25; Schweizer, 1949: 39; Turk, 1953: 11.
elegantulus; *non-Laelaps* [sic].—Tipton, 1960: 293.
Hypoaspis (*Geolaelaps*) *elegantulus*.—Bregetova, 1977b: 504.
Hypoaspis (*Geolaelaps*) *elegantula*.—Karg, 1979: 85; Teng, 1982: 161.
Hypoaspis elegantula.—Bernini *et al*., 1995: 28.
Gaeolaelaps elegantulus.—Moreira, 2014: 249.
Androlaelaps elegantulus.—Nemati *et al*., 2018c: 227.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Cison di Valmarino, Treviso, Italy, in nests of *Tapinoma erraticum* [Animalia: Hymenoptera: Formicidae].
Note. Bregetova (1977b: 504) and Karg (1979: 85, 1982: 243, 1989c: 116, 1993a: 144) suspected this species to be a senior synonym of *Hypoaspis* (*Hypoaspis*) *brevipilis*.

***Androlaelaps ellobii* (Bregetova, 1952)**
Haemolaelaps ellobii Bregetova, 1952: 870.
Haemolaelaps ellobii.—Bregetova, 1955b: 306, 1956: 93; Schulman, 1957: 97; Strandtmann & Wharton, 1958: 36; Tipton, 1960: 242; Violovich, 1961: 258; Reitblat, 1963: 70; Sheals, 1964: 16.
Androlaelaps ellobii.—Senotrusova, 1987: 189; Chelebiev, 1988: 10; Vinarski & Korallo-Vinarskaya, 2016: 234.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series, Chkalov, West Kazakhstan and Tajikistan, on *Ellobius talpinus* [Animalia: Rodentia: Cricetidae], Turkmenistan, on *E. talpinus* and *Ellobius fuscocapillus* [Animalia: Rodentia: Cricetidae].

***Androlaelaps elongatus* (Berlese, 1918)**
Hypoaspis (*Haemolaelaps*) *elongatus* Berlese, 1918: 125.
Hypoaspis (*Haemolaelaps*) *elongatus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 127.
Haemolaelaps elongatus.—Radford, 1943: 61, 1950: 366; Strandtmann & Wharton, 1958: 36; Tipton, 1960: 242.
Androlaelaps elongatus.—Bernini *et al*., 1995: 27; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, "Etruria" and Sardinia, Italy, in hay litter in stables.

***Androlaelaps euryplatamus* Yang & Li, 1992**
Androlaelaps euryplatamus Yang & Li, 1992: 428.
Androlaelaps euryplatamus.—Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.

Type depository. Institute for Endemic Disease Control, Qinghai, China.
Type locality and habitat. Guinan (35°21'N, 100°59'E), Qinghai, China, in nest of *Passer montanus* [Animalia: Passeriformes: Passeridae].

***Androlaelaps ewingi* (Keegan, 1956)**
Haemolaelaps ewingi Keegan, 1956a: 243.
Haemolaelaps ewingi.—Strandtmann & Wharton, 1958: 36; Tipton, 1960: 242; Costa, 1961a: 16.
Androlaelaps ewingi.—Moreira, 2014: 137.

Type depository. Unspecified.
Type locality and habitat. El Mansuriya, Imbaba, Giza, Egypt, in nest of *Gerbillus gerbillus* [Animalia: Rodentia: Muridae].
Note. Costa (1961a: 16) suspected this species to be a junior synonym of *Haemolaelaps hirsti* Keegan.

***Androlaelaps extremitatis* Karg, 1991**
Androlaelaps extremitatis Karg, 1991: 165.

Type depository. Zoological Museum, Berlin, Germany.
Type locality and habitat. Madagascar, on *Princisia* sp. [Animalia: Blattodea: Blaberidae].

***Androlaelaps extremus* Karg, 1990**
Androlaelaps extremus Karg, 1990: 50.
Androlaelaps extremus.—Kůrka, 2005: 23.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Maracay, Venezuela, on fallen leaves and humus layer in a forest.

***Androlaelaps fahrenholzi* (Berlese, 1911)**
Laelaps (*Haemolaelaps*) *fahrenholzi* Berlese, 1911b: 432.
Liponyssus setiger Ewing, 1920: 290 [junior synonym of *L*. (*H*.) *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65].
Laelaps californicus Ewing, 1925: 5 [junior synonym of *L*. (*H*.) *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L. glasgowi* by Strandtmann & Wharton, 1958: 38; of *H. glasgowi* by Strandtmann, 1949: 343].

Laelaps glasgowi Ewing 1925: 6 [junior synonym of *L*. (*H*.) *fahrenholzi* by Samšiňák, 1958: 188; Strandtmann, 1963: 4; Evans & Till, 1966: 156; Karg, 1971: 187, 1993a: 164; Furman, 1972: 50; Domrow, 1988: 830; Farrier & Hennessey, 1993: 65; Halliday, 1998: 123; of *L*. *californicus* by Strandtmann, 1949: 343; Womersley, 1955: 421; Fonseca, 1958a: 49; Tipton, 1960: 289; Till, 1963: 40].

Laelaps virginianus Ewing, 1925: 6 [junior synonym of *L*. (*H*.) *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Ewing, 1947: 84; Strandtmann, 1949: 343; Womersley, 1955: 421; Fonseca, 1958a: 49; Strandtmann & Wharton, 1958: 38; Tipton, 1960: 295; Till, 1963: 40].

Hypoaspis microti Oudemans, 1926b: 101 [junior synonym of *L*. (*H*.) *fahrenholzi* by Strandtmann, 1963: 4; Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann & Wharton, 1958: 38; 1963: 40; Meng *et al*., 2021: 4].

Haemolaelaps mohrae Oudemans, 1928b: 374 [junior synonym of *L*. (*H*.) *fahrenholzi* by Willmann, 1952b: 402; Strandtmann, 1963: 4; Evans & Till, 1966: 156; Domrow, 1988: 830; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann & Wharton, 1958: 38; Till, 1963: 40; Meng *et al*., 2021: 4].

Haemolaelaps mohrae.—Oudemans, 1929d: 13; Vitzthum, 1931c: 38; Radford, 1943: 61, 1950: 367; Tipton, 1960: 242.

Hypoaspis cricetophilus Vitzthum, 1930b: 417 [junior synonym of *L*. (*H*.) *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann, 1949: 343; Womersley, 1955: 421; Fonseca, 1958a: 49; Strandtmann & Wharton, 1958: 38; Tipton, 1960: 295; Till, 1963: 40].

Lelaps [sic] *stegemani* Hefley, 1935: 22 [junior synonymy; of *L*. (*H*.) *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann, 1949: 343; Womersley, 1955: 421; Fonseca, 1958a: 49; Strandtmann & Wharton, 1958: 38; Tipton, 1960: 295; Till, 1963: 40].

Atricholaelaps glasgowi.—Harkema, 1936: 195; Wharton, 1938: 140; Ewing, 1947: 84; Strandtmann, 1948: 187; Linardi *et al*., 1984b: 215.

Ischnolaelaps reticulatus Fonseca, 1936a: 19 [junior synonym of *L*. *glasgowi* by Fonseca, 1958a: 49].

Ischnolaelaps coelogenys Fonseca, 1936b: 31 (based on the abstract, "*Ischnolaelaps sciureus*" on page 31 is interpreted as *lapsus calami* for *I*. *coelogenys*) [junior synonym of *Laelaps glasgowi* by Fonseca, 1958a: 49].

Ischnolaelaps sciureus Fonseca, 1936b: 32 [junior synonym of *L*. *glasgowi* by Fonseca, 1958a: 49].

Ischnolaelaps reticulatus.—Fonseca, 1937a: 1599; Radford, 1943: 62.

Ischnolaelaps coelogenys.—Fonseca, 1937a: 1600.

Ischnolaelaps sciureus.—Fonseca, 1937a: 1601; Radford, 1943: 62.

Ischnolaelaps rhabdomys Radford, 1939: 249 [junior synonym of *A*. *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Till, 1963: 40].

Laelaps californicus.—Radford, 1943: 59, 1950: 368.

Laelaps virginianus.—Radford, 1943: 59, 1950: 369.

Laelaps glasgowi.—Radford, 1943: 59, 1950: 369; Sheals, 1964: 16.

Haemolaelaps fahrenholzi.—Radford, 1943: 61, 1950: 366; Willmann, 1952b: 402; Strandtmann & Wharton, 1958: 37; Tipton, 1960: 242; Garrett & Allred, 1971: 294; Mrciak & Brelih, 1972: 343; Domrow, 1973: 64, 1988: 830; Sakamoto *et al*., 1979: 43; Nemati & Gwiazdowicz, 2016b: 44.

Ischnolaelaps coelogenys.—Radford, 1943: 62.

Ischnolaelaps rhabdomys.—Radford, 1943: 62.

Haemolaelaps microti.—Buitendijk, 1945: 299; Radford, 1950a: 369.

Haemolaelaps scalopi Keegan, 1946: 71 [junior synonym of *A*. *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann, 1949: 343; Womersley, 1955: 421; Strandtmann & Wharton, 1958: 38; Tipton, 1960: 295; Till, 1963: 40; Meng *et al*., 2021: 4].

Atricholaelaps sigmodoni Strandtmann, 1946: 164 [junior synonym of *A*. *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann, 1949: 343; Womersley, 1955: 421; Strandtmann & Wharton, 1958: 38; Tipton, 1960: 295; Till, 1963: 40].

Atricholaelaps strandtmanni Fox, 1947: 598 [junior synonym of *A*. *fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L*. *glasgowi* by Strandtmann, 1949: 343; Womersley, 1955: 421; Strandtmann & Wharton, 1958: 38; Tipton, 1960: 295; Till, 1963: 40].

Atricholaelaps virginianus.—Ewing, 1947: 84.

Ischnolaelaps sciurinus [sic].—Strandtmann, 1949: 331.

Haemolaelaps glasgowi.—Strandtmann, 1949: 343; Jameson, 1950b: 140; Zumpt & Patterson, 1950: 68; Bregetova, 1952: 872, 1953: 309, 1955b: 299, 1956: 86; Eads *et al*., 1952: 250, 1965: 19; Asanuma, 1953: 11; Keegan, 1953: 37; Zumpt & Till, 1953a: 239, 1954: 213, 1956: 282; Burgess, 1955: 639; Ellis, 1955: 16; Womersley, 1955: 421; Zemskaya, 1955: 297; Allred & Beck, 1956: 40; Lavoipierre, 1956: 295; Allred & Roscoe, 1957: 397; Drummond, 1957: 50; Howell *et al*., 1957: 84; Schulman, 1957: 97; Allred, 1958: 22, 1961: 124, 1963: 231; Hays & Guyton, 1958: 260; Strandtmann & Wharton, 1958: 37; Taufflieb & Mouchet, 1959: 351; Tipton, 1960: 242; Costa, 1961a: 12, 1961b: 258, 1962: 489; Furman & Tipton, 1961: 185; Violovich, 1961: 256; Mauri & Capri, 1962: 60; Piryanik, 1962: 81; Randolph & Eads, 1962: 60; Goates, 1963: 4; Reitblat, 1963: 70; Wang, 1963: 202; Allred & Goates, 1964a: 72; Goncharova & Buyakova, 1964: 279; Hansen, 1964: 77; Teng & Pan, 1964: 330; Mauri, 1965: 17, 1966a: 52, 1966b: 36, 1967a: 69, 1967b: 517, 1967c: 3; Mellott & Connell, 1965: 87; Błaszak, 1969: 31; Mauri & Capri, 1970: 134; Gadzhiev, 1973: 417; Shcherbak, 1973: 446; Fernández, 1977: 4; Fernández & Capri, 1978: 48; Wang *et al*., 1981: 106; Ye & Ma, 1991: 98; Deng *et al*., 1993: 106; Wang & Liao, 2000: 19; Shayan & Rafinejad, 2006: 71; Hanafi-Bojd *et al*., 2007: 175; Ren & Guo, 2008: 327, 2009: 100; Xin *et al*., 2010: 2; Kazemi & Rajaei, 2013: 88; Meng *et al*., 2021: 4.

Atricholaelaps coelogenys.—Radford, 1950a: 370.

Atricholaelaps reticulatus.—Radford, 1950a: 370.

Atricholaelaps rhabdomys.—Radford, 1950a: 370.

Atricholaelaps sciureus.—Radford, 1950a: 370.

Haemolaelaps scalopi.—Radford, 1950a: 367.

Haemolaelaps rhabdomys.—Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 242; Strandtmann & Wharton, 1958: 44; Tipton, 1960: 242.

Hypoaspis (*Haemolaelaps*) *rhabdomys*.—Zumpt & Patterson, 1951: 71.

Hypoaspis (*Haemolaelaps*) *eos* Zumpt & Patterson, 1951: 79 [junior synonym of *A. fahrenholzi* by Evans & Till, 1966: 156; Farrier & Hennessey, 1993: 65; of *L. glasgowi* by Zumpt & Till, 1953a: 246; Strandtmann & Wharton, 1958: 38; Till, 1963: 40].

Haemolaelaps glasgovi [sic].—Lange, 1955a: 242.

Haemolaelaps eos.—Zumpt & Till, 1956: 282.

Atricholaelaps (*Ischnolaelaps*) *glasgowi*.—Fonseca, 1958a: 50, 1958b: 176, 1960a: 27; Linardi *et al*., 1984a: 240.

Emolaelaps glascowi [sic].—Valle, 1958: 185.

Emolaelaps glasgowi [sic].—Valle, 1958: 185.

Haemolaelaps coelogenys.—Strandtmann & Wharton, 1958: 35.

Haemolaelaps reticulatus.—Strandtmann & Wharton, 1958: 44.

Haemolaelaps sciureus.—Strandtmann & Wharton, 1958: 45; Tipton, 1960: 242.

Haemolaelaps reticulatus.—Tipton, 1960: 242.

californicus; *non-Laelaps* [sic].—Tipton, 1960: 289.

fahrenholzi; *non-Laelaps* [sic].—Tipton, 1960: 294.

glasgowi; *non-Laelaps* [sic].—Tipton, 1960: 289.

stegemani; *non-Laelaps* [sic].—Tipton, 1960: 308.

virginianus; *non-Laelaps* [sic].—Tipton, 1960: 310.

Hypoaspis microti.—Strandtmann, 1963: 4.

Hypoaspis mohrae.—Strandtmann, 1963: 4.

Androlaelaps glasgowi.—Till, 1963: 40; Costa, 1966a: 73; Bregetova, 1977b: 534; Senotrusova, 1987; 179; Chelebiev, 1988: 10; Marchenko, 2002: 45; Vinarski & Korallo-Vinarskaya, 2016: 234.

Androlaelaps fahrenholzi.—Evans & Till, 1965a, 252, 1966: 156; Solomon, 1968b: 675; Whitaker & Wilson, 1968: 538; Dusbábek, 1970: 274; Karg, 1971: 187, 1990: 52, 1993a: 164; Furman, 1972: 50; Timm, 1972: 19; Beron, 1974: 163; Whitaker & Schmeltz, 1974: 480; Whitaker & Wilson, 1974: 4; Treat, 1975: 67; Whitaker *et al*., 1976: 435, 2007: 13; Goff & Whitaker, 1977: 458; Whitaker, 1977: 195; De la Cruz, 1981: 7; Ambros, 1983a: 202, 1983b: 144, 1983c: 61; Whitaker & Dietz, 1987: 190; Farrier & Hennessey, 1993: 65; Cuervo *et al*., 1994: 17; Oyoun & El Kady, 1995: 96; Barros-Battesti *et al*., 1998: 721; Halliday, 1998: 123, 2019: internet page; Çobanoğlu & Bayram, 1998: 190; Botelho *et al*., 2002: 54; González &

Pardinãs, 2002: 3; Nieri-Bastos *et al*., 2004: 31; Gwiazdowicz & Gulvik, 2005: 119; Kůrka, 2005: 23; Lareschi *et al*., 2006: 597; Matthee & Ueckermann, 2008: 189; Lareschi, 2011: 798; Shaw, 2014a: 290; Klimov *et al*., 2016: internet page; Nemati *et al*., 2018b: 119.

Androlaelaps (*Haemolaelaps*) *glasgowi*.—Taufflieb *et al*., 1967: 123.

Androlaelaps (*Haemolaelaps*) *fahrenholzi*.—Barrera, 1979: 476; Bassols, 1981: 16; Estébanez-Gonzales, 1997: 5; Estébanez-Gonzales & Cervantes, 2005: 26; Light *et al*., 2020: 84.

Hypoaspis (*Haemolaelaps*) *fahrenholzi*.—Castagnoli & Pegazzano, 1985: 140.

Lelaps stegemoni [sic].—Farrier & Hennessey, 1993: 65.

Androlaelaps ahrenholzi [sic].—Nieri-Bastos *et al*., 2004: 31.

Androlaelaps reticulatus.—Moreira, 2014: 171.

Androlaelaps sciureus.—Moreira, 2014: 118.

Type depository. *I. coelogenys*, *I. reticulatus* and *I. sciureus*: Instituto Butantan, São Paulo, Brazil; *L.* (*H.*) *fahrenholzi*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *L. setiger*, *H. microti*, *H. mohrae*, *H. cricetophilus* and *I. rhabdomys*: unspecified; *L. californicus* (specimen number 905), *L. glasgowi* (specimen number 906), *L. virginianus* (specimen number 907) and *A. sigmodoni*: National Museum of Natural History, Washington, District of Columbia, United States of America; *L. stegemani*: University of Kansas, Kansas, United States of America; *H. scalopi*: Army Medical Museum, Washington, United States of America; *A. strandtmanni*: Departmentof Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico; *H.* (*H.*) *eos*: South African Institute for Medical Research, Johannesburg, South Africa.

Type locality and habitat. *I. coelogenys*: Estrella, Rio de Janeiro, Brazil, on *Cuniculus paca* (cited as *Coelogenys pacca*) [Animalia: Rodentia: Cuniculidae]; *I. reticulatus*: Instituto Butantan, São Paulo, São Paulo state, Brazil, on *Euryzygomatomys spinosus catellus* [Animalia: Rodentia: Echimyidae]; *I. sciureus*: Angra dos Reis, Rio de Janeiro state, Brazil, on *Sciurus aestuans* [Animalia: Rodentia: Sciuridae]; *L.* (*H.*) *fahrenholzi*: Germany, on wild murids [Animalia: Rodentia: Muridae]; *L. setiger*: Madison, Wisconsin, United States of America, on unidentified "short-tailed shrew" [probably *Blarina brevicauda*] [Animalia: Soricomorpha: Soricidae]; *L. californicus*: Topaz, California, United States of America, in mouse nest [Animalia: Rodentia]; *L. glasgowi*: Urbana, Illinois, United States of America, on "wild rat" [Animalia: Rodentia]; *L. virginianus*: East Falls Church, Virginia, United States of America, on "wild mouse" [Animalia: Rodentia]; *H. microti*: Arnhem, The Netherlands, on *Microtus amphibious* [Animalia: Rodentia: Cricetidae]; *H. mohrae*: Holstein, Maart and Glückstadt, Germany, in nest of *Microtus arvalis* [Animalia: Rodentia: Cricetidae]; *H. cricetophilus*: Tungljau, north China, in nest of *Phodopus bedfordiae* [Animalia: Rodentia: Cricetidae]; *L. stegemani*: near East Syracuse, Onondaga and Oswego County Sanitarium, Oswego, New York, United States of America, on *Mephitis nigra* [Animalia: Carnivora: Mephitidae]; *I. rhabdomys*: Onderstepoort, Transvaal, South Africa, on *Rhabdomys pumilio* (Animalia: Rodentia: Muridae); *A. sigmodoni*: Galveston, near La Marque, Texas, United States of America, on *Sigmodon hispidus texianus* [Animalia: Rodentia: Cricetidae]; *H. scalopi*: Omaha, Nebraska, United States of America, on *Scalopus aquaticus* [Animalia: Eulypotyphla: Talpidae]; *A. strandtmanni*: Camp O'Reilly, Gurabo, Puerto Rico, on *Rattus* sp. [Animalia: Rodentia: Muridae] or *Mus musculus* [Animalia: Rodentia: Muridae]; *H.* (*H.*) *eos*: Rietfontein, near Johannesburg, Transvaal, South Africa, on *Rhabdomys pumilio* [Animalia: Rodentia: Muridae].

Note. Specimens reported as *Atricholaelaps sigmodoni* by Randolph & Eads (1946: 599) were re-identified as *Androlaelaps geomys* (Strandtmann) by Strandtmann (1949: 340). Bregetova (1952: 866) had suspected *H. microti* to be a junior synonym of *L. glasgowi*. Specimens identified as *H. glasgowi* by Bregetova (1956: 86) were re-identified as *H. fahrenholzi* by Ambros (1983b: 144). Vinarski & Korallo-Vinarskaya (2016: 234) considered the following species as synonyms: *L.* (*H.*). *fahrenholzi*, *L. californicus*, *L. glasgowi*, *L. virginianus*, *H. microti*, *H. mohrae*, *H. cricetophilus*, *L. stegemani*, *I. rhabdomys*, *H. scalopi*, *A. sigmodoni*, *A. strandtmanni* and *H.* (*H.*) *eos*. They considered *L. glasgowi* as the valid name, despite the priority of *L.* (*H.*) *fahrenholzi*, according to the ICZN.

***Androlaelaps fenilis* (Mégnin, 1876)**

Gamasus fenilis Mégnin, 1876: 332.

Gamasus fenilis.—Berlese, 1882e: 127.

Haemolaelaps fenilis.—Willmann 1939: 173; Buitendijk, 1945: 299; Samšiňák, 1958: 186; Garrett & Haramoto,

1967: 387; McGraw & Farrier, 1969: 137; Kazemi & Rajaei, 2013: 88; Khaleghabadian *et al*., 2015: 560; Khalili-Moghadam & Saboori, 2015: 318; Kordeshami *et al*., 2015: 592.
Hypoaspis fenilis.—Hill & Gordon, 1945: 47.
Androlaelaps fenilis.—Kůrka, 2005: 23; Nemati *et al*., 2018b: 133.

Type depository. Unspecified.
Type locality and habitat. Unspecified locality, on decomposing, mouldy fodder.
Note. Berlese (1882e: 127) reported a possible taxonomic relation between *G. fenilis*, *Gamasus stabularis* Koch, 1839 and *Gamasus complanatus* Kramer, 1873, suggesting the need for studies to confirm his observations. Specimens reported by McGraw & Farrier (1969: 137) as *H. fenilis* were re-identified as *A. casalis casalis* by Farrier & Hennessey (1993: 64). *Gamasus fenilis* was considered a senior synonym of *Atricholaelaps megaventralis* (Samšiňák, 1958: 186; Garret & Haramoto, 1967: 387; McGraw & Farrier, 1969: 137), *Haemolaelaps haemorrhagicus* (McGraw & Farrier, 1969: 138), *Haemolaelaps mohrae* (Buitendijk, 1945: 299), *Haemolaelaps molestus* (Buitendijk, 1945: 299; Samšiňák, 1958: 186 and Strandtmann, 1963: 4), *Hypoaspis freemani* (Samšiňák, 1958: 186 and McGraw & Farrier, 1969: 137) and *Hypoaspis oculatus* (Buitendijk, 1945: 299 and McGraw & Farrier, 1969: 137). As summarised by Halliday (2011: 63), *G. fenilis* was considered senior synonym of *I. casalis* by some authors (*e.g*. Samšiňák, 1958: 186; McGraw & Farrier, 1969: 137; Garrett & Haramoto, 1967: 387), but not by others (Domrow, 1980: 209; Farrier & Hennessey, 1993: 64). The synonymies remain unresolved because of the inadequate original descriptions of those species. Evans & Till (1966: 152) suspected *G. fenilis* to be a synonym of *A. casalis casalis*, stating that the identity of the former could not be ascertained because of the inadequate original description of *G. fenilis*.

***Androlaelaps foenalis* (Berlese, 1887)**
Laelaps (*Iphis*) *foenalis* Berlese, 1887a: 7.
Iphis foenalis.—Berlese, 1892f: 35.
Laelaps foenalis.—Berlese, 1892f: 42.
foenalis; *non-Laelaps* [sic].—Tipton, 1960: 294.
Haemolaelaps foenalis.—Schweizer, 1961: 152.
Hypoaspis (*Haemolaelaps*) *foenalis*.—Castagnoli & Pegazzano, 1985: 149.
Androlaelaps foenalis.—Bernini *et al*., 1995: 27; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Padua and Florence, Italy, in stables, on *Rattus norvegicus* (cited as *Mus decumanus*) [Animalia: Rodentia: Muridae].

***Androlaelaps franzi* Marais & Loots, 1970**
Androlaelaps (*Androlaelaps*) *franzi* Marais & Loots, 1970: 7.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. Near Cunene River, Angola, in soil.

***Androlaelaps galagus* (Lavoipierre, 1955)**
Haemolaelaps galagus Lavoipierre, 1955a: 304.
Haemolaelaps galagus.—Strandtmann & Wharton, 1958: 37; Taufflieb & Mouchet, 1959: 352; Sakamoto *et al*., 1979: 43.
Androlaelaps galagus.—Till, 1963: 36; Dusbábek *et al*., 1982: 171; Fain & Hart, 1988: 441.

Type depository. Liverpool School of Tropical Medicine, Liverpool, England.
Type locality and habitat. Barombi Kang [cited as Barombikang] Forest, Cameroon [cited as British Cameroons], on *Galago alleni* [Animalia: Primates: Galagidae].

***Androlaelaps gallinarii* (Grokhovskaya & Huan-Hoe, 1961)**

Haemolaelaps gallinarii Grokhovskaya & Huan-Hoe, 1961: 1634.

Haemolaelaps audyi Baker, Traub & Evans, 1962: 92 [junior synonym of *H. gallinarii* by Nadchatram *et al*., 1966: 131].

Haemolaelaps gallinarii.—Domrow, 1963b: 201; Nadchatram *et al*., 1966: 131.

Haemolaelaps audyi.—Gu & Wang, 1980: 47; Chen *et al*., 1995a: 229.

Androlaelaps gallinarii.—Moreira, 2014: 144.

Type depository. *H. gallinarii*: unspecified; *H. audyi*: National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2469.

Type locality and habitat. *H. gallinarii*: Kam-Dong, Lao Cai, Vietnam, in chicken house substrate; *H. audyi*: Selangor, Gombak Forest Reserve, near Pahang Road, 20 km north of Kuala Lumpur, Malaysia (cited as Malaya), on *Callosciurus tenuis* [Animalia: Rodentia: Sciuridae].

***Androlaelaps geomys* (Strandtmann, 1949)**

Haemolaelaps geomys Strandtmann, 1949: 339.

Atricholaelaps sigmodoni.—Randolph & Ead, 1946: 599 (misidentification, according to Strandtmann, 1949: 340).

Haemolaelaps geomys.—Allred & Beck, 1956: 41; Lavoipierre, 1956: 295; Hays & Guyton, 1958: 260; Strandtmann & Wharton, 1958: 37; Tipton, 1960: 242.

Androlaelaps geomys.—Tuszynski & Whitaker, 1972: 546; Whitaker & Wilson, 1974: 5; Farrier & Hennessey, 1993: 66; Wilkins & Houck, 2001: 311; Whitaker *et al*., 2007: 14.

Androlaelaps (*Haemolaelaps*) *geomys*.—Barrera, 1979: 477; Bassols, 1981: 19.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Brooks, Georgia, United States of America, on *Geomys* sp. [Animalia: Rodentia: Geomyidae].

***Androlaelaps georychi* Till, 1963**

Androlaelaps georychi Till, 1963: 38.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.

Type locality and habitat. Knysna, Cape, South Africa, on *Georychus capensis* [Animalia: Rodentia: Bathyergidae].

***Androlaelaps ghanensis* Till, 1963**

Androlaelaps ghanensis Till, 1963: 38.

Androlaelaps ghanensis.—Zumpt & Elliott, 1970: 344; Dusbábek *et al*., 1982: 175.

Haemolaelaps ghanensis.—Sakamoto *et al*., 1979: 43.

Type depository. Natural History Museum, London, England; specimen number 1962.6.12.10.

Type locality and habitat. Ghana, on *Claviglis* sp. [Animalia: Rodentia: Gliridae].

***Androlaelaps graingeri* Zumpt & Patterson, 1952**

Androlaelaps graingeri Zumpt & Patterson, 1952: 162.

Turkiella graingeri.—Zumpt & Till, 1953a: 224.

Androlaelaps graingeri.—Till, 1963: 42.

Androlaelaps ?*graingeri* [sic].—Costa, 1969b: 194.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Kerio Valley, Kenya, on unidentified rodent [Animalia: Rodentia].

***Androlaelaps grandiculatus* Eads, 1951**
Androlaelaps grandiculatus Eads, 1951: 212.
Androlaelaps grandiculatus.—Eads, 1952: 239; Eads *et al*., 1952: 250; Furman, 1954: 119; Farrier & Hennessey, 1993: 66.
Androlaelaps gradiculatus [sic].—Fonseca, 1958b: 179.
Androlaelaps grandiculata.—Whitaker & Wilson, 1974: 5.
Androlaelaps (*Androlaelaps*) *grandiculatus*.—Barrera, 1979: 477; Bassols, 1981: 3; Estébanez-Gonzales & Cervantes, 2005: 26; Light *et al*., 2020: 84.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 1912.
Type locality and habitat. Zavala, Texas, United States of America, on *Perognathus merriami* [Animalia: Rodentia: Heteromyidae].
Note. Radovsky (1969: 456) refers to the possible relationship of this species with Haemogamasinae.

***Androlaelaps guimaraesi* (Fonseca, 1958)**
Atricholaelaps (*Atricholaelaps*) *guimaraesi* Fonseca, 1958b: 172.
Androlaelaps guimaraesi.—Moreira, 2014: 147.

Type depository. Unspecified; specimen number 2209.
Type locality and habitat. Northeastern Brazil, on *Hesperomys* sp. [Animalia: Rodentia: Cricetidae].

***Androlaelaps havliki* Mrciak *et al*., 1973**
Androlaelaps havliki Mrciak, Rosický & Wattal, 1973: 613.
Androlaelaps havliki.—Okáli, 1991: 199.

Type depository. According to the original description, Department of Systematic and Ecologic Zoology, Bratislava, Slovakia; according to Okáli (1991: 199), Slovak National Museum - Natural History Museum, Bratislava.
Type locality and habitat. Badli village area, near Delhi, India, on *Tatera indica* [Animalia: Rodentia: Muridae].

***Androlaelaps haydocki* (Till, 1959)**
Haemoloaelaps haydocki Till, 1959: 426.
Haemoloaelaps haydocki.—Grokhovskaya & Huan-Hoe, 1961: 1636; Domrow, 1981b: 118.
Androlaelaps haydocki.—Till, 1963: 45; Cort & Forbes, 1975: 571.
Androlaelaps (*Haemolaelaps*) *haydocki*.—Marais & Loots, 1970: 2.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Luanshya, Zambia (cited as Northern Rhodesia), on *Thripias namaquus* [Animalia: Piciformes: Picidae].

***Androlaelaps heliosciuri* Till, 1963**
Androlaelaps heliosciuri Till, 1963: 46.
Androlaelaps heliosciuri.—Costa, 1969b: 198; Fain & Hart, 1988: 441.
Haemolaelaps heliosciuri.—Sakamoto *et al*., 1979: 41.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Amani, Tanzania (cited as Tanganyika), on *Heliosciurus gambianus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps hermaphrodita* (Berlese, 1887)**
Laelaps (*Iphis*) *hermaphrodita* Berlese, 1887b: 6.
Iphis hermaphrodita.—Berlese, 1892f: 35.
Laelaps hermaphrodita.—Berlese, 1892f: 35; Radford, 1950b: 19.
Hypoaspis hermaphrodita.—Oudemans, 1902d: 23, 1903a: 129, 1912c: 245; Buitendijk, 1945: 296.
Laelaps (*Androlaelaps*) *hermaphrodita*.—Berlese, 1903b: 14, 1904c: 432.
Androlaelaps hermaphrodita.—Vitzthum, 1921: 22; Hull, 1925: 208; Radford, 1943: 61; Eads, 1952: 239; Turk & Turk, 1952: 483; Turk, 1953: 11; Zumpt & Till, 1953a: 215; Womersley, 1956a: 570; Fonseca, 1958b: 179; Garrett & Haramoto, 1967: 387; Wilson, 1967: 139; Whitaker & Wilson, 1974: 5; Castagnoli & Pegazzano, 1985: 178; Tenorio *et al*., 1985: 300; Domrow, 1987: 827; Bernini *et al*., 1995: 27; Halliday, 1998: 123, 2019: internet page; Kůrka, 2005: 23; Nateghpour *et al*., 2013: 74; Shaw, 2014a: 290; Zhou *et al*., 2015: 487; Nemati *et al*., 2018b: 134.
Androlaelaps setosus Fox, 1946b: 173 [junior synonym of *L*. (*I*.). *hermaphrodita* by Garrett & Haramoto, 1967: 387; Wilson, 1967: 139; Farrier & Hennessey, 1993: 66].
Androlaelaps setosus.—Thurman *et al*., 1948: 134; Radford, 1950a: 366; Eads, 1951: 213, 1952: 239; Furman, 1954: 120, 1972: 56; Fonseca, 1958b: 179; Baker, 1991: 222.
Androlaelaps hemaphrodita [sic].—Radford, 1950a: 366.
Hypoaspis (*Androlaelaps*) *hermaphrodita*.—Zumpt & Patterson, 1950: 67.
Androlaelaps hermaphroditus.—Womersley, 1956a: 575; Wang & Li, 1965: 237; Domrow, 1977: 200, 1980: 212; Farrier & Hennessey, 1993: 66.
Androlaelaps foxi Fonseca, 1958b: 180 [junior synonym of *L*. (*I*.) *hermaphrodita* by Wilson, 1967: 139].
hermaphrodita; *non-Laelaps* [sic].—Tipton, 1960: 296.
Haemolaelaps travisi Delfinado, 1961: 49 [junior synonym of *L*. (*I*.) *hermaphrodita* by Wilson, 1967: 139].
Haemolaelaps vietnamensis Grochovskaya & Huan-Hoe, 1961: 1636 [junior synonym of *L*. (*I*.) *hermaphrodita* by Wilson, 1967: 139].
Androlaelaps foxi.—Mauri & Alzuet, 1970: 143; Furman, 1972: 51; Botelho *et al*., 2002: 54.
Androlaelaps (*Androlaelaps*) *setosus*.—Barrera, 1979: 477; Bassols, 1981: 12; Light *et al*., 2020: 84.
Haemolaelaps hermaphrodita.—Shaw, 1999: 45.

Type depository. *H. foxi*: unspecified, specimen number 2412; *L*. (*I*.) *hermaphrodita*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *A. setosus*: Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico; *H. travisi*: Chicago Natural History Museum, Chicago, United States of America; *H. vietnamensis*: unspecified.
Type locality and habitat. *A. foxi*: Comorango, Pesqueira, Pernambuco state, Brazil, on *Zygodontomys pixuna* (Animalia: Rodentia: Cricetidae); *L*. (*I*.) *hermaphrodita*: Rome, Italy, from the countryside; *A. setosus*: San Juan (Santurce), Puerto Rico, on *Rattus norvegicus* [Animalia: Rodentia: Muridae]; *H. travisi*: Manila, Philippines, on *Rattus* sp. [Animalia: Rodentia: Muridae]; *H. vietnamensis*: type series, Fu Kui, Tan-Hoa, Vinh-Linh, Cam Pha, Hallam, Ha-Giang, Lao Cai, Vietnam, on *Suncus murinus* [Animalia: Soricomorpha: Soricidae], *Rattus concolor*, *Rattus rattus hainanicus*, *Rattus norvegicus*, *Rattus rattus flavipectus* and *Rattus sabanus* [Animalia: Rodentia: Muridae] and in chicken house.

***Androlaelaps himehimizu* Uchikawa & Asanuma, 1974**
Androlaelaps himehimizu Uchikawa & Asanuma, 1974: 72.

Type depository. National Science Museum, Tokio, Japan.
Type locality and habitat. Hapo-one, Hakuba, Nagano, Japan, on *Dymecodon pilirostris* [Animalia: Soricomorpha: Talpidae].

***Androlaelaps himizu* (Jameson, 1966)**
Haemolaelaps himizu Jameson, 1966: 103.
Androlaelaps himizu.—Ushikawa & Asanuma, 1974: 65; Moreira, 2014: 149.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Ohara, Kyoto-Fu, Honshu, Japan, on *Urotrichus talpoides* [Animalia: Eulypotyphla: Talpidae].

***Androlaelaps hirsti* (Keegan, 1956)**
Haemolaelaps hirsti Keegan, 1956a: 242.
Haemolaelaps hirsti.—Strandtmann & Wharton, 1958: 39; Costa, 1961a: 14; Sheals, 1964: 16; Domrow, 1977: 198; Sakamoto *et al*., 1979: 42; Kazemi & Rajaei, 2013: 88.
Haemolaelaps hirtsi [sic].—Tipton, 1960: 242.
Androlaelaps hirsti.—Till, 1963: 46; Costa, 1966a: 73; Zumpt & Elliott, 1970: 345; Radovsky, 1985: 453; Nemati *et al*., 2019: 93.
Androlaelaps (*Haemolaelaps*) *hirsti*.—Taufflieb *et al*., 1967: 123.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Yubo, Equatoria, South Sudan (cited as Sudan), on unidentified rat [Animalia: Rodentia].
Note. Costa (1961a: 16) suspected this species to be a senior synonym of *Haemolaelaps ewingi*.

***Androlaelaps hirstionyssoides* (Costa, 1961)**
Haemolaelaps hirstionyssoides Costa, 1961a: 16.
Haemolaelaps hirstionyssoides.—Costa, 1962: 491; Sheals, 1964: 16.
Androlaelaps hirstionyssoides.—Costa, 1966a: 73.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Type series, Akko, Beit Hakerem and Zikhron Ya'aqov, Israel, on *Spalax ehrenbergi* [Animalia: Rodentia: Spalacidae].

***Androlaelaps hirsuta* Furman, 1972**
Androlaelaps hirsuta Furman, 1972: 51.
Androlaelaps hirsuta.—Gettinger *et al*., 2005: 47.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number SVP 13950.
Type locality and habitat. 1335 m above sea level, La Laguna, 2 km north of and 4 km west of Caripe, Monagas, Venezuela, on *Marmosa fuscata* [Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps hollisteri* (Ewing, 1925)**

Laelaps hollisteri Ewing, 1925: 2.

Eubrachylaelaps hollisteri.—Ewing, 1929: 187; Jameson, 1947: 391, 1950a: 63, 1951: 556; Radford, 1950a: 370; Furman, 1955a: 58; Allred & Beck, 1956: 38; Allred, 1958: 20; Strandtmann & Wharton, 1958: 48; Tipton, 1960: 241; Allred & Goates, 1964a: 72; Whitaker & Wilson, 1974: 6; Whitaker *et al*., 2007: 17.

Laelaps hollisteri.—Radford, 1943: 59, 1950b: 31.

hollisteri; *non-Laelaps* [sic].—Tipton, 1960: 297.

Androlaelaps hollisteri.—Farrier & Hennessey, 1993: 66; Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 900.

Type locality and habitat. San Francisco, California, United States of America, on *Peromyscus californicus* [Animalia: Rodentia: Cricetidae].

***Androlaelaps hsui* Wang & Li, 1965**

Androlaelaps hsui Wang & Li, 1965: 235.

Androlaelaps hsui.—Deng *et al*., 1993: 117; Wang & Liao, 2000: 25; Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.

Type depository. Institute of Zoology, Academia Sinica, Beijing, China.

Type locality and habitat. Fujian, China, on *Rattus losea exiguus* [Animalia: Rodentia: Muridae].

***Androlaelaps hystrici* (Zumpt & Till, 1953)**

Haemolaelaps hystrici Zumpt & Till, 1953a: 235.

Haemolaelaps hystrici.—Keegan, 1956a: 239; Strandtmann & Wharton, 1958: 39; Tipton, 1960: 242; Sakamoto *et al*., 1979: 43.

Androlaelaps hystrici.—Till, 1963: 49.

Androlaelaps (*Haemolaelaps*) *hystrici*.—Taufflieb *et al*., 1967: 123.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.

Type locality and habitat. Karamoja District, Uganda, on *Hystrix cristata* [Animalia: Rodentia: Hystricidae].

***Androlaelaps ilhacardosoi* Gettinger & Martins-Hatano, 2003**

Androlaelaps ilhacardosoi Gettinger & Martins-Hatano, 2003: 909.

Type depository. Instituto Butantan, São Paulo, São Paulo state, Brazil.

Type locality and habitat. Ilha do Cardoso, São Paulo state, Brazil, on *Monodelphis americana* [Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps impensus* Eads, 1952**

Androlaelaps impensus Eads, 1952: 239.

Androlaelaps impensus.—Furman, 1954: 119; Fonseca, 1958b: 179.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 1983.

Type locality and habitat. Japan, intercepted at New York, United States of America, on *Lilium* sp. [Plantae: Liliales: Liliaceae] bulb.

***Androlaelaps inops* (Berlese, 1911)**
Laelaps (*Haemolaelaps*) *inops* Berlese, 1911b: 432.
Hypoaspis (*Haemolaelaps*) *inops*.—Lombardini, 1936: 42; Zumpt & Patterson, 1951: 70; Castagnoli & Pegazzano, 1985: 197.
Haemolaelaps inops.—Radford, 1943: 61, 1950: 366; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 237; Tipton, 1960: 242.
Androlaelaps inops.—Moreira, 2014: 152.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Nigeria, on murids [Animalia: Rodentia: Muridae].

***Androlaelaps insculptus* (Keegan, 1956)**
Haemolaelaps insculptus Keegan, 1956a: 244.
Haemolaelaps insculptus.—Strandtmann & Wharton, 1958: 40; Tipton, 1960: 242; Costa, 1961a: 19.
Androlaelaps insculptus.—Costa, 1966a: 73.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Abu Rawash, Imababa, Giza, Egypt, on *Gerbillus pyramidum* [Animalia: Rodentia: Muridae].

***Androlaelaps jamesoni* (Furman, 1955)**
Eubrachylaelaps jamesoni Furman, 1955a: 52.
Eubrachylaelaps jamesoni.—Strandtmann & Wharton, 1958: 49; Tipton, 1960: 241; Light *et al*., 2020: 85.
Androlaelaps jamesoni.—Farrier & Hennessey, 1993: 66; Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Cerro del Cañon del Sumidero [cited as Sumidaro], 19 km from Tuxtla Gutierrez, Chiapas, Mexico, on *Peromyscus mexicanus saxatilis* [Animalia: Rodentia: Cricetidae].

***Androlaelaps jindaochaoi* (Bai *et al*., 2013) new combination**
Haemolaelaps jindaochaoi Bai, Yan & Gao, 2013: 286.

Type depository. Collection of Medical Entomology of the Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing, China.
Type locality and habitat. Shahu tourist area, Pingluo County (106°22'N, 38°47'E), Ningxia Hui Autonomous Region, China, on unidentified beetle [Animalia: Coleoptera].
Note. The new combination proposed for this species under *Androlaelaps* results from the suggestion by Shaw (2014a: 290) that species cited in the literature as *Haemolaelaps* should be regarded as *Androlaelaps* until further revision, except for the species included in *Haemolaelaps* by Shaw (2014a) and in *Ulyxes* Shaw by Shaw (2014b).

***Androlaelaps johnstoni* Eads & Hightower, 1951**
Androlaelaps johnstoni Eads & Hightower, 1951: 249.
Androlaelaps johnstoni.—Eads, 1952: 239; Furman, 1954: 120; Farrier & Hennessey, 1993: 67.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Gaines, Texas, United States of America, in nesting material of *Neotoma micropus* [Animalia: Rodentia: Cricetidae].

***Androlaelaps kathuensis* Jordaan, 1988**
Androlaelaps kathuensis Jordaan, 1988: 132.
Androlaelaps kathuensis.—Kůrka, 2005: 23.

Type depository. Department of Zoology, Potchesfstroom University for Christian Higher Education, Potchefstroom, South Africa.
Type locality and habitat. 40 km west of Kuruman, Northern Cape, South Africa, in soil underneath *Ziziphus mucronata* [Plantae: Rosales: Rhamnaceae].

***Androlaelaps keegani* (Fonseca, 1958)**
Atricholaelaps (*Ischnolaelaps*) *keegani* Fonseca, 1958b: 174.
Androlaelaps keegani.—Moreira, 2014: 153.

Type depository. Unspecified.
Type locality and habitat. Northeastern Brazil, on *Oryzomys subflavus* [Animalia: Rodentia: Cricetidae].

***Androlaelaps kenyaensis* Marais & Loots, 1970**
Androlaelaps (*Haemolaelaps*) *kenyaensis* Marais & Loots, 1970: 15.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. Mount Kenya, Kenya, in forest soil.

***Androlaelaps kifli* Metwally & Ibrahim, 1985**
Androlaelaps (*Androlaelaps*) *kifli* Metwally & Ibrahim, 1985: 309.
Androlaelaps kifli.—Nemati *et al*., 2000: 381; Kazemi & Rajaei, 2013: 78.

Type depository. Agricultural Zoology and Nematology Department, Faculty of Agriculture, Al-Azhar University, Cairo, Egypt.
Type locality and habitat. Cairo Governorate, Egypt, in soil under mango [*Mangifera indica*; Plantae: Sapindales: Anacardiaceae] and citrus [*Citrus* sp.; Plantae: Sapindales: Rutaceae] trees.

***Androlaelaps kivuensis* Fain & Hart, 1988**
Androlaelaps kivuensis Fain & Hart, 1988: 445.
Androlaelaps kivuensis.—Kůrka, 2005: 23.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Lemera, Kivu, Democratic Republic of the Congo (cited as Zaire), on *Lophuromys* sp. [Animalia: Rodentia: Muridae].

***Androlaelaps kununeensis* Marais & Loots, 1970**
Androlaelaps (*Androlaelaps*) *kununeensis* Marais & Loots, 1970: 11.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. Near Cunene River, Angola, in soil.

***Androlaelaps latiporus* (Bai & Gu, 1993)**
Haemolaelaps latiporus Bai & Gu, 1993a: 39.
Androlaelaps latiporus.—Kůrka, 2005: 23.
Haemolaelaps latiporus.—Ren & Guo, 2008: 327, 2009: 100; Bai *et al*., 2013: 286.

Type depository. Ningxia Institute of Endemic Disease Control, Yinchuan, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant (*Myrmos* spp.) nest [Animalia: Hymenoptera: Formicidae].

***Androlaelaps lehfeni* Oyoun & El Kady, 1995**
Androlaelaps lehfeni Oyoun & El Kady, 1995: 94.
Androlaelaps lehfeni.—Kůrka, 2005: 23.

Type depository. Faculty of Agriculture, Cairo University, Egypt.
Type locality and habitat. Beer Lehfin, north Sinai, Egypt, on *Gerbillus pyramidum* [Animalia: Rodentia: Muridae].

***Androlaelaps leviculus* Eads, 1951**
Androlaelaps leviculus Eads, 1951: 213.
Androlaelaps leviculus.—Eads, 1952: 239; Eads *et al*., 1952: 250; Keegan, 1953: 38; Furman, 1954: 119; Allred & Beck, 1956: 34; Fonseca, 1958b: 179; Goates, 1963: 4; Allred & Goates, 1964a: 72; Farrier & Hennessey, 1993: 67.
Hypoaspis leviculus.—Allred, 1958: 28; Whitaker & Wilson, 1974: 9; Whitaker *et al*., 2007: 19.
Androlaelaps (*Androlaelaps*) *leviculus*.—Barrera, 1979: 477; Bassols, 1981: 11; Light *et al*., 2020: 84.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 1913.
Type locality and habitat. Zavala, Texas, United States of America, on *Perognathus hispidus* [Animalia: Rodentia: Heteromyidae].

***Androlaelaps liae* (Wang, 1963)**
Haemolaelaps liae Wang, 1963: 200.
Haemolaelaps liae.—Teng & Pan, 1964: 330; Deng *et al*., 1993: 108; Wang & Liao, 2000: 21; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps liae.—Moreira, 2014: 155.

Type depository. Unspecified.
Type locality and habitat. Chong'an County, Fujian province, China, on *Rattus fulvescens* and *Rattus losea exiguus* [Animalia: Rodentia: Muridae].

***Androlaelaps lipsi* Till, 1972**
Androlaelaps lipsi Till, 1972: 160.

Type depository. Unspecified.
Type locality and habitat. Lubumbashi [cited as Elizabethville], Democratic Republic of the Congo [cited as Congo], in nest of *Steatomys pratensis* [Animalia: Rodentia: Nesomyidae].

***Androlaelaps longipes* (Bregetova, 1952)**
Haemolaelaps longipes Bregetova, 1952: 867.
Haemolaelaps namrui Radford, 1954: 310 [junior synonym of *H. longipes* by Till, 1963: 50].
Haemolaelaps longipes.—Bregetova, 1955b: 306, 1956: 92; Lange, 1955a: 228; Zemskaya, 1955: 298; Strandtmann & Wharton, 1958: 40; Tipton, 1960: 242; Costa, 1961a: 21; Reitblat, 1963: 71; Wang, 1963: 200; Sheals, 1964: 16; Furman, 1966: 331; Allred, 1975: 126; Ibrahim & Abdel-Samad, 1990: 97.
Haemolaelaps aegyptius Keegan, 1956a: 246 [junior synonym of *H. longipes* by Costa, 1961a: 21; Till, 1963: 50].
Haemolaelaps aegyptius.—Strandtmann & Wharton, 1958: 33; Tipton, 1960: 242.
Haemolaelaps namrui.—Strandtmann & Wharton, 1958: 42.
Androlaelaps longipes.—Till, 1963: 50; Costa, 1966a: 73; Allred, 1969: 242; Beron, 1974: 174; Bregetova, 1977b: 534; Senotrusova, 1987; 187; Halliday *et al*., 2018: 49; Nemati *et al*., 2019: 93.

Type depository. *H. longipes*: Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia; *H. namrui* and *H. aegyptius*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *H. longipes*: type series, Armenia, on *Meriones tristami* [Animalia: Rodentia: Muridae], Turkmenistan and Tajikistan, on *Meriones erythrourus* and *Rhombomys opimus* [Muridae], Astrakhan, Russia, on *Meriones tamariscinus* and *Citellus pygmaeus* [Animalia: Rodentia: Muridae]; *H. namrui*: Ta'izz, Yemem, on *Meriones rex buryi* [Animalia: Rodentia: Muridae]; *H. aegyptius*: Saint Catherine Monastery, Sinai, Egypt, on *Meriones crassus* [Animalia: Rodentia: Muridae].

***Androlaelaps longirodus* (Ma, 2006)**
Haemolaelaps longirodus Ma, 2006b: 553.
Haemolaelaps longirodus.—Ren & Guo, 2008: 328, 2009: 100.
Androlaelaps longirodus.—Moreira, 2014: 156.

Type depository. Institute for Endemic Disease Prevention and Control of Qinghai province, China.
Type locality and habitat. Huangnan, Qinghai, China, on *Ochotona erythrotis* [Animalia: Lagomorpha: Ochotonidae].

***Androlaelaps longoventris* Karg, 1978**
Androlaelaps longoventris Karg, 1978b: 31.
Androlaelaps longoventris.—Kůrka, 2005: 23.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Azapa, Tarapaca, Chile, in soil.

***Androlaelaps macrosetoses* Marais & Loots, 1970**
Androlaelaps (*Haemolaelaps*) *macrosetoses* Marais & Loots, 1970: 17.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. Kaliba, Kivu, Democratic Republic of the Congo [cited as Congo], in soil.

***Androlaelaps macroventralis* (Asanuma, 1953)**
Haemolaelaps macroventralis Asanuma, 1953: 14.
Haemolaelaps macroventralis.—Strandtmann & Wharton, 1958: 41; Tipton, 1960: 242; Gu & Wang, 1981: 394.
Androlaelaps macroventralis.—Moreira, 2014: 157.

Type depository. Author's collection.
Type locality and habitat. Onsen, Matsuyama, Shikoku, Japan, on *Petaurista leucogenys* [Animalia: Rodentia: Sciuridae].

***Androlaelaps madagascariensis* (Tipton, 1957)**
Zygolaelaps madagascariensis Tipton, 1957: 369.
Androlaelaps madagascariensis.—Dowling & OConnor, 2010: 304.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 69 km from Tananarive, Tamatave road, Madagascar, on *Nesogale dobsoni* [Animalia: Afrosoricida: Tenrecidae].

***Androlaelaps malachela* (Sakamoto *et al*., 1979)**
Haemolaelaps malachela Sakamoto, Jorgensen & Herrin, 1979: 53.
Androlaelaps malachela.—Fain & Hart, 1988: 451.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Sienso, Ivory Coast, on *Funisciurus pyrrhopus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps marioi* (Fonseca, 1964)**
Atricholaelaps (*Ischnolaelaps*) *marioi* Fonseca, 1964: 111.
Androlaelaps marioi.—Moreira, 2014: 158.

Type depository. Instituto Butantan, São Paulo, São Paulo state, Brazil (D. Moraes-Battesti, pers. comm., 2019), specimen number 2039.
Type locality and habitat. Biriguí, São Paulo state, Brazil, on "cuic" [*Didelphys* sp.; Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps marmosops* Martins-Hatano *et al*., 2001**
Androlaelaps marmosops Martins-Hatano, Gettinger & Bergalo, 2001: 686.
Androlaelaps marmosops.—Kůrka, 2005: 23.

Type depository. Museu Nacional do Rio de Janeiro, Rio de Janeiro, Rio de Janeiro state, Brazil.
Type locality and habitat. Serrinha do Alambari, Itatiaia, Rio de Janeiro state, Brazil, on *Marmosops incanus* [Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps marshalli* (Berlese, 1911)**
Laelaps (*Androlaelaps*) *marshalli* Berlese, 1911b: 433.
Hypoaspis (*Androlaelaps*) *marshalli*.—Berlese, 1918: 131; Zumpt & Patterson, 1950: 69.
Androlaelaps marshalli.—Radford, 1943: 61, 1950: 366; Costa, 1961a: 45, 1966a: 73, 1969b: 202; Keegan, 1956a: 227; Till, 1963: 53; Allred, 1969: 242, 1975: 125; Castagnoli & Pegazzano, 1985: 242; Oyoun & El Kady, 1995: 96; Matthee & Ueckermann, 2008: 185; Kazemi & Rajaei, 2013: 78; Halliday *et al*., 2018: 50.
Androlaelaps oudemansi Radford, 1944: 161 [junior synonym of *L*. (*A*.) *marshalli* by Till, 1963: 54].
Androlaelaps oudemansi.—Radford, 1950a: 366; Eads, 1951: 213, 1952: 239; Zumpt & Patterson, 1951: 70.
Hypoaspis (*Androlaelaps*) *africanus* Zumpt, 1950b: 300 [junior synonym of *L*. (*A*.) *marshalli* by Keegan, 1956a: 227; Costa, 1961a: 45; Till, 1963: 54].

Hypoaspis (*Androlaelaps*) *africanus*.—Zumpt & Patterson, 1950: 70.
Hypoaspis (*Androlaelaps*) *africanoides* Zumpt & Patterson, 1950: 72 [junior synonym of *L*. (*A*.) *marshalli* by Keegan, 1956a: 227; Costa, 1961a: 45; Till, 1963: 54].
Androlaelaps africanoides.—Eads, 1952: 239; Zumpt & Patterson, 1952: 162; Tipton, 1960: 249.
Androlaelaps africanus.—Eads, 1952: 239, Zumpt & Patterson, 1952: 162.
Turkiella africanoides.—Zumpt & Till, 1953a: 216.
Turkiella africanus.—Zumpt & Till, 1953a: 216.
Turkiella oudemansi.—Zumpt & Till, 1953a: 221.
marshalli; *non-Laelaps* [sic].—Tipton, 1960: 300.
Laelaps (*Androlaelaps*) *marshalli*.—Sheals, 1964: 15.
Androlaelaps (*Androlaelaps*) *marshalli*.—Taufflieb *et al*., 1967: 123.

Type depository. *L*. (*A*.) *marshalli*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *A*. *oudemansi*: Natural History Museum, London, England; *H*. (*A*.) *africanus* and *H*. (*A*.) *africanoides*: South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. *L*. (*A*.) *marshalli*: Somalia [cited as Somalia Britannica], on unidentified murids [Animalia: Rodentia: Muridae]; *A*. *oudemansi*: Masindi, Bunyoro, Uganda, on *Arvicanthis abyssinicus rubescens* [Animalia: Rodentia: Muridae]; *H*. (*A*.) *africanus*: Abercorn pont, Zululand [KwaZulu-Natal], South Africa, on *Saccostomus* sp. [Animalia: Rodentia: Nesomyidae]; *H*. (*A*.) *africanoides*: Filabusi, Zimbabwe (cited as South Rhodesia), on *Tatera schinzi* [Animalia: Rodentia: Muridae].
Note. Turk & Turk (1952: 484) suspected that *H*. (*A*.) *africanus* and *H*. (*A*.) *africanoides* did not belong to *Hypoaspis* (*Androlaelaps*). Zumpt & Till (1953a: 223) considered that *L*. (*A*.) *marshalli* could belong to *Turkiella* (here recognised as a junior synonym of *Androlaelaps*, but a conclusion in this regard was hampered by the inadequate description of the species).

***Androlaelaps martini* (Jameson, 1951)**
Eubrachylaelaps martini Jameson, 1951: 556.
Eubrachylaelaps martini.—Furman, 1955a: 58; Strandtmann & Wharton, 1958: 50; Tipton, 1960: 241; Light *et al*., 2020: 85.
Androlaelaps (*Eubrachylaelaps*) *martini*.—Barrera, 1979: 477; Bassols, 1981: 14.
Androlaelaps martini.—Farrier & Hennessey, 1993: 67; Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 1977.
Type locality and habitat. Ajusco, 40 km south of Mexico City, Distrito Federal, Mexico, on *Neotomodon alstoni* [Animalia: Rodentia: Cricetidae].

***Androlaelaps maurii* Lareschi & Gettinger, 2009**
Androlaelaps maurii Lareschi & Gettinger, 2009: 1352.
Androlaelaps maurii.—Lareschi, 2010: 201, 2011: 798; Lareschi & Galliari, 2014: 486.

Type depository. División de Entomología, Museo de La Plata, La Plata, Argentina; specimen number MLP-LER403–1.
Type locality and habitat. Reserva Ecológica Costanera Sur (34°36'S, 58°27'W), Ciudad Autónoma de Buenos Aires, Argentina, on *Deltamys kempi* [Animalia: Rodentia: Cricetidae].
Note. The type specimens of this species had been reported by Lareschi & Mauri (1998: 585), González & Pardinãs (2002: 3) and Lareschi *et al*. (2006: 598) as *Androlaelaps rotundus* (Fonseca).

***Androlaelaps mesopicos* (Radford, 1942)**
Haemolaelaps mesopicos Radford, 1942a: 192.
Haemolaelaps mesopicos.—Radford, 1943: 61, 1950: 366; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 244; Till, 1959: 423; Tipton, 1960: 242; Sheals, 1964: 16; Domrow, 1977: 198, 1981b: 118.
Haemolaelaps mesopicus [sic].—Strandtmann, 1948: 189; Strandtmann & Wharton, 1958: 41.
Hypoaspis (*Haemolaelaps*) *mesopicos*.—Zumpt & Patterson, 1951: 72.
Androlaelaps mesopicos.—Till, 1963: 56; Cort & Forbes, 1975: 571.
Androlaelaps (*Haemolaelaps*) *mesopicos*.—Marais & Loots, 1970: 2.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Kabale, Kigezi, Uganda, on *Mesopicos ruwenzorii* [Animalia: Piciformes: Picidae].

***Androlaelaps micropteropi* Zumpt & Elliott, 1970**
Androlaelaps micropteropi Zumpt & Elliott, 1970: 344.
Haemolaelaps micropteropi.—Sakamoto *et al*., 1979: 43.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Ibadan, Nigeria, on *Micropteropus pusillus* [Animalia: Chiroptera: Pteropodidae].

***Androlaelaps minutiventralis* (Gu, 1983)**
Haemolaelaps minutiventralis Gu, 1983: 159.
Haemolaelaps minutiventralis.—Deng *et al*., 1993: 108; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps minutiventralis.—Moreira, 2014: 161.

Type depository. Department of Parasitology, Guiyang Medical College, Guiyang, Guizhou, China.
Type locality and habitat. Ceheng (24°58'N, 105°48'E), Guizhou, China, on *Petaurista alborufus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps misionalis* Lareschi, 2010**
Androlaelaps misionalis Lareschi, 2010: 200.
Androlaelaps misionalis.—Lareschi, 2011: 798; Lareschi & Galliari, 2014: 486; Lareschi, 2018: 372.

Type depository. Collection of the División de Entomología, Museo de La Plata, La Plata, Argentina; specimen number MLP-CNP1925–10.
Type locality and habitat. Salto El Paraíso (27°13'S, 54°02'W), Misiones, Argentina, on *Akodon montensis* [Animalia: Rodentia: Cricetidae].

***Androlaelaps modestus* (Reitblat, 1963) new combination**
Haemolaelaps modestus Reitblat, 1963: 72.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Yevlakh, Azerbaijan, on *Allactaga elater* [Animalia: Rodentia: Dipodidae].
Note. This species is transferred to *Androlaelaps* because of the inflated pilus dentilis, a diagnostic character state for the genus.

***Androlaelaps montensis* Lareschi & Savchenko, 2021**
Androlaelaps montensis Lareschi, 2020: 5 (*nomen nudum*; ICZN Article 8.5.3).
Androlaelaps montensis Lareschi & Savchenko, 2021: 299.

Type depository. Collección de Entomologia, Museo de La Plata, Argentina.
Type locality and habitat. Parque Provincial Urugua-í, Misiones province, Argentina (25°51'10.29"S, 54°10'41.53"W), on *Akodon montensis* (Animalia: Rodentia: Cricetidae).

***Androlaelaps morlani* (Strandtmann, 1949)**
Haemolaelaps morlani Strandtmann, 1949: 337.
Haemolaelaps morlani.—Zumpt & Till, 1953a: 235; Lavoipierre, 1956: 295; Strandtmann & Wharton, 1958: 41; Tipton, 1960: 242; Wang, 1963: 201; Teng & Pan, 1964: 328.
Androlaelaps morlani (?) [sic].—Whitaker & Wilson, 1968: 538.
Androlaelaps morlani.—Whitaker & Wilson, 1974: 5; Whitaker, 1977: 195; Farrier & Hennessey, 1993: 67; Whitaker *et al*., 2007: 14.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimens number G-4004.
Type locality and habitat. Grady, Georgia, United States of America, on *Rattus rattus* [Animalia: Rodentia: Muridae].

***Androlaelaps murinus* (Berlese, 1911)**
Laelaps (*Haemolaelaps*) *murinus* Berlese, 1911b: 432.
Hypoaspis (*Haemolaelaps*) *murinus*.—Berlese, 1918: 131; Zumpt & Patterson, 1951: 70; Castagnoli & Pegazzano, 1985: 265.
Laelaps (*Haemolaelaps*) *murinus*.—Berlese, 1922: 97.
Ischnolaelaps arvicanthis Radford, 1939: 246 [junior synonym of *L*. (*H*.) *murinus* by Keegan, 1956a: 233; Zumpt & Till, 1958: 267; Till, 1963: 58].
Haemolaelaps murinus.—Radford, 1943: 61, 1950: 367; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 237, 1958: 267; Keegan, 1956a: 233, 1956b: 318; Strandtmann & Wharton, 1958: 41; Tipton, 1960: 242; Sakamoto *et al*., 1979: 43.
Ischnolaelaps arvicanthis.—Radford, 1943: 62.
Hypoaspis (*Haemolaelaps*) *arvicanthis*.—Zumpt & Patterson, 1951: 72.
Androlaelaps murinus.—Till, 1963: 58; Zumpt & Elliott, 1970: 344; Fain & Hart, 1988: 442.
Androlaelaps (*Haemolaelaps*) *murinus*.—Taufflieb *et al*., 1967: 123.

Type depository. *L*. (*H*.) *murinus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *I. arvicanthis*: unspecified.
Type locality and habitat. *L*. (*H*.) *murinus*: southern Ethiopia, on unidentified murid [Animalia: Rodentia: Muridae]; *I. arvicanthis*: Kakumiro, Uganda, on *Arvicanthis abyssinicus rubescens* [Animalia: Rodentia: Muridae].

***Androlaelaps myrmecophila* Evans & Till, 1966**
Androlaelaps casalis myrmecophila Evans & Till, 1966: 154.
Androlaelaps myrmecophila.—Huhta & Karg, 2010: 334; Klimov *et al*., 2016: internet page.
Androlaelaps myrmecophilus.—Joharchi *et al*., 2019e: 72.

Type depository. Natural History Museum, London, England; specimen number 1965: 29: 7.
Type locality and habitat. Black Wood of Rannoch, Perthshire, Scotland, in nests of *Formica rufa* [Animalia: Hymenoptera: Formicidae].

***Androlaelaps nadchatrami* (Baker *et al*., 1962)**
Haemolaelaps nadchatrami Baker, Traub & Evans, 1962: 94.
Haemolaelaps nadchatrami.—Domrow, 1979a: 246.
Androlaelaps nadchatrami.—Moreira, 2014: 163; Gwiazdowicz *et al*., 2020b: 604.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2470.
Type locality and habitat. Gombak Forest Reserve, Selangor, 20 km north of Kuala Lumpur, Malaysia (cited as Malaya), on *Callosciurus caniceps* [Animalia: Rodentia: Sciuridae].

***Androlaelaps natricis* (Feider & Solomon, 1960) new combination**
Haemolaelaps natricis Feider & Solomon, 1960: 35.

Type depository. Unspecified.
Type locality and habitat. Agigea, Constanţa, Dobruja, Romania, on *Natrix natrix* [Animalia: Squamata: Colubridae].
Note. This species is transferred to *Androlaelaps* because of the inflated pilus dentilis, a diagnostic character state for the genus.

***Androlaelaps navonae* Lareschi & Galliari, 2014**
Androlaelaps navonae Lareschi & Galliari, 2014: 486.

Type depository. Collection of División de Entomología, Museo de La Plata, Argentina; specimen number MLP-CNP4262–1.
Type locality and habitat. Parque Provincial Urugua-í (25°51'10.29"S, 54°10'41.53"W), Misiones province, Argentina, on *Thaptomys nigrita* [Animalia: Rodentia: Cricetidae].

***Androlaelaps neoflagellata* (Baker *et al*., 1962)**
Haemolaelaps neoflagellata Baker, Traub & Evans, 1962: 95.
Haemolaelaps neoflagellata.—Domrow, 1979a: 248.
Androlaelaps neoflagellata.—Moreira, 2014: 164; Gwiazdowicz *et al*., 2020b: 604.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2471.
Type locality and habitat. Gombak Forest Reserve, Selangor, 20 km north of Kuala Lumpur, Malaysia (cited as Malaya), on *Rhinosciurus laticaudatus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps oliffi* (Zumpt & Patterson, 1951)**
Hypoaspis (*Haemolaelaps*) *oliffi* Zumpt & Patterson, 1951: 81.
Haemolaelaps oliffi.—Zumpt & Till, 1953a: 243; Strandtmann & Wharton, 1958: 42; Tipton, 1960: 242.
Androlaelaps oliffi.—Till, 1963: 60.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Vredefort, Orange Free State, South Africa, in nests of *Tatera brantsii* [Animalia: Rodentia: Muridae].

***Androlaelaps omnitectus* (Vitzthum, 1928)**

Hypoaspis (*Haemolaelaps*) *omnitectus* Vitzthum, 1928: 181.

Haemolaelaps omnitectus.—Radford, 1943: 61, 1950: 367; Strandtmann, 1949: 329; Strandtmann & Wharton, 1958: 42; Tipton, 1960: 242.

Androlaelaps omnitectus.—Moreira, 2014: 164.

Type depository. Unspecified.

Type locality and habitat. Wai Lima, Java, Indonesia, on *Chrysocolaptes validus* [Animalia: Piciformes: Picidae].

***Androlaelaps orientalis* (Teng & Pan, 1964)**

Haemolaelaps orientalis Teng & Pan, 1964: 325.

Haemolaelaps orientalis.—Wang *et al*., 1981: 105; Deng *et al*., 1993: 109; Ren & Guo, 2008: 327, 2009: 100.

Androlaelaps orientalis.—Moreira, 2014: 165.

Type depository. Institute of Zoology, Academia Sinica, Beijing, China.

Type locality and habitat. Yunnan, China, on *Tupaia glis* [Animalia: Scandentia: Tupaiidae].

***Androlaelaps orientalis* Ibrahim & Abdel-Samad, 1990**

Androlaelaps (*Haemolaelaps*) *orientalis* Ibrahim & Abdel-Samad, 1990: 97.

Androlaelaps (*Haemolaelaps*) *orientalis*.—Basha & Yousef, 2001: 396.

Androlaelaps orientalis.—Kůrka, 2005: 23.

Type depository. Unspecified.

Type locality and habitat. Sidye Krier, Alexandria, Egypt, in litter under fig [*Ficus carica*; Plantae: Rosales: Moraceae] trees.

Note. If the transfer of *Haemolaelaps orientalis* Teng & Pan to *Androlaelaps* is confirmed, *Androlaelaps orientalis* Ibrahim & Abdel-Samad will become a secondary junior homonym of *Androlaelaps orientalis* (Teng & Pan). However, considering the uncertainty about the placement of these two species, we refrain from suggesting a replacement of the junior homonym until further taxonomic study is conducted.

***Androlaelaps ovalis* (Costa, 1961)**

Haemolaelaps ovalis Costa, 1961a: 24.

Androlaelaps ovalis.—Costa, 1966a: 73.

Type depository. Natural History Museum, London, England.

Type locality and habitat. Type series, Mishmar Ha'Emeq, Nir David and Shavei Zion, Israel, on *Meriones tristrami* [Animalia: Rodentia: Muridae].

***Androlaelaps pachyptilae* (Zumpt & Till, 1956)**

Haemolaelaps pachyptilae Zumpt & Till, 1956: 285.

Haemolaelaps pachyptilae.—Strandtmann & Wharton, 1958: 43; Tipton, 1960: 242; Domrow, 1977: 195, 1988: 832.

Androlaelaps pachyptilae.—Till, 1963: 62; Hunter, 1964b: 639, 1970: 51; Spain & Luxton, 1971: 185; Furman, 1972: 54; Karg, 1991: 167; Fain & Galloway, 1993: 98; Pugh, 1993: 333; Halliday, 1998: 123, 2019: internet page; Shaw, 2014a: 290.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.

Type locality and habitat. Heard Island, in nest of *Pachyptila desolata* [Animalia: Procellariiformes: Procelariidae].

***Androlaelaps pakistanicus* Allred, 1970**
Androlaelaps pakistanicus Allred, 1970: 107.
Androlaelaps pakistanicus.—Allred, 1975: 125; Halliday *et al*., 2018: 50.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number B-66530.
Type locality and habitat. Naltar, Gilgit, Gilgit Agency, Pakistan (cited as West Pakistan), on *Cricetulus migratorius* [Animalia: Rodentia: Cricetidae].

***Androlaelaps palaniae* (Domrow, 1981)**
Haemolaelaps palaniae Domrow, 1981b: 115.
Androlaelaps palaniae.—Kůrka, 2005: 23.
Haemolaelaps palaniae.—Kazemi, 2020: 134.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 3973.
Type locality and habitat. Rantau Panjang, Selangor, Malaysia, on *Chrysocolaptes lucidus* [Animalia: Piciformes: Picidae].

***Androlaelaps paracasalis* (Ryke, 1963)**
Hypoaspis paracasalis Ryke, 1963: 4.
Hypoaspis paracasalis.—Costa, 1969a: 167; McGraw & Farrier, 1969: 148; Halliday, 2005: 34.
Hypoaspis (*Holostaspis*) *paracasalis*.—Aswegen & Loots, 1970: 193; Karg, 1979: 98, 1982: 248.
Androlaelaps paracasalis.—Jordaan, 1988: 129; Babaeian *et al*., 2019a: 331.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. Potchefstroom, South Africa, in soil of a blue-gum [*Eucalyptus* sp.] plantation [Plantae: Myrtales: Myrtaceae].

***Androlaelaps parahirsti* (Sakamoto *et al*., 1979)**
Haemolaelaps parahirsti Sakamoto, Jorgensen & Herrin, 1979: 54.
Androlaelaps parahirsti.—Kůrka, 2005: 23.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 20 km northwest of Chinguetti, Mauritania, on *Gerbillus gerbillus* [Animalia: Rodentia: Muridae].

***Androlaelaps paraxeri* Fain & Hart, 1988**
Androlaelaps paraxeri Fain & Hart, 1988: 450.
Androlaelaps paraxeri.—Kůrka, 2005: 23.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Irangi, Kivu, Democratic Republic of the Congo (cited as Zaire), on *Paraxerus bohemi emini* (also cited as *Tamiscus emini emini*) [Animalia: Rodentia: Sciuridae].

***Androlaelaps patersoni* (Zumpt & Till, 1956)**
Haemolaelaps patersoni Zumpt & Till, 1956: 286.
Haemolaelaps patersoni.—Strandtmann & Wharton, 1958: 43; Tipton, 1960: 242.
Androlaelaps patersoni.—Till, 1963: 63.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Near Rustenburg, Transvaal, South Africa, on *Gyps coprotheres* [Animalia: Acciptriformes: Accipitridae].

***Androlaelaps petauristae* (Gu & Wang, 1980)**
Haemolaelaps petauristae Gu & Wang, 1980: 46.
Haemolaelaps petauristae.—Gu, 1983: 159; Deng *et al*., 1993: 110; Chen *et al*., 1995a: 229; Liu & Ma, 2003: 655; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps petauristae.—Moreira, 2014: 168.

Type depository. Unspecified.
Type locality and habitat. Guilin, Guangxi Autonomous Region, China, on *Petaurista elegans* [Animalia: Rodentia: Sciuridae].

***Androlaelaps phialiger* (Berlese, 1916)**
Hypoaspis (*Haemolaelaps*) *phialiger* Berlese, 1916b: 170.
Hypoaspis (*Haemolaelaps*) *phialiger*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 319.
Haemolaelaps phialiger.—Radford, 1943: 61, 1950: 367.
Haemolaelaps phialger [sic].—Tipton, 1960: 242.
Androlaelaps phialiger.—Moreira, 2014: 169.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, in nests of *Acromyrmex lundi* [Animalia: Hymenoptera: Formicidae].

***Androlaelaps phoeniculi* (Zumpt & Till, 1954)**
Haemolaelaps phoeniculi Zumpt & Till, 1954: 209.
Haemolaelaps phoeniculi.—Strandtmann & Wharton, 1958: 43; Tipton, 1960: 242.
Androlaelaps phoeniculi.—Till, 1963: 65; Cort & Forbes, 1975: 575; Karg, 1990: 48.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Near Potchefstroom, Transvaal, South Africa, on *Phoeniculus purpureus* [Animalia: Upupiformes: Phoeniculidae].

***Androlaelaps pilosus* Baker, 1991**
Androlaelaps pilosus Baker, 1991: 219
Androlaelaps pilosus.—Kůrka, 2005: 23.

Type depository. Natural History Museum, London, England; specimen number 1989.10.11.2–12.
Type locality and habitat. El Pedregoso, east of Facinas, Cadiz, Spain, on *Macrothele calpeiana* [Animalia: Araneae: Hexathelidae].

***Androlaelaps postcuspidatus* Ma & Chen, 2014**
Androlaelaps postcuspidatus Ma & Chen, in Ma *et al*., 2014: 98.
Androlaelaps postcuspidatus.—Zhou *et al*., 2015: 488.

Type depository. Institute of Plant Protection, Fujian Academy of Agricultural Science, Fuzhou, China.
Type locality and habitat. Fuzhou (26°04'N, 119°19'E), Fujian province, China, on wheat bran.
Note. This species may belong to *Euandrolaelaps* Bregetova.

***Androlaelaps praeporus* (Gu & Wang, 1981)**
Haemolaelaps praeporus Gu & Wang, 1981: 392.
Haemolaelaps praeporus.—Deng *et al*., 1993: 111; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps praeporus.—Moreira, 2014: 169.

Type depository. Department of Parasitology, Guiyang Medical College, Guiyang, Guizhou, China.
Type locality and habitat. Guizhou, China, on *Rattus losea* [Animalia: Rodentia: Muridae].

***Androlaelaps projecta* Furman, 1972**
Androlaelaps projecta Furman, 1972: 54.
Androlaelaps projecta.—Joharchi & Negm, 2020: 489.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number SVP 34089.
Type locality and habitat. La Vega del Rio Santo Domingo, 2 km southwest of Altamira, Barinas, Venezuela, on *Sciurus granatensis* [Animalia: Rodentia: Sciuridae].

***Androlaelaps pulchriventris* Karg, 1978**
Androlaelaps pulchriventris Karg, 1978b: 28.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Farellones, Santiago, Chile, in wet turf.

***Androlaelaps pumilionis* Karg, 1993**
Androlaelaps pumilionis Karg, 1993b: 270.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Tortuga Bay, Santa Cruz, Galapagos Islands, in litter in rock crevices.

***Androlaelaps rahmi* Fain & Hart, 1988**
Androlaelaps rahmi Fain & Hart, 1988: 444.
Androlaelaps rahmi.—Kůrka, 2005: 23.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Kasindi, Kivu, Democratic Republic of the Congo (cited as Zaire), on *Crocidura* sp. [Animalia: Soricomorpha: Soricidae].

***Androlaelaps razumovae* (Bregetova, 1952)**
Haemolaelaps razumovae Bregetova, 1952: 870.
Haemolaelaps razumovae.—Bregetova, 1955b: 305, 1956: 91; Strandtmann & Wharton, 1958: 43; Tipton, 1960: 242.
Androlaelaps rasumovae [sic].—Bregetova, 1977b: 534.
Androlaelaps razumovae.—Karg, 1978b: 30, 1990: 49.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Neighbourhood of Kobi, Georgia, on *Prometheomys schaposchnikowi* [Animalia: Rodentia: Cricetidae] and in its nest.

***Androlaelaps reithrodontis* (Ewing, 1925)**
Laelaps reithrodontis Ewing, 1925: 7.
Atricholaelaps reithrodontis.—Ewing, 1929: 186; Radford, 1950b: 31.
Laelaps reithrodontis.—Radford, 1943: 60.
Haemolaelaps reithrodontis.—Strandtmann & Wharton, 1958: 43; Tipton, 1960: 242; Mauri, 1965: 17, 1967a: 69.
Androlaelaps reithrodontis.—Moreira, 2014: 171.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 908.
Type locality and habitat. Huanuluan, Rio Negro, Argentina, on *Reithrodon cuniculoides* [Animalia: Rodentia: Cricetidae].

***Androlaelaps reticulus* Hafez *et al*., 1982**
Androlaelaps (*Haemolaelaps*) *reticulus* Hafez, Elbadry & Nasr, 1982: 6.
Androlaelaps reticulatus.—Zaher, 1986: 184.
Androlaelaps reticulus.—Basha & Yousef, 2001: 396.

Type depository. Unspecified.
Type locality and habitat. Etay El-Barood, Beheera, Egypt, in litter.

***Androlaelaps rhabdomysi* Matthee & Ueckermann, 2008**
Androlaelaps rhabdomysi Matthee & Ueckermann, 2008: 186.

Type depository. National Collection of Arachnida, Plant Protection Research Institute, Pretoria, South Africa.
Type locality and habitat. Wellington region (33°26'25"S, 19°03'02"E), Western Cape, South Africa, on *Rhabdomys pumilio* [Animalia: Rodentia: Muridae].

***Androlaelaps rhodesiensis* (Zumpt & Patterson, 1951)**
Hypoaspis (*Haemolaelaps*) *rhodesiensis* Zumpt & Patterson, 1951: 82.
Haemolaelaps rhodesiensis.—Zumpt & Till, 1953a: 243; Strandtmann & Wharton, 1958: 44; Tipton, 1960: 242.
Androlaelaps rhodesiensis.—Till, 1963: 66.
Androlaelaps rhodiesiensis [sic].—Shaw, 2014a: 290.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Dowa, Rusapi, Zimbabwe (cited as South Rhodesia), on *Saccostomus campestris* [Animalia: Rodentia: Nesomyidae].

***Androlaelaps rohaniae* (Domrow, 1979)**
Haemolaelaps rohaniae Domrow, 1979a: 243.
Androlaelaps rohaniae.—Moreira, 2014: 172.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Johor, Labis Forest Reserve, Bekok, Tong Nam, Malaysia, on *Pteromyscus pulverulentus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps rotundus* (Fonseca, 1936)**
Eubrachylaelaps rotundus Fonseca, 1936a: 20.
Eubrachylaelaps rotundus.—Fonseca, 1937a: 1602, 1958b: 163, 1960a: 15, 1960b: 98; Radford, 1943: 62, 1950: 370; Jameson, 1951: 556; Furman, 1955a: 59; Strandtmann & Wharton, 1958: 50; Tipton, 1960: 241; Furman & Tipton, 1961: 171; Mauri, 1966a: 51, 1967a: 67, 1967b: 518; Mauri & Capri, 1970: 133; Fernández, 1977: 4; Fernández & Capri, 1978: 48; Linardi *et al*., 1984b: 215; Whitaker & Dietz, 1987: 190; Nieri-Bastos *et al*., 2004: 31; Estébanez-Gonzales & Cervantes, 2005: 27; Light *et al*., 2020: 85.
Eubrachilaelaps [sic] *rotundus*.—Mauri, 1965: 16, 1966b: 36.
Androlaelaps rotundus.—Furman, 1972: 56; Barros-Battesti *et al*., 1998: 721; Botelho *et al*., 2002: 54; Lareschi *et al*., 2006: 598; Gettinger & Lareschi, 2009: 162; Lareschi & Gettinger, 2009: 1353; Lareschi, 2010: 201, 2011: 798; Lareschi & Barros-Battesti, 2010: 116; Lareschi & Galliari, 2014: 486.
Androlaelaps (*Eubrachylaelaps*) *rotundus*.—Barrera, 1979: 477; Bassols, 1981: 15; Gettinger & Owen, 2000: 425; Gettinger & Gardner, 2015: 244.

Type depository. Instituto Butantan, São Paulo, São Paulo state, Brazil.
Type locality and habitat. São Paulo, São Paulo state, Brazil, on a small undetermined wild rodent species [Animalia: Rodentia].
Note. Specimens reported by Lareschi & Mauri (1998: 585), González & Pardinãs (2002: 3) and Lareschi *et al*. (2006: 598) as *A*. *rotundus* were described as *Androlaelaps maurii* Lareschi & Gettinger. Gettinger & Owen (2000: 432) suspected that specimens from Paraguay identifiable as *A*. *rotundus* comprised three or more species.

***Androlaelaps sanduensis* (Gu & Wang, 1981)**
Haemolaelaps sanduensis Gu & Wang, 1981: 393.
Androlaelaps sanduensis.—Moreira, 2014: 173.

Type depository. Department of Parasitology, Guiyang Medical College, Guiyang, Guizhou, China.
Type locality and habitat. Guizhou, China, on *Mus pahari* [Animalia: Rodentia: Muridae].

***Androlaelaps sangsteri* (Radford, 1942)**
Liponyssus sangsteri Radford, 1942a: 190.
Liponyssus sangsteri.—Zumpt & Till, 1953b: 7.
Haemolaelaps sangsteri.—Strandtmann & Wharton, 1958: 44; Sakamoto *et al*., 1979: 41.
Androlaelaps sangsteri.—Till, 1963: 68; Fain & Hart, 1988: 442.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Bwamba Valley, Toro, Uganda, on *Protoxerus stangeri centricola* [Animalia: Rodentia: Sciuridae].

***Androlaelaps scapularis* (Berlese, 1918)**
Hypoaspis (*Haemolaelaps*) *scapularis* Berlese, 1918: 124.
Hypoaspis (*Haemolaelaps*) *scapularis*.—Lombardini, 1936: 42; Sheals, 1964: 16; Castagnoli & Pegazzano, 1985: 371.
Ischnolaelaps bathyergus Radford, 1939: 250 [junior synonym of *H*. (*H*.) *scapularis* by Till, 1963: 70].
Haemolaelaps scapularis.—Radford, 1943: 61, 1950: 367; Keegan, 1956b: 317; Strandtmann & Wharton, 1958: 44.
Ischnolaelaps bathyergus.—Radford, 1943: 62.
Atrichoalaelaps bathyergus.—Radford, 1950a: 370.
Haemolaelaps bathyergus.—Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 230; Strandtmann & Wharton, 1958: 34; Tipton, 1960: 242.
Hypoaspis (*Haemolaelaps*) *bathyergus*.—Zumpt & Patterson, 1951: 71.
Haemolaelaps eloffi Zumpt & Till, 1953a: 226 [junior synonym of *H*. (*H*.) *scapularis* by Till, 1963: 70].
Haemolaelaps natalensis Zumpt & Till, 1953a: 230 [junior synonym of *H*. (*H*.) *scapularis* by Till, 1963: 70].
Haemolaelaps eloffi.—Zumpt & Till, 1954: 209; Strandtmann & Wharton, 1958: 36; Tipton, 1960: 242.
Haemolaelaps natalensis.—Zumpt & Till, 1954: 209; Strandtmann & Wharton, 1958: 42; Tipton, 1960: 242.
Androlaelaps scapularis.—Till, 1963: 70.

Type depository. *H*. (*H*.) *scapularis*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *I. bathyergus*: unspecified [according to Till (1963: 71) in Dr. C. D. Radford's collection]; *H. eloffi* and *H. natalensis*: South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. *H*. (*H*.) *scapularis*: Durban, KwaZulu-Natal, South Africa, on *Spalax typhus* [Animalia: Rodentia: Spalacidae]; *I. bathyergus*: Strandtfontein, Cape Town, South Africa, on *Bathyergus suillus* [Animalia: Rodentia: Bathyergidae]; *H. eloffi*: near Bloemfontein, Orange Free State, South Africa, on *Cryptomys bigalkei* [Animalia: Rodentia: Bathyergidae]; *H. natalensis*: near Pietermaritzburg, Natal, South Africa, on *Crytomyus natalensis* [Animalia: Rodentia: Bathyergidae].

***Androlaelaps schusteri* Hirschmann, 1966**
Androlaelaps schusteri Hirschmann, 1966: 36.
Haemolaelaps schusteri.—Kordeshami *et al*., 2015: 592.
Androlaelaps schusteri.—Nemati *et al*., 2018b: 134.

Type depository. Unspecified.
Type locality and habitat. Carro, Marseille, France, in gravel and sand on the beach.

***Androlaelaps sclerotarsus* (Gu & Bai, 1995)**
Haemolaelaps sclerotarsus Gu & Bai, 1995: 429.
Androlaelaps sclerotarsus.—Kůrka, 2005: 23.
Haemolaelaps clerotarsus [sic].—Ren & Guo, 2008: 328, 2009: 100.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Zhongwei (37°5'N, 105°1'E), Ningxia Hui Autonomous Region, China, in a beetle tunnel [Animalia: Coleoptera] and *Eremias prezewalskii* [Animalia: Squamata: Lacertidae].

***Androlaelaps scutalis* Marais & Loots, 1970**
Androlaelaps (*Androlaelaps*) *scutalis* Marais & Loots, 1970: 3.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. Left side of the Chari River, near Lake Chad [Cameroon], in damp soil.

***Androlaelaps semidesertus* (Bregetova, 1952)**
Haemolaelaps semidesertus Bregetova, 1952: 870.
Haemolaelaps semidesertus.—Bregetova, 1955b: 305, 1956: 91; Strandtmann & Wharton, 1958: 45; Tipton, 1960: 242; Reitblat, 1963: 72, 1965: 863; Sheals, 1964: 16; Teng & Pan, 1964: 328; Shcherbak, 1973: 446; Deng *et al*., 1993: 112; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps semidesertus.—Bregetova, 1977b: 534; Senotrusova, 1987; 184; Vinarski & Korallo-Vinarskaya, 2016: 234.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series, Tajikistan, on *Allactaga elater* [Animalia: Rodentia: Dipodidae] and in its nest, Astrakhan and Stalingrad, Russia, on *Allactaga jaculus* [Animalia: Rodentia: Dipodidae].

***Androlaelaps setaceosa* (Baker *et al*., 1962)**
Haemolaelaps setaceosa Baker, Traub & Evans, 1962: 99.
Haemolaelaps setaceosa.—Domrow, 1979a: 246.
Androlaelaps setaceosus.—Moreira, 2014: 177.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2474.
Type locality and habitat. 20 km north of Kuala Lumpur, Selangor, Malaysia (cited as Malaya), on *Lariscus insignis* [Animalia: Rodentia: Sciuridae].

***Androlaelaps setosa* (Baker *et al*., 1962)**
Haemolaelaps setosa Baker, Traub & Evans, 1962: 97.
Haemolaelaps setosa.—Domrow, 1979a: 246.
Androlaelaps setosa.—Moreira, 2014: 177.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2473.
Type locality and habitat. Gombak Forest Reserve, Selangor, 20 km north of Kuala Lumpur, Malaysia (cited as Malaya), on *Aeromys tephromeles* [Animalia: Rodentia: Sciuridae].

***Androlaelaps shealsi* Costa, 1968**
Androlaelaps shealsi Costa, 1968: 21.
Androlaelaps sheali [sic].—Costa, 1968: 24.
Haemolaelaps shealsi.—Kazemi & Rajaei, 2013: 89; Kazemi & Yazdanpanah, 2013: 270; Mahjoori *et al*., 2014: 1600; Yazdanpanah & Kazemi, 2014: 333; Kordeshami *et al*., 2015: 593; Maleki *et al*., 2016: 187; Hajizadeh & Joharchi, 2018: 26.
Androlaelaps shealsi.—Amani *et al*., 2015: 92; Kavianpour *et al*., 2017: 165; Nemati *et al*., 2018b: 134.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mishmar Ha'Emeq, Israel, in forest litter.

***Androlaelaps sikapusi* (Sakamoto *et al*., 1979)**
Haemolaelaps sikapusi Sakamoto, Jorgensen & Herrin, 1979: 55.
Androlaelaps sikapusi.—Moreira, 2014: 177.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Oda, Ghana, on *Lophuromys sikapusi* [Animalia: Rodentia: Muridae].

***Androlaelaps soricinus* (Jameson, 1966)**
Haemolaelaps soricinus Jameson, 1966: 100.
Androlaelaps soricinus.—Moreira, 2014: 178.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 6400 feet [1950 m] above sea level, 10 miles east of Wu-She, Nan-T'ou, Taiwan, on *Anourosorex squamipes* [Animalia: Soricomorpha: Soricidae].

***Androlaelaps spatuliformis* (Lavoipierre, 1956)**
Haemolaelaps spatuliformis Lavoipierre, 1956: 293.
Haemolaelaps spatuliformis.—Strandtmann & Wharton, 1958: 45; Tipton, 1960: 242.
Androlaelaps spatuliformis.—Till, 1963: 72; Shaw, 2014a: 290.

Type depository. Liverpool School of Tropical Medicine, Liverpool, England.
Type locality and habitat. Bombe Rest House, near Kumba, Cameroon (cited as British Cameroons), on *Anomalurus fraseri* [Animalia: Rodentia: Anomaluridae].

***Androlaelaps spegazzinii* (Berlese, 1923) new combination**
Hypoaspis (*Haemolaelaps*) *spegazzinii* Berlese, 1923a: 254.
Haemolaelaps spegazzinii.—Strandtmann & Wharton, 1958: 45.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Ethiopia (reported as Abyssinia), from unspecified substrate.
Note. The new combination proposed for this species under *Androlaelaps* results from the promotion of *Haemolaelaps* from the subgeneric to the generic level, and the suggestion by Shaw (2014a: 290) that species that have been cited in the literature as *Haemolaelaps* should be regarded as *Androlaelaps* until further revision, except for the species included in *Haemolaelaps* by Shaw (2014a) and in *Ulyxes* Shaw by Shaw (2014b).

***Androlaelaps spinosulus* (Berlese, 1920)**
Hypoaspis (*Haemolaelaps*) *spinosulus* Berlese, 1920: 152.
Hypoaspis (*Haemolaelaps*) *spinosolus* [sic].—Lombardini, 1936: 42.
Haemolaelaps spinosulus.—Radford, 1943: 61, 1950: 367; Strandtmann & Wharton, 1958: 45.
Hypoaspis (*Haemolaelaps*) *spinosulus*.—Castagnoli & Pegazzano, 1985: 392.
Androlaelaps spinosulus.—Farrier & Hennessey, 1993: 67; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Mexico, from unspecified substrate.

***Androlaelaps spinosus* (Furman, 1955)**
Eubrachylaelaps spinosus Furman, 1955a: 54.
Eubrachylaelaps spinosus.—Strandtmann & Wharton, 1958: 50; Tipton, 1960: 241; Light *et al*., 2020: 86.
Androlaelaps (*Eubrachylaelaps*) *spinosus*.—Barrera, 1979: 477; Bassols, 1981: 15.
Androlaelaps spinosus.—Farrier & Hennessey, 1993: 67.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Four miles east of Apatzingan, Michoacan, Mexico, on *Peromyscus* sp. [Animalia: Rodentia: Cricetidae].

***Androlaelaps spreo* (Zumpt & Till, 1956)**
Haemolaelaps spreo Zumpt & Till, 1956: 290.
Haemolaelaps spreo.—Strandtmann & Wharton, 1958: 46; Tipton, 1960: 242.
Androlaelaps spreo.—Till, 1963: 73, 1972: 156.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Springs, South Africa, on *Spreo bicolor* [Animalia: Passeriformes: Sturnidae].

***Androlaelaps sternalis* (Ewing, 1923)**
Ichoronyssus sternalis Ewing, 1923: 13.
Haemolaelaps sternalis.—Strandtmann, 1956: 138; Strandtmann & Wharton, 1958: 46.
Androlaelaps sternalis.—Whitaker & Wilson, 1974: 5; Farrier & Hennessey, 1993: 67.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 24746.
Type locality and habitat. Plummer Island, Maryland, on a "woodchuck" [*Marmota morax*; Animalia: Rodentia: Sciuridae].

***Androlaelaps steyni* (Till, 1959)**
Haemolaelaps steyni Till, 1959: 430.
Haemolaelaps steyni.—Grokhovskaya & Huan-Hoe, 1961: 1636; Sheals, 1964: 16; Domrow, 1981b: 118.
Androlaelaps steyni.—Till, 1963: 75; Cort & Forbes, 1975: 572.
Androlaelaps (*Haemolaelaps*) *steynii* [sic].—Marais & Loots, 1970: 2.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Near Mabelikwa, north Transvaal, South Africa, on *Lybius torquatus* [Animalia: Piciformes: Lybiidae].

***Androlaelaps subterraneus* (Berlese, 1920)**
Hypoaspis (*Haemolaelaps*) *subterraneus* Berlese, 1920: 153.
Hypoaspis (*Haemolaelaps*) *subterraneus*.—Lombardini, 1936: 42.
Haemolaelaps subterraneus.—Radford, 1943: 61, 1950: 367; Strandtmann & Wharton, 1958: 46.
Androlaelaps subterraneus.—Bernini *et al*., 1995: 27; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Florence, Italy, in deep soil.

***Androlaelaps suncus* Till, 1963**
Androlaelaps suncus Till, 1963: 76.
Androlaelaps suncus.—Till, 1972: 160; Fain & Hart, 1988: 442.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.

Type locality and habitat. Tibedi, Kingdom of Lesotho (cited as Basutoland), on *Suncus varius* [Animalia: Soricomorpha: Soricidae].

***Androlaelaps tachyoryctes* (Radford, 1941)**
Haemolaelaps tachyoryctes Radford, 1941: 309.
Haemolaelaps tachyoryctes.—Radford, 1943: 61, 1950: 367; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 240; Keegan, 1956a: 236; Strandtmann & Wharton, 1958: 46; Tipton, 1960: 242.
Hypoaspis (*Haemolaelaps*) *tachyoryctes*.—Zumpt & Patterson, 1951: 71.
Androlaelaps tachyoryctes.—Till, 1963: 78; Dusbábek *et al*., 1982: 171; Fain & Hart, 1988: 443.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Kapretwa, Mount Elgon, Kenya, on *Tachyoryctes ruddi* [Animalia: Rodentia: Spalacidae].

***Androlaelaps talpae* (Oudemans, 1902) new combination**
Hypoaspis talpae Oudemans, 1902c: 51.
Hypoaspis talpae.—Voigts & Oudemans, 1905: 232; Oudemans, 1926b: 101; Naturalis, 2020: internet page.
Haemolaelaps talpae.—Oudemans, 1929d: 13; Buitendijk, 1945: 300.

Type depository. Unspecified.
Type locality and habitat. Italy and Germany, associated with *Talpa europaea* [Animalia: Eulipotyphla: Talpidae].
Note. An illustration made available by Naturalis (2020: internet page), attributed to Oudemans, shows characteristics compatible with *Androlaelaps*, including chelicera with inflated pilus dentilis.

***Androlaelaps tarsacanthus* Ma & Lin, 2008**
Androlaelaps tarsacanthus Ma & Lin, 2008: 95.
Androlaelaps tarsacanthus.—Zhou *et al*., 2015: 488.

Type depository. Medical Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Yong'an (25°28'N, 117°24'E), Fujian, China, under bark and in humus.

***Androlaelaps taterae* (Zumpt & Patterson, 1951)**
Hypoaspis (*Haemolaelaps*) *taterae* Zumpt & Patterson, 1951: 83.
Haemolaelaps taterae.—Zumpt & Till, 1953a: 244; Strandtmann & Wharton, 1958: 47; Tipton, 1960: 242.
Androlaelaps taterae.—Till, 1963: 80; Shaw, 2014a: 290.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Zuurbekom, Roodepoort, Transvaal, South Africa, on *Tatera brantsii* [Animalia: Rodentia: Muridae].

***Androlaelaps taterakempi* (Sakamoto *et al*., 1979)**
Haemolaelaps taterakempi Sakamoto, Jorgensen & Herrin, 1979: 58.
Androlaelaps tateronis.—Zumpt & Elliot, 1970: 346 (misidentification, according to Sakamoto *et al*., 1979: 58).
Androlaelaps taterakempi.—Moreira, 2014: 182.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Damongo, Ghana, on *Tatera valida kempi* [Animalia: Rodentia: Muridae].

***Androlaelaps tateronis* (Radford, 1939)**
Ischnolaelaps tateronis Radford, 1939: 247.
Ischnolaelaps tateronis.—Radford, 1943: 62.
Atricholaelaps tareronis.—Radford, 1950a: 370.
Hypoaspis (*Haemolaelaps*) *tateronis*.—Zumpt & Patterson, 1951: 71.
Haemolaelaps tateronis.—Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 242; Strandtmann & Wharton, 1958: 47; Tipton, 1960: 242; Sakamoto *et al*., 1979: 42.
Haemolaelaps radfordi Keegan, 1956a: 241 [junior synonym of *I. tateronis* by Till, 1963: 82; Zumpt & Elliot, 1970: 346].
Haemolaelaps radfordi.—Strandtmann & Wharton, 1958: 43; Tipton, 1960: 242.
Androlaelaps tateronis.—Till, 1963: 82; Okereke, 1979: 280.

Type depository. *I. tateronis*: unspecified [according to Till (1963: 83) syntype in Natural History Museum, London, England]; *H. radfordi*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *I. tateronis*: Toio River, Gulu, Uganda, on *Taterona benvenuta* [Animalia: Rodentia: Muridae]; *H. radfordi*: Yei, Equatoria, South Sudan (cited as Sudan), on unidentified rat [Rodentia].
Note. Specimens reported as *Androlaelaps tateronis* by Zumpt & Elliot (1970: 346) were re-identified as *Haemolaelaps taterakempi* Sakamoto, Jorgensen & Herrin, 1979 by Sakamoto *et al*. (1979: 58).

***Androlaelaps tauffliebi* Till, 1963**
Androlaelaps tauffliebi Till, 1963: 83.
Haemolaelaps tauffliebi.—Sakamoto *et al*., 1979: 41.
Androlaelaps tauffliebi.—Nemati *et al*., 2019: 93.

Type depository. Natural History Museum, London, England; specimen number 1962.6.12.21.
Type locality and habitat. Lac Calundo, Angola, on *Cryptomys mechowi* [Animalia: Rodentia: Bathyergidae].

***Androlaelaps theseus* (Zumpt, 1950)**
Hypoaspis (*Androlaelaps*) *theseus* Zumpt, 1950b: 301.
Hypoaspis (*Androlaelaps*) *theseus*.—Zumpt & Patterson, 1950: 73; Lavoipierre, 1955b: 126; Sheals, 1964: 15.
Androlaelaps theseus.—Eads, 1952: 239; Zumpt & Patterson, 1952: 162; Cooreman, 1954: 163; Tipton, 1960: 249; Till, 1963: 85.
Turkiella theseus.—Zumpt & Till, 1953a: 225.
Androlaelaps ?*theseus* [sic].—Costa, 1969b: 196.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Wakkerstroom, Transvaal, South Africa, on *Mastomys coucha* [Animalia: Rodentia: Muridae].
Note. Turk & Turk (1952: 484) suspected that this species did not belong to *Hypoaspis* (*Androlaelaps*), which led to the description of *Turkiella* by Zumpt & Till (1953: 215) and the designation of *H.* (*A.*) *theseus* as its type species. This genus was later synonymised with *Androlaelaps*, as previously mentioned in this publication.

***Androlaelaps tillae* Makowski, 1965**
Androlaelaps tillae Makowski, 1965: 461.
Androlaelaps tillae.—Zumpt & Elliott, 1970: 341.
Haemolaelaps tillae.—Sakamoto *et al*., 1979: 43.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Bloemof Dam Nature Reserve, Transvaal, South Africa, on *Cynictis penicillata* [Animalia: Carnivora: Herpestidae].
Note. This species is returned to *Androlaelaps* because of the inflated pilus dentilis, a diagnostic character state for the genus.

***Androlaelaps torresi* Mauri & Alzuet, 1970**
Androlaelaps torresi Mauri & Alzuet, 1970: 143.
Androlaelaps torresi.—Mauri & Capri, 1970: 134.

Type depository. División de Entomología de La Facultad de Ciencias Naturales y Museo de La Plata, La Plata, Argentina.
Type locality and habitat. General Lavalle, Buenos Aires, Argentina, on *Ctenomys talarum antonii* [Animalia: Rodentia: Ctenomyidae].

***Androlaelaps traubi* (Strandtmann, 1948)**
Atricholaelaps traubi Strandtmann, 1948: 187.
Atricholaelaps traubi.—Radford, 1950a: 370.
Haemolaelaps traubi.—Asanuma, 1953: 10; Strandtmann & Wharton, 1958: 47; Tipton, 1960: 242; Baker *et al*., 1962: 91; Domrow, 1963b: 202, 1979a: 246; Teng & Pan, 1964: 328; Deng *et al*., 1993: 113; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps traubi.—Moreira, 2014: 184; Gwiazdowicz *et al*., 2020b: 604.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Myitkyina, Myanmar, on *Callosciurius quinquestriatus quinquestriatus* [Animalia: Rodentia: Sciuridae].

***Androlaelaps triangularis* (Wang, 1963)**
Haemolaelaps triangularis Wang, 1963: 202.
Haemolaelaps triangularis.—Teng & Pan, 1964: 329; Gu & Wang, 1981: 392; Wang & Liao, 2000: 22.
Haemolaelaps triangular [sic].—Deng *et al*., 1993: 114; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps triangularis.—Moreira, 2014: 184.

Type depository. Unspecified.
Type locality and habitat. Shaowu, Fujian, China, from unspecified substrate.

***Androlaelaps tuberans* Furman, 1972**
Androlaelaps tuberans Furman, 1972: 56.
Androlaelaps tuberans.—Gettinger *et al*., 2005: 47.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number SVP 15761.

Type locality and habitat. 150 m above sea level, Belén, Rio Cununcunuma, Tropical Forest Amazonas, Venezuela, on *Marmosa cinerea* [Animalia: Didelphimorphia: Didelphidae].

***Androlaelaps turcmenicus* (Meledzhayeva, 1963) new combination**
Haemolaelaps turcmenicus Meledzhayeva, 1963: 55.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series: Kerky, Zakhmet, Karakum, Turkmenistan, in tunnel of Barkan cat and on unidentified tenebrionid beetle [Animalia: Coleoptera Tenebrionidae].
Note. This species is transferred to *Androlaelaps* because of the long and stout pilus dentilis, a diagnostic character state for the genus.

***Androlaelaps ultraspinosa* (Baker *et al*., 1962)**
Haemolaelaps ultraspinosa Baker, Traub & Evans, 1962: 98.
Androlaelaps ultraspinosus.—Moreira, 2014: 186.

Type depository. Chicago Natural History Museum, Illinois, United States of America; specimen number 63025.
Type locality and habitat. Palawan Island, Puerto Princesa, Babuyan, Philippines, on *Hylopetes nigripes nigripes* [Animalia: Rodentia: Sciuridae].

***Androlaelaps ulysespardinasi* Lareschi, 2011**
Androlaelaps ulysespardinasi Lareschi, 2011: 795.
Androlaelaps ulysespardinasi.—Lareschi & Galliari, 2014: 486; Lareschi, 2018: 374.

Type depository. División de Entomología, Museo de La Plata, La Plata, Argentina; specimen number MLP-CNP742–3.
Type locality and habitat. 95 m above sea level, Estancia Santa Inés (27°31'32"S, 55°52'19"W), Ruta 105, km 10, Posadas, Misiones, Argentina, on *Akodon philipmyersi* [Animalia: Rodentia: Cricetidae].

***Androlaelaps verneri* Dusbábek *et al*., 1982**
Androlaelaps verneri Dusbábek, Daniel & Till, 1982: 172.
Androlaelaps verneri.—Kůrka, 2005: 23.

Type depository. Institute of Parasitology of the Czechoslovak Academy of Science, Prague, Czech Republic; specimen number PaÚ ČSAV 1924.
Type locality and habitat. Toro Game Reserve, Semliki Valley, Uganda, on *Pelomys minor* [Animalia: Rodentia: Muridae].

***Androlaelaps villosissimus* (Berlese, 1918)**
Hypoaspis (*Haemolaelaps*) *villosissimus* Berlese, 1918: 128.
Hypoaspis (*Haemolaelaps*) *villosissimus*.—Lombardini, 1936: 42; Zumpt & Patterson, 1950: 68, 1951: 83; Castagnoli & Pegazzano, 1985: 440.
Haemolaelaps villosissimus.—Radford, 1943: 61, 1950: 367; Zumpt & Patterson, 1951: 70; Zumpt & Till, 1953a: 244; Keegan, 1956b: 315; Strandtmann & Wharton, 1958: 47; Tipton, 1960: 242.
Androlaelaps villosissimus.—Till, 1963: 87.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. M'fongosi, Zululand [KwaZulu-Natal], South Africa, on *Saccostomus campestris* [Animalia: Rodentia: Nesomyidae] and *Mastomys coucha* [cited as *Mus coucha*] [Animalia: Rodentia: Muridae].

***Androlaelaps walkerae* Till, 1963**
Androlaelaps walkerae Till, 1963: 88.
Androlaelaps walkerae.—Fain & Hart, 1988: 443; Shaw, 2014a: 290.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Muguga North, Kenya, on *Tachyoryctes splendens* [Animalia: Rodentia: Spalacidae].

***Androlaelaps wilkini* (Till, 1959)**
Haemolaelaps wilkini Till, 1959: 432.
Androlaelaps wilkini.—Till, 1963: 90; Cort & Forbes, 1975: 571.
Androlaelaps (*Haemolaelaps*) *wilkini*.—Marais & Loots, 1970: 2.
Haemolaelaps wilkini.—Domrow, 1981b: 118.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Near Debeete, Botswana (cited as Bechuanaland Protectorate), on *Myrmecocichla formicivora* [Animalia: Passeriformes: Muscicapidae].

***Androlaelaps willmanni* (Fonseca, 1958)**
Atricholaelaps (*Atricholaelaps*) *willmanni* Fonseca, 1958b: 170.
Androlaelaps willmanni.—Moreira, 2014: 188.

Type depository. Unspecified; specimen number 2410.
Type locality and habitat. Triunfo, Pernambuco state, Brazil, on *Zygodontomys pixuna* [Animalia: Rodentia: Cricetidae].

***Androlaelaps wingei* Lareschi & Galliari, 2014**
Androlaelaps wingei Lareschi & Galliari, 2014: 492.

Type depository. Collection of División de Entomología, Museo de La Plata, Argentina; specimen number MLP-CNP4262–1.
Type locality and habitat. Mata do Paraíso Research Station, Viçosa, Minas Gerais, Brazil, on *Akodon cursor* [Animalia: Rodentia: Cricetidae].

***Androlaelaps yiliensis* (Ye & Ma, 1996)**
Haemolaelaps yiliensis Ye & Ma, 1996: 296.
Haemolaelaps yiliensis.—Ma, 2007a: 922; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps yiliensis.—Moreira, 2014: 188.

Type depository. Xinjiang Institute for Endemic Disease Control and Research, Urumqi, China.
Type locality and habitat. Chabuchaer (43°50"N, 81°05"E), Xinjiang, China, on *Meriones tamariscinus* [Animalia: Rodentia: Muridae].

***Androlaelaps zaheri* Hafez *et al*., 1982**
Androlaelaps (*Haemolaelaps*) *zaheri* Hafez, Elbadry & Nasr, 1982: 5.
Androlaelaps zaheri.—Zaher, 1986: 183; Basha & Yousef, 2001: 396; Joharchi & Negm, 2020: 491.

Type depository. Unspecified.
Type locality and habitat. Faculty of Agriculture, Cairo University, Giza, Egypt, in manure.

***Androlaelaps zhongweiensis* (Bai *et al*., 1987)**
Haemolaelaps zhongweiensis Bai, Chen & Wang, 1987: 387.
Haemolaelaps zhongweiensis.—Deng *et al*., 1993: 115; Ren & Guo, 2008: 327, 2009: 100.
Androlaelaps zhongweiensis.—Kůrka, 2005: 23.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Zhongwei (37°5'N, 105°1'E), Ningxia Hui Autonomous District, China, in a mouse [Animalia: Rodentia] hole.

***Androlaelaps ziegleri* Karg, 1991**
Androlaelaps ziegleri Karg, 1991: 166.
Androlaelaps ziegleri.—Kůrka, 2005: 23.

Type depository. Zoological Museum, Berlin, Germany.
Type locality and habitat. Madagascar, on *Princisia* sp. [Animalia: Blattodea: Blaberidae].

***Androlaelaps zulu* (Berlese, 1918)**
Hypoaspis (*Haemolaelaps*) *inops* var. *zulu* Berlese, 1918: 125.
Haemolaelaps inops var. *zulu*.—Radford, 1943: 61, 1950: 366; Zumpt & Till, 1953a: 237; Keegan, 1956a: 234, 1956b: 318.
Hypoaspis (*Haemolaelaps*) *zulu*.—Zumpt & Patterson, 1951: 70.
Haemolaelaps zulu.—Zumpt & Patterson, 1951: 70; Strandtmann & Wharton, 1958: 47; Sakamoto *et al*., 1979: 43.
Androlaelaps zulu.—Till, 1963: 91; Okereke, 1979: 280; Dusbábek *et al*., 1982: 172; Fain & Hart, 1988: 443.
Hypoaspis (*Haemolaelaps*) *inops* var. *zulu*.—Castagnoli & Pegazzano, 1985: 443.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. M'fongosi, Zululand [KwaZulu-Natal], South Africa, on *Arvicanthus dorsalis* [Animalia: Rodentia: Muridae].

***Androlaelaps zuluensis* (Zumpt, 1950)**
Hypoaspis (*Androlaelaps*) *zuluensis* Zumpt, 1950b: 300.
Hypoaspis (*Androlaelaps*) *zuluensis*.—Zumpt & Patterson, 1950: 70.
Androlaelaps zuluensis.—Eads, 1952: 239; Keegan, 1956a: 229; Till, 1963: 94; Athias-Henriot, 1968: 253; Allred, 1969: 242, 1975: 125; Costa, 1969b: 202; Okereke & Rack, 1983: 439; Fain & Hart, 1988: 443; Karg, 1993b: 270; Oyoun & El Kady, 1995: 96; Halliday *et al*., 2018: 50.
Turkiella zuluensis.—Zumpt & Till, 1953a: 218.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Abercorn pont, Zululand, KwaZulu-Natal, South Africa, on *Aethiomys namaquensis* [Animalia: Rodentia: Muridae].

Note. Turk & Turk (1952: 484) suspected that this species did not belong to *Hypoaspis* (*Androlaelaps*). This led to the transfer of this species to *Turkiella* by Zumpt & Till (1953a: 218), a genus later synonymised with *Androlaelaps*, as previously mentioned in this publication.

***Androlaelaps zumpti* Till, 1963**
Androlaelaps zumpti Till, 1963: 95.
Androlaelaps zumpti.—Till, 1972: 160; Fain & Hart, 1988: 448; Matthee & Ueckermann, 2008: 189.
Haemolaelaps zumpti.—Sakamoto *et al*., 1979: 43.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Richmond, Cape, South Africa, on *Rattus* (*Aethomys*) sp. [Animalia: Rodentia: Muridae].

***Angosomaspis* Costa, 1971**
Angosomaspis Costa, 1971: 92 (type species: *Angosomaspis multisetosus* Costa, 1971, by monotypy).
Angosomaspis.—Joharchi *et al*., 2019d: 346.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Angosomaspis multisetosus* Costa, 1971**
Angosomaspis multisetosus Costa, 1971: 92.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Near Abidjan, Ivory Coast, on *Angosoma centarus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Apolaelaps* Silvestri, 1911 new status**
Laelaps (*Apolaelaps*) Silvestri, 1911b: 189 (type species: *Apolaelaps mexicanus* Silvestri, 1911, by monotypy).

Note. *Laelaps* (*Apolaelaps*) was described in Laelaptidae. *Apolaelaps* is here elevated to the generic level based on the morphological differences between the type species, sole representative of the taxon, and typical *Laelaps* species or any other laelapid genus. In relation to *Laelaps*, some of most striking differences are the epigynal shield with only one pair of setae (*st*5, instead of four pairs in *Laelaps*), cheliceral digits edentate and without pilus dentilis (instead of dentate and with usually large and distally inflated pilus dentilis); coxal setae aciculate (instead of spiny). Additionally, the type species of this taxon was found in association with ants, instead of being parasitic on vertebrates, as typical of *Laelaps* species.

***Apolaelaps mexicanus* (Silvestri, 1911)**
Laelaps (*Apolaelaps*) *mexicanus* Silvestri, 1911b: 189.

Type depository. Unspecified.
Type locality and habitat. San Francisco, Veracruz, Mexico, in nest of *Solenopsis geminata* [Animalia: Hymenoptera: Formicidae].

***Berlesia* Canestrini, 1884**

Berlesia Canestrini, 1884: 716 (type species: *Berlesia rapax* Canestrini, 1884: 717, by monotypy).

Berlesia.—Oudemans, 1901: 63, 1902e: 292; Berlese, 1913b: 10; Vitzthum, 1931c: 143, 1942: 767; Radford, 1950b: 27; Baker & Wharton,1952: 91; Halliday, 2019: internet page; Lindquist *et al*., 2020: 33.

Note. This genus was described in "Gamasini" and included in Laelapidae-Iphiopsinae by Vitzthum (1942: 767). Bailey & McCrae (1978: 270) reported an unidentified species of this genus as a tracheal mite of *Ruspolia flavovirens* [Animalia: Orthoptera: Tettigoniidae] in Kampala, Uganda.

***Berlesia hospitabilis* Lindquist *et al*., 2020**

Berlesia hospitabilis Lindquist, OConnor, Shaw & Sidorchuk, 2020: 9.

Type depository. Australian National Insect Collection, Canberra, Australia.
Type locality and habitat. 104 m above sea level, Upper Stanton Road (Smithfield), 16°49'S, 145°40'E, Queensland, Australia, on *Chauliogryllacris acaropenates* [Animalia: Orthoptera: Gryllacrididae].
Note. The type specimens of this species had been reported as *Berlesia* sp. by Lindquist & Sidorchuk (2019: 126).

***Berlesia multisetosa* Lindquist *et al*., 2020**

Berlesia multisetosa Lindquist, OConnor, Shaw & Sidorchuk, 2020: 18.

Type depository. Australian National Insect Collection, Canberra, Australia.
Type locality and habitat. Cape Naturaliste, West Coast Road (33°33'S, 115°01'E), Western Australia, Australia, on *Craspedogryllacris* sp. [Animalia: Orthoptera: Gryllacrididae].

***Berlesia rapax* Canestrini, 1884**

Berlesia rapax Canestrini, 1884: 717.

Berlesia rapax.—Rainbow, 1906: 173; Radford, 1950b: 27; Sellnick, 1958: 25; Halliday, 1998: 14, 2019: internet page; Lindquist *et al*., 2020: 44.

Berlesia rapace [sic].—Berlese, 1910a: 261.

Type depository. Unspecified.
Type locality and habitat. Australia, associated with preserved insect.

***Berlesia vorontsovi* Lindquist *et al*., 2020**

Berlesia vorontsovi Lindquist, OConnor, Shaw & Sidorchuk, 2020: 26.

Type depository. Australian National Insect Collection, Canberra, Australia.
Type locality and habitat. 835 m above sea level; vicinity of Lake Balinsasayao (9°21'N, 123°10'E), 3km north, 14 km west Dumaguete, Sibulan, Negros Oriental province, Philippines, on *Anancistrogera* sp. [Animalia: Orthoptera: Gryllacrididae].

***Bisternalis* Hunter, 1963**

Bisternalis Hunter, 1963: 5 (type species: *Bisternalis rettenmeyeri* Hunter, 1963: 6, by monotypy).

Bisternalis.—Baker *et al*., 1984: 181; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 67; Ueckermann & Loots, 1995: 35; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Bisternalis camargoi* Baker *et al*., 1984**

Bisternalis camargoi Baker, Flechtmann & Delfinado-Baker, 1984: 183.
Bisternalis camargoi.—Delfinado-Baker & Baker, 1988: 135; Klimov *et al*., 2016: internet page.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, São Paulo state, Brazil; specimen number 1399.
Type locality and habitat. Acanga, Borelos, Amazonas, Brazil, in nest of *Lestrimellita limao* [Animalia: Hymenoptera: Apidae].

***Bisternalis formosus* Baker *et al*., 1984**

Blisternalis [sic] *formosus* Baker, Flechtmann & Delfinado-Baker, 1984: 183.
Bisternalis formosus.—Delfinado-Baker & Baker, 1988: 135.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, São Paulo, Brazil; specimen number 1525.
Type locality and habitat. Aruti, Amazonas, Brazil, in nest of *Trigona* (*Trigona*) *fulviventris* [Animalia: Hymenoptera: Apidae].

***Bisternalis hunteri* Baker *et al*., 1983**

Bisternalis hunteri Baker, Delfinado-Baker & Ordaz, 1983: 3.
Bisternalis hunteri.—Baker *et al*., 1984: 183; Farrier & Hennessey, 1993: 67.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Barro Colorado Island, Canal Zone, Panama, in wasp [Animalia: Hymenoptera] nest.
Note. This species was described based on an adult female previously considered a paratype of *Bisternalis rettenmeyeri* Hunter.

***Bisternalis mexicanus* Baker *et al*., 1983**

Bisternalis mexicanus Baker, Delfinado-Baker & Ordaz, 1983: 7.
Bisternalis mexicanus.—Baker *et al*., 1984: 188; Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 67; Klimov *et al*., 2016: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Potrero Viejo, Cordoba, Veracruz, Mexico, in nest of *Melipona* sp. [Animalia: Hymenoptera: Apidae].

***Bisternalis rettenmeyeri* Hunter, 1963**

Bisternalis rettenmeyeri Hunter, 1963: 6.
Bisternalis rettenmeyeri.—Baker *et al*., 1983: 3, 1984: 188; Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 67; Klimov *et al*., 2016: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Barro Colorado Island, Canal Zone, Panama, on *Trigona* sp. [Animalia: Hymenoptera: Apidae] and its nests.
Note. An adult female previously considered a paratype of this species was described as *Bisternalis hunteri* Baker, Delfinado-Baker & Ordaz.

***Bisternalis trigonarum* Baker *et al*., 1984**
Bisternalis trigonarum Baker, Flechtmann & Delfinado-Baker, 1984: 185.
Bisternalis trigonarum.—Delfinado-Baker & Baker, 1988: 135.

Type depository. Escola Superior de Agricultura «Luiz de Queiroz», Universidade de São Paulo, Piracicaba, São Paulo state, Brazil; specimen number 1520.
Type locality and habitat. Tauari, Pará, Brazil, in nest of *Trigona chanchamayoensis* [Animalia: Hymenoptera: Apidae].

***Blaberolaelaps* Costa, 1980**
Blaberolaelaps Costa, 1980: 547 (type species: *Blaberolaelaps matthiesensis* Costa, 1980: 548, by monotypy).
Blaberolaelaps.—Hunter *et al*., 1988: 297; Casanueva, 1993: 40.

Note. This genus was described in Laelapidae.

***Blaberolaelaps beckeri* Hunter *et al*., 1988**
Blaberolaelaps beckeri Hunter, Rosario & Flechtmann, 1988: 298.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Morro Reuter, Dois Irmãos, Rio Grande do Sul state, Brazil, on *Hieroblatta cassidea* [Animalia: Blattodea: Blaberidae].

***Blaberolaelaps matthiesensis* Costa, 1980**
Blaberolaelaps matthiesensis Costa, 1980: 548.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Rio Claro São Paulo state, Brazil, in a laboratory colony of *Blaberus piracicabensis* [Animalia: Blattodea: Blaberidae].

***Chapalaelaps* Gwiazdowicz *et al*., 2020**
Chapalaelaps Gwiazdowicz, Nemati & Riahi, 2020b: 595 (type species: *Coleolaelaps granulatus* Hyatt, 1964, by original designation).

Note. This genus was described in Laelapidae.

***Chapalaelaps granulatus* (Hyatt, 1964)**
"*Coleolaelaps*"*granulatus* [sic] Hyatt, 1964: 477.
Coleolaelaps granulatus.—Bhattacharyya, 1967: 132.
Hypoaspis granulatus.—Joharchi *et al*., 2012b: 279.
Chapalaelaps granulatus.—Gwiazdowicz *et al*., 2020b: 599.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.93.
Type locality and habitat. Rio Caura, Bolivar, Venezuela, on unidentified scarabaeid beetle [Animalia: Coleoptera: Scarabaeidae].

***Chapalaelaps latisternalis* (Hyatt, 1964)**
"*Coleolaelaps*" *latisternalis* [sic] Hyatt, 1964: 481.
Hypoaspis latisternalis.—Joharchi *et al*., 2012b: 279.
Chapalaelaps latisternalis.—Gwiazdowicz *et al*., 2020b: 600.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.95.
Type locality and habitat. Rio Caura, Bolivar, Venezuela, on unidentified scarabaeid beetle [Animalia: Coleoptera: Scarabaeidae].

***Chapalaelaps secretumsternalis* Gwiazdowicz *et al*., 2020**
Chapalaelaps secretumsternalis Gwiazdowicz, Nemati & Riahi, 2020: 8.

Type depository. Ohio State University Acarology Laboratory, Columbus, Ohio, United States of America; specimen number 106615.
Type locality and habitat. 299 m above sea level; Amazon Nature Lodge, Kaw Mountain, French Guyana, litter near entrance of old burrow near a tree buttress.

***Chapalania* Hoffmann & López-Campos, 1995**
Chapalania Hoffmann & López-Campos, 1995: 38 (type species: *Chapalania cifuentesi* Hoffmann & López-Campos, 1995, by monotypy).
Chapalania.—Gwiazdowicz & Nemati, 2018: 1941; Joharchi *et al*., 2019d: 346; Gwiazdowicz *et al*., 2020b: 599.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Chapalania cifuentesi* Hoffmann & López-Campos, 1995**
Chapalania cifuentesi Hoffmann & López-Campos, 1995: 39.

Type depository. Anita Hoffmann's collection, Instituto de Biología, Universidad Nacional Autónoma de Mexico, Distrito Federal, Mexico.
Type locality and habitat. Near Lago de Chapala, Jalisco, Mexico, on *Strategus aloeus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Chapalania erichi* Gwiazdowicz & Nemati, 2018**
Chapalania erichi Gwiazdowicz & Nemati, 2018: 1942.

Type depository. Poznan University of Life Sciences, Poznań, Poland.
Type locality and habitat. Panguana (9°36'49.3"S, 74°56'8.2"W), Peru, from unidentified passalid beetle [Animalia: Coleoptera: Passalidae].

***Coleolaelaps* Berlese, 1914**
Coleolaelaps Berlese, 1914: 141 (type species: *Laelaps* (*Iphis*) *agrestis* Berlese, 1887, by original designation).
Hypoaspis (*Coleolaelaps*).—Berlese, 1913b: 199 (*nomen nudum*, ICZN Article 12); Ryke, 1959: 7; Bregetova, 1977b: 496.
Coleolaelaps.—Vitzthum, 1929: 23 (in part), 1931c: 142, 1942: 763; Cooreman 1948: 7; Radford, 1950b: 21; Baker & Wharton, 1952: 94; Ryke & Meyer, 1958: 158; Costa & Hunter, 1971: 326; Karg, 1979: 67; Casanueva, 1993: 40; Deng *et al*., 1993: 180; Farrier & Hennessey, 1993: 67; Joharchi & Halliday, 2011: 24; Clark & Hawke, 2012: 192; Joharchi *et al*., 2012b: 283; Kontschán, 2015: 419; Joharchi *et al*., 2019d: 346; Gwiazdowicz *et al*., 2020b: 597.

Note. *Coleolaelaps* was not assigned to a family in the original description. It was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763).

***Coleolaelaps abnormalis* Costa & Hunter, 1971**

Coleolaelaps abnormalis Costa & Hunter, 1971: 331.
Coleolaelaps abnormalis.—Karg, 1999: 432; Joharchi & Halliday, 2011: 24; Joharchi *et al*., 2012b: 283.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Sdeh Nekhemia, Israel, on larva of *Anoxia orientalis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps agrestis* (Berlese, 1887)**

Laelaps (*Iphis*) *agrestis* Berlese, 1887b: 7.
Laelaps agrestis.—Berlese, 1892e: 4, 1892f: 42.
Iphis agrestis.—Berlese, 1892f: 35.
Hypoaspis (*Coleolaelaps*) *agrestis*.—Berlese, 1913b: 199; Bregetova, 1977b: 499; Arutunjan, 1993: 116.
Coleolaelaps agrestis.—Berlese, 1914: 141; Grandi, 1925: 212; Vitzthum, 1929: 27; Lombardini, 1936: 39; Womersley 1956a: 585; Costa & Hunter, 1971: 328; Castagnoli & Pegazzano, 1985: 8; Bernini *et al*., 1995: 27; Ma, 1997a: 26; Karg, 1999: 433; Trach & Joharchi, 2018: 218; Kazemi, 2020: 137.
agrestis; *non-Laelaps* [sic].—Tipton, 1960: 286.
Coleolaelaps ?*agrestis*.—Costa, 1966a: 73.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Italy, on *Melolontha fullonis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].
Note. Costa & Hunter (1971: 323) considered this species to be a senior synonym of *Coleolaelaps inopinatus* Grandi. However, that synonymy was not accepted by subsequent authors. In this publication, those species are considered different entities. Specimens reported by Costa & Hunter (1971: 328) and Kontschán (2015: 417) as *L*. (*I*.) *agrestis* were re-identified as *C*. *inopinatus* by Trach & Joharchi (2018: 219).

***Coleolaelaps amazon* Berlese, 1920**

Coleolaelaps amazon Berlese, 1920: 156.
Coleolaelaps amazon.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 11.
Hypoaspis (*Coleolaelaps*) *amazon*.—Evans, 1955: 361; Ryke, 1959: 7.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Bardeira, Somalia (cited as Somalia italiana), on unidentified centipedes [Animalia: Myriapoda: Chilopoda].

***Coleolaelaps anoxiae* (Koyumdjieva, 1977)**

Pelethiphis anoxiae Koyumdjieva, 1977: 64.
Coleolaelaps anoxiae.—Makarova, 1998: 121; Mašán & Halliday, 2010: 100.

Type depository. Author's collection at Institute of Zoology, Bulgarian Academy of Sciences, Sofia, Bulgaria.
Type locality and habitat. Arcutino, near the mouth of the Ropotamo River, Black Sea Coast, Bulgaria, on *Anoxia rumelica* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps asiaticus* Karg, 1999**
Coleolaelaps asiaticus Karg, 1999: 431.
Coleolaelaps asiaticus.—Joharchi & Halliday, 2011: 24; Kazemi & Rajaei, 2013: 78; Nemati *et al*., 2018b: 134.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Alma Ata, Kazakhstan, on *Polyphylla* cf. *adspersa* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps bakeri* Costa & Hunter, 1971**
Coleolaelaps bakeri Costa & Hunter, 1971: 337.
Coleolaelaps bakeri.—Farrier & Hennessey, 1993: 68.

Type depository. American Museum of Natural History, New York, United States of America.
Type locality and habitat. Saint Andrew's State Park, Florida, United States of America, on *Polyphylla pubescens* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps brachysetus* Costa & Hunter, 1971**
Coleolaelaps brachysetus Costa & Hunter, 1971: 333.
Coleolaelaps brachysetus.—Farrier & Hennessey, 1993: 68.

Type depository. American Museum of Natural History, New York, United States of America.
Type locality and habitat. Douglas, Georgia, United States of America, on *Polyphylla occidentalis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps brasilianus* Lombardini, 1940**
Coleolaelaps brasilianus Lombardini, 1940: 102.

Type depository. Unspecified.
Type locality and habitat. Brazil, on *Oryctes* sp. [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Coleolaelaps camini* Costa & Hunter, 1971**
Coleolaelaps camini Costa & Hunter, 1971: 346.
Coleolaelaps camini.—Farrier & Hennessey, 1993: 68.

Type depository. American Museum of Natural History, New York, United States of America.
Type locality and habitat. Visalia, California, United States of America, on *Polyphylla sobrina* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps caudatus* (Berlese, 1904)**
Laelaps (*Hypoaspis*) *caudatus* Berlese, 1904b: 17.
Hypoaspis (*Coleolaelaps*) *caudatus*.—Berlese, 1913b: 199.
caudatus; *non-Laelaps* [sic].—Tipton, 1960: 290.
Coleolaelaps caudatus.—Castagnoli & Pegazzano, 1985: 68.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Sumatra, Indonesia, on *Parathelphusa tridentata* [cited as *Paratelphusa tridentata*] [Animalia: Decapoda: Gecarcinucidae].

***Coleolaelaps chongqingensis* (Ma *et al*., 2003) new combination**
Hypoaspis chongqingensis Ma, Zhang & Li, 2003: 72.
Hypoaspis chongqingensis.—Yan *et al*., 2010: 904; Ren & Guo, 2008: 329; 2009: 101.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Chongqing (29°34'N, 106°30'E), China, on *Polyphylla laticollis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Despite the apparent absence of macrosetae on leg IV (perhaps except on tarsus), we provisionally place it in *Coleolaelaps* because of its dorsal shield with only 23 pairs of long setae, *r* setae on unsclerotised cuticle, the eroded sternal shield and narrow, irregular epigynal shield.

***Coleolaelaps coriaceus* Berlese, 1920**
Coleolaelaps coriaceus Berlese, 1920: 156.
Coleolaelaps coriaceus.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 88.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. South America, from unspecified substrate.

***Coleolaelaps costai* Joharchi & Halliday, 2011**
Coleolaelaps costai Joharchi & Halliday 2011: 24.
Coleolaelaps costai.—Bahrami *et al*., 2011: 350; Kazemi & Rajaei, 2013: 78; Nemati *et al*., 2018b: 134; Joharchi & Halliday, 2020: 24.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 2130 m above sea level, Shahrestanak (35°57'N, 51°21'E), [Karaj], Tehran, Iran, on *Polyphylla olivieri* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps egregius* Berlese: 1920**
Coleolaelaps egregius Berlese: 1920: 155.
Coleolaelaps egregius.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 123.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, from unspecified substrate.

***Coleolaelaps ferdowsi* Joharchi, 2012**
Coleolaelaps ferdowsi Joharchi, in Joharchi *et al*., 2012b: 280.
Coleolaelaps ferdowsi.—Kazemi & Rajaei, 2013: 79.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Tehran, Iran.
Type locality and habitat. Neishabour, Khorasan Razavi, Iran, on larva of *Polyphylla* sp. [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps gracilis* Costa & Hunter, 1971**
Coleolaelaps gracilis Costa & Hunter, 1971: 335.
Coleolaelaps gracilis.—Farrier & Hennessey, 1993: 68.

Type depository. American Museum of Natural History, New York, United States of America; specimen number 5409; specimen AMNH 5409.
Type locality and habitat. Kissimmee, Florida, United States of America, on *Polyphylla gracilis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps indicus* Bhattacharyya, 1967**
Coleolaelaps indicus Bhattacharyya, 1967: 131.

Type depository. Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India; specimen number Z.S.I. Reg. No. 2730/17.
Type locality and habitat. Station number 22, North East Frontier Agency, Kameng Division, Bhalukpung, Arunachal Pradesh, India, in soil of potato and brinjal cultivation [*Solanum tuberosum* and *S. melongena*; Plantae: Solanales: Solanaceae].

***Coleolaelaps inopinatus* Grandi, 1925**
Coleolaelaps inopinatus Grandi, 1925: 211.
Coleolaelaps inopinatum [sic].—Womersley, 1956a: 585.
Coleolaelaps ?*inopinatus* [sic].—Costa, 1966a: 73.
Coleolaelaps agrestis.—Costa & Hunter, 1971: 356; Kontschán, 2015: 417 (misidentifications, according to Trach & Joharchi, 2018: 218).
Hypoaspis (*Coleolaelaps*) *inopinatus*.—Bregetova, 1977b: 499; Karg, 1999: 433.
Coleolaelaps inopinatus.—Bernini *et al*., 1995: 27; Trach & Joharchi, 2018: 218.

Type depository. Unspecified.
Type locality and habitat. Unspecified type locality, on *Anoxia matutinalis* v. *suturalis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].
Note. Costa & Hunter (1971: 323) considered this species to be a junior synonym of *L.* (*I.*) *agrestis*. However, that synonymy was not accepted by subsequent authors. In this publication, those species are considered different entities.

***Coleolaelaps krantzi* Costa & Hunter, 1971**
Coleolaelaps krantzi Costa & Hunter, 1971: 339.
Coleolaelaps krantzi.—Farrier & Hennessey, 1993: 68.

Type depository. American Museum of Natural History, New York, United States of America.
Type locality and habitat. Dahlonega, Georgia, United States of America, on *Polyphylla comes* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps lepisternalis* (Ma, 2004) new combination**
Hypoaspis lepisternalis Ma, 2004a: 18.
Hypoaspis lepisternalis.—Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2010: 904.
Hypoaspis lepiternails [sic].—Yan *et al*., 2018: 262.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.

Type locality and habitat. Lushan Mountain (29°32'N, 115°55'E), Jiangxi, China, on *Polyphylla laticollis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Joharchi & Halliday (2011: 24) suggested that it might belong to *Coleolaelaps*, but it lacks some of the diagnostic character states for the genus. The mostly long dorsal setae, longer post-anal seta than para-anal setae and eroded sternal shield lead us to provisionally place this species in *Coleolaelaps*.

***Coleolaelaps lizeri* Berlese, 1914**
Coleolaelaps lizeri Berlese, 1914: 142.
Coleolaelaps lizeri.—Lombardini, 1940: 103; Castagnoli & Pegazzano, 1985: 222.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, on *Diloboderus abderus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Coleolaelaps longisetatus* Ishikawa, 1968**
Coleolaelaps longisetatus Ishikawa, 1968: 211.
Coleolaelaps longisetatus.—Costa & Hunter, 1971: 342; Deng *et al*., 1993: 180; Ma, 1997a: 26; Karg, 1999: 433; Ren & Guo, 2008: 330, 2009: 101; Yan *et al*., 2010: 905.

Type depository. Biological Laboratory, Matsuyama Shinonome Junior College, Matsuyama, Japan.
Type locality and habitat. OdaMachi, Shikoku, Japan, on *Polyphylla laticollis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps longius* Lombardini, 1940**
Coleolaelaps longius Lombardini, 1940: 104.

Type depository. Unspecified.
Type locality and habitat. Brazil, on *Oryctes* sp. [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Coleolaelaps massoumii* Khanjani *et al*., 2013**
Coleolaelaps massoumii Khanjani, Ghaedi & Ueckermann, 2013: 473.
Coleolaelaps massoumii.—Nemati *et al*., 2018b: 134.

Type depository. Acarology Laboratory, Bu-Ali Sina University, Hamedan, Iran.
Type locality and habitat. 1733 m above sea level, Hamedan (36°46'N, 48°34'E), Iran, on *Polyphylla olivieri* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae] from cherry trees [Plantae: Rosales: Rosaceae] in a potato farm.

***Coleolaelaps maximus* Cooreman, 1948**
Coleolaelaps maximus Cooreman, 1948: 7.

Type depository. Unspecified.
Type locality and habitat. 1480 m above sea level, Tchegera island, Lake Kivu, 3 km south of Bolengo, Democratic Republic of the Congo, on a tool to cut weeds.

***Coleolaelaps minor* Lombardini, 1940**
Coleolaelaps minor Lombardini, 1940: 104.

Type depository. Unspecified.
Type locality and habitat. Brazil, on *Mallodon* sp. [Animalia: Coleoptera: Cerambycidae].

***Coleolaelaps passali* Lombardini, 1940**
Coleolaelaps passali Lombardini, 1940: 104.

Type depository. Unspecified.
Type locality and habitat. Brazil, on a passalid beetle [Animalia: Coleoptera: Passalidae].

***Coleolaelaps proximus* Cooreman, 1948**
Coleolaelaps proximus Cooreman, 1948: 13.

Type depository. Unspecified.
Type locality and habitat. 1480 m above sea level, Kisenyi, northeast of Lake Kivu, Democratic Republic of the Congo, near a small pond, from unspecified substrate.

***Coleolaelaps sternotomus* Cooreman, 1948**
Coleolaelaps sternotomus Cooreman, 1948: 14.

Type depository. Unspecified.
Type locality and habitat. 1750 m above sea level, Kalondo, near the shore of Lake Ndalaga, Democratic Republic of the Congo, from unspecified substrate.

***Coleolaelaps terrestris* (Berlese, 1908)**
Laelaps terrestris Berlese, 1908: 14.
Hypoaspis (*Coleolaelaps*) *terrestris*.—Berlese, 1913b: 199.
terrestris; *non-Laelaps* [sic].—Tipton, 1960: 308.
Hypoaspis terrestris.—Costa & Hunter, 1971: 324; Bernini *et al*., 1995: 29.
Coleolaelaps terrestris.—Castagnoli & Pegazzano, 1985: 412.

Type depository. Berlese Acaroteca, Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Rosignano (Pisa) [sic], Italy, on *Copris hispanus* [Animalia: Coleoptera: Scarabaeidae, Scarabaeinae].
Note. *Laelaps terrestris* Berlese, 1908 (currently *Coleolaelaps terrestris*) is a junior primary homonym of *Laelaps terrestris* Leonardi, 1899 (currently *Hypoaspis terrestris*). We choose not to take any action to resolve the homonymy at this time, because the available information about the Berlese species is still very limited and it may have an available synonym.

***Coleolaelaps tillae* Costa & Hunter, 1971**
Coleolaelaps tillae Costa & Hunter, 1971: 344.
Coleolaelaps tillae.—Deng *et al*., 1993: 181; Ma, 1997a: 26; Karg, 1999: 433; Ren & Guo, 2008: 330, 2009: 101; Yan *et al*., 2010: 905.

Type depository. American Museum of Natural History, New York, United States of America.

Type locality and habitat. Yen-Ping, China, on *Polyphylla mongola* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Coleolaelaps tongyuensis* Ma, 1997**

Coleolaelaps tongyuensis Ma, 1997a: 26.
Coleolaelaps tongyuensis.—Karg, 1999: 433; Ren & Guo, 2008: 330, 2009: 101; Yan *et al*., 2010: 905.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Tongyu (44.8°N, 123.1°E), Jilin province, China, on unidentified beetle, in a decomposing rodent nest.

***Coleolaelaps variosetatus* Karg, 1999**

Coleolaelaps variosetatus Karg, 1999: 430.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Aladagh Mountain, Demirkazik, Turkey, on *Anoxia villosa* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Conolaelaps* Womersley, 1959**

Conolaelaps Womersley, 1959: 344 (type species: *Laelaps coniferus* Canestrini, 1884, by monotypy).
Conolaelaps.—Halliday, 2019: internet page.

Note. This genus was described in Laelapidae.

***Conolaelaps coniferus* (Canestrini, 1884)**

Laelaps coniferus Canestrini, 1884: 711.
?*Laelaps conifer* [sic].—Berlese, 1892f: 43.
Laelaps coniferus.—Rainbow, 1906: 172.
Conolaelaps coniferus.—Womersley, 1959: 345; Halliday, 1998: 124, 2010: 5, 2019: internet page.
Eviphidid.—Walter & Proctor, 2001: electronic format.
Conolaelaps sp. nr. *coniferus*.—Beaulieu *et al*., 2010: Table S1.

Type depository. Unspecified.
Type locality and habitat. Queensland, Australia, with unidentified insect.

***Cosmolaelaps* Berlese, 1903**

Hypoaspis.—Canestrini, 1885: 55 (in part); Karg, 1979: 66 (in part), 1993a: 133 (in part); Zaher, 1986: 185 (in part); Deng *et al*., 1993: 157 (in part).
Laelaps (*Cosmolaelaps*) Berlese, 1903b: 13 (type species: *Laelaps claviger* Berlese, 1882, by original designation).
Laelaps (*Cosmolaelaps*).—Berlese, 1904c: 415.
Cosmolaelaps.—Berlese, 1913b: 10; Vitzthum, 1929: 22, 1931c: 143; Radford, 1950b: 20; Bregetova, 1955b: 290, 1956: 73; Evans, 1957a: 231; Piryanik, 1962: 78; Zhang *et al*., 1963: 186; Athias-Henriot, 1968: 237; Evans & Till, 1979: 201; Rosario, 1981: 37; Zaher, 1986: 200; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 67; Hunter, 1993: 23; Fouly *et al*., 1997: 33; Botelho *et al*., 2002: 54; OConnor & Klimov, 2012a: internet page; Karg & Schorlemmer, 2013: 202; Gwiazdowicz *et al*., 2014: 436; Moreira *et al*., 2014: 318; Klimov *et al*., 2016: internet page; Nemati & Gwiazdowicz, 2016a: 548; 2016b: 29; Hajizadeh & Joharchi, 2018: 25; Halliday, 2019: internet page; Mašán & Babaeian, 2019: 502.

Hypoaspis (*Cosmolaelaps*).—Vitzthum, 1942: 762; Baker & Wharton, 1952: 94; Schweizer, 1961: 149; Karg, 1965: 271, 1971: 160 (in part), 1979: 71 (in part), 1981a: 213 (in part), 1982: 234, 1988: 510 (in part), 1989a: 107, 1993a: 136 (in part); Evans & Till, 1966: 160; Bregetova, 1977b: 511; Hafez *et al*., 1982: 3; Faraji *et al*., 2008: 207; Huhta & Karg, 2010: 330 (in part).
Hypoaspis (*Hypoaspis*).—Aswegen & Loots, 1970: 169 (in part).
Hypoaspis (*Holostaspis*).—Karg, 1971: 171 (in part).

Note. *Laelaps* (*Cosmolaelaps*) was described in Laelapidae, included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 201). Karg (1979: 72) transferred *Laelaps* (*Iphis*) *miles* Berlese to *Hypoaspis* (*Cosmolaelaps*). As that is the type species of *Stratiolaelaps* Berlese, the latter became junior synonym of *Cosmolaelaps*, as adopted by Farrier & Hennessey (1993: 67) and Karg (1971: 163, 1993a: 137). However, that proposed generic change was not accepted by other authors (Casanueva, 1993: 40; Walter & Campbell, 2003: 257; Gwiazdowicz *et al*., 2014: 441; Moreira *et al*., 2014: 318; Nemati & Gwiazdowicz, 2016b: 29), or by Karg & Schorlemmer (2013: 202). In this publication, *Cosmolaelaps* and *Stratiolaelaps* are considered different entities. Farrier & Hennessey (1993: 68) cited *Davisiella* Zumpt & Patterson as a synonym of *Cosmolaelaps*, but we here treat *Davisiella* as a synonym of *Stratiolaelaps*, following Evans & Till (1966: 159, 1979: 201) and Bregetova (1977b: 510).

***Cosmolaelaps aciphila* (Karg, 1987)**
Hypoaspis (*Cosmolaelaps*) *aciphila* Karg, 1987: 295.
Hypoaspis (*Cosmolaelaps*) *aciphila*.—Karg, 1988: 511, 1993a: 138; Mašán, 1992: 387, 2001: 216.
Cosmolaelaps aciphila.—Bernini *et al*., 1995: 28; Gwiazdowicz *et al*., 2014: 436.
Cosmolaelaps aciphilus.—Moreira *et al*., 2014: 319.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. "Pra dei Cavai" Farm, San Stino, Livenza, Venice, Italy, in corn field soil.

***Cosmolaelaps acuta* (Michael, 1891)**
Laelaps acuta Michael, 1891: 652.
Lælaps acuta.—Moniez, 1892: 381.
Loelaps acutus [sic].—Wasmann, 1894: 198.
Laelaps acutus.—Leonardi, 1897: 863.
Laelaps (*Hypoaspis*) *acutus*.—Berlese, 1904c: 413; Halbert, 1915: 71; Donisthorpe, 1927: 213.
Gymnolaelaps acutus.—Hull, 1918: 68; Vitzthum, 1929: 25; Schweizer, 1949: 40; Turk, 1953: 11.
Hypoaspis acutus.—Turk, 1948: 113.
acuta; *non-Laelaps* [sic].—Tipton, 1960: 286.
Hypoaspis acuta.—Evans & Till, 1966: 212; Gupta & Chattopadhyay, 1978: 79; Gupta & Paul, 1989: 317; Chaudhury *et al*., 2010: 136.
Hypoaspis (*Holostaspis*) *acuta*.—Karg, 1971: 177, 1979: 98, 1982: 248, 1993a: 159.
Hypoaspis (*Cosmolaelaps*) *acuta*.—Bregetova, 1977b: 513.
Holostaspis acuta.—Farrier & Hennessey, 1993: 77.
Hypoaspis (*Alloparasitus*) *acuta*.—Luxton, 1998: 19.
Cosmolaelaps acuta.—Sklyar, 2012: 82; Nasr & Momen, 2016: 263; Babaeian *et al*., 2019a: 328.

Type depository. Unspecified.
Type locality and habitat. Near Innsbruck, Tyrol, Austria, in nests of *Camponotus herculeanus* [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps acutiscutus* Teng, 1982**

Cosmolaelaps acutiscutus Teng, 1982: 162.

Cosmolaelaps acutiscutus.—Wang & Wang, 1991: 250; Ma, 1995: 15; Bai & Wang, 2005: 27; Ma & Yin, 2011: 119; Kazemi & Rajaei, 2013: 79; Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 542; Ma, 2016b: 95; Nemati & Gwiazdowicz, 2016a: 545.

Hypoaspis (*Cosmolaelaps*) *acutiscutus*.—Deng *et al*., 1993: 161; Yan *et al*., 2008: 2230, 2010: 904; Bai & Ma, 2012: 557; Bai *et al*., 2016: 9.

Cosmolaelaps subacutiscutus Bai & Wang, 2005: 26 [junior synonym of *C. acutiscutus* by Ma, 2016b: 95].

Hypoaspis acutiscutus.—Ren & Guo, 2008: 329, 2009: 101.

Cosmolaelaps subacutiscutus.—Ren & Guo, 2008: 328, 2009: 101; Kazemi & Rajaei, 2013: 80; Moreira *et al*., 2014: 320; Ramroodi *et al*., 2014a: 542; Nemati & Gwiazdowicz, 2016a: 545.

Hypoaspis (*Cosmolaelaps*) *subacutiscutus*.—Bai & Ma, 2012: 557; Bai *et al*., 2016: 9.

Type depository. *C. acutiscutus*: Institute of Zoology, Academia Sinica, Taipei, China; *C. subacutiscutus*: Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing, China.

Type locality and habitat. *C. acutiscutus*: Jiangsu, China, on unidentified Coleoptera [Animalia]; *C. subacutiscutus*: Yinchuan suburb (38.50°N, 106.30°E), Ningxia Hui Autonomous Region, China, on decomposing rice straw.

Note. Nemati & Gwiazdowicz (2016a: 544) suspected that *C. acutiscutus* could be a senior synonym of *H. subacutiscutus* and a junior synonym of *Hypoaspis angustiscutatus* Willmann, while Ma (2016b: 95) officially synonymised *C. acutiscutus* and *H. subacutiscutus*.

***Cosmolaelaps aegyptiacus* Nasr & Momen, 2016**

Cosmolaelaps aegyptiacus Nasr & Momen, 2016: 258.

Cosmolaelaps egyptiacus [sic].—Nasr & Momen, 2016: 258.

Hypoaspis s. l. *aeypticus* [sic].—Nemati *et al*., 2018b: 175.

Cosmolaelaps aegyptiacus.—Joharchi *et al*., 2019e: 81.

Type depository. Collection of the Acarological Unit, Pests and Plant Protection Department at National Research Centre, Cairo, Egypt.

Type locality and habitat. 1.5 km west of Menia (28.11°N, 3.74°E), Menia governorate, Egypt, in soil of a soybean, *Glycine max* [Plantae: Fabales: Fabaceae] field.

Note. Nemati *et al*. (2018b: 175) questioned the generic placement of this species. Mašán & Babaeian (2019: 502) also questioned its placement in *Cosmolaelaps* instead of in *Laelaspis*, given the epigynal shield widened behind coxae IV and its ornamentation.

***Cosmolaelaps alexandrini* (Fox, 1946)**

Ischnolaelaps alexandrini Fox, 1946a: 447.

Hypoaspis s. l. *alexandrini*.—Strandtmann, 1949: 348.

Androlaelaps alexandrini.—Farrier & Hennessey, 1993: 64; Kůrka, 2005: 22.

Cosmolaelaps alexandrini.—Freire & Moraes, 2007: 356; Moreira *et al*., 2014: 319.

Type depository. Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico.

Type locality and habitat. Camp O'Reilly, Gurabo, Puerto Rico, on *Rattus rattus* [Animalia: Rodentia: Muridae].

***Cosmolaelaps anserina* (Karg, 1981)**

Hypoaspis (*Cosmolaelaps*) *anserina* Karg, 1981a: 222.

Hypoaspis (*Cosmolaelaps*) *anserina*.—Karg, 1988: 513; Cuervo *et al*., 1994: 18.

Cosmolaelaps anserinus.—Farrier & Hennessey, 1993: 68; Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 535.

Hypoaspis anserina.—Kůrka, 2005: 24.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Cuba, from unspecified substrate.

***Cosmolaelaps badrii* (Nasr & Nawar, 1989)**
Laelaspis badrii Nasr & Nawar, 1989b: 76.
Laelaspis badrii.—Joharchi *et al*., 2012a: 2014.
Cosmolaelaps badrii.—Kazemi, 2015: 415.

Type depository. Acarology Research Unit, National Research Centre, Dokki, Cairo, Egypt.
Type locality and habitat. Om-Saber village, Tahreer, Behera, Egypt, in soil under *Mangifera indica* [Plantae: Sapindales: Anacardiaceae].

***Cosmolaelaps barbatus* Moreira *et al*., 2014**
Cosmolaelaps barbatus Moreira, Klompen & Moraes, 2014: 322.
Cosmolaelaps barbatus.—Duarte *et al*., 2017: 543.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. From a laboratory colony originated from specimens collected at Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil, from litter under *Capsicum chinense* [Plantae: Solanales: Solanaceae].

***Cosmolaelaps bengalensis* (Bhattacharyya, 1968)**
Hypoaspis bengalensis Bhattacharyya, 1968: 543.
Hypoaspis bengalensis.—Prasad, 1974: 150.
Hypoaspis (*Cosmolaelaps*) *bengalensis*.—Karg, 1987: 293, 1988: 512; Huhta & Karg, 2010: 330.
Cosmolaelaps bengalensis.—Moreira *et al*., 2014: 319; Joharchi *et al*., 2020a: 159.

Type depository. Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India.
Type locality and habitat. Uttar Jhapardaha, Domjur, Howrah, West Bengal, India, in grass litter.

***Cosmolaelaps bicuspisetosus* Willmann, 1954**
Cosmolaelaps bicuspisetosus Willmann, 1954a: 460.
Hypoaspis (*Cosmolaelaps*) *bicuspisetosus*.—Bregetova, 1977b: 511.
Hypoaspis (*Cosmolaelaps*) *bicuspisetosa*.—Karg, 1981a: 214, 1987: 293, 1988: 511, 1993a: 137; Mašán, 1992: 387.
Cosmolaelaps bicuspisetosus.—Moreira *et al*., 2014: 319.

Type depository. Unspecified.
Type locality and habitat. 1400–1500 m above sea level, Heiligenblut, Glockner Group, [Carinthia], Austria, from sieved grass from a steppe meadow.

***Cosmolaelaps bipennata* (Karg, 2003)**
Hypoaspis (*Cosmolaelaps*) *bipennata* Karg, 2003b: 230.
Cosmolaelaps bipennata.—Gwiazdowicz *et al*., 2014: 437.
Cosmolaelaps bipennatus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Pichinca (probably Pichincha), Ecuador, in moss.

***Cosmolaelaps bispinosa* (Karg, 1997)**
Hypoaspis (*Cosmolaelaps*) *bispinosa* Karg, 1997b: 84.
Hypoaspis bispinosa.—Kůrka, 2005: 24.
Cosmolaelaps bispinosus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Mont Koghi, New Caledonia, from unspecified substrate.

***Cosmolaelaps brevilingua* (Karg, 2006)**
Hypoaspis (*Cosmolaelaps*) *brevilingua* Karg, 2006: 149.
Cosmolaelaps brevilingua.—Moreira *et al*., 2014: 319; Nasr & Momen, 2016: 264.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Flavio Alfaro, Ecuador, in litter of a cacao [*Theobroma cacao*; Plantae: Malvales: Malvaceae] plantation.

***Cosmolaelaps brevipedestra* (Karg, 1985)**
Hypoaspis (*Cosmolaelaps*) *brevipedestra* Karg, 1985: 234.
Hypoaspis (*Cosmolaelaps*) *brevipedestra*.—Karg, 1988: 516; Nemati *et al*., 2000: 381; Faraji *et al*., 2008: 207.
Cosmolaelaps brevipedestrus.—Farrier & Hennessey, 1993: 68; Moreira *et al*., 2014: 319.
Hypoaspis brevipedestra.—Kůrka, 2005: 24.
Cosmolaelaps brevipedestra.—Kazemi & Rajaei, 2013: 79; Gwiazdowicz *et al*., 2014: 437; Ramroodi *et al*., 2014a: 542; Nemati & Gwiazdowicz, 2016a: 540; Nemati *et al*., 2018b: 135.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Near Havana-Mariel, Cuba, in nest of *Nasutitermes* sp. [Animalia: Blattodea: Termitidae].
Note. Mašán & Babaeian (2019: 502) questioned the placement of this species in *Cosmolaelaps* instead of in *Laelaspis*, given the epigynal shield widened behind coxae IV.

***Cosmolaelaps brevistilis* (Karg, 1978)**
Hypoaspis (*Cosmolaelaps*) *brevistilis* Karg, 1978b: 1.
Hypoaspis (*Cosmolaelaps*) *brevistilis*.—Karg, 1979: 72, 1981a: 218, 1987: 290, 1988: 516, 2003b: 232; Karg & Schorlemmer, 2009: 61.
Hypoaspis brevistilis.—Xu & Liang, 1996: 193.
Cosmolaelaps brevistilis.—Moreira *et al*., 2014: 319; Duarte *et al*., 2017: 536.

Type depository. Magyar Természettudományi Múzeum / Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Misituni, Tarapaca, Chile, in soil.

***Cosmolaelaps burdwanensis* (Bhattacharyya, 1972)**
Hypoaspis burdwanensis Bhattacharyya, 1972: 133.
Cosmolaelaps burdwanensis.—Moreira *et al*., 2014: 319.

Type depository. Zoological Survey of India, Kolkata (cited as Calcutta), India.
Type locality and habitat. Near Burdwan Railway Station, Burdwan, West Bengal, India, in soil under *Vigna* sp. [Plantae: Fabales: Fabaceae].

***Cosmolaelaps busolii* Moreira *et al*., 2014**
Cosmolaelaps busolii Moreira, Klompen & Moraes, 2014: 331.
Cosmolaelaps busolii.—Duarte *et al*., 2017: 543.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Rodovia 226 (Pariquera-Açu-Cananéia), km 16, Cananéia, São Paulo state, Brazil, in soil under *Syagrus romanzoffiana* [Plantae: Arecales: Arecaceae].

***Cosmolaelaps calamitus* (Faraji & Halliday, 2009)**
Hypoaspis (*Cosmolaelaps*) *calamitus* Faraji & Halliday, 2009: 258.
Cosmolaelaps calamitus.—Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 319; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Wreck Rock, 12 km south of Agnes Water, Queensland, Australia, on *Macropanesthia* sp. [Animalia: Blattodea: Blaberidae].
Note. Mašán & Babaeian (2019: 502) questioned the placement of this species in *Cosmolaelaps*.

***Cosmolaelaps carvalhoi* (Aswegen & Loots, 1970)**
Hypoaspis (*Hypoaspis*) *carvalhoi* Aswegen & Loots, 1970: 175.
Hypoaspis (*Cosmolaelaps*) *carvalhoi*.—Karg, 1981a: 220, 1987: 292, 1988: 518.
Cosmolaelaps carvalhoi.—Moreira *et al*., 2014: 319.

Type depository. Museu do Dundo, Dundo, Lunda Norte, Angola; specimen number Ang. 16 888.
Type locality and habitat. Luachimo River, near Dundo, tourist road (7.22°S, 20.50°E), Angola, in forest soil.

***Cosmolaelaps cassoidea* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *cassoidea* Karg, 1981a: 221.
Hypoaspis (*Cosmolaelaps*) *cassoidea*.—Karg, 1987: 291, 1988: 517, 1993b: 267, 2006: 150; Faraji *et al*., 2008: 207.
Cosmolaelaps cassoidea.—Freire & Moraes, 2007: 356; Kazemi & Rajaei, 2013: 79; Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 542; Duarte *et al*., 2017: 543.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Type series, Brazil and Venezuela, in litter.

***Cosmolaelaps ceylonensis* Joharchi *et al*., 2020**
Cosmolaelaps ceylonensis Joharchi, Ermilov & Khaustov, 2020a: 152.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 42 m above sea level, near Thambadola Ella waterfall, Polgampola (6°27'N, 80°12'E), Sabaragamuwa province, Sri Lanka, in forest soil-litter.

***Cosmolaelaps chenchuanhoi* (Samšiňák, 1964)**
Stratiolaelaps chenchuanhoi Samšiňák, 1964: 37.
Hypoaspis (*Cosmolaelaps*) *chenchuanhoi*.—Karg, 1985: 237, 1988: 514, 2006: 151; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Cosmolaelaps chenchuanhoi.—Moreira *et al*., 2014: 319.

Type depository. Institute of Zoology of the Chinese Academy of Sciences, Beijing, China.
Type locality and habitat. Shun-te, Kreis, China, in nest of *Odontotermes formosanus* [Animalia: Blattodea: Termitidae].

***Cosmolaelaps chianensis* (Gu, 1990)**
Hypoaspis chianensis Gu, 1990: 441.
Hypoaspis (*Cosmolaelaps*) *chianensis*.—Deng *et al*., 1993: 163; Yan *et al*., 2008: 2231; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Hypoaspis (*Cosmolaelaps*) *hefeiensis* Xu & Liang, 1996: 193 [junior synonym of *H. chianensis* by Ma, 2006a: 23; Yan *et al*., 2008: 2231; Bai & Ma, 2012: 558; Moreira *et al*., 2014: 319; Keum *et al*., 2017: 486].
Hypoaspis (*Cosmolaelaps*) *hefeiensis*.—Bei *et al*., 2003: 648; Bai *et al*., 2016: 9.
Cosmolaelaps chianensis.—Ma, 2006a: 23; Fouly & Al-Rehianyyani, 2014: 269; Moreira *et al*., 2014: 319; Ma, 2016a: 20; Keum *et al*., 2017: 486.
Hypoaspis chianensis.—Ma & Lin, 2008: 95; Ren & Guo, 2008: 329, 2009: 101.

Type depository. *H. chianensis*: Department of Parasitology, Guiyang Medical College, Guiyang, Guizhou, China; *H.* (*C.*) *hefeiensis*: Department of Environmental and Resources Biology, Fudan University, Shanghai, China.
Type locality and habitat. *H. chianensis*: Xingyi (24.9°N, 104.7°E), Guizhou, China, on *Mus pahara* [Animalia: Rodentia: Muridae]; *H.* (*C.*) *hefeiensis*: Hefei, Anhui, China, in moss.

***Cosmolaelaps chini* Bai & Gu, 1993**
Cosmolaelaps chini Bai & Gu, 1993a: 40.
Hypoaspis chini.—Ren & Guo, 2008: 328, 2009: 101.
Cosmolaelaps chini.—Ren & Guo, 2008: 328, 2009: 101; Gwiazdowicz *et al*., 2014: 436; Moreira *et al*., 2014: 319.
Hypoaspis (*Cosmolaelaps*) *chini*.—Yan *et al*., 2010: 905; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Type depository. Ningxia Institute of Endemic Disease Control, Yinchuan, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant (*Myrmos* spp.) nest [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps claviger* (Berlese, 1882)**
Laelaps claviger Berlese, 1882d: unpaginated.
Laelaps claviger.—Berlese, 1892f: 35, 1883a: 2, 1893b: 216; Leonardi, 1897: 862; Radford, 1950b: 20.
Hypoaspis claviger.—Canestrini, 1885: 83; Evans & Till, 1966: 182; Costa, 1968: 5; Niedbała *et al*., 1982: 247, 1990: 32; Karg, 2000: 247; Kůrka, 2005: 24; Manu *et al*., 2021: 6.
Lælaps claviger [sic].—Moniez, 1894: 204.
Loelaps ? *claviger* [sic].—Wasmann, 1894: 198.
Iphis claviger.—Berlese, 1892f: 35.
Laelaps (*Cosmolaelaps*) *claviger*.—Berlese, 1903b: 20; Halbert, 1915: 73.
Cosmolaelaps claviger.—Hull, 1918: 68; Lombardini, 1936: 39; Turk, 1953: 11; Evans & Till, 1965a: 256; Athias-Henriot, 1968: 249; Afifi & Van der Geest, 1984: 587; Castagnoli & Pegazzano, 1985: 75; Bernini *et al*., 1995: 28; Luxton, 1998: 18; Mahjoori *et al*., 2014: 1602; Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 541; Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 135; Joharchi & Trach, 2019: 492; Joharchi *et al*., 2020a: 159; Kazemi, 2020: 137; Joharchi *et al*., 2021b: 272.
Cosmolaelaps bregetovae Piryanik, 1959: 101 [junior synonym of *L. claviger* by Bregetova, 1977b: 513; Moreira *et al*., 2014: 319; Joharchi & Trach, 2019: 492].

claviger; *non-Laelaps* [sic].—Tipton, 1960: 291.
Cosmolaelaps bregetovae.—Piryanik, 1962: 78.
Hypoaspis (*Hypoaspis*) *auris* Karg, 1965: 276 [junior synonym of *L. claviger* by Costa, 1968: 5; Moreira *et al*., 2014: 319].
Hypoaspis (*Cosmolaelaps*) *macroanalis* Bernhard, in Hirschmann *et al*., 1969: 137 [junior synonym of *L. claviger* by Karg, 1981a: 216, 1988: 513; Moreira *et al*., 2014: 319; of *H.* (*C.*) *claviger claviger* by Karg, 1971: 178, 1993a: 138].
Hypoaspis (*Cosmolaelaps*) *claviger auris*.—Karg, 1971: 166, 1993a: 138.
Hypoaspis (*Cosmolaelaps*) *claviger claviger*.—Karg, 1971: 166, 1993a: 138.
Hypoaspis (*Cosmolaelaps*) *claviger*.—Bregetova, 1977b: 513; Karg, 1978b: 8, 1979: 72, 1981a: 216, 1988: 513, 2000: 247; Skorupski *et al*., 2013: 9.
Hypoaspis (*Cosmolaelaps*) *bregetovae*.—Karg, 1988: 513, 1993a: 138.
Hypoaspis claviger claviger.—Iavorschi, 1995: 59.

Type depository. *L. claviger*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *C. bregetovae* and *H.* (*C.*) *macroanalis*: unspecified; *H.* (*H.*) *auris*: Karg's collection.
Type locality and habitat. *L. claviger*: according to Berlese (1983a: 2), type series from Padua and Acireale, Sicily, Italy, in moss [cited as "muscis"]; *C. bregetovae*: Zarechye, Dnipro, Kaneva, Ukraine, on *Microtus ratticeps* [Animalia: Rodentia: Cricetidae] and *Clethrionomys glareolus* (Animalia: Rodentia: Cricetidae); *H.* (*H.*) *auris*: Egeln, Sachsen-Anhalt, Germany, in pasture soil; *H.* (*C.*) *macroanalis*: Erlangen, Germany, in litter, alder [*Alnus*; Plantae: Fagales: Betulaceae] and linden [*Tilia*; Plantae: Malvales: Malvaceae] stumps and rotting acorns.
Note. Oudemans (1902d: 19) considered *H. claviger* to be a junior synonym of *Hypoaspis pavidus* Koch (presently in Ameroseiidae), but Berlese (1904a: 276) did not accept that synonymy. Berlese's interpretation is adopted in this publication, thereby retaining *Cosmolaelaps* in Laelapidae, given that *H. claviger* is the type species of this genus. *Cosmolaelaps bregetovae* Fonseca, 1960 is a junior primary homonym of *Cosmolaelaps bregetovae* Piryanik, 1959. However we refrain from providing a replacement name until a detailed taxonomic revision of *C. bregetovae* Fonseca, 1960 can be completed, because it may have an available synonym.

Cosmolaelaps communis Trägårdh, 1931

Cosmolaelaps communis Trägårdh, 1931: 613.
Cosmolaelaps communis.—Piryanik, 1959: 104; Moreira *et al*., 2014: 319.

Type depository. Unspecified.
Type locality and habitat. 10 m above sea level; Masatierra, Juan Fernandez Island (Chile), under stones.

Cosmolaelaps crossocauda (Karg, 2006)

Hypoaspis (*Cosmolaelaps*) *crossocauda* Karg, 2006: 150.
Cosmolaelaps crossocauda.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near San Andres, Ecuador, in moss on epiphytes.

Cosmolaelaps cubaensis (Karg, 1981)

Hypoaspis (*Cosmolaelaps*) *cubaensis* Karg, 1981a: 224.
Hypoaspis (*Cosmolaelaps*) *cubaensis*.—Karg, 1987: 292, 1988: 519, 1994: 183; Cuervo *et al*., 1994: 18.
Cosmolaelaps cubaensis.—Farrier & Hennessey, 1993: 68; Moreira *et al*., 2014: 319.
Hypoaspis cubaensis.—Kůrka, 2005: 24.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Cuba, in litter.

***Cosmolaelaps cuneifer* (Michael, 1891)**
Laelaps cuneifer Michael, 1891: 647.
Laelaps cuneifer.—Moniez, 1892: 383.
Lælaps cuneifer [sic].—Moniez, 1892: 383.
Loelaps cuneifer [sic].—Wasmann, 1894: 198.
Lealaps cuneifer [sic].—Leonardi, 1897: 862.
Hypoaspis cuneifer.—Oudemans, 1902d: 24, 1903a: 129; Buitendijk, 1945: 295; Evans & Till, 1966: 184; Wiśniewski, 1982: 163; Gu & Bai, 1992: 192; Munderloh, 1996: 590; Kůrka, 2005: 24.
Laelaps (*Cosmolaelaps*) *cuneifer*.—Berlese, 1903b: 20, 1904c: 416; Donisthorpe, 1927: 214.
Laelaps (*Cosmolaelaps*) *cuneifer* var. *americanus* Berlese, 1904c: 418.
Laelaps cuneifer var. *americanus*.—Banks, 1907: 610.
Cosmolaelaps cuneifer.—Hull, 1918: 68; Vitzthum, 1929: 25, 1931c: 119; Lombardini, 1936: 39; Schweizer, 1949: 40; Thurman *et al*., 1949: 2; Willmann, 1951: 116, 1954b: 225; Turk, 1953: 11; Bregetova, 1956: 75; Goncharova & Buyakova, 1964: 281; Athias-Henriot, 1968: 239; Castagnoli & Pegazzano, 1985: 101; Bernini *et al*., 1995: 28; Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 319; Joharchi & Trach, 2019: 492; Joharchi *et al*., 2019e: 77.
cuneifer; *non-Laelaps* [sic].—Tipton, 1960: 292.
Hypoaspis (*Cosmolaelaps*) *cuneifer*.—Schweizer, 1961: 149; Karg, 1971: 163, 1978b: 8, 1979: 71, 1981a: 216, 1987: 293, 1988: 511, 1993a: 138; Bregetova, 1977b: 511; Chelebiev, 1988: 11; Mašán, 1992: 387, 2001: 216; Skorupski *et al*., 2013: 10.
Cosmolaelaps cuneifer var. *americanus*.—Castagnoli & Pegazzano 1985: 12; Farrier & Hennessey, 1993: 68.

Type depository. *L. cuneifer*: unspecified; *L.* (*C.*) *cuneifer* var. *americanus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. *L. cuneifer*: near Innsbruck, Tyrol, Austria, in nests of *Camponotus herculeanus* [Animalia: Hymenoptera: Formicidae]; *L.* (*C.*) *cuneifer* var. *americanus*: Colebrook, Connecticut, United States of America, in nest of *Aphenogaster fulva* var. *picea* [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps cursoria* (Karg, 1988)**
Hypoaspis (*Cosmolaelaps*) *cursoria* Karg, 1988: 523.
Cosmolaelaps cursorius.—Farrier & Hennessey, 1993: 68; Moreira *et al*., 2014: 319.
Hypoaspis (*Cosmolaelaps*) *cursoria*.—Karg, 1993b: 265.
Hypoaspis cursoria.—Kůrka, 2005: 24.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Cosmolaelaps dendrophilus* Davydova, 1977**
Cosmolaelaps dendrophilus Davydova, 1977: 23.
Hypoaspis dendrophilus.—Kůrka, 2005: 24.
Cosmolaelaps dendrophilus.—Moreira *et al*., 2014: 319; Joharchi *et al*., 2019e: 73.

Type depository. Unspecified.
Type locality and habitat. Rovno, Kargat, Novosibirsk, Russia, on rotting stems of trees and stumps.

***Cosmolaelaps digrediens* Berlese, 1923**
Cosmolaelaps simplex var. *digrediens* Berlese, 1923a: 253.
Hypoaspis (*Hypoaspis*) *simplex* v. *digrediens*.—Aswegen & Loots, 1970: 181.

Hypoaspis (*Cosmolaelaps*) *digrediens*.—Karg, 1981a: 218, 1987: 291, 1988: 517.
Cosmolaelaps simplex var. *digrediens*.—Castagnoli & Pegazzano, 1985: 113; Gwiazdowicz *et al*., 2014: 437.
Cosmolaelaps digrediens.—Moreira *et al*., 2014: 320.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.

***Cosmolaelaps dilleri* Gwiazdowicz & Nemati, 2014**
Cosmolaelaps dilleri Gwiazdowicz & Nemati, in Gwiazdowicz *et al*., 2014: 437.

Type depository. Natural History Museum, Lima, Peru.
Type locality and habitat. Basin of Rio Yuyapichis (9°36'49.32"S, 74°56'8.16"W), Panguana, Huànuco, Peru, on rotting wood.

***Cosmolaelaps dioscorea* Joharchi *et al*., 2017**
Cosmolaelaps dioscorea Joharchi, Fan & Arjomandi, 2017b: 790.
Cosmolaelaps dioscorea.—Joharchi *et al*., 2020a: 164.

Type depository. Plant Health & Environment Laboratory, Auckland, New Zealand.
Type locality and habitat. Fiji, on *Dioscorea* sp. [Plantae: Dioscoreales: Dioscoreaceae].

***Cosmolaelaps diversichaetatus* Grochovskaya & Huan-Hoe, 1961**
Cosmolaelaps diversichaetatus Grochovskaya & Huan-Hoe, 1961: 1633.
Cosmolaelaps diversichaetatus.—Garrett & Haramoto, 1967: 387; Farrier & Hennessey, 1993: 69; Moreira *et al*., 2014: 319.
Hypoaspis (*Cosmolaelaps*) *diversichaetatus*.—Tenorio *et al*., 1985: 300.

Type depository. Unspecified.
Type locality and habitat. Type series, Cam Pha, Hallam, Kha-Zhang, Tây-Nguyên, Vietnam, on *Rattus tomenzumi* (cited as *Rattus rattus flavipectus*), *Leopoldamys sabanus* (cited as *Rattus sabanus*) and *Crocidura dracula* [Animalia: Rodentia: Soricidae].

***Cosmolaelaps diversa* (Karg, 1994)**
Hypoaspis (*Cosmolaelaps*) *diversa* Karg, 1994: 182.
Cosmolaelaps diversus.—Moreira *et al*., 2014: 319; Joharchi *et al*., 2020a: 159.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. At sea level, near Pinnacle Rock, Bartolomé, Galapagos Islands, in damp litter of mangrove.

***Cosmolaelaps dorfakiensis* Ramroodi *et al*., 2014**
Cosmolaelaps dorfakiensis Ramroodi, Hajizadeh & Joharchi, 2014a: 534.
Cosmolaelaps dorfakiensis.—Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 135.

Type depository. Mite Collection, Acarology Laboratory, Department of Plant Protection, Faculty of Agriculture Sciences, University of Guilan, Guilan, Iran.
Type locality and habitat. Khotbesara (38°25'N, 48°52'E), Astara, Guilan province, Iran, in soil and litter.

***Cosmolaelaps ekaterinae* Mašán & Babaeian, 2019**
Cosmolaelaps ekaterinae Mašán & Babaeian, 2019: 496.

Type depository. Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia.
Type locality and habitat. 190 m above sea level, Burda Mountains, Kováčov, Chľaba, Slovakia, nest of *Lasius umbratus* colonised by *Lasius fuliginosus* [Animalia: Hymenoptera: Formicidae] in rotting stump of *Quercus* sp. [Plantae: Fagales: Fagaceae].

***Cosmolaelaps ensiger* (Berlese, 1904)**
Laelaps (*Cosmolaelaps*) *vacuus* var. *ensiger* Berlese, 1904c: 420.
Laelaps (*Cosmolaelaps*) *scalpriger*.—Berlese, 1903b: 19 (in part) (misidentification, according to Berlese, 1904c: 420).
Cosmolaelaps vacuus var. *ensiger*.—Schweizer, 1949: 40; Turk, 1953: 12; Castagnoli & Pegazzano, 1985: 129; Bernini *et al*., 1995: 28.
Cosmolaelaps ensifer [sic].—Willmann, 1951: 115.
Hypoaspis (*Cosmolaelaps*) *vacuus* var. *ensiger*.—Schweizer, 1961: 150.
Hypoaspis ensiger.—Costa, 1968: 19; Kůrka, 2005: 24.
Cosmolaelaps ensiger.—Moreira, 2014: 211.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Cansiglio Forest, Italy, in nests of *Myrmica laevinodis* [Animalia: Hymenoptera: Formicidae].
Note. This species was described based on the larger specimens, from Trento, previously identified by Berlese (1903b: 19) as *Laelaps* (*Cosmolaelaps*) *scalpriger*.

***Cosmolaelaps euarmata* (Karg, 1996)**
Hypoaspis (*Cosmolaelaps*) *euarmata* Karg, 1996: 151.
Hypoaspis (*Cosmolaelaps*) *euarmata*.—Karg, 1997b: 84.
Hypoaspis euarmata.—Kůrka, 2005: 24.
Cosmolaelaps euarmata.—Gwiazdowicz *et al*., 2014: 436.
Cosmolaelaps euarmatus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Hienghène (cited as Hienghen), New Caledonia, in litter in rock crevices.

***Cosmolaelaps eucapillata* (Karg, 2003)**
Hypoaspis (*Cosmolaelaps*) *eucapillata* Karg, 2003b: 232.
Cosmolaelaps eucapillatus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Loreto, Ecuador, in soil and litter.

***Cosmolaelaps euventricosa* (Karg, 1995)**
Hypoaspis (*Cosmolaelaps*) *euventricosa* Karg, 1995: 24.
Hypoaspis (*Cosmolaelaps*) *euventricosa*.—Faraji & Halliday, 2009: 260.
Cosmolaelaps euventricosa.—Gwiazdowicz *et al*., 2014: 437.
Cosmolaelaps euventricosus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. New Guinea, on unidentified passalid beetle [Animalia: Coleoptera: Passalidae].
Note. Mašán & Babaeian (2019: 502) questioned the placement of this species in *Cosmolaelaps*.

***Cosmolaelaps furcatoides* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *furcatoides* Karg, 1981a: 231.
Hypoaspis (*Cosmolaelaps*) *furcatoides*.—Karg, 1985: 235, 1987: 290, 1988: 516, 2006: 150.
Cosmolaelaps furcatoides.—Moreira *et al*., 2014: 319; Duarte *et al*., 2017: 543.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Aracariguana [São Paulo state], Brazil, in soil.

***Cosmolaelaps gladii* (Karg, 1993)**
Hypoaspis (*Cosmolaelaps*) *gladii* Karg, 1993b: 264.
Cosmolaelaps gladii.—Moreira *et al*., 2014: 319; Joharchi *et al*., 2020a: 164.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Academy Bay, Santa Cruz, Galapagos Islands, in litter.

***Cosmolaelaps guoi* (Bai & Ma, 2012)**
Hypoaspis (*Cosmolaelaps*) *guoi* Bai & Ma, 2012: 556.
Cosmolaelaps guoi.—Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 541; Joharchi & Trach, 2019: 491.
Hypoaspis (*Cosmolaelaps*) *guoi*.—Bai *et al*., 2016: 9.

Type depository. Medical Entomology Collection, Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant nest [cited as *Myrmos*] [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps guttaforma* (Karg, 1989) new combination**
Hypoaspis (*Geolaelaps*) *guttaforma* Karg, 1989d: 1.
Gaeolaelaps guttaforma.—Moreira, 2014: 253.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Leutratal Nature Reserve, near Jena, Germany, on *Arrhenatherum* sp. [Plantae: Poales: Poaceae].
Note. This species was provisionally excluded from *Gaeolaelaps* by Beaulieu (2009: 37). It is here provisionally assigned to *Cosmolaelaps* because some of the dorsal shield setae are scimitar-like.

***Cosmolaelaps guttulata* (Karg, 1978)**
Hypoaspis (*Cosmolaelaps*) *guttulata* Karg, 1978b: 5.
Hypoaspis (*Cosmolaelaps*) *guttulata*.—Karg, 1979: 72, 1981a: 218, 1985: 235, 1987: 291, 1988: 516.
Hypoaspis guttulata.—Xu & Liang, 1996: 193; Kůrka, 2005: 24.
Cosmolaelaps confinisetarum Moreira, Klompen & Moraes, 2014: 333 [junior synonym of *H.* (*C.*) *guttulatus* by Nemati & Gwiazdowicz, 2016a: 546; Duarte *et al*., 2017: 536].
Cosmolaelaps guttulatus.—Moreira *et al*., 2014: 319.
Cosmolaelaps guttulata.—Nemati & Gwiazdowicz, 2016a: 546; Duarte *et al*., 2017: 536.

Type depository. *H*. (*C*.) *guttulata*: Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary; *C*. *confinisetarum*: Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. *H*. (*C*.) *guttulata*: Laguna La Cotacotani [Parinacora], Chile, under stones on the edge of the lake; *C*. *confinisetarum*: Rodovia Geraldo de Barros, km 204, São Pedro, São Paulo state, Brazil, from litter under *Syagrus oleracea* [Plantae: Arecales: Arecaceae].

***Cosmolaelaps hastiger* Berlese, 1920**
Cosmolaelaps vacuus var. *hastiger* Berlese, 1920: 157.
Cosmolaelaps vacuus var. *hastiger*.—Castagnoli & Pegazzano, 1985: 176; Bernini *et al*., 1995: 28.
Hypoaspis hastiger.—Kůrka, 2005: 24.
Cosmolaelaps hastiger.—Moreira, 2014: 214.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Florence, Italy, in nest of unidentified ant [Animalia: Hymenoptera: Formicidae].
Note. The original description of the female of this taxa is very brief and general, and its status remains unknown, as indicated by Moreira *et al*. (2014: 320).

***Cosmolaelaps helanshanensis* (Bai *et al*., 2016) new combination**
Hypoaspis (*Cosmolaelaps*) *helanshanensis* Bai, Yan & Zhang, 2016: 6.

Type depository. Medical Entomology Collection, Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing, China.
Type locality and habitat. 2160 m above sea level, Suyukou Region, Helan Mountain Nature Reserve, Ningxia Hui Autonomous Region, China, in ant nest [cited as *Myrmos*] [Animalia: Hymenoptera: Formicidae].
Note. The new combination proposed for this species results from the promotion of *Cosmolaelaps* from the subgeneric to the generic level, and the presence of features typical of the genus, including knife-shaped dorsal shield setae, each with a small basal protuberance, and unpaired *Jx* setae.

***Cosmolaelaps hortensis* (Ishikawa, 1986)**
Hypoaspis (*Cosmolaelaps*) *hortensis* Ishikawa, 1986: 174.
Cosmolaelaps hortensis.—Farfan & Klompen, 2012: 72; Moreira *et al*., 2014: 319; Keum *et al*., 2017: 487.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac 9792.
Type locality and habitat. Kuwabara, Matsuyama-shi, Ehime, Japan, on *Oxidus gracilis* [Animalia: Myriapoda: Paradoxosomatidae].

***Cosmolaelaps hrdyi* (Samšiňák, 1961)**
Hypoaspis (*Cosmolaelaps*) *hrdyi* Samšiňák, 1961: 205.
Hypoaspis (*Cosmolaelaps*) *hrdyi*.—Karg, 1985: 237, 1988: 516; Deng *et al*., 1993: 167; Yan *et al*., 2010: 905; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Hypoaspis hrydi [sic].—Gu, 1990: 441; Li *et al*., 1996: 55.
Hypoaspis hrdyi.—Ma, 1996: 48; Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *shenyangensis* Bei, Shi & Yin, 2003: 648 [junior synonym of *H*. (*C*.) *hrdyi* by Ma, 2006a: 23; Yan *et al*., 2010: 905; Bai & Ma, 2012: 558; Moreira *et al*., 2014: 319; Keum *et al*., 2017: 486].
Cosmolaelaps hrdyi.—Ma & Yin, 2004: 117; Ma, 2005a: 535, 2006a: 23; Moreira *et al*., 2014: 319; Fouly & Al-Rehianyyani, 2014: 269; Keum *et al*., 2017: 487.

Cosmolaelaps shenyangensis.—Ren & Guo, 2008: 328, 2009: 101; Joharchi *et al*., 2019e: 80.
Hypoaspis (*Cosmolaelaps*) *shenyangensis*.—Bai *et al*., 2016: 9.

Type depository. *H*. (*C*.) *hrdyi*: Entomological Institute of Chinese Academy of Sciences, Beijing, China; *H*. (*C*.) *shenyangensis*: College of Plant Protection, Shenyang Agricultural University, Shenyang, Liaoning province, China.
Type locality and habitat. *H*. (*C*.) *hrdyi*: Hsin-hui, Canton [now Guangzhou in Guangdong province], China, in termite mound [Animalia: Blattodea]; *H*. (*C*.) *shenyangensis*: Tianzhu Mountain, Shenyang, Liaoning province, China, in soil litter.

***Cosmolaelaps inarmata* (Karg, 1997)**
Hypoaspis (*Cosmolaelaps*) *inarmata* Karg, 1997b: 83.
Hypoaspis inarmata.—Kůrka, 2005: 24.
Cosmolaelaps inarmatus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Mont Koghi, New Caledonia, from unspecified substrate.

***Cosmolaelaps indicus* Bhattacharyya, 1966**
Cosmolaelaps indicus Bhattacharyya, 1966: 154.
Hypoaspis calcuttaensis Bhattacharyya, 1971: 501 [replacement name, given the existence of *Laelaps* (*Hypoaspis*) *indicus* Vitzthum, 1921; unjustified replacement name, as indicated by Moreira *et al*., 2014: 319].
Hypoaspis calcuttaensis.—Prasad, 1974: 151; Khanjani & Ueckermann, 2005: 119.
Hypoaspis (*Cosmolaelaps*) *indicus*.—Karg, 1988: 514, 2006: 151.
Cosmolaelaps indicus.—Moreira *et al*., 2014: 319 Joharchi *et al*., 2020a: 164.

Type depository. Author's collection.
Type locality and habitat. Calcutta University College of Science, Ballygunge, Kolkata (cited as Calcutta), West Bengal, India, in soil litter under decomposing water hyacinth, *Eichhornia* sp. [Plantae: Commelinales: Pontederiaceae].

***Cosmolaelaps jaboticabalensis* Moreira *et al*., 2014**
Cosmolaelaps jaboticabalensis Moreira, Klompen & Moraes, 2014: 331.
Cosmolaelaps jaboticabalensis.—Duarte *et al*., 2017: 543.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. From a laboratory colony originated from specimens collected at Jaboticabal, São Paulo state, Brazil, from litter under *Eriobotrya japonica* [Plantae: Rosales: Rosaceae].

***Cosmolaelaps kassaii* (Aswegen & Loots, 1970)**
Hypoaspis (*Hypoaspis*) *kassaii* Aswegen & Loots, 1970: 190.
Hypoaspis (*Geolaelaps*) *kassai* [sic].—Karg, 1982: 239.
Gaeolaelaps kassaii.—Nemati & Kavianpour, 2013: 70.
Hypoaspis s. l. *kassaii*.—Kazemi *et al*., 2014: 522.
Cosmolaelaps kassaii.—Moreira *et al*., 2014: 319.

Type depository. Museu do Dundo, Dundo, Lunda Norte, Angola; specimen number Ang. 17383.
Type locality and habitat. Near Tshitengo River (7°40'S, 21°45'E), subaffluent of the Kasai River, Angola, in forest soil.

Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps*, without assigning it to another genus.

***Cosmolaelaps keni* (Hafez *et al*., 1982)**
Hypoaspis (*Cosmolaelaps*) *keni* Hafez, Elbadry & Nasr, 1982: 3.
Cosmolaelaps keni.—Hafez, Elbadry & Nasr, 1982: 7.
Cosmolaelaps keni.—Zaher, 1986: 201; Nasr & Nawar, 1989b: 77; El-Banhawy *et al*., 2006: 66; Moreira *et al*., 2014: 319; Nasr & Momen, 2016: 263.

Type depository. Unspecified.
Type locality and habitat. Nagh-Hamaadi, Kena, Egypt, in soil under mango [Plantae: Sapindales: Anacardiaceae] trees.

***Cosmolaelaps lawrencei* (Aswegen & Loots, 1970)**
Hypoaspis (*Laelaspis*) *lawrencei* Aswegen & Loots, 1970: 197.
Hypoaspis (*Cosmolaelaps*) *lawrencei*.—Karg, 1981a: 217, 1987: 290, 1988: 515, 1995: 22.
Hypoaspis (*Laelaspis*) *lawrencei*.—Nasr & Nawar, 1989b: 76.
Cosmolaelaps lawrencei.—Moreira, 2014: 216.

Type depository. Unspecified.
Type locality and habitat. Natal [South Africa], from unspecified substrate.
Note. Kazemi (2015: 415) suggested that this species did not belong to *Laelaspis*, without referring it to another genus.

***Cosmolaelaps leeae* (Tseng, 1977)**
Hypoaspis leeae Tseng, 1977: 49.
Hypoaspis (*Cosmolaelaps*) *leeae*.—Deng *et al*., 1993: 168; Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Hypoaspis leeae.—Ren & Guo, 2008: 329, 2009: 101.
Cosmolaelaps leeae.—Moreira *et al*., 2014: 319.

Type depository. Tainan Branch Office, Bureau of Commodity Inspection and Quarantine, Tainan, Taiwan.
Type locality and habitat. Yun-Lin, Taiwan, in litter.

***Cosmolaelaps lepoauris* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *lepoauris* Karg, 1981a: 224.
Hypoaspis (*Cosmolaelaps*) *lepoauris*.—Karg, 1988: 513, 2006: 150; Cuervo *et al*., 1994: 18.
Cosmolaelaps lepauris [sic].—Farrier & Hennessey, 1993: 69.
Cosmolaelaps lepoauris.—Moreira *et al*., 2014: 319.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Cuba, in soil.

***Cosmolaelaps leptochaetes* Ma & Lin, 2009**
Cosmolaelaps leptochaetes Ma & Lin, 2009: 30.
Hypoaspis (*Cosmolaelaps*) *leptochaetes*.—Bai & Ma, 2012: 557; Bai *et al*., 2016: 9.
Cosmolaelaps leptochaetes.—Moreira *et al*., 2014: 319; Nemati *et al*., 2018b: 135; Mašán & Babaeian, 2019: 501.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Guiyang (26°34'N, 106°41'E), Guizhou, China, in litter.

***Cosmolaelaps leptolingua* (Karg, 1994)**
Hypoaspis (*Cosmolaelaps*) *leptolingua* Karg, 1994: 183.
Cosmolaelaps leptolingua.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 860 m above sea level, Cerro Crocker, Santa Cruz, Galapagos Islands, in thick layer of wood litter (fern-sedge zone).

***Cosmolaelaps liae* Bai & Gu, 1993**
Cosmolaelaps liae Bai & Gu, 1993a: 42.
Cosmolaelaps liae.—Ma, 2007a: 920; Gwiazdowicz *et al*., 2014: 436; Moreira *et al*., 2014: 319.
Hypoaspis liae.—Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *liae*.—Yan *et al*., 2010: 905; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Type depository. Ningxia Institute of Endemic Disease Control, Yinchuan, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant (*Myrmos* spp.) nest [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps lignicola* (G. & R. Canestrini, 1882)**
Laelaps lignicola G. & R. Canestrini, 1882a: 74.
Hypoaspis lignicola.—Canestrini, 1885: 89 (in part); Oudemans, 1902d: 24, 1903a: 129.
Laelaps (*Iphis*) *lignicola*.—Berlese, 1892e: 2.
Laelaps lignicola.—Berlese, 1892f: 42; Joharchi *et al*., 2020b: 467.
Hypoaspis (*Gymnolaelaps*) *lignicola*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 220.
lignicola; *non-Laelaps* [sic].—Tipton, 1960: 299.
Gymnolaelaps lignicola.—Bernini *et al*., 1995: 28.
Pseudoparasitus lignicola.—Kůrka, 2005: 26.
Cosmolaelaps lignicolus.—Plumari & Joharchi, 2017: 22; Mašán & Babaeian, 2019: 502.

Type depository. Unspecified.
Type locality and habitat. Padova, Italy, from a rotten tree.
Note. As reported by Leonardi (1897: 861), the types of *Laelaps canestrinii* Berlese, 1892 were specimens from Ponte Molle (in Rome), that had previously been identified by Canestrini (1885: 89) as *Laelaps lignicola* G. & R. Canestrini, 1882. Berlese (1892e: 2) indicated that *L. lignicola* had also been collected by Canestrini in Ponte Molle, apparently referring to other specimens, not to the ones described by Berlese (1892d: 1) as *L. canestrinii*, as inferred from the illustrations of the respective publications by Berlese. These specimens are certainly distinct from the type specimens of *L. lignicola*.

***Cosmolaelaps lingua* (Karg, 1987)**
Hypoaspis (*Cosmolaelaps*) *lingua* Karg, 1987: 295.
Hypoaspis (*Cosmolaelaps*) *lingua*.—Karg, 1988: 516.
Cosmolaelaps lingua.—Bernini *et al*., 1995: 28; Moreira *et al*., 2014: 319; Joharchi *et al*., 2019e: 81.
Hypoaspis lingua.—Kůrka, 2005: 24.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.

Type locality and habitat. "Pra dei Cavai" Farm, San Stino, Livenza, Venice, Italy, from soil of a corn field.

***Cosmolaelaps lisimilis* Ma, 2007**
Cosmolaelaps lisimilis Ma, 2007a: 920.
Hypoaspis (*Cosmolaelaps*) *lisimilis*.—Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.
Cosmolaelaps lisimilis.—Moreira *et al*., 2014: 319.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Haikou (20°N, 110°20'E), Hainan province, China, in soil.

***Cosmolaelaps liujingyuani* (Bai *et al*., 2016) new combination**
Hypoaspis (*Cosmolaelaps*) *liujingyuani* Bai, Yan & Zhang, 2016: 7.

Type depository. Medical Entomology Collection, Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing, China.
Type locality and habitat. 2160 m above sea level, Suyukou Region, Helan Mountain Nature Reserve, Ningxia Hui Autonomous Region, China, in ant nest [cited as *Myrmos*] [Animalia: Hymenoptera: Formicidae].
Note. The new combination proposed for this species results from the promotion of *Cosmolaelaps* from the subgeneric to the generic level, and the presence of features typical of the genus, including knife-shaped dorsal shield setae, each with a small basal protuberance, and unpaired *Jx* setae.

***Cosmolaelaps longanalis* (Karg, 2003)**
Hypoaspis (*Cosmolaelaps*) *longanalis* Karg, 2003b: 232.
Cosmolaelaps longanalis.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Imbabura, Ecuador, in meadow soil.

***Cosmolaelaps longocrinita* (Karg, 2006)**
Hypoaspis (*Cosmolaelaps*) *longocrinita* Karg, 2006: 148.
Cosmolaelaps longocrinitus.—Moreira *et al*., 2014: 319.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near La Mana, Ecuador, in litter.

***Cosmolaelaps longodigiti* (Karg, 1979)**
Hypoaspis (*Cosmolaelaps*) *longodigiti* Karg, 1979: 73.
Hypoaspis (*Cosmolaelaps*) *longodigiti*.—Karg, 1981a: 218, 1987: 290, 1988: 515.
Cosmolaelaps longodigiti.—Moreira *et al*., 2014: 319.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 920 m above sea level, near Norquinco, Argentina, in litter.

***Cosmolaelaps longus* (Hafez *et al*., 1982)**

Hypoaspis (*Cosmolaelaps*) *longus* Hafez, Elbadry & Nasr, 1982: 3.

Cosmolaelaps longus.—Hafez, Elbadry & Nasr, 1982: 8.

Cosmolaelaps longus.—Zaher, 1986: 201; Nasr & Nawar, 1989b: 77; Kazemi & Rajaei, 2013: 79; Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 541; Nasr & Momen, 2016: 263; Joharchi & Negm, 2020: 491.

Type depository. Unspecified.

Type locality and habitat. National Research Centre, Dokki, Giza, Egypt, in litter under *Lantana camara* [Plantae: Lamiales: Verbenaceae].

***Cosmolaelaps lutegiensis* (Shcherbak, 1971)**

Hypoaspis lutegiensis Shcherbak, 1971b: 76.

Cosmolaelaps lutegiensis.—Kazemi & Rajaei, 2013: 79; Ghasemi-Moghadam *et al*., 2014: 964; Gwiazdowicz *et al*., 2014: 437; Mahjoori *et al*., 2014: 1602; Moreira *et al*., 2014: 319; Ramroodi *et al*., 2014a: 542, 2015a: 79; Maleki *et al*., 2016: 186; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237; Saberi *et al*., 2016: 128; Kavianpour *et al*., 2017: 162; Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 135; Joharchi & Trach, 2019: 492; Joharchi *et al*., 2020e: 479.

Type depository. Institute of Zoology, Ukrainian Academy of Sciences, Ukraine; specimen number 60–1 (Zoological Museum, National Museum Natural History, Kiev, Ukrainian Academy of Sciences; according to Pysanets, 2001: 20).

Type locality and habitat. Lyutezh, Kiev, Svyatoshin, Ukraine, in soil and litter of a pine forest.

Note. Bregetova (1977b: 501) suspected this species to be a junior synonym of *Hypoaspis helianthi*.

***Cosmolaelaps mabilogus* Rosario, 1981**

Cosmolaelaps mabilogus Rosario, 1981: 38.

Cosmolaelaps mabilogus.—Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 319; Nemati & Gwiazdowicz, 2016a: 538.

Type depository. Unspecified.

Type locality and habitat. Makiling Botanical Garden, Mount Makiling, College, Laguna, Philippines, in secondary forest litter.

Note. Mašán & Babaeian (2019: 502) questioned the placement of this species in *Cosmolaelaps* instead of in *Laelaspis*, given the epigynal shield widened behind coxae IV.

***Cosmolaelaps machadoi* (Aswegen & Loots, 1970)**

Hypoaspis (*Hypoaspis*) *machadoi* Aswegen & Loots, 1970: 179.

Hypoaspis (*Cosmolaelaps*) *machadoi*.—Karg, 1981a: 217, 1988: 514, 2006: 151.

Cosmolaelaps machodoi [sic].—Gwiazdowicz *et al*., 2014: 436.

Cosmolaelaps machadoi.—Moreira *et al*., 2014: 319.

Type depository. Museu do Dundo, Dundo, Lunda Norte, Angola.

Type locality and habitat. Near Tshitengo River (7.40ºS, 21.45ºE), affluent of the Luango and subaffluent of the Kasai River, Angola, in soil.

***Cosmolaelaps machaeratus* (Domrow, 1957)**

Haemolaelaps machaeratus Domrow, 1957: 207.

Haemolaelaps machaeratus.—Monroe, 1972: 298.

Androlaelaps machaeratus.—Halliday, 1998: 123, 2019: internet page.
Cosmolaelaps machaeratus.—Moreira *et al*., 2014: 319; Shaw, 2014a: 289.

Type depository. Queensland Museum, South Brisbane, Australia; specimen number G2347/ 2348 (Monroe, 1972: 298).
Type locality and habitat. Green Ant Island, Great Barrier Reef, Australia, in leaf mould.

***Cosmolaelaps macrochaeta* (Karg, 1988)**
Hypoaspis (*Cosmolaelaps*) *macrochaeta* Karg, 1988: 520.
Cosmolaelaps macrochaetus.—Farrier & Hennessey, 1993: 69; Moreira *et al*., 2014: 319.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Cosmolaelaps mahuncai* (Karg, 1988)**
Hypoaspis (*Cosmolaelaps*) *mahuncai* Karg, 1988: 519.
Cosmolaelaps mahuncai.—Farrier & Hennessey, 1993: 69; Moreira *et al*., 2014: 319.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Vigie Point, near Castries, Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Cosmolaelaps malakutsilyus* Rosario, 1981**
Cosmolaelaps malakutsilyus Rosario, 1981: 39.
Cosmolaelaps malakutsilyus.—Moreira *et al*., 2014: 319; Kavianpour *et al*., 2017: 163.

Type depository. Unspecified.
Type locality and habitat. Animal Science pasture, University of the Philippines at Los Baños campus, College, Laguna, Philippines, on hog manure.

***Cosmolaelaps malmiriensis* Nemati & Gwiazdowicz, 2016**
Cosmolaelaps malmiriensis Nemati & Gwiazdowicz, 2016a: 536.
Cosmolaelaps malmiriensis.—Plumari & Joharchi, 2017: 37; Nemati *et al*., 2018b: 135.

Type depository. Plant Protection Department, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. Izeh, Khuzestan province, Iran, in soil of ant nest *Tapinoma* sp. [Animalia: Hymenoptera: Formicidae].
Note. Mašán & Babaeian (2019: 502) questioned the placement of this species in *Cosmolaelaps* instead of in *Laelaspis*, given the epigynal shield widened behind coxae IV and its ornamentation.

***Cosmolaelaps markewitschi* (Piryanik, 1959)**
Laelaspis markewitschi Piryanik, 1959: 97.
Laelaspis markewitschi.—Reitblat, 1963: 81; Piryanik, 1962: 74; Lapinya, 1970: 278, 1976: 52; Bregetova, 1977b: 547.
Hypoaspis markewitschi.—Shcherbak, 1971a: 29.

Gymnolaelaps markewitschi.—Joharchi *et al*., 2012a: 2013.
Cosmolaelaps markewitschi.—Nemati & Gwiazdowicz, 2016a: 545**;** Joharchi *et al*., 2020e: 483.

Type depository. Unspecified (Zoological Museum, National Museum Natural History, Kiev, Ukrainian Academy of Sciences (according to Pysanets, 2001: 19).
Type locality and habitat. Type series, Zarechye, Dnipro, Kaneva, Ukraine, on *Microtus arvalis* [Animalia: Rodentia: Cricetidae], *Microtus ratticeps* [Animalia: Rodentia: Cricetidae], *Apodemus agrarius* [Animalia: Rodentia: Muridae] and *Clethrionomys glareolus* [Animalia: Rodentia: Cricetidae].
Note. Joharchi *et al*. (2012a: 2013) excluded this species from *Laelaspis* because it lacked the characteristic ornamentation of the epigynal shield, and indicating that it appeared to be a species of *Gymnolaelaps*.

***Cosmolaelaps masculina* (Karg, 1988)**
Hypoaspis (*Cosmolaelaps*) *masculina* Karg, 1988: 521.
Cosmolaelaps musculinus [sic].—Farrier & Hennessey, 1993: 69; Moreira *et al*., 2014: 319.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Vigie Point, near Castries, Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Cosmolaelaps mediocuspis* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *mediocuspis* Karg, 1981a: 227.
Hypoaspis (*Cosmolaelaps*) *mediocuspis*.—Karg, 1987: 292, 1988: 518, 2003b: 232.
Cosmolaelaps mediocuspis.—Moreira *et al*., 2014: 319.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Ecuador, in soil.

***Cosmolaelaps michaeli* (Huhta & Karg, 2010)**
Hypoaspis (*Cosmolaelaps*) *michaeli* Huhta & Karg, 2010: 329.
Cosmolaelaps michaeli.—Moreira *et al*., 2014: 319; Khalili-Moghadam & Saboori, 2015: 317; Duarte *et al*., 2017: 543; Nemati *et al*., 2018b: 136.

Type depository. Zoological Museum, University of Turku, Finland.
Type locality and habitat. Nauvo, Seili, southwestern archipelago of Finland, in nest of *Tetramorium* sp. [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps mixta* (Shcherbak, 1971)**
Hypoaspis mixta Shcherbak, 1971a: 27.
Hypoaspis mixta.—Lapinya, 1976: 31; Bregetova, 1977b: 513.
Hypoaspis (*Cosmolaelaps*) *mixta*.—Karg, 1988: 518, 1993a: 140; Marchenko, 2002: 44.
Cosmolaelaps mixta.—Moreira *et al*., 2014: 319; Nemati *et al*., 2018b: 136; Joharchi & Trach, 2019: 492; Joharchi *et al*., 2019e: 81.

Type depository. Unspecified (Zoological Museum, National Museum Natural History, Kiev, Ukrainian Academy of Sciences, according to Pysanets, 2001: 20).
Type locality and habitat. Lyutezh, Kiev, Ukraine, in soil, litter and ant [Animalia: Hymenoptera: Formicidae] nest.

***Cosmolaelaps multidentatus* (Aswegen & Loots, 1970)**
Hypoaspis (*Hypoaspis*) *multidentatus* Aswegen & Loots, 1970: 177.
Hypoaspis (*Cosmolaelaps*) *multidentata*.—Karg, 1981a: 217, 1988: 513.
Cosmolaelaps multidentatus.—Moreira *et al*., 2014: 319.

Type depository. Unspecified.
Type locality and habitat. Lastourville (most certainly in Gabon, instead of South Africa, as mentioned in the original description), in soil from a cave.

***Cosmolaelaps multisetosus* Domrow, 1957**
Cosmolaelaps multisetosus Domrow, 1957: 209.
Cosmolaelaps multisetosus.—Monroe 1972: 296; Halliday, 1998: 124, 2019: internet page; Gwiazdowicz *et al*., 2014: 436; Moreira *et al*., 2014: 320; Nemati & Gwiazdowicz, 2016a: 538.
Hypoaspis (*Cosmolaelaps*) *multisetosus*.—Faraji & Halliday, 2009: 260.

Type depository. Queensland Museum, South Brisbane, Australia (Monroe, 1972: 296).
Type locality and habitat. Low Isles (16°23'S, 145°34'E), Great Barrier Reef, Australia, on leaf mould on cay; specimen number G2352.
Note. Mašán & Babaeian (2019: 503) questioned the placement of this species in *Cosmolaelaps*.

***Cosmolaelaps nasoseta* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *nasoseta* Karg, 1981a: 220.
Hypoaspis (*Cosmolaelaps*) *nasoseta tarsalis* Karg, 1981a: 221.
Hypoaspis (*Cosmolaelaps*) *nasoseta*.—Karg, 1987: 290, 1988: 515, 2000: 247.
Cosmolaelaps nasosetus.—Farrier & Hennessey, 1993: 69; Moreira *et al*., 2014: 320.
Hypoaspis (*Cosmolaelaps*) *nasoseti* [sic].—Cuervo *et al*., 1994: 18.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Type series, Cuba and Venezuela, in litter.

***Cosmolaelaps neocuneifer* (Evans & Till, 1966)**
Hypoaspis (*Cosmolaelaps*) *neocuneifer* Evans & Till, 1966: 187.
Hypoaspis (*Cosmolaelaps*) *neocuneifer*.—Bregetova, 1977b: 512; Karg, 1978b: 8, 1979: 71, 1981a: 216, 1987: 293, 1988: 511, 1993a: 137; Mašán, 1992: 387; 2001: 216; Sklyar, 2001: 101; Marchenko, 2002: 44.
Hypoaspis neocuneifer.—Gu & Bai, 1992: 192.
Cosmolaelaps neocuneifer.—Moreira *et al*., 2014: 320; Joharchi & Trach, 2019: 492; Joharchi *et al*., 2019e: 76.

Type depository. Natural History Museum, London, England; specimen number 1965: 12: 29: 23.
Type locality and habitat. White Hill Wood, Canterbury, England, in nests of *Formica rufa* [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps ningxiaensis* Bai & Gu, 1993**
Cosmolaelaps ningxiaensis Bai & Gu, 1993a: 44.
Cosmolaelaps ningxiaensis.—Ren & Guo, 2008: 328, 2009: 101; Xin *et al*., 2010: 2; Gwiazdowicz *et al*., 2014: 436; Moreira *et al*., 2014: 320.
Hypoaspis (*Cosmolaelaps*) *ningxiaensis*.—Ren & Gu, 2008: 329, 2009: 101; Yan *et al*., 2010: 905; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.

Type depository. Ningxia Institute of Endemic Disease Control, Yinchuan, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant (*Myrmos* spp.) nest [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps oliveirai* Moreira *et al*., 2014**
Cosmolaelaps oliveirai Moreira, Klompen & Moraes, 2014: 339.
Cosmolaelaps oliveirai.—Duarte *et al*., 2017: 543; Plumari & Joharchi, 2017: 37.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Núcleo Agrícola Vale do Ribeira, IAC, Pariquera-Açu, São Paulo state, Brazil, from soil under *Astrocaryum aculeatissimum* [Plantae: Arecales: Arecaceae].

***Cosmolaelaps onustus* (Berlese, 1904)**
Laelaps (*Cosmolaelaps*) *onustus* Berlese, 1904b: 16.
Cosmolaelaps onustus.—Willmann 1949: 116; Castagnoli & Pegazzano, 1985: 286; Bernini *et al*., 1995: 28.
onustus; *non-Laelaps* [sic].—Tipton 1960: 302.
Hypoaspis (*Cosmolaelaps*) *onusta*.—Karg, 1981: 216, 1988: 512.
Hypoaspis onustus.—Kůrka, 2005: 25.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Florence, Italy, in garden litter.
Note. Moreira et al. (2014) questioned the placement of this species in *Cosmolaelaps*.

***Cosmolaelaps ornatus* (Berlese, 1903)**
Laelaps (*Cosmolaelaps*) *ornatus* Berlese, 1903b: 19.
Laelaps (*Cosmolaelaps*) *ornatus*.—Berlese, 1904c: 421.
Cosmolaelaps ornatus.—Hull, 1918: 68; Vitzthum, 1929: 25; Turk, 1953: 11; Castagnoli & Pegazzano, 1985: 290; Bernini *et al*., 1995: 28; Moreira *et al*., 2014: 320; Ramroodi *et al*., 2014a: 541; Nemati *et al*., 2018b: 136; Joharchi & Trach, 2019: 491.
ornatus; *non-Laelaps* [sic].—Tipton, 1960: 302.
Hypoaspis (*Cosmolaelaps*) *ornatus*.—Schweizer, 1961: 149.
Hypoaspis (*Cosmolaelaps*) *ornata*.—Karg, 1981a: 216, 1987: 293, 1988: 512, 1993a: 138; Mašán, 1992: 387.
Hypoaspis ornatus.—Kůrka, 2005: 25.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, in nests of *Solenopsis fugax* [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps pahabaeus* Rosario, 1981**
Cosmolaelaps pahabaeus Rosario, 1981: 42.
Cosmolaelaps pahabaeus.—Moreira *et al*., 2014: 320.

Type depository. Unspecified.
Type locality and habitat. Makiling Botanical Garden, Mount Makiling, College, Laguna, Philippines, in soil of secondary forest.

***Cosmolaelaps pampaensis* Duarte *et al*., 2017**
Cosmolaelaps pampaensis Duarte, Moreira, Cunha & Moraes, 2017: 538.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Aceguá, Rio Grande do Sul, Brazil, in soil.

***Cosmolaelaps pannicula* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *pannicula* Karg, 1981a: 229.
Hypoaspis (*Cosmolaelaps*) *pannicula*.—Karg, 1987: 291, 1988: 517.
Cosmolaelaps panniculus.—Moreira *et al*., 2014: 320; Duarte *et al*., 2017: 543; Joharchi & Negm, 2020: 497.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. "Faz. Itaquere" [sic], [?São Paulo state], Brazil, in soil.

***Cosmolaelaps paracuneifer* (Gu & Bai, 1992)**
Hypoaspis paracuneifer Gu & Bai, 1992: 189.
Hypoaspis paracuneifer.—Ma, 1995: 14; Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *paracuneifer*.—Yan *et al*., 2008: 2230, 2010: 905; Xin *et al*., 2010: 2; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Cosmolaelaps paracuneifer.—Moreira *et al*., 2014: 320; Ma, 2016a: 20.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Haiyuan (16.5°N, 105.6°E), Ningxia Autonomous Region, China, in ant [Animalia: Hymenoptera: Formicidae] nest.

***Cosmolaelaps paravacua* Nasr & Nawar, 1989**
Cosmolaelaps paravacua Nasr & Nawar, 1989b: 77.
Cosmolaelaps paravacua.—Moreira *et al*., 2014: 320; Nasr & Momen, 2016: 263; Duarte *et al*., 2017: 543.

Type depository. Acarology Research Unit, National Research Centre, Dokki, Cairo, Egypt.
Type locality and habitat. El-Wasta, Beni-Suef, Egypt, in soil under *Zea maize* [sic] [*Zea mays*; Plantae: Poales: Poaceae].

***Cosmolaelaps parvidentis* (Karg & Schorlemmer, 2009)**
Hypoaspis (*Cosmolaelaps*) *parvidentis* Karg & Schorlemmer, 2009: 61.
Cosmolaelaps parvidentis.—Moreira *et al*., 2014: 320.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Forest near University park [sic], Maracay, Venezuela, in litter and humus.

***Cosmolaelaps paulista* Freire & Moraes, 2007**
Cosmolaelaps paulista Freire & Moraes, 2007: 355.
Cosmolaelaps paulista.—Moreira *et al*., 2014: 320; Duarte *et al*., 2017: 543; Joharchi *et al*., 2017b: 793.
Cosmolaelaps pauliseta [sic].—Nemati & Gwiazdowicz, 2016a: 535.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Cananéia (24°53'45"S, 47°50'17"W), São Paulo state, Brazil, in litter of the Atlantic Forest.

***Cosmolaelaps pauperculus* (Berlese, 1918) new combination**
Hypoaspis (*Stratiolaelaps*) *pauperculus* Berlese, 1918: 120.
Hypoaspis (*Stratiolaelaps*) *pauperculus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 310.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Samarang, Java, Indonesia, in humus.
Note. In contrast to *Stratiolaelaps*, this species does not have elongate chelicerae and is better placed in *Cosmolaelaps*.

***Cosmolaelaps penicillata* (Karg, 1979)**
Hypoaspis (*Cosmolaelaps*) *penicillata* Karg, 1979: 73.
Hypoaspis (*Cosmolaelaps*) *penicillata*.—Karg, 1981a: 214, 1987: 292, 1988: 511.
Hypoaspis penicillata.—Kůrka, 2005: 25.
Cosmolaelaps penicillatus.—Moreira *et al*., 2014: 320.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 300 m above sea level, near El Bolsón, Rio Azul Valley, [Rio Negro], Argentina, in litter of *Nothofagus dombeyi* [Plantae: Fagales: Fagaceae].

***Cosmolaelaps pinnatus* Ramroodi *et al*., 2014**
Cosmolaelaps pinnatus Ramroodi, Hajizadeh & Joharchi, 2014a: 538.
Cosmolaelaps pinnatus.—Kavianpour *et al*., 2017: 163; Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 136; Joharchi & Trach, 2019: 491.

Type depository. University of Guilan Mite Collection, Acarology Laboratory, Department of Plant Protection, Faculty of Agriculture Sciences, University of Guilan, Guilan, Iran.
Type locality and habitat. Chobar (37°10'N, 49°23'E), Shaft, Guilan province, Iran, in soil and litter.

***Cosmolaelaps pronex* Silva *et al*., 2018**
Cosmolaelaps pronex Silva, Moreira & Oliveira, in Silva *et al*., 2018: 14.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Itajuípe (14°42'49"S, 39°21'12"W), Bahia state, Brazil, in nest of the ponerine ant *Neoponera inversa* [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps pugiocuspis* (Karg, 1981)**
Hypoaspis (*Cosmolaelaps*) *pugiocuspis* Karg, 1981a: 220.
Hypoaspis (*Cosmolaelaps*) *pugiocuspis*.—Karg, 1987: 291, 1988: 517.
Cosmolaelaps pugiocuspis.—Gwiazdowicz *et al*., 2014: 440; Moreira *et al*., 2014: 320; Duarte *et al*., 2017: 543.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Brazil, in litter.

***Cosmolaelaps pumili* (Karg, 1988)**
Hypoaspis (*Cosmolaelaps*) *pumili* Karg, 1988: 524.
Hypoaspis (*Cosmolaelaps*) *punuli* [sic].—Karg, 1988: 523.

Cosmolaelaps pumili.—Farrier & Hennessey, 1993: 69; Moreira *et al*., 2014: 320; Joharchi *et al*., 2019e: 81.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Vigie Point, near Castries, Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Cosmolaelaps punyalus* Rosario, 1981**
Cosmolaelaps punyalus Rosario, 1981: 43.
Cosmolaelaps punyalus.—Gwiazdowicz *et al*., 2014: 436; Moreira *et al*., 2014: 320.

Type depository. Unspecified.
Type locality and habitat. Animal Science pasture, University of the Philippines, Los Baños campus, College, Laguna, Philippines, in soil of *Imperata cylindrica* [Plantae: Poales: Poaceae], grassland.

***Cosmolaelaps qassimensis* Fouly & Al-Rehianyani, 2014**
Cosmolaelaps qassimensis Fouly & Al-Rehianyyani, 2014: 263.
Cosmolaelaps qassimensis.—Nasr & Momen, 2016: 263.

Type depository. Department of Agricultural Zoology, Faculty of Agriculture, Mansoura University, Egypt.
Type locality and habitat. Melida District, Buraydah West, Saudi Arabia, from soil and roots of date palm [*Phoenix*; Plantae: Arecales: Arecaceae].

***Cosmolaelaps qinghaiensis* (Li *et al*., 1997)**
Hypoaspis qinghaiensis Li, Yang & Yue, 1997: 60.
Hypoaspis qinghaiensis.—Kůrka, 2005: 25; Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *qinghaiensis*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Cosmolaelaps qinghaiensis—Moreira *et al*., 2014: 320; Ma, 2016a: 20.

Type depository. Qinghai Institute for Endemic Disease Control and Research, Qinghai, China.
Type locality and habitat. 3400 m above sea level, Tongde, Qinghai, China, on *Cricetulus longicaudatus* [Animalia: Rodentia: Cricetidae].

***Cosmolaelaps quasiclaviger* Ma & Lin, 2009**
Cosmolaelaps quasiclaviger Ma & Lin, 2009: 33.
Hypoaspis (*Cosmolaelaps*) *quasiclaviger*.—Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.
Cosmolaelaps quasiclaviger.—Moreira *et al*., 2014: 320.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Xunhua (35°47'N, 102°27'E), Qinghai, China, in forest soil.

***Cosmolaelaps rectangularis* Sheals, 1962**
Cosmolaelaps rectangularis Sheals, 1962: 107.
Hypoaspis rectangularis.—Costa, 1968: 18.
Hypoaspis (*Cosmolaelaps*) *rectangularis*.—Karg, 1978b: 9, 1979: 72, 1981a: 217, 1988: 514, 2006: 151; Faraji *et al*., 2008: 207.

Cosmolaelaps rectangularis.—Kazemi & Rajaei, 2013: 80; Gwiazdowicz *et al*., 2014: 436; Hasanvand *et al*., 2014a: 95; Moreira *et al*., 2014: 320; Ramroodi *et al*., 2014a: 541; Kordeshami *et al*., 2015: 591; Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 136, 2019: 93; Joharchi *et al*., 2020a: 159.

Type depository. Natural History Museum, London, England; specimen number 1961–6–20–47.
Type locality and habitat. Nahuel Huapi, Arroyo Pilmaiquen, Patagonia, Argentina, from unspecified substrate.

***Cosmolaelaps reticulatus* (Xu & Liang, 1996)**
Hypoaspis (*Cosmolaelaps*) *reticulatus* Xu & Liang, 1996: 191.
Cosmolaelaps reticulatus.—Ma, 2005b: 74; Moreira *et al*., 2014: 320.
Hypoaspis (*Cosmolaelaps*) *reticulatus*.—Bai & Ma, 2012: 557; Bai *et al*., 2016: 9.

Type depository. Department of Environmental and Resources Biology, Fudan University, Shanghai, China.
Type locality and habitat. Hefei, Anhui, China, in moss.
Note. *Hypoaspis* (*Cosmolaelaps*) *reticulatus* Xu & Liang, 1996 is a junior primary homonym of *Hypoaspis reticulatus* Sheals, 1962 (here classified as *Gaeolaelaps*), and must be replaced. We refrain from doing that here, to give the original authors a chance to propose a replacement name.

***Cosmolaelaps robustochaetes* Ma & Lin, 2009**
Cosmolaelaps robustochaetes Ma & Lin, 2009: 29.
Hypoaspis (*Cosmolaelaps*) *robustochaetes*.—Bai & Ma, 2012: 557; Bai *et al*., 2016: 9.
Cosmolaelaps robustochaetes.—Moreira *et al*., 2014: 320.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Guiyang (26°34'N, 106°41'E), Guizhou, China, in litter, tree cavity and tree bark.

***Cosmolaelaps robustoventralis* Ma, 2011**
Cosmolaelaps robustoventralis Ma, 2011: 84.
Hypoaspis (*Cosmolaelaps*) *robustoventralis*.—Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Cosmolaelaps robustoventralis.—Moreira *et al*., 2014: 320.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Dali (25°42'N, 100°10'E), Yunnan, China, in litter.

***Cosmolaelaps robustus* (Berlese, 1905)**
Laelaps (*Cosmolaelaps*) *robustus* Berlese, 1905: 170.
Cosmolaelaps robustus.—Lombardini, 1936: 39; Bregetova, 1953: 310, 1956: 75; Goncharova & Buyakova, 1964: 281; Castagnoli & Pegazzano, 1985: 360; Moreira *et al*., 2014: 320.
robustus; *non-Laelaps* [sic].—Tipton, 1960: 305.
Hypoaspis (*Cosmolaelaps*) *robustus*.—Bregetova, 1977b: 513; Karg, 1978b: 9.
Hypoaspis (*Cosmolaelaps*) *robusta*.—Karg, 1979: 72, 1981a: 217, 1988: 514, 1993a: 139, 2006: 150.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Tjiompea, Java, Indonesia, from unspecified substrate.
Note. Specimens reported by Lapinya (1970: 278) as *Cosmolaelaps robustus* were re-identified as *Cosmolaelaps vacua* by Lapinya (1976: 28).

***Cosmolaelaps scalpriger* (Berlese, 1902)**
Laelaps scalpriger Berlese, 1902: 699.
Laelaps (*Cosmolaelaps*) *scalpriger*.—Berlese, 1903b: 19 (in part).
Laelaps (*Cosmolaelaps*) *vacuus* var. *scalpriger*.—Berlese, 1904c: 421.
scalpriger; *non-Laelaps* [sic].—Tipton, 1960: 306.
Hypoaspis (*Cosmolaelaps*) *vacuus* var. *scalpiger* [sic].—Karg, 1965: 312.
Cosmolaelaps vacuus var. *scalpriger*.—Castagnoli & Pegazzano, 1985: 370; Bernini *et al*., 1995: 28.
Hypoaspis scalpiger [sic].—Kůrka, 2005: 25.
Cosmolaelaps scalpriger.—Moreira, 2014: 230.
Laelaps (*Cosmolaelaps*) *vacuus* var. *scalpiger* [sic].—Moreira *et al*., 2014: 320.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, in nests of unidentified ants [Animalia: Hymenoptera: Formicidae].
Note. Specimens from Trento, Italy reported by Berlese (1903b: 19) as *L*. (*C*.) *scalpriger*, larger than specimens from Portici, were later described as *Laelaps* (*Cosmolaelaps*) *vacuus* var. *ensiger* by Berlese (1904c: 420).

***Cosmolaelaps sejongi* Keum *et al*., 2017**
Cosmolaelaps sejongi Keum, Jung & Joharchi, 2017: 487.

Type depository. Department of Plant Medicine, Andong National University, Republic of Korea.
Type locality and habitat. 666 m above sea level, Taehwa River (35°32'N, 129°17'E), Ulsan Metropolitan City, Republic of Korea, in soil around roots of oak tree.

***Cosmolaelaps serratus* Trägårdh, 1952**
Cosmolaelaps serratus Trägårdh, 1952: 63.
Cosmolaelaps serratus.—Hirschmann *et al*., 1969: 137; Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 320; Joharchi *et al*., 2020a: 159.
Hypoaspis (*Cosmolaelaps*) *serrata*.—Karg, 1981a: 217, 1988: 514, 2006: 151.

Type depository. Unspecified.
Type locality and habitat. Pare, Arihiri, Society Islands, Tahiti, from unspecified substrate.
Note. Specimens identified by Bernhard (1955) in an unpublished dissertation as *Hypoaspis* (*Cosmolaelaps*) *serratus* were described as *Hypoaspis* (*Cosmolaelaps*) *serratosimilis* Hirschmann *et al*.

***Cosmolaelaps siberiensis* Joharchi *et al*., 2019**
Cosmolaelaps siberiensis Joharchi, Tolstikov, Khaustov, Khaustov & Sarcheshmeh, 2019: 77.

Type depository. Tyumen State University Museum of Zoology, Tyumen Russia.
Type locality and habitat. Vicinity of Uspenka (57°04'N, 65°04'E), Tyumen province, Russia, in nest of *Myrmica rubra* [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps sidorchukae* Joharchi & Trach, 2019**
Cosmolaelaps sidorchukae Joharchi & Trach, 2019: 487.

Type depository. Museum of Zoology, I.I. Mechnikov Odessa National University, Odessa, Ukraine.
Type locality and habitat. Vicinity of Budyachki (46°42'N, 30°23'E), Razdelnaya, Odessa, Ukraine, from nest of unknown ant, under stone.

***Cosmolaelaps simplex* Berlese, 1920**
Cosmolaelaps simplex Berlese, 1920: 157.
Cosmolaelaps simplex.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 382; Fouly *et al*., 1997: 36; Halliday, 1998: 124; Fouly & Al-Rehiayani, 2011: 142; Moreira *et al*., 2014: 320.
Hypoaspis simplex.—Turk, 1953: 11; Kůrka, 2005: 25.
Hypoaspis (*Cosmolaelaps*) *simplex*.—Karg, 1981a: 217, 1988: 513.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Buenos Aires, Argentina and Termuco, Chile, from unspecified substrate.

***Cosmolaelaps sorecis* (Li *et al*., 1996)**
Hypoaspis sorecis Li, Zheng & Yang, 1996: 55.
Hypoaspis sorecis.—Li *et al*., 1997: 60; Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *sorecis*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.
Cosmolaelaps sorecis.—Moreira *et al*., 2014: 320; Ma, 2016a: 20.

Type depository. Qinghai province Institute of Endemic Disease Control, Qinghai, China.
Type locality and habitat. Huzhu (36°50'N, 102°28'E), Qinghai, China, on *Sorex sinalis* [Animalia: Soricomorpha: Soricidae].

***Cosmolaelaps subpictus* (Gu & Bai, 1992)**
Hypoaspis subpictus Gu & Bai, 1992: 192.
Hypoaspis subpietus [sic].—Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *subpictus*.—Yan *et al*., 2010: 905; Bai & Ma, 2012: 557; Bai *et al*., 2016: 10.
Cosmolaelaps subpictus.—Moreira *et al*., 2014: 320; Ma, 2016a: 20.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Haiyuan (16.5°N, 105.6°E), Ningxia Autonomous Region, China, in ant [Animalia: Hymenoptera: Formicidae] nest.

***Cosmolaelaps sungaris* (Ma, 1996)**
Hypoaspis sungaris Ma, 1996: 48.
Cosmolaelaps sungaris.—Ma, 2005a: 536, 2016a: 20; Moreira *et al*., 2014: 320; Joharchi *et al*., 2019e: 80.
Hypoaspis sungaris.—Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *sungaris*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 9.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Qianguoerluosi Mongolian Autonomous County (45°N, 125°E), Jilin province, China, in nest of *Cricetulus barabensis* [Animalia: Rodentia: Cricetidae].

***Cosmolaelaps tetraspinae* (Karg, 1995)**
Hypoaspis (*Cosmolaelaps*) *tetraspinae* Karg, 1995: 23.
Hypoaspis (*Cosmolaelaps*) *tetraspinae*.—Faraji & Halliday, 2009: 260.
Cosmolaelaps tetraspinae.—Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 320.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Île des Pins, New Caledonia, in litter.
Note. Mašán & Babaeian (2019: 503) questioned the placement of this species in *Cosmolaelaps*.

***Cosmolaelaps thysanifer* Zeman, 1982**
Cosmolaelaps thysanifer Zeman, 1982: 234.
Hypoaspis thysanifer.—Kůrka, 2005: 25.
Cosmolaelaps thysanifer.—Moreira *et al*., 2014: 320; Joharchi *et al*., 2019e: 74.

Type depository. Arachnoentomological Department, Institute of Parasitology, Czechoslovak Academy of Science, Prague, Czech Republic; specimen number Pa. Ú. ČSAV1890.
Type locality and habitat. Near Bubovice, Beroun, Bohemia, Czech Republic, in nest of *Formica fusca* [Animalia: Hymenoptera: Formicidae] in a meadow.

***Cosmolaelaps transvaalensis* Ryke, 1963**
Cosmolaelaps transvaalensis Ryke, 1963: 7.
Cosmolaelaps transvaalensis.—Costa, 1968: 19; Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 320.
Hypoaspis (*Hypoaspis*) *transvaalensis*.—Aswegen & Loots, 1970: 182.
Hypoaspis (*Cosmolaelaps*) *transvaalensis*.—Karg, 1978b: 9, 1979: 73, 1981a: 219, 1987: 292, 1988: 518.

Type depository. Institute for Zoological Research, Potchefstroom University, Potchefstroom, South Africa.
Type locality and habitat. Potchefstroom, South Africa, in litter of a grassland.

***Cosmolaelaps trichiurus* Joharchi *et al*., 2020**
Cosmolaelaps trichiurus Joharchi, Ermilov & Khaustov, 2020a: 159.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 42 m above sea level, near the Thambadola Ella waterfall, Polgampola (6°27'N, 80°12'E), Sabaragamuwa province, Sri Lanka, in forest soil-litter.

***Cosmolaelaps trifidus* (Pearse *et al*., 1936)**
Seiodes trifidus Pearse, Patterson, Rankin & Wharton, 1936: 474.
Cosmolaelaps passali Hunter & Mollin, 1964: 247 [junior synonym of *S. trifidus* by Delfinado & Baker, 1975: 52; Farrier & Hennessey, 1993: 70; Moreira *et al*., 2014: 320].
Cosmolaelaps trifidus.—Delfinado & Baker, 1975: 52; Farrier & Hennessey, 1993: 70; Hunter, 1993: 22; Moreira *et al*., 2014: 320.
Hypoaspis (*Cosmolaelaps*) *passali*.—Karg, 1988: 517, 1993a: 139.

Type depository. *S. trifidus* and *C. passali*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *S. trifidus*: Duke Forest, Durham, North Carolina, United States of America, on *Odontotaenius disjunctus* (cited as *Passalus cornutus*) [Animalia: Coleoptera: Passalidae]; *C. passali*: Athens, Georgia, United States of America, from laboratory colony started by mites collected on *O. disjunctus* (cited as *Popilius disjunctus*) [Animalia: Coleoptera: Passalidae].

***Cosmolaelaps tuberculata* (Mašán, 1992)**
Hypoaspis (*Cosmolaelaps*) *tuberculata* Mašán, 1992: 383.
Hypoaspis (*Cosmolaelaps*) *quadrituberculata* [sic].—Karg, 1993a: 137.
Cosmolaelaps tuberculatus.—Moreira *et al*., 2014: 320.

Type depository. Author's collection at Institute of Zoology and Ecosozology of the Slovak Academy of Sciences, Bratislava, Slovakia.

Type locality and habitat. Považský Inovec - Hrádok, Slovakia, in nest of *Lasius flavus* [Animalia: Hymenoptera: Formicidae].
Note. According to P. Mašán (pers. comm., 2012), *Hypoaspis* (*Cosmolaelaps*) *quadrituberculata*, reported by Karg (1993a: 137), refers to a manuscript (unpublished) name for *H*. (*C*.) *tuberculata*.

***Cosmolaelaps ungeri* (Karg, 1985)**
Hypoaspis (*Cosmolaelaps*) *ungeri* Karg, 1985: 235.
Hypoaspis (*Cosmolaelaps*) *ungeri*.—Karg, 1988: 515.
Cosmolaelaps ungeri.—Farrier & Hennessey, 1993: 70; Moreira *et al*., 2014: 320.
Hypoaspis ungeri.—Kůrka, 2005: 25.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Near Havana-Mariel, Cuba, in nest of *Nasutitermes* sp. [Animalia: Blattodea: Termitidae].

***Cosmolaelaps vacua* (Michael, 1891)**
Laelaps vacua Michael, 1891: 651.
Lælaps vacua [sic].—Moniez, 1892: 381.
Loelaps vacuus [sic].—Wasmann, 1894: 199.
Laelaps vacuus.—Leonardi, 1897: 863.
Hypoaspis militiformis Oudemans, 1902c: 53 [junior synonym of *L. vacua* by Bregetova, 1977b: 512; Moreira *et al*., 2014: 320].
Hypoaspis militiformis.—Oudemans, 1903d: 14; Bernini *et al*., 1995: 28; Kůrka, 2005: 25.
Laelaps (*Cosmolaelaps*) *vacuus*.—Berlese, 1904c: 419; Halbert, 1915: 72; Donisthorpe, 1927: 214; Luxton, 1998: 18.
Laeleps [sic] (*Cosmolaelaps*) *styliferus* Halbert, 1915: 73 [junior synonym of *L. vacua* by Luxton, 1998: 18; Moreira *et al*., 2014: 320].
Cosmolaelaps styliferus.—Hull, 1918: 69; Turk, 1953: 12.
Cosmolaelaps vacuus.—Hull, 1918: 69; Falconer, 1923: 275; Vitzthum, 1929: 25; Lombardini, 1936: 39; Buitendijk, 1945: 298; Schweizer, 1949: 40; Willmann, 1951: 115, 1956: 222; Turk, 1953: 12; Haarlov, 1957: 17; Halašková & Kunst, 1961: 23; Rosario, 1981: 44; Teng, 1982: 163; Bai & Gu, 1993a: 41; Farrier & Hennessey, 1993: 70; Bernini *et al*., 1995: 28; Freire & Moraes, 2007: 356; Moreira *et al*., 2014: 320; Klimov *et al*., 2016: internet page; Plumari & Joharchi, 2017: 37.
Laelaps (*Cosmolaelaps*) *styliferus*.—Donisthorpe, 1927: 214.
Cosmolaelaps militiformis.—Buitendijk, 1945: 298; Grochovskaya & Huan-Hoe, 1961: 1633.
vacua; *non-Laelaps* [sic].—Tipton, 1960: 309.
Hypoaspis vacua.—Evans & Till, 1966: 190; Costa, 1968: 19; Solomon, 1968a: 664; Allred, 1969: 242, 1975: 127; Shcherbak, 1971a: 27; Solomon, 1971: 300; Prasad, 1974: 151; Tseng, 1977: 55; Gupta & Chattopadhyay, 1978: 79; Chelebiev, 1981: 185; Niedbała *et al*., 1982: 247, 1990: 32; Gupta & Paul, 1989: 317; Ma, 1996: 48; Munderloh, 1996: 590; Ma & Yin, 2004: 117; Ren & Guo, 2008: 329, 2009: 101; Kontschán *et al*., 2015b: 65; Telnov & Salmane, 2015: 130; Kontschán *et al*., 2016a: 26; Manu *et al*., 2021: 5.
Cosmolaelaps vacua.—Athias-Henriot, 1968: 243; Lapinya, 1976: 28; Zeman, 1982: 237; Luxton, 1998: 18; Ma & Yin, 2004: 117, 2011: 119; Xin *et al*., 2010: 2; Kazemi & Rajaei, 2013: 80; Ghasemi-Moghadam *et al*., 2014: 964; Gwiazdowicz *et al*., 2014: 437; Hasanvand *et al*., 2014a: 95; Mahjoori *et al*., 2014: 1602; Ramroodi *et al*., 2014a: 542, 2015a: 79; Maleki *et al*., 2016: 186; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237; Nasr & Momen, 2016: 263; Kavianpour *et al*., 2017: 162; Hajizadeh & Joharchi, 2018: 25; Halliday *et al*., 2018: 50; Nemati *et al*., 2018b: 136; Joharchi & Trach, 2019: 492; Joharchi *et al*., 2019e: 74, 2020a: 164.
Hypoaspis (*Cosmolaelaps*) *serratosimilis* Hirschmann *et al*., 1969: 136 [junior synonym of *L. vacua* by Karg, 1971: 178, 1981a: 219, 1993a: 139; Bregetova, 1977b: 512; Farrier & Hennessey, 1993: 70; Moreira *et al*., 2014: 320].

Cosmolaelaps robustus.—Lapinya, 1970: 278 (misidentification, according to Lapinya, 1976: 28).
Hypoaspis (*Cosmolaelaps*) *vacua*.—Karg, 1971: 163, 1978b: 9, 1979: 72, 1981a: 219, 1987: 292, 1988: 518, 1993a: 139, 1994: 182, 2000: 247; Bregetova, 1977b: 512; Chelebiev, 1988: 11; Nasr & Nawar, 1989b: 77; Deng *et al*., 1993: 179; Marchenko, 2002: 44; Gwiazdowicz, 2004: 181; Gwiazdowicz & Klemt, 2004: 14; Gwiazdowicz & Gulvik, 2005: 120; Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Skorupski *et al*., 2013: 10; Bai *et al*., 2016: 9.
Cosmolaelaps vacuum [sic].—Teng, 1982: 163.
Hypoaspis (*Cosmolaelaps*) *serratosimilis*.—Ishikawa, 1986: 175; Joharchi *et al*., 2019e: 75.
Hypoaspis vacura [sic].—Karg, 2003b: 233.
Hypoaspis vacuus.—Kůrka, 2005: 25.

Type depository. *L. vacua*, *H. militiformis* and *H.* (*C.*) *serratossimilis*: unspecified; *L.* (*C.*) *styliferus*: National Museum, Dublin, Ireland.
Type locality and habitat. *L. vacua*: near Innsbruck, Tyrol, Austria, in nest of *Camponotus herculeanus* [Animalia: Hymenoptera: Formicidae]; *H. militiformis*: Italy, from unspecified substrate; *L.* (*C.*) *styliferus*: Mulranny, Clare Island, Ireland, on *Lasius flavus* [Animalia: Hymenoptera: Formicidae]; *H.* (*C.*) *serratossimilis*: Polster, Germany, in nest of *Lasius fuliginosus* [Animalia: Hymenoptera: Formicidae], soil and under dry stones.
Note. *Hypoaspis* (*Cosmolaelaps*) *serratosimilis* was described based on specimens that according to Hirschmann *et al*. (1969: 136) had been identified by Bernhard (1955) as *Hypoaspis* (*Cosmolaelaps*) *serratus* in an unpublished dissertation.

***Cosmolaelaps vanmoli* (Loots, 1980)**
Hypoaspis (*Hypoaspis*) *vanmoli* Loots, 1980: 760.
Cosmolaelaps vanmoli.—Moreira *et al*., 2014: 320.

Type depository. Koninklijk Museum voor Midden Africa, Tervuren, Belgium; specimen number 143.518.
Type locality and habitat. Morne Blanc, Mahé Centre, Seychelles, in soil of endemic forest.

***Cosmolaelaps wangae* Bai & Gu, 1993**
Cosmolaelaps wangae Bai & Gu, 1993a: 43.
Cosmolaelaps wangae.—Chen *et al*., 1995b: 501; Ren & Guo, 2008: 328, 2009: 101; Moreira *et al*., 2014: 320.
Hypoaspis wangae.—Ren & Guo, 2008: 330, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *wangae*.—Huhta & Karg, 2010: 331; Yan *et al*., 2010: 905; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Type depository. Ningxia Institute of Endemic Disease Control, Yinchuan, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant (*Myrmos* spp.) nest [Animalia: Hymenoptera: Formicidae].

***Cosmolaelaps weeversi* (Oudemans, 1926)**
Hypoaspis weeversi Oudemans, 1926b: 101.
Hypoaspis weeversi.—Buitendijk, 1945: 297; Solomon, 1971: 304.
Cosmolaelaps weeversi.—Strandtmann, 1963: 3; Hunter & Mollin, 1964: 250; Moreira *et al*., 2014: 320; Duarte *et al*., 2017: 543; Joharchi & Negm, 2020: 497.
Hypoaspis (*Cosmolaelaps*) *weeversi*.—Karg, 1979: 73, 1981a: 219, 1987: 291, 1988: 517, 1993a: 139.

Type depository. Unspecified.
Type locality and habitat. Rio de Janeiro Botanical Garden, Rio de Janeiro, Brazil, on rotten fruit of *Phytelephas* sp. [Plantae: Arecales: Arecaceae].

***Cosmolaelaps zachvatkinae* (Shereef & Afifi, 1980)**
Hypoaspis zachvatkinae Shereef & Afifi, 1980: 125.
Hypoaspis zachvatkinae.—Zaher, 1986: 194.
Hypoaspis zachvatkini [sic].—Nawar *et al*., 1993: 347.
Cosmolaelaps zachvatkinae.—Nasr & Momen, 2016: 263; Nemati & Gwiazdowicz, 2016a: 548.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.
Type locality and habitat. Giza, Egypt, in manure.
Note. Moreira *et al*. (2014: 322) suspected that this species could belong to *Cosmolaelaps* because of its similarity with *C. brevipedestrus*. *Hypoaspis zachvatkinae* Shereef & Afifi, 1980 is a junior primary homonym of *Hypoaspis zachvatkini* Buyakova & Goncharova, 1972 (ICZN Article 58.14). However, considering the uncertainty about the placement of these two species, we refrain from suggesting a replacement of the junior homonym until further taxonomic study is conducted.

***Cosmolaelaps zachvatkini* (Buyakova & Goncharova, 1972) new combination**
Hypoaspis zachvatkini Buyakova & Goncharova, 1972: 451.
Hypoaspis (*Geolaelaps*) *zachvatkini*.—Bregetova, 1977b: 506; Karg, 1979: 84, 1982: 242, 1989c: 116.
Hypoaspis zachvatkini.—Ma, 1996: 48.
Gaeolaelaps zachvatkini.—Moreira, 2014: 271.

Type depository. Unspecified.
Type locality and habitat. Chita, Eastern Siberia, Russia, in soil.
Note. This species was provisionally excluded from *Gaeolaelaps* by Beaulieu (2009: 37). It is here provisionally assigned to *Cosmolaelaps* for the scimitar-like dorsal shield setae. See note under the previous species.

***Cyclothorax* von Frauenfeld, 1868**
Cyclothorax von Frauenfeld, 1868: 893 (type species: *Cyclothorax carcinicola* von Frauenfeld, 1868, by monotypy).
Aspidilaelaps Trägårdh, 1949: 311 (type species: *Aspidilaelaps mirabilis* Trägårdh, 1949, by original designation) [junior synonym of *Cyclothorax* by Kethley, 1977: 142].
Aspidilaelaps.—Johnston, 1960: 444.
Cyclothorax.—Casanueva, 1993: 41.

Note. *Cyclothorax* was not assigned to a family in the original description, and *Aspidilaelaps* was described in Laelapidae. According to Kethley (1977: 142), without stating it explicitly, Johnston (1960: 444) indicated that *Aspidilaelaps* was a junior synonym of *Cyclothorax*, by considering *Aspidilaelaps mirabilis* to be most similar and probably identical to *Cyclothorax carcinicola*, the type species of *Cyclothorax*.

***Cyclothorax carcinicola* von Frauenfeld, 1868**
Cyclothorax carcinicola von Frauenfeld, 1868: 893.
Cyclothorax carcinicola.—Vitzthum, 1931c: 117; Johnston, 1960: 443; Kethley, 1977: 142; Kim, 2015: 203.

Type depository. Unspecified.
Type locality and habitat. Nicobar Islands, on *Calcinus tibicen* [Animalia: Decapoda: Diogenidae].
Note. According to Johnston (1960: 442), either the host or the locality where the holotype of this species was collected was most probably incorrectly reported in the original description. Johnston (1960) also pointed out that the specimens reported by Vitzthum (1928: 189) as *C. carcinicola* were misidentified and were probably an undescribed species of Cercomegistidae instead. Kethley (1977: 139) renamed Vitzthum's specimens as *Vitzthumegistus andrei* Kethley (placing it in Cercomegistidae), while Kim (2015: 203) transferred it to Vitzthumegistidae.

***Cyclothorax mirabilis* (Trägårdh, 1949)**
Aspidilaelaps mirabilis Trägårdh, 1949: 312.
Aspidilaelaps mirabilis.—Johnston, 1960: 444.
Cyclothorax mirabilis.—Kethley, 1977: 142.

Type depository. Entomological Museum of the University of Copenhagen, Denmark.
Type locality and habitat. Samoa, on unspecified substrate.

***Cyclothorax pagurophilus* (André, 1937)**
Laelaps pagurophilus André, 1937: 56.
Aspidilaelaps pagurophilus.—Johnston, 1960: 444.
Cyclothorax pagurophilus.—Kethley, 1977: 142.

Type depository. Unspecified.
Type locality and habitat. Melsisi Bay, Pentecost island, Vanuatu (cited as New Hebrides), on *Coenobita* spp. [Animalia: Decapoda: Coenobitidae].

***Dicrocheles* Krantz & Khot, 1962**
Dicrocheles Krantz & Khot, 1962: 535 (type species: *Myrmonyssus phalaenodectes* Treat, 1954, by original designation).
Dicrocheles.—Treat, 1969b: 630, 1970: 631; Farrier & Hennessey, 1993: 70; Halliday, 2019: internet page; Lindquist *et al*., 2020: 41.

Note. *Dicrocheles* was described in Otopheidomenidae, whereas Evans (1963c: 620) and Treat (1970: 631) considered it to belong respectively to Laelapidae and Dermanyssidae-Iphiopsidinae.

***Dicrocheles eothenes* Treat, 1970**
Dicrocheles eothenes Treat, 1970: 644.
Myrmonyssus phalaenodectes Treat, 1955a: 55 (in part) (misidentification, according to Treat, 1970: 644).
Dicrocheles eothenes.—Treat, 1975: 165; Halliday, 1998: 124; Halliday, 2019: internet page.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 3).
Type locality and habitat. Tungjen, China, in the left tympanic recess of *Spodoptera litura* [Animalia: Lepidoptera: Noctuidae].
Note. Part of the specimens reported by Treat (1955a: 55; 1970: 633; 1975: 143) as *Myrmonyssus phalaenodectes* Treat or *Dicrocheles phalaenodectes* (Treat) were later re-identified and redescribed as *Dicrocheles eothenes*, *D. scedastes* Treat and *D. hippeoides* Treat.

***Dicrocheles hippeoides* Treat, 1978**
Dicrocheles hippeoides Treat, 1978: 192.
Myrmonyssus phalaenodectes.—Treat, 1955: 55 (in part), 1970: 633 (in part), 1975: 143 (in part) (misidentification, according to Treat, 1978: 192).
Dicrocheles hippeoides.—Farrier & Hennessey, 1993: 70.

Type depository. According to the original description and to Hernandes *et al*. (2011: 3), at American Museum of Natural History, New York, United States of America.
Type locality and habitat. Baton Rouge, Louisiana, United States of America, on *Chrysodeixis includens* [reported as *Pseudoplusia includens*] [Animalia: Lepidoptera: Noctuidae].
Note. See note under *Dicrocheles eothenes*.

***Dicrocheles pelates* Treat, 1970**
Dicrocheles pelates Treat, 1970: 641.
Dicrocheles pelates.—Treat, 1975: 163.

Type depository. According to the original description, at Natural History Museum, London, England; according to Hernandes *et al*. (2011: 3), at American Museum of Natural History, New York, United States of America.
Type locality and habitat. According to the original description, from Durban, KwaZulu-Natal, South Africa, in the right tympanic recess of *Borolia longirostris* [Animalia: Lepidoptera: Noctuidae: Hadeninae]; according to Hernandes *et al*. (2011: 3), holotype from Natal, South Africa, on *Vietteania pinna* [Animalia: Lepidoptera: Noctuidae], a senior synonym of *B*. (now *Vietteania*) *longirostris*.

***Dicrocheles phalaenodectes* (Treat, 1954)**
Myrmonyssus phalaenodectes Treat, 1954: 619.
Myrmonyssus phalaenodectes.—Treat, 1955a: 55, 1955b: 555, 1957: 41, 1958a: 475, 1958b: 629; Evans *et al*., 1961: 176.
Dicrocheles phalaenodectes.—Krantz & Khot, 1962: 535; Treat, 1965a: 12, 1965b: 420, 1966: 153, 1967: 174, 1969: 276, 1970: 633 (in part), 1975: 143 (in part); Farrier & Hennessey, 1993: 70; Halliday, 1998: 124, 2019: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2191.
Type locality and habitat. Tyringham, Massachusetts, United States of America, on *Mythimna unipuncta* (cited as *Pseudaletia unipuncta*) [Animalia: Lepidoptera: Noctuidae].
Note. See note under *Dicrocheles eothenes*.

***Dicrocheles scedastes* Treat, 1970**
Dicrocheles scedastes Treat, 1970: 637.
Myrmonyssus phalaenodectes Treat, 1955a: 55 (in part) (misidentification, according to Treat, 1970: 637).
Dicrocheles scedastes.—Spain & Luxton, 1971: 185; Treat, 1975: 160.
Dicrocheles scedastes.—Farrier & Hennessey, 1993: 70.

Type depository. According to the original description, at Natural History Museum, London, England; according to Hernandes *et al*. (2011: 3), at American Museum of Natural History, New York, United States of America.
Type locality and habitat. Haumoana, Hawkes Bay, New Zealand, in the tympanic recess of *Mythimna separata* (cited as *Pseudaletia separata*) [Animalia: Lepidoptera: Noctuidae].
Note. See note under *Dicrocheles eothenes*.

***Dinogamasus* Kramer, 1898**
Dinogamasus Kramer, 1898: 417 (type species: *Dinogamasus crassipes* Kramer, 1898, by monotypy).
Greenia Oudemans, 1901: 60 (type species: *Greenia perkinsi* Oudemans, 1901, by monotypy) [junior synonym of *Dinogamasus* by Oudemans, 1928a: 112; LeVeque, 1930b: 3; van Eyndhoven, 1941: 329; Vitzthum, 1942: 763; Radford, 1950b: 21].
Greenia.—Oudemans, 1902e: 292; Trägårdh, 1904a: 151.
Greeniella Banks, 1904: 56 [replacement name given the existence of *Greenia* Kirby, 1896: 456 (Hemiptera); Vitzthum, 1919: 4, 1942: 763; van Eyndhoven, 1941: 329; Radford, 1950b: 21].
Paragreenia Cockerell, 1907: 448 [replacement name given the existence of *Greeniella* Cockerell, 1897: 703; van Eyndhoven, 1941: 329].
Iphiopsis (*Greeniella*).—Berlese, 1910a: 247.
Dolaea Oudemans, 1912d: 262 [replacement name given the existence of *Greeniella* Cockerell, 1897: 703; Vitzthum,

1914: 315, 1919: 4, 1930a: 314, 1942: 763; van Eyndhoven, 1941: 329; Radford, 1950b: 21].
Dolaea.—Berlese, 1913b: 10; Vitzthum, 1919: 4, 1930a: 314, 1931c: 143.
Paragreenia.—Banks, 1915a: 79.
Dinogamasus.—LeVeque, 1930b: 3; Vitzthum, 1931c: 143, 1942: 763; Van Eyndhoven, 1941: 328; Radford, 1950b: 21; Baker & Wharton, 1952: 94; Van Eyndhoven, 1964: 345; Casanueva, 1993: 40; Lundqvist, 1999: 28; Walter *et al*., 2002: 132; OConnor & Klimov, 2012a: internet page; Joharchi *et al*., 2016b: 792; Klimov *et al*., 2016: internet page; Gwiazdowicz *et al*., 2020b: 604.
Dinogamasus (*Allophilaelaps*) Cunliffe, 1959: 172 [type species: *Dinogamasus* (*Allophilaelaps*) *medini* Cunliffe, 1959: 172, by monotypy].

Note. *Dinogamasus* was described in "Gamasids". It was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762). *Dinogamasus* (*Allophilaelaps*) was described in Laelapidae-Hypoaspidinae.

***Dinogamasus acutus* LeVeque, 1930**
Dinogamasus acutus LeVeque, 1930b: 13.
Dinogamasus acutus.—Lundqvist, 1999: 46.

Type depository. American Museum of Natural History, New York, United States of America (ACC 31184, according to Hernandes *et al*., 2011: 3).
Type locality and habitat. Faradje, Democratic Republic of the Congo, on *Xylocopa* (*Mesotrichia*) *luteola* (cited as *Mesotrichia luteola*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus affinis* (Berlese, 1918)**
Dolaea affinis Berlese, 1918: 131.
Dolaea affinis.—LeVeque, 1930b: 6; Castagnoli & Pegazzano, 1985: 6.
Dinogamasus cockerelli LeVeque, 1930b: 14 [junior synonym of *D. affinis* by Lundqvist, 1999: 47].
Dinogamasus affinis.—LeVeque, 1933: 104; Lundqvist *et al*., 1999: 47.
Paragreenia affinis.—Lombardini, 1936: 46.
Dinogamasus northolmensis Loots, 1980: 756 [junior synonym of *D. affinis* by Lundqvist, 1999: 47].

Type depository. *D. affinis*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *D. cockerelli*: American Museum of Natural History, New York, United States of America; *D. northolmensis*: Koninkijk Museum voor Midden Africa, Tervuren, Belgium; specimen number 143.597.
Type locality and habitat. *D. affinis* Somalia (cited as "Somalia italiana"), on *Xylocopa* sp. [Animalia: Hymenoptera: Apidae]; *D. cockerelli*: Mahé, Seychelles, on *Xylocopa* (*Mesotrichia*) *incerta seychellensis* (cited as *Mesotrichia incerta seychellensis*) [Animalia: Hymenoptera: Apidae]; *D. northolmensis*: Northolme, Mahé North, Seychelles, on unspecified substrate.
Note. LeVeque (1933: 104) considered *D. cockerelli* to be very similar to *D. affinis*.

***Dinogamasus albulus* Lundqvist, 1999**
Dinogamasus albulus Lundqvist, 1999: 28.

Type depository. American Museum of Natural History, New York, United States of America.
Type locality and habitat. Sikkim, India, on *Xylocopa* (*Mesotrichia*) *confusa* (cited as *Mesotrichia confusa*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus alfkeni* (Oudemans, 1902)**
Greenia alfkeni Oudemans, 1902a: 37.
Greenia alfkeni.—Oudemans, 1903a: 126 (junior homonymy); Trägårdh, 1904a: 154; Berlese, 1910a: 263; LeVeque, 1930b: 5.
Greeniella alfkeni.—Vitzthum, 1912: 94.
Paragreenia alfkeni.—Banks, 1915a: 82.
Dolaea alfkeni.—Vitzthum, 1919: 8, 1930a: 343.
Dinogamasus alfkeni.—LeVeque, 1931: 3; Van Eyndhoven, 1964: 348; Lundqvist, 1999: 49; Gwiazdowicz *et al*., 2020b: 604.

Type depository. Lundqvist (1999: 49) was not able to find the types of this species.
Type locality and habitat. Malakka, Indië [sic] (according to Van Eyndhoven, 1964: 348, Oudemans was referring to Indonesia, then called Dutch East Indies), on *Xylocopa* (*Koptorthosoma*) *aestuans* (cited as *Koptorthosoma aestuans*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus amaniensis* (Vitzthum, 1919)**
Dolaea amaniensis Vitzthum, 1919: 18.
Dolaea amaniensis.—LeVeque, 1930b: 6; Vitzthum, 1930a: 350.
Dinogamasus amaniensis.—Lundqvist, 1999: 51.

Type depository. Zoologische Staatssammlung, München, Germany.
Type locality and habitat. Amani, Tanzania (cited as East-Africa), on *Xylocopa* (*Koptorthosoma*) *nigrita* (cited as *Koptorthosoma nigrita*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 51).

***Dinogamasus assimiensis* Lundqvist, 1999**
Dinogamasus assimiensis Lundqvist, 1999: 30

Type depository. Lund University, Lund, Sweden (Hernandes *et al*., 2011: 4).
Type locality and habitat. Sunbaws, Indonesia? [sic; probably Sumbawa Island], on *Xylocopa* (*Mesotrichia*) *assimilis*? (cited as *Mesotrichia assimilis*? [sic]) [Animalia: Hymenoptera: Apidae].

***Dinogamasus bakeri* LeVeque, 1931**
Dinogamasus bakeri LeVeque, 1931: 12.
Dinogamasus bakeri.—Lundqvist, 1999: 55.

Type depository. According to the original description and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Singapore, on *Xylocopa* (*Mesotrichia*) *dormeyeri* (cited as *Mesotrichia dormeyeri*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus bequaerti* LeVeque, 1930**
Dinogamasus bequaerti LeVeque, 1930b: 18.
Dinogamasus bequaerti.—Lundqvist, 1999: 58.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Mbandaka, Democratic Republic of Congo (cited as Coquilhatville, Belgian Congo), on *Xylocopa* (*Mesotrichia*) *albifrimbia* (cited as *Mesotrichia albifrimbia*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus braunsi* (Vitzthum, 1914)**
Dolaea braunsi Vitzthum, 1914: 315.
Dolaea braunsi.—Vitzthum, 1919: 10, 1930a: 333, 1930b: 5.
Dinogamasus braunsi.—LeVeque, 1930b: 11; van Eyndhoven, 1941: 327; Skaife, 1952: 71; Shulov, 1957: 234; Lundqvist, 1999: 59.

Type depository. Zoologische Staatssammlung, München, Germany.
Type locality and habitat. According to the original description, Willowmore, Cape, South Africa and Amani, Tanzania (cited as German East-Africa) on *Xylocopa caffra* and *Xylocopa* (*Koptorthosoma*) *nigrita* (cited as *Koptorthosoma nigrita*) [Animalia: Hymenoptera: Apidae]; according to Lundqvist (1999: 49), only at Willowmore.
Note. According to LeVeque (1930b: 5), Vitzthum (1930a: 324) and Lundqvist (1999: 81), specimens reported as second stage nymphs of *D. braunsi* by Vitzthum (1914: 318) were described as *Dolaea maxima* by Vitzthum (1919: 13). A lectotype of this species was designated by Lundqvist (1999: 59).

***Dinogamasus brevihirtus* LeVeque, 1930**
Dinogamasus brevihirtus LeVeque, 1930b: 13.
Dinogamasus brevihirtus.—Lundqvist, 1999: 61.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Kisangani (cited as Stanleyville, Belgian Congo), Zaire on *Xylocopa* (*Mesotrichia*) *cloti* (cited as *Mesotrichia cloti*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 61).

***Dinogamasus brevipes* LeVeque, 1931**
Dinogamasus brevipes LeVeque, 1931: 12.
Dinogamasus brevipes.—Lundqvist, 1999: 63.

Type depository. According to the original description and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Xi Xiang Chi (cited as Shin Kai Si), Mount Omei, Emeishan, Sichuan, China, on *Xylocopa* (*Mesotrichia*) *sinensis* (cited as *Mesotrichia sinensis*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus cockerelli* LeVeque, 1930**
Dinogamasus cockerelli LeVeque, 1930b: 14.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Mahé, Seychelles, on *Xylocopa incerta seychellensis* [Animalia: Hymenoptera, Apidae].

***Dinogamasus collarti* (Oudemans, 1929)**
Dolaea collarti Oudemans, 1929b: 422.
Dolaea collarti.—LeVeque, 1930b: 6; Vitzthum, 1930a: 328.
Dinogamasus collarti.—Lundqvist, 1999: 65.

Type depository. Koninklijk Museum voor Midden Afrika (cited as Musée du Congo Belge), Tervuren, Belgium.
Type locality and habitat. Kisangani, Zaire (cited as Stanleyville, Congo Belge), on *Xylocopa* (*Mesotrichia*) *nigrita* (cited as *Koptorthosoma nigrita*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus concinnus* LeVeque, 1931**
Dinogamasus concinnus LeVeque, 1931: 5.
Dinogamasus concinnus.—Lundqvist, 1999: 68.

Type depository. According to the original description and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Mati Davas, Mindanao, Philippines, on *Xylocopa* (*Mesotrichia*) *bluthgeni* (cited as *Mesotrichia blüthgeni*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus crassipes* Kramer, 1898**
Dinogamasus crassipes Kramer, 1898: 417.
Greenia sjöstedti Trägårdh, 1904a: 152; LeVeque, 1930b: 5 [junior synonym of *D. crassipes* by Lundqvist, 1999: 70].
Dolaea sjöstedti.—Vitzthum, 1919: 16.
Dinogamasus crassipes.—Oudemans, 1928: 112; LeVeque, 1930b: 5; Lundqvist, 1999: 70; Klimov *et al*., 2016: internet page.
Dolaea schoutedeni Oudemans, 1929b: 423; LeVeque, 1930b: 6 [junior synonym of *D. crassipes* by Lundqvist, 1999: 70].

Type depository. *D. crassipes*: Zoologisches Museum, Hamburg, Germany; *G. sjöstedti*: Swedish Museum of Natural History, Stockholm, Sweden; *D. schoutedeni*: Musée Royale de l'Afrique Central (cited as Musée du Congo Belge), Tervuren, Belgium.
Type locality and habitat. *D. crassipes*: German East Africa, on "bumble-bee-like" specimens [Animalia: Hymenoptera]; *G. sjöstedti*: Cameroon, on *Xylocopa nigrita* [Animalia: Hymenoptera: Apidae]; *D. schoutedeni*: Kisangani, Zaire (cited as Stanleyville, Congo Belge), on *Xylocopa* (*Mesotrichia*) *nigrita* (cited as *Koptorthosoma nigrita*) and in its nest.
Note. The specimens reported as *G. sjöstedti* by Vitzthum (1919: 16) had been considered by LeVeque (1930b: 5) to be possibly *D. crassipes*. Oudemans (1929b: 424) suggested accurate comparisons of the types of *Dolaea maxima*, *D. schoutedeni* and *D. sjöstedti* to evaluate whether they were really different species. LeVeque (1930b: 6) considered that *D. crassipes* could be a senior synonym of those three species. Vitzthum (1930a: 323) considered *D. maxima* to be a senior synonym of *D. schoutedeni* but not of *G. sjöstedti*. Lectotypes of *D. crassipes*, *G. sjöstedti* and *D. schoutedeni* were designated by Lundqvist (1999: 71).

***Dinogamasus heteraspis* LeVeque, 1930**
Dinogamasus heteraspis LeVeque, 1930b: 15.
Dinogamasus heteraspis.—Lundqvist, 1999: 72.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Medje, Democratic Republic of the Congo (cited as Belgian Congo), on *Xylocopa* (*Mesotrichia*) *imitator* (cited as *Mesotrichia imitator*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus hirtissima* (Berlese, 1910)**
Greenia hirtissima Berlese, 1910a: 263.
Dolaea hirtissima.—Vitzthum, 1919: 18.
Greenia hirtissima.—LeVeque, 1930b: 5; Castagnoli & Pegazzano, 1985: 182.
Dinogamasus hirtissimus.—LeVeque, 1933: 103.
Paragreenia hirtissima.—Lombardini, 1936: 46.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Java, Indonesia, on *Xylocopa* (*aestuans*?) [sic] [Animalia: Hymenoptera: Apidae], cited as *Pteropus edulis* [Animalia: Chiroptera: Pteroptidae] by LeVeque, 1930b: 5.
Note. LeVeque (1933: 104) considered *Dinogamarus inflatus* LeVeque to be very similar to *G. hirtissima*, but Lundqvist (1999: 75) decided to maintain them as separate species, as also done in this publication.

***Dinogamasus inflatus* LeVeque, 1930**
Dinogamasus inflatus LeVeque, 1930b: 14.
Dinogamasus inflatus.—Van Eyndhoven, 1964: 346; Costa, 1966a: 74; Lundqvist, 1999: 75.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Suez, Lisht, Egypt, on *Xylocopa* (*Koptorthosoma*) *aestuans* (cited as *Mesotrichia aestuans*; according to Van Eyndhoven, 1964: 346, the correct identification should be *X.* (*K.*) *pubescens*) [Animalia: Hymenoptera: Apidae).
Note. Despite referring to the great similarity between *D. inflatus* and *G. hirtissima*, LeVeque (1933: 102) stopped short of synonymising them. Lundqvist (1999: 75) decided to maintain them as separate species, as also done in this publication. A lectotype of *D. inflatus* was designated by Lundqvist (1999: 75).

***Dinogamasus jacobsoni* (Berlese, 1910)**
Greenia jacobsoni Berlese, 1910a: 263.
Dolaea jacobsoni.—Vitzthum, 1919: 17.
Greenia jacobsoni.—LeVeque, 1930b: 5; Castagnoli & Pegazzano, 1985: 205.
Dinogamasus longipes LeVeque, 1931: 7 [junior synonym of *D. jacobsoni* by Lundqvist, 1999: 76].
Dinogamasus (*Dolaea*) *jacobsoni*.—LeVeque, 1931: 9.
Dinogamasus jacobsoni.—LeVeque, 1933: 102; Lundqvist, 1999: 76.
Dinogamasus longipes.—LeVeque, 1933: 102.
Paragreenia jacobsoni.—Lombardini, 1936: 46.

Type depository. *G. jacobsoni*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *D. longipes*: according to the original description and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. *G. jacobsoni*: Java, Indonesia, on *Xylocopa aestuans* (Animalia: Hymenoptera: Apidae); *D. longipes*: Trong, Thailand (cited as Siam), on *Euglossa viridissima* (cited as *Mesotrichia confusa virridissima*) [Animalia: Hymenoptera: Apidae].
Note. Specimens reported as *Dolaea jacobsoni* by Vitzthum (1930a: 346) were re-identified as *Dinogamasus octoconus* by LeVeque (1931: 11, 1933: 103; Lundqvist, 1999: 82). Despite referring to the great similarity between *D. jacobsoni* and *D. longipes*, LeVeque (1933: 102) stopped short of synonymising them.

***Dinogamasus kazerunensis* Joharchi *et al*., 2016**
Dinogamasus kazerunensis Joharchi, Khodaparast & Moghadam, 2016b: 793.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran.
Type locality and habitat. 721 m above sea level, Bid Zard (29°19'N, 51°52'E), Kazerun, Fars province, Iran, on *Xylocopa* (*Koptorthosoma*) [sic] *pubescens* [Animalia: Hymenoptera: Apidae].

***Dinogamasus kerrianus* LeVeque, 1931**
Dinogamasus kerrianus LeVeque, 1931: 1.
Dinogamasus kerrianus.—Lundqvist, 1999: 77; Attasopa *et al*., 2021: 484.

Type depository. According to the original description, and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Ranawng, Thailand (cited as Siam), on *Xylocopa* (*Mesotrichia*) *kerri* (cited as *Mesotrichia kerri*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 77).

***Dinogamasus kordofaniensis* Lundqvist, 1999**
Dinogamasus kordofaniensis Lundqvist, 1999: 32.

Type depository. Lund University, Lund, Sweden.
Type locality and habitat. Kordofan, Sudan, on *Xylocopa* (*Koptorthosoma*) *leucothorax* (cited as *Koptorthosoma leucothorax*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus levequae* Lundqvist, 1999**
Dinogamasus levequae Lundqvist, 1999: 34.

Type depository. American Museum of Natural History, New York, United States of America.
Type locality and habitat. Perak, Malaysia, on *Xylocopa* (*Mesotrichia*) *aurantiaca* (cited as *Mesotrichia aurantiaca*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus macgregori* LeVeque, 1931**
Dinogamasus macgregori LeVeque, 1931: 8.
Dinogamasus macgregori.—Lundqvist, 1999: 80.

Type depository. According to the original description and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Samar, Philippines, on *Xylocopa* (*Mesotrichia*) *ghilianii* (cited as *Mesotrichia ghilianii*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus macrotrichus* Van Eyndhoven, 1964**
Dinogamasus macrotrichus Van Eyndhoven, 1964: 350.

Type depository. Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands.
Type locality and habitat. Pelabuan Ratu, Wijnkoops Bay, Karang Havu, Java, Indonesia on *Xylocopa* (*Koptorthosoma*) *aestuans* (cited as *Koptorthosoma aestuans*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus maxima* (Vitzthum, 1919)**
Dolaea maxima Vitzthum, 1919: 13.
Dolaea braunsi Vitzthum, 1914: 315 (in part) (misidentification, according to LeVeque, 1930b: 5; Lundqvist, 1999: 81).
Dolaea maxima.—LeVeque, 1930b: 5; Vitzthum, 1930a: 324.
Dinogamasus maxima.—Lundqvist, 1999: 81.

Type depository. Zoologische Staatssammlung, München, Germany.
Type locality and habitat. Amani, Tanzania (cited as German East-Africa), in nest of *Xylocopa* (*Koptorthosoma*) *nigrita* (cited as *Koptorthosoma nigrita*) [Animalia: Hymenoptera: Apidae].
Note. Specimens reported as second stage nymphs of *Dolaea braunsi* by Vitzthum (1914: 318) were described as *D. maxima* (LeVeque, 1930b: 5; Vitzthum, 1930a: 324; Lundqvist, 1999: 81). Oudemans (1929b: 424) suggested accurate comparisons of the types of *Dolaea maxima*, *D. schoutedeni* and *D. sjöstdti* to evaluate whether they were really different species. LeVeque (1930b: 6) considered that *Dinogamassus crassipes* could be a senior synonym of *D. maxima*, *D. schoutedeni* Oudemans and *Greenia sjöstedti* Trägårdh, although on the previous page she had explicitly indicated *D. maxima* to be a junior synonym of *D. crassipes*. Vitzthum (1930a: 323) considered *D. maxima* to be a senior synonym of *D. schoutedeni* but not of *G. sjöstedti* or *Greenia perkinsi* Oudemans. A lectotype of *D. maxima* was designated by Lundqvist (1999: 81).

Dinogamasus medini Cunliffe, 1959

Dinogamasus (*Allophilaelaps*) *medini* Cunliffe, 1959: 172.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2547.
Type locality and habitat. Inga-Zanga, Angola, with unidentified aphids [Animalia: Hemiptera: Aphididae].
Note. The original description of this species does not specify whether the holotype (only known specimen) was on the aphids or only close to them.

Dinogamasus minor Lundqvist, 1999

Dinogamasus minor Lundqvist, 1999: 36.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Mount Matang, Sarawak, Borneo, Malaysia on *Xylocopa* (*Mesotrichia*) *shelfordi* (cited as *Mesotrichia shelfordia*) [Animalia: Hymenoptera: Apidae].

Dinogamasus occidentalis Lundqvist, 1999

Dinogamasus occidentalis Lundqvist, 1999: 39.

Type depository. Lund University, Lund, Sweden.
Type locality and habitat. Freetown, Sierra Leone, on *Xylocopa* (*Koptothorsoma*) *modesta* [Animalia: Hymenoptera: Apidae].

Dinogamasus octoconus LeVeque, 1931

Dinogamasus octoconus LeVeque, 1931: 11.
Dolaea jacobsoni.—Vitzthum (1930a: 346) (misidentification, according to LeVeque, 1931: 11, 1933: 103; Lundqvist, 1999: 82).
Dinogamasus octoconus.—Lundqvist, 1999: 82.

Type depository. According to the original description and to Hernandes *et al*. (2011: 4), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Mount Salak, Java, Indonesia, on *Xylocopa* (*Mesotrichia*) *caerulea* (cited as *Mesotrichia caerulea*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus oudemansi* LeVeque, 1930**
Dinogamasus oudemansi LeVeque, 1930b: 18.
Dinogamasus oudemansi.—Lundqvist, 1999: 85.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Rikatla, Maputo Bay (cited as Delagoa Bay), Mozambique, on *Xylocopa* (*Mesotrichia*) *flavicollis* (cited as *Mesotrichia stuhlmanni*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 85).

***Dinogamasus parvus* LeVeque, 1930**
Dinogamasus parvus LeVeque, 1930b: 16.
Dinogamasus parvus.—Lundqvist, 1999: 86.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 4).
Type locality and habitat. Lisala, Democratic Republic of the Congo (cited as Congo), on *Xylocopa* (*Mesotrichia*) *codinai* (cited as *Mesotrichia codinai*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus perkinsi* (Oudemans, 1901)**
Greenia perkinsi Oudemans, 1901: 60.
Greenia perkinsi.—Oudemans, 1902a: 37, 1902b: 9, 1903a: 128; LeVeque, 1930b: 5; Castagnoli & Pegazzano, 1985: 316.
Greeniella perkinsi.—Vitzthum, 1912: 95.
Dolaea perkinsi.—Vitzthum, 1919: 5, 1930a: 337.
Dolaea affinis Oudemans, 1926a: 68.
Dolaea vitzthumi Oudemans, 1926c: 144 [replacement name given the existence of *Dolaea affinis* Berlese, 1918: 131; junior synonym of *Dinogamasus perkinsi* by Vitzthum, 1930a: 337; Lundqvist, 1999: 87].
Dinogamasus perkinsi.—LeVeque 1930a: 1, 1933: 106; Lundqvist, 1999: 87; Andhale *et al*., 2020: 981; Attasopa *et al*., 2021: 484.
Dolaea vitzthumi.—LeVeque, 1930b: 6.
Paragreenia perkinsi.—Lombardini, 1936: 46.

Type depository. Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands.
Type locality and habitat. *G. perkinsi*: Java, Indonesia and India, on *Xylocopa* (*Mesotrichia*) *tenuiscapa* (cited as *Xylocopa* (*Koptorthosoma*) *tenuiscapa*) [Animalia: Hymenoptera: Apidae]; *D. affinis*: Buitenzorg, Java, Indonesia, on *Koptorthosoma* sp. [Animalia: Hymenoptera: Apidae].
Note. Vitzthum (1930a: 323) did not consider *D. maxima* to be a senior synonym of *G. perkinsi*. A lectotype of *D. vitzthumi* was designated by Lundqvist (1999: 88).

***Dinogamasus philippinensis* LeVeque, 1930**
Dinogamasus philippinensis LeVeque, 1930a: 3.
Dinogamasus philippinensis.—Lundqvist, 1999: 91; Andhale *et al*., 2020: 981; Attasopa *et al*., 2021: 484.

Type depository. According to the original description and to Hernandes *et al*. (2011: 5), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Cuernos Mountains, Negros, Philippines, on (*Xylocopa* (*Mesotrichia*) *latipes* (cited as *Mesotrichia latipes*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 91).

***Dinogamasus piperi* LeVeque, 1930**
Dinogamasus piperi LeVeque, 1930a: 5.
Dinogamasus piperi.—LeVeque, 1933: 106; Lundqvist, 1999: 92; Andhale *et al*., 2020: 981; Attasopa *et al*., 2021: 484.

Type depository. According to the original description and to Hernandes *et al*. (2011: 5), American Museum of Natural History, New York, United States of America.
Type locality and habitat. India, on *Xylocopa* (*Mesotrichia*) *tenuiscapa* (cited as *Mesotrichia tenuiscapa*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 93).

***Dinogamasus productus* LeVeque, 1930**
Dinogamasus productus LeVeque, 1930b: 16.
Dinogamasus productus.—Lundqvist, 1999: 93.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 5).
Type locality and habitat. Umbilo, Durban, Natal, South Africa, on *Xylocopa* (*Mesotrichia*) *flavicollis* (cited as *Mesotrichia divisa* [Animalia: Hymenoptera: Apidae].

***Dinogamasus ramaleyi* LeVeque, 1931**
Dinogamasus ramaleyi LeVeque, 1931: 5.
Dinogamasus ramaleyi.—Lundqvist, 1999: 95.

Type depository. According to the original description and to Hernandes *et al*. (2011: 5), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Manila, Philippines, on *Xylocopa* (*Mesotrichia*) *bombiformis* (cited as *Mesotrichia bombiformi*s) [Animalia: Hymenoptera: Apidae].

***Dinogamasus saengdaoae* Attasopa & Ferrari, 2021**
Dinogamasus saengdaoae Attasopa & Ferrari, 2021, in Attasopa, Ferrari, Chantawannakul & Bänziger, 2021: 479.

Type depository. Queen Sirikit Botanical Garden, Mae Rim, Chiang Mai province, Thailand.
Type locality and habitat. Agricultural field of Faculty of Agriculture (18°47'41.3"N, 98°57'34.3"E), Chiang Mai University, Chiang Mai province, Thailand, on *Xylocopa tenuiscapa* [Animalia: Hymenoptera: Apidae] (specimen number CMUD_01).

***Dinogamasus similis* LeVeque, 1931**
Dinogamasus similis LeVeque, 1931: 5.
Dinogamasus similis.—Lundqvist, 1999: 97.

Type depository. According to the original description and to Hernandes *et al*. (2011: 5), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Manila, Philippines, on *Xylocopa* (*Mesotrichia*) *chlorina* (cited as *Mesotrichia chlorina*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus sternisetosa* (Vitzthum, 1930)**
Dolaea sternisetosa Vitzthum, 1930a: 342.
Dinogamasus sternisetosus.—LeVeque, 1931: 2.
Dinogamasus sternisetosa.—Lundqvist, 1999: 98.

Type depository. Zoologischen Staatssammlung, München, Germany.
Type locality and habitat. Sumatra, on *Xylocopa* (*Koptorthosoma*) *splendidipennis* (cited as *Koptorthosoma splendidipennis*) [Animalia: Hymenoptera: Apidae].
Note. A lectotype of this species was designated by Lundqvist (1999: 99).

***Dinogamasus tonkinensis* Lundqvist, 1999**
Dinogamasus tonkinensis Lundqvist, 1999: 42.

Type depository. American Museum of Natural History, New York, United States of America (Hernandes *et al*., 2011: 5).
Type locality and habitat. North Khasia Hills, India, on *Xylocopa* (*Mesotrichia*) sp. (cited as *Mesotrichia* sp.) [Animalia: Hymenoptera: Apidae].

***Dinogamasus tortivus* Lundqvist, 1999**
Dinogamasus tortivus Lundqvist, 1999: 44.

Type depository. American Museum of Natural History, New York, United States of America, as confirmed by Hernandes *et al*. (2011: 5).
Type locality and habitat. Bua-Kraeng? [sic], Celebes, Indonesia; according to Hernandes *et al*. (2011: 5), on *Xylocopa* sp. (cited as *Mesotrichia pentachroma* in the original description) [Animalia: Hymenoptera: Apidae].

***Dinogamasus trihirtus* LeVeque, 1931**
Dinogamasus trihirtus LeVeque, 1931: 8.
Dinogamasus trihirtus.—Lundqvist, 1999: 101.

Type depository. According to the original description and to Hernandes *et al*. (2011: 5), American Museum of Natural History, New York, United States of America.
Type locality and habitat. Mati, Davao, Mindanao, Philippines, on *Xylocopa* (*Mesotrichia*) *trifasciata* (cited as *Mesotrichia trifasciata*) [Animalia: Hymenoptera: Apidae].

***Dinogamasus villosior* (Berlese, 1918)**
Dolaea villosior Berlese, 1918: 132.
Dolaea villosior.—LeVeque, 1930b: 6; Vitzthum, 1930a: 331; Castagnoli & Pegazzano, 1985: 440.
Dinogamasus villosior.—LeVeque, 1933: 105; Madel, 1975: 146; Lundqvist, 1999: 103.
Paragreenia villosior.—Lombardini, 1936: 46.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Blantyre, Malawi (cited as Nyasaland), on *Xylocopa nigrita* [Animalia: Hymenoptera: Apidae].

***Dynastaspis* Costa, 1971**
Dynastaspis Costa, 1971: 90 (type species: *Dynastaspis walhallae* Costa, 1971, by monotypy).
Dynastaspis.—Farrier & Hennessey, 1993: 71; Joharchi *et al*., 2019d: 346; Gwiazdowicz *et al*., 2020b: 598.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Dynastaspis hercules* Costa, 1976**
Dynastaspis hercules Costa, 1976: 187.
Dynastes hercules Costa, 1976: 187 (*lapsus calami*).
Dynastaspis hercules.—Farrier & Hennessey, 1993: 71.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Guadeloupe, Lesser Antilles [Caribbean area], on *Hercules hercules* [sic] [probably *Dynastes hercules*; Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Dynastaspis walhallae* Costa, 1971**
Dynastaspis walhallae Costa, 1971: 90.
Dynastaspis walhallae.—Costa, 1976: 193; Farrier & Hennessey, 1993: 71.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Walhalla, South Carolina, United States of America, on larva of *Dynastes tytius* [Animalia: Coleoptera: Scarabaeidae, Dynastinae] in dead black locust tree [*Robinia*; Plantae: Fabales: Fabaceae].

***Dynatochela* Keegan, 1950**
Dynatochela Keegan, 1950: 511 (type species: *Dynatochela primus* Keegan, 1950, by monotypy).
Dynatochela.—Farrier & Hennessey, 1993: 71; Lindquist *et al*., 2020: 50.

Note. This genus was described in Laelapidae-Iphiopsidinae.

***Dynatochela primus* Keegan, 1950**
Dynatochela primus Keegan, 1950: 511.
Dynatochela prima.—Farrier & Hennessey, 1993: 71.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Omaha, Nebraska, United States of America, on *Phyllophaga* sp. [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Dyscinetonyssus* Moss & Funk, 1965**
Dyscinetonyssus Moss & Funk, 1965: 235 (type species: *Dyscinetonyssus hystricosus* Moss & Funk, 1965, by monotypy).
Dyscinetonyssus.—Casanueva, 1993: 40.
Dycinetonyssus [sic].—Farrier & Hennessey, 1993: 71.

Note. This genus was purposefully not assigned to a family in the original description.

***Dyscinetonyssus hystricosus* Moss & Funk, 1965**
Dyscinetonyssus hystricosus Moss & Funk, 1965: 237.
Dycinetonyssus [sic] *hystricosus*.—Farrier & Hennessey, 1993: 71.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 2965.

Type locality and habitat. Highlands Hammock State Park, Highland, Florida, United States of America, under the elytra of *Dyscinetus morator* [cited as *Dyscinetus trachypygus*; Animalia: Coleoptera: Scarabaeidae, Dynastinae].

Euandrolaelaps Bregetova, 1977

Hypoaspis (*Euandrolaelaps*) Bregetova, 1977b: 527 (type species: *Laelaps* (*Androlaelaps*) *sardous* Berlese, 1911, by original designation).
Androlaelaps.—Hughes, 1948: 136; Bregetova, 1955a: 233 (in part), 1955b: 313, 1956: 71 (in part); Zhang *et al*., 1963: 193; Karg, 1971: 185 (in part).
Hypoaspis (*Hypoaspis*).—Karg, 1971: 160 (in part).
Hypoaspis.—Hughes, 1976: 292 (in part); Zaher, 1986: 185 (in part); Deng *et al*., 1993: 157 (in part).
Euandrolaelaps.—Casanueva, 1993: 40; Hajizadeh & Joharchi, 2018: 26; Babaeian *et al*., 2019a: 333.

Note. *Hypoaspis* (*Euandrolaelaps*) was described in Laelapidae. Farrier & Hennessey (1993: 63) and Karg (1993a: 140) considered *Hypoaspis* (*Euandrolaelops*) to be a junior synonym of *Pseudoparasitus* (*Alloparasitus*).

Euandrolaelaps chelaris (Teng *et al*., 1992)

Hypoaspis (*Holostaspis*) *chelaris* Teng, Zhang & Cui, 1992: 196.
Hypoaspis (*Holostaspis*) *chelaris*.—Deng *et al*., 1993: 162.
Hypoaspis chelaris.—Ma, 2000a: 384; Ren & Guo, 2008: 329, 2009: 101; Bai & Ma, 2011: 21.
Euandrolaelaps chelaris.—Babaeian *et al*., 2019a: 328.

Type depository. Institute of Zoology, Academia Sinica, Beijing, China.
Type locality and habitat. Beijing, China, in soil.
Note. Babaeian *et al*. (2019a: 333) suspected this species to be a junior synonym of *Laelaps* (*Androlaelaps*) *karawaiewi*.

Euandrolaelaps karawaiewi (Berlese, 1904)

Laelaps (*Androlaelaps*) *karawaiewi* Berlese, 1904c: 432.
Androlaelaps karawaiewi.—Vitzthum, 1921: 22; Radford, 1943: 61; 1950: 366; Willmann, 1949a: 116, 1951: 116; Bregetova, 1955b: 316, 1956: 83; Till, 1963: 12; Shcherbak, 1969: 79; Karg, 1971: 185; Lapinya, 1976: 52; Davydova, 1977: 26; Castagnoli & Pegazzano, 1985: 206; Ren & Guo, 2008: 328, 2009: 100; Ma & Yin, 2011: 119; Lin *et al*., 2013: 159; Zhou *et al*., 2015: 488.
Hypoaspis (*Androlaelaps*) *karawaieni* [sic].—Zumpt & Patterson, 1950: 67.
Androlaelaps karawaieni [sic].—Eads, 1952: 239.
karawaiewi; *non-Laelaps* [sic].—Tipton, 1960: 298.
Androlaelaps karawaiewi.—Athias-Henriot, 1968: 251; Solomon, 1969a: 273.
Hypoaspis karawaiewi.—Costa, 1968: 7; Granpayeh & Ostovan, 2014: 614; Kontschán *et al*., 2015b: 63; Manu *et al*., 2021: 6.
Hypoaspis (*Euandrolaelaps*) *karawaiewi*.—Bregetova, 1977b: 530; Sklyar, 2001: 101.
Hypoaspis (*Pneumolaelaps*) *karawaiewi*.—Karg, 1979: 90, 1982: 244, 1993a: 149; Faraji *et al*., 2008: 208.
Hypoaspis karawaewi [sic].—Chelebiev, 1981: 185.
Hypoaspis (*Euandrolaelaps*) *karawaewi* [sic].—Chelebiev, 1988: 11.
Pneumolaelaps karawaiewi.—Farrier & Hennessey, 1993: 86; Khalili-Moghadam & Saboori, 2015: 320.
Euandrolaelaps karawaiewi.—Arjomandi *et al*., 2013: 256; Kazemi & Rajaei, 2013: 80; Ghasemi-Moghadam *et al*., 2014: 964; Hasanvand *et al*., 2014a: 95, 2014b: 2868; Mahjoori *et al*., 2014: 1602; Amani *et al*., 2015: 92; Kordeshami *et al*., 2015: 591; Ramroodi *et al*., 2015a: 79; Maleki *et al*., 2016: 187; Kavianpour *et al*., 2017: 164; Hajizadeh & Joharchi, 2018: 26; Nemati *et al*., 2018b: 137; Babaeian *et al*., 2019a: 333.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. "Mursinzi, Russia" [probably Murzintsy, Ukraine], in nest of *Formica pratensis* [Animalia: Hymenoptera: Formicidae].

Note. Khalili-Moghadam & Saboori (2015: 320) questioned the generic placement of this species. Babaeian *et al*. (2019: 333) suspect this species to be a senior synonym of *H*. (*H*.) *chelaris*. This species is provisionally placed in *Euandrolaelaps*, following Bregetova (1977b: 530), until the type specimens are redescribed. It differs from other *Euandrolaelaps* species particularly by its epigynal shield bearing only *st*5 but also by its very short cheliceral digits, based on the redescriptions of Bregetova (1977b: 530) and particularly of Costa (1968: 7) who illustrated the chelicerae.

***Euandrolaelaps pavlovskii* (Bregetova, 1955) new combination**

Androlaelaps pavlovskii Bregetova, 1955a: 234.

Androlaelaps sardous.—Bregetova, 1953: 308 (misidentification, according to Vinarski & Korallo-Vinarskaya, 2016: 235).

Androlaelaps pavlovskii.—Bregetova, 1955b: 314, 1956: 83; Violovich, 1961: 255; Till, 1963: 12; Zhang *et al*., 1963: 193; Sheals, 1964: 15; Wang & Li, 1965: 238; Allred, 1975: 125; Yang & Li, 1992: 429; Liu *et al*., 2000: 380; Vinarski & Korallo-Vinarskaya, 2016: 235; Halliday *et al*., 2018: 50; Meng *et al*., 2021: 4.

Hypoaspis pavlovskii.—Allred, 1969: 242; Ren & Guo, 2008: 329, 2009: 101.

Hypoaspis (*Euandrolaelaps*) *pavlovskii*.—Bregetova, 1977b: 530; Ishikawa, 1982: 91; Marchenko, 2002: 45.

Hypoaspis (*Laelaspis*) *pavlovskii*.—Karg, 1979: 100, 1982: 248; Deng *et al*., 1993: 174; Yan *et al*., 2008: 2231; Xin *et al*., 2010: 2.

Hypoaspis (*Laelaps*) *pavlovskii*.—Meng *et al*., 2021: 4.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.

Type locality and habitat. Primorsky Territory and Kuril Islands, Russia, on rodents [Animalia: Rodentia].

Note. The shape of the epigynal shield of this species, constricted between coxae IV and bulging posteriorly so as to include *Zv*1, the spur-shaped ventral setae of femur, genu and tibia of leg II and the relatively small pilus dentilis, suggest it belongs to *Euandrolaelaps*.

***Euandrolaelaps sardous* (Berlese, 1911)**

Laelaps (*Androlaelaps*) *sardous* Berlese, 1911b: 433.

Hypoaspis laevis var. *pilifer* Oudemans, 1912b: 231 [junior synonym of *L*. (*A*.) *sardous* by Berlese, 1916a: 67; Evans & Till, 1966: 175; Karg, 1971: 178; Karg, 1993a: 140; Zaher 1986: 187; Farrier & Hennessey, 1993: 64; Keum *et al*., 2016: 478].

Hypoaspis laevis var. *pilifer*.—Oudemans, 1912c: 245.

Androlaelaps pilifer.—Oudemans, 1912d: 262, 1914a: 179; Vitzthum, 1921: 22; Buitendijk, 1945: 298; Hughes, 1948: 136; Turk & Turk, 1952: 483; Turk, 1953: 11; Zumpt & Till, 1953a: 215.

Androlaelaps sardous.—Vitzthum, 1929: 27; Willmann, 1935: 22, 1952b: 425; Wolf, 1938: 644; Sellnick, 1940: 28; Radford, 1943: 61, 1950: 366; Eads, 1952: 239; Bregetova, 1955b: 316, 1956: 83; Piryanik, 1962: 83; Till, 1963: 12; Błaszak, 1969: 31; Mrciak & Brelih, 1972: 343; Ambros, 1983a: 202, 1983b: 144; Castagnoli & Pegazzano, 1985: 369.

Hypoaspis (*Androlaelaps*) *sardous*.—Zumpt & Patterson, 1950: 67.

sardous; *non-Laelaps* [sic].—Tipton, 1960: 306.

Hypoaspis sardoa.—Evans & Till, 1966: 175; Beron, 1974: 180; Lundqvist, 1974: 42; Hughes, 1976: 297; Zaher, 1986: 187; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347.

Hypoaspis (*Hypoaspis*) *sardoa*.—Karg, 1971: 166, 1978b: 20.

Hypoaspis (*Euandrolaelaps*) *sardous*.—Bregetova, 1977b: 530.

Hypoaspis (*Alloparasitus*) *sardoa*.—Karg, 1979: 76, 1982: 237, 1989c: 119, 1993a: 140; Tenorio, 1982: 267; Tenorio *et al*., 1985: 300; Gwiazdowicz & Gulvik, 2005: 119; Huhta & Karg, 2010: 328.

Alloparasitus sardous.—Farrier & Hennessey, 1993: 64; Bernini *et al*., 1995: 27.

Hypoaspis sardous.—Beaulieu, 2009: 37.

Euandrolaelaps sardoa.—Kazemi & Rajaei, 2013: 80; Mahjoori *et al*., 2014: 1603; Nemati & Gwiazdowicz, 2016b: 44; Hajizadeh & Joharchi, 2018: 26; Nemati *et al*., 2018b: 138.

Hypoaspis (*Alloparasitus*) *sardous*.—Keum *et al*., 2016: 478.

Type depository. *L*. (*A*.) *sardous*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *H*. *laevis* var. *pilifer*: author's collection.
Type locality and habitat. *L*. (*A*.) *sardous*: Asuni, Sardinia, Italy, in nests of wild murids (*Apodemus sylvaticus*, according to Berlese, 1916a: 67) [Animalia: Rodentia: Muridae]; *H*. *laevis* var. *pilifer*: Sittard, The Netherlands, in nest of an unidentified mole (*Talpa* sp. according to Berlese, 1916a: 67) [Animalia: Eulypotyphla: Talpidae].
Note. Beaulieu (2009: 37) excluded the possibility that *L*. (*A*.) *sardous* could belong to *Gaeolaelaps*, without assigning it to another genus. Specimens reported as *Androlaelaps sardous* by Bregetova (1953: 308) were re-identified as *A*. *pavlovskii* Bregetova by Vinarski & Korallo-Vinarskaya (2016: 235), whereas specimens reported as *Hypoaspis sardous* by Keum *et al*. (2016: 478) were re-identified as *Laelaspis mandibularis* (Ewing) by Keum *et al*. (2017: 498).

Euandrolaelaps subpavlovskii (Liu *et al*., 2000) new combination

Androlaelaps subpavlovskii Liu, Ma & Ding, 2000: 380.
Androlaelaps subpavlovshi [sic].—Liu & Ma, 2003: 655; Kůrka, 2005: 23; Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.

Type depository. Institute of Parasitic Diseases, Hubei Academy of Medical Sciences, Hubei, China.
Type locality and habitat. About 2000 m above sea level, Shennongjia Forest region (31°15'-31°57'N, 109°56'-110°58'E), Hubei, China, on *Petaurista clarkei* [Animalia: Rodentia: Sciuridae].
Note. The similarity between this species and *E*. *pavlovskii* and the reportedly serrate anterior margin of its epistome suggest that this species belongs to *Euandrolaelaps*.

Euandrolaelaps yamauchii (Ishikawa, 1982) new combination

Hypoaspis (*Euandrolaelaps*) *yamauchii* Ishikawa, 1982: 89.
Alloparasitus yamauchii.—Moreira, 2014: 113.

Type depository. Biological Laboratory, Matsuyama Shinonome Junior College, Matsuyama, Japan; specimen number MSJC-BL 156.
Type locality and habitat. Abandoned mine of Kawashimo-kô, Kawashimo, Tobé-chô, Ehime, Japan, in baited traps.
Note. The similarity of this species with *E*. *pavlovskii* and *E*. *subpavlovskii* suggests that it belongs to *Euandrolaelaps*.

Eumellitiphis Turk, 1948

Eumellitiphis Turk, 1948: 110 (type species: *Eumellitiphis mellitus* Turk, 1948, by monotypy).
Eumellitiphis.—Radford, 1950b: 30; Farrier & Hennessey, 1993: 72; OConnor & Klimov, 2012a,d: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelaptidae.

Eumellitiphis inouei Delfinado-Baker & Baker, 1988

Eumellitiphis inouei Delfinado-Baker & Baker, 1988: 129.
Eumellitiphis inouei.—OConnor & Klimov, 2012d: internet page; Klimov *et al*., 2016: internet page.

Type depository. Systematic Entomology Laboratory, Agricultural Research Service, United Stated Department of Agriculture, Beltsveille, Maryland, United States of America.
Type locality and habitat. Sawahlunto, Sumatera Barat, Sumatra, in nest of *Trigona thoracica* [Animalia: Hymenoptera: Apidae].

***Eumellitiphis mellitus* Turk, 1948**

Eumellitiphis mellitus Turk, 1948: 111.

Eumellitiphis mellitus.—Radford, 1950b: 30; Delfinado-Baker & Baker, 1988: 129; Farrier & Hennessey, 1993: 72; OConnor & Klimov, 2012d: internet page; Klimov *et al*., 2016: internet page.

Type depository. Unspecified.

Type locality and habitat. Arena Forest, Trinidad, in nest of *Lestimellita limao* [Animalia: Hymenoptera: Apidae].

***Eumellitiphis philippinensis* Delfinado-Baker & Baker, 1988**

Eumellitiphis philippinensis Delfinado-Baker & Baker, 1988: 131.

Eumellitiphis philippinensis.—OConnor & Klimov, 2012d: internet page.

Type depository. Systematic Entomology Laboratory, Agricultural Research Service, United Stated Department of Agriculture, Beltsveille, Maryland, United States of America.

Type locality and habitat. Inopacan, Leyte, Philippines, on *Trigona* sp. [Animalia: Hymenoptera: Apidae].

***Gaeolaelaps* Evans & Till, 1966**

Hypoaspis (*Gaeolaelaps*) Evans & Till, 1966: 160 (type species: *Laelaps aculeifer* Canestrini, 1884, by original designation).

Hypoaspis.—Canestrini, 1885: 55 (in part); Bregetova, 1955b: 292 (in part); Zhang *et al*., 1963: 186 (in part); Hughes, 1976: 292 (in part); Karg, 1979: 66 (in part), 1993a: 133 (in part); Zaher, 1986: 185 (in part); Domrow, 1988: 825; Deng *et al*., 1993: 157 (in part).

Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).

Hypoaspis (*Geolaelaps*) Berlese, 1923a: 254 (*nomen nudum*, ICZN Article 12).

Gymnolaelaps.—Vitzthum, 1929: 22 (in part).

Gaeolaelaps Trägårdh, 1952: 66 (*nomen nudum*; ICZN Article 13.1).

Gaeolaelaps.—Athias-Henriot, 1968: 237; Casanueva, 1993: 40; Beaulieu, 2009: 35; Kazemi *et al*., 2014: 504; Hajizadeh & Joharchi, 2018: 26; Joharchi *et al*., 2018a: 27, 2021a: 255; Halliday, 2019: internet page; Mašán & Babaeian, 2019: 502.

Hypoaspis (*Hypoaspis*).—Aswegen & Loots, 1970: 169 (in part).

Hypoaspis (*Gaeolaelaps*).—Karg, 1971: 160 (in part); Faraji *et al*., 2008: 207.

Hypoaspis (*Holostaspis*).—Karg, 1971: 171 (in part).

Hypoaspis (*Geolaelaps*).—Bregetova, 1977b: 499; Karg, 1979: 79, 1982: 237, 1989a: 107, 1993a: 136 (in part).

Hypoaspis s.l.—Evans & Till, 1979: 202 (in part).

Geolaelaps.—Rosario, 1981: 46; Walter & Oliver, 1989: 295; Farrier & Hennessey 1993: 72; Hunter, 1993: 23; Karg & Schorlemmer, 2013: 203; Gwiazdowicz *et al*., 2014: 441.

Hypoaspis (*Osmodermus*) Arutunjan, 1990c: 185 (type species: *Hypoaspis breiti*, by monotypy) **new synonymy.**

Note. *Gaeolaelaps* was described in Dermanyssidae-Laelapinae, included (as a synonym of *Hypoaspis*) in Laelapidae-Laelapinae by Evans & Till (1979: 202) and (as a subgenus of *Hypoaspis*) in Laelapidae by Bregetova (1977b). The use of the names *Gaeolaelaps* and *Geolaelaps* was extensively discussed by Halliday & Lindquist (2007: 65). The generic concepts of Beaulieu (2009: 35) and Kazemi *et al*. (2014: 504) are adopted in this publication.

***Gaeolaelaps acanthopedus* Joharchi & Friedrich, 2021**

Gaeolaelaps acanthopedus Joharchi & Friedrich, 2021: 57.

Type depository. Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru.

Type locality and habitat. Monte Potrero (9°54'30"S, 76°03'48"W), west of Molino, Huánuco, Peru, in soil-litter.

***Gaeolaelaps aculeifer* (Canestrini, 1884)**

Laelaps aculeifer Canestrini, 1884: 698.

Hypoaspis aculeifer.—Canestrini, 1885: 84; Oudemans, 1902d: 24, 1903a: 129; Falconer, 1923: 275; Sellnick, 1931: 695, 1958: 23; Lombardini, 1936: 42; Wolf, 1938: 644; Willmann, 1949a: 115, 1951: 117, 1952a: 146; Turk, 1953: 11; Bregetova, 1955b: 294, 1956: 77; Fonseca, 1958a: 50; Costa, 1961b: 258, 1962: 489, 1966a: 74, 1966b: 141, 1968: 11; Piryanik, 1962: 87; Zhang *et al*., 1963: 189; Strandtmann, 1963: 3; Karg, 1965: 312, 1978b: 18; Evans & Till, 1966: 166; Solomon, 1968b: 675; Solomon & Roznovăţ, 1969: 288; Bhattacharyya, 1968: 540; Lapinya, 1970: 278, 1976: 31; Beron, 1974: 176; Hughes, 1976: 292; Chelebiev, 1981: 185; Neves & Carmona, 1982: 295; Niedbała *et al*., 1982: 247, 1990: 32; Zeman, 1982: 233; Castagnoli & Pegazzano, 1985: 3; Radovsky, 1985: 453; Ruf & Koehler, 1993: 198; Bai *et al*., 1994: 299; Strong & Halliday, 1994: 87; Ma, 1996: 48; Çobanoğlu & Bayram, 1998: 190; Halliday, 1998: 125; Gwiazdowicz, 2003: 8; Liu & Ma, 2003: 654; Kůrka, 2005: 24; Ren & Guo, 2008: 329, 2009: 101; Fouly & Al-Rehiayani, 2011: 145; Kontschán *et al*., 2015b: 60; Telnov & Salmane, 2015: 130; Keum *et al*., 2016: 478; Ma, 2016b: 95; Manu *et al*., 2021: 5.

Laelaps (*Iphis*) *aculeifer*.—Berlese, 1892b: 10; Halbert, 1923: 367.

Laelaps aculeifer.—Berlese, 1892f: 42; Sheals, 1964: 15.

Laelaps (*Eulaelaps*) *aculeifer*.—Berlese, 1903b: 13.

Androlaelaps concisus Womersley, 1956a: 579 [junior synonym of *L. aculeifer* by Strong & Halliday, 1994: 87; Halliday, 1998: 125].

aculeifer; *non-Laelaps* [sic].—Tipton, 1960: 286.

Hypoaspis (*Hypoaspis*) *aculeifer*.—Karg, 1962: 61, 1971: 171.

Gaeolaelaps aculeifer.—Hyatt, 1964: 472; Athias-Henriot, 1968: 247; Beaulieu, 2009: 36; Bahrami *et al*., 2011: 351; Kazemi & Rajaei, 2013: 82; Kavianpour *et al*., 2013: 8, 2017: 160; Tajmiri & Hajizadeh, 2013: 17; Ghasemi-Moghadam *et al*., 2014: 964; Hasanvand *et al*., 2014a: 95, 2014b: 2868; Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 516; Mahjoori *et al*., 2014: 1601; Khalili-Moghadam & Saboori, 2015: 318; Kordeshami *et al*., 2015: 592; Ramroodi *et al*., 2015a: 79; Maleki *et al*., 2016: 186; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237; Saberi *et al*., 2016: 128; Trach, 2016: 7; Hajizadeh & Joharchi, 2018: 26; Nemati *et al*., 2018b: 120, 2018c: 233; Yan *et al*., 2018: 262; Halliday, 2019: internet page; Gwiazdowicz *et al*., 2020a: 522; Kazemi, 2020: 137; Joharchi *et al*., 2021b: 273.

Hypoaspis (*Gaeolaelaps*) *aculeifer*.—Evans & Till, 1965a: 260; Luxton, 1998: 20; Faraji *et al*., 2008: 207.

Hypoaspis aculifer [sic].—Mrciak & Brelih, 1972: 343; Pinto-da-Rocha, 1995: 87; Munderloh, 1996: 590.

Hypoaspis (*Geolaelaps*) *aculeifer*.—Bregetova, 1977b: 503; Karg, 1979: 84, 1982: 242, 1989c: 116, 1993a: 143, 2000: 247; Teng, 1982: 162; Tenorio, 1982: 262; Tenorio *et al*., 1985: 300; Chelebiev, 1988: 11; Arutunjan, 1990: 96; Deng *et al*., 1993: 159; Gwiazdowicz & Biernacik, 2000: 203; Sklyar, 2001: 100; Gwiazdowicz & Gulvik, 2005: 119; Gabryś *et al*., 2008: 48; Yan *et al*., 2008: 2229; Skorupski *et al*., 2013: 10.

Hypoaspis (*Geolaelaps*) *consisa* [sic].—Karg, 1979: 84, 1982: 242, 1989c: 116.

Hypoaspis aculefer [sic].—Radovsky, 1985: 453.

Geolaelaps aculeifer.—Walter & Oliver, 1989: 295; Farrier & Hennessey, 1993: 72; Dowling & OConnor, 2010: 304; Tajmiri & Hajizadeh, 2013: 17; Granpayeh & Ostovan, 2014: 614.

Geolaelaps aculeifer aculeifer.—Bernini *et al*., 1995: 28.

Androlaelaps novemspinosus Li, Yang & Zhang, 1998: 264 [junior synonym of *L. aculeifer* by Ma, 2016b: 95; Ma & Lin 2019: 66].

Androlaelaps novemspinosus.—Kůrka, 2005: 23; Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.

Gaeolaelaps aculiefer [sic].—Kazemi & Yazdanpanah, 2013: 270.

Geaolaelaps aculiefer [sic].—Yazdanpanah & Kazemi, 2014: 333.

Gaeolaelaps aculifer [sic].—Amani *et al*., 2015: 92.

Androlaelaps aculeifer.—Ma 2016a: 20; Ma & Lin 2019: 66; Lin *et al*., 2019: 128.

Type depository. *L. aculeifer*: unspecified; *A. concisus*: South Australian Museum, Adelaide, Australia; *A. novemspinosus*: Research Institute of Endemic Disease Control of Qinghai province, Qinghai, China.

Type locality and habitat. *L. aculeifer*: Botanical garden, Padua, Italy, from unspecified substrate; *A. concisus*: Holland, intercepted at Perth, Western Australia, on *Begonia* sp. bulb [Plantae: Cucurbitales: Begoniaceae], with *Rhizoglyphus echinopus* [Acari: Sarcoptiformes: Acaridae]; *A. novemspinosus*: 2400 m above sea level, Huangzhong (36°34'N, 101°54'E), Qinghai, China, in nest of *Cricetulus longicaudatus* [Animalia: Rodentia: Cricetidae].
Note. Oudemans (1929a: 393, 1929e: 88) and Buitendijk (1945: 295) considered *H. aculeifer* to be a junior synonym of *Acarus cadaverinus* Hermann [Acari: Sarcoptiformes: Acaridae], but that was not accepted by Strandtmann (1963: 3) and is not accepted in this publication. Ryke (1963: 11) suspected *A. concisus* to belong to *Geolaelaps*. Kazemi *et al*. (2014: 519) suspected *L. aculeifer* to be a senior synonym of *Hypoaspis* (*Hypoaspis*) *gergus* Hafez *et al*.

***Gaeolaelaps aculeiferoides* (Teng, 1982)**
Hypoaspis (*Geolaelaps*) *aculeiferoides* Teng, 1982: 161.
Hypoaspis (*Geolaelaps*) *aculeiferoides*.—Deng *et al*., 1993: 160; Yan *et al*., 2008: 2229.
Hypoaspis aculeiferoides.—Ren & Guo, 2008: 329, 2009: 101; Ma, 2016b: 95.
Gaeolaelaps aculeiferoides.—Beaulieu, 2009: 37; Kazemi *et al*., 2014: 504; Yan *et al*., 2018: 262; Joharchi *et al*., 2019a: 478, 2019d: 342; Kafi *et al*., 2020: 72.

Type depository. Institute of Zoology, Academia Sinica, Taipei, China.
Type locality and habitat. Beijing, China, in nest of *Citellus dauricus* [Animalia: Rodentia: Sciuridae].
Note. Ma (2016b: 95) considered this species to be the same as *Hypoaspis fujianensis* Wang & Liao (*nomen nudum*; ICZN Article 16.4.2).

***Gaeolaelaps ahangarani* Kazemi & Beaulieu, 2014**
Gaeolaelaps ahangarani Kazemi & Beaulieu, in Kazemi *et al*., 2014: 514.
Gaeolaelaps ahangarani.—Trach, 2016: 13; Nemati *et al*., 2018b: 139, 2018c: 233.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.
Type locality and habitat. 1465 m above sea level, Tirom Forest (40°62'69"N, 47°11'26"E), Tonecabon, Mazandaran province, Iran, in decaying wood of beech [Plantae: Fagales: Fagaceae] trees.

***Gaeolaelaps altaiensis* Joharchi, 2021**
Gaeolaelaps altaiensis Joharchi, in Joharchi *et al*., 2021a: 241.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 1533 m above sea level, Ulaganskiy Rayon (50°14'N, 87°42'E), Chuysky Trakt, Altai Republic, Russia, in nest of *Lasius* sp. [Animalia: Hymenoptera: Formicidae].

***Gaeolaelaps americanus* Gwiazdowicz *et al*., 2020**
Gaeolaelaps americanus Gwiazdowicz, Nemati & Riahi, 2020a: 527.
Gaeolaelaps americanus.—Joharchi & Friedrich, 2021: 69.

Type depository. Ohio State University Acarology Laboratory, Columbus, Ohio, United States of America; specimen number OSAL 31039.
Type locality and habitat. Big Island Wildlife Area, Marion, Ohio, United States of America, in forest litter.

***Gaeolaelaps analis* (Karg, 1982)**
Hypoaspis (*Geolaelaps*) *analis* Karg, 1982: 251.
Hypoaspis (*Geolaelaps*) *analis*.—Karg, 1989c: 117, 2000: 247.
Gaeolaelaps analis.—Kazemi *et al*., 2014: 516; Joharchi & Friedrich, 2021: 68.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Venezuela, in soil.

***Gaeolaelaps andensis* Joharchi & Friedrich, 2021**
Gaeolaelaps andensis Joharchi & Friedrich, 2021: 62.

Type depository. Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Peru.
Type locality and habitat. Monte Potrero (9°54'30"S, 76°03'48"W), west of Molino, Huánuco, Peru, in soil-litter.

***Gaeolaelaps angustiscutatus* (Willmann, 1951)**
Hypoaspis angustiscutatus Willmann, 1951: 117.
Hypoaspis angustiscutatus.—Karg, 1965: 312; Hirschmann *et al*., 1969: 140.
Hypoaspis elongatus Götz, in Hirschmann *et al*., 1969: 140 [junior synonym of *H. angustiscutatus* by Bregetova, 1977b: 504; Karg, 1993a: 141].
Hypoaspis (*Hypoaspis*) *angustiscutata*.—Karg, 1971: 169.
Hypoaspis (*Hypoaspis*) *elongata*.—Karg, 1971: 169.
Hypoaspis angusticutatus [sic].—Lapinya, 1976: 31.
Hypoaspis (*Geolaelaps*) *angustiscutata*.—Bregetova, 1977b: 504; Karg, 1979: 81, 1982: 239, 1993a: 141.
Hypoaspis (*Geolaelaps*) *elongata*.—Karg, 1979: 81, 1982: 239.
Gaeolaelaps angustiscutatus.—Beaulieu, 2009: 36; Trach, 2012: 161, 2016: 10; Kavianpour *et al*., 2013: 7; Kazemi & Rajaei, 2013: 83; Nemati & Kavianpour, 2013: 71; Kavianpour & Nemati, 2014: 321; Kazemi *et al*., 2014: 504; Hajizadeh & Joharchi, 2018: 26.
Cosmolaelaps mirificus Sklyar, 2012: 80 [junior synonym of *H. angustiscutatus* by Joharchi & Trach, 2019: 492].
Gaeolaelaps elongata.—Nemati & Kavianpour, 2013: 71.
Hypoaspis angustiscutata.—Kontschán *et al*., 2015b: 60.
Cosmolaelaps angustiscutatus.—Nemati & Gwiazdowicz, 2016a: 544; Kavianpour *et al*., 2017: 163, 2018: 183; Nemati *et al*., 2018b: 134; Joharchi & Trach, 2019: 492.
Gaeolaelaps elongatus.—Trach, 2016: 10; Kavianpour e*t al*., 2018: 184; Joharchi *et al*., 2019f: 574.

Type depository. *H. angusticustatus*: in Willmann's collection; *H. elongatus*: unspecified; *C. mirificus*: I.I. Schmalhausen Institute of Zoology, National Academy of Sciences, Kiev, Ukraine; specimen number 119.
Type locality and habitat. *H. angusticustatus*: 140 m above sea level, Leitha River, Zurndorf, Pannonian Basin, Austria, in soil of a swamp with moss and grass; *H. elongatus*: unspecified (probably Germany), from unspecified substrate; *C. mirificus*: Zaporozhye region, Novonikolaevka, Ukraine, in litter of a meadow.
Note. Hirschmann *et al*. (1969: 14) and Kazemi *et al*. (2014: 520) considered *H. elongatus* to be very similar to *H. angustiscutatus*. Based on the redescription of Lapinya (1976: 31), Beaulieu (2009: 37) pointed out that the latter species had at least some dorsal setae inflated near the base, as typical (though not exclusive) of *Cosmolaelaps*, while Nemati & Gwiazdowicz (2016a: 544) transferred it to *Cosmolaelaps*, suspecting it to be a senior synonym of *C. acutiscutus* and *C. subacutiscutus*. Kavianpour *et al*. (2018: 183) expressed their uncertainly about the generic placement of *H. angustiscutatus* and *H. elongatus* and their possible synonymy. Joharchi & Trach (2019: 492) suspected *Laelaps* (*Hypoaspis*) *gryllotalpae* to be a senior synonym of *H. angustiscutatus*.

***Gaeolaelaps arabicus* (Hafez *et al*., 1982)**
Hypoaspis (*Hypoaspis*) *arabicus* Hafez, Elbadry & Nasr, 1982: 4.
Hypoaspis arabicus Hafez, Elbadry & Nasr, 1982: 9.
Hypoaspis arabicus.—Zaher, 1986: 188; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347.
Gaeolaelaps arabicus.—Nemati & Mohseni, 2013: 80; Vatankhah *et al*., 2016: 572; Nemati *et al*., 2018: 233; Kazemi, 2020: 136.

Type depository. Unspecified.
Type locality and habitat. Faculty of Agriculture, Cairo University, Giza, Egypt, in manure.
Note. Without referring to Nemati & Mohseni (2013: 80), Kazemi *et al*. (2014: 519) considered that this species could belong to *Gaeolaelaps*.

***Gaeolaelaps ardoris* (Karg, 1993)**
Hypoaspis (*Geolaelaps*) *ardoris* Karg, 1993b: 263.
Gaeolaelaps ardoris.—Moreira, 2014: 242; Nemati & Gwiazdowicz, 2016b: 44.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Tortuga Bay, Santa Cruz, Galapagos Islands, in moist litter in rock crevices.
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps* based on its hypertrichous dorsal shield (more than 60 pairs of setae), without assigning it to another genus.

***Gaeolaelaps armstrongi* (Womersley, 1956)**
Androlaelaps armstrongi Womersley, 1956a: 576.
Hypoaspis (*Geolaelaps*) *armstrongi*.—Karg, 1979: 84, 1982: 242, 1989c: 116.
Hypoaspis armstrongi.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 24.
Gaeolaelaps armstrongi.—Moreira, 2014: 242.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Acacia Plateau, New South Wales, Australia, on unidentified beetle [Animalia: Coleoptera].
Note. Ryke (1963: 11) suspected this species to belong to *Gaeolaelaps*. We agree provisionally with this hypothesis and with the placement proposed by Karg (1979, 1982, 1989), associating this species with *Gaeolaelaps*, at the generic level.

***Gaeolaelaps atomarius* (Berlese, 1916)**
Hypoaspis atomarius Berlese, 1916b: 167.
Hypoaspis atomarius.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 28.
Hypoaspis (*Pneumolaelaps*) *atomarius*.—Aswegen & Loots, 1970: 208.
Pneumolaelaps atomarius.—Rosario, 1981: 72.
Hypoaspis (*Geolaelaps*) *atomaria*.—Karg, 1982: 242, 1989c: 116.
Hypoaspis atomaria.—Strong & Halliday, 1994: 91; Strong, 1995: 222.
Hypoaspis (*sensu lato*) *atomarius* [sic].—Kazemi *et al*., 2014: 514.
Gaeolaelaps atomarius.—Kazemi *et al*., 2014: 514; Joharchi *et al*., 2019f: 569; Gwiazdowicz *et al*., 2020a: 529.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Mogadishu, Somalia (cited as Mogadiscio, Somalia italiana), on unidentified Coleoptera.
Note. Hunter & Husband (1973: 77) suspected this species to belong to *Androlaelaps*, whereas Beaulieu (2009:

37) excluded this species from *Gaeolaelaps* because it has two ventral setae on genu IV, without assigning it to another genus. In this publication we maintain it in *Gaeolaelaps*, as used in most recent publications, and because it otherwise fits well within the accepted concept of the genus, apart from the different genu IV chaetotaxy.

***Gaeolaelaps azul* Marticorena *et al*., 2020**
Gaeolaelaps azul Marticorena, Moreira & Moraes, 2020: 334.

Type depository. Departamento de Entomologia e Acarologia, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo, Brazil.
Type locality and habitat. Jataí (17°54'26"S, 51°35'56"W), Goiás state, Brazil, in litter of a sugarcane field, cultivar RB 855453.

***Gaeolaelaps baichengensis* (Ma, 2000)**
Hypoaspis baichengensis Ma, 2000a: 384.
Hypoaspis baiehengensis [sic].—Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps baichengensis.—Yan *et al*., 2018: 261.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Baicheng (45°37'N, 122°49'E), Jilin province, China, in soil of poplar [Plantae: Malpighiales: Salicaceae] forest.

***Gaeolaelaps barbarae* (Strong, 1995)**
Hypoaspis barbarae Strong, 1995: 221.
Hypoaspis barbarae.—Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 24.
Gaeolaelaps barbarae.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 516; Trach, 2016: 13.
Hypoaspis (*Gaeolaelaps*) *barbarae*.—Faraji & Halliday, 2009: 249.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Australian Capital Territory, Australia, on *Hadronyche* sp. [Animalia: Araneae: Atracidae].

***Gaeolaelaps barbatula* (Karg, 1989)**
Hypoaspis (*Geolaelaps*) *barbatula* Karg, 1989d: 3.
Hypoaspis barbatula.—Kůrka, 2005: 24.
Gaeolaelaps (?) *barbatulae* [sic].—Kazemi *et al*., 2014: 522.
Gaeolaelaps barbatula.—Moreira, 2014: 243.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Leutratal Nature Reserve, near Jena, Germany, on *Arrhenatheretum* sp. [Plantae: Poales: Poaceae].
Note. Kazemi *et al*. (2014: 522) tentatively placed this species in *Gaeolaelaps* because it fits well the concept, except for the conspicuously barbed *Z*5. The barbs of *Z*5 could in fact be less conspicuous then shown in the original description, and compatible with the barbs on posteriomost setae (*J*4–5, *Z*5, *S*4–5) observed in several *Gaeolaelaps* species.

***Gaeolaelaps baywangus* (Rosario, 1981) new combination**
Pneumolaelaps baywangus Rosario, 1981: 70.

Type depository. Unspecified.
Type locality and habitat. Makiling Botanical Garden, Mount Makiling, College, Laguna, Philippines, in secondary forest litter.
Note. This species is transferred to *Gaeolaelaps* because it does not have diagnostic features of *Pneumolaelaps* (broad peritremes, smooth-margined epistome), and apart from having two ventral setae on genu IV, it is otherwise compatible with *Gaeolaelaps*.

***Gaeolaelaps blattae* (Strong & Halliday, 1994)**
Hypoaspis blattae Strong & Halliday, 1994: 88.
Hypoaspis blattae.—Strong, 1995: 222, 1996: 426; Halliday, 1998: 125; Kůrka, 2005: 24.
Gaeolaelaps blattae.—Beaulieu, 2009: 36; Joharchi & Babaeian, 2014: 94; Halliday, 2019: internet page.
Hypoaspis (*Gaeolaelaps*) *blattae*.—Faraji & Halliday, 2009: 249.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Dimbulah, Queensland, Australia, on *Macropanesthia rhinoceros* [Animalia: Blattodea: Blaberidae].
Note. Faraji & Halliday (2009: 246) considered that some of the paratypes of *H. blattae* were misidentified, and they were designated as paratypes of *Hypoaspis* (*Gaeolaelaps*) *concavus* Faraji & Halliday and *Hypoaspis* (*Gaeolaelaps*) *segregatus* Faraji & Halliday.

***Gaeolaelaps bochkovi* Joharchi *et al*., 2019**
Gaeolaelaps bochkovi Joharchi, Khaustov & Ermilov, 2019b: 222.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. Zanzibar (6°16'S, 39°25'E), Tanzania, in litter.

***Gaeolaelaps bregetovae* (Shereef & Afifi, 1980)**
Hypoaspis bregetovae Shereef & Afifi, 1980: 129.
Hypoaspis bregetovae.—Zaher, 1986: 189; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347.
Gaeolaelaps bregetovae.—Nemati & Mohseni, 2013: 80; Vatankhah *et al*., 2016: 572; Kavianpour e*t al*., 2018: 184; Joharchi *et al*., 2019f: 574.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.
Type locality and habitat. Giza, Egypt, in manure.
Note. Without referring to Nemati & Mohseni (2013: 80), Kazemi *et al*. (2014: 519) considered that this species could belong to *Gaeolaelaps*.

***Gaeolaelaps breiti* (Arutunjan, 1990)**
Hypoaspis breiti Arutunjan, 1990c: 184.
Hypoaspis (*Osmodermus*) *breiti*.—Arutunjan, 1990c: 185.

Type depository. Acarology Laboratory, Institute of Zoology, Armenian Academy of Science, Armenia; specimen number 92.

Type locality and habitat. Near Vienna, Austria, on *Osmoderma eremita* [Animalia: Coleoptera: Scarabaeidae, Cetoniinae].
Note. Trach & Joharchi (2012: 219) suspected that this species could be a senior synonym of *Hypoaspis eremitus* Sklyar.

***Gaeolaelaps brevior* (Faraji & Halliday, 2009)**
Hypoaspis (*Gaeolaelaps*) *brevior* Faraji & Halliday, 2009: 252.
Gaeolaelaps brevior.—Walter & Moser, 2010: 405; Kazemi *et al*., 2014: 505; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Dawson Range (23°49'S, 149°06'E), Blackdown Tableland, Queensland, Australia, on *Parapanesthia* sp. [Animalia: Blattodea: Blaberidae].

***Gaeolaelaps brevipellis* (Karg, 1979)**
Hypoaspis (*Geolaelaps*) *brevipellis* Karg, 1979: 87.
Hypoaspis (*Geolaelaps*) *brevipellis*.—Karg, 1982: 243, 1989c: 117, 2000: 247.
Gaeolaelaps brevipellis.—Nemati & Mohseni, 2013: 75; Gwiazdowicz *et al*., 2020a: 526; Joharchi & Friedrich, 2021: 67.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near El Bolsón, Epuyen and El Bolson, Argentina, in litter.

***Gaeolaelaps brevipilis* (Bernhard, 1969)**
Hypoaspis (*Hypoaspis*) *brevipilis* Bernhard, in Hirschmann *et al*., 1969: 133.
Hypoaspis (*Hypoaspis*) *brevipilis*.—Karg, 1971: 171.
Hypoaspis (*Geolaelaps*) *brevipilis*.—Karg, 1979: 85, 1982: 243, 1989c: 116, 1993a: 144; Gwiazdowicz & Biernacik, 2000: 203; Mašán, 2001: 216; Gwiazdowicz & Klemt, 2004: 14; Gwiazdowicz & Gulvik, 2005: 119; Gabryś *et al*., 2008: 48.
Hypoaspis brevipilis.—Gwiazdowicz, 2003: 9; Ma *et al*., 2008: 6.
Gaeolaelaps brevipilis.—Beaulieu, 2009: 37; Nemati & Mohseni, 2013: 76; Nemati *et al*., 2018c: 228; Yan *et al*., 2018: 261.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, in sludge.
Note. Bregetova (1977b: 504) and Karg (1979: 85, 1982: 243, 1989c: 116, 1993a: 144) suspected this species to be a junior synonym of *Laelaps elegantulus* Berlese.

***Gaeolaelaps carabidophilus* Trach, 2012**
Gaeolaelaps carabidophilus Trach, 2012: 158.
Gaeolaelaps carabidophilus.—Nemati & Mohseni, 2013: 79; Kazemi *et al*., 2014: 504; Trach, 2016: 15; Vatankhah *et al*., 2016: 571; Saeidi *et al*., 2019: 123; Kazemi *et al*., 2020: 1985.

Type depository. Museum of Zoology, I.I. Mechnikov Odessa National University, Odessa, Ukraine; slide number 4–07–2010/01.
Type locality and habitat. Vicinity of Zatoka (46°00'N, 30°23'E), Belgorod-Dnestrovsky, Odessa, Ukraine, on *Stenophus mixtus* [Animalia: Coleoptera: Carabidae].

***Gaeolaelaps cerata* (Karg, 1982)**
Hypoaspis (*Geolaelaps*) *cerata* Karg, 1982: 251.
Hypoaspis (*Geolaelaps*) *cerata*.—Karg, 2000: 247, 2006: 148.
Gaeolaelaps cerata.—Nemati & Mohseni, 2013: 80; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2019c: 272; Joharchi & Friedrich, 2021: 62.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Venezuela, in soil.

***Gaeolaelaps cerrii* Marticorena *et al*., 2020**
Gaeolaelaps cerrii Marticorena, Moreira & Moraes, 2020: 338.

Type depository. Departamento de Entomologia e Acarologia, Escola Superior de Agricultura "Luiz de Queiroz", Piracicaba, São Paulo, Brazil.
Type locality and habitat. Valparaiso (21°14'17"S, 50°47'27"W), São Paulo, Brazil, in soil of a grassland dominated by *Brachiaria* sp. grass [Plantae: Poales: Poaceae].

***Gaeolaelaps chaetopus* (Meledzhayeva, 1963) new combination**
Hypoaspis chaetopus Meledzhayeva, 1963: 49.
Hypoaspis chaetopus.—Amanniyazova, 1976: 92.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series, Lengych, on clawed ground squirrel [Animalia: Rodentia: Sciuridae]; Kizyldzha-Baba, on great gerbil [Animalia: Rodentia: Sciuridae]; Zakhmet, in nest of a great gerbil; Kara-Belenda, on clawed ground squirrel [Animalia: Rodentia: Sciuridae]; Kizyldzha-Baba, in tunnel of a great gerbil; Karakum Canal, on great gerbil; all in Karakum, Turkmenistan.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it does not have macrosetae on the dorsal shield. It appears to be a species of *Gaeolaelaps*, where we place it provisionally.

***Gaeolaelaps changlingensis* (Ma, 2000)**
Hypoaspis changlingensis Ma, 2000b: 150.
Hypoaspis changlingensi [sic].—Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps changlingensis.—Nemati & Kavianpour, 2013: 71; Kazemi *et al*., 2014: 510; Yan *et al*., 2018: 262.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Taipingchuan (44°24'N, 123°11'E), Changling, Jilin province, China, in soil.

***Gaeolaelaps ciconia* (Karg, 1979)**
Hypoaspis (*Geolaelaps*) *ciconia* Karg, 1979: 82.
Hypoaspis (*Geolaelaps*) *ciconia*.—Karg, 1982: 241, 1987: 299, 1989c: 118, 1989d: 5.
Gaeolaelaps ciconia.—Moreira, 2014: 245; Nemati & Gwiazdowicz, 2016b: 44.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Rio Azul Valley, near El Bolsón [Rio Negro], Argentina, in litter of *Nothofagus dombeyi* [Plantae: Fagales: Nothofagaceae].
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps*, because of its moderate hypertrichy in the opisthonotal region, without assigning it to another genus.

***Gaeolaelaps circularis* Hyatt, 1964**
Gaeolaelaps circularis Hyatt, 1964: 470.
Hypoaspis (*Geolaelaps*) *circularis*.—Karg, 1979: 84, 1982: 242, 1989c: 116.
Gaeolaelaps circularis.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 505; Joharchi *et al*., 2020g: 444; Marticorena *et al*., 2020: 343; Joharchi & Friedrich, 2021: 62.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.19.
Type locality and habitat. Mérida, Venezuela, on unidentified passalid beetle [Animalia: Coleoptera: Passalidae].

***Gaeolaelaps concavus* (Faraji & Halliday, 2009)**
Hypoaspis (*Gaeolaelaps*) *concavus* Faraji & Halliday, 2009: 246.
Gaeolaelaps concavus.—Joharchi & Babaeian, 2014: 94; Kazemi *et al*., 2014: 504; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Duaringa, Queensland, Australia, on *Macropanesthia rhinoceros* [Animalia: Blattodea: Blaberidae].
Note. Faraji & Halliday (2009: 246) considered that some of the paratypes of *H. blattae* were misidentified, and they were designated as paratypes of *Hypoaspis* (*Gaeolaelaps*) *concavus* Faraji & Halliday and *Hypoaspis* (*Gaeolaelaps*) *segregatus* Faraji & Halliday.

***Gaeolaelaps concinna* (Teng, 1982)**
Hypoaspis (*Geolaelaps*) *concinna* Teng, 1982: 160.
Hypoaspis (*Geolaelaps*) *concinna*.—Deng *et al*., 1993: 165; Yan *et al*., 2008: 2229.
Hypoaspis concinna.—Kůrka, 2005: 24; Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps concinna.—Beaulieu, 2009: 37.
Gaeolaelaps condinna [sic].—Yan *et al*., 2018: 262.

Type depository. Institute of Zoology, Academia Sinica, Taipei, China.
Type locality and habitat. Beijing, China, in nest of *Tscherskia triton* (cited as *Cricetus triton*) [Animalia: Rodentia: Cricetidae].

***Gaeolaelaps corpolongus* Rosario, 1981**
Geolaelaps corpolongus Rosario, 1981: 48.
Gaeolaelaps corpolongus.—Strong & Halliday, 1994: 91; Beaulieu, 2009: 37.

Type depository. Unspecified.
Type locality and habitat. Mount Makiling, Mud Spring Area, College, Laguna, Philippines, on *Panesthia* sp. [Animalia: Blattodea: Blaberidae] from decomposing bark of fallen log.

***Gaeolaelaps cubaensis* Joharchi *et al*., 2019**
Gaeolaelaps cubaensis Joharchi, Halliday, Tolstikov & Trach, 2019d: 339.
Gaeolaelaps cubaensis.—Joharchi *et al*., 2019a: 478; Kafi *et al*., 2020: 72.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. North of Matanzas province, Cuba, in soil and litter.

***Gaeolaelaps cucumerus* (Nasr & Nawar, 1989) new combination**
Hypoaspis cucumerus Nasr & Nawar, 1989a: 71.
Hypoaspis cucumerus.—Shereef *et al*., 1992: 1131; Nawar *et al*., 1993: 347.

Type depository. Acarology Research Unit, National Research Centre, Dokki, Cairo, Egypt and Agricultural Zoology Department, Faculty of Agriculture, Cairo University, Giza, Egypt.
Type locality and habitat. Qassasin, Ismailia, Egypt, in soil under *Cucumerus melon* [sic] [probably *Cucumis melo*; Plantae: Cucurbitales: Cucurbitaceae].
Note. This species does not fit the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Kazemi *et al*. (2014: 519) considered that it could belong to *Gaeolaelaps*, and we agree with that assessment.

***Gaeolaelaps curtipilus* (Greim, 1969) new combination**
Hypoaspis curtipilus Greim, in Hirschmann *et al*., 1969: 138.
Hypoaspis (*Holostaspis*) *curtipilis* [sic].—Karg, 1971: 175.
Hypoaspis (*Pneumolaelaps*) *curtipilis* [sic].—Karg, 1979: 91, 1982: 246, 1993a: 151.
Hypoaspis curtipilis [sic].—Karg, 1984: 39.
Hypoaspis (*Pneumolaelaps*) *curtipilus*.—Faraji *et al*., 2008: 208.
Pneumolaelaps curtipilus.—Kazemi & Rajaei, 2013: 94; Babaeian *et al*., 2019a: 328.

Type depository. Unspecified.
Type locality and habitat. Type series, Erlangen-Bayreuth-Steigerwald, Germany, on *Camponotus ligniperda*, *Lasius alienus*, *L. flavus*, *L. fuliginosus* [Animalia: Hymenoptera: Formicidae].
Note. From the information provided in the literature, this species seems to be a typical *Gaeolaelaps* with opisthogaster not hypertrichous and peritreme with normal width, in contrast with our concept of *Pneumolaelaps*.

***Gaeolaelaps dactylifera* (Fouly & Al-Rehiayani, 2011)**
Hypoaspis dactylifera Fouly & Al-Rehiayani, 2011: 145.
Gaeolaelaps dactylifera.—Nemati & Kavianpour, 2013: 70; Kazemi *et al*., 2014: 505.

Type depository. Zoology Laboratory, College of Agriculture and Veterinary Medicine, Qassim University, Saudi Arabia.
Type locality and habitat. Melida, Al-Qassim, Saudi Arabia, in litter.
Note. Without referring to the placement of this species in *Gaeolaelaps* by other authors, Joharchi *et al*. (2014: 573) suggested that it could belong to *Gaeolaelaps*.

***Gaeolaelaps dasypus* (Menzies & Strandtmann, 1952)**
Hypoaspis dasypus Menzies & Strandtmann, 1952: 265.
Hypoaspis dasypus.—Zhang *et al*., 1963: 191.
Hypoaspis dasypa.—Farrier & Hennessey, 1993: 77.
Gaeolaelaps dasypus.—Kazemi *et al*., 2014: 505.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Austin, Travis, Texas, United States of America, in nest of *Dasypus novemcinctus* [Animalia: Cingulata: Dasypodidae].

***Gaeolaelaps dailingensis* (Ma & Yin, 1998)**

Hypoaspis (*Geolaelaps*) *dailingensis* Ma & Yin, 1998: 226.

Hypoaspis (*Geolaelaps*) *dailingensis*.—Ren & Guo, 2008: 329, 2009: 101.

Gaeolaelaps dailingensis.—Beaulieu, 2009: 37; Nemati & Mohseni, 2013: 80; Vatankhah *et al*., 2016: 572; Yan *et al*., 2018: 261; Joharchi *et al*., 2019c: 268.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.

Type locality and habitat. Liangshui Natural Preserve (47°10'N, 128°53'E), Dailing, Yichun, Heilongjiang, China, in forest soil.

***Gaeolaelaps debilis* (Ma, 1996)**

Hypoaspis debilis Ma, 1996: 51.

Hypoaspis debilis.—Ma, 2004b: 83, 2016b: 95; Kůrka, 2005: 24; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2008: 2229.

Gaeolaelaps debilis.—Beaulieu, 2009: 37; Kazemi *et al*., 2014: 504; Yan *et al*., 2018: 261; Joharchi *et al*., 2019a: 478, 2019d: 342; Kafi *et al*., 2020: 66.

Hypoaspis debilis ningxiaensis Bai, in Bai *et al*., 2012: 101 [junior synonym of *H. debilis s.s*. by Ma, 2016b: 95].

Type depository. *H. debilis*: National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China; *H. debilis ningxiaensis*: Medical Entomology Collection, Institute of Microbiology and Epidemiology, Academy of Military Medical Science, Beijing, China.

Type locality and habitat. *H. debilis*: Sheli (45°33'N, 123°23'E), Daan, Jilin province, China, in nest of *Spermophilus dauricus* (cited as *Citellus dauricus*) [Animalia: Rodentia: Sciuridae]; *H. debilis ningxiaensis*: Yinchuan (38.5°N, 106.3°E), Ningxia Hui Autonomous Region, China, in litter.

***Gaeolaelaps deinos* (Zeman, 1982)**

Hypoaspis deinos Zeman, 1982: 231.

Hypoaspis deinos.—Kůrka, 2005: 24.

Gaeolaelaps deinos.—Beaulieu, 2009: 37; Kavianpour *et al*., 2013: 8; Kazemi & Rajaei, 2013: 83; Ghasemi-Moghadam *et al*., 2014: 964; Kavianpour & Nemati, 2014: 322; Nemati *et al*., 2018b: 139, 2018c: 233; Kazemi, 2020: 137; Kazemi *et al*., 2020: 1976.

Type depository. Arachnoentomological Department, Institute of Parasitology, Czech Academy of Science, Prague, Czech Republic; specimen number Pa. Ú. ČSAV1888.

Type locality and habitat. Prague, Czech Republic, in nest of *Lasius flavus* [Animalia: Hymenoptera: Formicidae] in garden soil.

***Gaeolaelaps diomphalia* (Yin & Qin, 1984) new combination**

Hypoaspis (*Geolaelaps*) *diomphalia* Yin & Qin, 1984: 41.

Hypoaspis (*Geolaelaps*) *diomphalia*.—Deng *et al*., 1993: 166; Yan *et al*., 2010: 904.

Hypoaspis weni Bai, Gu & Chen, in Bai *et al*., 1994: 297 [junior synonym of *H.* (*G.*) *diomphalia* by Ma, 2006a: 23; Yan *et al*., 2010: 904].

Hypoaspis diomphalia.—Ma, 2006a: 23; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2018: 262.

Hypoaspis weni.—Ren & Guo, 2008: 329, 2009: 101.

Type depository. *H.* (*G.*) *diomphalia*: Department of Plant Protection, Shenyang Agricultural College, Shenyang, Liaoning province, China; *H. weni*: Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.

Type locality and habitat. *H.* (*G.*) *diomphalia*: Jianping, Liaoning province, China, on *Holotrichia diomphalia*

[Animalia: Coleoptera: Scarabaeidae, Melolonthinae]; *H. weni*: suburb of Yinchuan (38.5°N, 106.3°E), Ningxia Hui Autonomous Region, China, on unidentified insect larva.
Note. The new combination proposed for this species results from the promotion of *Gaeolaelaps* from the subgeneric to the generic level, and based on presence of features typical of the genus, including the serrate anterior margin of the epistome, dorsal idiosomal setae simple, relatively short and of uniform lengths, weakly sclerotised presternal area and drop-shaped epigynal shield.

***Gaeolaelaps disjuncta* (Hunter & Yeh, 1969)**
Hypoaspis (*Geolaelaps*) *disjuncta* Hunter & Yeh, 1969: 97.
Hypoaspis (*Geolaelaps*) *disjuncta*.—Delfinado & Baker, 1975: 53.
Geolaelaps disjuncta.—Walter & Oliver, 1989: 295; Hunter, 1993: 22.
Geolaelaps disjunctus.—Farrier & Hennessey, 1993: 73.
Gaeolaelaps disjuncta.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 516; Joharchi *et al*., 2020g: 444.

Type depository. The Acarology Collection, University of Georgia, Athens, United States of America.
Type locality and habitat. Athens, Georgia, United States of America, from a laboratory colony on *Odontotaenius disjunctus* (cited as *Popilius disjunctus*) [Animalia: Coleoptera: Passalidae].

***Gaeolaelaps dubininae* (Sklyar, 2012)**
Hypoaspis dubininae Sklyar, 2012: 84.
Gaeolaelaps dubininae.—Trach, 2016: 15; Vatankhah *et al*., 2016: 571.

Type depository. I.I. Schmalhausen Institute of Zoology, National Academy of Sciences, Kiev, Ukraine; specimen number 518.
Type locality and habitat. Poltava, Ukraine, on *Amara* (*Bradytus*) *majuscula* [Animalia: Coleoptera: Carabidae, Pterostichinae].
Note. Trach (2016: 7) suspected this species to be a junior synonym of *Hypoaspis* (*Hypoaspis*) *rhizotrogi* Mašán.

***Gaeolaelaps elimatus* (Berlese, 1920)**
Hypoaspis elimatus Berlese, 1920: 152.
Hypoaspis elimatus.—Castagnoli & Pegazzano, 1985: 125.
Hypoaspis elimata.—Bernini *et al*., 1995: 28.
Gaeolaelaps elimatus.—Gwiazdowicz *et al*., 2020a: 522.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, "Etruria" (Florence and Pisa), Italy, in litter.
Note. This species has never been adequately described or illustrated, but it is here provisionally accepted in *Gaeolaelaps*, following Gwiazdowicz *et al*. (2020a).

***Gaeolaelaps ellipsoides* (Karg, 1962)**
Hypoaspis ellipsoides Karg, 1962: 63.
Hypoaspis (*Hypoaspis*) *ellipsoides*.—Hirschmann *et al*., 1969: 133.
Gaeolaelaps ellipsoides.—Beaulieu, 2009: 37.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, in forest floor, moss, *Calluna* sp. [Plantae: Ericales: Ericaceae], sludge and compost.
Note. According to Karg (1971: 171), the type specimens of this species refer to a mixture of *Hypoaspis nolli* Karg and *H. praesternalis* Willmann.

***Gaeolaelaps eremitus* (Sklyar, 2012) new combination**
Hypoaspis eremitus Sklyar, 2012: 82.
Hypoaspis eremitus.—Trach & Joharchi, 2018: 219.

Type depository. I.I. Schmalhausen Institute of Zoology, National Academy of Sciences, Kiev, Ukraine; specimen number 342.
Type locality and habitat. Bogorodichnoe, Slavyansky, Donetsk, Ukraine, under elytra of *Osmoderma eremita* [Animalia: Coleoptera: Scarabaeidae, Cetoniinae] in the hollow of a maple tree [Plantae: Sapindales: Sapindaceae].
Note. According to Sklyar (2012: 82), this species has characteristics of both *Hypoaspis* and *Gaeolaelaps*. Trach & Joharchi (2012: 219) considered that it could be a junior synonym of *Hypoaspis* (*Osmodermus*) *breiti*. The placement of this species in *Gaeolaelaps* is provisional, given the insufficient details available in the literature. In part, it is based on the assumption of Sklyar (2012: 84) in that it seems intermediate to *Hypoaspis* and *Gaeolaelaps*, and on the serrate anterior margin of its epistome, deutosternal groove relatively broad, dorsal idiosomal setae simple, relatively short and of uniform lengths, weakly sclerotised presternal area, sternal shield slightly longer than wide, drop-shaped epigynal shield. However, the reported small number of dorsal shield setae (27 pairs) does not fit the usual characteristics of *Gaeolaelaps*.

***Gaeolaelaps etiopicus* (Berlese, 1918)**
Hypoaspis (*Stratiolaelaps*) *etiopicus* Berlese, 1918: 120.
Hypoaspis (*Hypoaspis*) *etiopicus*.—Aswegen & Loots, 1970: 188.
Hypoaspis (*Geolaelaps*) *etiopica*.—Karg, 1982: 241, 1987: 298, 1989c: 118, 1989d: 5.
Hypoaspis (*Stratiolaelaps*) *ethiopicus* [sic].—Castagnoli & Pegazzano, 1985: 132.
Gaeolaelaps etiopicus.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 505; Joharchi *et al*., 2019c: 277.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, in humus.

***Gaeolaelaps euparadactylifer* Joharchi, 2021**
Gaeolaelaps euparadactylifer Joharchi, in Joharchi *et al*., 2021a: 248.
Gaeolaelaps euparadactylifer.—Joharchi *et al*., 2021b: 279.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. Teletskoye Lake (51°21'N, 87°45'E), Altai Republic, Russia, in moss on the shore.

***Gaeolaelaps eupygidialis* (Karg, 2003)**
Hypoaspis (*Geolaelaps*) *eupygidialis* Karg, 2003b: 233.
Gaeolaelaps eupygidialis.—Moreira, 2014: 250; Joharchi *et al*., 2021b: 279.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Tenatol [probably Tena], Ecuador, in litter and soil.

***Gaeolaelaps expaventralis* (Ma *et al*., 2018) new combination**
Hypoaspis expaventralis Ma, Lin & Dai, 2018: 22.

Type depository. Institute of Plant Protection, Fujian Academy of Agricultural Science, Fuzhou, China.
Type locality and habitat. Yadong (27°30' N, 88°56' E), Xizang Autonomous Region, China, in moss.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it lacks macrosetae on the dorsal shield and legs. It is provisionally placed in *Gaeolaelaps*.

***Gaeolaelaps expolitus* (Berlese, 1904)**
Laelaps (*Hypoaspis*) *expolitus* Berlese, 1904b: 18.
Hypoaspis expolitus.—Willmann, 1951: 117; Costa, 1968: 3.
expolitus; *non-Laelaps* [sic].—Tipton, 1960: 293.
Hypoaspis (*Geolaelaps*) *expolitus*.—Bregetova, 1977b: 508.
Hypoaspis expolita.—Bernini *et al*., 1995: 28.
Gaeolaelaps expolitus.—Moreira, 2014: 250.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Florence, Italy, in litter.
Note. Bregetova (1977b: 508) suspected this species to be a senior synonym of *Hypoaspis minor* Costa.

***Gaeolaelaps exquisita* (Karg, 1989)**
Hypoaspis (*Geolaelaps*) *exquisita* Karg, 1989c: 122.
Hypoaspis (*Geolaelaps*) *exquisita*.—Karg, 1989d: 4.
Gaeolaelaps exquisita.—Moreira, 2014: 250.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps* without assigning it to another genus, because the dorsal shield extends ventrally and bears spatulate setae. It is here placed provisionally in *Gaeolaelaps*.

***Gaeolaelaps farajii* Nemati & Mohseni, 2013**
Gaeolaelaps farajii Nemati & Mohseni, 2013: 72.
Gaeolaelaps farajii.—Kavianpour & Nemati, 2014: 321; Kazemi *et al*., 2014: 505; Trach, 2016: 7; Vatankhah *et al*., 2016: 572; Nemati *et al*., 2018b: 139, 2018c: 233; Kazemi, 2020: 137.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. 845 m above sea level, Izeh (31°49'52"N, 49°52'9"E), Khuzestan, Iran, in soil.

***Gaeolaelaps fishtowni* (Ruf & Koehler, 1993)**
Hypoaspis fishtowni Ruf & Koehler, 1993: 194.
Hypoaspis (*Geolaelaps*) *fishtowni*.—Karg, 1993a: 141; Ruf & Koehler, 1993: 197.
Gaeolaelaps fishtowni.—Beaulieu, 2009: 37; Trach, 2012: 162; Kavianpour *et al*., 2013: 7; Nemati & Kavianpour, 2013: 70.

Type depository. Author's laboratory, University Bremen, Germany.
Type locality and habitat. From a laboratory colony of the described species initiated with specimens from Bügerpark, Bremerhaven, Germany.

***Gaeolaelaps franzi* (Aswegen & Loots, 1970)**
Hypoaspis (*Hypoaspis*) *franzi* Aswegen & Loots, 1970: 185.
Hypoaspis (*Geolaelaps*) *franzi*.—Karg, 1982: 243, 1989c: 117.
Gaeolaelaps franzi.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 505; Joharchi *et al*., 2019a: 478, 2019d : 342; Kafi *et al*., 2020: 72.

Type depository. Institute for Zoological Research, Potchefstroom University, Potchefstroom, South Africa.
Type locality and habitat. *Hagenia* forest, at the western side of Mont Meru, Kenya, in soil.

***Gaeolaelaps furcatus* Joharchi & Ueckermann, 2021**
Gaeolaelaps furcatus Joharchi & Ueckermann, 2021 *in* Joharchi *et al*., 2021b: 275.

Type depository. National Collection of Arachnida, ARC-Plant Health Protection (NCA-PPRI), Queenswood, Pretoria, South Africa.
Type locality and habitat. 842 m above sea level, in drainage area in a "natural area" (37°14'S, 12°29'W), Tristan da Cunha Island, in peat moss (Plantae: Sphagnales: *Sphagnum*).

***Gaeolaelaps genitotortus* Sklyar, 2012**
Geolaelaps genitotortus Sklyar, 2012: 75.
Gaeolaelaps genitotortus.—Trach, 2016: 13; Kafi *et al*., 2020: 72.

Type depository. I.I. Schmalhausen Institute of Zoology, National Academy of Sciences, Kiev, Ukraine; specimen number 178.
Type locality and habitat. Khomutovskaya Steppe Reserve, south of Donetsk region, Ukraine, in nest of a forest mouse [Animalia: Rodentia].

***Gaeolaelaps gergus* (Hafez *et al*., 1982) new combination**
Hypoaspis (*Hypoaspis*) *gergus* Hafez, Elbadry & Nasr, 1982: 4.
Hypoaspis gergus.—Hafez *et al*., 1982: 11; Zaher, 1986: 193; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347; El-Banhawy *et al*., 2006: 66.
Hypoaspis gregus [sic].—Nasr & Nawar, 1989a: 70.

Type depository. Unspecified.
Type locality and habitat. Bondar, Girga, Sohag, Egypt, under peach trees [Plantae: Rosales: Rosaceae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Kazemi *et al*. (2014: 519) considered that it could belong to *Gaeolaelaps* and could be a junior synonym of *Laelaps aculeifer*. It appears to be a typical *Gaeolaelaps* species.

***Gaeolaelaps gigantis* (Karg, 1982) new combination**
Hypoaspis (*Pneumolaelaps*) *gigantis* Karg, 1982: 251.
Hypoaspis gigantis.—Karg, 1984: 39.
Hypoaspis (*Pneumolaelaps*) *gigantis*.—Karg, 2003b: 234.
Pneumolaelaps gigantis.—Moreira, 2014: 349.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Venezuela, in soil.
Note. This species appears to be a typical *Gaeolaelaps*, except for the smooth margin of the epistome. We provisionally place it in *Gaeolaelaps* until more morphological information is available.

***Gaeolaelaps gillespiei* Beaulieu, 2009**
Gaeolaelaps gillespiei Beaulieu, 2009: 38.
Gaeolaelaps gillespiei.—Yan *et al*., 2018: 258; Kazemi, 2020: 137.

Type depository. Canadian National Collection of Insects, Arachnids and Nematodes, at Agriculture and Agri-Food Canada, Ottawa, Canada.
Type locality and habitat. Sidney, British Columbia, Canada, on roots and in soil of wilting gerbera [Plantae: Asterales: Asteraceae] plants.

***Gaeolaelaps glaber* (Trägårdh, 1952) new combination**
Stratiolaelaps glaber Trägårdh, 1952: 66.

Type depository. Unspecified.
Type locality and habitat. Pare, Arihiri, Society Islands, Tahiti, unspecified substrate.
Note. Nemati & Gwiazdowicz (2016a: 548) excluded this species from *Stratiolaelaps*, without referring it to another genus. It appears to be a typical species of *Gaeolaelaps* except for the epistome, which is triangular and smooth. We provisionally place it in *Gaeolaelaps* until more information is available concerning the legs and hypostome. According to Hirschmann *et al*. (1969: 134), specimens identified by Bernhard (1955) as *Hypoaspis* (*Stratiolaelaps*) *glaber* Trägårdh belonged to a different species, which they described as *Hypoaspis glabrosimilis*.

***Gaeolaelaps glabrosimilis* (Hirschmann *et al*., 1969)**
Hypoaspis glabrosimilis Hirschmann, Bernhard, Greim & Götz, 1969: 134.
Stratiolaelaps glaber.—Bernhard, 1955: unknown page.
Pseudoparasitus (*Gymnolaelaps*) *glabrosimilis*.—Karg, 1971: 162.
Hypoaspis (*Geolaelaps*) *glabrosimilis*.—Bregetova, 1977b: 501; Karg, 1979: 82, 1982: 241, 1987: 298, 1989c: 118, 1989d: 5, 1993a: 142.
Hypoaspis (*Gaeolaelaps*) *glabrosimilis*.—Faraji *et al*., 2008: 208.
Gaeolaelaps glabrosimilis.—Beaulieu, 2009: 36; Kavianpour *et al*., 2013: 8; Kazemi & Rajaei, 2013: 83; Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 505; Nemati *et al*., 2018c: 233; Joharchi *et al*., 2019c: 277, 2020f: 514, 2021a: 257.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, on *Lasius fuliginosus* [Animalia: Hymenoptera: Formicidae].
Note. According to Hirschmann *et al*. (1969: 134), the specimens identified by Bernhard (1955) as *Hypoaspis* (*Stratiolaelaps*) *glaber* Trägårdh belonged to a different species, which they described as *Hypoaspis glabrosimilis* Hirschmann *et al*. The illustrations in Hirschmann *et al*. (1969) show the epigynal shield slightly expanded, but in other respects this appears to be a species of *Gaeolaelaps*. Bregetova (1977b: 503) suspected this species to be a junior synonym of *Hypoaspis hermaphroditoides*. Tenorio (1982: 264) and Tenorio *et al*. (1985: 300) reported a species referred to as *Hypoaspis* (*Geolaelaps*) nr. *glabrosimilis* from Hawaii, but were unable to confirm its identity.

***Gaeolaelaps gleba* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *glabra* Karg, 1978b: 24.
Hypoaspis (*Geolaelaps*) *gleba* Karg, 1979: 79 [replacement name, given the existence of *Hypoaspis glaber* Trägårdh, 1952].
Hypoaspis (*Geolaelaps*) *gleba*.—Karg, 1982: 239, 2006: 147.
Hypoaspis glabra.—Kůrka, 2005: 24.
Gaeolaelaps gleba.—Nemati & Mohseni, 2013: 80; Kazemi *et al*., 2014: 516; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2020e: 489.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Misituni, Tarapaca, Chile, in plankton sample with Phyllopoda [Animalia: Crustacea].

***Gaeolaelaps gracilis* (Meledzhayeva, 1963)**
Hypoaspis gracilis Meledzhayeva, 1963: 52.
Hypoaspis negevi Costa, 1969a: 167 [junior synonym of *H. gracilis* by Bregetova, 1977b: 508; Karg, 1979: 84, 1982: 242, 1989c: 116].

Hypoaspis (*Geolaelaps*) *gracilis*.—Bregetova, 1977b: 508; Karg, 1979: 84, 1982: 242, 1989c: 116; Gwiazdowicz & Klemt, 2004: 14.
Hypoaspis negevi.—Okáli, 1991: 200.
Hypoaspis gracilis.—Ye & Ma, 1991: 99; Yan *et al*., 2008: 2230.
Hypoaspis graeilis [sic].—Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps gracilis.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 504.
Gaeolaelaps negevi.—Beaulieu, 2009: 36; Walter & Moser, 2010: 405; Kazemi *et al*., 2014: 504.

Type depository. *H. gracilis*: Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia; *H. negevi*: unspecified.
Type locality and habitat. of *H. gracilis*: type series: Kizyldzha-Baba, on great gerbil [Animalia: Rodentia: Sciuridae]; Kizyldzha-Baba, in tunnel of a great gerbil; Lengych, on red-tailed gerbil [Animalia: Rodentia: Sciuridae]; vicinity of Kadyr-Gotyr, Karabile, in tunnel of Afghan vole [Animalia: Rodentia: Cricetidae]; vicinity of Morgunovka, Kushka, on great gerbil; all in Karakum, Turkmenistan; *H. negevi*: Yeroham, Israel, in nest of *Spalax ehrenbergi* [Animalia: Rodentia: Spalacidae].

Gaeolaelaps guiyangensis (Ma & Lin, 2009) new combination

Hypoaspis guiyangensis Ma & Lin, 2009: 28.
Hypoaspis Guiyang [sic].—Yan *et al*., 2018: 262.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Guiyang (26°34'N, 106°41'E), Guizhou, China, under bark of withered tree.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26) because it lack macrosetae on the dorsal shield. The illustrations appear to show a species of *Gaeolaelaps*, but our placement of it in this genus is provisional.

Gaeolaelaps haiyuanensis (Bai *et al*., 1994)

Hypoaspis haiyuanensis Bai, Gu & Chen, in Bai *et al*., 1994: 296.
Hypoaspis haiyvanensis [sic].—Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps haiyuanensis.—Beaulieu, 2009: 37.
Hypoaspis haiyuanensis.—Yan *et al*., 2010: 905.
Gaeolaelaps haiyuannensis [sic].—Yan *et al*., 2018: 261.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant nest [cited as Myrmos] [Animalia: Hymenoptera: Formicidae].

Gaeolaelaps hermaphroditoides (Oudemans, 1902) new combination

Hypoaspis hermaphroditoides Oudemans, 1902c: 53.
Hypoaspis hermaphroditoides.—Oudemans, 1903d: 10, 1926b: 101; Voigts & Oudemans, 1905: 230; Buitendijk, 1945: 296; Bernini *et al*., 1995: 28; Naturalis, 2020.

Type depository. Unspecified.
Type locality and habitat. Italy, unspecified substrate.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it lacks macrosetae on the dorsal shield. The illustration in Naturalis (2020) appears to show a typical species of *Gaeolaelaps*. Bregetova (1977b: 503) suspected this species to be a senior synonym of *Hypoaspis glabrosimilis*.

***Gaeolaelaps heteroceri* Trach, 2016**

Gaeolaelaps heteroceri Trach, 2016: 4.

Gaeolaelaps heteroceri.—Vatankhah *et al*., 2016: 571; Joharchi *et al*., 2021a: 243.

Type depository. Museum of Zoology, I. I. Mechnikov Odessa National University, Odessa, Ukraine; specimen number N 11–06–2013/01.

Type locality and habitat. Shore of Salt Lake (46°39'N, 31°10'E), lower reaches of the Tiligul Estuary, vicinity of Koshary, Kominternovsky, Odessa, Ukraine, under elytra of *Heterocerus* sp. [Animalia: Coleoptera: Heteroceridae].

***Gaeolaelaps hirschmanni* (Karg, 1979) new combination**

Hypoaspis gracilis Greim, in Hirschmann *et al*., 1969: 138.

Hypoaspis (*Holostaspis*) *gracilis*.—Karg, 1971: 176.

Hypoaspis (*Pneumolaelaps*) *hirschmanni* Karg, 1979: 93 [replacement name, given the existence of *Hypoaspis gracilis* Meledzahayeva, 1963].

Hypoaspis (*Pneumolaelaps*) *hirschmanni*.—Karg, 1982: 247, 1993a: 153; Nemati *et al*., 2000: 381; Faraji *et al*., 2008: 208.

Pneumolaelaps hirschmanni.—Kazemi & Rajaei, 2013: 94.

Pneumolaelaps gracilis.—Babaeian *et al*., 2019a: 329.

Type depository. Unspecified.

Type locality and habitat. Type series, Bayreuth-Erlangen, Germany, in soil nests of *Formica fusca*, *F. pratensis*, *F. rufa rufopratensis*, *F. rufibarbis*, *F. sanguinea*, *Lasius flavus*, *L. niger*, *Myrmica scabrinodis*, *M. schenki*, *Tapinoma erraticum* and *Tetramorium caespitum* [Animalia: Hymenoptera: Formicidae].

Note. From the information provided in the literature, this species seems to be a typical *Gaeolaelaps* with opisthogaster not hypertrichous, serrate epistome and peritreme of normal width, in contrast with most recognised species of *Pneumolaelaps*.

***Gaeolaelaps invictianus* Walter & Moser, 2010**

Gaeolaelaps invictianus Walter & Moser, 2010: 400.

Gaeolaelaps invictianus.—Kazemi *et al*., 2014: 505; Trach, 2016: 13; Joharchi *et al*., 2021a: 258.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 47, 760.

Type locality and habitat. Pineville, Louisiana, United States of America, on alate *Solenopsis invicta* [Animalia: Hymenoptera: Formicidae].

***Gaeolaelaps iranicus* Kavianpour & Nemati, 2013**

Gaeolaelaps iranicus Kavianpour & Nemati, in Kavianpour *et al*., 2013: 3.

Gaeolaelaps iranicus.—Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 521; Khalili-Moghadam & Saboori, 2015: 318; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237; Vatankhah *et al*., 2016: 571; Hajizadeh & Joharchi, 2018: 17; Nemati *et al*., 2018b: 139, 2018c: 233; Kazemi, 2020: 137.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.

Type locality and habitat. 1777 m above sea level, Shahreza (32°03'N, 51°54'E), Esfahan, Iran, in soil.

***Gaeolaelaps isodentis* (Karg, 1989)**
Hypoaspis (*Geolaelaps*) *isodentis* Karg, 1989c: 121.
Hypoaspis (*Geolaelaps*) *isodentis*.—Karg, 2000: 247.
Gaeolaelaps isodentis.—Moreira, 2014: 254; Trach, 2016: 7.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Gaeolaelaps izajiensis* Saeidi *et al*., 2016**
Gaeolaelaps izajiensis Saeidi, Nemati & Khalili-Moghadam, 2016: 33.
Gaeolaelaps izajiensis.—Kavianpour *et al*., 2018: 182; Nemati *et al*., 2018b: 140, 2018c: 233.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. Izeh, Khuzestan province, Iran, in soil.

***Gaeolaelaps jondishapouri* Nemati & Kavianpour, 2013**
Gaeolaelaps jondishapouri Nemati & Kavianpour, 2013: 64.
Gaeolaelaps jondishapouri.—Kavianpour & Nemati, 2014: 320; Kazemi *et al*., 2014: 504; Kavianpour *et al*., 2018: 183; Nemati *et al*., 2018b: 140, 2018c: 233; Joharchi *et al*., 2019a: 478; Joharchi *et al*., 2020g: 444; Kazemi, 2020: 137.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. Ahwaz, Khuzestan, Iran, in soil.

***Gaeolaelaps kanati* Joharchi & Issakova, 2020**
Gaeolaelaps kanati Joharchi & Issakova, in Joharchi *et al*., 2020e: 484.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. Kostanay Region (53°15'N, 66°29'E), Kazakhstan, from soil-litter.

***Gaeolaelaps kargi* (Costa, 1968)**
Hypoaspis kargi Costa, 1968: 7.
Hypoaspis kargi.—Shcherbak, 1971a: 21; Lapinya, 1976: 36; Ishikawa, 1982: 92; Xu & Liang, 1996: 191; Kontschán *et al*., 2015a: 35, 2016a: 28; Lin *et al*., 2016: 32.
Hypoaspis (*Geolaelaps*) *kargi*.—Bregetova, 1977b: 509; Karg, 1979: 85, 1982: 243, 1989c: 117, 1993a: 145; Teng *et al*., 1992: 197; Sklyar, 2001: 101; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2008: 2229.
Gaeolaelaps kargi.—Beaulieu, 2009: 37; Kazemi & Rajaei, 2013: 83; Kavianpour *et al*., 2013: 7, 2017: 161; Nemati & Mohseni, 2013: 76; Hasanvand *et al*., 2014a: 95; Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 520; Mahjoori *et al*., 2014: 1601; Amani *et al*., 2015: 92; Ramroodi *et al*., 2015a: 79; Vatankhah *et al*., 2016: 571; Hajizadeh & Joharchi, 2018: 27; Nemati *et al*., 2018b: 140, 2018c: 233; Yan *et al*., 2018: 261; Joharchi *et al*., 2021a: 243, 2021b: 279.
Hypoaspis (*Gaeolaelaps*) *kargi*.—Saito & Takaku, 2011: 90.
Geolaelaps kargi.—Tajmiri & Hajizadeh, 2013: 17.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Akko junction, Israel, in nest of *Spalax ehrenbergi* [Animalia: Rodentia: Spalacidae].
Note. Bregetova (1977b: 509) suspected this species to be a junior synonym of *Hypoaspis neglectus* Willmann.

***Gaeolaelaps khajooii* Kazemi *et al*., 2014**

Gaeolaelaps khajooii Kazemi, Rajaei & Beaulieu, 2014: 510.

Gaeolaelaps khajooii.—Vatankhah *et al*., 2016: 572; Kavianpour *et al*., 2017: 161; Nemati *et al*., 2018b: 140, 2018c: 233; Joharchi *et al*., 2019f: 569; Kazemi, 2020: 136.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.

Type locality and habitat. 1044 m above sea level, Baft (28°39'46"N, 56°45'37"E), Kerman province, Iran, in soil and litter of alfalfa farm.

***Gaeolaelaps khaustovi* Trach, 2016**

Gaeolaelaps khaustovi Trach, 2016: 7.

Gaeolaelaps khaustovi.—Vatankhah *et al*., 2016: 571; Kazemi, 2020: 133; Kazemi *et al*., 2020: 1985.

Type depository. Collection of the Museum of Zoology, I. I. Mechnikov Odessa National University, Odessa, Ukraine; specimen number N 22–04–2001.

Type locality and habitat. Canyon Uch-Kosh (44°32'N, 34°12'E), vicinity of Sovetskoe, Yalta, Crimea, Ukraine, under elytra of *Bembidion* sp. [Animalia: Coleoptera: Carabidae].

***Gaeolaelaps klompeni* Gwiazdowicz *et al*., 2020**

Gaeolaelaps klompeni Gwiazdowicz, Nemati & Riahi, 2020: 523.

Gaeolaelaps klompeni.—Joharchi & Friedrich, 2021: 69.

Type depository. Ohio State University Acarology Laboratory, Columbus, Ohio, United States of America; specimen number OSAL 31084.

Type locality and habitat. Brush Creek Wildlife Area, Jefferson, Ohio, United States of America, in soil with roots.

***Gaeolaelaps koseii* (Hafez *et al*., 1982)**

Hypoaspis (*Hypoaspis*) *koseii* Hafez, Elbadry & Nasr, 1982: 4.

Hypoaspis koseii Hafez, Elbadry & Nasr, 1982: 10.

Hypoaspis koseii.—Zaher, 1986: 190; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347; El-Banhawy *et al*., 2006: 66.

Gaeolaelaps koseii.—Nemati & Mohseni, 2013: 80; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2018a: 26.

Type depository. Unspecified.

Type locality and habitat. El-Koseya, Asiut, Egypt, in soil of an orange [Plantae: Sapindales: Rutaceae] orchard.

Note. Without referring to the placement of this species in *Gaeolaelaps* by other authors, Kazemi *et al*. (2014: 519) considered that it could belong to *Gaeolaelaps*.

***Gaeolaelaps krantzi* (Arutunjan, 1993)**

Hypoaspis krantzi Arutunjan, 1993: 116.

Hypoaspis krantzi.—Kůrka, 2005: 24.

Gaeolaelaps krantzi.—Beaulieu, 2009: 37; Kazemi *et al*., 2014: 504; Joharchi *et al*., 2019a: 478, 2019d: 342; Kafi *et al*., 2020: 72.

Type depository. Armenian Institute of Zoology, Yerevan, Armenia; specimen number 558.

Type locality and habitat. Armenia, on *Megopis scabricorne* [Animalia: Coleoptera: Cerambycidae, Prioninae].

Note. The name of the author of this species was transliterated in the original description as Arutunian.

***Gaeolaelaps lankaensis* Joharchi *et al*., 2019**
Gaeolaelaps lankaensis Joharchi, Khaustov & Ermilov, 2019f: 564.
Gaeolaelaps lankaensis.—Joharchi *et al*., 2019a: 478; Kafi *et al*., 2020: 72.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 42 m above sea level; near the Thambadola Ella waterfall, Polgampola (6°27'N, 80°12'E), Sabaragamuwa province, Sri Lanka, in soil and litter.

***Gaeolaelaps latifrons* (Hull, 1925) new combination**
Hypoaspis latifrons Hull, 1925: 208.
Hypoaspis latifrons.—Turk, 1953: 11.

Type depository. Unspecified.
Type locality and habitat. Great Britain, unspecified substrate.
Note. Evans & Till (1966: 362) suggested that this species could be placed in *Hypoaspis* (*Gaeolaelaps*) and we have provisionally accepted that interpretation, with *Gaeolaelaps* at the genus level.

***Gaeolaelaps latopuga* (Karg, 2006)**
Hypoaspis (*Geolaelaps*) *latopuga* Karg, 2006: 147.
Gaeolaelaps latopuga.—Nemati & Mohseni, 2013: 80; Kazemi *et al*., 2014: 521; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2019c: 272; Joharchi & Friedrich, 2021: 68.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. near La Mana, Ecuador, in litter.

***Gaeolaelaps lenis* Vatankhah & Nemati, 2016**
Gaeolaelaps lenis Vatankhah & Nemati, in Vatankhah *et al*., 2016: 567.
Gaeolaelaps lenis.—Nemati *et al*., 2018b: 140, 2018c: 233; Gwiazdowicz *et al*., 2020a: 522; Joharchi *et al*., 2020e: 489, 2021a: 255; Kazemi, 2020: 136.
Gaeolaelaps lensi [sic].—Kazemi, 2020: 137.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. Shahrekord, Chaharmahal va Bakhtiari province, Iran, in nest of *Formica* sp. [Animalia: Hymenoptera: Formicidae].

***Gaeolaelaps littoralis* Kazemi, 2020**
Gaeolaelaps littoralis Kazemi, 2020: 131.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.
Type locality and habitat. Qeshm Island, Iran, eastern Persian Gulf, in soil of littoral zone in mangrove forests (26º 50'N, 55º 41'E).

***Gaeolaelaps loksai* (Karg, 2000)**
Hypoaspis (*Geolaelaps*) *loksai* Karg, 2000: 246.
Hypoaspis loksai.—Kůrka, 2005: 24.
Hypoaspis (*Geolaelaps*) *loksai*.—Karg, 2006: 148.
Gaeolaelaps loksai.—Nemati & Mohseni, 2013: 80; Saeidi *et al*., 2016: 38; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2019c: 272; Joharchi & Friedrich, 2021: 62.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Between Pifo and Papallacta, Pichinca [probably Pichincha], Ecuador, in moss and litter.
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps* because of the enlarged epigynal shield almost touching the anal shield, without assigning it to another genus.

***Gaeolaelaps longichaetus* (Ma, 1996)**
Hypoaspis longichaetus Ma, 1996: 51.
Hypoaspis iongichaetus [sic].—Ren & Guo, 2008: 329.
Hypoaspis longichaetus.—Ren & Guo, 2009: 101; Yan *et al*., 2008: 2229, 2018: 262.
Hypoaspis s. l. *longichaetus*.—Kazemi *et al*., 2014: 522.
Gaeolaelaps longichaetus.—Joharchi *et al*., 2019c: 272; 2020f: 518, 2021a: 257.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Zhanyu (44°31'N, 122°38'E), Tongyu, Jilin province, China, in nest of *Cricetulus barabensis* [Animalia: Rodentia: Cricetidae].
Note. Babaeian *et al*. (2019a: 335) considered it to be similar to *Holostaspis* species, but differing from them by the form of the cheliceral digits. We believe it is more similar to *Gaeolaelaps*.

***Gaeolaelaps longior* (Berlese, 1882)**
Laelaps longior Berlese, 1882d: unpaginated.
Laelaps longior.—Berlese, 1883b: 216.
Laelaps (*Iphis*) *aculeifer* var. *longior*.—Berlese, 1892b: 10.
Hypoaspis aculeifer var. *longior*.—Castagnoli & Pegazzano, 1985: 224.
Geolaelaps aculeifer longior.—Bernini *et al*., 1995: 28.
Hypoaspis longior.—Kůrka, 2005: 24.
Gaeolaelaps longior.—Moreira, 2014: 240.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Acireale, Catania, Sicilia, Italy, in moss.
Note. This species is provisionally placed in *Gaeolaelaps* on the basis of the limited information available in the Berlese publications listed, especially concerning its similarity with *G. aculeifer*, the type species of the genus, as reported by Berlese; but a confirmation of its correct placement depends on an examination of the types.

***Gaeolaelaps macra* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *macra* Karg, 1978b: 25.
Hypoaspis (*Geolaelaps*) *macra*.—Karg, 1979: 80, 1982: 238, 2006: 147.
Hypoaspis macra.—Kůrka, 2005: 25.
Gaeolaelaps macra.—Nemati & Mohseni, 2013: 80; Saeidi *et al*., 2016: 38; Vatankhah *et al*., 2016: 571.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Azapa, Tarapaca, Chile, in soil.

***Gaeolaelaps magkadikitus* Rosario, 1981**
Geolaelaps magkadikitus Rosario, 1981: 50.
Gaeolaelaps magkadikitus.—Beaulieu, 2009: 36; Trach, 2016: 10.

Type depository. Unspecified.
Type locality and habitat. Animal Science pasture, University of the Philippines, Los Baños campus, College, Laguna, Philippines, in litter.

***Gaeolaelaps marksi* (Strandtmann & Crossley, 1962)**
Hypoaspis marksi Strandtmann & Crossley, 1962: 180.
Hypoaspis marksi.—Farrier & Hennessey, 1993: 77.
Gaeolaelaps marksi.—Beaulieu, 2009: 37.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Bed of former White Oak Lake, United States Atomic Energy Commission Controlled Area, Roane, Tennessee, United States of America, in soil.

***Gaeolaelaps matinikus* Rosario, 1981**
Geolaelaps matinikus Rosario, 1981: 52.
Gaeolaelaps matinikus.—Beaulieu, 2009: 37; Trach, 2016: 7.

Type depository. Unspecified.
Type locality and habitat. Forestry Nursery, University of the Philippines, Los Baños campus, Mud Spring Area, Mount Makiling, College, Laguna, Philippines, on *Asparagus plumosus* [Plantae: Asparagales: Asparagacea].

***Gaeolaelaps millipedus* Rosario, 1981**
Geolaelaps millipedus Rosario, 1981: 54.
Hypoaspis millipedus.—Kůrka, 2005: 25.
Gaeolaelaps millipedus.—Beaulieu, 2009: 36; Trach, 2012: 161, 2016: 10; Kazemi *et al*., 2014: 504.

Type depository. Unspecified.
Type locality and habitat. Mud Spring Area, Mount Makiling, College, Laguna, Philippines, on unidentified millipede [Animalia: Myriapoda] from decomposing bark of fallen log.

***Gaeolaelaps minor* (Costa, 1968)**
Hypoaspis minor Costa, 1968: 9.
Hypoaspis (*Hypoaspis*) *minor*.—Karg, 1978b: 26.
Hypoaspis (*Geolaelaps*) *minor*.—Karg, 1979: 82, 1982: 241, 1987: 298, 1989c: 117, 1989d: 4, 1993a: 142.
Hypoaspis minor.—Gu & Bai, 1991: 182; Arutunjan, 1993: 118; Bai *et al*., 1994: 297.
Hypoaspis (*Gaeolaelaps*) *minor*.—Faraji *et al*., 2008: 208.
Gaeolaelaps minor.—Beaulieu, 2009: 36; Kavianpour *et al*., 2013: 8; Kazemi & Rajaei, 2013: 84; Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 504; Kordeshami *et al*., 2015: 592; Hajizadeh & Joharchi, 2018: 27; Nemati *et al*., 2018b: 140, 2018c: 233; Joharchi *et al*., 2019a: 478, 2019d: 342; Kafi *et al*., 2020: 72; Kazemi, 2020: 137.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mishmar Ha'Emeq, Israel, in moss in a forest.
Note. Bregetova (1977b: 508) suspected this species to be a junior synonym of *Laelaps* (*Hypoaspis*) *expolitus*.

***Gaeolaelaps mirzakhaniae* Kazemi & Khalesi, 2018**
Gaeolaelaps mirzakhaniae Kazemi & Khalesi, in Khalesi & Kazemi, 2018: 629.
Gaeolaelaps mirzakhaniae.—Joharchi & Negm, 2020: 498; Kazemi, 2020: 136.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.
Type locality and habitat. 640 m above sea level, Dosari (28°25'36"N, 57°57'19"E), Kerman province, Iran, in soil and litter of a citrus orchard [Planta: Sapindales: Rutaceae].

***Gaeolaelaps mohrii* (Ishikawa, 1982)**
Hypoaspis (*Geolaelaps*) *mohrii* Ishikawa, 1982: 92.
Gaeolaelaps mohrii.—Beaulieu, 2009: 36.

Type depository. Biological Laboratory, Matsuyama Shinonome Junior College, Matsuyama, Japan; specimen number MSJC- BL 157.
Type locality and habitat. Abandoned mine at Ueki-kôzan, Ueki, Nomura-chô, Ehime, Japan, in baited traps.

***Gaeolaelaps mossadeghi* Kavianpour & Nemati, 2014**
Gaeolaelaps mossadeghi Kavianpour & Nemati, 2014: 316.
Gaeolaelaps mossadeghi.—Trach, 2016: 7; Vatankhah *et al*., 2016: 572; Nemati *et al*., 2018b: 141, 2018c: 233.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. 1849 m above sea level, Shahreza (31°58'15.14"N, 51°50'53.63"E), Esfahan province, Iran, in soil.

***Gaeolaelaps neglectus* (Willmann, 1949) new combination**
Hypoaspis neglectus Willmann, 1949b: 341.
Hypoaspis neglectus.—Willmann, 1951: 118; Evans, 1954: 796.

Type depository. Unspecified.
Type locality and habitat. Germany, in unspecified habitat.
Note. Bregetova (1977b: 509) suggested this species may be a senior synonym of *Hypoaspis* (*Geolaelaps*) *kargi*. For that reason, we have transferred *Hypoaspis neglectus* to *Gaeolaelaps*.

***Gaeolaelaps neimongolianus* (Ma & Wang, 1998) new combination**
Hypoaspis neimongolianus Ma & Wang, 1998: 1.
Hypoaspis neimongolianus.—Ma, 2005b: 74; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2008: 2229.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Sunite Right Banner (42°46'N, 112°40'E), Inner Mongolia Autonomous Region, China, in the nests of *Microtus brandti* [Animalia: Rodentia: Cricetidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). It appears to be a species of *Gaeolaelaps*, and we have placed it in this genus provisionally.

***Gaeolaelaps neoaculeifer* (Hirschmann, 1966)**
Hypoaspis neoaculeifer Hirschmann, 1966: 35.
Hypoaspis neoaculeifer.—Costa, 1966b: 147; Zeman, 1982: 233; Farrier & Hennessey, 1993: 78.

Geolaelalps neaculeifer [sic].—Walter & Oliver, 1989: 295.
Gaeolaelaps neoaculeifer.—Beaulieu, 2009: 37.

Type depository. Unspecified.
Type locality and habitat. Tomales Bay, California, United States of America, supralittoral, in sand and seagrass.

***Gaeolaelaps nolli* (Karg, 1962)**
Hypoaspis nolli Karg, 1962: 62.
Hypoaspis praesternalis Willmann.—Evans, 1953: 272 (misidentification, according to Joharchi & Negm, 2020: 498; Joharchi *et al*., 2020e: 490).
Hypoaspis nolli.—Karg, 1965: 311; Costa, 1968: 9; Niedbała *et al*., 1982: 247, 1990: 32; Bernini *et al*., 1995: 29; Fain *et al*., 1995: 112; Kůrka, 2005: 25; Joharchi *et al*., 2018a: 25.
Hypoaspis (*Gaeolaelaps*) *praesternalis*.—Evans & Till, 1966: 173 (misidentification, according to Fain *et al*., 1995: 112; Kavianpour & Nemati, 2014: 321; Joharchi & Negm, 2020: 499).
Hypoaspis (*Hypoaspis*) *nolli*.—Karg, 1971: 169, 1978b: 16.
Hypoaspis (*Geolaelaps*) *nolli*.—Karg, 1979: 80, 1982: 239, 1993a: 140, 2006: 148.
Geolaelaps nolli.—Farrier & Hennessey, 1993: 73; Xu & Liang, 1996: 191.
Hypoaspis (*Gaeolaelaps*) *nolli*.—Faraji *et al*., 2008: 207.
Gaeolaelaps nolli.—Beaulieu, 2009: 36; Bahrami *et al*., 2011: 351; Trach, 2012: 162, 2016: 7; Arjomandi *et al*., 2013: 256; Kazemi & Rajaei, 2013: 84; Kavianpour *et al*., 2013: 7, 2017: 161; Nemati & Mohseni, 2013: 80; Hasanvand *et al*., 2014a: 95; Kavianpour & Nemati, 2014: 321;Kazemi *et al*., 2014: 514; Mahjoori *et al*., 2014: 1601; Amani *et al*., 2015: 92; Khalili-Moghadam & Saboori, 2015: 318; Vatankhah *et al*., 2016: 572; Hajizadeh & Joharchi, 2018: 26; Nemati *et al*., 2018b: 141, 2018c: 233; Joharchi *et al*., 2019c: 272, 2020e: 490, 2021a: 243, 2021b: 279; Joharchi & Negm, 2020: 498; Kazemi, 2020: 137.
Gaeolaelaps praesternalis.—Joharchi *et al*., 2018a: 24 (misidentification, according to Joharchi *et al*., 2020e: 490).

Type depository. Author's collection; specimen number 840.
Type locality and habitat. Kleinmachnow experiment station, Biologische Zentralanstalt, Kleinmachnow, Germany, in agricultural soil and grassland.
Note. According to Karg (1971: 171), the type specimens of *Hypoaspis* (*Hypoaspis*) *ellipsoides* Bernhard are a mixture of *Hypoaspis nolli* and *H. praesternalis*. There is considerable disagreement about the possible synonymy of *Hypoaspis nolli* and *H. praesternalis*. Fain *et al*. (1995: 112), Kavianpour & Nemati (2014: 321), Khalili-Moghadam & Saboori (2015: 318), Joharchi & Negm (2020: 499) and Joharchi *et al*. (2020e: 490) disagree with Evans & Till (1966: 173), Shcherbak (1971a: 21), Farrier & Hennessey (1993: 73), Saito & Takaku (2011) and Kavianpour *et al*. (2013: 7), who considered *H. nolli* and *H. praesternalis* to be synonyms. Kavianpour *et al*. (2013: 8) suspected that the specimens reported as *Gaeolaelaps postreticulatus* (Xu & Liang) by Montazeri *et al*. (2011: 44) could be *G. nolli*; in the same way, Joharchi *et al*. (2020e: 490) suspected that the specimens reported as *H. praesternalis* by Chelebiev (1981: 185) and as *H.* (*Geolaelaps*) *praesternalis* by Chelebiev (1988: 11) could be *G. nolli*. Joharchi & Negm (2020: 499) presented a list of differences between *G. nolli* and *G. praesternalis*.

***Gaeolaelaps olszanowskii* Joharchi *et al*., 2020**
Gaeolaelaps olszanowskii Joharchi, Hugo-Coetzee, Ermilov & Khaustov, 2020g: 440.

Type depository. National Museum, Bloemfontein, South Africa.
Type locality and habitat. 1404 m above sea level, Franklin Game Reserve on Naval Hill (29°05'57.9"S, 26°14'3.2"E), Bloemfontein, South Africa, in soil.

***Gaeolaelaps orbiculatus* Nemati & Mohseni, 2013**

Gaeolaelaps orbiculatus Nemati & Mohseni, 2013: 76.

Gaeolaelaps orbiculatus.—Kavianpour & Nemati, 2014: 321; Kazemi *et al*., 2014: 504; Trach, 2016: 7; Vatankhah *et al*., 2016: 572; Nemati *et al*., 2018b: 141, 2018c: 233; Joharchi *et al*., 2021b: 279.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.

Type locality and habitat. 845 m above sea level, Izeh (31°49'52"N, 49°52'9"E), Khuzestan, Iran, in soil.

***Gaeolaelaps oreithyiae* Walter & Oliver, 1989**

Geolaelaps oreithyiae Walter & Oliver, 1989: 295.

Geolaelaps oreithyiae.—Farrier & Hennessey, 1993: 73.

Hypoaspis oreithyiae.—Kůrka, 2005: 25.

Gaeolaelaps oreithyiae.—Beaulieu, 2009: 37; Kavianpour *et al*., 2013: 8, 2017: 160; Kazemi & Rajaei, 2013: 85; Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 504; Kordeshami *et al*., 2015: 592; Nemati *et al*., 2018b: 141, 2018c: 233.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Fort Collins, Colorado, United States of America from a laboratory colony originated from females collected in an abandoned alfalfa field.

***Gaeolaelaps orientalis* (Hafez *et al*., 1982)**

Hypoaspis (*Hypoaspis*) *orientalis* Hafez, Elbadry & Nasr, 1982: 4.

Hypoaspis orientalis Hafez, Elbadry & Nasr, 1982: 11.

Hypoaspis orientalis.—Zaher, 1986: 191; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347.

Gaeolaelaps orientalis.—Nemati & Mohseni, 2013: 80; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2019f: 573, 2020e: 489.

Type depository. Unspecified.

Type locality and habitat. National Research Centre, Dokki, Giza, Egypt, under *Poinciana* sp. [Plantae: Fabales: Fabaceae] trees.

Note. Without referring to the placement of this species in *Gaeolaelaps* by other authors, Kazemi *et al*. (2014: 519) considered that it could belong to *Gaeolaelaps*. *Hypoaspis* (*Hypoaspis*) *orientalis* Hafez *et al*., 1982 is a junior primary homonym of *Hypoaspis orientalis* Bhattacharyya, 1968, and must be replaced. We refrain from doing that here, to give the original authors a chance to propose a replacement name.

***Gaeolaelaps ovoideus* (Greim, 1969) new combination**

Hypoaspis ovoideus Greim, in Hirschmann *et al*., 1969: 139.

Hypoaspis (*Holostaspis*) *ovoidea*.—Karg, 1971: 179.

Hypoaspis (*Pneumolaelaps*) *ovoidea*.—Karg, 1979: 93, 1982: 247, 1993a: 154.

Hypoaspis (*Pneumolaelaps*) *ovoideus*.—Faraji *et al*., 2008: 208.

Pneumolaelaps ovoidea.—Kazemi & Rajaei, 2013: 95.

Type depository. Unspecified.

Type locality and habitat. Unspecified locality, on *Lasius fuliginosus*, *Lasius brunneus* and *Formica rufa rufa* [Animalia: Hymenoptera: Formicidae].

Note. Babaeian *et al*. (2019a: 331) excluded this species from *Holostaspis* but were unable to place it in another genus. It does not present key characteristics of the genus *Pneumolaelaps*, such as a wide peritreme and

hypertrichous opisthogaster. The serrate margin of the epistome and other characteristics lead us to place this species in *Gaeolaelaps*.

***Gaeolaelaps paraculeifer* Rosario, 1981**
Geolaelaps paraculeifer Rosario, 1981: 55.
Gaeolaelaps paraculeifer.—Beaulieu, 2009: 36; Trach, 2016: 13.

Type depository. Unspecified.
Type locality and habitat. Mud Spring Area, Mount Makiling, College, Laguna, Philippines, on unidentified passalid beetle [Animalia: Coleoptera: Passalidae].

***Gaeolaelaps parasingularis* (Gu *et al*., 1996) new combination**
Androlaelaps parasingularis Gu, Wang & Fan, 1996: 408.
Androlaelaps parasingularis.—Kůrka, 2005: 23; Ren & Guo, 2008: 328, 2009: 100; Ma *et al*., 2012: 97; Zhou *et al*., 2015: 488.

Type depository. Department of Parasitology, Medical School, Nanjing University, Nanjing, Jiangsu, China.
Type locality and habitat. Yuanjiang (23.6°N, 101.9°E), Yunnan, China, on unidentified scarabaeid beetles [Animalia: Coleoptera: Scarabaeidae].
Note. Kazemi *et al*. (2014: 519) considered that this species could belong to *Gaeolaelaps*. We provisionally agree with that interpretation until the species is described in more detail.

***Gaeolaelaps passalus* Rosario, 1981**
Geolaelaps passalus Rosario, 1981: 58.
Hypoaspis passalus.—Kůrka, 2005: 25.
Gaeolaelaps passalus.—Beaulieu, 2009: 36; Trach, 2016: 13.

Type depository. Unspecified.
Type locality and habitat. Mud Spring Area, Mount Makiling, College, Laguna, Philippines, on unidentified passalid beetle [Animalia: Coleoptera: Passalidae].

***Gaeolaelaps patagoniensis* (Sheals, 1962) new combination**
Hypoaspis patagoniensis Sheals, 1962: 106.
Hypoaspis (*Pneumolaelaps*) *patagoniensis*.—Karg, 1979: 92, 1982: 246.
Pneumolaelaps patagoniensis.—Moreira, 2014: 357.
Hypoaspis patagoniensis.—Joharchi & Friedrich, 2021: 68.

Type depository. Natural History Museum, London, England; specimen number 1961–6–20–48.
Type locality and habitat. Nahuel Huapi, Arroyo Pilmaiquen, Lake Gutierrez, Patagonia Andina, Argentina, in moss and lichens on rock.
Note. This species appears to be a typical *Gaeolaelaps*. We provisionally place it in *Gaeolaelaps* until more information is available about the gnathosoma and the leg chaetotaxy.

***Gaeolaelaps petrovae* (Shereef & Afifi, 1980) new combination**
Hypoaspis petrovae Shereef & Afifi, 1980: 131.
Hypoaspis petrovae.—Zaher, 1986: 192; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347; Fouly & Al-Rehiayani, 2011: 143.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.
Type locality and habitat. Giza, Egypt, in organic manure.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Kazemi *et al*. (2014: 519) considered that this species could belong to *Gaeolaelaps*, and we agree with that assessment.

***Gaeolaelaps pinnae* (Karg, 1987)**
Hypoaspis (*Geolaelaps*) *pinnae* Karg, 1987: 299.
Hypoaspis (*Geolaelaps*) *pinnae*.—Karg, 1989c: 117, 1989d: 4.
Geolaelaps pinnae.—Bernini *et al*., 1995: 28.
Hypoaspis s. l. *pinnae*.—Kazemi *et al*., 2014: 522.
Gaeolaelaps pinnae.—Moreira, 2014: 261; Saeidi *et al*., 2016: 38.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. "Pra dei Cavai" Farm, in San Stino, Livenza, Venice, Italy, in soil of corn field.
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps* because of its strongly barbed dorsal setae, without assigning it to another genus.

***Gaeolaelaps praesternalis* (Willmann, 1949)**
Hypoaspis praesternalis Willmann, 1949a: 115.
Hypoaspis praesternalis.—Ryke, 1963: 2; Evans & Till, 1965a: 269; Karg, 1965: 311; Costa, 1968: 9; Solomon, 1968a: 664; Błaszak, 1969: 32; Shcherbak, 1971a: 21; Lapinya, 1976: 36; Chelebiev, 1981: 185; Niedbała *et al*., 1982: 247, 1990: 32; Farrier & Hennessey, 1993: 73; Bernini *et al*., 1995: 29; Xu & Liang, 1996: 191; Ma, 1997b: 31, 2006a: 23; Ma *et al*., 2001: 118; Fenďa & Schniererová, 2004; Ma & Yin, 2004: 117, 2011: 119; Ren & Guo, 2008: 329, 2009: 101; Chaudhury *et al*., 2010: 136; Kontschán *et al*., 2015b: 63; Manu *et al*., 2021: 5.
Hypoaspis sinicus Zhang, Zheng & Yin, 1963: 190 [junior synonym of *H. praesternalis* by Deng *et al*., 1993: 175; Yan *et al*., 2008: 2230; Meng *et al*., 2021: 4].
Gaeolaelaps praesternalis.—Athias-Henriot, 1968: 243; Kavianpour *et al*., 2013: 8; Kazemi & Rajaei, 2013: 85; Kavianpour & Nemati, 2014: 322; Kazemi *et al*., 2014: 514; Mahjoori *et al*., 2014: 1601; Ramroodi *et al*., 2015a: 79; Trach, 2016: 13; Vatankhah *et al*., 2016: 571; Nemati *et al*., 2018b: 141, 2018c: 233; Yan *et al*., 2018: 261; Joharchi *et al*., 2019e: 81, 2021a: 243, 2021b: 279; Gwiazdowicz *et al*., 2020a: 522; Kazemi, 2020: 136.
Hypoaspis (*Hypoaspis*) *praesternalis*.—Aswegen & Loots, 1970: 190; Karg, 1971: 170, 1978b: 15.
Hypoaspis (*Geolaelaps*) *praesternalis*.—Karg, 1979: 85, 1982: 243, 1989c: 117, 1993a: 144; Teng, 1982: 162; Chelebiev, 1988: 11; Deng *et al*., 1993: 175; Ma & Yin, 1998: 223; Sklyar, 2001: 101; Marchenko, 2002: 44; Gwiazdowicz & Klemt, 2004: 14; Yan *et al*., 2008: 2230; Skorupski *et al*., 2013: 10; Meng *et al*., 2021: 4.
Hypoaspis (*Geolaelaps*) *postreticulatus* Xu & Liang, 1996: 189 [junior synonym of *H. praesternalis* by Ma, 2006a: 23; Yan *et al*., 2008: 2230; Khalili-Moghadam & Saboori, 2015: 318].
Gaeolaelaps postreticulatus.—Beaulieu, 2009: 37; Kazemi & Rajaei, 2013: 85; Kazemi *et al*., 2014: 521; Joharchi *et al*., 2018a: 25; Yan *et al*., 2018: 261.
Hypoaspis praesentalis [sic].—Chaudhury *et al*., 2010: 136.
Hypoaspis (*Gaeolaelaps*) *praesternalis*.—Saito &Takaku, 2011: 88.
Hypoaspis (*Gaeolaelaps*) *postreticulatus*.—Saito & Takaku, 2011: 91.
Hypoaspis presternalis [sic].—Kontschán *et al*., 2015a: 35.
Gaeolaelaps prasternalis [sic].—Hajizadeh & Joharchi, 2018: 27.

Type depository. *H. praesternalis*: author's collection (according to Joharchi *et al*. (2018: 25), the types are not in Willmann's collection at the Zoologische Staatssammlungen, München); *H. sinicus*: Department of Biology, Jilin Medical University, Changchun, Jilin province, China; *H.* (*G.*) *postreticulatus*: Department of Environmental and Resources Biology, Fudan University, Shanghai, China.

Type locality and habitat. *H. praesternalis*: Ciechocinek, Poland, in sod root from salt marsh; *H. sinicus*: Jilin province, China, in mouse's nest; *H.* (*G.*) *postreticulatus*: Lujiang, Anhui, China, in moss.
Note. Karg (1971: 170, 1979: 85) considered the specimens identified as *Hypoaspis* (*Gaeolaelaps*) *praesternalis* by Evans & Till (1966: 173) to belong to a different species. See also note under *Gaeolaelaps nolli*.

***Gaeolaelaps praesternaloides* (Ma & Yin, 1998)**
Hypoaspis (*Geolaelaps*) *praesternaloides* Ma & Yin, 1998: 223.
Hypoaspis (*Geolaelaps*) *praesternaloides*.—Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps praesternaloides.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 521; Yan *et al*., 2018: 261; Joharchi *et al*., 2021a: 253.
Hypoaspis (*Gaeolaelaps*) *praesternaloides*.—Saito & Takaku, 2011: 91.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Liangshui Natural Preserve (47°10'N, 128°53'E), Dailing, Yichun, Heilongjiang, China, in forest soil.

***Gaeolaelaps praetarsalis* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *praetarsalis* Karg, 1978b: 20.
Gaeolaelaps praetarsalis.—Gwiazdowicz *et al*., 2020: 526; Joharchi & Friedrich, 2021: 68.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Parinacota, Tarapaca, Chile, under rocks.

***Gaeolaelaps pygmaeus* (Meledzhayeva, 1963) new combination**
Hypoaspis pygmaeus Meledzhayeva, 1963: 53.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series: Kizyldzha-Baba, in tunnel of a great gerbil [Animalia: Rodentia: Sciuridae]; vicinity of Kadyr-Gotyr, Karabile, unspecified substrate; all in Karakum, Turkmenistan.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it does not have macrosetae on the dorsal shield. It appears to be a species of *Gaeolaelaps*, where we place it provisionally.

***Gaeolaelaps quadridentatus* (Allred, 1970)**
Hypoaspis quadridentatus Allred, 1970: 110.
Gaeolaelaps quadridentatus.—Halliday *et al*., 2018: 50.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number B-67721.
Type locality and habitat. 4.8 km above [sic] Saidu, Margarzar Road, Swat, Pakistan (cited as West Pakistan), on *Tatera indica* [Animalia: Rodentia: Muridae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Halliday *et al*. (2018: 50) transferred it to *Gaeolaelaps*.

***Gaeolaelaps queenslandicus* (Womersley, 1956)**

Hypoaspis tripodiger Berlese, 1916b: 167.

Hypoaspis tripodiger.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 422; Bernini *et al*., 1995: 29.

Androlaelaps queenslandicus Womersley, 1956a: 577.

Geolaelaps queenslandicus.—Ryke, 1963: 13; Walter & Oliver, 1989: 295; Farrier & Hennessey, 1993: 73; Halliday, 2019: internet page.

Androlaelaps queenslandicus.—Sheals, 1964: 15; Wang & Li, 1965: 239.

Gaeolaelaps queenslandicus.—Hyatt, 1964: 472; Beaulieu, 2009: 37; Kavianpour *et al*., 2013: 8; Kazemi & Rajaei, 2013: 85; Nemati & Kavianpour, 2013: 71; Ghasemi-Moghadam *et al*., 2014: 964; Hasanvand *et al*., 2014a: 96, 2014b: 2868; Kavianpour & Nemati, 2014: 321; Kazemi *et al*., 2014: 510; Mahjoori *et al*., 2014: 1601; Amani *et al*., 2015: 92; Ramroodi *et al*., 2015a: 79; Trach, 2016: 13; Abbaspour *et al*., 2017: 747; Hajizadeh & Joharchi, 2018: 26; Kavianpour e*t al*., 2018: 184; Khalesi & Kazemi, 2018: 638; Nemati *et al*., 2018a: 713, 2018b: 142, 2018c: 233; Halliday, 2019: internet page; Joharchi *et al*., 2019a: 482, 2019f: 574; Gwiazdowicz *et al*., 2020a: 523; Joharchi & Negm, 2020: 499; Kazemi, 2020: 137.

Androlaelaps trifurcatus Wang & Li, 1965: 238 [junior synonym of *A*. *queenslandicus* by Nemati *et al*., 2018a: 713; Joharchi & Negm, 2020: 499].

Hypoaspis (*Hypoaspis*) *angustus* Karg, 1965: 274 [junior synonym of *A*. *queenslandicus* by Nemati *et al*., 2018a: 713; Joharchi & Negm, 2020: 499].

Hypoaspis queenslandicus.—Costa, 1966b: 141; Spain & Luxton, 1971: 186; Zeman, 1982: 233; Zaher, 1986: 191; Nasr & Nawar, 1989a: 70; Shereef *et al*., 1992: 1130; Nawar *et al*., 1993: 347; Strong & Halliday, 1994: 87; Halliday, 1998: 125; Kůrka, 2005: 25; El-Banhawy *et al*., 2006: 66; Fouly & Al-Rehiayani, 2011: 145.

Hypoaspis angustus.—Costa, 1966b: 147; Zeman, 1982: 233; Ma, 1996: 51.

Hypoaspis (*Hypoaspis*) *queenslandicus*.—Aswegen & Loots, 1970: 190; Nasr, 1978: 65; Hafez *et al*., 1982: 4.

Hypoaspis (*Hypoaspis*) *angusta*.—Karg, 1971: 171, 1978b: 15.

Hypoaspis (*Geolaelaps*) *angustus*.—Bregetova, 1977b: 504.

Hypoaspis (*Geolaelaps*) *angusta*.—Karg, 1979: 81, 1982: 239, 1993a: 141; Ruf & Koehler, 1993: 197.

Hypoaspis (*Geolaelaps*) *queenslandica*.—Karg, 1979: 81, 1993a: 141, 1993b: 266; Tenorio, 1982: 265; Tenorio *et al*., 1985: 300.

Geolaelaps augustus [sic].—Walter & Oliver, 1989: 295.

Hypoaspis angusta.—Farrier & Hennessey, 1993: 77; Ruf & Koehler, 1993: 197; Kůrka, 2005: 24.

Androlaelaps trifurcatus.—Deng *et al*., 1993: 120; Li *et al*., 1998b: 266; Yan & Ma, 1999: 149; Wang & Liao, 2000: 27; Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.

Androlaelaps trifurcatoides Yan & Ma, 1999: 149 [junior synonym of *A*. *queenslandicus* by Nemati *et al*., 2018a: 713; Joharchi & Negm, 2020: 499].

Hypoaspis (*Gaeolaelaps*) *queenslandica*.—Faraji *et al*., 2008: 207.

Androlaelaps trifurcatoides.—Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.

Gaeolaelaps angustus.—Beaulieu, 2009: 36; Kazemi & Rajaei, 2013: 83; Kazemi *et al*., 2014: 516, 2018a: 714; Saberi *et al*., 2016: 128; Kavianpour, 2017: 161.

Gaeolaelaps angusta.—Trach, 2012: 162; Kavianpour *et al*., 2013: 7, 2017: 161; Nemati & Kavianpour, 2013: 70; Kavianpour & Nemati, 2014: 321; Ramroodi *et al*., 2015a: 79; Maleki *et al*., 2016: 187; Hajizadeh & Joharchi, 2018: 26; Nemati *et al*., 2018a: 717, 2018b: 139.

Gaeolaelaps queenslandica.—Trach, 2012: 162; Maleki *et al*., 2016: 187.

Geolaelaps queenslandica.—Tajmiri & Hajizadeh, 2013: 17.

Gaeololaelaps [sic] *angustus*.—Abbaspour *et al*., 2017: 746.

Gaeolaelaps tripodiger.—Nemati *et al*., 2018a: 714.

Gaeolaelaps trifurcatus.—Nemati *et al*., 2018a: 716.

Gaeolaelaps trifurcatoides.—Nemati *et al*., 2018a: 717.

Type depository. *H*. *tripodiger*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *A*. *queenslandicus*: South Australian Museum, Adelaide, Australia; *H*. (*H*.) *angustus*: Karg's collection [according to Nemati *et al*., 2018a: 712, in Museum für Naturkunde, Berlin]; *A*. *trifurcatus*: Institute of Zoology, Academia Sinica, Beijing, China; *A*. *trifurcatoides*: National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.

Type locality and habitat. *H. tripodiger*: La Plata, Argentina, in nest of *Acromyrmex lundi* [Animalia: Hymenoptera: Formicidae]; *A. queenslandicus*: Taringa, South Queensland, Australia, in litter; *H.* (*H.*) *angustus*: "Biologischen Zentralanstalt Berlin", Kleinmachnow, Germany, in pasture soil; *A. trifurcatus*: Fujian, China, on *Rattus losea exiguus* [Animalia: Rodentia: Muridae]; *A. trifurcatoides*: Wuhan (30°31'N, 114°16'E), Hubei, China, in humus under trees.
Note. *Hypoaspis tripodiger* was described earlier than *A. queenslandicus*. However, for the interest of nomenclatural stability, the name *G. queenslandicus* was maintained by Nemati *et al*. (2018a: 713) as the valid name (ICZN Article 23.9.1; A. Nemati, pers. comm. 2018). Kazemi *et al*. (2014: 519) considered that *A. trifurcatus* could belong to *Gaeolaelaps* and that it was very similar to *G. angustus*, *G. queenslandicus* and *G. xiningensis*. Without referring to Nemati *et al*. (2018a: 713), Khalesi & Kazemi (2018: 638) suggested that *A. queenslandicus* could be a senior synonym of *H.* (*H.*) *angustus*.

***Gaeolaelaps rarosae* Rosario, 1981**
Geolaelaps rarosae Rosario, 1981: 59.
Gaeolaelaps rarosae.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 516; Trach, 2016: 13.

Type depository. Unspecified.
Type locality and habitat. Mud Spring Area, Mount Makiling, College, Laguna, Philippines, on decomposing bark of fallen log with passalid beetles [Animalia: Coleoptera: Passalidae].

***Gaeolaelaps reticulatus* (Sheals, 1962) new combination**
Hypoaspis reticulatus Sheals, 1962: 105.
Hypoaspis reticulotus [sic].—Sheals, 1962: 106.
Hypoaspis reticulatus.—Joharchi & Friedrich, 2021: 68.

Type depository. Natural History Museum, London, England; specimen number 1961–6–20–46.
Type locality and habitat. Nahuel Huapi, Puerto Catello [sic], Patagonia, Argentina, on vegetation among rocks.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Besides the lack of details on the epistome, deutosternum and leg chaetotaxy, it is otherwise compatible with *Gaeolaelaps*, and we have placed it in this genus provisionally. The name *Hypoaspis reticulatus* Sheals, 1962 is a senior homonym of *Hypoaspis* (*Cosmolaelaps*) *reticulatus* Xu & Liang, 1996 and *Hypoaspis reticulatus* Chaudhury *et al*., 2010.

***Gaeolaelaps rhizotrogi* (Mašán, 1998)**
Hypoaspis (*Hypoaspis*) *rhizotrogi* Mašán, 1998: 20.
Hypoaspis rhizotrogi.—Kůrka, 2005: 25; Sklyar, 2012: 84.
Gaeolaelaps rhizotrogi.—Trach, 2016: 7; Vatankhah *et al*., 2016: 571; Trach & Joharchi, 2018: 219.

Type depository. Institute of Zoology of the Slovak Academy of Sciences in Bratislava, Slovakia.
Type locality and habitat. Pobedím (Podunajská nížina lowland), southwest Slovakia, on *Rhizotrogus aequinoctialis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].
Note. Trach (2016: 7) suspected this species to be a senior synonym of *Hypoaspis dubininae*.

***Gaeolaelaps rigensis* (Lapinya, 1976) new combination**
Hypoaspis rigensis Lapinya, 1976: 48.
Hypoaspis rigensis.—Kůrka, 2005: 25.

Type depository. Unspecified.

Type locality and habitat. Type series: Mežaparks, Riga, Latvia, in pine forest; Âgenskalns, Riga, Latvia, in garden.
Note. The placement of this species in *Gaeolaelaps* is provisional, given the insufficient details available in the literature. Features typical of the genus are given in the original description, including the simple, relatively short and uniform dorsal idiosomal setae, weakly sclerotised presternal area, sternal shield longer than wide and drop-shaped epigynal shield. Characteristics of the epistome of this species are unknown.

***Gaeolaelaps rosei* (Strong & Halliday, 1994)**
Hypoaspis rosei Strong & Halliday, 1994: 93.
Hypoaspis rosei.—Strong, 1995: 222, 1996: 426; Halliday, 1998: 125; Kůrka, 2005: 25.
Gaeolaelaps rosei.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 505; Halliday, 2019: internet page.
Hypoaspis (*Gaeolaelaps*) *rosei*.—Faraji & Halliday, 2009: 249.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. 26 km southwest of Boree Creek, near Urana, New South Wales, Australia, on *Geoscapheus dilatatus* [Animalia: Blattodea: Blaberidae].

***Gaeolaelaps ruehmi* (Hirschmann, 1972) new combination**
Hypoaspis ruehmi Hirschmann, 1972: 32.

Type depository. Unspecified.
Type locality and habitat. Laboratory colony at Valdivia and Lonquimay, Chile, on *Araucaria araucana* [Plantae: Pinales: Araucariaceae], associated with *Araucarius minor* and *Araucarius medius* [Animalia: Coleoptera: Curculionidae].
Note. The original description of this species is very brief. It is placed in *Gaeolaelaps* based on its similarity with *Gaeolaelaps aculeifer*, reported by Hirschmann (1972: 32).

***Gaeolaelaps ruggi* (Strong & Halliday, 1994)**
Hypoaspis ruggi Strong & Halliday, 1994: 91.
Hypoaspis ruggi.—Strong, 1995: 222; Halliday, 1998: 125; Kůrka, 2005: 25.
Gaeolaelaps ruggi.—Beaulieu, 2009: 36; Walter & Moser, 2010: 405; Kazemi *et al*., 2014: 505; Halliday, 2019: internet page; Joharchi *et al*., 2020g: 444.
Hypoaspis (*Gaeolaelaps*) *ruggi*.—Faraji & Halliday, 2009: 249.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Magnetic Island, Queensland, Australia, on *Macropanesthia rhinoceros* [Animalia: Blattodea: Blaberidae].

***Gaeolaelaps saboorii* Joharchi & Babaeian, 2014**
Gaeolaelaps saboorii Joharchi & Babaeian, 2014: 90.
Hypoaspis s.l. *saboorii*.—Nemati *et al*., 2018b: 177.
Gaeolaelaps saboorii.—Saeidi *et al*., 2019: 123; Joharchi & Halliday, 2020: 24.

Type depository. Originally at Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. Presently at Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Iran (according to Joharchi & Halliday, 2020: 23).

Type locality and habitat. Polur (35°50'N, 52°17'E), Mazandaran, Iran, on *Acinopus* sp. [Animalia: Coleoptera: Carabidae, Harpalinae].

***Gaeolaelaps scarites* Joharchi & Saeidi, 2019**
Gaeolaelaps scarites Joharchi & Saeidi, *in* Saeidi *et al*., 2019: 119.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 1850 m above sea level, Garmeh Khani (38°43'N, 35°15'E), Dehgolan, Kurdistan province, Iran, on *Scarites* (*Parallelomorphus*) *terricola* (Animalia: Coleoptera: Carabidae, Scaritinae).

***Gaeolaelaps schusteri* (Hirschmann, 1966)**
Hypoaspis schusteri Hirschmann, 1966: 35.
Hypoaspis schusteri.—Costa, 1974: 221.
Hypoaspis (*Geolaelaps*) *schusteri*.—Karg, 1979: 81, 1982: 241, 1987: 298, 1989c: 117, 1989d: 4, 1993a: 141.
Geolaelaps schusteri.—Bernini *et al*., 1995: 28.
Gaeolaelaps schusteri.—Beaulieu, 2009: 36; Walter & Moser, 2010: 405; Kazemi *et al*., 2014: 504; Trach, 2016: 10; Khalesi & Kazemi, 2018: 636; Kazemi, 2020: 137; Kazemi *et al*., 2020: 1978.

Type depository. Unspecified.
Type locality and habitat. Type series, Kavouri, Athens, Greece; Palaea, Epidaurus, Peloponnes, Greece, and Le Brusc, Toulon, France, on sand and gravel of flat beaches.

***Gaeolaelaps segregatus* (Faraji & Halliday, 2009)**
Hypoaspis (*Gaeolaelaps*) *segregatus* Faraji & Halliday, 2009: 249.
Gaeolaelaps segregatus.—Moreira, 2014: 265; Kazemi *et al*., 2014: 505; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Blackdown Base, Dawson Range, Queensland, Australia, on *Geoscapheus* sp. [Animalia: Blattodea: Blaberidae].
Note. Faraji & Halliday (2009: 246) considered that some of the paratypes of *H. blattae* were misidentified, and they were designated as paratypes of *Hypoaspis* (*Gaeolaelaps*) *concavus* Faraji & Halliday and *Hypoaspis* (*Gaeolaelaps*) *segregatus* Faraji & Halliday.

***Gaeolaelaps seriopilosa* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *seriopilosa* Karg, 1978b: 16.
Hypoaspis (*Geolaelaps*) *seriopilosa*.—Karg, 1979: 84, 1982: 242, 1989c: 115.
Gaeolaelaps seriopilosa.—Moreira, 2014: 265; Kazemi, 2020: 132.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 1000 m above [sic] Azapa, Tarapaca, Chile, in soil.

***Gaeolaelaps setillus* Joharchi *et al*., 2019**
Gaeolaelaps setillus Joharchi, Khaustov & Ermilov, 2019f: 569.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 42 m above sea level; near the Thambadola Ella waterfall, Polgampola (6°27'N, 80°12'E), Sabaragamuwa province, Sri Lanka, in soil and litter.

***Gaeolaelaps setosus* (Meledzhayeva, 1963) new combination**
Hypoaspis setosus Meledzhayeva, 1963: 53.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.
Type locality and habitat. Type series, vicinity of Kadyr-Gotyr, Karabile, in tunnel of the Afghan vole [Animalia: Rodentia: Cricetidae]; Kizyldzha-Baba, in tunnel of a great gerbil [Animalia: Rodentia: Sciuridae]; all in Karakum, Turkmenistan.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it does not have macrosetae on the dorsal shield. It appears to be a species of *Gaeolaelaps*, but our placement in this genus is provisional.

***Gaeolaelaps sevastianovi* Trach, 2016**
Gaeolaelaps sevastianovi Trach, 2016: 10.
Gaeolaelaps sevastianovi.—Vatankhah *et al*., 2016: 571; Joharchi *et al*., 2020g: 444.

Type depository. Collection of the Museum of Zoology, I. I. Mechnikov Odessa National University, Odessa, Ukraine; specimen number N 29–07–2010.
Type locality and habitat. Near Cherepaha river (49°18'N, 40°05'E), vicinity of Krinichnoe, Melovskoj District, Lugansk Region, Ukraine, under elytra of *Heterocerus* sp. [Animalia: Coleoptera: Heteroceridae].

***Gaeolaelaps similisetae* (Karg, 1965)**
Hypoaspis (*Hypoaspis*) *similisetea* [sic] Karg, 1965: 273.
Hypoaspis similisetae.—Costa, 1968: 21; Ma, 1988: 147, 1996: 51; Kontschán *et al*., 2015b: 63.
Hypoaspis (*Hypoaspis*) *similisetae*.—Karg, 1971: 167, 1978b: 16.
Hypoaspis (*Geolaelaps*) *similisetae*.—Karg, 1979: 80, 1982: 239, 1993a: 140, 2006: 148.
Geolaelaps similisetae.—Farrier & Hennessey, 1993: 73; Nemati & Mohseni, 2013: 80.
Gaeolaelaps similisetae.—Beaulieu, 2009: 36; Trach, 2012: 162, 2016: 7; Kazemi *et al*., 2014: 521; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2018a: 26, 2019a: 482, 2019c: 272.

Type depository. Karg's collection.
Type locality and habitat. Zörbig, near Halle, Sachsen-Anhalt, Germany, in field and pasture soils.

***Gaeolaelaps singularis* (Wang & Li, 1965) new combination**
Androlaelaps singularis Wang & Li, 1965: 237.
Androlaelaps singularis.—Gu & Duan, 1991: 340, 1993: 49; Deng *et al*., 1993: 118; Gu *et al*., 1996: 409; Wang & Liao, 2000: 26; Kůrka, 2005: 23; Ren & Guo, 2008: 328, 2009: 100; Xin *et al*., 2010: 2; Zhou *et al*., 2015: 488.

Type depository. Institute of Zoology, Academia Sinica, Beijing, China.
Type locality and habitat. Fujian, China, *Suncus murinus* [Animalia: Soricomorpha: Soricidae].
Note. Kazemi *et al*. (2014: 519) considered that this species could belong to *Gaeolaelaps*. We provisionally agree with that interpretation until the species is described in more detail.

***Gaeolaelaps singuloides* (Gu & Duan, 1991)**
Androlaelaps singuloides Gu & Duan, 1991: 339.
Androlaelaps singuloides Gu & Duan, 1993: 48 (objective synonymy).
Androlaelaps singuloides.—Gu *et al*., 1996: 409; Kůrka, 2005: 23; Ren & Guo, 2008: 328, 2009: 100; Zhou *et al*., 2015: 488.
Gaeolaelaps singuloides.—Beaulieu, 2009: 37; Yan *et al*., 2018: 261.

Type depository. Department of Parasitology, Guiyang Medical College, Guizhou, China.
Type locality and habitat. Longchuan (24.3°N, 97.9°E), Yunnan, China, on *Gryllulus* sp. [Animalia: Orthoptera: Gryllidae].

***Gaeolaelaps sitalaensis* (Bhattacharyya, 1965)**
Hypoaspis sitalaensis Bhattacharyya, 1965: 149.
Hypoaspis (*Geolaelaps*) *sitalaensis*.—Karg, 1989c: 118, 1989d: 4.
Gaeolaelaps sitalaensis.—Moreira, 2014: 266; Joharchi *et al*., 2019f: 573.

Type depository. Author's collection.
Type locality and habitat. Near Sonarpur, Sitala, 16 km southeast of Kolkata (cited as Calcutta), West Bengal, India, in soil near stump of a fig [*Ficus carica*; Plantae: Rosales: Moraceae] tree.

***Gaeolaelaps spiniseta* (Barilo, 1991)**
Hypoaspis (*Geolaelaps*) *spiniseta* Barilo, 1991: 13.
Hypoaspis (*Geolaelaps*) *stranslineatus* [sic].—Barilo, 1991: 17.
Hypoaspis spiniseta.—Kůrka, 2005: 25.
Gaeolaelaps spiniseta.—Beaulieu, 2009: 37; Kazemi *et al*., 2014: 510; Joharchi *et al*., 2020g: 444.

Type depository. Institute of Zoology, Kiev, Ukraine; specimen number G-76.
Type locality and habitat. Vicinity of Samarkand, Uzbekistan, in soil under mixed grass.

***Gaeolaelaps subminor* (Gu &Bai, 1991)**
Hypoaspis subminor Gu & Bai, 1991: 181.
Hypoaspis subminor.—Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2008: 2230.
Gaeolaelaps subminor.—Beaulieu, 2009: 37; Yan *et al*., 2018: 261.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Zhangning (27.4°N, 105.6°E), Ningxia Hui Autonomous Region, China, on *Cricetulus barabensis* [Animalia: Rodentia: Cricetidae].

***Gaeolaelaps urumiensis* Kavianpour *et al*., 2018**
Gaeolaelaps urumiensis Kavianpour, Nemati & Krimpour, 2018: 180.
Gaeolaelaps urumiensis.—Joharchi *et al*., 2019b: 226, 2019f: 574; Kavianpour e*t al*., 2018: 184.

Type depository. Acarology Laboratory, Plant Protection Department, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. 1695 m above sea level, Urmia (37°19'54"N, 44°51'57"E), West Azarbaijan province, Iran, in soil and litter.

***Gaeolaelaps taitzujungi* (Samšiňák, 1964)**
Hypoaspis taitzujungi Samšiňák, 1964: 46.
Hypoaspis (*Geolaelaps*) *taitzujungi*.—Deng *et al*., 1993: 178; Yan *et al*., 2010: 904.
Hypoaspis taitzujungi.—Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps taitzujungi.—Beaulieu, 2009: 37; Yan *et al*., 2018: 262.

Type depository. Institute of Zoology of the Chinese Academy of Sciences, Beijing, China.
Type locality and habitat. Kao-ho, Kanton, China, in mounds of *Coptotermes formosanus* [Animalia: Blattodea: Rhinotermitidae].

***Gaeolaelaps tarsalis* (Bhattacharyya, 1968)**
Hypoaspis tarsalis Bhattacharyya, 1968: 540.
Hypoaspis tarsalis.—Prasad, 1974: 151.
Gaeolaelaps tarsalis.—Beaulieu, 2009: 37; Joharchi *et al*., 2019f: 574.

Type depository. Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India.
Type locality and habitat. Nursery Garden, Botanical Garden, Shibpur, Howrah, West Bengal, India, in soil.

***Gaeolaelaps tengi* (Gu &Bai, 1991)**
Hypoaspis tengi Gu & Bai, 1991: 183.
Hypoaspis tengi.—Kůrka, 2005: 25; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2008: 2230.
Gaeolaelaps tengi.—Beaulieu, 2009: 37; Kazemi *et al*., 2014: 516; Yan *et al*., 2018: 261.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Zhangning (27.4°N, 105.6°E), Ningxia Hui Autonomous Region, China, on *Phodopus roborovskii* [Animalia: Rodentia: Cricetidae].

***Gaeolaelaps tenuisetus* Rosario, 1981**
Geolaelaps tenuisetus Rosario, 1981: 61.
Hypoaspis tenuisetus.—Kůrka, 2005: 25.
Gaeolaelaps tenuisetus.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 516; Trach, 2016: 7.

Type depository. Unspecified.
Type locality and habitat. Makiling Botanical Garden, Mount Makiling, College, Laguna, Philippines, in soil of secondary forest.

***Gaeolaelaps theodori* (Costa, 1974)**
Hypoaspis theodori Costa, 1974: 224.
Hypoaspis (*Geolaelaps*) *theodori*.—Karg, 1979: 82, 1982: 241, 1987: 299, 1989c: 118, 1989d: 5, 1993a: 143, 1993b: 263.
Gaeolaelaps theodori.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 504; Trach, 2016: 10; Kazemi *et al*., 2020: 1985.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Nakhsholim, Israel, in algal debris.

***Gaeolaelaps transversanalis* (Karg, 2000)**
Hypoaspis (*Geolaelaps*) *transversanalis* Karg, 2000: 247.
Hypoaspis (*Geolaelaps*) *transversanalis*.—Karg, 2003b: 233.

Gaeolaelaps transversanalis.—Moreira, 2014: 269; Trach, 2016: 7; Joharchi *et al*., 2021b: 279.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Between Pifo and Papallacta, Pichinca [probably Pichincha], Ecuador, in litter.

***Gaeolaelaps tridentifera* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *tridentifera* Karg, 1978b: 14.
Hypoaspis (*Geolaelaps*) *tridentifera*.—Karg, 1979: 85, 1982: 243, 1989c: 117.
Gaeolaelaps tridentifera.—Nemati & Mohseni, 2013: 75; Gwiazdowicz *et al*., 2020a: 526; Joharchi & Friedrich, 2021: 68.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Valdivia, Valdivia, Chile, in litter and humus.

***Gaeolaelaps tuberculatus* Kazemi & Paktinat-Saeij, 2020**
Gaeolaelaps tuberculatus Kazemi & Paktinat-Saeij, 2020, in Kazemi *et al*., 2020: 1970.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.
Type locality and habitat. Osku Mahalleh village (36º24′24.52″N, 52º18′23.22″E), Amol, in soil and on rotten leaves under citrus trees [Planta: Sapindales: Rutaceae].

***Gaeolaelaps vanpletzeni* (Aswegen & Loots, 1970)**
Hypoaspis (*Hypoaspis*) *vanpletzeni* Aswegen & Loots, 1970: 183.
Hypoaspis (*Geolaelaps*) *vanpletzeni*.—Karg, 1982: 242, 1989c: 116.
Hypoaspis vanpletzeni.—Strong & Halliday, 1994: 91; Strong, 1995: 222.
Gaeolaelaps vanpletzeni.—Beaulieu, 2009: 36; Kavianpour *et al*., 2013: 7; Nemati & Mohseni, 2013: 76.

Type depository. Institute for Zoological Research, Potchefstroom University, Potchefstroom, South Africa.
Type locality and habitat. Knysna, South Africa, in forest soil.

***Gaeolaelaps variabilis* (Faraji & Halliday, 2009)**
Hypoaspis (*Gaeolaelaps*) *variabilis* Faraji & Halliday, 2009: 254.
Gaeolaelaps variabilis.—Walter & Moser, 2010: 405; Halliday, 2019: internet page; Joharchi *et al*., 2020g: 444.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Mount Woowoonga, Queensland, Australia, on *Macropanesthia mackerrasae* [Animalia: Blattodea: Blattidae].
Note. Kazemi *et al*. (2014: 519) did not agree with the placement of this species in *Gaeolaelaps*, without referring it to another genus.

***Gaeolaelaps verticis* (Karg, 1978)**
Hypoaspis (*Hypoaspis*) *verticis* Karg, 1978b: 16.
Hypoaspis (*Geolaelaps*) *verticis* Karg, 1979: 80 (objective synonymy).
Hypoaspis (*Geolaelaps*) *verticis*.—Karg, 1982: 239, 1994: 184, 2006: 147.
Gaeolaelaps verticis.—Nemati & Mohseni, 2013: 80; Kazemi *et al*., 2014: 521; Trach, 2016: 13; Vatankhah *et al*., 2016: 572; Joharchi *et al*., 2021a: 243.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 600 m above sea level, near the main road of Cholilai, Epuyen, Argentina, in litter.

***Gaeolaelaps vertisimilis* (Karg, 1994)**
Hypoaspis vertisimilis Karg, 1994: 184.
Hypoaspis (*Geolaelaps*) *vertisimilis*.—Karg, 2006: 147.
Gaeolaelaps vertisimilis.—Beaulieu, 2009: 36; Nemati & Mohseni, 2013: 80; Trach, 2016: 13; Vatankhah *et al*., 2016: 572 Joharchi *et al*., 2021a: 243.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 450 m above sea level, below "Green Crater", Fernandina, Galapagos Islands, *Psychotria* [Plantae: Gentianales: Rubiaceae] zone, in litter.

***Gaeolaelaps xiningensis* (Ma & Lin, 2009)**
Hypoaspis xiningensis Ma & Lin, 2009: 28.
Gaeolaelaps xiningensis.—Yan *et al*., 2018: 261.
Hypoaspis xiningensis.—Lin *et al*., 2019: 130.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Xining (36°34'N, 101°49'E), Qinghai, China, on scraps of wood.
Note. Kazemi *et al*. (2014: 519) suspected this species could belong to *Gaeolaelaps*, and we agree on that interpretation.

***Gaeolaelaps wufengensis* (Liu & Ma, 2003)**
Hypoaspis wufengensis Liu & Ma, 2003: 653.
Hypoaspis wufengensis.—Kůrka, 2005: 25; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2018: 262.
Gaeolaelaps wufengensis.—Beaulieu, 2009: 36; Kazemi *et al*., 2014: 516.

Type depository. Medical Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Hubei, China, on *Collocalia brevirostris* [Animalia: Apodiformes: Apodidae].

***Gaeolaelaps zanzibarensis* Joharchi *et al*., 2018**
Gaeolaelaps zanzibarensis Joharchi, Halliday, Khaustov & Ermilov, 2018a: 25.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 8 m above sea level, Zanzibar (6°16'S, 39°25'E), Tanzania, in forest litter.

***Gaeolaelaps zhoumanshuae* (Ma, 1997)**
Hypoaspis zhoumanshuae Ma, 1997b: 31.
Hypoaspis zhoumanshuae.—Ma, 2005b: 74; Ren & Guo, 2008: 329, 2009: 101.
Gaeolaelaps zhoumanshuae.—Nemati & Kavianpour, 2013: 70; Nemati & Mohseni, 2013: 80; Kazemi *et al*., 2014: 505; Vatankhah *et al*., 2016: 572; Yan *et al*., 2018: 262; Gwiazdowicz *et al*., 2020a: 523; Kazemi, 2020: 136; Joharchi *et al*., 2019a: 482, 2021a: 243.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Baicheng (45°37'N, 122°49'E), Jilin province, China, in humus.

Gecarcinolaelaps Casanueva & Johnston, 1992

Gecarcinolaelaps Casanueva & Johnston, 1992a: 20 (type species: *Laelaps cancer* Pearse, 1929, by monotypy).
Gecarcinolaelaps.—Casanueva, 1993: 41.

Note. This genus was described in Laelapidae.

Gecarcinolaelaps cancer (Pearse, 1929)

Laelaps cancer Pearse, 1929: 229.
Laelaps cancer.—Radford, 1950a: 368.
cancer; *non-Laelaps* [sic].—Tipton, 1960: 290.
Gecarcinolaelaps cancer.—Casanueva & Johnston, 1992a: 20.

Type depository. Unspecified.
Type locality and habitat. Loggerhead Key, Dry Tortugas, Florida, United States of America, on *Gecarcinus lateralis* [Animalia: Decapoda: Gecarcinidae].

Gromphadorholaelaps Till, 1969

Gromphadorholaelaps Till, 1969: 515 (type species: *Gromphadorholaelaps schaeferi* Till, 1969, by monotypy).
Gromphadorholaelaps.—Casanueva, 1993: 40.

Note. This genus was described in Dermanyssidae-Laelapinae. Karg (1991: 167) and Vinarski & Korallo-Vinarskaya (2016: 232) considered it to be a junior synonym of *Androlaelaps*, but that interpretation is not accepted in this publication.

Gromphadorholaelaps schaeferi Till, 1969

Gromphadorholaelaps schaeferi Till, 1969: 516.
Gromphadorholaelaps schaeferi.—Costa, 1980: 547; Fain & Grootaert, 1991: 335; Gerdeman *et al*., 1998: 301.
Androlaelaps schaeferi.—Karg, 1991: 167; Kůrka, 2005: 23; Dowling & OConnor, 2010: 304.
Gromphadorholaelaps schafferi [sic].—Kontschán, 2007: 104.

Type depository. Author's collection.
Type locality and habitat. Connecticut, United States of America, in laboratory colonies of *Gromphadorhina portentosa* [Animalia: Blattodea: Blaberidae].

Gymnolaelaps Berlese, 1916

Hypoaspis (*Gymnolaelaps*) Berlese, 1916b: 170 (type species: *Laelaps myrmecophilus* Berlese, 1892, by original designation).
Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).
Gymnolaelaps.—Hull, 1918: 68; Vitzthum, 1929: 22 (in part), 1931c: 143; Radford, 1950b: 20; Trägårdh, 1952: 66; Evans, 1957a: 221; Tipton, 1960: 252; Schweizer, 1961: 87; Evans & Till, 1965a: 261, 1979: 201; Hunter, 1967: 99; Athias-Henriot, 1968: 237; Hunter & Costa, 1971: 51; Afifi & Abdel-Halim, 1988: 397; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 73; Joharchi *et al*., 2011: 23; Joharchi & Halliday, 2013: 40; Nemati & Gwiazdowicz, 2016b: 29; Hajizadeh & Joharchi, 2018: 23; Halliday, 2019: internet page.

Laeliphis Hull, 1925: 207 (type species: *Laeliphis fuscipes* Hull, 1925, by original designation) [junior synonym of *Hypoaspis* (*Gymnolaelaps*) by Vitzthum, 1942: 762; Radford, 1950b: 20; Hunter, 1967: 101; Bregetova, 1977b: 523; of *Gymnolaelaps* by Turk, 1953: 11; Tipton, 1960: 252; Farrier & Hennessey, 1993: 73].
Austrogamasus Womersley, 1942: 157 (type species: *Cyrtolaelaps gracilipes* Banks, 1916 (cited as *Cytolaelaps gracilipes*), by monotypy) [junior synonym of *Hypoaspis* (*Gymnolaelaps*) by Hunter, 1967: 101; Bregetova, 1977b: 523; of *Gymnolaelaps* by Farrier & Hennessey, 1993: 73].
Hypoaspis (*Gymnolaelaps*).—Vitzthum, 1942: 762; Baker & Wharton, 1952: 94; Karg, 1965: 271; Evans & Till, 1966: 160; Hunter, 1967: 99; Aswegen & Loots, 1970: 199; Bregetova, 1977b: 523.
Pseudoparasitus (*Gymnolaelaps*).—Karg, 1971: 159, 1978a: 205, 1981b: 209, 1993a: 133, 2000: 248.
Hypoaspis (*Holostaspis*).—Karg, 1982: 247 (in part).

Note. *Gymnolaelaps* was not assigned to a family in the original description. It was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 199); *Laeliphis* was described in Gamasidae-Laelaptinae. *Austrogamasus* was considered a junior synonym of *Pseudoparasitus* by Halliday (1998: 129). The concept of *Gymnolaelaps* adopted in this publication is that of Joharchi & Halliday (2013: 40) and Nemati & Gwiazdowicz (2016b: 29).

***Gymnolaelaps alpinus* (Guo *et al*., 1999)**
Mysolaelaps alpinus Guo, Pan & Yan 1999: 10.
Gymnolaelaps alpinus.—Ma, 2016a: 20.

Type depository. Medical Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Xichang, Sichuan, China, on *Apodemus chevrieri* [Animalia: Rodentia: Muridae].

***Gymnolaelaps artavilensis* Joharchi & Halliday, 2013**
Gymnolaelaps artavilensis Joharchi & Halliday, 2013: 41.
Gymnolaelaps artavilensis.—Kavianpour *et al*., 2017: 165; Nemati *et al*., 2018b: 142.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 1875 m above sea level, Ardabil (38°15'N, 48°17'E), Iran, in nest of *Pheidole pallidula* [Animalia: Hymenoptera: Formicidae].

***Gymnolaelaps birksianus* (Hull, 1925)**
Laeliphis birksianus Hull, 1925: 208.
Gymnolaelaps birksianus.—Turk, 1953: 11.

Type depository. Unspecified.
Type locality and habitat. Staffordshire, England, on dead wood.
Note. Evans & Till (1966: 362) suggested that this species could be placed in *Hypoaspis* (*Gymnolaelaps*) and we have provisionally accepted that interpretation, with *Gymnolaelaps* at the genus level, as done by Turk (1953: 11).

***Gymnolaelaps bisetus* (Aswegen & Loots, 1970)**
Hypoaspis (*Gymnolaelaps*) *bisetus* Aswegen & Loots, 1970: 200.
Pseudoparasitus (*Gymnolaelaps*) *bisetus*.—Karg, 1981b: 217, 1989b: 334.
Gymnolaelaps bisetus.—Moreira, 2014: 273.

Type depository. Museu do Dundo, Dundo, Lunda Norte, Angola; specimen number Ang. 17384.

Type locality and habitat. Near Kasai River at Nordeste (7°22'S, 21°50'E), Lunda Norte, Angola, in soil.

***Gymnolaelaps caudicomatus* (Berlese, 1916) new combination**
Hypoaspis (*Gymnolaelaps*) *caudicomatus* Berlese, 1916b: 170.
Hypoaspis (*Gymnolaelaps*) *caudicomatus*.—Castagnoli & Pegazzano, 1985: 69.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, in nests of *Acromyrmex lundi* [Animalia: Hymenoptera: Formicidae].
Note. The new combination proposed for this species results from the promotion of *Gymnolaelaps* from the subgeneric to the generic level, and the presence of features typical of the genus, including the truncate and serrate anterior margin of the epistome, marginal and dorsal setae simple and thin, longer posterior setae, and long epigynal shield.

***Gymnolaelaps fuscipes* (Hull, 1925)**
Laeliphis fuscipes Hull, 1925: 207.
Gymnolaelaps fuscipes.—Turk, 1953: 11.

Type depository. Unspecified.
Type locality and habitat. Swanage, England, from unspecified substrate.
Note. Evans & Till (1966: 362) suggested that this species could be placed in *Hypoaspis* (*Gymnolaelaps*) and we have provisionally accepted that interpretation, with *Gymnolaelaps* at the genus level, as done by Turk (1953: 11).

***Gymnolaelaps gracilipes* (Banks, 1916)**
Cyrtolaelaps gracilipes Banks, 1916: 228.
Cytolaelaps gracilipes [sic].—Womersley, 1942: 157.
Pseudoparasitus gracilipes.—Halliday, 1998: 129; Kůrka, 2005: 26.
Gymnolaelaps gracilipes.—Halliday, 1999: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Type series, Sydney and Liverpool, New South Wales, Australia, from unspecified substrate and Lal Lal, Victoria, Australia with *Camponotus nigriceps*, *Ectatomma metallicum*, *Polyrachis hexacantha* and *Ponera lutea* [Animalia: Hymenoptera: Formicidae].

***Gymnolaelaps gulinensis* Ma & Lin, 2013**
Gymnolaelaps gulinensis Ma & Lin, 2013: 78.
Gymnolaelaps gulinensis.—Lin *et al*., 2019: 128.

Type depository. Institute of Plant Protection, Fujian Academy of Agricultural Science, Fuzhou, China.
Type locality and habitat. Gulin (28°04'N, 105°50'E), Sichuan province, China, in moss.

***Gymnolaelaps guangxiensis* Ma, 2007**
Gymnolaelaps guangxiensis Ma, 2007a: 920.

Type depository. Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Nanning (22°54'N, 108°20'E), Guangxi Zhuang Autonomous Region, China, in soil.

Note. The classification of this species as *Gymnolaelaps* remains uncertain, given its drop-shaped epigynal shield and the lack of information for other attributes of the genus (*e.g*. palp tarsal claw).

***Gymnolaelaps krantzi* (Hunter, 1967)**

Hypoaspis (*Gymnolaelaps*) *krantzi* Hunter, 1967: 101.
Gymnolaelaps krantzi.—Farrier & Hennessey, 1993: 74; Joharchi *et al*., 2011: 23; Nemati & Gwiazdowicz, 2016b: 42.
Pseudoparasitus krantzi.—Kůrka, 2005: 26.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Ashville, North Carolina, United States of America, on *Dendroctonus frontalis* [Animalia: Coleoptera: Curculionidae, Scolytinae].

***Gymnolaelaps laevis* (Michael, 1891)**

Laelaps laevis Michael, 1891: 648.
Lælaps laevis [sic].—Moniez, 1892: 381.
Loelaps laevis [sic].—Wasmann, 1894: 198.
Loelaps ovalis Moniez.—Wasmann, 1894: 198 (misidentification, according to Berlese, 1904c: 407).
Laelaps laevis.—Leonardi, 1897: 863.
Laelaps (*Eulaelaps*) *laevis*.—Berlese, 1903b: 13.
Laelaps (*Hypoaspis*) *laevis*.—Berlese, 1904c: 406; Karawajew, 1909: 234; Donisthorpe, 1927: 213.
Gymnolaelaps laevis.—Hull, 1918: 68; Oudemans, 1929e: 81; Vitzthum, 1929: 25, 1931c: 33; Balogh, 1938: 74; Turk, 1953: 11; Ma, 2007a: 920; Athias-Henriot, 1968: 239; Joharchi *et al*., 2012a: 2013; Joharchi & Halliday, 2013: 44; Kazemi & Rajaei, 2013: 86; Keum *et al*., 2017: 490; Nemati *et al*., 2018b: 142.
Laelaspis laevis.—Turk, 1953: 12; Bai & Gu, 1994: 181; Ren & Guo, 2008: 328, 2009: 101; Xin *et al*., 2010: 2.
laevis; *non-Laelaps* [sic].—Tipton, 1960: 298.
ovalis; *non-Laelaps* [sic].—Tipton, 1960: 303.
Hypoaspis laevis.—Evans & Till, 1966: 220; Castagnoli & Pegazzano, 1985: 211.
Hypoaspis (*Gymnolaelaps*) *laevis*.—Hunter, 1967: 99; Bregetova, 1977b: 527.
Pseudoparasitus (*Gymnolaelaps*) *laevis*.—Karg, 1971: 162, 1978a: 207, 1981b: 218, 1989b: 334, 1993a: 135.
Hypoaspis laeuis [sic].—Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis (*Laelaspis*) *laevis*.—Yan *et al*., 2010: 905.

Type depository. Unspecified.
Type locality and habitat. Near Innsbruck, Tyrol, Austria, in nests of unidentified ants [Animalia: Hymenoptera: Formicidae].
Note. Specimens reported by Moniez (1894: 204) as *Laelaps myrmecophilus* were suspected by Berlese (1904c: 406) to constitute more than one species, namely *L. laevis*, *L. myrmecophilus* and/or *Laelaps myrmophila* Michael. Joharchi *et al*. (2012a: 2013) excluded *L. laevis* from *Laelaspis* because it lacked the characteristic ornamentation of the epigynal shield, and indicated that it appeared to be a species of *Gymnolaelaps*.

***Gymnolaelaps longiosetae* Ramroodi *et al*., 2015**

Gymnolaelaps longiosetae Ramroodi, Joharchi & Hajizadeh, 2015b: 130.
Gymnolaelaps longiosetae.—Ramroodi *et al*., 2015a: 79; Saberi *et al*., 2016: 128; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 142.

Type depository. University of Guilan Mite Collection, Acarology Laboratory, Department of Plant Protection, Faculty of Agricultural Sciences, University of Guilan, Guilan, Iran.

Type locality and habitat. Chobar Forest (37°05'N, 49°24'E), Shaft, Guilan province, Iran, in nest of *Myrmica* sp. [Animalia: Hymenoptera: Formicidae].

***Gymnolaelaps longisetosa* (Oudemans, 1902)**
Hypoaspis myrmecophila var. *longisetosa* Oudemans, 1902c: 53.
Hypoaspis myrmecophila longisetosa.—Oudemans, 1903d: 12.
Hypoaspis longisetosus.—Buitendijk, 1945: 296.
Gymnolaelaps myrmecophilus longisetosus.—Bernini *et al*., 1995: 28.

Type depository. Unspecified.
Type locality and habitat. Italy, from unspecified substrate.

***Gymnolaelaps longisetus* (Aswegen & Loots, 1970)**
Hypoaspis (*Alloparasitus*) *longisetus* Aswegen & Loots, 1970: 210.
Pseudoparasitus (*Gymnolaelaps*) *longisetus*.—Karg, 1981b: 217, 1989b: 334.
Gymnolaelaps longisetus.—Moreira, 2014: 275.

Type depository. Dundo Museum, Dundo, Lunda Norte, Angola; specimen number Ang. 17384.
Type locality and habitat. Near Kasai River at Nordeste (7°22'S, 21°50'E), Lunda Norte, Angola, in forest soil.

***Gymnolaelaps margopilus* (Hunter, 1966)**
Pseudoparasitus margopilus Hunter, 1966a: 8.
Pseudoparasitus margopilus.—Farrier & Hennessey, 1993: 87.
Gymnolaelaps margopilus.—Joharchi *et al*., 2011: 32.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Singapore, intercepted at Hawaii, United States of America, on *Vanda dearei* [Plantae: Asparagales: Orchidaceae].

***Gymnolaelaps messor* Joharchi *et al*., 2011**
Gymnolaelaps messor Joharchi, Halliday, Saboori & Kamali, 2011: 23.
Gymnolaelaps messor.—Joharchi & Halliday, 2013: 44; Kazemi & Rajaei, 2013: 86; Maleki *et al*., 2016: 187; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 142.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 1831 m above sea level, Karaj (36°01'N, 51°09'E), Iran, in nest of *Messor* sp. [Animalia: Hymenoptera: Formicidae].

***Gymnolaelaps metapodalii* (Karg, 1978)**
Hypoaspis (*Holostaspis*) *metapodalii* Karg, 1978b: 9.
Hypoaspis (*Laelaspis*) *metapodalii*.—Karg, 1979: 100, 1982: 248.
Laelaspis metapodalii.—Moreira, 2014: 309.
Gymnolaelaps metapodalii.—Babaeian *et al*., 2019a: 330.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.

Type locality and habitat. In a valley 130 km northwest of Santiago, Chile, in mud.

***Gymnolaelaps myrmecophilus* (Berlese, 1892)**

Laelaps myrmecophilus Berlese, 1892d: 2.
Laelaps myrmecophilus.—Berlese, 1892f: 35; Leonardi, 1897: 861.
Loelaps myrmecophilus [sic].—Wasmann, 1894: 198.
Lælaps ovalis [sic] Moniez, 1894: 203 [junior synonym of *L. myrmecophilus* by Berlese, 1904c: 406; Evans & Till, 1966: 214].
Loelaps ovalis [sic].—Wasmann, 1894: 198.
Laelaps ovalis.—Leonardi, 1897: 862.
Hypoaspis ovalis.—Oudemans, 1902d: 7.
Hypoaspis myrmecophilus.—Oudemans, 1902d: 24, 1903a: 129; Hull, 1925: 208; Buitendijk, 1945: 296.
Laelaps (*Eulaelaps*) *myrmecophilus*.—Berlese, 1903b: 13.
Laelaps (*Hypoaspis*) *myrmecophilus*.—Berlese, 1904c: 409; Karawajew, 1909: 234; Donisthorpe, 1927: 213.
Hypoaspis (*Gymnolaelaps*) *myrmecophilus*.—Berlese, 1916b: 170; Hunter, 1967: 99; Castagnoli & Pegazzano, 1985: 267.
Gymnolaelaps myrmecophilus.—Hull, 1918: 68; Vitzthum, 1929: 25, 1931c: 119; Sellnick, 1931: 695; Turk, 1953: 11; Willmann, 1954b: 225; Shulov, 1957: 234; Costa, 1966a: 74; Hunter, 1967: 99; Joharchi *et al*., 2011: 28; Joharchi & Halliday, 2013: 44; Kazemi & Rajaei, 2013: 86; Amani *et al*., 2015: 92; Ramroodi *et al*., 2015a: 79; Saberi *et al*., 2016: 128; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 142; Kazemi, 2020: 137.
Laelaps myrmicophilus [sic].—Radford, 1950b: 20.
myrmecophilus; *non-Laelaps* [sic].—Tipton, 1960: 302.
ovalis; *non-Laelaps* [sic].—Tipton, 1960: 303.
Ololaelaps (*Gymnolaelaps*) *myrmecophilus*.—Karg, 1965: 312.
Hypoaspis myrmecophila.—Evans & Till, 1966: 214.
Gymnolaelaps myrmecophila.—Athias-Henriot, 1968: 235; Gu & Guo, 1997: 247; Arjomandi *et al*., 2013: 256; Mahjoori *et al*., 2014: 1602; Kazemi, 2020: 135.
Pseudoparasitus (*Gymnolaelaps*) *myrmecophilus*.—Karg, 1971: 162, 1978a: 207, 1981b: 218, 1989b: 334, 1993a: 135.
Hypoaspis (*Gymnolaelaps*) *myrmecophila*.—Bregetova, 1977b: 526.
Gymnolaelaps myrmecophilus myrmecophilus.—Bernini *et al*., 1995: 28.
Pseudoparasitus (*Gymnolaelaps*) *myrmecophila*.—Xu & Liang, 1996: 195.
Pseudoparasitus myrmicophilus [sic].—Kůrka, 2005: 26.
Gymnolaelaps myrmecophilus Michael, 1891 [sic].—Maleki *et al*., 2016: 186.

Type depository. *L. myrmecophilus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *L. ovalis*: unspecified.
Type locality and habitat. *L. myrmecophilus*: Portici and Monte Argentario, Italy, in nest of unidentified ants [Animalia: Hymenoptera: Formicidae]; *L. ovalis*: Exaten [cited as Exaeten], The Netherlands, associated with *Formica sanguinea* [Animalia: Hymenoptera: Formicidae].
Note. Specimens reported by Moniez (1894: 204) as *Laelaps myrmecophilus* were suspected by Berlese (1904c: 406) to constitute more than one species, *L. laevis*, *L. myrmecophilus* and/or *Laelaps myrmophila* Michael.

***Gymnolaelaps myrmophila* (Michael, 1891)**

Laelaps myrmophila Michael, 1891: 649.
Lælaps myrmophila [sic].—Moniez, 1892: 381.
Loelaps myrmophilus [sic].—Wasmann, 1894: 198.
Laelaps myrmophilus.—Leonardi, 1897: 862.
Laelaps (*Eulaelaps*) *myrmophilus*.—Berlese, 1903b: 13.
Laelaps (*Hypoaspis*) *myrmophilus*.—Berlese, 1904c: 410, 1922: 97; Karawajew, 1909: 234; Donisthorpe, 1927: 213.

Gymnolaelaps myrmophilus.—Hull, 1918: 68; Vitzthum, 1929: 25; Schweizer, 1949: 40; Turk, 1953: 11; Hunter, 1967: 99; Bernini *et al*., 1995: 28; Joharchi *et al*., 2011: 23; Kazemi & Rajaei, 2013: 87; Nemati *et al*., 2018b: 143.
myrmophila; *non-Laelaps* [sic].—Tipton, 1960: 302.
Hypoaspis myrmophila.—Evans & Till, 1966: 218.
Hypoaspis (*Gymnolaelaps*) *myrmophilus*.—Hunter, 1967: 101.
Pseudoparasitus (*Gymnolaelaps*) *myrmophilus*.—Karg, 1971: 162, 1978a: 206, 1981b: 218, 1989b: 334, 1993a: 135; Nemati *et al*., 2000: 381.
Hypoaspis (*Gymnolaelaps*) *myrmophila*.—Bregetova, 1977b: 523.
Hypoaspis myrmophilus.—Castagnoli & Pegazzano, 1985: 268.
Laelaspis myrmophila.—Bai & Gu, 1994: 182; Ma, 1995b: 499; Ren & Guo, 2008: 328, 2009: 101.
Pseudoparasitus myrmophilus.—Kůrka, 2005: 26.
Hypoaspis (*Laelaspis*) *myrmophila*.—Yan *et al*., 2008: 2230, 2010: 905.
Gymnolaelaps myrmophila.—Joharchi & Halliday, 2013: 45; Ramroodi *et al*., 2015a: 79; Hajizadeh & Joharchi, 2018: 24.

Type depository. Unspecified.
Type locality and habitat. Near Ajaccio, Corsica (France), in nest of *Aphaenogaster testaceopitosa* [sic] [probably *testaceopilosa*] [Animalia: Hymenoptera: Formicidae].
Note. Specimens reported by Moniez (1894: 204) as *Laelaps myrmecophilus* were suspected by Berlese (1904c: 406) to constitute more than one species, *L. laevis*, *L. myrmecophilus* and/or *L. myrmophila*.

Gymnolaelaps myrmophilus novus (Lombardini, 1957)
Hypoaspis myrmophilus var. *novus* Lombardini, 1957: 288.
Gymnolaelaps myrmophilus novus.—Moreira, 2014: 278.

Type depository. Unspecified.
Type locality and habitat. Orto Botanico, Rome, Italy, ant nest under rock.
Note. Lombardini (1957) described *Hypoaspis myrmophilus* var. *novus* for specimens that differed slightly from the original description of *Laelaps myrmophila* by Michael (1891). The relative taxonomic status of these populations cannot be determined on the basis of the available information.

Gymnolaelaps prestoni Joharchi *et al*., 2011
Gymnolaelaps prestoni Joharchi, Halliday, Saboori & Kamali, 2011: 26.
Gymnolaelaps prestoni.—Joharchi & Halliday, 2013: 48; Kazemi & Rajaei, 2013: 87.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 2130 m above sea level, [Karaj, Alborz], Iran (35°57'N, 51°21'E), in nest of *Myrmica* sp. [Animalia: Hymenoptera: Formicidae].

Gymnolaelaps shealsi Hunter & Costa, 1971
Gymnolaelaps shealsi Hunter & Costa, 1971: 52.
Hypoaspis (*Pneumolaelaps*) *shealsi*.—Karg, 1979: 90, 1982: 245, 1993a: 149.
Pneumolaelaps shealsi.—Farrier & Hennessey, 1993: 86.
Gymnolaelaps shealsi.—Joharchi *et al*., 2011: 28; Nemati & Gwiazdowicz, 2016b: 42.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Trebloc, Mississippi, United States of America, on imported fire ants [*Solenospis invicta*; Animalia: Hymenoptera: Formicidae].

***Gymnolaelaps sinensis* Wang *et al*., 1991**
Gymnolaelaps sinensis Wang, Zhou & Ji, 1991: 5.
Gymnolaelaps weishanensis Gu & Guo, 1997: 246 [junior synonym of *G. sinensis* by Ma, 2006a: 23].
Gymnolaelaps sinensis.—Ma, 2006a: 23; Ma & Lin, 2008: 98; Ren & Guo, 2008: 329, 2009: 101.

Type depository. *G. sinensis*: Sanitary and Anti-Epidemic Station of Sichuan, Sichuan, China; *G. weishanensis*: Department of Parasitology, Medical School, Nanjing University, Nanjing, Jiangsu, China.
Type locality and habitat. *G. sinensis*: Qingyin Pavilion, Mount Emei, Sichuan, China, in nest of unidentified bird; *G. weishanensis*: Weishan, 25.3°N, 100.3°E), Yunnan, China, on *Apodemus chevreri* [Animalia: Rodentia: Muridae].

***Gymnolaelaps sitalaensis* Bhattacharyya, 1966**
Gymnolaelaps sitalaensis Bhattacharyya, 1966: 153.
Gymnolaelaps sitalaensis.—Wang *et al*., 1991: 6; Joharchi *et al*., 2011: 28.

Type depository. Author's collection.
Type locality and habitat. Sonarpur, Sitala, 24 Parganas, West Bengal, India, in faecal litter of pigeon [Animalia: Columbiformes: Columbidae].

***Gymnolaelaps spinosus* (Berlese, 1920)**
Hypoaspis (*Gymnolaelaps*) *spinosus* Berlese, 1920: 154.
Hypoaspis (*Gymnolaelaps*) *spinosus*.—Castagnoli & Pegazzano, 1985: 393.
Gymnolaelaps spinosus.—Bernini *et al*., 1995: 28.
Pseudoparasitus spinosus.—Kůrka, 2005: 26.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Florence, Italy, in litter.

***Gymnolaelaps submyrmecophila* (Xu & Liang, 1996)**
Pseudoparasitus (*Gymnolaelaps*) *submyrmecophila* Xu & Liang, 1996: 195.
Gymnolaelaps submyrmecophila.—Joharchi *et al*., 2011: 28.

Type depository. Department of Environmental and Resources Biology, Fudan University, Shanghai, China.
Type locality and habitat. Shanghai, China, in litter.

***Gymnolaelaps tilli* (Costa, 1968) new combination**
Pseudoparasitus tilli Costa, 1968: 24.
Hypoaspis (*Holostaspis*) *tilli*.—Karg, 1978b: 11.
Hypoaspis (*Laelaspis*) *tilli*.—Karg, 1979: 99, 1982: 248.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Qiryat Tiv'on, Israel, in litter of *Quercus-Styrax* [Plantae: Fagales: Fagaceae, Ericales: Styracaceae].
Note. This species is provisionally placed in *Gymnolaelaps* for presenting the main characteristics of this genus (except for the smooth epistome), including the presence of presternal and well developed parapodal plates, epigynal shield with four pairs of setae, all marginal, and palp tarsal claw 3-tined.

***Gymnolaelaps tridentata* (Karg, 1979)**
Hypoaspis (*Holostaspis*) *tridentata* Karg, 1979: 96.
Hypoaspis (*Holostaspis*) *tridentata*.—Karg, 1982: 247.
Hypoaspis tridentata.—Kůrka, 2005: 25.
Holostaspis tridentata.—Moreira, 2014: 287.
Gymnolaelaps tridentata.—Babaeian *et al*., 2019a: 332.

Type depository. Magyar Természettudományi Múzeum/Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 1140 m above sea level, Mount Piltriquitron, near El Bolsón, [Rio Negro], Argentina, in litter under *Mulinum spinosum* [Plantae: Apiales: Apiaceae].

***Gymnolaelaps unospinosus* (Karg, 1978)**
Pseudoparasitus (*Gymnolaelaps*) *unospinosus* Karg, 1978a: 205.
Pseudoparasitus (*Gymnolaelaps*) *unospinosus*.—Karg, 1981b: 218, 1989b: 334.
Gymnolaelaps unospinosus.—Joharchi *et al*., 2011: 25; Nemati & Gwiazdowicz, 2016b: 42.

Type depository. Zoologischen Abteilung des Ungarischen Naturwissenschaftlichen Museums in Budapest, Hungary.
Type locality and habitat. Near El Bolsón, Rio Azul Valley, [Rio Negro], Argentina, in litter of *Notophagus dombey* [Plantae: Fagales: Fagaceae] and *Myrceugenia exsupca* [Plantae: Myrtales: Myrtaceae].

***Gymnolaelaps victoriensis* Sheals, 1962**
Gymnolaelaps victoriensis Sheals, 1962: 109.
Gymnolaelaps victoriensis.—Bhattacharyya, 1968: 539; Hunter & Costa, 1971: 51.
Pseudoparasitus (*Gymnolaelaps*) *victoriensis*.—Karg, 1978a: 206, 1981b: 218, 1989b: 335.

Type depository. Natural History Museum, London, England; specimen number 1961–6–20–49.
Type locality and habitat. Nahuel Huapi, Victoria Island, Argentina, in soil under *Libocedrus* sp. [Plantae: Pinales: Cupressaceae].

***Gymnolaelaps zaheri* Afifi & Abdel-Halim, 1988**
Gymnolaelaps zaheri Afifi & Abdel-Halim, 1988: 398.
Gymnolaelaps zaheri.—Joharchi & Halliday, 2013: 48.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.
Type locality and habitat. Giza, Egypt, in debris.

***Haemolaelaps* Berlese, 1910**
Laelaps (*Haemolaelaps*) Berlese, 1910a: 261 (type species: *Laelaps* (*Haemolaelaps*) *marsupialis* Berlese, 1910, by monotypy).
Laelaps (*Haemolaelaps*).—Berlese, 1911b: 432, 1922: 94.
Hypoaspis (*Haemolaelaps*).—Berlese, 1916b: 170; Vitzthum, 1942: 763; Zumpt, 1950b: 299; Zumpt & Patterson, 1951: 64.
Haemolaelaps.—Berlese, 1913b: 10; Vitzthum, 1929: 22, 1931c: 142; Radford, 1950b: 20; Zumpt, 1950b: 299; Zumpt & Patterson, 1951: 70; Baker & Wharton, 1952: 96; Trägårdh, 1952: 66; Bregetova, 1955a: 233 (in part), 1955b: 296 (in part), 1956: 84; Allred & Beck 1956: 34; Keegan, 1956a: 231; Evans, 1957a: 231; Fonseca, 1958a: 46; Strandtmann & Wharton, 1958: 31 (in part); Tipton, 1960: 242; Costa, 1961a: 5;

Furman & Tipton, 1961: 184; Schweizer, 1961: 152; Karg, 1965: 272; Marais & Loots, 1970: 2; Sakamoto *et al*., 1979: 39; Domrow, 1988: 825 (in part); Deng *et al*., 1993: 98; Shaw, 2014a: 285; Halliday, 2019: internet page.

Androlaelaps (*Haemolaelaps*).—Hafez *et al*., 1982: 3.

Note. *Laelaps* (*Haemolaelaps*) was not specifically assigned to a family in the original description. It was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763) and in Laelapidae-Laelapinae by Evans & Till (1979: 200). *Haemolaelaps* was considered a senior synonym of *Atricholaelaps* Ewing and *Ischnolaelaps* Fonseca by Strandtmann (1949: 329), Zumpt (1950a: 77), Zumpt & Patterson (1951: 70), Keegan (1956a: 231), Tipton (1960: 242) and Furman & Tipton (1961: 184); of *Cavilaelaps* Fonseca by Zumpt & Patterson (1951: 70); and of *Eubrachylaelaps* Ewing by Zumpt & Patterson (1951: 70) and Zumpt & Till (1958: 267). We here consider those genera as junior synonyms of *Androlaelaps* (see note under that genus). According to Zumpt & Patterson (1951: 70), the specimens used for the redescription of *Macrolaelaps* Ewing by Ewing (1933: 6) actually belong to *Haemolaelaps* Berlese; in that redescription, the author described *Macrolaelaps peruvianus* Ewing, a species that Tipton (1960: 241), Lee & Strandtmann (1967: 26) and Furman (1972: 4) considered to belong to *Gigantolaelaps* Fonseca, 1939. That interpretation is accepted in this publication. Tipton (1960: 250) considered that *Haemolaelaps* could be a senior synonym of *Bolivilaelaps* Fonseca, 1940.

Haemolaelaps cleptusa Domrow, 1972

Haemolaelaps cleptusa Domrow, 1972b: 291.

Haemolaelaps cleptusa.—Domrow, 1987: 830; Halliday, 2019: internet page; Shaw, 2014a: 289.

Androlaelaps cleptusa.—Halliday, 1998: 123.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.

Type locality and habitat. Tanjil Bren, Victoria, Australia, on *Gymnobelideus leadbeateri* (Animalia: Diprotodontia: Petauridae).

Haemolaelaps domrowi Womersley, 1957

Haemolaelaps domrowi Womersley, 1957a: 301.

Haemolaelaps domrowi.—Domrow, 1958: 358, 1961: 61, 1962: 275, 1963b: 201, 1967: 770, 1979b: 191, 1980: 210, 1988: 830; Tipton, 1960: 242; Halliday, 2019: internet page; Shaw, 2014a: 289.

Androlaelaps domrowi.—Halliday, 1998: 123; Kůrka, 2005: 23.

Type depository. South Australian Museum, Adelaide, Australia.

Type locality and habitat. Mount Glorious, Queensland, Australia, on *Perameles nasuta* [Animalia: Peramelemorphia: Peramelidae].

Haemolaelaps flagellata Womersley, 1957

Haemolaelaps flagellata Womersley, 1957a: 300.

Haemolaelaps marsupialis.—Womersley, 1955: 423 (misidentification, according to Womersley, 1957a: 297).

Haemolaelaps flagellatus.—Domrow, 1973: 64, 1977: 198, 1988: 830; Shaw, 2014a: 289; Halliday, 2019: internet page.

Androlaelaps flagellatus.—Halliday, 1998: 123; Kůrka, 2005: 23.

Type depository. South Australian Museum, Adelaide, Australia.

Type locality and habitat. Fisher Island, Bass Strait, Australia, in nest material from burrows of *Puffinus tenuirostris* [Animalia: Procellariiformes: Procellariidae].

Note. The type specimens of this species had been erroneously identified as *Haemolaelaps marsupialis* by Womersley (1955: 423).

***Haemolaelaps hattenae* Domrow, 1963**

Haemolaelaps hattenae Domrow, 1963b: 201.

Haemolaelaps hattenae.—Domrow, 1972a: 109, 1980: 211, 1988: 831; Shaw, 2014a: 286; Halliday, 2019: internet page.

Androlaelaps hattenae.—Halliday, 1998: 123.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.

Type locality and habitat. Green's Beach, Tasmania, Australia, on *Bettongia cuniculus* [Animalia: Diprotodontia: Potoroidae, cited as Macropodidae].

***Haemolaelaps marsupialis* (Berlese, 1910)**

Laelaps (*Haemolaelaps*) *marsupialis* Berlese, 1910a: 261.

Haemolaelaps marsupialis.—Vitzthum, 1928: 187; Radford, 1943: 61, 1950: 366; Domrow & Smith, 1956: 202; Keegan, 1956b: 315; Womersley, 1957a: 297; Fonseca, 1958a: 50; Strandtmann & Wharton, 1958: 33; Tipton, 1960: 242; Domrow, 1961: 61, 1962: 276, 1963b: 202, 1967: 770, 1973: 64, 1980: 210, 1988: 831; Karg, 1965: 272; Shaw, 2014a: 285; Halliday, 2019: internet page.

Hypoaspis perameles.—Derrick *et al*., 1939: 154 (*nomen nudum*, ICZN Article 13.1; misidentification, according to Domrow & Smith, 1956: 202; Domrow, 1988: 831; Halliday, 1998: 123).

Laelaps (*Haemolaelaps*) *marsupialis*.—Radford, 1950b: 20; Sheals, 1964: 16.

marsupialis; *non-Laelaps* [sic].—Tipton, 1960: 300.

Hypoaspis (*Haemolaelaps*) *marsupialis*.—Castagnoli & Pegazzano, 1985: 242.

Androlaelaps marsupialis.—Halliday, 1998: 123; Kůrka, 2005: 23.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. Australia, on unidentified bandicoot [Animalia: Peramelemorphia: Peramelidae].

Note. The type specimens of *H. flagellata* had been erroneously identified as *H. marsupialis* by Womersley (1955: 423).

***Haemolaelaps quartus* Domrow, 1961**

Haemolaelaps quartus Domrow, 1961: 61.

Haemolaelaps quartus.—Domrow, 1963b: 202, 1980: 212, 1988: 832; Shaw, 2014a: 289; Halliday, 2019: internet page.

Androlaelaps quartus.—Halliday, 1998: 123.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.

Type locality and habitat. Peacock Creek, Bonalbo, New South Wales, Australia, on *Aepyprymnus rufescens* [Animalia: Diprotodontia: Potoroidae, cited as Macropodidae].

***Holostaspis* Kolenati, 1858**

Holostaspis Kolenati, 1858: 87 (type species: *Holostaspis isotricha* Kolenati, 1858, by monotypy).

Holostaspis.—Berlese, 1882b: 338 (in part), 1887: 44: 2 (in part), 1906: 68 (in part); 1913b: 96 (in part); Canestrini, 1885: 55; Vitzthum, 1929: 22, 1931c: 143; Evans, 1957a: 231; Athias-Henriot, 1968: 237; Evans & Till, 1979: 201; Bregetova, 1977b: 547; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 77; Ueckermann & Loots, 1995: 35; Keum *et al*., 2017: 490; Babaeian *et al*., 2019a: 302.

Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).

Laelaps (*Oolaelaps*) Berlese, 1904c: 428 (type species: *Laelaps oophilus* Moniez [cited as Wasmann], 1897, by original designation) [junior synonym of *Holostaspis* by Oudemans, 1914c: 68; Vitzthum, 1931c: 143; Turk, 1953: 11; Bregetova, 1977b: 547; Babaeian *et al*., 2019a: 302].

Oolaelaps.—[junior synonym of *Holostaspis* by Vitzthum, 1929: 26].
Myrmonyssus (*Laelaspulus*) Berlese, 1904c: 437 (type species: *Myrmonyssus acuminatus* Berlese, 1903, by monotypy) [junior synonym of *Holostaspis* by Babaeian *et al*., 2019a: 302].
Hypoaspis (*Holostaspis*).—Vitzthum, 1942: 762; Baker & Wharton, 1952: 94; Evans & Till, 1966: 160; Aswegen & Loots, 1970: 171; Karg, 1971: 160, 1978b: 1, 1979: 94, 1982: 247 (in part), 1989a: 108, 1993a: 136 (in part).
Myrmonyssus (*Laelaspulus*).—Vitzthum, 1942: 764.
Laelaspulus.—Radford, 1950b: 22; Evans & Till, 1965a: 277.
Hypoaspis.—Karg, 1979: 66 (in part), 1993a: 133 (in part).
Holotaspis [sic].—Karg & Schorlemmer, 2013: 203.

Note. *Holostaspis* was described in an unspecified family of Gamasida, included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 201); *Myrmonyssus* (*Laelaspulus*) was not assigned to a family in the original description, and it was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 764). Radford (1950b: 20) considered *Ololaelaps* Berlese, 1904a (probably a *lapsus calami* for *Oolaelaps* Berlese, 1904c) a junior synonym of *Holostaspis*, whereas Karg (1971: 171) also considered *Laelaspis* Berlese, *Hypoaspis* (*Pneumolaelaps*) Berlese and *Hypoaspis* (*Hypoaspisella*) Bernhard, 1962 junior synonyms of *Holostaspis*. The synonymy of *Holostaspis* with *Laelaspis* was not accepted by Kazemi (2015: 413), whereas the synonymy of *Holostaspis* with *Hypoaspisella* and *Pneumolaelaps* was not accepted by Joharchi *et al*. (2018: 28); these synonymies are also not accepted here. *Myrmonyssus* (*Laelaspulus*) Berlese was considered junior synonym of *Myrmozercon* by Shaw & Seeman (2009: 54), Joharchi *et al*. (2011: 29, 2015: 550), Ghafarian *et al*. (2013: 22) and Joharchi & Moradi (2013: 245). We agree with Babaeian *et al*. (2019a: 302), who considered *Myrmonyssus* (*Laelaspulus*) a junior synonym of *Holostaspis*. The generic concept of Babaeian *et al*. (2019a: 302) is adopted in this publication.

***Holostaspis acuminatus* (Berlese, 1903)**
Myrmonyssus acuminatus Berlese, 1903b: 18.
Myrmonyssus acuminatus.—Berlese, 1904c: 441; Vitzthum, 1930c: 89; Hull, 1918: 63; Radford, 1950b: 22; Hunter & Hunter, 1963: 336; Bernini *et al*., 1995: 29.
Myrmonyssus (*Laelaspulus*) *acuminatus*.—Donisthorpe, 1927: 214; Lombardini, 1936: 45; Schweizer, 1949: 41, 1961: 152; Castagnoli & Pegazzano, 1985: 3.
Laelaspulus acuminatus.—Turk, 1953: 12.
Myrmozercon acuminatus.—Rosario & Hunter, 1988: 470; Shaw & Seeman, 2009: 54; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 557.
Holostaspis acuminata.—Babaeian *et al*., 2019a: 305.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, on *Messor barbarus capitatus* var. *minor* [Animalia: Hymenoptera: Formicidae].
Note. Babaeian *et al*. (2019a: 333) suspected this species to be a senior synonym of *Myrmozercon michaeli*.

***Holostaspis ambigua* Babaeian *et al*., 2019**
Holostaspis ambigua Babaeian, Mašán & Halliday, 2019: 306

Type depository. Institute of Zoology, Slovak Academy of Sciences, Bratislava, Slovakia.
Type locality and habitat. 280 m above sea level, Uličˇ Village (48°57'44"N, 22°25'34"E), Bukovské Vrchy Hills, northeast Slovakia, meadow, in hill of *Lasius flavus* [Animalia: Hymenoptera: Formicidae] under *Quercus palustris* [Plantae: Fagales: Fagaceae].

***Holostaspis collina* (Huhta & Karg, 2010)**

Hypoaspis (*Pneumolaelaps*) *collina* Huhta & Karg, 2010: 332.

Hypoaspis (*Holostaspis*) *montana*.—Karg, 1971: 171, 172, Fig. 192 (in part) (misidentification, according to Babaeian *et al*., 2019a: 309).

Hypoaspis (*Pneumolaelaps*) *montana*.—Karg, 1979: 88 (in part), 1993a: 146, 158 (in part) (misidentification, according to Huhta & Karg, 2010: 332, Babaeian *et al*. (2019a: 309).

Pneumolaelaps collina.—Moreira, 2014: 347.

Holostaspis collina.—Huhta, 2016: 145; Babaeian *et al*., 2019a: 309.

Type depository. Zoological Museum, University of Helsinki, Finland.

Type locality and habitat. Hailuoto Island, near Oulu, Finland, in compost of garbage and garden residues.

Note. Babaeian *et al*. (2019a: 312) suspected *H*. (*P*.) *collina* to be a junior synonym of *Hypoaspis submontana* Bai *et al*.

***Holostaspis flexuosa* (Michael: 1891)**

Laelaps flexuosa Michael: 1891: 650.

Lælaps flexuosus [sic].—Moniez, 1892: 383.

Loelaps flexuosus [sic].—Wasmann, 1894: 198.

Laelaps flexuosus.—Leonardi, 1897: 863.

Myrmonyssus ? *flexuosus* [sic].—Berlese, 1904c: 440.

flexuosa; *non-Laelaps* [sic].—Tipton, 1960: 294.

Myrmonyssus ? *flexuosa***.**—Hunter & Hunter, 1963: 337.

Laelaspulus flexuosus.—Evans & Till, 1965a: 284; Nemati & Gwiazdowicz, 2016b: 44.

Hypoaspis (*Holostaspis*) *isotricha*.—Mašán, 2001: 216 (in part; misidentification, according to Babaeian *et al*., 2019a: 312).

Myrmozercon flexuosus.—Shaw & Seeman, 2009: 55; Joharchi & Moradi, 2013: 252.

Myrmozercon flexuosa.—Joharchi *et al*., 2015: 551.

Holostaspis flexuosa.—Babaeian *et al*., 2019a: 312; Joharchi *et al*., 2020f: 519.

Type depository. Unspecified.

Type locality and habitat. Near Innsbruck, Tyrol, Austria, in nests of *Camponotus herculeanus* [Animalia: Hymenoptera: Formicidae].

Note. Berlese (1903b: 19) considered the generic placement of this species uncertain. Berlese (1904c: 440) referred to the great similarity between *Laelaps flexuosa* and the type species of *Myrmonyssus*, a genus considered as a junior synonym of *Myrmozercon* in this publication. This species was included by Joharchi *et al*. (2015: 556) in *Myrmozercon sensu lato*. Babaeian *et al*. (2019a: 316) considered provisional the placement of this species in *Holostaspis*.

***Holostaspis iranicus* (Babaeian & Nemati, 2014)**

Myrmozercon iranicus Babaeian & Nemati, in Babaeian *et al*., 2014: 222.

Myrmozercon iranicus.—Joharchi *et al*., 2015: 556; Khalili-Moghadam & Saboori, 2015: 320; Nemati *et al*., 2018b: 147.

Holostaspis iranica.—Babaeian *et al*., 2019a: 305.

Type depository. Jafal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.

Type locality and habitat. Taft (31°45'N 54°14'E), Yazd, Iran, in nest of *Messor* sp. [Animalia: Hymenoptera: Formicidae].

Note. This species was included by Joharchi *et al*. (2015: 555) in *Myrmozercon sensu lato*, whereas Babaeian *et al*. (2019a: 305) considered provisional the placement of this species in *Holostaspis*.

***Holostaspis isotricha* Kolenati, 1858**

Holastaspis isotricha Kolenati, 1858: 87.

Holostaspis isotricha.—Oudemans, 1914c: 68 (in part); Vitzthum, 1929: 26, 1931c: 119; Turk, 1953: 11; Athias-Henriot, 1968: 239; Bregetova, 1977b: 549; Dowling & OConnor, 2010: 304; Keum *et al*., 2017: 490; Babaeian *et al*., 2019a: 317; Joharchi *et al*., 2019e: 81.

Hypoaspis isotricha.—Evans & Till, 1966: 203.

Hypoaspis (*Holostaspis*) *isotricha*.—Karg, 1971: 177, 1979: 97, 1982: 248, 1993a: 157; Mašán, 2001: 216 (in part).

Type depository. Type series, author's collection and Naturhistorisches Museum Wien, Vienna, Austria.

Type locality and habitat. Unspecified locality (apparently Brünn Germany), on *Formica rufa* [Animalia: Hymenoptera: Formicidae].

Note. Turk (1953: 11) considered *L. oophilus* junior synonym of *H. isotricha*. As Evans & Till (1966: 206), we consider them separate entities. Part of the specimens reported by Mašán (2001: 216) as *Hypoaspis* (*Holostaspis*) *isotricha* were re-identified as *Holostaspis flexuosa* by Babaeian *et al*. (2019a: 312).

***Holostaspis michaeli* (Joharchi, 2013)**

Myrmozercon michaeli Joharchi, in Joharchi & Moradi, 2013: 248.

Myrmozercon michaeli.—Joharchi *et al*., 2015: 556; Nemati *et al*., 2018b: 147.

Holostaspis michaeli.—Babaeian *et al*., 2019a: 305.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran.

Type locality and habitat. 2422 m above sea level, Damavand Mountain (35°52'N, 52°07'E), Iran, in nest of *Messor* sp. [Animalia: Hymenoptera: Formicidae].

Note. This species was included by Joharchi *et al*. (2015: 555) in *Myrmozercon sensu lato*. Babaeian *et al*. (2019a: 305) suspected this species to be a junior synonym of *Myrmonyssus acuminatus*.

***Holostaspis montanus* (Berlese, 1904)**

Laelaps (*Oolaelaps*) *montanus* Berlese, 1904c: 430.

Laelaps (*Oolaelaps*) *montanus*.—Halbert, 1915: 73; Donisthorpe, 1927: 214; Lombardini, 1962: 198.

Oolaelaps montanus.—Hull, 1918: 69; Castagnoli & Pegazzano, 1985: 262.

Holostaspis montanus.—Vitzthum, 1929: 26; Schweizer, 1949: 40; Turk, 1953: 11; Keum *et al*., 2017: 490.

Gymnolaelaps viennensis Sellnick, 1935: 347 [junior synonym of *L*. (*O*.) *montanus* by Karg, 1971: 179, 1993a: 146; Bregetova, 1977b: 549; Babaeian *et al*., 2019a: 320; Joharchi *et al*., 2019e: 81].

montanus; *non-Laelaps* [sic].—Tipton, 1960: 301.

Hypoaspis montana.—Evans & Till, 1966: 206; Shcherbak, 1971a: 24; Lapinya, 1976: 36; Karg, 1984: 39; Bai *et al*., 1994: 295.

Holostaspis montana.—Athias-Henriot, 1968: 241; Bregetova, 1977b: 549; Luxton, 1998: 20; Babaeian *et al*., 2019a: 320; Joharchi *et al*., 2019e: 81.

Hypoaspis (*Holostaspis*) *montana*.—Karg, 1971: 170, 171, Fig. 191e (in part).

Hypoaspis (*Pneumolaelaps*) *montana*.—Karg, 1979: 88 (in part), 1982: 244, 1993: 146, 156, Fig. 111e (in part); Mašán, 2001: 216; Huhta & Karg, 2010: 332.

Pneumolaelaps montanus.—Bernini *et al*., 1995: 30.

Gymnolaelaps viennensis.—Nemati & Gwiazdowicz, 2016b: 42.

Holostaspis viennensis.—Babaeian *et al*., 2019a: 332.

Type depository. *L*. (O.) *montanus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *G. viennensis*: unspecified.

Type locality and habitat. *L*. (*O*.) *montanus*: Cansiglio Forest, Veneto, Italy, in nest of unidentified ants [Animalia:

Hymenoptera: Formicidae]; *G. viennensis*: Anninger, Austria, in nest of *Formica rufa* [Animalia: Hymenoptera: Formicidae].
Note. Part of the specimens reported by Karg (1971: 171; 1979: 88, 1993a: 146, 158) as *Hypoaspis* (*Holostaspis*) *montana* or *Hypoaspis* (*Pneumolaelaps*) *montana* were re-identified as *Holostaspis collina* by Babaeian *et al*. (2019a: 309); Joharchi *et al*. (2019e: 85) suspected *H. submontana* to be a junior synonym of *L.* (*O.*) *montanus*.

***Holostaspis oophila* (Moniez, 1897)**
Uropoda oophila Moniez.—Wasmann, 1894: 197 (*nomen nudum*, ICZN Article 12).
Laelaps oophilus Moniez, in Wasmann, 1897: 172.
Hypoaspis oophilus.—Oudemans, 1902d: 24, 1903a: 130; Buitendijk, 1945: 296.
Laelaps (*Eulaelaps*) *oophilus*.—Berlese, 1903b: 13.
Laelaps (*Oolaelaps*) *oophilus*.—Berlese, 1904c: 428; Donisthorpe, 1927: 214; André, 1937: 47.
Oolaelaps oophilus.—Oudemans, 1914c: 68; Hull, 1918: 69; Falconer, 1923: 275; Castagnoli & Pegazzano, 1985: 286.
oophila; *non-Laelaps* [sic].—Tipton, 1960: 302.
Hypoaspis oophila.—Evans & Till, 1966: 206.
Hypoaspis (*Holostaspis*) *oophila*.—Karg, 1971: 176, 1979: 97, 1982: 247, 1993a: 157; Mašán, 2001: 217.
Holostaspis oophila.—Bregetova, 1977b: 549; Keum *et al*., 2017: 490; Babaeian *et al*., 2019a: 324; Joharchi *et al*., 2019e: 85.

Type depository. Unspecified.
Type locality and habitat. Type series, from unspecified location, among eggs in colonies of *Formica sanguinea* and *Formica rufobarbis* [Animalia: Hymenoptera: Formicidae].
Note. Turk (1953: 11) considered *L. oophilus* junior synonym of *H. isotricha*. As Evans & Till (1966: 206), we consider them separate entities.

***Holostaspis submontana* (Bai *et al*., 1994)**
Hypoaspis submontana Bai, Gu & Chen, in Bai *et al*., 1994: 295.
Hypoaspis submoniana [sic].—Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis submontana.—Yan *et al*., 2010: 905, 2018: 262.
Holostaspis submontana.—Babaeian *et al*., 2019a: 305.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant nest [cited as Myrmos] [Animalia: Hymenoptera: Formicidae].
Note. Babaeian *et al*. (2019a: 312) suspected this species to be a senior synonym of *H.* (*P.*) *collina*, whereas Joharchi *et al*. (2019e: 85) suspects it to be a junior synonym of *L.* (*O.*) *montanus*.

***Hunteria* Delfinado-Baker *et al*., 1984**
Hunteria Delfinado-Baker, Baker & Flechtmann, 1984: 6 (type species: *Hunteria brasiliensis* Delfinado-Baker, Baker & Flechtmann, 1984, by monotypy).
Hunteria.—Casanueva, 1993: 40; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae.

***Hunteria brasiliensis* Delfinado-Baker *et al*., 1984**
Hunteria brasiliensis Delfinado-Baker, Baker & Flechtmann, 1984: 9.
Hunteria brasiliensis.—Delfinado-Baker & Baker, 1988: 135; Klimov *et al*., 2016: internet page.

Hypoaspis brasiliensis.—Smiley *et al*., 1996: 201.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, São Paulo, Brazil; specimen number 1369.
Type locality and habitat. São Luis, Maranhão, Brazil, in nest of *Melipona compressipes fasciculata* [Animalia: Hymenoptera: Apidae].

***Hypoaceus* Nemati *et al*., 2021**

Hypoaceus Nemati, Gwiazdowicz & Riahi, 2021: 168 (type species: *Hypoaspis eugenitalis* Karg, 1978, by original designation).

Note. This genus was described in Laelapidae.

***Hypoaceus eugenitalis* (Karg, 1978)**

Hypoaspis (*Hypoaspis*) *eugenitalis* Karg, 1978b: 22.
Hypoaspis (*Alloparasitus*) *eugenitalis*.—Karg, 1979: 75, 1982: 237, 1989c: 119; Huhta & Karg, 2010: 328.
Alloparasitus eugenitalis.—Casanueva, 1993: 157; Moreira, 2014: 109.
Laelaspis eugenitalis.—Freire, 2007: 209.
Hypoaspis (*Hypoaspis*) *eugenitalis*.—Nemati & Gwiazdowicz, 2016b: 43.
Hypoaceus eugenitalis.—Nemati *et al*., 2021: 172.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Misituni, Tarapaca, Chile, in soil.

***Hypoaceus pycnosis* (Karg, 1979)**

Hypoaspis (*Alloparasitus*) *pycnosis* Karg, 1979: 77.
Hypoaspis (*Alloparasitus*) *pycnosis*.—Karg, 1982: 237, 1989c: 119; Nemati & Gwiazdowicz, 2016b: 43.
Alloparasitus pycnosis.—Casanueva, 1993: 157; Moreira, 2014: 110.
Hypoaspis (*Alloparasitus*) *pygnosis* [sic].—Huhta & Karg, 2010: 328.
Hypoaceus pycnosis.—Nemati & Gwiazdowicz, 2016b: 179.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Azul [probably Rio Azul] Valley, near El Bolsón, [Rio Negro], Argentina, in litter of a forest of *Libocedrus* and *Lomatia* [Plantae: Pinales: Cupressaceae; Proteales: Proteaceae].

***Hypoaspis* Canestrini, 1885**

Hypoaspis Canestrini, 1885: 55 (type species: *Gamasus krameri* G. & R. Canestrini, 1881, by subsequent designation by Berlese, 1904c: 405).
Laelaps.—Berlese, 1887b: 8 (in part).
Hypoaspis.—Oudemans, 1902e: 289 (in part); Banks, 1915a: 80 (in part); Berlese, 1913b: 198 (in part); Vitzthum, 1929: 23, 1931c: 142, 1942: 762; Radford, 1950b: 19; Zumpt, 1950b: 299; Bregetova, 1955a: 232 (in part), 1955b: 292 (in part), 1977b: 494 (in part); Evans, 1955: 352 (in part), 1957a: 231; Allred & Beck 1956: 34; Schweizer, 1961: 149 (in part); Zhang *et al*., 1963: 186 (in part); Karg, 1965: 271, 1979: 66 (in part), 1993a: 133 (in part); Evans & Till, 1966: 158 (in part), 1979: 202; Athias-Henriot, 1968: 239; Aswegen & Loots, 1970: 170 (in part); Costa, 1971: 70; Costa & Hunter, 1971: 327; Rosario, 1981: 63; Casanueva, 1993: 40; Deng *et al*., 1993: 157 (in part); Farrier & Hennessey, 1993: 77 (in part); Strong & Halliday, 1994: 88; Joharchi & Halliday, 2011: 26; Clark & Hawke, 2012: 192; OConnor & Klimov, 2012a: internet page; Joharchi *et al*., 2013: 382, 2014: 570, 2019d: 346; Karg & Schorlemmer, 2013:

202; Razavi Susan *et al*., 2014: 52; Kontschán, 2015: 419; Joharchi & Shahedi, 2016: 107; Klimov *et al*., 2016: internet page; Hajizadeh & Joharchi, 2018: 26; Halliday, 2019: internet page; Gwiazdowicz *et al*., 2020b: 597.

Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).

Laelaps (*Hypoaspis*).—Berlese, 1904c: 405 (in part).

Coleolaelaps.—Vitzthum, 1929: 23 (in part).

Hypoaspis (*Hypoaspis*).—Vitzthum, 1942: 762; Baker & Wharton, 1952: 93; Bregetova, 1956: 75, 1977b: 494; Ryke, 1959: 7; Schweizer, 1961: 151; Karg, 1965: 271, 1971: 160 (in part), 1979: 69, 1982: 235, 1989a: 107; 1993a: 135; Evans & Till, 1966: 160; Aswegen & Loots, 1970: 169 (in part); Hafez *et al*., 1982: 3; Faraji *et al*., 2008: 207.

Hypoaspis (*Hypohasta*) Karg, 1979: 70 (type species *Coleolaelaps simplexans* Womersley, 1956, by original designation) [junior synonym of *Hypoaspis* (*Hypoaspis*) by Joharchi *et al*., 2012b: 279].

Hypoaspis (*Hypohasta*).—Karg, 1982: 236, 1989a: 107.

Tengilaelaps Gu, Wang & Fan, 1996: 406 (type species *Tengilaelaps cerambycius* Gu, Wang & Fan, 1996, by monotypy) [junior synonym of *Hypoaspis* by Ma, 2016b: 95].

Hypohasta.—Karg & Schorlemmer, 2013: 202; Gwiazdowicz *et al*., 2020b: 597.

Note. *Hypoaspis* was described in the family Gamasini [sic]. It was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 202); *Tengilaelaps* was described in Laelapidae.

Hypoaspis alborzensis Razavi Susan & Joharchi, 2014

Hypoaspis alborzensis Razavi Susan & Joharchi, in Razavi Susan *et al*., 2014: 52.

Hypoaspis alborzensis.—Joharchi *et al*., 2014: 574; Nemati *et al*., 2018b: 143.

Type depository. Jalal Afshar Zoological Museum, Faculty of Agriculture, University of Tehran, [Karaj, Alborz], Iran; specimen number ARS-20130311–1a.

Type locality and habitat. 1384 m above sea level, Karaj (35°48'N, 50°59'E), Alborz, Iran, on *Oryctes* sp. [Animalia: Coleoptera: Scarabaeidae, Dynastinae] under *Platanus* sp. [Plantae: Proteales: Platanaceae].

Hypoaspis athiasae Costa, 1971

Hypoaspis athiasae Costa, 1971: 81.

Hypoaspis (*Hypoaspis*) *athiasi* [sic].—Karg, 1979: 69, 1982: 235.

Hypoaspis (*Hypoaspis*) *athiasae*.—Khanjani & Ueckermann, 2005: 119.

Type depository. Natural History Museum, London, England.

Type locality and habitat. Ivory Coast, in humid soil.

Hypoaspis boas (Ryke & Meyer, 1958)

Coleolaelaps boas Ryke & Meyer, 1958: 158.

Hypoaspis (*Hypoaspis*) *boas*.—Aswegen & Loots, 1970: 174; Karg, 1982: 235; Khanjani & Ueckermann, 2005: 121.

Coleolaelaps boas.—Ishikawa, 1985: 188.

Hypoaspis boas.—Joharchi & Halliday, 2011: 27.

Type depository. Department of Zoology, Potchefstroom University, Potchefstroom, South Africa.

Type locality and habitat. Potchefstroom, South Africa, on *Oryctes boas* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis campestris* (Berlese, 1887)**
Laelaps (*Iphis*) *campestris* Berlese, 1887b: 7.
Hypoaspis campestris.—Oudemans, 1902d: 24, 1903a: 129; Kazemi & Rajaei, 2013: 89; Joharchi *et al*., 2014: 574.
Hypoaspis (*Coleolaelaps*) *campestris*.—Berlese, 1913b: 199.
Coleolaelaps campestris.—Berlese, 1914: 142; Grandi, 1925: 212; Vitzthum, 1929: 26; Womersley, 1956a: 585; Castagnoli & Pegazzano, 1985: 58; Bernini *et al*., 1995: 28.
campestris; *non-Laelaps* [sic].—Tipton, 1960: 290.
Hypoaspis campestris.—Costa & Hunter, 1971: 324; Kůrka, 2005: 24.
Hypoaspis (*Hypoaspis*) *campestris*.—Bregetova, 1977b: 496; Karg, 1979: 70, 1982: 236, 1993a: 136.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Italy, on *Pentodontus punctati* [probably *Pentodon bidens punctatus*] [Animalia: Coleoptera: Scarabaeidae] and *Melolontha fullone* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].
Note. Berlese (1892e: 4, 1892f: 44, 1908: 14) considered *Gamasus krameri* (described from a male) to be a senior synonym of *L*. (*I*.) *campestris* (described from a female), but Oudemans (1902d: 22) considered them to be different taxonomic entities. The latter interpretation is adopted in this publication.

***Hypoaspis cerambycius* (Gu *et al*., 1996) new combination**
Tengilaelaps cerambycius Gu, Wang & Fan, 1996: 407.
Tengilaelaps cerambycius.—Ren & Guo, 2008: 328, 2009: 101.

Type depository. Department of Parasitology, Medical School, Nanjing University, Nanjing, China.
Type locality and habitat. Huating (24.2°N, 102.8°E), Yunnan, China, on unidentified cerambycid [Animalia: Coleoptera: Cerambycidae].
Note. Ma (2016b: 95) synonymised *Tengilaelaps* under *Hypoaspis*. The type species, *Tengilaelaps cerambycius*, is automatically transferred to *Hypoaspis*. The host record of this species on a cerambycid is unusual, and requires confirmation.

***Hypoaspis coffeae* Canestrini, 1888**
Hypoaspis coffeae Canestrini, 1888: 102.

Type depository. Unspecified.
Type locality and habitat. Rio de Janeiro, Brazil, on coffee [Plantae: Gentianales: Rubiaceae] plants.

***Hypoaspis coxalis* (Hyatt, 1964)**
Coleolaelaps coxalis Hyatt, 1964: 475.
Hypoaspis coxalis.—Joharchi *et al*., 2012b: 279.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.70.
Type locality and habitat. Morón, Venezuela, on *Megasoma elephas* (cited as *Megosoma*) [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis dubius* Costa, 1971**
Hypoaspis dubius Costa, 1971: 84.
Hypoaspis (*Hypoaspis*) *dubia*.—Karg, 1979: 69, 1982: 236.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Apia, Samoa (cited as W. Samoa), laboratory rearing started with specimens collected on *Oryctes monoceros* from Ivory Coast [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis eupatori* (Womersley, 1956)**
Coleolaelaps eupatori Womersley, 1956a: 587.
Hypoaspis (*Hypoaspis*) *eupatori*.—Karg, 1979: 69, 1982: 235.
Hypoaspis eupatori.—Halliday, 1998: 125, 2019: internet page.
Hypoaspis euputori [sic].—Joharchi *et al*., 2012b: 279.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Brisbane, Australia, on *Haploscapanes australicus* (cited as *Eupatorus australicus*) [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis heteronychus* (Womersley, 1956)**
Coleolaelaps heteronychus Womersley, 1956b: 116.
Hypoaspis heteronychus.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 24.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. M. Edw. [probably Mount Edward], Maclean, New South Wales, Australia, on *Heteronychus sanctaehelenae* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis hunanensis* Ma & Zheng, 2000**
Hypoaspis hunanensis Ma & Zheng, 2000: 373.
Hypoaspis hunanensis.—Kůrka, 2005: 24; Ren & Guo, 2008: 329, 2009: 101; Joharchi & Halliday, 2011: 27; Ma *et al*., 2014: 98; Lin *et al*., 2019: 130; Yan *et al*., 2010: 904.

Type depository. Central-South Forestry University, Zhuzhou, Hunan, China.
Type locality and habitat. Liuyang (28°10'N, 113°38'E), Hunan, China, on unidentified scarab beetle [Animalia: Coleoptera: Scarabaeidae].

***Hypoaspis integer* (Berlese, 1911)**
Laelaps (*Hypoaspis*) *integer* Berlese, 1911a: 186.
Hypoaspis (*Coleolaelaps*) *integer*.—Berlese, 1913b: 199.
Coleolaelaps integer.—Berlese, 1914: 142; Grandi, 1925: 212; Vitzthum, 1929: 26; Willmann, 1935: 23; Lombardini, 1936: 39; Wolf, 1938: 645; Womersley, 1956a: 585; Samšiňák, 1960: 280; Costa, 1966a: 73; Castagnoli & Pegazzano, 1985: 200.
Hypoaspis integer.—Buitendijk, 1945: 296; Costa, 1971: 76; Costa & Hunter, 1971: 351; Bernini *et al*., 1995: 28; Karg, 1999: 430; Kůrka, 2005: 24; Joharchi & Halliday, 2011: 27; Kazemi & Rajaei, 2013: 89; Khanjani *et al*., 2013: 473; Joharchi *et al*., 2014: 574; Hajizadeh & Joharchi, 2018: 26; Nemati *et al*., 2018b: 143; Trach & Joharchi, 2018: 219; Gwiazdowicz *et al*., 2020b: 597.
integer; *non-Laelaps* [sic].—Tipton, 1960: 298.
Hypoaspis (*Hypoaspis*) *integer*.—Karg, 1979: 70, 1982: 236, 1993a: 136 (all sensu Samšiňák, 1960).

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Unspecified locality, on *Oryctes nasicornis* (cited as *Oryctem nasicornem*) [Animalia: Coleoptera: Scarabaeidae, Dynastinae].
Note. According to Joharchi & Halliday (2011: 27), the specimens reported by Willmann (1935: 23) as *C. integer* belong to a different species which they did not determine. Specimens identified as *Coleolaelaps* ? *integer* [sic] by Womersley (1956a: 585) were described as *Hypoaspis* (*Hypohasta*) *serrata* by Karg (1979: 70).

***Hypoaspis jambar* Ishikawa, 1985**
Hypoaspis (*Hypoaspis*) *jambar* Ishikawa, 1985: 185.
Hypoaspis jambar.—Kůrka, 2005: 24.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac9708.
Type locality and habitat. Ié Forestry Road, Kunigami, Ryukyus, Okinawa Island, Japan, on *Cheirotonus jambar* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae] on *Quercus miyagii* (cited as *Cyclobalanopsis miyagii*) [Plantae: Fagales: Fagaceae].

***Hypoaspis krameri* (G. & R. Canestrini, 1881)**
Gamasus krameri G. & R. Canestrini, 1881: 1083.
Laelaps krameri.—G. & R. Canestrini, 1882a: 60; Berlese, 1892f: 42.
Hypoaspis krameri.—Canestrini, 1885: 80; Oudemans, 1902d: 22, 1903a: 130; Vitzthum, 1921: 14; Buitendijk, 1945: 296; Radford, 1950b: 19; Evans & Till, 1966: 163; Athias-Henriot, 1968: 237; Domocoș, 1969: 112; Rosario, 1981: 64; Bernini *et al*., 1995: 28; Kůrka, 2005: 24; Kazemi & Rajaei, 2013: 89; Joharchi *et al*., 2014: 574; Kontschán, 2015: 418; Nemati *et al*., 2018b: 143; Trach & Joharchi, 2018: 224.
Laelaps (*Iphis*) *kramerii* [sic].—Berlese, 1892e: 4.
Iphis kramerii [sic].—Berlese, 1892f: 35.
Laelaps (*Eulaelaps*) *kramerii* [sic].—Berlese, 1903b: 13.
Coleolaelaps krameri.—Grandi, 1925: 212; Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 208.
krameri; *non-Laelaps* [sic].—Tipton, 1960: 298.
Hypoaspis (*Hypoaspis*) *krameri*.—Schweizer, 1961: 151; Evans & Till, 1965a: 252; Karg, 1971: 170, 1979: 70, 1982: 236, 1993a: 136; Bregetova, 1977b: 496; Ishikawa, 1985: 188; Gwiazdowicz & Gulvik, 2005: 119; Faraji *et al*., 2008: 207.

Type depository. Unspecified.
Type locality and habitat. Padua, Italy, on rotten wood.
Note. Berlese (1892e: 4, 1892f: 44, 1908: 14) considered *G. krameri* (described from a male) to be a senior synonym of *L.* (*I.*) *campestris* (described from a female), but Oudemans (1902d: 22) considered them to be different species. The latter interpretation is adopted in this publication. Hirschmann *et al*. (1969: 140) considered *Hypoaspis stammeri* very similar to *G. krameri*. Karg (1971: 179, 1993a: 136) considered them synonyms, but Joharchi *et al*. (2014: 574) considered them separate entities, which is also the interpretation in this publication.

***Hypoaspis larvicolus* Joharchi & Halliday, 2011**
Hypoaspis larvicolus Joharchi & Halliday, 2011: 27.
Hypoaspis larvicolus.—Kazemi & Rajaei, 2013: 90; Joharchi *et al*., 2014: 574; Kavianpour *et al*., 2017: 164; Joharchi & Halliday, 2020: 27.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 1384 m above sea level, Karaj (35°48'N, 50°59'E), [Alborz], Iran, on larva of *Polyphylla* sp. [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Hypoaspis liui* (Samšiňák, 1962)**
Coleolaelaps liui Samšiňák, 1962: 196.
Coleolaelaps allomyrinatus Ishikawa, 1968: 210 [junior synonym of *C. liui* by Ma, 2016b: 95].
Hypoaspis (*Hypoaspis*) *liui*.—Karg, 1979: 69, 1982: 235; Deng *et al*., 1993: 170; Yan *et al*., 2010: 904.
Hypoaspis liui.—Gu & Duan, 1991: 342, 1993: 51; Kůrka, 2005: 24; Ma, 2006a: 23; Ren & Guo, 2008: 329, 2009: 101; Joharchi *et al*., 2012b: 279; Ma, 2016b: 95.

Coleolaelaps liui.—Karg, 1999: 432.
Hypoaspis spinaperaffinis Ma & Cui, in Ma *et al*., 2002: 736 [junior synonym of *C. liui* by Ma, 2006a: 23; Yan *et al*., 2010: 904].
Hypoaspis spinaperaffinis.—Ren & Guo, 2008: 329, 2009: 101.
Hypoaspis allomyrinatus.—Joharchi *et al*., 2012b: 279.

Type depository. *C. liui*: author's collection, specimen number 632K; *C. allomyrinatus*: Biological Laboratory, Matsuyama Shinonome Junior College, Matsuyama, Japan; *H. spinaperaffinis*: National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. *C. liui*: South China, on unidentified dynastid beetle [Animalia: Coleoptera: Scarabaeidae, Dynastinae]; *C. allomyrinatus*: Matsuyama, Shikoku, Japan, on *Allomyrina dichotomus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae]; *H. spinaperaffinis*: Ji'an (41°08'N, 126°09'E), Jilin province, China, on unidentified beetle [Coleoptera].
Note. Costa & Hunter (1971: 325) considered *C. allomyrinatus* not to belong to *Coleolaelaps* and to have closer affinities with *Hypoaspis*.

Hypoaspis longchuanensis Gu & Duan, 1991

Hypoaspis longchuanensis Gu & Duan, 1991: 341.
Hypoaspis longchuanensis Gu & Duan, 1993: 50 (objective synonymy).
Hypoaspis longchuanensis.—Kůrka, 2005: 24; Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2010: 904; Joharchi & Halliday, 2011: 27; Lin *et al*., 2019: 130.

Type depository. Department of Parasitology, Guiyang Medical College, Guizhou, China.
Type locality and habitat. Longchuan (24.3°N, 97.9°E), Yunnan, China, on *Xylotrupes* sp. [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

Hypoaspis louisensis Loots, 1980

Hypoaspis louisensis Loots, 1980: 764.
Hypoaspis louisensis.—Kůrka, 2005: 24.
Hypoaspis (*Hypoaspis*) *louisensis*.—Kazemi, 2020: 134.

Type depository. Koninklijk Museum voor Midden Africa, Tervuren, Belgium; specimen number 143.554.
Type locality and habitat. Anse Louis, Mahé Sud, Seychelles, in a mangrove.

Hypoaspis maryamae Joharchi & Halliday, 2011

Hypoaspis maryamae Joharchi & Halliday, 2011: 31.
Hypoaspis maryamae.—Kazemi & Rajaei, 2013: 90; Joharchi *et al*., 2014: 574; Saberi *et al*., 2016: 128; Nemati *et al*., 2018b: 143; Joharchi & Halliday, 2020: 27.
Hypoaspis (*Hypoaspis*) *surii* Khanjani, Ghaedi & Ueckermann, 2013: 470 [junior synonym of *H. maryamae* by Joharchi *et al*., 2014: 573].

Type depository. *H. maryamae*: Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran; *H.* (*H.*) *surii*: Acarology Laboratory, Bu-Ali Sina University, Hamedan, Iran.
Type locality and habitat. *H. maryamae*: 2250 m above sea level, Yazd (31°38'N, 53°59'E), Iran, on *Polyphylla olivieri* (Animalia: Coleoptera: Scarabaeidae, Melolonthinae); *H.* (*H.*) *surii*: 1876 m above sea level, potato farms at Bahar (34°54'N, 48°26'E), Hamedan, Iran, on *Polyphylla olivieri* [Scarabaeidae, Melolonthinae].

***Hypoaspis melolonthae* Joharchi & Halliday, 2011**
Hypoaspis melolonthae Joharchi & Halliday, 2011: 33.
Hypoaspis melolonthae.—Kazemi & Rajaei, 2013: 90; Joharchi *et al*., 2014: 574; Joharchi & Halliday, 2020: 32.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 2300 m above sea level, Yazd (31°33'N, 54°11'E), Iran, on *Melolontha melolontha* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Hypoaspis metasternalis* (Hyatt, 1964)**
Coleolaelaps metasternalis Hyatt, 1964: 472.
Coleolaelaps metasternalis.—Ishikawa, 1968: 211.
Hypoaspis metasternalis.—Joharchi *et al*., 2012b: 279.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.21.
Type locality and habitat. 1000 m above sea level, Cota, Venezuela, on unidentified scarabaeid beetle [Animalia: Coleoptera: Scarabaeidae].

***Hypoaspis neokrameri* Costa, 1971**
Hypoaspis neokrameri Costa, 1971: 71.
Hypoaspis (*Hypoaspis*) *neokrameri*.—Karg, 1979: 69, 1982: 235
Hypoaspis neokrameri.—Kazemi & Rajaei, 2013: 90; Joharchi *et al*., 2014: 574; Kazemi, 2020: 137.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Tivon, Israel, on *Oryctes nasicornis* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis oryctes* Joharchi, 2020**
Hypoaspis sp..—Damghani, 2001: 59 (according to Joharchi *et al*., 2014: 570).
Hypoaspis elegans Joharchi, Ostovan & Babaeian, 2014: 570.
Hypoaspis elegans.—Nemati *et al*., 2018b: 143; Joharchi & Halliday, 2020: 27.
Hypoaspis oryctes Joharchi, 2020: 207 [replacement name, given the existence of *Hypoaspis elegans* Berlese, 1918].

Type depository. Originally at Acarological Collection, Science and Research Branch, Islamic Azad University, Fars, Iran. Presently at Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran; specimen number ARS-20191222–9a (according to Joharchi & Halliday, 2020: 27).
Type locality and habitat. Bam, Kerman, Iran, on *Oryctes elegans* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis pentodoni* Costa, 1971**
Hypoaspis pentodoni Costa, 1971: 71.
Hypoaspis (*Hypoaspis*) *pentodoni*.—Karg, 1979: 70, 1982: 236, 1993a: 136.
Hypoaspis pentodoni.—Joharchi & Halliday, 2011: 35; Kazemi & Rajaei, 2013: 90; Joharchi *et al*., 2014: 574; Nemati *et al*., 2018b: 144.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mishmar Haemek, Israel, on *Pentodon bispinosus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis phyllognathi* Costa, 1971**

Hypoaspis phyllognathi Costa, 1971: 74.

Hypoaspis (*Hypoaspis*) *phyllognathi*.—Karg, 1979: 70, 1982: 236, 1993a: 137; Khanjani & Ueckermann, 2005: 121.

Hypoaspis phyllognathi.—Bahrami *et al*., 2011: 351; Joharchi & Halliday, 2011: 35; Kazemi & Rajaei, 2013: 90; Joharchi *et al*., 2014: 574.

Type depository. Natural History Museum, London, England.

Type locality and habitat. Bardawil, northern Sinai, Egypt, on *Phyllognathus silenus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis polyphyllae* Khanjani & Ueckermann, 2005**

Hypoaspis (*Hypoaspis*) *polyphyllae* Khanjani & Ueckermann, 2005: 119.

Hypoaspis (*Hypoaspis*) *polyphyllae*.—Faraji *et al*., 2008: 207.

Hypoaspis polyphyllae.—Kazemi & Rajaei, 2013: 91; Khanjani *et al*., 2013: 473; Joharchi *et al*., 2014: 574.

Type depository. Acarology Laboratory, Bu-Ali Sina University, Hamadan, Iran.

Type locality and habitat. Ganjnameh, Hamadan, Iran, on *Polyphylla olivieri* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae] on roots of black cherry [Plantae: Rosales: Rosaceae].

***Hypoaspis punctatus* Aswegen & Loots, 1970**

Hypoaspis (*Hypoaspis*) *punctatus* Aswegen & Loots, 1970: 172.

Hypoaspis (*Hypoaspis*) *punctata*.—Karg, 1982: 236.

Type depository. Koninklijk Museum voor Midden Africa, Tervuren, Belgium.

Type locality and habitat. Kundelungu, Democratic Republic of the Congo (cited as Belgian Congo), in soil.

***Hypoaspis remilleti* Costa, 1971**

Hypoaspis remilleti Costa, 1971: 86.

Hypoaspis (*Hypoaspis*) *remilleti*.—Karg, 1979: 69, 1982: 235.

Type depository. Natural History Museum, London, England.

Type locality and habitat. Near Abidjan, Ivory Coast, on *Heteroligus meles* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis rhinocerotis* Oudemans, 1925**

Hypoaspis rhinocerotis Oudemans, 1925: 30.

Coleolaelaps rhinocerotis.—Oudemans, 1927: 189; Buitendijk, 1945: 298; Cooreman, 1948: 9; Ryke & Meyer, 1958: 158.

Hypoaspis rhinocerotis.—Costa, 1971: 78; Ren & Guo, 2008: 329, 2009: 101; Joharchi *et al*., 2014: 574; Razavi Susan *et al*., 2014: 55; Nemati *et al*., 2018b: 144.

Hypoaspis (*Hypoaspis*) *rhinocerotis*.—Karg, 1979: 70, 1982: 236; Teng & Luo, 1983: 433; Deng *et al*., 1993: 176; Khanjani & Ueckermann, 2005: 119; Yan *et al*., 2010: 904.

Type depository. Unspecified.

Type locality and habitat. Ambon, Indonesia, on *Oryctes rhinoceros* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis rhopaea* (Womersley, 1956)**
Coleolaelaps rhopaea Womersley, 1956a: 588.
Hypoaspis (*Hypohasta*) *rhopaea*.—Karg, 1979: 70, 1982: 236.
Hypoaspis rhopaea.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Joharchi *et al*., 2012b: 279.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Broken Hill, New South Wales, Australia, on larvae of *Rhopaea magnicornis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Hypoaspis serrata* Karg, 1979**
Hypoaspis (*Hypohasta*) *serrata* Karg, 1979: 70.
Coleolaelaps ?*integer* [sic].—Womersley, 1956a: 585 (misidentification, according to Karg, 1979: 70).
Hypoaspis (*Hypohasta*) *serrata*.—Karg 1982: 236.
Hypoaspis serrata.—Kůrka, 2005: 25.

Type depository. Unspecified [probably at South Australian Museum, Adelaide, South Australia, Australia].
Type locality and habitat. Samoa [cited as Western Samoa], on *Oryctes rhinoceros* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].
Note. This species was described based on the specimens identified as *Coleolaelaps* ? *integer* [sic] by Womersley (1956a: 585).

***Hypoaspis simplexans* (Womersley, 1956)**
Coleolaelaps simplexans Womersley, 1956a: 586.
Coleolaelaps simplexans.—Ishikawa, 1968: 213.
Hypoaspis (*Hypohasta*) *simplexans*.—Karg, 1979: 71, 1982: 236.
Hypoaspis simplexans.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Ma, Zhang & Li, 2003: 72; Ma, 2004a: 18; Joharchi *et al*., 2012b: 279.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Acacia Plateau, New South Wales, Australia, on unidentified scarab pupa [Animalia: Coleoptera: Scarabaeidae].

***Hypoaspis spinacrassus* Rosario, 1981**
Hypoaspis spinacrassus Rosario, 1981: 65.
Hypoaspis spinacrassus.—Gu *et al*., 1992: 430; Ma *et al*., 2002: 737; Kůrka, 2005: 25; Yan *et al*., 2010: 904.

Type depository. Unspecified.
Type locality and habitat. International Rice Research Institute experimental farm, Philippines, on unidentified dynastine beetle [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis stammeri* Götz, 1969**
Hypoaspis stammeri Götz, in Hirschmann *et al*., 1969: 140.
Hypoaspis stammeri.—Joharchi *et al*., 2014: 574.

Type depository. Unspecified.
Type locality and habitat. Unspecified (probably Germany), on *Geotrupes sylvaticus* [Animalia: Coleoptera: Geotrupidae, Geotrupinae].

Note. Hirschmann *et al*. (1969: 140) considered *H. stammeri* very similar to *Gamasus krameri*. Karg (1971: 179, 1993a: 136) considered them synonyms, but Joharchi *et al*. (2014: 574) considered them separate entities, which is also the interpretation in this publication.

***Hypoaspis striatus* (Hyatt, 1964)**
Coleolaelaps striatus Hyatt, 1964: 477.
Hypoaspis striatus.—Joharchi *et al*., 2012b: 279.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.91.
Type locality and habitat. Caracas, Venezuela, on *Dynastes* sp. (Animalia: Coleoptera: Scarabaeidae, Dynastinae).

***Hypoaspis surenai* Joharchi & Shahedi, 2016**
Hypoaspis surenai Joharchi & Shahedi, 2016: 107.
Hypoaspis surenai.—Nemati *et al*., 2018b: 144.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran; specimen number ARS-20150304–1a.
Type locality and habitat. 1496 m above sea level, Taft, Kahduiyeh, Yazd (31°16'N, 53°43'E), Iran, on adult *Oryctes* sp. (Animalia: Coleoptera: Scarabaeidae, Dynastinae).

***Hypoaspis surigaoensis* Rosario, 1981**
Hypoaspis surigaoensis Rosario, 1981: 67.

Type depository. Unspecified.
Type locality and habitat. Mangagoy, Bislig, Surigao del Sur, Philippines, on unidentified dynastid beetle [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Hypoaspis terrestris* (Leonardi, 1899)**
Laelaps terrestris Leonardi, 1899: 508.
Coleolaelaps terrestris.—Grandi, 1925: 212.
Hypoaspis terrestris.—Costa & Hunter, 1971: 324; Bernini *et al*., 1995: 29; Ma & Zheng, 2000: 373; Ma, Zhang & Li, 2003: 75; Kůrka, 2005: 25; Joharchi & Halliday, 2011: 35; Kazemi & Rajaei, 2013: 91; Joharchi *et al*., 2014: 574; Nemati *et al*., 2018b: 144; Trach & Joharchi, 2018: 226.
Hypoaspis (*Hypoaspis*) *terrestris*.—Bregetova, 1977b: 494; Karg, 1979: 70, 1982: 236, 1993a: 137.

Type depository. Unspecified.
Type locality and habitat. Portici, Naples, Italy, on larva of *Cetonia* sp. [Animalia: Coleoptera: Scarabaeidae].
Note. *Laelaps terrestris* Leonardi, 1899 (currently *Hypoaspis terrestris*) is a senior primary homonym of *Laelaps terrestris* Berlese, 1908 (currently *Coleolaelaps terrestris*). Based on the illustration of the Leonardi species by Bregetova (1977b, Figure 389), it fits better the characteristics cited by Joharchi & Halliday (2011: 36) for *Hypoaspis* than for *Coleolaelaps*.

***Hypoaspis terrestrisimilis* Ma *et al*., 2003**
Hypoaspis terrestrisimilis Ma, Zhang & Li, 2003: 72.
Hypoaspis terrestrisimilis.—Ren & Guo, 2008: 329, 2009: 101; Yan *et al*., 2010: 904; Joharchi & Halliday, 2011: 27.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Chongqing (29°34'N, 106°30'E), China, on *Polyphylla laticollis* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Hypoaspis zaheri* Fouly & Al-Rehiayani, 2011**
Hypoaspis zaheri Fouly & Al-Rehiayani, 2011: 143.
Hypoaspis zaheri.—Joharchi *et al*., 2014: 574.

Type depository. Zoology Laboratory, College of Agriculture and Veterinary Medicine, Qassim University, Saudi Arabia.
Type locality and habitat. Onayzah, Al-Qassim, Saudi Arabi, in litter.

***Hypoaspisella* Bernhard, 1962**
Hypoaspis (*Hypoaspisella*) Bernhard, in Karg, 1962: 64 (type species: *Hypoaspis* (*Hypoaspisella*) *heyi* Karg, 1962, by monotypy; see discussion about the type species in Joharchi *et al*., 2018a: 27).
Hypoaspis.—Zhang *et al*., 1963: 186 (in part); Hughes, 1976: 292 (in part); Deng *et al*., 1993: 157 (in part).
Hypoaspis (*Hypoaspisella*).—Karg, 1965: 271; Bernhard, 1971: 6.
Hypoaspis s.l..—Evans & Till, 1979: 202 (in part)
Hypoaspis (*Pneumolaelaps*).—Karg, 1982: 243 (in part).
Hypoaspisella.—Joharchi *et al*., 2018a: 26.

Note. *Hypoaspis* (*Hypoaspisella*) was described in Hypoaspididae and included in Laelapidae-Laelapinae by Evans & Till (1979: 202). *Hypoaspisella* was considered junior synonym of *Holostaspis* by Karg (1971: 171), but that synonymy was not accepted by Joharchi *et al*. (2018: 26) and is also not accepted in this publication.

***Hypoaspisella antipai* (Solomon, 1968)**
Hypoaspis antipai Solomon, 1968a: 663.
Hypoaspis (*Pneumolaelaps*) *antipai*.—Karg, 1979: 89, 1982: 244, 1993a: 147.
Hypoaspis antipai.—Karg, 1984: 39.
Pneumolaelaps antipai.—Moreira, 2014: 344.
Hypoaspisella antipai.—Joharchi *et al*., 2020c: 200.

Type depository. Unspecified.
Type locality and habitat. Jijila, Dobruja, Romania, on *Crocidura suaveolens* [Animalia: Soricomorpha: Soricidae].
Note. Karg (1979: 88, 1982: 244, 1993a: 147) suspected this species to be a senior synonym of *Hypoaspis grandiporus* Greim. Joharchi *et al*. (2020c: 200) disagreed with Karg and suspected this species to be a senior synonym of *Hypoaspis hermonensis* Costa.

***Hypoaspisella asperatus* (Berlese, 1904)**
Laelaps (*Hypoaspis*) *asperatus* Berlese, 1904b: 17.
asperatus; *non-Laelaps* [sic].—Tipton, 1960: 287.
Hypoaspis (*Hypoaspisella*) *procerus* Karg, 1965: 277 [junior synonym of *L*. (*H*.) *asperata* by Bregetova, 1977b: 506; Joharchi & Negm, 2020: 501].
Hypoaspis asperatus.—Costa, 1968: 3; Shcherbak, 1971a: 24; Castagnoli & Pegazzano, 1985: 26; Khalili-Moghadam & Saboori, 2015: 319.
Hypoaspis (*Hypoaspisella*) *incertus* Bernhard, in Hirschmann *et al*., 1969: 136 [junior synonym of *H*. (*H*.) *procerus* by Karg, 1971: 180, 1993a: 151; Joharchi *et al*., 2018a: 28].
Hypoaspis (*Holostaspis*) *procera*.—Karg, 1971: 176, 1978b: 11.

Hypoaspis incertus.—Lapinya, 1976: 44.
Hypoaspis (*Geolaelaps*) *asperatus*.—Bregetova, 1977b: 506; Chelebiev, 1988: 11; Sklyar, 2001: 100.
Hypoaspis (*Pneumolaelaps*) *asperata*.—Karg, 1979: 90, 1982: 245, 1993a: 149; Faraji *et al*., 2008: 208.
Hypoaspis (*Pneumolaelaps*) *procera*.—Karg, 1979: 92, 1982: 246, 1993a: 151.
Pneumolaelaps asperatus.—Bernini *et al*., 1995: 30; Arjomandi *et al*., 2013: 256; Kazemi & Rajaei, 2013: 93; Hasanvand *et al*., 2014a: 96; Maleki *et al*., 2016: 187.
Gaeolaelaps asperatus.—Amani *et al*., 2015: 92.
Hypoaspis s. l. *asperatus*.—Klimov *et al*., 2016: internet page.
Gaeololaelaps [sic] *asperatus*.—Abbaspour *et al*., 2017: 746.
Hypoaspisella procera.—Joharchi *et al*., 2018a: 28; Babaeian *et al*., 2019a: 331.
Hypoaspisella asperata.—Joharchi & Negm, 2020: 501.

Type depository. *L*. (*H*.) *asperatus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *H*. (*H*.) *procerus*: Karg's collection; *H*. (*H*.) *incertus*: unspecified.
Type locality and habitat. *L*. (*H*.) *asperatus*: type series, Padua, Italy, hay litter in stable and Florence, Italy, in litter; *H*. (*H*.) *procerus*: Zörbig, near Halle, Sachsen-Anhalt, Germany, from unspecified substrate; *H*. (*H*.) *incertus*: Erlangen, Germany, in moist forest soil with decaying pine needles and moss.
Note. Shcherbak (1971a: 24) had suspected *L*. (*H*.) *asperatus* to be a senior synonym of *H*. (*H*.) *procerus*, whereas Bregetova (1977b: 506) suspected the latter species to be a senior synonym of *Hypoaspis* (*Hypoaspisella*) *intermedius* Bernhard. Khalili-Moghadam & Saboori (2015: 319) and Nemati *et al*. (2018b: 175) considered the generic placement of *L*. (*H*.) *asperatus* as uncertain.

***Hypoaspisella azarbaijaniensis* (Faraji *et al*., 2008)**
Hypoaspis (*Pneumolaelaps*) *azarbaijaniensis* Faraji, Abedi & Ostovan, 2008: 205.
Pneumolaelaps azarbaijaniensis.—Kazemi & Rajaei, 2013: 94.

Type depository. Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands.
Type locality and habitat. Uleq, Salmas, West Azarbaijan, Iran, in soil mixed with wheat straw in a barn.

***Hypoaspisella berlesei* (Bernhard, 1969)**
Hypoaspis (*Hypoaspisella*) *berlesei* Bernhard, in Hirschmann *et al*., 1969: 136.
Hypoaspis (*Holostaspis*) *berlesei*.—Karg, 1971: 176.
Hypoaspis (*Pneumolaelaps*) *berlesei*.—Karg, 1979: 93, 1982: 247, 1993a: 154.
Hypoaspis berlesei.—Kůrka, 2005: 24.
Pneumolaelaps (*Hypoaspisella*) *berlesei*.—Khalili-Moghadam *et al*., 2016: 515; Nemati *et al*., 2018b: 149.
Pneumolaelaps berlesei.—Kavianpour *et al*., 2017: 162.
Hypoaspisella berlesei.—Joharchi *et al*., 2018a: 28; Babaeian *et al*., 2019a: 328.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, under carrion and in the humus of a forest floor.

***Hypoaspisella bernhardi* Joharchi *et al*., 2018**
Hypoaspisella bernhardi Joharchi, Halliday, Khaustov & Ermilov, 2018a: 28.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 8 m above sea level, Zanzibar (6°16'S, 39°25'E), Tanzania, in forest litter.

***Hypoaspisella dentipilosa* (Karg, 1978)**
Hypoaspis (*Holostaspis*) *dentipilosa* Karg, 1978b: 11.
Hypoaspis (*Pneumolaelaps*) *dentipilosa*.—Karg, 1979: 92, 1982: 246.
Pneumolaelaps dentipilosa.—Kazemi & Rajaei, 2013: 94.
Hypoaspisella dentipilosa.—Babaeian *et al*., 2019a: 329.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 84 km northwest of Santiago, Chile, under rocks.

***Hypoaspisella egenus* (Berlese, 1918)**
Hypoaspis (*Stratiolaelaps*) *egenus* Berlese, 1918: 122.
Hypoaspis (*Stratiolaelaps*) *egenus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 122.
Hypoaspis (*Hypoaspis*) *egenus*.—Aswegen & Loots, 1970: 186.
Hypoaspis (*Geolaelaps*) *egena*.—Karg, 1982: 241, 1987: 299, 1989c: 118, 1989d: 5.
Gaeolaelaps egenus.—Moreira, 2014: 248.
Hypoaspisella egenus.—Joharchi *et al*., 2020c: 200.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. M'fongozi, Zululand [KwaZulu-Natal], South Africa, on *Mastomys coucha* (cited as *Mus coucha*) [Animalia: Rodentia: Muridae].
Note. Kazemi *et al*. (2014: 519) suggested that this species did not belong to *Gaeolaelaps*, suspecting it to be a junior synonym of *Hypoaspis spiculifer* Berlese.

***Hypoaspisella forcipatus* (Willmann, 1956) new combination**
Hypoaspis forcipatus Willmann, 1956: 222.
Hypoaspis (*Hypoaspisella*) *richteri* Karg, 1965: 276 [junior synonym of *H. forcipatus* by Karg, 1971: 180; 1993a: 157; Bregetova, 1977b: 499].
Hypoaspis (*Holostaspis*) *forcipata*.—Karg, 1971: 174, 1979: 97, 1982: 248, 1993a: 157; Gwiazdowicz & Biernacik, 2000: 203; Gabryś *et al*., 2008: 48.
Hypoaspis (*Geolaelaps*) *forcipata*.—Bregetova, 1977b: 499; Gwiazdowicz & Gulvik, 2005: 120.
Hypoaspis forcipata.—Chelebiev, 1981: 185.
Gaeolaelaps forcipatus.—Babaeian *et al*., 2019a: 329.

Type depository. *H. forcipatus*: unspecified; *H.* (*H.*) *richteri*: Karg's collection.
Type locality and habitat. *H. forcipatus*: 1000 m above sea level, Králický Sněžník mountain (cited as Glatzer Schneeberg) [Eastern Bohemia, between Czech Republic and Poland], in humus; *H.* (*H.*) *richteri*: Caputher Heuweg, Potsdam, Germany, in soil of a mixed oak forest.
Note. The smooth anterior margin of the epistome of this species, the narrow deutosternum (2–6 denticles per row) and epigynal shield relatively close to the anal shield suggest that this species belongs to *Hypoaspisella*.

***Hypoaspisella giffordi* (Evans & Till, 1966)**
Hypoaspis giffordi Evans & Till, 1966: 170.
Gaeolaelaps giffordi.—Athias-Henriot, 1968: 261.
Hypoaspis giffordi.—Costa, 1968: 11; Solomon, 1968a: 664; Chelebiev, 1981: 185; Ma, 2000b: 150.
Hypoaspis (*Geolaelaps*) *giffordi*.—Bregetova, 1977b: 510.
Hypoaspis (*Pneumolaelaps*) *giffordi*.—Karg, 1979: 92, 1982: 246, 1993a: 153.
Geolaelaps giffordi.—Sklyar, 2012: 86.
Hypoaspisella giffordi.—Joharchi *et al*., 2020c: 200.

Type depository. Unspecified; specimen number 1965: 12: 29: 3.
Type locality and habitat. Rannoch, Perthshire, Scotland, on birch [Plantae: Fagales: Betulaceae] timber rotted by *Polyporus betulinus* [Fungi: Polyporales: Polyporaceae].
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps*, without assigning it to another genus.

***Hypoaspisella golanii* (Costa, 1969) new combination**
Hypoaspis golanii Costa, 1969a: 163.
Hypoaspis (*Geolaelaps*) *golanii*.—Bregetova, 1977b: 510.
Hypoaspis (*Pneumolaelaps*) *golanii*.—Karg, 1979: 90, 1982: 245.
Hypoaspis golanii.—Okáli, 1991: 200.
Pneumolaelaps golanii.—Moreira, 2014: 350.
Hypoaspis s. l. *golanii*.—Nemati *et al*., 2018b: 176.

Type depository. Slovak Natural History Museum, Bratislava.
Type locality and habitat. Mount Hermon, border between Syria and Lebanon, in nest of *Spalax ehrenbergi* [Animalia: Rodentia: Spalacidae].
Note. Nemati *et al*. (2018b: 176) questioned the generic placement of this species, referring to it as *Hypoaspis* s. l. *golanii*. It does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it lacks macrosetae on the dorsal shield. The original description shows a typical species of *Hypoaspisella*; the fusion of the peritrematal and parapodal plates has been reported in some species of this genus.

***Hypoaspisella grandiporus* (Greim, 1969)**
Hypoaspis grandiporus Greim, in Hirschmann *et al*., 1969: 139.
Hypoaspis (*Holostaspis*) *grandipori* [sic].—Karg, 1971: 173.
Hypoaspis (*Pneumolaelaps*) *grandipori* [sic].—Karg, 1982: 244.
Hypoaspis (*Geolaelaps*) *grandipori*.—Chelebiev, 1988: 11.
Pneumolaelaps grandiporus.—Moreira, 2014: 350.
Hypoaspisella grandiporus.—Babaeian *et al*., 2019a: 329.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Steigerwald, Germany, in tree nests of *Camponotus ligniperda* and *Lasius fuliginosus* [Animalia: Hymenoptera: Formicidae].
Note. Karg (1979: 88, 1982: 244, 1993a: 147) suspected this species to be a junior synonym of *H. antipai* but Joharchi *et al*. (2020c: 200) disagreed with Karg.

***Hypoaspisella hermonensis* (Costa, 1969)**
Hypoaspis hermonensis Costa, 1969a: 165.
Hypoaspis (*Pneumolaelaps*) *hermonensis*.—Karg, 1979: 90, 1982: 245.
Hypoaspis hermonensis.—Okáli, 1991: 200.
Pneumolaelaps hermonensis.—Moreira, 2014: 351.
Hypoaspisella hermonensis.—Joharchi *et al*., 2020c: 200.

Type depository. Unspecified.
Type locality and habitat. Mount Hermon, border between Syria and Lebanon, in nest of *Spalax ehrenbergi* [Animalia: Rodentia: Spalacidae].
Note. Joharchi *et al*. (2020c: 200) suspected this species to be a junior synonym of *H. antipai*.

***Hypoaspisella heterosetosus* (Bernhard, 1969)**
Hypoaspis (*Hypoaspisella*) *heterosetosus* Bernhard, in Hirschmann *et al*., 1969: 135.
Hypoaspis (*Holostaspis*) *heterosetosa*.—Karg, 1971: 175.
Hypoaspis (*Pneumolaelaps*) *heterosetosa*.—Karg, 1979: 92, 1982: 246, 1993a: 153.
Hypoaspis heterosetosa.—Karg, 1984: 39.
Hypoaspis cf. *heterosetosus*.—Makarova, 2014: 1406.
Hypoaspisella heterosetosus.—Joharchi *et al*., 2018a: 28; Babaeian *et al*., 2019a: 329.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, in compost, *Elymus* sp. [Plantae: Poales: Poaceae] hay, rabbit manure.

***Hypoaspisella heyi* (Karg, 1962)**
Hypoaspis (*Hypoaspisella*) *heyi* Karg, 1962: 64.
Hypoaspis heyi.—Karg, 1965: 312, 1984: 39; Costa, 1969a: 167.
Hypoaspis (*Hypoaspisella*) *heyi*.—Bhattacharyya, 1968: 546.
Hypoaspis (*Holostaspis*) *heyi*.—Karg, 1971: 173.
Hypoaspis (*Pneumolaelaps*) *heyi*.—Karg, 1979: 90, 1982: 245, 1993a: 149.
Pneumolaelaps heyi.—Moreira, 2014: 351.
Hypoaspisella heyi.—Joharchi *et al*., 2018a: 28, 2020c: 200; Babaeian *et al*., 2019a: 329.

Type depository. Author's collection; specimen number 852.
Type locality and habitat. Experiment station, Biologische Zentralanstalt, Teltow, Germany, in grassland.
Note. Lapinya (1976: 46) described *Hypoaspis heyi* var. *latvicus*. However *latvicus* is not an available name, given that a new name published after 1960 expressly as the name of a "variety" or "form" is deemed to be infrasubspecific, and not available for nomenclatural purposes (ICZN, Article 15.2).

***Hypoaspisella intermedius* (Bernhard, 1969)**
Hypoaspis (*Hypoaspisella*) *intermedius* Bernhard, in Hirschmann *et al*., 1969: 135.
Hypoaspis (*Holostaspis*) *intermedia*.—Karg, 1971: 173.
Hypoaspis (*Pneumolaelaps*) *intermedia*.—Karg, 1979: 89, 1982: 244, 1993a: 147.
Hypoaspis intermedia.—Karg, 1984: 39.
Pneumolaelaps intermedius.—Kazemi & Rajaei, 2013: 95.
Hypoaspisella intermedius.—Joharchi *et al*., 2018a: 28; Babaeian *et al*., 2019a: 329.

Type depository. Unspecified.
Type locality and habitat. Type series, Erlangen, Germany, in compost and rotting garden waste, *Elymus* sp. [Plantae: Poales: Poaceae] hay and on fungi on a rotten stump.
Note. Bregetova (1977b: 506) suspected this species to be a junior synonym of *L.* (*H.*) *asperatus*.

***Hypoaspisella lasiomyrmecophilus* (Bernhard, 1969)**
Hypoaspis (*Hypoaspisella*) *lasiomyrmecophilus* Bernhard, in Hirschmann *et al*., 1969: 135.
Hypoaspis (*Holostaspis*) *lasiomyrmecophila*.—Karg, 1971: 176.
Hypoaspis (*Pneumolaelaps*) *lasiomyrmecophila*.—Karg, 1979: 92, 1982: 246, 1993a: 153.
Pneumolaelaps lasiomyrmecophila.—Moreira, 2014: 353.
Hypoaspisella lasiomyrmecophilus.—Joharchi *et al*., 2018a: 28; Babaeian *et al*., 2019a: 330.

Type depository. Unspecified.
Type locality and habitat. Germany, in nest of *Lasius fuliginosus* [Animalia: Hymenoptera: Formicidae].

Note. Bernhard (1955) described this species in an unpublished dissertation as *Hypoaspis* (*Hypoaspisella*) *myrmecophilus*.

Hypoaspisella linteyini **(Samšiňák, 1964)**

Hypoaspis linteyini Samšiňák, 1964: 49.
Hypoaspis (*Holostaspis*) *linteyini*.—Deng *et al*., 1993: 169.
Hypoaspis linteyini.—Ren & Guo, 2008: 329, 2009: 101; Lin *et al*., 2018: 49, 2019: 129.
Pneumolaelaps linteyini.—Kazemi & Rajaei, 2013: 95; Kavianpour *et al*., 2017: 162.
Pneumolaelaps (*Hypoaspisella*) *linteyini*.—Kavianpour *et al*., 2017: 159.
Hypoaspis (*Hypoaspisella*) *linteyini*.—Hajizadeh & Joharchi, 2018: 20.
Hypoaspis s. l. *linteyini*.—Nemati *et al*., 2018b: 176.
Hypoaspisella linteyini.—Hajizadeh & Joharchi, 2018: 22.

Type depository. Institute of Zoology of the Chinese Academy of Sciences, Beijing, China.
Type locality and habitat. Kao-ho, Kanton, China, in nests of *Coptotermes formosanus* (Animalia: Blattodea: Rhinotermitidae).
Note. Nemati *et al*. (2018b: 176) considered uncertain the generic placement of this species, referring to it as *Hypoaspis* s. l. *linteyini*. It cannot be placed in *Pneumolaelaps* because it does not have the features of that genus, *e*.*g*. broad peritreme, hypertrichous opisthogaster. We provisionally place it in *Hypoaspisella*, as previously done by Hajizadeh & Joharchi (2018: 22), on the basis of its smooth epistome, but note that the genus is not clearly defined.

Hypoaspisella lubrica **(Oudemans & Voigts, 1904)**

Hypoaspis lubrica Oudemans & Voigts, in Voigts & Oudemans, 1904: 654.
Hypoaspis lubrica.—Voigts & Oudemans, 1905: 230; Oudemans, 1915a: 183; Allred & Beck, 1956: 39; Samšiňák, 1960: 278; Evans & Till, 1966: 172; Shcherbak, 1973: 446; Beron, 1974: 175; Lundqvist, 1974: 42; Whitaker & Wilson, 1974: 9; Hughes, 1976: 295; Whitaker, 1977: 195; Ma, 1996: 48, 2000a: 384; Whitaker *et al*., 2007: 19; Ren & Guo, 2008: 329, 2009: 101; Xin *et al*., 2010: 2; OConnor & Klimov, 2012a: internet page; Yan *et al*., 2018: 262.
Hypoaspis (*Haemolaelaps*) *inversus* Berlese, 1918: 127 [junior synonym of *H*. *lubrica* by Samšiňák, 1960: 278; Evans & Till, 1966: 172; Karg, 1971: 181, 1993a: 151; Farrier & Hennessey, 1993: 86].
Hypoaspis compressus Hull, 1925: 209 [junior synonym of *H*. *lubrica* by Evans & Till, 1966: 172; Karg, 1971: 181, 1993a: 151; Farrier & Hennessey, 1993: 86; Bernini *et al*., 1995: 30].
Hypoaspis (*Haemolaelaps*) *inversus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 202.
Haemolaelaps inversus.—Radford, 1943: 61, 1950: 366; Strandtmann & Wharton, 1958: 40; Tipton, 1960: 242.
Haemolaelaps lubrica.—Buitendijk, 1945: 299; Grokhovskaya & Huan-Hoe, 1961: 1634.
Hypoaspis smithii Hughes, 1948: 131 [junior synonym of *H*. *lubrica* by Samšiňák, 1960: 278; Evans & Till, 1966: 172; Hughes, 1976: 295; Bregetova, 1977b: 505; Karg, 1971: 181, 1993a: 151; Farrier & Hennessey, 1993: 86; Yan *et al*., 2008: 2230; Meng *et al*., 2021: 4].
Hypoaspis murinus Strandtmann & Menzies, 1948: 479 [junior synonym of *H*. *smithii* by Strandtmann, 1956: 138; Samšiňák, 1958: 189; of *H*. *lubrica* by Allred & Beck, 1956: 39; Samšiňák, 1960: 278; Evans & Till, 1966: 172; Hughes, 1976: 295; Bregetova, 1977b: 505; Karg, 1971: 181, 1993a: 151; Farrier & Hennessey, 1993: 86; Yan *et al*., 2008: 2230; Meng *et al*., 2021: 4].
Hypoaspis murinus.—Jameson, 1950b: 140; Menzies & Strandtmann, 1952: 268; Bregetova, 1953: 308, 1955b: 295b: 295, 1956: 79; Violovich, 1961: 255; Piryanik, 1962: 87; Reitblat, 1963: 76; Zhang *et al*., 1963: 187; Goncharova & Buyakova, 1964: 277; Solomon 1968a: 664; Keum *et al*., 2016: 478.
Hypoaspis compressus.—Turk, 1953: 11.
Hypoaspis smithi.—Turk, 1953: 11.
Gaeolaelaps lubrica.—Athias-Henriot, 1968: 249.
Hypoaspis (*Holostaspis*) *lubrica*.—Karg, 1971: 177.

Hypoaspis (*Geolaelaps*) *lubrica*.—Bregetova, 1977b: 505; Chelebiev, 1988: 11; Deng *et al*., 1993: 171; Sklyar, 2001: 100; Marchenko, 2002: 44; Yan *et al*., 2008: 2230; Meng *et al*., 2021: 4.
Hypoaspis (*Pneumolaelaps*) *lubrica*.—Karg, 1979: 91, 1982: 245, 1993a: 151; Gwiazdowicz & Klemt, 2004: 14; Gwiazdowicz & Gulvik, 2005: 120; Faraji *et al*., 2008: 208.
Hypoaspis lubrioca [sic].—Karg, 1984: 39.
Pneumolaelaps lubricus.—Farrier & Hennessey, 1993: 86; Bernini *et al*., 1995: 30.
Pneumolaelaps lubrica.—Bahrami *et al*., 2011: 351; Arjomandi *et al*., 2013: 256; Kazemi & Rajaei, 2013: 95; Hasanvand *et al*., 2014a: 96; Hajizadeh & Joharchi, 2018: 25.
Geolaelaps lubrica.—Sklyar, 2012: 80; Tajmiri & Hajizadeh, 2013: 18.
Hypoaspis s. l. *lubrica*.—Klimov *et al*., 2016: internet page; Nemati *et al*., 2018b: 176.
Hypoaspisella lubrica.—Babaeian *et al*., 2019a: 330.

Type depository. *H. lubrica* and *H. smithii*: unspecified; *H.* (*H.*) *inversus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *H. compressus*: unspecified; *H. murinus*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *H. lubrica*: Oslebshausen, Bremen, Germany, on the soil surface of a barnyard; *H. smithii*: Edinburgh, Scotland, on rotting oats; *H.* (*H.*) *inversus*: Florence, Italy, in hay litter in stables; *H. compressus*: Great Britain, from unspecified substrate; *H. murinus*: Galveston, Texas, United States of America, on *Rattus norvegicus* [Animalia: Rodentia: Muridae].
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps*, without assigning it to another genus. Nemati *et al*. (2018b: 176) considered the generic placement of this species uncertain, calling it *Hypoaspis* s. l. *lubrica*.

***Hypoaspisella lubricoidea* (Karg, 1971)**
Hypoaspis (*Holostaspis*) *lubricoides* Karg, 1971: 175.
Hypoaspis (*Pneumolaelaps*) *lubricoides*.—Karg, 1979: 92, 1982: 246, 1993a: 152; Huhta & Karg, 2010: 331.
Hypoaspis lubricoides.—Karg, 1984: 39; Makarova, 2014: 1406.
Hypoaspis (*Geolaelaps*) *lubricoides*.—Chelebiev, 1988: 11.
Pneumolaelaps (*Hypoaspisella*) *lubricoides*.—Khalili-Moghadam *et al*., 2016: 515; Nemati *et al*., 2018b: 149.
Hypoaspisella lubricoides.—Babaeian *et al*., 2019a: 330.

Type depository. Institut fur Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Teufelssee nature reserve, southeast of Siehdichum, Schlaubetal, district of Frankfurt/Oder, Germany, from coniferous litter.
Note. Joharchi *et al*. (2018: 28) had suggested the placement of this species in *Hypoaspisella*.

***Hypoaspisella lusisi* (Lapinya, 1976) new combination**
Hypoaspis lusisi Lapinya, 1976: 51.
Hypoaspis lusisi.—Kůrka, 2005: 24.

Type depository. Unspecified.
Type locality and habitat. Type series; Dzelzamurs, Latvia, in pine forest with white moss; Âgenskalns, Riga, Latvia, in pine forest.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), but it seems to fit the concept of *Hypoaspisella*.

***Hypoaspisella mooni* (Keum *et al*., 2017)**
Holostaspis mooni Keum, Jung & Joharchi, 2017: 491.
Hypoaspisella mooni.—Babaeian *et al*., 2019a: 330.

Type depository. Department of Plant Medicine, Andong National University, Republic of Korea.

Type locality and habitat. 1110 m above sea level, Samcheock (37°19'N, 128°12'E), Gangwon province, Republic of Korea, in soil.
Note. Babaeian *et al*. (2019a: 334) considered the generic placement of this species in *Hypoaspisella* to be provisional.

***Hypoaspisella pini* (Hirschmann *et al*., 1969)**
Hypoaspis pini Hirschmann, Bernhard, Greim & Götz, 1969: 140.
Hypoaspis ninabregus McGraw & Farrier, 1969: 144 [junior synonym of *H. pini* by Karg, 1982: 246, 1993a: 152].
Hypoaspis (*Holostaspis*) *pini*.—Karg, 1971: 174.
Hypoaspis sp. ?*ninabregus* [sic].—Treat, 1975: 70.
Hypoaspis (*Pneumolaelaps*) *pini*.—Karg, 1979: 92, 1982: 246, 1993a: 152.
Hypoaspis ninabregus.—Farrier & Hennessey, 1993: 78.
Pneumolaelaps pini.—Moreira, 2014: 358.
Hypoaspisella pini.—Babaeian *et al*., 2019a: 331; Joharchi *et al*., 2020c: 194.

Type depository. *H. pini*: unspecified; *H. ninabregus*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *H. pini*: Erlangen, Germany, on spruce [*Picea* sp.; Plantae: Pinales: Pinaceae] stump; *H. ninabregus*: Davie, North Carolina, United States of America, with *Dendroctonus frontalis*, *Ips avulsus*, *Ips grandicolis* [Animalia: Coleoptera: Curculionidae, Scolytinae] on *Pinus echinata* [Plantae: Pinales: Pinaceae].

***Hypoaspisella sclerotarsus* (Costa, 1968) new combination**
Hypoaspis sclerotarsus Costa, 1968: 21.
Hypoaspis (*Pneumolaelaps*) *sclerotarsa*.—Karg, 1979: 88, 1982: 244, 1993a: 146.
Hypoaspis sclerotarsa.—Munderloh, 1996: 590.
Hypoaspis (*Pneumolaelaps*) *sclerotarsa*.—Habibpour *et al*., 2002: 90.
Hypoaspis (*Pneumolaelaps*) *sclerotarsus*.—Faraji *et al*., 2008: 208.
Pneumolaelaps sclerotarsus.—Arjomandi *et al*., 2013: 256; Kazemi & Rajaei, 2013: 95; Maleki *et al*., 2016: 187; Hajizadeh & Joharchi, 2018: 26.
Hypoaspis sclerotarsus.—Khalili-Moghadam & Saboori, 2015: 319.
Gaeolaelaps sclerotarsus.—Trach, 2016: 7; Abbaspour *et al*., 2017: 747.
Pneumolaelaps sclerotarsa.—Nemati *et al*., 2018b: 121.
Hypoaspis s. l. *sclerotarsus*.—Nemati *et al*., 2018b: 177.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mishmar Ha'Emeq, Israel, in litter.
Note. Khalili-Moghadam & Saboori (2015: 319) pointed out that this species is not consistent with *Hypoaspis sensu stricto*, and Nemati *et al*. (2018b: 177) placed it in *Hypoaspis sensu lato*, after referring to it under *Pneumolaelaps* on page 121 of the same publication. Having a smooth-margined epistome and a deutosternum with only 2–6 denticles per row, it appears to be consistent with *Hypoaspisella*.

***Hypoaspisella serpentis* (Karg, 1979)**
Hypoaspis (*Holostaspis*) *serpentis* Karg, 1979: 96.
Hypoaspis (*Holostaspis*) *serpentis*.—Karg, 1982: 247.
Hypoaspis serpentis.—Kůrka, 2005: 25.
Holostaspis serpentis.—Moreira, 2014: 286; Keum *et al*., 2017: 490.
Hypoaspisella serpentis.—Babaeian *et al*., 2019a: 331.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.

Type locality and habitat. 720 m above sea level, Mount Piltriquitron, near El Bolsón, [Rio Negro], Argentina, in moss in a swamp.

***Hypoaspisella spiculifer* (Berlese, 1918)**
Hypoaspis spiculifer Berlese, 1918: 118.
Hypoaspis spiculifer.—Ryke, 1963: 5; Castagnoli & Pegazzano, 1985: 390; Halliday, 2005: 35.
Hypoaspis (*Hypoaspis*) *spiculifer*.—Aswegen & Loots, 1970: 189.
Hypoaspis (*Geolaelaps*) *spiculifera*.—Karg, 1982: 241, 1987: 298, 1989c: 118, 1989d: 5.
Gaeolaelaps spiculifer.—Moreira, 2014: 267; Joharchi *et al*., 2019c: 277.
Gaeolaelaps spiculifera.—Joharchi *et al*., 2019d: 347.
Hypoaspisella spiculifer.—Joharchi *et al*., 2020c: 200, 2020d: 56.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, unspecified substrate.
Note. Beaulieu (2009: 37) excluded this species from *Gaeolaelaps* on the grounds that its epistome is almost smooth. Kazemi *et al*. (2014: 519) also excluded it from *Gaeolaelaps*, and suggested that it could be a senior synonym of *H.* (*S.*) *egenus*.

***Hyposternus* Joharchi & Halliday, 2021**
Hyposternus Joharchi & Halliday, 2021: 392 (type species: *Hyposternus ceylonicus* Joharchi & Halliday, 2021, by original designation).

Note. This genus was described in Laelapidae.

***Hyposternus ceylonicus* Joharchi & Halliday, 2021**
Hyposternus ceylonicus Joharchi & Halliday, 2021: 393

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. 42 m above sea level, near Thambadola Ella waterfall, Polgampola (6°27'N, 80°12'E), Sabakagamuwa province, Sri Lanka, in forest soil-litter.

***Iphiolaelaps* Womersley, 1956**
Iphiolaelaps Womersley, 1956a: 541 (type species: *Iphiolaelaps myriapoda* Womersley, 1956, by monotypy).
Iphiolaelaps.—Ryke, 1959: 21; Casanueva, 1993: 41; Halliday, 2019: internet page.

Note. This genus was described in Iphiopsididae.

***Iphiolaelaps myriapoda* Womersley, 1956**
Iphiolaelaps myriapoda Womersley, 1956a: 542.
Iphidolaelaps myriapoda [sic].—Womersley, 1956a: 542; Farfan & Klompen, 2012: 71.
Iphiolaelaps myriapoda.—Ryke, 1959: 21; Halliday, 1998: 126, 2019: internet page; Seeman & Nahrung, 2012: 355.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Mount Lamington [Lamington National Park], Queensland, Australia, on unidentified millipedes [Animalia: Diplopoda].

***Iphiopsis* Berlese, 1882**

Iphiopsis Berlese, 1882c: 4 (type species: *Iphis mirabilis* Berlese, 1882, by monotypy).

Iphiopsis.—Canestrini, 1885: 56; Berlese, 1892f: 37, 1913b: 10; Oudemans, 1901: 62, 1902e; 292; Banks, 1904: 56, 1915a: 79; Vitzthum, 1919: 4, 1931b: 153, 1931c: 143, 1942: 766; Radford, 1950b: 27; Baker & Wharton, 1952: 91; Evans, 1955: 352; Ryke, 1959: 6; Casanueva, 1993: 41; Farrier & Hennessey, 1993: 63; Lindquist *et al*., 2020: 49.

Note. This genus was not assigned to a family in the original description, and was included in Laelapidae-Iphiopsidinae by Vitzthum (1942: 766). The name *Iphiopsis* was presented (Berlese, 1882c: 4) with the expression "an genus novum, nomine *Iphiopsis* dintinguendum?", placed at the end of the original description of *Iphis mirabilis* Berlese. Our interpretation is that Berlese described *Iphiopsis* as a new genus with *Iphis mirabilis* as type species.

***Iphiopsis mirabilis* (Berlese, 1882)**

Iphis mirabilis Berlese, 1882c: 4.

Iphiopsis mirabilis.—Berlese, 1882c: 4, 1892f: 45; Canestrini, 1885: 92; Lombardini, 1936: 42; Radford, 1950b: 27; Castagnoli & Pegazzano, 1985: 256; Bernini *et al*., 1995: 27; Farfan & Klompen, 2012: 71; Lindquist *et al*., 2020: 49.

Iphiopsis miriabilis [sic].—Evans, 1955: 352.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. Padua, Italy, in humus and on *Pachyiulus varius* (cited as iulo vario) [Animalia: Julida: Julidae].

***Iphiopsis obesus* Banks, 1917**

Iphiopsis obesus Banks, 1917: 198.

Iphiopsis obesus.—Farrier & Hennessey, 1993: 63.

Type depository. Unspecified.

Type locality and habitat. Altamonte Springs, Florida, United States of America, from unspecified substrate.

***Jacobsonia* Berlese, 1910**

Iphiopsis (*Greeniella*) Berlese, 1910a: 247 [type species: *Iphiopsis* (*Greeniella*) *submollis* Berlese, 1910, by monotypy].

Jacobsonia Berlese, 1910b: 373 [replacement name, given the existence of *Greeniella* Cockerell, 1897: 703 (Diaspididae)].

Jacobsonia.—Berlese, 1913b: 10; Vitzthum, 1931c: 142, 1942: 766; Radford, 1950b: 27; Baker & Wharton, 1952: 91; Evans, 1955: 353; Ryke, 1959: 7; Fain, 1994: 586; Casanueva & Johnston, 1992b: 58; Casanueva, 1993: 41; Gwiazdowicz *et al*., 2020b: 604.

Iphiopsis (*Jacobsonia*).—Banks, 1915a: 81.

Jacobsonia (*Parajacobsonia*) Evans, 1955: 358 (type species: *Jacobsonia tertia* Vitzthum, 1931, by monotypy).

Jacobsonia (*Parajacobsonia*).—Ryke, 1959: 7; Fain, 1994: 587.

Trichoaspis Gu, Wang & Li, 1991: 428 (type species: *Trichoaspis julus* Gu, Wang & Li, 1991, by monotypy) [junior synonym of *Jacobsonia* **new synonymy**]

Note. *Iphiopsis* (*Greeniella*) was not assigned to a family in the original description, and included in Laelapidae-Iphiopsidinae by Vitzthum (1942: 766). *Trichoaspis* was described in Trichoaspididae, a new family created specifically to contain this genus. The new synonymy of *Trichoaspis* under *Jacobsonia* is here proposed, because of the great morphological similarity between the species of this group, especially for the apomorphic elongate distal process on the female fixed cheliceral digit, as well as the elongate sternal shield and the hypotrichous dorsal shield, bearing short to minute setae.

***Jacobsonia africanus* Fain, 1994**
Jacobsonia (*Parajacobsonia*) *africanus* Fain, 1994: 594.
Jacobsonia africanus.—Farfan & Klompen, 2012: 71.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. "Galim", Cameroon, on *Spirostreptus* sp. (cited as *Spirostrepta*) [Animalia: Spirostreptida: Spirostreptidae].

***Jacobsonia andrei* Fain, 1994**
Jacobsonia (*Parajacobsonia*) *andrei* Fain, 1994: 588.
Jacobsonia andrei.—Farfan & Klompen, 2012: 71.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Mieri, Batouri, Cameroon, on *Spirostreptus* sp. (cited as *Spirostrepta*) [Animalia: Spirostreptida: Spirostreptidae].

***Jacobsonia audyi* Evans, 1955**
Jacobsonia (*Jacobsonia*) *audyi* Evans, 1955: 354.
Jacobsonia (*Jacobsonia*) *audyi*.—Fain, 1994: 587.
Jacobsonia audyi.—Farfan & Klompen, 2012: 71; Gwiazdowicz *et al*., 2020b: 604.

Type depository. Natural History Museum, London, England; specimen number 1954: 6: 14: 1.
Type locality and habitat. 4000 feet [1220 m] above sea level, Fraser's Hill, Pahang, Malaysia, on *Thyropygus* sp. [Animalia: Spirostreptida: Harpagophoridae].

***Jacobsonia berlesei* Casanueva & Johnston, 1992**
Jacobsonia berlesei Casanueva & Johnston, 1992b: 56.
Jacobsonia berlesei.—Farfan & Klompen, 2012: 71.

Type depository. Ohio State University Acarology Laboratory, Columbus, Ohio, United States of America.
Type locality and habitat. Pangandaran Natural Preserve, Java, Indonesia, on unidentified millipede [Animalia: Myriapoda].

***Jacobsonia julus* (Gu *et al*., 1991) new combination**
Trichoaspis julus Gu, Wang & Li, 1991: 429.
Trichaspis julus [sic].—Farfan & Klompen, 2012: 72.

Type depository. Department of Parasitology, Guiyang Medical College, Guizhou, China.
Type locality and habitat. Guiyang (16.6°N, 106.7°E), Guizhou province, China, on *Julus terrestris* [Animalia: Julida: Julidae].
Note. The new combination proposed for this species results from the synonymisation of *Trichoaspis* under *Jacobsonia*.

***Jacobsonia minor* Berlese, 1910**
Jacobsonia minor Berlese, 1910b: 374.
Jacobsonia minor.—Berlese, 1913a: 80; Castagnoli & Pegazzano, 1985: 253.
Jacobsonia (*Jacobsonia*) *minor*.—Evans, 1955: 354; Fain, 1994: 587.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. "Wosonobo", Java, Indonesia, on scolopendrid [Animalia: Scolopendromorpha: Scolopendridae].

***Jacobsonia puylaerti* Fain, 1994**
Jacobsonia (*Parajacobsonia*) *puylaerti* Fain, 1994: 589.
Jacobsonia puylaerti.—Farfan & Klompen, 2012: 71.

Type depository. Koninklijk Museum voor Midden-Afrika, Tervuren, Belgium.
Type locality and habitat. Forest along Kwango river, Democratic Republic of the Congo (cited as Zaire), on *Pachybolus macrosternus* [Animalia: Spirobolida: Pachybolidae].

***Jacobsonia submollis* (Berlese, 1910)**
Iphiopsis (*Greeniella*) *submollis* Berlese, 1910a: 248.
Jacobsonia submollis.—Berlese, 1913a: 80; Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 402.
Jacobsonia (*Greeniella*) *submollis*.—Radford, 1950b: 27.
Jacobsonia (*Jacobsonia*) *submollis*.—Evans, 1955: 354; Fain, 1994: 587.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Java, Indonesia, on *Scolopendra* sp. [Animalia: Scolopendromorpha: Scolopendridae].

***Jacobsonia tertia* Vitzthum, 1931**
Jacobsonia tertia Vitzthum, 1931b: 153.
Jacobsonia (*Parajacobsonia*) *tertia* Evans, 1955: 358; Fain, 1994: 587.

Type depository. Naturalis Biodiversity Centre, Arnhem, The Netherlands and Natural History Museum, Hamburg, Germany [sic].
Type locality and habitat. Gabon, on Myriapoda [Animalia: Arthropoda].

***Julolaelaps* Berlese, 1916**
Julolaelaps Berlese, 1916a: 31 (type species: *Julolaelaps dispar* Berlese, 1916, by original designation).
Julolaelaps.—Vitzthum, 1931c: 142, 1942: 763; Radford, 1950b: 21; Baker & Wharton, 1952: 94; Evans, 1955: 360; Hunter & Rosario, 1986: 63; Casanueva & Johnston, 1992b: 58; Casanueva, 1993: 41; Farrier & Hennessey, 1993: 63; Uppstrom & Klompen, 2005: 146; Moraza & Kazemi, 2012: 12; Nemati *et al*., 2015: 105.
Hypoaspis (*Julolaelaps*).—Ryke, 1959: 7.

Note. *Julolaelaps* was not assigned to a family in the original description. It was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763) and in Laelapidae-Iphiopsidinae by Moraza & Kazemi (2012: 12).

***Julolaelaps buensis* Maes, 1983**
Julolaelaps buensis Maes, 1983: 214.
Julolaelaps buensis.—Fain, 1987: 204; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. 1200 m above sea level, Buea, Mount Cameroon, Cameroon, on Myriapoda [Animalia: Arthropoda].

***Julolaelaps cameroonensis* Maes, 1983**

Julolaelaps cameroonensis Maes, 1983: 216.

Julolaelaps cameroonensis.—Fain, 1987: 204; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. 1200 m above sea level, Buea, Mount Cameroon, Cameroon, on Myriapoda [Animalia: Arthropoda].

***Julolaelaps celestiae* Uppstrom & Klompen, 2005**

Julolaelaps celestiae Uppstrom & Klompen, 2005: 143.

Julolaelaps celestiae.—Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Ohio State University Acarology Collection, Columbus, Ohio; specimen number: OSAL 000439.
Type locality and habitat. Coastal forests of East Africa, on *Archispirostreptus gigas* [Animalia: Spirostreptida: Spirostreptidae].

***Julolaelaps dispar* Berlese, 1916**

Julolaelaps dispar Berlese, 1916a: 31.

Julolaelaps dispar.—Lombardini, 1936: 42; Radford, 1950b: 21; Evans, 1955: 361; Castagnoli & Pegazzano, 1985: 114; Fain, 1987: 203; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 13; Nemati *et al*., 2015: 111.

Hypoaspis (*Julolaelaps*) *dispar*.—Ryke, 1959: 19.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. "Goriei", Somalia (cited as Somalia italiana), on an unidentified julid [Animalia: Juliformes].

***Julolaelaps excavatus* Fain, 1987**

Julolaelaps excavatus Fain, 1987: 207.

Julolaelaps excavatus.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Mayumbe Forest, Madiakoko, Zaire, on unidentified julid [Animalia: Juliformes].

***Julolaelaps hallidayi* Nemati *et al*., 2015**

Julolaelaps hallidayi Nemati, Riahi & Gwiazdowicz, 2015: 107.

Julolaelaps hallidayi.—Nemati *et al*., 2018b: 144.

Type depository. Acarological Laboratory, Shahrekord University, Chaharmahal va Bakhtiari province, Iran.
Type locality and habitat. Brujen region, Chaharmahal va Bakhtiari province, Iran, in soil.

***Julolaelaps idjwiensis* Fain, 1987**

Julolaelaps idjwiensis Fain, 1987: 206.

Julolaelaps idjwiensis.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Idjwi Island, Kivu Lake, Rwanda, on unidentified julid [Animalia: Juliformes].

***Julolaelaps kilifiensis* Kontschán, 2005**
Julolaelaps kilifiensis Kontschán, 2005: 259.
Julolaelaps kilifiensis.—Farfan & Klompen, 2012: 71.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Kilifi, 3°37'47"S, 39°50'30"E, Kenya, on large Spirostreptida millipedes [Animalia: Myriapoda].

***Julolaelaps luctator* Berlese, 1916**
Julolaelaps luctator Berlese, 1916a: 32.
Laelaps (*Hypoaspis*) *indicus* Vitzthum, 1921: 16 [junior synonym of *J. luctator* by Ryke, 1959: 20; Fain, 1987: 203].
Julolaelaps luctator.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 231; Fain, 1987: 203; Kontschán, 2005: 260; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 13; Nemati *et al*., 2015: 111.
Hypoaspis (*Hypoaspis*) *indicus*.—Evans, 1955: 361.
Julolaelaps lucator [sic].—Evans, 1955: 361.
Hypoaspis (*Julolaelaps*) *luctator*.—Ryke, 1959: 20.
indicus; *non-Laelaps* [sic].—Tipton, 1960: 297.

Type depository. *J. luctator*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *L.* (*H.*) *indicus*: in Vitzthum's collection.
Type locality and habitat. *J. luctator*: Somalia (cited as Somalis italiana), on an unidentified julid [Animalia: Juliformes]; *L.* (*H.*) *indicus*: India, on *Spirostreptus* sp. (cited as *Spirosthreptus*) [Animalia: Spirostreptida: Spirostreptidae].

***Julolaelaps madiakokoensis* Fain, 1987**
Julolaelaps madiakokoensis Fain, 1987: 207.
Julolaelaps madiakokoensis.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Mayumbe Forest, Madiakoko, Zaire, on an unidentified julid [Animalia: Juliformes].

***Julolaelaps moseri* Hunter & Rosario, 1986**
Julolaelaps moseri Hunter & Rosario, 1986: 63.
Julolaelaps moseri.—Fain, 1987: 203; Farrier & Hennessey, 1993: 63; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 14; Nemati *et al*., 2015: 114.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Insect Zoo, Smithsonian Institute, Washington, District of Columbia, United States of America, on an unidentified spirostreptid millipede [Animalia: Spirostreptida].

***Julolaelaps myriapodalis* (Ryke, 1959)**

Hypoaspis (*Julolaelaps*) *myriapodalis* Ryke, 1959: 12.

Julolaelaps myriapodalis.—Fain, 1987: 204; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Natural History Museum, London, England.

Type locality and habitat. West Africa, intercepted apparently at South Africa on an unidentified spirostreptid millipede [Animalia: Spirostreptida] on bananas.

***Julolaelaps nishikawai* (Ishikawa, 1986)**

Hypoaspis (*Julolaelaps*) *nishikawai* Ishikawa, 1986: 170.

Julolaelaps nishikawai.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac 9790.

Type locality and habitat. Benten-no-iwaya Cave, Ajiro, Itsukaichi-machi, Nishitama-gun, Tokyo, Japan, on *Nedyopus patrioticus* [Animalia: Polydesmida: Paradoxosomatidae].

***Julolaelaps pararotundatus* (Ryke, 1959)**

Hypoaspis (*Julolaelaps*) *pararotundatus* Ryke, 1959: 16.

Hypoaspis (*Julolaelaps*) *pararotundatus*.—Ishikawa, 1986: 168.

Julolaelaps pararotundatus.—Fain, 1987: 203; Kontschán, 2005: 258; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 13; Nemati *et al*., 2015: 111.

Type depository. Natural History Museum, London, England.

Type locality and habitat. Pemba [Mozambique], on an unidentified spirostreptid millipede [Animalia: Spirostreptida].

***Julolaelaps parvitergalis* (Ishikawa, 1986)**

Hypoaspis (*Julolaelaps*) *parvitergalis* Ishikawa, 1986: 166.

Julolaelaps parvitergalis.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac 9786.

Type locality and habitat. Yonebara, Ishigaki Island, Ryukyus, Japan, on *Parafontaria* sp. [Animalia: Polydesmida: Xystodesmidae].

***Julolaelaps parvunglatus* (Ishikawa, 1986)**

Hypoaspis (*Julolaelaps*) *parvunglatus* Ishikawa, 1986: 168.

Julolaelaps parvunglatus.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71.

Julolaelaps parvungulatus [sic].—Moraza & Kazemi, 2012: 15.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac 9788.

Type locality and habitat. Miyanotani, Oda-cho, Ehime, Japan, on *Parafontaria* sp. [Animalia: Polydesmida: Xystodesmidae].

***Julolaelaps paucipilis* Fain, 1987**

Julolaelaps paucipilis Fain, 1987: 208.

Julolaelaps paucipilis.—Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 14.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.

Type locality and habitat. Mayumbe Forest, Madiakoko, Zaire, on unidentified julid [Animalia: Juliformes].

***Julolaelaps peritremalis* (Ryke, 1959)**

Hypoaspis (*Julolaelaps*) *peritremalis* Ryke, 1959: 9.

Julolaelaps peritremalis.—Fain, 1987: 204; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Natural History Museum, London, England.

Type locality and habitat. West Africa, on an unidentified spirostreptid millipede [Animalia: Spirostreptida].

***Julolaelaps serratus* Maes, 1983**

Julolaelaps serratus Maes, 1983: 218.

Julolaelaps serratus.—Fain, 1987: 204; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.

Type locality and habitat. 1200 m above sea level, Buea, Mount Cameroon, Cameroon, on Myriapoda [Animalia: Arthropoda].

***Julolaelaps spirostrepti* (Oudemans, 1914)**

Hypoaspis spirostrepti Oudemans, 1914c: 69.

Hypoaspis spirostrepti.—Oudemans, 1915a: 183; 1915b: 131; Farfan & Klompen, 2012: 71.

Julolaelaps rotundatus Berlese, 1916a: 32 [junior synonym of *H. spirostrepti* by Ryke, 1959: 20; of *Julolaelaps spirostrepti* by Fain, 1987: 203].

Laelaps (*Hypoaspis*) *spirostrepti*.—Vitzthum, 1921: 14.

Haemolaelaps spirostrepti [sic].—Oudemans, 1929d: 13; Buitendijk, 1945: 300.

Julolaelaps rotundatus.—Lombardini, 1936: 42; Evans, 1955: 361; Castagnoli & Pegazzano, 1985: 363; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71.

Hypoaspis (*Hypoaspis*) *spirostrepti*.—Evans, 1955: 361.

Hypoaspis (*Julolaelaps*) *spirostrepti*.—Ryke, 1959: 20.

spirostrepti; *non-Laelaps* [sic].—Tipton, 1960: 308.

Julolaelaps spirostrepti.—Fain, 1987: 203; Moraza & Kazemi, 2012: 14; Nemati *et al*., 2015: 111.

Type depository. *H. spirostrepti*: unspecified; *J. rotundatus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. *H. spirostrepti*: from *Spirostreptus* sp. [Animalia: Spirostreptida: Spirostreptidae] intercepted at Amsterdam, The Netherlands from "German East Africa" [sic]; *J. rotundatus*: "El Ualac", Somalia (cited as Somalia italiana), on an unidentified julid [Animalia: Juliformes].

***Julolaelaps tritosternalis* Moraza & Kazemi, 2012**

Julolaelaps tritosternalis Moraza & Kazemi, 2012: 7.

Julolaelaps tritosternalis.—Farfan & Klompen, 2012: 71; Kazemi & Rajaei, 2013: 97; Nemati *et al*., 2015: 114.

Type depository. Museum of Zoology, Faculty of Science, University of Navarra, Pamplona, Spain.
Type locality and habitat. 6 m above sea level, Noor Forest (36°34'85"N, 52°02'94"E), Mazandaran, Iran, on *Ommatoiulus caspius* [Animalia: Julida: Julidae].

***Julolaelaps vandaelensis* Maes, 1983**

Julolaelaps vandaelensis Maes, 1983: 213.
Julolaelaps vandaelensis.—Fain, 1987: 204; Uppstrom & Klompen, 2005: 146; Farfan & Klompen, 2012: 71; Moraza & Kazemi, 2012: 15.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. 1200 m above sea level, Buea, Mount Cameroon, Cameroon, on Myriapoda [Animalia: Arthropoda].

***Katydiseius* Fain & Lukoschus, 1983**

Katydiseius Fain & Lukoschus, 1983: 174 (type species: *Katydiseius nadchatrami* Fain & Lukoschus, 1983, by monotypy).
Katydiseius.—Zhang, 1995: 242; Lindquist *et al*., 2020: 8.

Note. This genus was described in Otopheidomenidae Treat, 1955, Katydiseiinae Fain & Lukoschus, 1983; this genus and subfamily was transferred to Laelapidae by Lindquist *et al*. (2020: 8).

***Katydiseius nadchatrami* Fain & Lukoschus, 1983**

Katydiseius nadchatrami Fain & Lukoschus, 1983: 175.
Katydiseius nadchatrami.—Lindquist *et al*., 2020: 44.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Taman Negara, Malaysia, in thoracic tracheae of *Chloracris brullei* [Animalia: Orthoptera: Tettigoniidae, Pseudophyllinae].

***Laelaspis* Berlese, 1903**

Laelaps (*Laelaspis*) Berlese, 1903b: 13 (type species: *Iphis astronomicus* Koch, 1839, by original designation).
Laelaps (*Laelaspis*).—Berlese, 1904c: 422.
Laelaps.—Ewing, 1909: 64 (in part).
Laelaspis.—Berlese, 1913b: 10; Vitzthum, 1929: 22, 1931c: 142; Radford, 1950b: 20; Evans, 1957a: 231; Hunter, 1961: 672; Schweizer, 1961: 147; Piryanik, 1962: 65; Zhang *et al*., 1963: 194; Athias-Henriot, 1968: 239; Bregetova, 1977b: 542; Evans & Till, 1979: 202; Zaher, 1986: 195; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 81; Joharchi *et al*., 2011: 28, 2012a: 2000, 2012c: 19; Karg & Schorlemmer, 2013: 203; Gwiazdowicz *et al*., 2014: 441; Ramroodi *et al*., 2014b: 178; Kazemi, 2015: 413; Nemati & Gwiazdowicz, 2016b: 29; Hajizadeh & Joharchi, 2018: 23; Halliday, 2019: internet page; Mašán & Babaeian, 2019: 502; Nemati *et al*., 2021: 170.
Hypoaspis (*Laelaspis*).—Vitzthum, 1942: 762; Baker & Wharton, 1952: 94; Evans & Till, 1966: 160; Aswegen & Loots, 1970: 193; Karg, 1979: 99, 1982: 248 (in part), 1989a: 108, 1993a: 136 (in part); Faraji *et al*., 2008: 208.
Hypoaspis.—Karg, 1979: 66 (in part), 1993a: 133 (in part); Deng *et al*., 1993: 157 (in part).
Hypoaspis (*Holostaspis*).—Karg, 1982: 247 (in part).

Note. *Laelaspis* was described in Laelapidae; included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 202). It was considered a junior synonym of *Holostaspis* by Karg

(1971: 171) but that conclusion was not accepted by Kazemi (2015: 413), whose concept for these genera is adopted in this publication.

***Laelaspis angustiseta* Khalili-Moghadam *et al*., 2018**

Laelaspis angustiseta Khalili-Moghadam, Saboori, Nemati & Golpayegani, 2018: 223.
Laelaspis angustiseta.—Rad *et al*., 2019: 130.

Type depository. Acarological collection, Jalal Afshar Zoological Museum, Department of Plant Protection, Faculty of Agriculture, University of Tehran, Karaj, Iran.
Type locality and habitat. 1756 m above sea level, Lordegan (31°31'03"N, 50°29'32"E), Chaharmahal va Bakhtiari province, Iran, in nest of *Tapinoma erraticum* [Animalia: Hymenoptera: Formicidae].

***Laelaspis astronomicus* (Koch, 1840)**

Iphis astronomicus Koch, 1840c: 18.
Iphis astronomicus.—Berlese, 1889b: 6; 1892f: 35; Leonardi, 1897: 860; Radford, 1950b: 20.
Laelaps (*Laelaspis*) *astronomicus*.—Berlese, 1903b: 13.
Laelaspis astronomicus.—Lombardini, 1936: 43; Oudemans, 1936: 217; Schweizer, 1949: 40, 1961: 147; Bregetova, 1953: 310, 1977b: 547; Hunter, 1961: 672, 1964c: 296; Reitblat, 1963: 81; Lapinya, 1970: 278, 1976: 52; Teng, 1981: 398; Castagnoli & Pegazzano, 1985: 27; Nasr & Nawar, 1989b: 76; Joharchi *et al*., 2012a: 2001, 2020e: 490; Kazemi & Rajaei, 2013: 91; Ramroodi *et al*., 2014b: 182; 2015a: 79; Kazemi, 2015: 413; Masoomi *et al*., 2016: 32; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237; Saberi *et al*., 2016: 128; Kavianpour *et al*., 2017: 163; Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 144; Babaeian *et al*., 2019a: 328; Rad *et al*., 2019: 130; Joharchi & Abramov, 2020: 634.
Hypoaspis astronomicus.—Buitendijk, 1945: 295.
Laelaspis ovatus Willmann, 1951: 115 [junior synonym of *I. astronomicus* by Evans & Till, 1966: 208; Karg, 1971: 180; 1993a: 160; Bregetova, 1977b: 547; Joharchi *et al*., 2012a: 2001, 2020e: 490].
Laelaspis ovatus.—Piryanik, 1958: 678, 1962: 67; Hunter, 1961: 676; Reitblat, 1963: 80.
astronomicus; *non-Laelaps* [sic].—Tipton, 1960: 288.
Laelaspis ?*astronomica* [sic].—Costa, 1966a: 74.
Hypoaspis astronomica.—Evans & Till, 1966: 208; Solomon, 1969b: 16; Solomon & Roznovăţ, 1969: 288; Niedbała *et al*., 1982: 247, 1990: 32; Kůrka, 2005: 24; Kontschán, 2007: 101; Kontschán *et al*., 2015b: 61.
Laelaspis astronomica.—Athias-Henriot, 1968: 241; Bernini *et al*., 1995: 29; Mahjoori *et al*., 2014: 1603.
Hypoaspis (*Holostaspis*) *astronomica*.—Karg, 1971: 176.
Laelaspis zaheri Shereef & Soliman, 1978: 845 [junior synonym of *I. astronomicus* by Zaher, 1986: 196; Joharchi *et al*., 2012a: 2001].
Hypoaspis (*Laelaspis*) *zaheri*.—Nasr, 1978: 49.
Hypoaspis (*Laelaspis*) *astronomica*.—Karg, 1979: 101, 1982: 249, 1989c: 120, 1993a: 160, 1993b: 265; Faraji *et al*., 2008: 208; Zendehfili *et al*., 2015: 269.
Hypoaspis (*Laelaspis*) *dubiatus* [sic].—Nemati *et al*., 2000: 381 (misidentification, according to Joharchi *et al*., 2012a: 2001).
Laelaspis astromicus [sic].—Sklyar, 2001: 102.
Hypoaspis (*Laelaspis*) *dubitatus*.—Faraji *et al*., 2008: 208 (misidentification, according to Joharchi *et al*., 2012a: 2001).
Laelaps astronômica [sic].—Manu *et al*., 2021: 5.

Type depository. *I. astronomicus*: unspecified; *L. ovatus*: in Willmann's collection; *L. zaheri*: Faculty of Agriculture, Cairo University, Giza, Egypt.
Type locality and habitat. *I. astronomicus*: Germany, from unspecified substrate; *L. ovatus*: Pannonian Basin, Austria, in soil; *L. zaheri*: Faculty of Agriculture, Giza, Egypt, in soil and litter.
Note. Specimens identified as *L. astronomicus* by Zaher (1986: 196) were re-identified as *Laelaspis calidus* Berlese by Joharchi & Negm (2020: 503).

***Laelaspis australicus* (Womersley, 1956)**
Gymnolaelaps australicus Womersley, 1956a: 582.
Laelaspis australicus.—Domrow, 1957: 208; Piryanik, 1959: 100; Joharchi & Halliday, 2013: 46; Kazemi, 2015: 413; Halliday, 2019: internet page.
Pseudoparasitus (*Gymnolaelaps*) *australicus*.—Karg, 1978a: 206, 1981b: 218, 1989b: 335; Nemati *et al*., 2000: 381.
Gymnolaelaps australicus.—Farrier & Hennessey, 1993: 74; Joharchi *et al*., 2011: 25; Kazemi & Rajaei, 2013: 86.
Pseudoparasitus australicus.—Halliday, 1998: 129.

Type depository. Unspecified.
Type locality and habitat. Glen Osmond, South Australia, in soil.

***Laelaspis aviator* Berlese, 1920**
Laelaspis aviator Berlese, 1920: 158.
Laelaspis aviator.—Lombardini, 1936: 43; Hunter, 1961: 675; Reitblat, 1963: 80; Castagnoli & Pegazzano, 1985: 31; Bernini *et al*., 1995: 29; Joharchi *et al*., 2012a: 2014; Kazemi, 2015: 413.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Pisa, Italy, on *Protaetia morio* (cited as *Cetonia morio*) [Animalia: Coleoptera: Scarabaeidae].

***Laelaspis bakeri* Hunter & Davis, 1962**
Laelaspis bakeri Hunter & Davis, 1962: 247.
Hypoaspis (*Laelaspis*) *bakeri*.—Hunter & Glover, 1968: 64.
Laelaspis bakeri.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Livingston, Michigan, United States of America, with *Myrmica fracticornis* [Animalia: Hymenoptera: Formicidae].

***Laelaspis brevichelis* Hunter, 1964**
Laelaspis brevichelis Hunter, 1964c: 299.
Hypoaspis (*Laelaspis*) *brevichelis*.—Hunter & Glover, 1968: 64.
Laelaspis brevichelis.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. University of Kansas Natural History Reservation, Lawrence, Kansas, United States of America, in nest and on adults and larvae of *Crematogaster* (*Acarocoelia*) *lineolata* [Animalia: Hymenoptera: Formicidae].

***Laelaspis brevipilis* Hunter, 1961**
Laelaspis brevipilis Hunter, 1961: 680.
Hypoaspis (*Laelaspis*) *brevipilis*.—Hunter & Glover, 1968: 65.
Laelaspis brevipilis.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Stanford University, California, United States of America, on Argentine ant [*Linepithema humile*; Animalia: Hymenoptera: Formicidae].

***Laelaspis calidus* Berlese, 1923**

Laelaspis calidus Berlese, 1923a: 255.
Laelaspis calidus.—Hunter, 1961: 676; Castagnoli & Pegazzano, 1985: 57; Joharchi *et al*., 2012c: 19; Kazemi & Rajaei, 2013: 91; Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Khalili-Moghadam *et al*., 2018: 230; Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 130; Joharchi & Negm, 2020: 503.
Hypoaspis (*Laelaspis*) *calidus*.—Aswegen & Loots, 1970: 194.
Hypoaspis (*Laelaspis*) *calida*.—Karg, 1982: 250, 1989c: 120.
Laelaspis astronomicus.—Zaher, 1986: 196 (misidentification, according to Joharchi & Negm, 2020: 502).

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.

***Laelaspis dariusi* Joharchi & Jalaeian, 2012**

Laelaspis dariusi Joharchi & Jalaeian, in Joharchi *et al*., 2012c: 20.
Laelaspis dariusi.—Kazemi & Rajaei, 2013: 91; Ghasemi-Moghadam *et al*., 2014: 964; Mahjoori *et al*., 2014: 1603; Ramroodi *et al*., 2014b: 182, 2015a: 79, 2015b: 134; Kazemi, 2015: 413; Masoomi *et al*., 2016: 32; Hajizadeh & Joharchi, 2018: 25; Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 130.

Type depository. Department of Plant Protection, Yazd Branch, Islamic Azad University, Tehran, Iran.
Type locality and habitat. 858 m above sea level, Khorasan Razavi, Kalate Naderi (Laeen) (37°07'N, 59°29'E), Iran, in soil of apple orchard.

***Laelaspis digitalis* Teng, 1981**

Laelaspis digitalis Teng, 1981: 397.
Laelaspis digitalis.—Bai & Gu, 1993b: 438.
Hypoaspis (*Laelaspis*) *digitalis*.—Deng *et al*., 1993: 166; Yan *et al*., 2008: 2230.
Hypoaspis digitalis.—Kůrka, 2005: 24; Ren & Guo, 2008: 329, 2009: 101.

Type depository. Institute of Zoology, Academia Sinica, Beijing, China.
Type locality and habitat. Morin Dawa (48°N, 124°E), Hulun Boir Meng, Inner Mongolia, China, on *Cricetulus barabensis* [Animalia: Rodentia: Cricetidae].

***Laelaspis dubitatus* Hunter, 1964**

Laelaspis dubitatus Hunter, 1964c: 293.
Hypoaspis (*Laelaspis*) *dubitatus*.—Hunter & Glover, 1968: 64.
Laelaspis dubitata.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.
L. dubitatus.—Masoomi *et al*., 2016: 32.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Clarke, Georgia, United States of America, with *Aphaenogaster* sp. [Animalia: Hymenoptera: Formicidae].
Note. According to Joharchi *et al*. (2012a: 2001), specimens reported by Nemati *et al*. (2000: 381) as *Hypoaspis* (*Laelaspis*) *dubiatus* [sic] and the subsequent report of that record by Faraji *et al*. (2008: 208) refer to a misidentification of *L. astronomica*.

***Laelaspis elongatus* Kazemi *et al*., 2016**
Laelaspis elongatus Kazemi, Mehrzard & Latifi, 2016: 147.
Laelaspis elongatus.—Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 129.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.
Type locality and habitat. 1107 m above sea level, Bam (29°06'096"N, 58°18'866"E), Kerman province, Iran, under the elytra of *Acinopus* (*Acinopus*) *picipes* [Animalia: Coleoptera: Carabidae, Harpalinae].

***Laelaspis equitans* (Michael, 1891)**
Laelaps equitans Michael, 1891: 649.
Lælaps equitans [sic].—Moniez, 1892: 381.
Loelaps equitans [sic].—Wasmann, 1894: 198.
Iphis equitans.—Leonardi, 1897: 860.
Laelaps (*Laelaspis*) *equitans*.—Berlese, 1903b: 16, 1904c: 423; Donisthorpe, 1927: 213.
Laelaspis equitans.—Hull, 1918: 63; Oudemans, 1929e: 81; Vitzthum, 1929: 26; Turk, 1953: 12; Haarlov, 1957: 18; Hunter, 1961: 675; Reitblat, 1963: 81; Zhang *et al*., 1963: 196; Bregetova, 1977b: 545; Castagnoli & Pegazzano, 1985: 131; Bai & Gu, 1993b: 441; Ren & Guo, 2008: 328, 2009: 101; Joharchi *et al*., 2012a: 2002; Kazemi & Rajaei, 2013: 92; Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Kavianpour *et al*., 2017: 163; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 130; Joharchi & Abramov, 2020: 641.
equitans; *non-Laelaps* [sic].—Tipton, 1960: 293.
Hypoaspis equitans.—Evans & Till, 1966: 210; Kůrka, 2005: 24; Kontschán *et al*., 2015b: 62.
Hypoaspis (*Laelaspis*) *equitans*.—Karg, 1979: 102, 1982: 250, 1989c: 120, 1993a: 162; Yan *et al*., 2010: 905.
Laelaspis aequitans [sic].—Farrier & Hennessey, 1993: 81.
Laelaspis equitans equitans.—Bernini *et al*., 1995: 29.
Hypoaspis equitas [sic].—Ren & Guo, 2008: 329, 2009: 101.

Type depository. Unspecified.
Type locality and habitat. Near Ajaccio, Corsica (France), in nest of *Tetramorium caespitum* [Animalia: Hymenoptera: Formicidae].

***Laelaspis equitans longitarsa* (Berlese, 1904)**
Laelaps (*Laelaspis*) *equitans* var. *longitarsa* Berlese, 1904c: 424.
Laelaspis equitans var. *longitarsa*.—Hunter, 1961: 675; Joharchi *et al*., 2012a: 2014; Kazemi, 2015: 413.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Russia, on *Tetramorium caespitum* [cited as *Tetramorii caespitum*, Animalia: Hymenoptera: Formicidae] and in its nests.
Note. Berlese (1904c) described *Laelaps* (*Laelaspis*) *equitans* var. *longitarsa* for specimens that differed slightly from the original description of *Laelaps equitans* by Michael (1891). The relative taxonomic status of these populations cannot be determined on the basis of the available information.

***Laelaspis finitimus* (Berlese, 1903)**
Laelaps (*Laelaspis*) *finitimus* Berlese, 1903b: 15.
Laelaps (*Laelaspis*) *finitimus*.—Berlese, 1904c: 426.
Laelaspis finitimus.—Buitendijk, 1945: 297; Hunter, 1961: 675; Reitblat, 1963: 81; Bregetova, 1977b: 544; Castagnoli & Pegazzano, 1985: 146; Joharchi *et al*., 2012a: 2014; Kazemi, 2015: 413.
finitimus; *non-Laelaps* [sic].—Tipton, 1960: 294.
Hypoaspis (*Laelaspis*) *finitima*.—Karg, 1979: 101, 1982: 249, 1989c: 120, 1993a: 160.

Laelaspis finitima.—Bernini *et al*., 1995: 29.
Hypoaspis finitima.—Kůrka, 2005: 24.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, in nest of *Tapinoma erraticum* [Animalia: Hymenoptera: Formicidae].

***Laelaspis formationis* (Karg, 1989)**
Hypoaspis (*Laelaspis*) *formationis* Karg, 1989c: 125.
Laelaspis formationis.—Moreira, 2014: 306; Kazemi, 2015: 413.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Laelaspis formicaphilus* Joharchi & Abramov, 2020**
Laelaspis formicaphilus Joharchi & Abramov, 2020: 635.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.
Type locality and habitat. In the vicinity of Suvorov town (54°07'N, 36°30'E), Tutal Region, Russia, in nest of *Formica cunicularia* [Animalia: Hymenoptera: Formicidae].

***Laelaspis guilaniensis* Ramroodi *et al*., 2014**
Laelaspis guilaniensis Ramroodi, Joharchi & Hajizadeh, 2014b: 178.
Laelaspis guilaniensis.—Kazemi, 2015: 413; Hajizadeh & Joharchi, 2018: 24; Khalili-Moghadam *et al*., 2018: 230; Nemati *et al*., 2018b: 145.
Laelaspis guilanenesis [sic].—Rad *et al*., 2019: 130.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran.
Type locality and habitat. Gisoom forest (37°39'N, 49°01'E), Guilan province, Iran, in soil.

***Laelaspis humeratus* (Berlese, 1904)**
Laelaps (*Laelaspis*) *humeratus* Berlese, 1904c: 425.
Laelaspis humeratus.—Hull, 1925: 210; Vitzthum, 1929: 25, 1931c: 119; Willmann, 1938: 149, 1951: 113; Turk, 1953: 12; Hunter, 1961: 675; Reitblat, 1963: 80; Castagnoli & Pegazzano, 1985: 188; Joharchi *et al*., 2012a: 2014, 2012c: 22; Kazemi & Rajaei, 2013: 92; Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Saberi *et al*., 2016: 128; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 145; Babaeian *et al*., 2019a: 329.
Laelaps (*Laelaspis*) *humeratus*.—Donisthorpe, 1927: 213.
humeratus; *non-Laelaps* [sic].—Tipton, 1960: 297.
Hypoaspis humerata.—Evans & Till, 1966: 212; Lapinya, 1976: 43.
Hypoaspis (*Holostaspis*) *humerata*.—Karg, 1971: 177.
Laelaspis humerata.—Bregetova, 1977b: 545.
Hypoaspis (*Laelaspis*) *humerata*.—Karg, 1979: 102, 1982: 250, 1989c: 120, 1993a: 161.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Luxemburg, in nest of unidentified ant [Animalia: Hymenoptera: Formicidae].

***Laelaspis imitatus* Reitblat, 1963**

Laelaspis imitatus Reitblat, 1963: 76.

Laelaspis imitatus.—Bregetova, 1977b: 547; Joharchi *et al*., 2012a: 2002; Kazemi & Rajaei, 2013: 92; Kazemi, 2015: 413; Khalili-Moghadam *et al*., 2018: 230; Joharchi & Abramov, 2020: 641.

Hypoaspis (*Laelaspis*) *imitata*.—Karg, 1979: 101, 1982: 249, 1989c: 120, 1993a: 161, 2000: 246.

Hypoaspis imitata.—Kontschán *et al*., 2015b: 62.

Type depository. Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.

Type locality and habitat. Tagybeyly, Agdam, Azerbaijan, on *Meriones tristrami* [Animalia: Rodentia: Muridae].

Note. Specimens reported as *Hypoaspis* (*Laelaspis*) *imitate* [sic] by Nemati & Babaeian (2010: 364) were re-identified as *Laelaspis mossadeghi* Babaeian & Joharchi by Ramroodi *et al*. (2014b: 180). Specimens reported as *Hypoaspis imitatus* by Kontschán *et al*. (2015a: 34) were re-identified as *Laelaspis mandibularis* (Ewing) by Keum *et al*. (2017: 498).

***Laelaspis kamalii* Joharchi & Halliday, 2012**

Laelaspis kamalii Joharchi & Halliday, in Joharchi *et al*., 2012a: 2004.

Laelaspis kamalii.—Kazemi & Rajaei, 2013: 92; Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Khalili-Moghadam & Saboori, 2015: 319; Kordeshami *et al*., 2015: 593; Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 129; Joharchi & Halliday, 2020: 32; Nemati *et al*., 2021: 185.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.

Type locality and habitat. 1890 m above sea level, Arrange (35°55'N, 51°04'E), Alborz, Iran, in nest of *Tapinoma* sp. [Animalia: Hymenoptera: Formicidae].

***Laelaspis latanalis* (Karg, 2000)**

Hypoaspis (*Laelaspis*) *latanalis* Karg, 2000: 246.

Laelaspis latanalis.—Moreira, 2014: 211; Kazemi, 2015: 413.

Type depository. Museum für Naturkunde, Berlin, Germany.

Type locality and habitat. Venezuela, in litter.

***Laelaspis latisetus* Rad *et al*., 2019**

Laelaspis latisetus Rad, Ramroodi, Joharchi & Sahebzadeh, 2019: 125.

Type depository. Tyumen State University Museum of Zoology, Tyumen, Russia.

Type locality and habitat. 492 m above sea level, Zahak County (30°54'N, 61°40'E), Sistan and Baluchestan province, Iran, on *Pheidole pallidula* [Animalia: Hymenoptera: Formicidae].

***Laelaspis longipilis* Hunter, 1964**

Laelaspis longipilis Hunter, 1964c: 297.

Hypoaspis (*Laelaspis*) *longipilus*.—Hunter & Glover, 1968: 64.

Laelaspis longipilis.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Nogales, Arizona, United States of America, in lumber foundation.

***Laelaspis longogenitalis* (Karg, 1978)**
Hypoaspis (*Cosmolaelaps*) *longogenitalis* Karg, 1978b: 2.
Hypoaspis (*Cosmolaelaps*) *longogenitalis*.—Karg, 1979: 71, 1981a: 217, 1987: 290, 1988: 514, 1995: 22.
Cosmolaelaps longogenitalis.—Gwiazdowicz *et al*., 2014: 437; Moreira *et al*., 2014: 319.
Laelaspis longogenitalis.—Kazemi, 2015: 413; Ramroodi *et al*., 2015b: 135; Joharchi & Abramov, 2020: 641.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. near Misituni, Tarapaca, Chile, from a pitfall trap in saline soil.

***Laelaspis lundi* Hunter, 1961**
Laelaspis lundi Hunter, 1961: 677.
Hypoaspis (*Laelaspis*) *lundi*.—Hunter & Glover, 1968: 64.
Laelaspis lundi.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Fortin, Veracruz, Mexico, on bulbs of *Polianthus* sp. [probably *Polianthes*, Plantae: Agavaceae] intercepted at Laredo, Texas, United States of America.

***Laelaspis mandibularis* (Ewing, 1909)**
Laelaps mandibularis Ewing, 1909: 65.
Hypoaspis (*Laelaspis*) *johnieae* Hunter & Glover, 1968: 70 [junior synonym of *L. mandibularis* by Hennessey & Farrier, 1988: 31; Farrier & Hennessey, 1993: 81; Keum *et al*., 2017: 498].
Laelaspis mandibularis.—Hennessey & Farrier, 1988: 31; Farrier & Hennessey, 1993: 81; Keum *et al*., 2017: 498.
Hypoaspis mandibularis.—Kůrka, 2005: 25.
Laelaspis johnieae.—Kazemi, 2015: 413.
Hypoaspis imitatus.—Kontschán *et al*., 2015a: 34 (misidentification, according to Keum *et al*., 2017: 498).
Hypoaspis (*Alloparasitus*) *sardous*.—Keum *et al*., 2016: 478 (misidentification, according to Keum *et al*., 2017: 498).

Type depository. *L. mandibularis*: Illinois State Laboratory of Natural History, Urbana, Illinois; *H.* (*L.*) *johnieae*: National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. *L. mandibularis*: Arcola, Illinois, United States of America, from unspecified substrate; *H.* (*L.*) *johnieae*: Sebastian, Florida, United States of America, in moist sand pine litter.

***Laelaspis morazae* Kazemi, 2015**
Laelaspis morazae Kazemi, 2015: 420.
Laelaspis morazae.—Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 128.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.
Type locality and habitat. 1023 m above sea level, Mashad (59°58'N, 36°24'E), Khorasan Ravazi province, Iran, on *Lepisiota semenovi* [Animalia: Hymenoptera: Formicidae].

***Laelaspis moseri* (Hunter & Glover, 1968)**
Hypoaspis (*Laelaspis*) *moseri* Hunter & Glover, 1968: 67.
Laelaspis moseri.—Farrier & Hennessey, 1993: 81; Kazemi, 2015: 413.
Hypoaspis moseri.—Kůrka, 2005: 25.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Pineville, Louisiana, United States of America, in laboratory cultures of *Anuroyryllus* [sic] *muticus* [probably *Anurogryllus muticus*, Animalia: Orthoptera: Gryllidae].

***Laelaspis mossadeghi* Babaeian & Joharchi, 2013**
Laelaspis mossadeghi Babaeian & Joharchi, in Babaeian *et al*., 2013b: 354.
Hypoaspis (*Laelaspis*) *imitate* [sic].—Nemati & Babaeian, 2010: 364 (misidentification, according to Ramroodi *et al*., 2014b: 180).
Laelaspis mossadeghi.—Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Khalili-Moghadam *et al*., 2018: 230; Nemati *et al*., 2018b: 145; Rad *et al*., 2019: 130.
Laelaspis mosadegi [sic].—Hajizadeh & Joharchi, 2018: 24.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Karaj, Alborz, Iran.
Type locality and habitat. Dotu, Shahrekord, Iran, in nest of *Messor* sp. [Animalia: Hymenoptera: Formicidae].

***Laelaspis mumai* (Hunter & Glover, 1968)**
Hypoaspis (*Laelaspis*) *mumai* Hunter & Glover, 1968: 65.
Laelaspis mumai.—Farrier & Hennessey, 1993: 82; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Fort Pierce, Florida, United States of America, in citrus litter.

***Laelaspis myrmicae* (Greim, 1969)**
Hypoaspis (*Laelaspis*) *myrmicae* Greim, in Hirschmann *et al*., 1969: 139.
Hypoaspis (*Holostaspis*) *myrmicae*.—Karg, 1971: 173, 1979: 95, 1982: 247, 1993a: 156.
Laelaspis myrmicae.—Joharchi *et al*., 2012a: 2015; Kazemi, 2015: 413; Babaeian *et al*., 2019a: 331.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, on *Myrmica laevinodis* [Animalia: Hymenoptera: Formicidae].

***Laelaspis natanziensis* Masoomi *et al*., 2016**
Laelaspis natanziensis Masoomi, Joharchi & Jalalizand, 2016: 28.
Laelaspis natanziensis.—Nemati *et al*., 2018b: 146; Rad *et al*., 2019: 130.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Tehran, Iran.
Type locality and habitat. 1600 m above sea level, Natanz (33°32'N, 54°51'E), Isfahan province, Iran, in nest of *Tetramorium* sp. [Animalia: Hymenoptera: Formicidae].

***Laelaspis ningxiaensis* Bai & Gu, 1994**
Laelaspis ningxiaensis Bai & Gu, 1994: 181.
Laelaspis ningxiaensis.—Ma, 1995b: 499; Ren & Guo, 2008: 328, 2009: 101.
Gymnolaelaps ningxiaensis.—Ma & Yin, 2004: 117, 2011: 119; Joharchi *et al*., 2012a: 2013; Kazemi. 2015: 413; Ma, 2016a: 20.

Hypoaspis (*Laelaspis*) *ningxiaensis*.—Yan *et al*., 2010: 905.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Haiyuan (36.5°N, 105.6°E), Ningxia Hui Autonomous Region, China, in ant nest [cited as *Myrmos*, Animalia: Hymenoptera: Formicidae].
Note. Joharchi *et al*. (2012a: 2013) excluded this species from *Laelaspis* because it lacked the characteristic ornamentation of the epigynal shield, and indicated that it appears to be a species of *Gymnolaelaps*. Kazemi (2015: 413) included it in *Laelaspis*.

***Laelaspis ovisugus* (Berlese, 1903)**
Laelaps (*Laelaspis*) *ovisugus* Berlese, 1903b: 14.
Laelaps (*Laelaspis*) *ovisugus*.—Berlese, 1904c: 427; André, 1937: 47.
ovisugas; *non-Laelaps* [sic].—Tipton, 1960: 303.
Laelaspis ovisugus.—Hunter, 1961: 675; Reitblat, 1963: 81; Bregetova, 1977b: 546; Castagnoli & Pegazzano, 1985: 296; Joharchi *et al*., 2012a: 2015; Kazemi & Rajaei, 2013: 92; Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Rad *et al*., 2019: 130.
Hypoaspis (*Laelaspis*) *ovisuga*.—Karg, 1979: 100, 1982: 249, 1993a: 159.
Laelaspis ovisuga.—Bernini *et al*., 1995: 29.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, in nest of unidentified ant [Animalia: Hymenoptera: Formicidae].

***Laelaspis patulus* Allred, 1969**
Laelaspis patulus Allred, 1969: 234.
Laelaspis patulus.—Allred, 1975: 128; Ren & Guo, 2008: 329, 2009: 101; Joharchi *et al*., 2011: 28, 2012a: 2014; Kazemi, 2015: 413; Halliday *et al*., 2018: 52.
Hypoaspis (*Laelaspis*) *patulus*.—Yan *et al*., 2008: 2230.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number B-66376.
Type locality and habitat. 2408 m above sea level, Naran, Kaghan Valley, Hazara, Pakistan (cited as West Pakistan), on *Apodemus flavicollis* [Animalia: Rodentia: Muridae].

***Laelaspis pauli* Hunter & Davis, 1962**
Laelaspis pauli Hunter & Davis, 1962: 250.
Laelaspis pauli.—Hunter, 1964c: 300; Farrier & Hennessey, 1993: 82; Kazemi, 2015: 413.
Hypoaspis (*Laelaspis*) *pauli*.—Hunter & Glover, 1968: 64.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Morgan, Georgia, United States of America, in ground litter around nest of *Crematogaster* sp. [Animalia: Hymenoptera: Formicidae].

***Laelaspis pennatus* Joharchi & Halliday, 2012**
Laelaspis pennatus Joharchi & Halliday, in Joharchi *et al*., 2012a: 2007.
Laelaspis pennatus.—Kazemi & Rajaei, 2013: 92; Hasanvand *et al*., 2014a: 96; Mahjoori *et al*., 2014: 1603; Ramroodi *et al*., 2014b: 181; Yazdanpanah & Kazemi, 2014: 334; Kazemi, 2015: 413; Hajizadeh &

Joharchi, 2018: 24; Khalili-Moghadam *et al*., 2018: 230; Nemati *et al*., 2018b: 146; Joharchi & Halliday, 2020: 32.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. Esfahan, Iran, in nest of *Tetramorium caespitum* [Animalia: Hymenoptera: Formicidae].

***Laelaspis persicus* Joharchi & Halliday, 2012**
Laelaspis persicus Joharchi & Halliday, in Joharchi *et al*., 2012a: 2009.
Laelaspis persicus.—Kazemi & Rajaei, 2013: 92; Ramroodi *et al*., 2014b: 181, 2015b: 136; Kazemi, 2015: 415; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 146; Rad *et al*., 2019: 128; Joharchi & Abramov, 2020: 641.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.
Type locality and habitat. 1595 m above sea level, Taleghan (36°71'N, 50°32'E), Alborz, Iran, in nest of *Pheidole pallidula* [Animalia: Hymenoptera: Formicidae].

***Laelaspis picketti* (Hunter & Glover, 1968)**
Hypoaspis (*Laelaspis*) *picketti* Hunter & Glover, 1968: 71.
Laelaspis picketti.—Farrier & Hennessey, 1993: 82; Kazemi, 2015: 413.
Hypoaspis picketti.—Kůrka, 2005: 25.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Malabar, Florida, United States of America, in citrus litter.

***Laelaspis piloscutuli* Hunter, 1961**
Laelaspis piloscutuli Hunter, 1961: 677.
Hypoaspis (*Laelaspis*) *piloscutuli*.—Hunter & Glover, 1968: 64.
Laelaspis piloscutuli.—Farrier & Hennessey, 1993: 82; Kazemi, 2015: 413.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Fortin, Veracruz, Mexico, intercepted at Laredo, Texas, United States of America, on orchid plants [Plantae: Asparagales: Orchidaceae].

***Laelaspis planus* (Womersley, 1956)**
Gymnolaelaps planus Womersley, 1956a: 583.
Laelaspis planus.—Domrow, 1957: 208; Halliday, 2019: internet page.
Pseudoparasitus (*Gymnolaelaps*) *planus*.—Karg, 1978a: 206, 1981b: 218, 1989b: 335.
Pseudoparasitus planus.—Halliday, 1998: 129; Kůrka, 2005: 26.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Mylor, South Australia, in moss.
Note. Without referring to the previous work by Domrow (1957: 208), Kazemi (2015: 413) suggested that this species could belong to *Laelaspis*.

***Laelaspis regalis* Berlese, 1920**

Laelaspis regalis Berlese, 1920: 157; Farrier & Hennessey, 1993: 82; Kazemi, 2015: 413.
Laelaspis regalis.—Lombardini, 1936: 43; Hunter, 1961: 675, 1964c: 296; Castagnoli & Pegazzano, 1985: 353; Hennessey & Farrier, 1988: 31; Joharchi & Abramov, 2020: 641.
Laelaspis cf. *regalis*.—Costa, 1966a: 74.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. "Columbia", United States of America (cited as N. A.), in moss [cited as "muscis"].

***Laelaspis secedens* Berlese, 1920**

Laelaspis secedens Berlese, 1920: 158.
Laelaspis secedens.—Lombardini, 1936: 43; Hunter, 1961: 675; Castagnoli & Pegazzano 1985: 373; Halliday, 2005: 35; Joharchi *et al*., 2012a: 2015; Kazemi & Rajaei, 2013: 92; Ramroodi *et al*., 2014b: 181; Kazemi, 2015: 413; Rad *et al*., 2019: 130.
Hypoaspis (*Laelaspis*) *seccedens* [sic].—Aswegen & Loots, 1970: 196.
Hypoaspis (*Laelaspis*) *secedens*.—Karg, 1982: 249, 1989c: 120.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Somalia (cited as Somalia italiana), on unidentified Coleoptera [Animalia: Arthropoda].

***Laelaspis sinicus* Zhang *et al*., 1963**

Laelaspis sinicus Zhang, Zheng & Yin, 1963: 195.
Laelaspis sinensis Bai & Gu, 1993b: 438 [junior synonym of *L. sinicus* by Ma, 2006a: 23; Yan *et al*., 2010: 905].
Laelaspis sinicus.—Ma, 2006a: 23.
Laelaspis sinensis.—Ren & Guo, 2008: 328; Kazemi, 2015: 413.
Laelapsi sinensis [sic].—Ren & Guo, 2009: 101.
Hypoaspis (*Laelaspis*) *sinicus*.—Yan *et al*., 2010: 905.

Type depository. *L. sinicus*: Department of Biology, Jilin Medical University, Changchun, Jilin province, China; *L. sinensis*: Institute of Endemic Disease Control, Ningxia Autonomous Region, China.
Type locality and habitat. *L. sinicus*: Baicheng, Jilin province, China, in ant nest [Animalia: Hymenoptera: Formicidae]; *L. sinensis*: Haiyuan (36.5°N, 105.6°E), China, in ant nest [cited as *Myrmos*, Animalia: Hymenoptera: Formicidae].

***Laelaspis variopilus* (Greim, 1969)**

Hypoaspis (*Laelaspis*) *variopilus* Greim, in Hirschmann *et al*., 1969: 140.
Hypoaspis (*Holostaspis*) *variopili* [sic].—Karg, 1971: 173, 1993a: 154.
Hypoaspis (*Holostaspis*) *variopilis* [sic].—Karg, 1979: 95, 1982: 247.
Laelaspis variopilus.—Joharchi *et al*., 2012a: 2015; Kazemi, 2015: 413; Babaeian *et al*., 2019a: 332; Joharchi & Abramov, 2020: 641.

Type depository. Unspecified.
Type locality and habitat. Erlangen, Germany, on *Tetramorium caespitum* [Animalia: Hymenoptera: Formicidae].

***Laelaspis vitzthumi* (Womersley, 1956)**

Gymnolaelaps vitzthumi Womersley, 1956a: 584.
Laelaspis vitzthumi.—Domrow, 1957: 207; Hunter, 1961: 676; Joharchi *et al*., 2011: 23; Arjomandi *et al*., 2013:

256; Kazemi & Rajaei, 2013: 93; Kazemi, 2015: 413; Nemati *et al*., 2018b: 146; Babaeian *et al*., 2019a: 332; Halliday, 2019: internet page.

Laelaspis georgiae Hunter, 1960: 698 (*nomen nudum*, ICZN Article 13.1).

Holostaspis vitzthumi.—Evans & Till, 1965a: 250.

Hypoaspis (*Laelaspis*) *vitzthumi*.—Hunter & Glover, 1968: 64.

Pseudoparasitus (*Gymnolaelaps*) *vitzthumi*.—Karg, 1978a: 206, 1981b: 218, 1989b: 334; Tenorio, 1982: 272; Tenorio *et al*., 1985: 301; Nemati *et al*., 2000: 381.

Gymnolaelaps vitzthumi.—Farrier & Hennessey, 1993: 74.

Pseudoparasitus vitzthumi.—Halliday, 1998: 129; Kůrka, 2005: 26.

Pseudoparasitus vitzhumi [sic].—Shaw, 1999: 45.

Type depository. South Australian Museum, Adelaide, Australia.

Type locality and habitat. Taringa, south Queensland, Australia, from unspecified substrate.

Note. specimens reported by Hunter (1960: 698) as *Laelaspis georgiae* were later identified by Hunter (1961: 676) as *L. vitzthumi*.

Laelaspis volgini Shereef & Afifi, 1980

Laelaspis volgini Shereef & Afifi, 1980: 123.

Laelaspis volgini.—Zaher, 1986: 197; Nasr & Nawar, 1989b: 76; Joharchi *et al*., 2012a: 2014; Kazemi, 2015: 413.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.

Type locality and habitat. Giza, Egypt, in manure.

Laelaspis zhongweiensis Bai & Gu, 1993

Laelaspis zhongweiensis Bai & Gu, 1993b: 439.

Hypoaspis zhongweiensis.—Ren & Guo, 2008: 330, 2009: 101.

Laelaspis zhongweiensis.—Ren & Guo, 2008: 328, 2009: 101; Kazemi, 2015: 413.

Hypoaspis (*Laelaspis*) *zhongweiensis*.—Yan *et al*., 2010: 905.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.

Type locality and habitat. Zhongwei (37.5°N, 105.1°E), Ningxia Hui Autonomous Region, China, in ant nest [cited as Myrmos] [Animalia: Hymenoptera: Formicidae].

Laelaspisella Marais & Loots, 1969

Laelaspisella Marais & Loots, 1969a: 1 (type species: *Laelaspisella epigynialis* Marais & Loots, 1969, by original designation).

Hypoaspis (*Laelaspisella*).—Karg, 1989a: 107 (in part).

Laelaspisella.—Farrier & Hennessey, 1993: 82; Joharchi & Halliday, 2013: 46 (in part); Karg & Schorlemmer, 2013: 196 (in part); Joharchi *et al*., 2016a: 15 (in part), 2020b: 466; Nemati & Gwiazdowicz, 2016b: 29; Hajizadeh & Joharchi, 2018: 23; Nemati *et al*., 2021: 170.

Note. *Laelaspisella* was described in Dermanysssidae-Laelapinae (corresponding to the present concept of Laelapidae), and included in Hypoaspididae by Karg & Schorlemmer (2013: 2002).

Laelaspisella epigynialis Marais & Loots, 1969

Laelaspisella epigynialis Marais & Loots, 1969a: 4.

Hypoaspis (*Laelaspisella*) *epigynialis*.—Karg, 1989a: 109.

Laelaspisella epgynialis [sic].—Krantz & Schorlemmer, 2013: 203.

Laelaspisella epigynialis.—Joharchi *et al*., 2016a: 21, 2020b: 470; Nemati & Gwiazdowicz, 2016b: 44; Nemati *et al*., 2019: 81.

Type depository. Institute for Zoological Research, Potchefstroom University, South Africa.
Type locality and habitat. near Maseru, Kingdom of Lesotho, in soil.

***Laelaspisella macrodorsalis* Marais & Loots, 1969**
Laelaspisella macrodorsalis Marais & Loots, 1969a: 8.
Hypoaspis (*Laelaspisella*) *macrodorsalis*.—Karg, 1989a: 110.
Laelaspisella macrodorsalis.—Krantz & Schorlemmer, 2013: 203; Joharchi *et al*., 2016a: 21, 2020b: 470; Nemati & Gwiazdowicz, 2016b: 44; Nemati *et al*., 2019: 81.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Kivu, Democratic Republic of the Congo, in soil.

***Laelaspoides* Eickwort, 1966**
Laelaspoides Eickwort, 1966: 410 (type species: *Laelaspoides ordwayae* Eickwort, 1966, by monotypy).
Laelaspoides.—Casanueva, 1993: 40; OConnor & Klimov, 2012a, g: internet page; Klimov *et al*., 2016: internet page.

Note. *Laelaspoides* was described in Laelapidae-Hypoaspidinae. Referring to *Laelaspoides ordwayae* Eickwort, Farrier & Hennessey (1993: 87) inadvertently mentioned the supposed synonymy of *Laelaspoides* under *Pseudoparasitus* Oudemans, by mistaking that genus with *Laelapsoides* Willmann (note the slight difference in spelling between the two genera), which had been synonymised under *Pseudoparasitus* by Evans (1957a: 221).

***Laelaspoides ordwayae* Eickwort, 1966**
Laelaspoides ordwayae Eickwort, 1966: 411.
Pseudoparasitus ordwayae.—Farrier & Hennessey, 1993: 87.
Laelaspoides ordwayae.—OConnor & Klimov, 2012g: internet page; Klimov *et al*., 2016: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number GCE 64–0205–1e.
Type locality and habitat. Lakeview Woods, Douglas, Kansas, United States of America, in nests of *Augochlorella persimilis* [Animalia: Hymenoptera: Halictidae].

***Ljunghia* Oudemans, 1932**
Ljunghia Oudemans, 1932: 204 (type species: *Ljunghia selenocosmiae* Oudemans, 1932, by monotypy).
Ljunghia.—Vitzthum, 1942: 764; Radford, 1950b: 24; Baker & Wharton, 1952: 94; Domrow, 1975: 31; Casanueva, 1993: 41; Moraza *et al*., 2009: 118; Mašán *et al*., 2012: 2; Halliday & Juvara-Bals, 2016: 832; Halliday, 2019: internet page; Lindquist *et al*., 2020: 47.
Ljunghia (*Ljunghia*).—Fain, 1989: 158, 1991a: 187; Moraza *et al*., 2009: 124.
Ljunghia (*Metaljunghia*) Fain, 1989: 158 (type species: *Ljunghia rainbowi* Domrow, 1975, by original designation).
Ljunghia (*Metaljunghia*).—Fain, 1991a: 187; Moraza *et al*., 2009: 124.
Arachnyssus Ma, 2002: 8 (type species: *Arachnyssus guangxiensis* Ma, 2002, by original designation) [junior synonym of *Ljunghia* by Mašán *et al*., 2012: 2; Halliday & Juvara-Bals, 2016: 832].

Note. *Ljunghia* was not assigned to a family in the original description, but was included in Laelapidae-Hypoaspidinae

by Vitzthum (1942: 764) and in Laelapidae-Iphiopsidinae by Moraza *et al*. (2009: 118); *Arachnyssus* was assigned to Macronyssidae in the original description. Moraza *et al*. (2009: 118) questioned the usefulness of the characteristics used by Fain (1989: 158) to separate the species of this genus into subgenera, proposing a new set of features for the two subgenera within the key. However, Mašán *et al*. (2012: 2) did not consider the division of the genus in subgenera adequate and this view is adopted in this publication.

***Ljunghia africana* Fain, 1991**
Ljunghia (*Metaljunghia*) *africana* Fain, 1991a: 189.
Ljunghia (*Metaljunghia*) *africana*.—Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 125.
Ljunghia africana.—Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 858.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Boende, Tshuapa, Democratic Republic of the Congo (cited as Zaire), on unidentified mygalomorph spider [Animalia: Araneae].

***Ljunghia aname* Fain, 1991**
Ljunghia pulleinei aname Fain, 1991b: 79.
Ljunghia (*Metaljunghia*) *aname*.—Fain, 1991a: 188; Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 124.
Ljunghia aname.—Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 857; Halliday, 2019: internet page.

Type depository. Western Australian Museum, Perth Australia; specimen number 89/187.
Type locality and habitat. Woorolo, Western Australia, Australia, on *Aname diversicolor* [Animalia: Areaneae: Dipluridae].
Note. This species was described based on specimens from *Aname* sp. [Animalia: Araneae: Dipluridae] that had been identified by Domrow (1975: 35) as *Ljunghia pulleinei* Womersley.

***Ljunghia annamitica* Halliday & Juvara-Bals, 2016**
Ljunghia annamitica Halliday & Juvara-Bals, 2016: 833.

Type depository. Museum of Natural History, Geneva, Switzerland.
Type locality and habitat. 860 m above sea level, old secondary forest, roadside, 18 km north of Bao Loc (11°38'42"N, 107°44'36"E), Dambri Waterfall, Lam Dong province, Vietnam, on *Qiongthela australis* (Animalia: Araneae: Liphistiidae).

***Ljunghia bristowi* (Finnegan, 1933)**
Copriphis (*Pelethiphis*) *bristowi* Finnegan, 1933: 413.
Ljunghia bristowi.—Welbourn & Young, 1988: 383; Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 837.
? *Copriphis* (*Pelethiphis*) *bristowi* [sic].—Fain & Jocqué, 1996: 106.
Ljunghia (*Ljunghia*) *bristowi*.—Moraza *et al*., 2009: 125.

Type depository. Natural History Museum, London, England; specimen number 1933.5.4.1.
Type locality and habitat. Klang Gates, near Kuala Lumpur, Malaysia, on *Liphistius malayanus* [Animalia: Araneae: Liphistiidae].

***Ljunghia guangxiensis* (Ma, 2002)**
Arachnyssus guangxiensis Ma, 2002: 8.
Ljunghia guangxiensis.—Mašán *et al*., 2012: 2; Halliday & Juvara-Bals, 2016: 858.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. From a laboratory colony of the spider *Selenocosmia huwena* [Animalia: Araneae: Theraphosidae] originated from specimens from Guangxi Zhuang Autonomous Region and maintained at Baicheng, Jilin province, China.

***Ljunghia hoggi* Domrow, 1975**
Ljunghia hoggi Domrow, 1975: 33.
Ljunghia (*Metaljunghia*) *hoggi*.—Fain, 1989: 158; Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 124.
Ljunghia hoggi.—Fain, 1991b: 78; Halliday, 1998: 127; Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 858; Halliday, 2019: internet page.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Seacliff, Adelaide, Australia, on *Aganippe subtristis* [Animalia: Araneae: Ctenizidae].

***Ljunghia huwenae* (Ma, 2002)**
Arachnyssus huwenae Ma, 2002: 10
Ljunghia huwenae.—Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 858.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. from a laboratory colony of the spider *Selenocosmia huwena* [Animalia: Araneae: Theraphosidae] originating from specimens from Guangxi Zhuang Autonomous Region and maintained at Baicheng, Jilin province, China.

***Ljunghia lannaensis* Halliday & Juvara-Bals, 2016**
Ljunghia lannaensis Halliday & Juvara-Bals, 2016: 845.

Type depository. Museum of Natural History, Geneva, Switzerland.
Type locality and habitat. 900 m above sea level, Doi Mae Salong, Mae Chan, Chiang Rai province, Thailand, on *Liphistius* sp. [Animalia: Araneae: Liphistiidae].

***Ljunghia luciae* Moraza *et al*., 2009**
Ljunghia (*Ljunghia*) *luciae* Moraza, Iraola & Alemany, 2009: 119.
Ljunghia luciae.—Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 858.

Type depository. Museum of Zoology, University of Navarra, Pamplona, Spain.
Type locality and habitat. "no type locality since the type specimens were collected from a spider kept in captivity" [sic], on *Cyclosternum fasciatum* [Animalia: Araneae: Theraphosidae].

***Ljunghia minor* Fain, 1989**
Ljunghia (*Ljunghia*) *minor* Fain, 1989: 159.
Ljunghia (*Ljunghia*) *minor*.—Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 125.
Ljunghia minor.—Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 858.

Type depository. Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.
Type locality and habitat. near Buitenzorg, Java, Indonesia, on *Selenocosmia javanensis* [Animalia: Araneae: Theraphosidae].

***Ljunghia novaecaledoniae* Fain, 1991**
Ljunghia (*Metaljunghia*) *novaecaledoniae* Fain, 1991c: 199.
Ljunghia (*Metaljunghia*) *novaecaledoniae*.—Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 124.
Ljunghia novaecaledoniae.—Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 857.

Type depository. Queensland Museum, South Brisbane, Australia.
Type locality and habitat. Riviere Bleue, New Caledonia, on *Barychelus* sp. [Animalia: Araneae: Barychelidae].

***Ljunghia pulleinei* Womersley, 1956**
Ljunghia pulleini [sic] Womersley, 1956a: 591.
Ljunghia pulleini [sic].—Domrow, 1975: 35 (in part).
Ljunghia (*Metaljunghia*) *pulleini*.—Fain, 1989: 159; Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 125 (in part).
Ljunghia pulleinei.—Fain, 1991b: 78 (Emendation, according to ICZN, 32c); Halliday, 1998: 127, 2019: internet page; Mašán *et al*., 2012: 2; Halliday & Juvara-Bals, 2016: 858.

Type depository. South Australian Museum, Adelaide, Australia; a lectotype was designated by Domrow (1975: 36).
Type locality and habitat. Orroroo, near Peterborough, South Australia, Australia, on *Selenocosmia stirlingi* [Animalia: Araneae: Theraphosidae].
Note. Specimens from *Aname* sp. (Araneae: Dipluridae), reported as *Ljunghia pulleini* by Domrow (1975: 35), were considered by Fain (1991b: 79) to be a new subspecies (*L. pulleinei aname*), elevated to species level by Fain (1991a: 188). According to Mašán *et al*. (2012: 4) descriptions and illustrations provided by Domrow (1975) and Fain (1991c: 203), reportedly of *L. pulleinei*, corresponded to a different species.

***Ljunghia rainbowi* Domrow, 1975**
Ljunghia rainbowi Domrow, 1975: 37.
Ljunghia (*Metaljunghia*) *rainbowi*.—Fain, 1989: 159; Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 125.
Ljunghia rainbowi.—Halliday, 1998: 127, 2019: internet page; Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 857.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Long Gully, South Australia, Australia, on an unidentified spider [Animalia: Araneae].

***Ljunghia schwendingeri* Halliday & Juvara-Bals, 2016**
Ljunghia schwendingeri Halliday & Juvara-Bals, 2016: 848.

Type depository. Museum of Natural History, Geneva, Switzerland.
Type locality and habitat. 50–100 m above sea level, semi evergreen rain forest, Nam Tok Phliu-Khao Sabap National Park (12°31'47"N, 102°11'06"E), Chanthaburi province and district, Thailand, on *Liphistius ornatus* [Animalia: Araneae: Liphistiidae].

***Ljunghia selenocosmiae* Oudemans, 1932**
Ljunghia selenocosmiae Oudemans, 1932: 204.
Ljunghia selenocosmiae.—Radford, 1950b: 24; Domrow, 1975: 32; Mašán *et al*., 2012: 4; Halliday & Juvara-Bals, 2016: 858.
Ljunghia (*Ljunghia*) *selenocosmiae*.—Fain, 1989: 158; Fain & Jocqué, 1996: 106; Moraza *et al*., 2009: 125.

Type depository. Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands.

Type locality and habitat. Deli, Sumatra, Indonesia, on *Selenocosmia javanensis* [Animalia: Araneae: Theraphosidae].

***Ljunghia uttaradita* Halliday & Juvara-Bals, 2016**
Ljunghia uttaradita Halliday & Juvara-Bals, 2016: 852.

Type depository. Museum of Natural History, Geneva, Switzerland.
Type locality and habitat. 1600 m above sea level, evergreen forest, bank of rivulet, Lan Son, Phu Soay Dao National Park, Nam Pat, Uttaradit province, Thailand, on *Liphistius* sp. [Animalia: Araneae: Liphistiidae].

***Lucanaspis* Costa, 1971**
Lucanaspis Costa, 1971: 88 (type species: *Lucanaspis brachypedes* Costa, 1971, by monotypy).
Lucanaspis.—Gwiazdowicz *et al*., 2020b: 598.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Lucanaspis brachypedes* Costa, 1971**
Lucanaspis brachypedes Costa, 1971: 88.

Type depository. Natural History Museum, London, England.
Type locality and habitat. near Abidjan, Ivory Coast, on unidentified lucanid beetle [Animalia: Coleoptera: Lucanidae].

***Meliponaspis* Vitzthum, 1930**
Meliponaspis Vitzthum, 1930a: 297 (type species: *Meliponaspis debilipes* Vitzthum, 1930, by monotypy).
Meliponaspis.—Vitzthum, 1931c: 143, 1942: 763; Radford, 1950b: 21; Baker & Wharton, 1952: 94.

Note. *Meliponaspis* was not assigned to a family in the original description, and included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763).

***Meliponaspis debilipes* Vitzthum, 1930**
Meliponaspis debilipes Salt, 1929: 447 (*nomen nudum*; ICZN Article 12).
Meliponaspis debilipes Vitzthum, 1930a: 297.

Type depository. Unspecified [Zoologischen Staatssammlung, München, Germany, according to http: //www.zsm.mwn.de/; date of access on March 6, 2014].
Type locality and habitat. East Africa, in nest of *Melipona alinderi* [Animalia: Hymenoptera: Apidae].

***Melittiphis* Berlese, 1918**
Melittiphis Berlese, 1918: 117 [type species: *Iphis alvearius* Berlese, 1895, by monotypy].
Melittiphis.—Vitzthum, 1930a: 284, 1931c: 143, 1942: 766; Radford, 1950b: 26; Baker & Wharton, 1952: 93; Evans, 1957a: 229; Evans & Till, 1966: 275; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 82; Walter *et al*., 2002: 132; OConnor & Klimov, 2012a,e: internet page; Klimov *et al*., 2016: internet page; Halliday, 2019: internet page.

Note. This genus was not assigned to a family in the original description, but was included in Laelapidae-Hyletastinae by Vitzthum (1942: 766) and in Laelapidae-Melittiphinae by Evans & Till (1979: 202). Oudemans (1936: 217) and

Evans (1957a: 220) presumed *Ololaelaps* to be a junior synonym of *Hyletastes* Gistel, 1848 [erroneously cited by Evans as *Hyletastea* Gistel, 1884]. Vitzthum (1942: 765) created Hyletastinae, a subfamily that included *Melittiphis* Berlese, 1918 and genera placed today in Eviphididae and Macrochelidae. Hyletastinae was considered junior synonym of Eviphididae by Bregetova (1973: 264).

***Melittiphis alvearius* (Berlese, 1895)**

Iphis alvearius Berlese, 1895: 318.

Laelaps (*Iphis*) *alvearius*.—Berlese, 1918: 117.

Melittiphis alvearius.—Berlese, 1918: 117; Vitzthum, 1930a: 285, 1931c: 119; Lombardini, 1936: 44; Radford, 1950b: 26; Evans & Till, 1966: 275; Haragsim *et al*., 1978: 60; Samšiňák *et al*., 1978: 50; Castagnoli & Pegazzano, 1985: 11; Farrier & Hennessey, 1993: 82; Bernini *et al*., 1995: 29; Knihinicki & Halliday, 1995: 323; Chmielewski, 1998: 206; Halliday, 1998: 127, 2019: internet page; Barreto *et al*., 2004: 107; Kůrka, 2005: 25; OConnor & Klimov, 2012e: internet page; Klimov *et al*., 2016: internet page; Nemati & Gwiazdowicz, 2016b: 45.

alvearius; *non-Laelaps* [sic].—Tipton, 1960: 286.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. Portici, Naples, Italy, in nest of unidentified bees [Animalia: Hymenoptera].

***Melittiphisoides* Delfinado-Baker *et al*., 1984**

Melittiphisoides Delfinado-Baker, Baker & Flechtmann, 1984: 3 (type species: *Melittiphisoides apiarium* Delfinado-Baker, Baker & Flechtmann, 1984, by monotypy).

Melittiphisoides.—Casanueva, 1993: 40; OConnor & Klimov, 2012a: internet page.

Note. This genus was described in Laelapidae.

***Melittiphisoides apiarium* Delfinado-Baker *et al*., 1984**

Melittiphisoides apiarium Delfinado-Baker, Baker & Flechtmann, 1984: 6.

Melittiphisoides apiarium.—Delfinado-Baker & Baker, 1988: 135.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, São Paulo state, Brazil; specimen number 1233.

Type locality and habitat. Recife, Pernambuco state, Brazil, in nest of *Melipona scutellaris* [Animalia: Hymenoptera: Apidae].

***Mumulaelaps* Clark, 2012**

Mumulaelaps Clark, in Clark & Hawke, 2012: 189 (type species: *Mumulaelaps ammochostos* Clark, in Clark & Hawke, 2012, by monotypy).

Mumulaelaps.—Joharchi *et al*., 2019d: 346; Gwiazdowicz *et al*., 2020b: 598.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Mumulaelaps ammochostos* Clark, 2012**

Mumulaelaps ammochostos Clark, in Clark & Hawke, 2012: 193.

Type depository. Canterbury Museum, Christchurch, New Zealand.

Type locality and habitat. Southshore (43°33.668'S, 172°42.986'E), Christchurch, South Island, New Zealand, on larvae of *Pericoptus truncatus* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].

***Myrmozercon* Berlese, 1902**

Myrmozercon Berlese, 1902: 699 (type species: *Myrmozercon brevipes* Berlese, 1902, by monotypy).

Myrmonyssus Berlese, 1903b: 16 (type species: *Myrmonyssus diplogenius* Berlese, 1903, by subsequent designation by Berlese, 1904c: 436) [junior synonym of *Myrmozercon* by Banks, 1915a: 84; Rosario & Hunter, 1988: 466; Walter, 2003: 81; Shaw & Seeman, 2009: 43; Joharchi *et al*., 2011: 28, 2015: 550; Ghafarian *et al*., 2013: 22].

Myrmonyssus.—Berlese, 1904c: 436, 1913b: 10; Hull, 1918: 63; Vitzthum, 1931c: 143, 1942: 764; Baker & Strandtmann, 1948: 386; Radford, 1950b: 22; Baker & Wharton, 1952: 95; Hunter & Hunter 1963: 341; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 82; Kontschán & Seeman, 2015: 30.

Myrmozercon.—Berlese, 1904c: 444, 1913b: 10; Banks, 1915a: 80; Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Baker & Wharton, 1952: 95; Rosario & Hunter, 1988: 466; Farrier & Hennessey, 1993: 83; Walter, 2003: 81; Shaw & Seeman, 2009: 44; Joharchi *et al*., 2011: 28, 2015: 555; Babaeian *et al*., 2013a: 459; Ghafarian *et al*., 2013: 22; Joharchi & Moradi, 2013: 245; Kontschán & Seeman, 2015: 21; Joharchi *et al*., 2018b: 310; Halliday, 2019: internet page.

Myrmonyssus (*Laelaspulus*).—Vitzthum, 1942: 764; Baker & Wharton, 1952: 95; Hunter & Hunter 1963: 341.

Myrmonyssus (*Myrmonyssus*).—Vitzthum, 1942: 764.

Parabisternalis Ueckermann & Loots, 1995: 35 (type species: *Parabisternalis yemeni* Ueckermann & Loots, 1995 by monotypy) [junior synonym of *Myrmozercon* by Shaw & Seeman, 2009: 54; Joharchi *et al*., 2011: 29, 2015: 550; Ghafarian *et al*., 2013: 22; Joharchi & Moradi, 2013: 245].

Note. *Myrmozercon* was described in Gamasidae, and included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 764); *Myrmonyssus* was described in Laelapidae, and included in Laelapidae-Hypoaspidinae by Vitzthum, 1942: 764; *Parabisternalis* was described in Laelapidae. Joharchi *et al*. (2015: 555) divided the species of *Myrmozercon* in two groups, *sensu lato* and *sensu stricto*. *Myrmonyssus* (*Laelaspulus*) Berlese was considered a junior synonym of *Myrmozercon* by Shaw & Seeman (2009: 54), Joharchi *et al*. (2011: 29, 2015: 550), Ghafarian *et al*. (2013: 22) and Joharchi & Moradi (2013: 245). We agree with Babaeian *et al*. (2019a: 302), who rather considered it junior synonym of *Holostaspis*.

***Myrmozercon aequalis* (Banks, 1916)**

Myrmonyssus aequalis Banks, 1916: 227.

Myrmonyssus equalis [sic].—Hunter & Hunter, 1963: 336.

Myrmozercon aequalis.—Halliday, 1998: 129, 2019: internet page; Walter, 2003: 83; Shaw & Seeman, 2009: 53; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 557; Trach & Khaustov, 2018: 49.

Type depository. Unspecified.

Type locality and habitat. type series, Devonport, Hobart and Ulverstone, Tasmania, Australia, on unidentified ants [Animalia: Hymenoptera: Formicidae], and Bagdad, Tasmania, Australia, on *Iridomyrmex gracilis* [Animalia: Hymenoptera: Formicidae].

Note. Vitzthum (1930c: 89) suspected this species to belong to a different genus. This species was included by Joharchi *et al*. (2015: 557) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

***Myrmozercon andongensis* Joharchi *et al*., 2018**

Myrmozercon andongensis Joharchi, Jung & Keum, 2018b: 310.

Type depository. Department of Plant Medicals, Andong National University, Andong, Republic of Korea.

Type locality and habitat. 683 m above sea level, Andong (36°54'N, 128°79'E), Gyeongbuk, Republic of Korea, on *Camponotus japonicus* (Animalia: Hymenoptera: Fornicidae).

***Myrmozercon antennophoroides* (Berlese, 1903)**

Myrmonyssus antennophoroides Berlese, 1903a: 244.

Myrmonyssus antennophoroides.—Berlese, 1904c: 439; Vitzthum, 1930c: 89; Hunter & Hunter, 1963: 336; Castagnoli & Pegazzano, 1985: 19; Bernini *et al*., 1995: 29.

Myrmonyssus (*Myrmonyssus*) *antennophoroides*.—Lombardini, 1936: 45.

Myrmozercon antennophoroides.—Rosario & Hunter, 1988: 470; Shaw & Seeman, 2009: 54; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 558; Trach & Khaustov, 2018: 47.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. Bevagna, Perugia (Umbria), Italy, on *Camponotus aethiops* [Animalia: Hymenoptera: Formicidae].

***Myrmozercon beardae* Shaw & Seeman, 2009**

Myrmozercon beardae Shaw & Seeman, 2009: 48.

Myrmozercon beardae.—Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 556; Trach & Khaustov, 2018: 47; Halliday, 2019: internet page.

Type depository. South Australian Museum, Adelaide, Australia; specimen number SAMA J11549.

Type locality and habitat. Lucindale, South Australia, with ants (Lea Collection) [Animalia: Hymenoptera: Formicidae].

Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

***Myrmozercon brachiatus* (Berlese, 1903)**

Myrmonyssus brachiatus Berlese, 1903b: 17.

Myrmonyssus brachiatus.—Berlese, 1904c: 441; Vitzthum, 1930c: 89; Hunter & Hunter, 1963: 335; Castagnoli & Pegazzano, 1985: 48; Bernini *et al*., 1995: 29.

Myrmonyssus (*Myrmonyssus*) *brachiatus*.—Lombardini, 1936: 45.

Myrmozercon brachiatus.—Rosario & Hunter, 1988: 470; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 558.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. Portici, Naples, Italy, on *Messor barbarus capitatus* var. *minor* [Animalia: Hymenoptera: Formicidae].

***Myrmozercon brachytrichos* Joharchi, Arjomandi & Trach, 2017**

Myrmozercon brachytrichos Joharchi, Arjomandi & Trach, 2017a: 726.

Myrmozercon tauricus.—Joharchi & Moradi, 2013: 250 (misidentification, according to Joharchi *et al*., 2017a: 726).

Myrmozercon brachytrichos.—Nemati *et al*., 2018b: 146; Joharchi & Halliday, 2020: 36.

Type depository. Originally at Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. Presently at Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Iran; specimen number ARS-20191222–15a (according o Joharchi & Halliday, 2020: 27).

Type locality and habitat. 1595 m above sea level, Khoznan (36°71'N, 50°32'E), Savojbolagh, Alborz, Iran, on *Crematogaster inermis* [Animalia: Hymenoptera: Formicidae].

Note. This species was included by Joharchi *et al*. (2017a: 726) in the *Myrmozercon sensu stricto* group, defined by Joharchi *et al*. (2015: 557).

***Myrmozercon brevipes* Berlese, 1902**

Myrmozercon brevipes Berlese, 1902: 700.

Myrmozercon brevipes.—Berlese, 1904c: 445; Lombardini, 1936: 45; Radford, 1950b: 23; Castagnoli & Pegazzano, 1985: 50; Rosario & Hunter, 1988: 470; Bernini *et al*., 1995: 29; Joharchi & Moradi, 2013: 252; Dunlop *et al*., 2014: 2; Joharchi *et al*., 2015: 555; Khalili-Moghadam & Saboori, 2015: 319; Kontschán & Seeman, 2015: 21; Nemati *et al*., 2018b: 146; Trach & Khaustov, 2018: 48.

Myrmozercon ovatum Karawajew, 1909: 236 [junior synonym of *M. brevipes* by Joharchi & Moradi, 2013: 253; Joharchi *et al*., 2015: 555; Khalili-Moghadam & Saboori, 2015: 318].

Type depository. *M. brevipes*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *M. ovatum*: unspecified.

Type locality and habitat. *M. brevipes*: Bevagna, Umbria, Italy, in nests of unidentified ants [Animalia: Hymenoptera: Formicidae]; *M. ovatum*: type series; Ashkhabad, Turkmenistan, on *Myrmecocystus emergi* and *Tapinoma erraticum nigerrimum* [cited as *Tapinoma nigerrimum*, Animalia: Hymenoptera: Formicidae].

Note. *Myrmozercon brevipes* was included by Joharchi *et al*. (2015: 555) in their *Myrmozercon sensu stricto* group. Shortly before Joharchi & Moradi (2013: 253) considered *M. brevipes* to be a senior synonym of *M. ovatum*, Ghafarian *et al*. (2013: 26) had suggested the possible synonymy between those species. Referring to Ghafarian *et al*. (2013: 26) but not to Joharchi & Moradi (2013: 253), Kontschán & Seeman (2015: 30) also suggested the possible synonymy between *M. brevipes* and *M. ovatum*.

***Myrmozercon burwelli* Shaw & Seeman, 2009**

Myrmozercon burwelli Shaw & Seeman, 2009: 44.

Myrmozercon burwelli.—Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 551; Trach & Khaustov, 2018: 48; Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia; specimen number QMS 83733.

Type locality and habitat. Boombana National Park (27°24'07"S, 152°47'23"E), Queensland, Australia, in nest of *Polyrhachis* (*Campomyrma*) *flavibasis* [Animalia: Hymenoptera: Formicidae] in subtropical rainforest.

Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

***Myrmozercon chapmani* (Baker & Strandtmann, 1948)**

Myrmonyssus chapmani Baker & Strandtmann, 1948: 388.

Myrmonyssus chapmani.—Hunter & Hunter, 1963: 337; Farrier & Hennessey, 1993: 82.

Myrmozercon chapmani.—Rosario & Hunter, 1988: 470; Shaw & Seeman 2009: 55; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 556; Trach & Khaustov, 2018: 49.

Type depository. Unspecified.

Type locality and habitat. Laredo, Texas, United States of America, on orchid plants [Plantae: Asparagales: Orchidaceae] imported from Federal District, Mexico.

Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

***Myrmozercon clarus* (Hunter & Hunter, 1963)**

Myrmonyssus clarus Hunter & Hunter, 1963: 339.

Myrmozercon clarus.—Rosario & Hunter, 1988: 469; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 555; Trach & Khaustov, 2018: 48.

Myrmonyssus clarus.—Farrier & Hennessey, 1993: 82.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Athens, Georgia, United States of America, with *Crematogaster clara* [Animalia: Hymenoptera: Formicidae] under the bark of a pine log.
Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 48) in their *Myrmozercon sensu stricto* group.

***Myrmozercon crinitus* Joharchi, 2013**
Myrmozercon crinitus Joharchi, in Joharchi & Moradi, 2013: 245.
Myrmozercon crinitus.—Joharchi *et al*., 2015: 555; Nemati *et al*., 2018b: 146; Trach & Khaustov, 2018: 48.
Myrmozercon crinitis [sic].—Joharchi *et al*., 2015: 556.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran.
Type locality and habitat. 1550 m above sea level, Karaj (35°48'N, 50°59'E), Alborz, Iran, on *Pheidole pallidula* [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 555) in *Myrmozercon sensu lato*.

***Myrmozercon cyrusi* Ghafarian & Joharchi, 2013**
Myrmozercon cyrusi Ghafarian & Joharchi, in Ghafarian *et al*., 2013: 23.
Myrmozercon cyrusi.—Babaeian *et al*., 2013a: 459; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 555; Nemati *et al*., 2018b: 147; Trach & Khaustov, 2018: 48.

Type depository. Acarological collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran.
Type locality and habitat. 945 m above sea level, Kenevist Rural District (36.97°N, 59.68°E), Central District, Mashhad, Khorasan Razavi, Iran, in nest of *Monomorium* sp. [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 555) in their *Myrmozercon sensu stricto* group.

***Myrmozercon diplogenius* (Berlese, 1903)**
Myrmonyssus diplogenius Berlese, 1903b: 16.
Myrmonyssus diplogenius.—Berlese, 1904c: 438; Vitzthum, 1930c: 89; Baker & Strandtmann, 1948: 388; Radford, 1950b: 22; Hunter & Hunter, 1963: 335; Castagnoli & Pegazzano, 1985: 114; Bernini *et al*., 1995: 29.
Myrmonyssus (*Myrmonyssus*) *diplogenius*.—Lombardini, 1936: 45.
Myrmozercon diplogenius.—Rosario & Hunter, 1988: 469; Shaw & Seeman, 2009: 54; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 558.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, on *Camponotus aethiops* [Animalia: Hymenoptera: Formicidae].

***Myrmozercon eidmanni* (Sellnick, 1941)**
Myrmonyssus eidmanni Sellnick, 1941: 221.
Myonyssus eidmanni.—Radford, 1950a: 371 (*lapsus calami*, according to Furman & Tipton, 1955: 179).
Myrmonyssus eidmanni.—Hunter & Hunter, 1963: 336.
Myrmozercon eidmanni.—Rosario & Hunter, 1988: 470; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 556, 2017a: 728; Trach & Khaustov, 2018: 48.

Type depository. Unspecified.
Type locality and habitat. Botonós, Bioko (cited as Fernando Poo), Equatorial Guinea, in nest of *Crematogaster impressa* [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 556) and Trach & Khaustov (2018: 48) in their *Myrmozercon sensu stricto* group.

***Myrmozercon hunteri* Joharchi *et al*., 2015**

Myrmozercon hunteri Joharchi, Babaeian & Seeman, 2015: 550.

Myrmozercon hunteri.—Nemati *et al*., 2018b: 147; Trach & Khaustov, 2018: 47; Joharchi *et al*., 2018b: 312; Joharchi & Halliday, 2020: 36.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Iran.

Type locality and habitat. 1595 m above sea level, Khoznan (36°71'N, 50°32'E), Savojbolagh, Alborz, Iran, on *Myrmica* sp. [Animalia: Hymenoptera: Formicidae].

Note. This species was included by Joharchi *et al*. (2015: 555) in *Myrmozercon sensu lato*.

***Myrmozercon iainkayi* Walter, 2003**

Myrmozercon iainkayi Walter, 2003: 83.

Myrmozercon iainkayi.—Shaw & Seeman, 2009: 51; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 551; Trach & Khaustov, 2018: 48; Halliday, 2019: internet page.

Type depository. University of Queensland Insect Collection, Department of Zoology & Entomology, The University of Queensland, Saint Lucia, Queensland, Australia.

Type locality and habitat. Bundaberg, Queensland, Australia, on *Polyrhachis* sp. [Animalia: Hymenoptera: Formicidae] in arboreal leaf nest.

Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

***Myrmozercon karajensis* Joharchi *et al*., 2011**

Myrmozercon karajensis Joharchi, Halliday, Saboori & Kamali, 2011: 29.

Myrmozercon karajensis.—Joharchi & Moradi, 2013: 252; Kazemi & Rajaei, 2013: 93; Joharchi *et al*., 2015: 556; Joharchi & Halliday, 2020: 36.

Type depository. Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, [Karaj, Alborz], Iran.

Type locality and habitat. 1880 m above sea level, [Karaj, Alborz], Iran (35°55'N, 51°04'E), in nest of *Camponotus* sp. [Animalia: Hymenoptera: Formicidae].

Note. This species was included by Joharchi *et al*. (2015: 555) in *Myrmozercon sensu lato*.

***Myrmozercon liguricus* (Vitzthum, 1930)**

Myrmonyssus liguricus Vitzthum, 1930c: 90.

Myrmonyssus liguricus.—Sellnick, 1941: 221; Hunter & Hunter, 1963: 336; Bernini *et al*., 1995: 29.

Myrmozercon liguricus.—Rosario & Hunter, 1988: 470; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 557, 2017a: 728.

Type depository. Unspecified.

Type locality and habitat. Santa Margherita Ligure, Genova, Italy, on adults of *Crematogaster* (*Acrocoelia*) *scutellaris* [Animalia: Hymenoptera: Formicidae] on *Castanea vesca* [Plantae: Fagales: Fagaceae].

***Myrmozercon minor* (Sellnick, 1941)**

Myrmonyssus minor Sellnick, 1941: 225.

Myonyssus minor.—Radford, 1950a: 371 (*lapsus calami*, according to Furman & Tipton, 1955: 179).

Myrmonyssus minor.—Hunter & Hunter, 1963: 337.

Myrmozercon minor.—Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 557, 2017a: 728; Trach & Khaustov, 2018: 48.

Type depository. Unspecified.
Type locality and habitat. Botonós, Bioko (cited as Fernando Poo), Equatorial Guinea, in nest of *Crematogaster impressa* [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 557) and Trach & Khaustov (2018: 48) in their *Myrmozercon sensu stricto* group.

Myrmozercon patagonicus Trach & Khaustov, 2018

Myrmozercon patagonicus Trach & Khaustov, 2018: 42.

Type depository. Museum of Zoology, I. I. Mechnikov Odessa National University, Odessa, Ukraine; specimen number 30–10–2015/01.
Type locality and habitat. vicinity of Puerto Natales (51°56'55.2"S, 72°23'24.8"W), Patagonia, Chile, on *Camponotus* sp. [Animalia: Hymenoptera: Formicidae] collected from rotten log of *Nothofagus* sp. [Plantae: Fagales: Fagaceae].
Note. This species was included by Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

Myrmozercon rotundiscutum Rosario & Hunter, 1988

Myrmozercon rotundiscutum Rosario & Hunter, 1988: 469.
Myrmozercon rotundiscutum.—Farrier & Hennessey, 1993: 83; Shaw & Seeman, 2009: 53; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 551, 2018b: 312; Trach & Khaustov, 2018: 47.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. 2135 m above sea level, Dismal Swamp, Elmore, Idaho, United States of America, on *Camponotus* sp. [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

Myrmozercon scutellatus (Hull, 1923)

Myrmonyssus scutellatus Hull, 1923: 611.
Myrmonyssus scutellatus.—Hunter & Hunter, 1963: 336; Halliday, 1998: 129.
Myrmozercon scutellatus.—Rosario & Hunter, 1988: 470; Walter, 2003: 83; Shaw & Seeman, 2009: 53; Joharchi & Moradi, 2013: 252.; Joharchi *et al*., 2015: 558; Trach & Khaustov, 2018: 49; Halliday, 2019: internet page.

Type depository. Unspecified.
Type locality and habitat. Western Australia, Australia, with *Iridomyrmex innocens* [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 558) and Trach & Khaustov (2018: 49) in *Myrmozercon sensu lato*.

Myrmozercon spinosus (Hunter & Hunter, 1963)

Myrmonyssus spinosus Hunter & Hunter, 1963: 337.
Myrmozercon spinosus.—Rosario & Hunter, 1988: 469; Shaw & Seeman 2009: 54; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 556; Trach & Khaustov, 2018: 48.
Myrmonyssus spinosus.—Farrier & Hennessey, 1993: 83.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Lawrence, Kansas, United States of America, in nest of *Crematogaster* sp. [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 48) in their *Myrmozercon sensu stricto* group.

***Myrmozercon sternalis* Babaeian *et al*., 2013**
Myrmozercon sternalis Babaeian, Joharchi & Saboori, 2013: 454.
Myrmozercon sternalis.—Joharchi *et al*., 2015: 556; Khalili-Moghadam & Saboori, 2015: 320; Nemati *et al*., 2018b: 147.

Type depository. Acarological Collection, Jalal Afshar Zoological Museum, Faculty of Agriculture, University of Tehran, Karaj, [Alborz], Iran.
Type locality and habitat. 1124 m above sea level, Najm Abad (35°52'N, 50°30'E), Karaj, [Alborz], Iran, in nest of *Formica* sp. [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 555) in *Myrmozercon sensu lato*.

***Myrmozercon tauricus* Trach & Khaustov, 2011**
Myrmozercon tauricus Trach & Khaustov, 2011: 23.
Myrmozercon tauricus.—Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 555, 2017a: 728.

Type depository. Museum of Zoology, I. I. Mechnikov National University of Odessa, Odessa, Ukraine; specimen number 19–02–2000/01.
Type locality and habitat. "Cape Martyan" Nature Reserve, Crimea, Ukraine, in nest of *Crematogaster schmidti* [Animalia: Hymenoptera: Formicidae] under bark of *Pinus pallasiana* [Plantae: Pinales: Pinaceae].
Note. This species was included by Joharchi *et al*. (2015: 555) in their *Myrmozercon sensu stricto* group. Specimens reported as *M. tauricus* by Joharchi & Moradi (2013: 250) were re-identified as *Myrmozercon brachytrichos* Joharchi, Arjomandi & Trach by Joharchi *et al*. (2017a: 726).

***Myrmozercon titan* (Berlese, 1916)**
Myrmonyssus titan Berlese, 1916b: 171.
Myrmonyssus titan.—Vitzthum, 1930c: 89; Hunter & Hunter, 1963: 336; Castagnoli & Pegazzano, 1985: 417.
Myrmonyssus (*Myrmonyssus*) *titan*.—Lombardini, 1936: 45.
Myrmozercon titan.—Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 559; Trach & Khaustov, 2018: 48.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, associated with unidentified ants [Animalia: Hymenoptera: Formicidae].
Note. This species was included by Joharchi *et al*. (2015: 559) and Trach & Khaustov (2018: 48) in *Myrmozercon sensu lato*.

***Myrmozercon yemeni* (Ueckermann & Loots, 1995)**
Parabisternalis yemeni Ueckermann & Loots, 1995: 36.
Parabisternalis yemeni.—Shaw & Seeman, 2009: 54.
Myrmozercon yemeni.—Trach & Khaustov, 2011: 26; Joharchi & Moradi, 2013: 252; Joharchi *et al*., 2015: 555; Trach & Khaustov, 2018: 48.

Type depository. Agricultural Research Council Plant Health and Protection Biosystematics: National Collection of Arachnida, ARC-PPRI, Queenswood (cited as National Collection of Acari, Plant Protection Research Institute), Pretoria, South Africa.

Type locality and habitat. Al Kowd (13.23°N, 44.07°E), Yemen, from malaise trap.
Note. This species was included by Joharchi *et al*. (2015: 555) and Trach & Khaustov (2018: 48) in their *Myrmozercon sensu stricto* group.

Narceolaelaps **Kethley, 1978**
Narceolaelaps Kethley, 1978: 195 (type species: *Narceolaelaps annularis* Kethley, 1978, by original designation).
Narceolalelaps [sic].—Casanueva & Johnston, 1992b: 58.
Narceolaelaps.—Casanueva, 1993: 41.

Note. This genus was described in Laelapidae-Hypoaspidinae.

Narceolaelaps americanus **Kethley, 1978**
Narceolaelaps americanus Kethley, 1978: 200.
Narceolaelaps americanus.—Farfan & Klompen, 2012: 72.

Type depository. Field Museum of Natural History, Chicago, Illinois, United States of America.
Type locality and habitat. Chimney Rock State Park, Henderson, North Carolina, United States of America, on *Narceus americanus* [Animalia: Spirobolida: Spirobolidae].

Narceolaelaps annularis **Kethley, 1978**
Narceolaelaps annularis Kethley, 1978: 196.
Narceolaelaps annularis.—Farfan & Klompen, 2012: 72.

Type depository. Field Museum of Natural History, Chicago, Illinois, United States of America.
Type locality and habitat. Indiana Dunes State Park, Porter, Indiana, United States of America, on *Narceus annularis* [Animalia: Spirobolida: Spirobolidae].

Narceolaelaps burdicki **Kethley, 1978**
Narceolaelaps burdicki Kethley, 1978: 206.
Narceolaelaps burdicki.—Farfan & Klompen, 2012: 72.

Type depository. Field Museum of Natural History, Chicago, Illinois, United States of America.
Type locality and habitat. San Joaquin Experimental Range, United States Department of Agriculture, Madura, California, United States of America, on *Tylobolus* sp. [Animalia: Spirobolida: Spirobolidae].

Narceolaelaps gordanus **Kethley, 1978**
Narceolaelaps gordanus Kethley, 1978: 202.
Narceolaelaps gordanus.—Farfan & Klompen, 2012: 72.

Type depository. Field Museum of Natural History, Chicago, Illinois, United States of America.
Type locality and habitat. Jacksonville, Florida, United States of America, on *Narceus gordanus* [Animalia: Spirobolida: Spirobolidae].

Neoberlesia **Berlese, 1892**
Neoberlesia Berlese, 1892a: 5 (type species: *Neoberlesia equitans* Berlese, 1892, by monotypy).
Neoberlesia.—Oudemans, 1901: 63; 1902e: 293; Berlese, 1892f: 32; 1904c: 442, 1913b: 10; Banks, 1915a: 80;

Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Baker & Wharton, 1952: 95; Casanueva, 1993: 40.

Note. This genus was not assigned to a family in the original description, but reported in Laelapidae by Berlese (1904c: 443) and included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 764).

***Neoberlesia equitans* Berlese, 1892**

Neoberlesia equitans Berlese, 1892a: 5.

Neoberlesia equitans.—Moniez, 1892: 380; Wasmann, 1894: 198; Leonardi, 1897: 865; Berlese, 1904c: 443; Lombardini, 1936: 45; Radford, 1950b: 23; Castagnoli & Pegazzano, 1985: 132; Bernini *et al*., 1995: 29.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Portici, Naples, Italy, on unidentified ants [Animalia: Hymenoptera: Formicidae] and in their nest.

***Neohypoaspis* Delfinado-Baker *et al*., 1983**

Neohypoaspis Delfinado-Baker, Baker & Roubik, 1983: 197 (type species: *Neohypoaspis ampliseta* Delfinado-Baker, Baker & Roubik, 1983, by monotypy).

Neohypoaspis.—Casanueva, 1993: 40; Farrier & Hennessey, 1993: 83; OConnor & Klimov, 2012a,c: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Neohypoaspis ampliseta* Delfinado-Baker *et al*., 1983**

Neohypoaspis ampliseta Delfinado-Baker, Baker & Roubik, 1983: 197.

Neohypoaspis ampliseta.—Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 83; OConnor & Klimov, 2012c: internet page; Klimov *et al*., 2016: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number USNM 4056.
Type locality and habitat. 22 km northeast of Chepo, Panama province, Panama, in nest of *Trigona* (*Trigona*) *hypogea* [Animalia: Hymenoptera: Apidae].

***Nidilaelaps* Shaw, 2012**

Nidilaelaps Shaw, 2012: 26 (type species: *Gymnolaelaps annectans* Womersley, 1955, by original designation).
Gymnolaelaps.—Domrow, 1988: 825.
Nidilaelaps.—Halliday, 2019: internet page.

Note. *Nidilaelaps* was described in Laelapidae. Shaw (2012: 26) was uncertain about the subfamilial placement of this genus, stating that the phoretic association with vertebrates relates it to Laelapinae (although some Hypoaspidinae species are also vertebrate associates), whereas the seemingly predatory behaviour relates it to Hypoaspidinae. The strong chelicerae with well-developed teeth also suggest mostly a predatory habit (Radovsky, 1985: 450). We include this genus in this catalogue because there is no evidence that these species are vertebrate parasites.

***Nidilaelaps annectans* (Womersley, 1955)**

Gymnolaelaps annectans Womersley, 1955: 419.

Gymnolaelaps annectans Womersley, 1956a: 584 (objective synonymy).

Gymnolaelaps annectans.—Domrow, 1961: 61, 1962: 274, 1963b: 201, 1967: 769, 1973: 63, 1977: 187, 1988: 828; Farrier & Hennessey, 1993: 73; Joharchi *et al*., 2011: 25.

Hypoaspis (*Gaeolaelaps*) *nidicorva* Evans & Till, 1965a: 288 (*nomen nudum*, ICZN Article 13.1).

Hypoaspis nidicorva Evans & Till, 1966: 179 [junior synonym of *G. annectans* by Domrow, 1973: 63; Tenorio, 1982: 268; Farrier & Hennessey, 1993: 73; Shaw, 2012: 28; Joharchi & Halliday, 2013: 48].

Pseudoparasitus annectans.—Hunter, 1966a: 12; Halliday, 1998: 129; Beaulieu *et al*., 2010: Table S1.

Hypoaspis nidicorva.—Shcherbak, 1971b: 78.

Hypoaspis (*Gymnolaelaps*) *nidicorva*.—Bregetova, 1977b: 524; Sklyar, 2001: 101.

Hypoaspis (*Holostaspis*) *nidicorva*.—Karg, 1978b: 14.

Pseudoparasitus (*Gymnolaelaps*) *annectans*.—Karg, 1978a: 206, 1981b: 218, 1989b: 334; Tenorio, 1982: 268; Radovsky, 1985: 450; Tenorio *et al*., 1985: 301.

Hypoaspis (*Laelaspis*) *nidicorva*.—Karg, 1979: 101, 1982: 249, 1989c: 120, 1993a: 159.

Gymnolaelaps nidicorva.—Joharchi *et al*., 2012a: 2013.

Nidilaelaps annectans.—Shaw, 2012: 28; Halliday, 2019: internet page; Joharchi *et al*., 2021b: 280.

Type depository. *G. annectans*: South Australian Museum, Adelaide, Australia; *H. nidicorva*: Natural History Museum, London, England; specimen number 1965: 12: 29: 27.

Type locality and habitat. *G. annectans*: Fisher Island, Bass Strait, Australia, in nesting material in burrows of *Puffinus tenuirostris* [Animalia: Procelariiformes: Procellariidae]; *H. nidicorva*: Wookey Hole, Somerset, England, in nest of jackdaw [*Corvus*; Animalia: Passeriformes: Corvidae].

Note. Domrow (1957: 208) had considered the taxonomic status of *G. annectans* as uncertain. Joharchi *et al*. (2012a: 2013) excluded *H. nidicorva* from *Laelaspis* because it lacked the characteristic ornamentation of the epigynal shield, indicating that it appeard to be a species of *Gymnolaelaps*.

***Nidilaelaps holdsworthi* Shaw, 2012**

Nidilaelaps holdsworthi Shaw, 2012: 32.

Nidilaelaps holdsworthi.—Halliday, 2019: internet page.

Type depository. Tasmanian Museum & Art Gallery, Hobart, Australia.

Type locality and habitat. Melaleuca (43°25'11"S, 146°09'44"E), Tasmania, Australia, in nest of *Neophema chrysogaster* [Animalia: Psittaciformes: Psittaculidae].

***Nidilaelaps lisae* Shaw, 2012**

Nidilaelaps lisae Shaw, 2012: 36.

Nidilaelaps lisae.—Halliday, 2019: internet page.

Type depository. Bernice Pauahi Bishop Museum, Honolulu, Hawaii.

Type locality and habitat. 1500 m above sea level, Wau Creek, Morobe province, Papua New Guinea, on *Rallicula forbesi* [Animalia: Gruiformes: Rallidae] (BBM-NG27546).

***Ololaelaps* Berlese, 1904**

Ololaelaps Berlese, 1904a: 260 (type species: *Laelaps* (*Hypoaspis*) *venetus* Berlese, 1903, by original designation).

Hypoaspis.—Canestrini, 1885: 55 (in part); Hughes, 1948: 129 (in part).

Laelaps (*Hypoaspis*) Canestrini.—Berlese, 1903b: 14 (in part) (non *Hypoaspis* Canestrini, according to Berlese, 1904a: 260). *Laelaps*.—Ewing, 1909: 64 (in part).

Ololaelaps.—Berlese, 1913b: 10; Vitzthum, 1931c: 143, 1942: 763; Sellnick, 1940: 66, 1961: 84; Radford, 1950b:

22; Evans, 1957a: 220; Piryanik, 1962: 98; Ryke, 1962: 124; Bregetova & Koroleva, 1964: 62; Evans & Till, 1965a: 261, 1966: 228, 1979: 200; Karg, 1965: 271, 2000: 248; Athias-Henriot, 1968: 241; Bregetova, 1977b: 536; Zaher, 1986: 178; Casanueva, 1993: 40, Farrier & Hennessey, 1993: 83; Ma, 2015: 95; Keum *et al*., 2017: 500; Hajizadeh & Joharchi, 2018: 23; Joharchi *et al*., 2018a: 29; Beaulieu *et al*., 2019: 6; Halliday, 2019: internet page; Nemati *et al*., 2021: 185.

Ololaelaps (*Cypholaelaps*) Berlese, 1916.—Baker & Wharton, 1952: 95.

Ololaelaps (*Ololaelaps*).—Vitzthum, 1942: 763; Baker & Wharton, 1952: 95; Karg, 2000: 248.

Pristolaelaps Womersley, 1956a: 571 (type species: *Pristolaelaps tasmanicus* Womersley, 1956, by monotypy) [junior synonym of *Ololaelaps* by Ryke, 1962: 124; Bregetova & Koroleva, 1964: 63; Evans & Till, 1966: 228; Bregetova, 1977b: 536; Zaher, 1986: 178; Farrier & Hennessey, 1993: 83; Halliday, 1998: 129; Beaulieu *et al*., 2019: 6].

Pristolaelaps.—Athias-Henriot, 1968: 241.

Pseudoparasitus (*Ololaelaps*).—Karg, 1971: 159, 1978a: 205, 1981b: 209, 1993a: 133.

Ololaelaps (*Pristolaelaps*).—Karg, 2000: 248.

Pristolaelaps.—Ma, 2015: 95; Womersley, 1960b: 33.

Note. *Ololaelaps* was not assigned to a family in the original description, but it was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763) and in Laelapidae-Laelapinae by Evans & Till (1979: 200); *Pristolaelaps* was described in Laelapidae-Laelapinae. Radford (1950b: 20) considered *Ololaelaps* Berlese, 1904a (probably a *lapsus calami* for *Oolaelaps* Berlese, 1904c) a junior synonym of *Holostaspis*. Oudemans (1936: 217) and Evans (1957a: 220) presumed *Ololaelaps* to be a junior synonym of *Hyletastes* Gistel, 1848 [erroneously cited by Evans as *Hyletastea* Gistel, 1884]. Vitzthum (1942: 765) created Hyletastinae, a subfamily that included *Melittiphis* Berlese, 1918 and other genera placed today in Eviphididae and Macrochelidae. Hyletastinae was considered junior synonym of Eviphididae by Bregetova (1973: 264).

Ololaelaps bregetovae Shereef & Soliman, 1980

Ololaelaps bregetovae Shereef & Soliman, 1980: 81.

Ololaelaps bregetovae.—Zaher, 1986: 179, El-Banhawy *et al*., 2006: 66; Babaeian *et al*., 2019b: 361; Beaulieu *et al*., 2019: 4.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.
Type locality and habitat. Giza, Egypt, in debris.

Ololaelaps burdwanensis Bhattacharyya, 1978

Ololaelaps burdwanensis Bhattacharyya, 1978: 86.

Ololaelaps burdwanensis.—Beaulieu *et al*., 2019: 4.

Type depository. Presumably at Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India.
Type locality and habitat. Burdwan, West Bengal, India, in soil under grass beside pond.

Ololaelaps caucasicus Bregetova & Koroleva, 1964

Ololaelaps caucasicus Bregetova & Koroleva, 1964: 73.

Ololaelaps caucasica.—Bregetova, 1977b: 539; Beaulieu *et al*., 2019: 4.

Ololaelaps caucasicus.—Babaeian *et al*., 2019b: 362.

Type depository. Zoological Institute of the Academy of Science of the USSR, Leningrad, Russia.
Type locality and habitat. Type series, vicinity of Kizlyar, Dagestan, Russia, on fallen rotting foliage of *Elaeagnus* [Plantae: Rosales: Elaeagnaceae] thickets, and Erevan, Armenia, in litter under an ash [*Fraxinus* sp.; Plantae: Lamiales: Oleaceae] tree.

Note. Babaeian *et al*. (2019: 362) considered that *O. caucasicus* could be a senior synonym of *Ololaelaps ussuriensis* Bregetova & Koroleva.

***Ololaelaps dililoensis* Marais & Loots, 1972**
Ololaelaps dililoensis Marais & Loots, 1972: 31.
Ololaelaps dililoensis.—Jordaan & Loots, 1987: 49; Beaulieu *et al*., 2019: 4.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium.
Type locality and habitat. Eala, Democratic Republic of the Congo (cited as Congo), in soil.

***Ololaelaps elongatus* Babaeian, 2019**
Ololaelaps elongatus Babaeian, in Babaeian *et al*., 2019b: 357.

Type depository. Jalal Afshar Zoological Museum, Department of Plant Protection, College of Agriculture, University of Tehran, Karaj, [Alborz], Iran.
Type locality and habitat. 1345 m above sea level, Marivan-Saghez (35°32'N, 46°18'E), Kurdestan, Iran, in detritus.

***Ololaelaps expansus* (Ma, 2015)**
Pristolaelaps expansus Ma, 2015: 95.
Ololaelaps expansus.—Beaulieu *et al*., 2019: 4.

Type depository. Medical Entomology Gallery, Institute of Microbiology and Epidemiology, Academy of Military Medical Sciences, Beijing, China.
Type locality and habitat. Tainan (23°19'N, 120°18'E), Taiwan, in soil.

***Ololaelaps formidabilis* Berlese, 1913**
Ololaelaps formidabilis Berlese, 1913a: 82.
Ololaelaps formidabilis.—Lombardini, 1936: 45; Ryke, 1962: 126; Castagnoli & Pegazzano, 1985: 151; Beaulieu *et al*., 2019: 4.
Pseudoparasitus (*Ololaelaps*) *formidabilis*.—Karg, 1978a: 210, 1981b: 211.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Samarang, Java, Indonesia, from unspecified substrate.

***Ololaelaps hemisphaera* Berlese, 1916**
Ololaelaps hemisphaera Berlese, 1916c: 303.
Ololaelaps hemisphaera.—Ryke, 1962: 125; Castagnoli & Pegazzano, 1985: 177; Hennessey & Farrier, 1988: 32; Beaulieu *et al*., 2019: 4.
Pseudoparasitus (*Ololaelaps*) *hemisphaerus*.—Karg, 1978a: 210, 1981b: 211, 1993a: 134.
Ololaelaps hemisphaerus.—Farrier & Hennessey, 1993: 83.
Pseudoparasitus hemisphaerus.—Karg, 1994: 186.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. "Columbia", United States of America (cited as N. A.), in litter.
Note. Ryke (1962:125) inadvertently reported Sellnick (1940: 69) as having redescribed *Ololaelaps hemisphaera* Berlese, whereas Sellnick was actually referring to *Iphis haemisphaericus* Koch, which he cited as *Ololaelaps haemisphaericus* (C.L. Koch).

***Ololaelaps holaspis* (Oudemans, 1902)**
Hypoaspis holaspis Oudemans, 1902c: 53.
Hypoaspis holaspis.—Oudemans, 1903d: 11; Buitendijk, 1945: 296.
Ololaelaps holaspis.—Ryke, 1962: 126; Castagnoli & Pegazzano, 1985: 184; Beaulieu *et al*., 2019: 4.
Pseudoparasitus (*Ololaelaps*) *holaspis*.—Karg, 1978a: 211, 1981b: 211, 1993a: 134.

Type depository. Unspecified.
Type locality and habitat. Italy, from unspecified substrate.

***Ololaelaps interruptus* (Karg, 1994)**
Pseudoparasitus interruptus Karg, 1994: 186.
Ololaelaps interruptus.—Moreira, 2014: 333; Beaulieu *et al*., 2019: 4.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 620 m above sea level, Cerro Bandera, 4 km northeast of Santa Rosa, Santa Cruz, Galapagos Islands, in litter of *Miconia* sp. (Plantae: Myrtales: Melastomataceae) in a cave.

***Ololaelaps leptochelae* (Karg, 1994)**
Pseudoparasitus leptochelae Karg, 1994: 187.
Ololaelaps leptochelae.—Moreira, 2014: 333.
Ololaelaps leptochelae.—Beaulieu *et al*., 2019: 4.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 730 m above sea level, near Puntudo, Santa Cruz, Galapagos Islands, Pteridophyta-Cyperaceae zone, in moist litter.

***Ololaelaps mooiensis* Ryke, 1962**
Ololaelaps mooiensis Ryke, 1962: 126.
Ololaelaps mooiensis.—Marais & Loots, 1972: 34; Jordaan & Loots, 1987: 49; Halliday, 2005: 36; Kazemi & Rajaei, 2013: 93; Hasanvand *et al*., 2014a: 96; Khalili-Moghadam & Saboori, 2015: 320; Nemati *et al*., 2018b: 147; Babaeian *et al*., 2019b: 361; Beaulieu *et al*., 2019: 4.
Pseudoparasitus (*Ololaelaps*) *mooiensis*.—Karg, 1978a: 210, 1981b: 211.
Ololaelaps gamagarensis Jordaan & Loots, 1987: 49 [junior synonym of *O. mooiensis* by Nemati *et al*., 2018b: 147; Beaulieu *et al*., 2019: 4].
Ololaelaps gamagarensis.—Ramroodi *et al*., 2015a: 79; Hajizadeh & Joharchi, 2018: 23.

Type depository. *O. mooiensis*: Institute for Zoological Research, Potchefstroom University, South Africa; *O. gamagarensis*: Zoology Department, Potchefstroom University for Cristian Higher Education, Potchefstroom, South Africa.
Type locality and habitat. *O. mooiensis*: Mooi River, Potchefstroom, South Africa, in wet top soil layer; *O. gamagarensis*: on the banks of the Gamagara River, Sishen, Northern Cape, South Africa, in soil underneath grasses and reeds.

***Ololaelaps nasri* Hassan, 1989**
Ololaelaps nasri Hassan, 1989: 593.
Ololaelaps nasri.—Beaulieu *et al*., 2019: 4.

Type depository. Unspecified.
Type locality and habitat. Kafr Shokr, Qualiobia, Egypt, in litter under citrus [Plantae: Sapindales: Rutacae] trees.

***Ololaelaps obovata* (Womersley, 1960)**
Pristolaelaps obovata Womersley, 1960b: 33.
Ololaelaps obovatus.—Halliday, 1998: 129; Beaulieu *et al*., 2019: 5.
Ololaelaps obovata.—Babaeian *et al*., 2019b: 356; Halliday, 2019: internet page.

Type depository. South Australian Museum, Adelaide, Australia.
Type locality and habitat. Koroit, Victoria, Australia, from unspecified substrate.

***Ololaelaps placentula* (Berlese, 1887)**
Laelaps placentula Berlese, 1887d: 3.
Laelaps placentula.—Berlese, 1892f: 35.
Hypoaspis placentula.—Oudemans, 1902d: 23, 1903a: 129; Buitendijk, 1945: 296.
Laelaps (*Hypoaspis*) *placentula*.—Berlese, 1903b: 14.
Ololaelaps placentula.—Berlese, 1904a: 261; Hull, 1918: 66; Falconer, 1923: 274; Sellnick, 1940: 69, 1958: 24; Cooreman, 1943: 24; Bregetova, 1953: 310, 1977b: 539; Willmann, 1954b: 225; Sellnick, 1958: 24; Halašková & Kunst, 1961: 23; Ryke, 1962: 125; Bregetova & Koroleva, 1964: 70; Evans & Till, 1965a: 276, 1966: 235; Karg, 1965: 312; Lapinya, 1970: 278, 1976: 58; Castagnoli & Pegazzano, 1985: 325; Hassan, 1989: 593; Bernini *et al*., 1995: 29; Gwiazdowicz & Klemt, 2004: 14; Gwiazdowicz & Gulvik, 2005: 120; Kazemi & Rajaei, 2013: 93; Skorupski *et al*., 2013: 11; Telnov & Salmane, 2015: 130; Joharchi *et al*., 2018a: 32; Nemati *et al*., 2018b: 148; Babaeian *et al*., 2019b: 362; Beaulieu *et al*., 2019: 5; Kazemi, 2020: 137.
Ololaelaps confinis Berlese, 1904a: 261 [junior synonym of *L. placentula* by Ryke, 1962: 125; Evans & Till, 1966: 235; Joharchi *et al*., 2018a: 33; Beaulieu *et al*., 2019: 4].
Ololaelaps confinis.—Hull, 1918: 66; Lombardini, 1936: 45; Castagnoli & Pegazzano, 1985: 84.
placentula; *non-Laelaps* [sic].—Tipton, 1960: 304.
Pseudoparasitus (*Ololaelaps*) *placentulus*.—Karg, 1971: 161, 1978a: 210, 1981b: 211, 1993a: 134.
Ololaelaps placentulus.—Niedbała *et al*., 1982: 247, 1990: 32; Farrier & Hennessey, 1993: 83; Bai & Ma, 2014: 29.
Pseudoparasitus placentula.—Kůrka, 2005: 26.
Pseudoparasitus placentulus.—Kontschán *et al*., 2015a: 35, 2016a: 30.

Type depository. *L. placentula* and *O. confinis*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. *L. placentula*: Vallombrosa, Florence, Italy, in moss [cited as "muscis"]; *O. confinis*: Norway, from unspecified substrate.
Note. Oudemans (1902e: 289) considered *L. placentula* to be a junior synonym of *Iphis globulus* Koch, 1840, but subsequent authors considered them to be different species; the latter interpretation is adopted in this publication. Oudemans (1906: 99) considered *L. placentula* to be a junior synonym of *Iphis pyrobolus* Koch (taken by some authors, apparently erroneously, as the type species of *Eviphis*, Eviphididae, as discussed by Mašán & Halliday, 2010). It was also considered by Oudemans (1906: 99, 1936: 216) to be a junior synonym of *Iphis haemisphaericus* Koch (designated by Berlese, 1914: 142 as type species of *Gamasiphis* (*Periphis*), junior synonym of *Stylochyrus* G. & R. Canestrini, Ologamasidae, as reported by Castilho *et al*., 2016: 102). Specimens reported as *Laelaps* (*Ololaelaps*) *confinis* by Halbert (1915: 70) were re-identified as *O. placentula* by Luxton (1998: 20). Sellnick (1940: 69) considered *O. haemisphaericus* to be different from *O. placentula*, whereas Bregetova & Koroleva (1964: 77) described *O. sellnicki* based on the specimens called *O. haemisphaericus* by Sellnick (1940). Turk (1953: 12) considered *Zercon festivus* Koch to be a senior synonym of *I. haemisphaericus* and *L. placentula*, and considered *Eumaeus inornatus* Johnston, 1849 to be a senior synonym of *O. confinis*.

***Ololaelaps placidus* (Banks, 1895)**
Laelaps placidus Banks, 1895: 128.
Laelaps placidus.—Banks, 1907: 610.

Laelaps magnichela Ewing, 1909: 65 [junior synonym of *L. placidus* by Hennessey & Farrier, 1988: 32; Farrier & Hennessey, 1993: 84; Joharchi *et al*., 2018a: 37; Beaulieu *et al*., 2019: 4].

Laelaps flavus Ewing, 1909: 66 [junior synonym of *L. placidus* by Hennessey & Farrier, 1988: 32; Farrier & Hennessey, 1993: 84; Joharchi *et al*., 2018a: 37; Beaulieu *et al*., 2019: 4].

flavus; *non-Laelaps* [sic].—Tipton, 1960: 294.

placidus; *non-Laelaps* [sic].—Tipton, 1960: 304.

Ololaelaps placidus.—Hennessey & Farrier, 1988: 32; Farrier & Hennessey, 1993: 84; Kazemi & Rajaei, 2013: 93; Joharchi *et al*., 2018a: 37; Babaeian *et al*., 2019b: 361; Beaulieu *et al*., 2019: 5.

Pseudoparasitus placidus.—Kůrka, 2005: 26.

Type depository. *L. placidus*: unspecified; *L. magnichela* and *L. flavus*: Illinois State Laboratory of Natural History, Urbana, Illinois, United States of America.

Type locality and habitat. *L. placidus*: near Roslyn, Long Island, New York, United States of America, on wet sphagnum; *L. magnichela*: Muncie, Illinois, United States of America, in moss; *L. flavus*: Arcola, Illinois, United States of America, under logs.

Note. Babaeian *et al*. (2019b: 361) considered *O. placidus* a taxonomically doubtful species, indicating that the report of this species from Iran by Kazemi & Rajaei (2013: 93) was probably a misidentification of *Ololaelaps sellnicki* Bregetova & Koroleva. Hennessey & Farrier (1988: 32), Farrier & Hennessey (1993: 84) and Joharchi *et al*. (2018: 37) considered *L.* (*H.*) *venetus* to be a junior synonym of *O. placidus* but that interpretation was not accepted by Beaulieu *et al*. (2019: 11), and is also not accepted in this publication. Joharchi *et al*. (2018: 37) considered *Ololaelaps halaskovae* Bregetova & Koroleva to be a junior synonym of *O. placidus*, but in this publication *O. halaskovae* is considered a junior synonym of *L.* (*H.*) *venetus*.

Ololaelaps platensis Berlese, 1916

Ololaelaps platensis Berlese, 1916b: 166.

Ololaelaps platensis.—Lombardini, 1936: 45; Ryke, 1962: 125; Castagnoli & Pegazzano, 1985: 326; Beaulieu *et al*., 2019: 5.

Pseudoparasitus (*Ololaelaps*) *platensis*.—Karg, 1978a: 210, 1981b: 211, 1993b: 269.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.

Type locality and habitat. La Plata, Argentina, from unspecified substrate.

Ololaelaps rectagoni (Karg, 1993)

Pseudoparasitus (*Ololaelaps*) *rectagoni* Karg, 1993b: 269.

Pseudoparasitus rectagoni.—Karg, 1994: 188.

Ololaelaps rectagoni.—Moreira, 2014: 338; Beaulieu *et al*., 2019: 5.

Type depository. Museum für Naturkunde, Berlin, Germany.

Type locality and habitat. San Christobal, South of Wreck Bay, Galapagos Islands, in moist and salty litter.

Ololaelaps sellnicki Bregetova & Koroleva, 1964

Ololaelaps sellnicki Bregetova & Koroleva, 1964: 77.

Ololaelaps haemisphericus (Koch).—Sellnick, 1940: 69 (misidentification, according to Reitblat, 1963: 75; Bregetova & Koroleva, 1964: 77; Evans & Till, 1966: 231; Farrier & Hennessey, 1993: 84).

Ololaelaps sellnicki.—Evans & Till, 1966: 231; Athias-Henriot, 1968: 249; Solomon, 1968b: 675; Beron, 1974: 175; Lapinya, 1970: 278, 1976: 62; Bregetova, 1977b: 541; Farrier & Hennessey, 1993: 84; Bernini *et al*., 1995: 29; Sklyar, 2001: 102; Marchenko, 2002: 45; Makarova, 2014: 1406; Kavianpour *et al*., 2017: 164; Babaeian *et al*., 2019b: 362; Beaulieu *et al*., 2019: 5.

Ololaelaps (*Cypholaelaps*) *haemisphericus* Berlese, 1916: 166 [synonym of *O. sellnicki* by Karg, 1971: 162].

Pseudoparasitus (*Ololaelaps*) *sellnicki*.—Karg, 1971: 161, 1978a: 209, 1981b: 211, 1993a: 134.
Pseudoparasitus sellnicki.—Kůrka, 2005: 26.
Ololaelaps sellnicki.—Skorupski *et al*., 2013: 11

Type depository. Unspecified.
Type locality and habitat. Barkarstadir, Fljotshlid, Iceland, in boggy meadows.
Note. This species was described based on specimens identified by Sellnick (1940: 69) as *O. haemisphaericus* Koch. Based on the comments of Bregetova & Koroleva (1964: 63), specimens reported as *Ololaelaps haemisphaericus* and *O. hemisphaericus* by Franz & Beier (1948: 447, 452), Willmann (1949: 116, 1950: 186, 1952a: 146, 1954b: 225, 1956: 222), Halašková & Kunst (1961: 24) and Reitblat (1963: 75) seem to refer to *O. sellnicki*. Ryke (1962: 125) inadvertently reported that Sellnick (1940: 69) had redescribed *Ololaelaps hemisphaera* Berlese, 1916, whereas Sellnick actually referred to specimens from Iceland that he identified as *Ololaelaps haemisphaericus* (C.L. Koch). Bregetova & Koroleva (1964: 63) pointed out the existence of the name *Ololaelaps* (*Cypholaelaps*) *haemisphaericus* Berlese, 1916, and proposed the name "*O. sellnicki* nom. nov." to apply to Sellnick's specimens from Iceland. However, that action is not valid, because the term "nom. nov." refers to a "name established expressly to replace an already established name" (ICZN 1999, Glossary), and in this case, the situation is more complex (the name *haemisphaericus* Koch also applies to a species of Ologamasidae). Beaulieu *et al*. (2019: 11) reviewed the confusion surrounding the specific name *haemisphaericus* and proposed a possible nomenclatural solution.

According to Bregetova & Koroleva (1964: 63), *Ololaelaps venetus* (Berlese) could be a senior synonym of *O. sellnicki* or of *O. halaskovae*. Babaeian *et al*. (2019b: 361) considered that the report of *O. placidus* from Iran by Kazemi & Rajaei (2013: 93) was probably a misidentification of *O. sellnicki*.

Ololaelaps sinensis Berlese, 1923

Ololaelaps venetus var. *sinensis* Berlese, 1923a: 252.
Ololaelaps sinensis.—Ryke, 1962: 126; Bai *et al*., 1996: 74; Ma, 2016b: 95; Beaulieu *et al*., 2019: 5.
Ololaelaps ussuriensis Bregetova & Koroleva, 1964: 75 [junior synonym of *O. sinensis* by Ma, 2016b: 95].
Ololaelaps ussuriensis.—Bregetova, 1977b: 539; Bai *et al*., 1996: 74; Ma *et al*., 2002: 117; Marchenko, 2002: 45; Ma & Yin, 2004: 117; Ren & Guo, 2008: 329, 2009: 101; Mahjoori *et al*., 2014: 1603; Hajizadeh & Joharchi, 2018: 23; Nemati *et al*., 2018b: 148; Beaulieu *et al*., 2019: 5.
Pseudoparasitus (*Ololaelaps*) *sinensis*.—Karg, 1978a: 210, 1981b: 211.
Ololaelaps venetus var. *sinensis*.—Castagnoli & Pegazzano, 1985: 385

Type depository. *O. venetus* var. *sinensis*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *O. ussuriensis*: Zoological Institute of the Academy of Science of the USSR, Leningrad, Russia.
Type locality and habitat. *O. venetus* var. *sinensis*: near Beijing, China, from unspecified substrate; *O. ussuriensis*: type series, Lesozavodsk and Pokrovka, Primorsky Territory, Russia, on *Apodemus agrarius* [Animalia: Rodentia: Muridae]; Pad'Buyanikha, Russia, in nest of *Microtus fortis* [Animalia: Rodentia: Cricetidae]; Ussuriysk, Russia, on *Cricetulus barabensis* [Animalia: Rodentia: Cricetidae] and on *A. agrarius*; Kraskino, Russia, on *M. fortis*; Russkiy Island, Russia, in nest of *M. fortis*.
Note. Babaeian *et al*. (2019b: 362) considered that *Ololaelaps caucasicus* could be a senior synonym of *O. ussuriensis*.

Ololaelaps sitalaensis Bhattacharyya, 1978

Ololaelaps sitalaensis Bhattacharyya, 1978: 84.
Ololaelaps sitalaensis.—Beaulieu *et al*., 2019: 5.

Type depository. Presumably at Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India.
Type locality and habitat. Sonarpur, Sitala, 24 Parganas, West Bengal, India, in soil and litter under decaying *Pistia striatotes* [Plantae: Alismatales: Araceae] at the margin of a pond.

***Ololaelaps tasmanicus* (Womersley, 1956)**

Pristolaelaps tasmanicus Womersley, 1956a: 571.

Pristolaelaps tasmanicus.—Womersley, 1960b: 35.

Ololaelaps tasmanicus.—Ryke, 1962: 126; Bhattacharyya, 1978: 86; Farrier & Hennessey, 1993: 84; Halliday, 1998: 129, 2019: internet page; Babaeian *et al*., 2919b: 352; Beaulieu *et al*., 2019: 5; Joharchi & Negm, 2020: 503; Kazemi, 2020: 137.

Ololaelaps paratasmanicus Ryke, 1962: 127 [junior synonyny by Babaeian *et al*., 2019b: 352).

Ololaelaps paratasmanicus.—Spain & Luxton, 1971: 186; Beaulieu *et al*., 2019: 5.

Pseudoparasitus (*Ololaelaps*) *paratasmanicus*.—Karg, 1978a: 211, 1981b: 211.

Pseudoparasitus (*Ololaelaps*) *tasmanicus*.—Karg, 1978a: 211, 1981b: 211; Tenorio, 1982: 271; Tenorio *et al*., 1985: 301.

Pseudoparasitus tasmanicus.—Kůrka, 2005: 26.

Pristolaelaps paratasmanicus.—Ma, 2015: 96.

Type depository. *P. tasmanicus*: South Australian Museum, Adelaide, Australia; *O. paratasmanicus*: Arachnida Section, Natural History Museum, London, England.

Type locality and habitat. *P. tasmanicus*: Tasmania, intercepted at Burnley Plant Research Laboratory, Burnley, Victoria, Australia, on strawberry [*Fragaria* sp.; Plantae: Rosales: Rosaceae] plants; *O. paratasmanicus*: Allan's Bay, Dunedin, New Zealand, on bracken [Plantae: Polypodiales: Dennstaedtiaceae].

***Ololaelaps translineatus* (Barilo, 1991)**

Pseudoparasitus (*Ololaelaps*) *translineatus* Barilo, 1991: 15.

Ololaelaps translineatus.—Moreira, 2014: 340; Beaulieu *et al*., 2019: 5.

Type depository. Institute of Zoology, Kiev, Ukraine; specimen number G-79.

Type locality and habitat. Baisun, Surkhan-Darja, Uzbekistan, in turf of parkland.

***Ololaelaps venetus* (Berlese, 1903)**

Laelaps (*Hypoaspis*) *venetus* Berlese, 1903b: 14.

Laelaps tumidulus Koch.—G. & R. Canestrini, 1882a: 70; Berlese, 1892f: 35 (misidentifications, according to Berlese, 1903b: 14).

Hypoaspis tumidulus Koch.—Canestrini, 1885: 87 (misidentification, according to Berlese, 1903b: 14); Oudemans (1902d: 23, 1903a: 129) and Buitendijk (1945: 297).

Laelaps tumidulus (Koch) G. & R. Can. [sic].—Berlese, 1889b: 5 (misidentification, according to Berlese, 1903b: 14; Evans & Till, 1966: 231; Karg, 1971: 162, 1993a: 133; Bernini *et al*., 1995: 29).

Ololaelaps venetus.—Berlese, 1904a: 260; Hull, 1918: 66; Balogh, 1938: 74, Schweizer, 1949: 41, 1961: 84; Turk, 1953: 12; Ryke, 1962: 125; Domocoş, 1969: 112; Castagnoli & Pegazzano, 1985: 434; Bernini *et al*., 1995: 29; Beaulieu *et al*., 2019: 5.

Laelaps (*Ololaelaps*) *tumidulus*.—Halbert, 1915: 70 (misidentification, according to Luxton, 1998: 18).

Ololaelaps haemisphaericus.—Oudemans, 1929c: 477; Piryanik, 1962: 98.

Ololaelaps venustus [sic].—Lombardini, 1936: 45.

Laelaps venetus.—Radford, 1950b: 22.

venetus; *non-Laelaps* [sic].—Tipton, 1960: 309.

Ololaelaps halaskovae Bregetova & Koroleva, 1964: 81 [junior synonym of *L.* (*H.*) *venetus* by Evans & Till, 1966: 231; Bregetova, 1977b: 541; Karg, 1971: 162, 1993a: 133; Beaulieu *et al*., 2019: 4].

Ololaelaps veneta.—Evans & Till, 1966: 231; Bregetova, 1977b: 541; Luxton, 1998: 20; Sklyar, 2001: 102; Ma *et al*., 2002: 117; Gwiazdowicz & Klemt, 2004: 14; Ren & Guo, 2008: 329, 2009: 101.

Ololaelaps halaskovae.—Lapinya, 1970: 278, 1976: 62.

Pseudoparasitus (*Ololaelaps*) *venetus*.—Karg, 1971: 161, 1978a: 209, 1981b: 210, 1993a: 133.

Ollaelaps [sic] *veneta*.—Gwiazdowicz & Gulvik, 2005: 120.

Pseudoparasitus venetus.—Kůrka, 2005: 26; Kontschán *et al*., 2015b: 65.

Type depository. *Laelaps* (*H*.) *venetus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *O*. *halaskovae*: Zoological Institute of the Academy of Science of the USSR, Leningrad, Russia.
Type locality and habitat. *Laelaps* (*H*.) *venetus*: Veneto, Italy on moss; *O*. *halaskovae*: type series, Russia, Leningrad Oblast - vicinity of Sablino, Pribytkovo, in moss of a spruce forest, on the roots of old stumps; vicinity of Sitenki village, Luga region, in moist moss in a damp mixed forest; Russia, Tatarstan - Sharshada (former Krasnoborskii region), in soil of a floodland meadow; Usady, Pestretsy region, in the surface layer of a long-fallow field; Russia, Stavropol Krai - Kislovodsk, in moss on a stone of a steppe; Russia, North Ossetia - Derg-Kokh village, on turf in pastures of a floodland of the Terek River; Russia, Irkutsk Oblast - Ilimsk, in litter layer in a mixed forest; Yakimovka village, Zhigalovo region, in litter layer in a spruce forest; confluence of the Malaya Pyara and Érgera Rivers; Russia, Amurskaya Oblast - Svobodnyy region, on *Clethrionomys rufocanus* [Animalia: Rodentia: Cricetidae]; Ukraine, Zakarpatskaya Oblast, in nests of *Microtus arvalis* [Cricetidae] and *Apodemus agrarius* [Animalia: Rodentia: Muridae]; vicinity of Egorovka village, former Sanzheriiskii region, on *Mus musculus* [Muridae] in a field.
Note. *Laelaps* (*H*.) *venetus* was described based on the specimens reported by Berlese (1889b: 5) as *Laelaps tumidulus* (K.), *sensu* G. & R. Canestrini (1882a: 70). The type specimens of *Gamasus tumidulus* Koch were considered by Berlese (1903b: 14) to correspond to the female of *Gamasus calcaratus* Koch, whose holotype is a male. Specimens reported by Halašková & Kunst (1961: 24) as *Ololaelaps* sp. were identified as *O*. *halaskovae* by Bregetova & Koroleva (1964: 63). According to Bregetova & Koroleva (1964: 63), *L*. (*H*.) *venetus* could be a senior synonym of *O*. *sellnicki* or of *O*. *halaskovae*. The latter species was synonymised with *L*. (*H*.) *venetus*, as just mentioned, but *O*. *sellnicki* is presently considered different from *O*. *venetus*. Specimens reported as *Pseudoparasitus venetus* by Kontschán *et al*. (2016a: 30) were re-identified as *Ololaealps wangi* by Keum *et al*. (2017: 500). Hennessey & Farrier (1988: 32), Farrier & Hennessey (1993: 84) and Joharchi *et al*. (2018: 37) considered *L*. (*H*.) *venetus* to be a junior synonym of *O*. *placidus* but that interpretation was not accepted by Beaulieu *et al*. (2019: 11), and is also not accepted in this publication. Joharchi *et al*. (2018: 37) considered *O*. *halaskovae* to be a junior synonym of *O*. *placidus*, but in this publication *O*. *halaskovae* is considered a junior synonym of *L*. (*H*.) *venetus*.

Ololaelaps wangi Bai *et al*., 1996

Ololaelaps wangi Bai, Gu & Wang, 1996: 74.
Pseudoparasitus venetus.—Kontschán *et al*., 2016a: 30 (misidentification, according to Keum *et al*., 2017: 500).
Ololaelaps wangi.—Keum *et al*., 2017: 500; Beaulieu *et al*., 2019: 5.

Type depository. Institute of Endemic Disease Control, Ningxia Hui Autonomous Region, China.
Type locality and habitat. Southern Yinchuan suburb (38.5°N, 106.3°E), Ningxia Hui Autonomous Region, China, on decaying *Zea mags* [sic; probably *Zea mays*; Plantae: Poales: Poaceae].

Oloopticus Karg, 1978

Pseudoparasitus (*Oloopticus*) Karg, 1978a: 207 (type species: *Pseudoparasitus* (*Oloopticus*) *costalis* Karg, 1978, by original designation).
Pseudoparasitus (*Oloopticus*).—Karg, 1981b: 209, 1993a: 133.
Oloopticus.—Karg, 2000: 248; Karg & Schorlemmer, 2013: 196.

Note. *Pseudoparasitus* (*Oloopticus*) was not specifically assigned to a family in the original description; Karg & Schorlemmer (2013: 196) included it in Hypoaspididae-Pseudoparasitinae.

Oloopticus africanus Karg & Schorlemmer, 2013

Oloopticus africanus Karg & Schorlemmer, 2013: 200.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Morogoro, Tanzania, in litter.

Note. According to the original description, this species was described based on specimens identified by Athias-Henriot (1969: 614) as "genre? (cf. Pachylaelapidae)". However, Athias-Henriot (1969) reported the specimens to be collected in Ivory Coast, differing from what is cited as type locality in the original description.

***Oloopticus brevispiculae* Karg, 2006**
Oloopticus brevispiculae Karg, 2003a: 28 (*nomen nudum*, ICZN Article 13.1).
Oloopticus brevispiculae Karg, 2006: 151.
Ollopticus brevispiculae.—Karg & Schorlemmer, 2013: 202.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near La Mana, Ecuador, in litter.

***Oloopticus costalis* (Karg, 1978)**
Pseudoparasitus (*Oloopticus*) *costalis* Karg, 1978a: 207.
Pseudoparasitus (*Oloopticus*) *costalis*.—Karg, 1981b: 210, 1997c: 42.
Oloopticus costalis.—Karg, 2003a: 28, 2003b: 236, 2006: 152; Karg & Schorlemmer, 2013: 202.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Norquinco, Epuyen and El Bolson, Argentina, in litter and on grass tussock.

***Oloopticus gradulus* Karg, 2003**
Oloopticus gradulus Karg, 2003b: 236.
Oloopticus gradulus.—Karg, 2003a: 28, 2006: 152; Karg & Schorlemmer, 2013: 201.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Tenatol, Ecuador, in litter of a cocoa [*Theobroma cacao*; Plantae: Malvales: Malvaceae] plantation.

***Oloopticus longospinosus* Karg, 2000**
Oloopticus longospinosus Karg, 2000: 250.
Oloopticus longospinosus.—Karg, 2003a: 28, 2006: 152; Karg & Schorlemmer, 2013: 202.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near La Libertad, Imbabura, Ecuador, on grass tussock.

***Oloopticus nudus* Karg, 2000**
Oloopticus nudus Karg, 2000: 250.
Oloopticus nudus.—Karg, 2003a: 28, 2006: 152; Karg & Schorlemmer, 2013: 202.
Pseudoparasitus nudus.—Kůrka, 2005: 26.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. La Selva, Heredia, Costa Rica, in soil.

***Oloopticus parvioculus* Karg, 2000**
Oloopticus parvioculus Karg, 2000: 249.
Oloopticus parvioculus.—Karg, 2003a: 28, 2006: 152; Karg & Schorlemmer, 2013: 202.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Forest at Rio Guajalito, Pichinca (probably Pichincha), Ecuador, in soil with roots.

***Oloopticus pinguis* (Karg, 1997)**
Pseudoparasitus (*Oloopticus*) *pinguis* Karg, 1997c: 42.
Oloopticus pinguis.—Karg, 2003a: 28, 2006: 152; Karg & Schorlemmer, 2013: 202.
Pseudoparasitus pinguis.—Kůrka, 2005: 26.

Type depository. Museums für Naturkunde, Berlin, Germany.
Type locality and habitat. Otavalo, Imbabura, Ecuador, in moss on trees.

***Oloopticus pulcher* Karg, 2003**
Oloopticus pulcher Karg, 2003a: 29.
Oloopticus pulcher.—Karg, 2006: 152; Karg & Schorlemmer, 2013: 202.

Type depository. Staatlichen Museum für Naturkunde Görlitz, Görlitz, Germany.
Type locality and habitat. Near Calderon, Ecuador, in litter of bamboo forest.

***Oloopticus reticulatus* (Karg, 1978)**
Pseudoparasitus (*Oloopticus*) *reticulatus* Karg, 1978a: 207.
Pseudoparasitus (*Oloopticus*) *reticulatus*.—Karg, 1981b: 210, 1997c: 42.
Oloopticus reticulatus.—Karg, 2003a: 28, 2006: 152; Karg & Schorlemmer, 2013: 202.
Pseudoparasitus reticulatus.—Kůrka, 2005: 26.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 5 km south of Epuyen, near the main road to Cholila, Argentina, in litter.

***Oloopticus retiventer* Karg, 2000**
Oloopticus retiventer Karg, 2000: 250.
Oloopticus retiventer.—Karg, 2003a: 29, 2006: 152; Karg & Schorlemmer, 2013: 202.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. La Selva, Heredia, Costa Rica, in soil.

***Oloopticus sulcus* Karg, 2003**
Oloopticus sulcus Karg, 2003b: 235.
Oloopticus sulcus.—Karg, 2003a: 29, 2006: 152; Karg & Schorlemmer, 2013: 202.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Quito, Pichinca (probably Pichincha), Ecuador, in soil and litter in irrigation canal.

***Persicolaelaps* Kazemi & Beaulieu, 2016**

Persicolaelaps Kazemi & Beaulieu, 2016: 488 (type species: *Persicolaelaps hallidayi* Kazemi & Beaulieu, 2016, by monotypy).

Persicolaelaps.—Nemati *et al*., 2021: 185.

Note. Kazemi & Beaulieu (2016: 488) discussed the features of the genus that are shared with other laelapid genera, especially those classified as Hypoaspidinae.

***Persicolaelaps hallidayi* Kazemi & Beaulieu, 2016**

Persicolaelaps hallidayi Kazemi & Beaulieu, 2016: 491.

Persicolaelaps hallidayi.—Nemati *et al*., 2018b: 148; Kazemi, 2020: 137.

Type depository. Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran.

Type locality and habitat. 522 m above sea level, Qarn-Abad Forest (36°47'N, 54°37'E), Golestan province, Iran, in rotten wood.

***Pneumolaelaps* Berlese, 1920**

Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).

Hypoaspis.—Hull, 1918: 66 (in part); Karg, 1979: 66 (in part), 1993a: 133 (in part).

Hypoaspis (*Pneumolaelaps*) Berlese, 1920: 151 (type species: *Iphis bombicolens* Canestrini, 1885, by original designation).

Pneumolaelaps.—Vitzthum, 1929: 22, 1931c: 142; Radford, 1950b: 20; Evans, 1957a: 231; Hunter, 1966b: 357; Athias-Henriot, 1968: 237; Hunter & Husband, 1973: 77; Evans & Till, 1979: 201; Rosario, 1981: 68; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 85; Ma, 2006a: 23; OConnor & Klimov, 2012a,f: internet page; Karg & Schorlemmer, 2013: 203; Klimov *et al*., 2016: internet page; Hajizadeh & Joharchi, 2018: 25; Joharchi *et al*., 2018a: 27.

Hypoaspis (*Pneumolaelaps*).—Vitzthum, 1942: 762; Baker & Wharton, 1952: 94; Schweizer, 1961: 150; Evans & Till, 1966: 160, Aswegen & Loots, 1970: 207; Bregetova, 1977b: 514; Karg, 1979: 88, 1982: 243 (in part), 1984: 38, 1989a: 107, 1993a: 136 (in part); Faraji *et al*., 2008: 208.

Qinghailaelaps Gu & Yang, 1984: 371 (type species: *Qinghailaelaps marmotae* Gu & Yang, 1984, by monotypy) [junior synonym of *Pneumolaelaps* by Ma, 2006a: 23; OConnor & Klimov, 2012f: internet page].

Note. *Pneumolaelaps* was not assigned to a family in the original description, but was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 762) and in Laelapidae-Laelapinae by Evans & Till (1979: 201); *Qinghailaelaps* was described in Laelapidae. *Pneumolaelaps* was considered a junior synonym of *Holostaspis* by Karg (1971: 171), but that synonymy was not accepted by Joharchi *et al*. (2018: 27) and is also not accepted in this publication.

***Pneumolaelaps aequalipilus* Hunter, 1966**

Pneumolaelaps aequalipilus Hunter, 1966b: 360.

Pneumolaelaps aequalipilus.—Hunter & Husband, 1973: 78; Farrier & Hennessey, 1993: 85; OConnor & Klimov, 2012f: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Athens, Georgia, United States of America, on *Bombus pennsylvanicus* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps bombicolens* (Canestrini, 1885)**
Iphis bombicolens Canestrini, 1885: 96.
Laelaps (*Iphis*) *bombicolens*.—Berlese, 1892c: 8.
Laelaps bombicolens.—Berlese, 1892f: 35.
Iphis bombicolens.—Berlese, 1892f: 35; Radford, 1950b: 20.
Hypoaspis bombicolens.—Oudemans, 1902d: 24, 1903a: 130, 1903b: 87, 1905: 7; Berlese, 1904a: 261; Hull, 1918: 67, 1925: 210; Buitendijk, 1945: 295; Evans & Till, 1966: 191; El-Banhawy & Nasr, 1984: 78; Karg, 1984: 36; Chmielewski, 1998: 205.
Laelaps (*Eulaelaps*) *bombicolens*.—Berlese, 1903b: 13.
Hypoaspis (*Pneumolaelaps*) *bombicolens*.—Berlese, 1920: 151; Schweizer, 1961: 151; Bregetova, 1977b: 522; Karg, 1979: 90, 1982: 244, 1993a: 148; Castagnoli & Pegazzano, 1985: 45; Marchenko, 2002: 45; Yan *et al*., 2008: 2230, 2010: 905.
Pneumolaelaps bombicolens.—Vitzthum, 1929: 26; Schweizer, 1949: 39; Turk, 1953: 11; Hunter, 1966b: 359; Farrier & Hennessey, 1993: 85; Bernini *et al*., 1995: 30; Ye & Ma, 1996: 298; Ren & Guo, 2008: 328, 2009: 101; OConnor & Klimov, 2012f: internet page; Fan *et al*., 2016: 120; Babaeian *et al*., 2019a: 328.
bombicolens; *non-Laelaps* [sic].—Tipton, 1960: 289.
Hypoaspis (*Holostaspis*) *bombicolens*.—Karg, 1971: 177.
Holostaspis bombicolens.—Haragsim *et al*., 1978: 60.

Type depository. Unspecified.
Type locality and habitat. Padua, Italy, on *Bombus* sp. [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps breviseta* (Evans & Till, 1966)**
Hypoaspis breviseta Evans & Till, 1966: 193.
Hypoaspis (*Pneumolaelaps*) *breviseta*.—Bregetova, 1977b: 523; Karg, 1979: 90, 1982: 244, 1993a: 148; Mašán, 2001: 216.
Hypoaspis breviseta.—Karg, 1984: 35; Farrier & Hennessey, 1993: 77.
Hypoaspis brevista [sic].—El-Banhawy & Nasr, 1984: 78; Chmielewski, 1998: 205; OConnor & Klimov, 2012f: internet page.
Pneumolaelaps breviseta.—OConnor & Klimov, 2012f: internet page; Fan *et al*., 2016: 123.

Type depository. Natural History Museum, London, England; specimen number 1965: 12: 29: 26.
Type locality and habitat. Scarborough, Yorkshire, England, on *Bombus muscorum* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps cavicolous* (Gu *et al*., 1997)**
Qinghailaelaps cavicolous Gu, Liu & Niu, 1997: 23.
Qinghailaelaps cavicolous.—Ren & Guo, 2008: 328, 2009: 100.
Pneumolaelaps cavicolous.—OConnor & Klimov, 2012f: internet page.

Type depository. Department of Parasitology, Medical School, Nanjing University, Nanjing, Jiangsu, China.
Type locality and habitat. Maqing (34.4°N, 100.1°E), Qinghai, China, in a “cave of bird”.

***Pneumolaelaps colomboi* (Evans & Till, 1966)**
Hypoaspis colomboi Evans & Till, 1966: 194.
Pneumolaelaps bombivicinus Davydova, 1971: 89 [junior synonym of *H. colomboi* by Bregetova, 1977b: 518].
Pneumolaelaps bambus [sic].—Davydova, 1971: 90.
Hypoaspis (*Pneumolaelaps*) *colomboi*.—Bregetova, 1977b: 518; Karg, 1979: 88, 1982: 244, 1993a: 146.
Hypoaspis colomboi.—Karg, 1984: 36.

Pneumolaelaps colomboi.—OConnor & Klimov, 2012f: internet page; Kazemi & Rajaei, 2013: 94; Nemati *et al*., 2018b: 121.

Type depository. *H. colomboi*: Natural History Museum, London, England; specimen number 1965: 12: 29: 1; *P. bombivicinus*: unspecified.
Type locality and habitat. *H. colomboi*: Langley Park, Buckinghamshire, England, in nest of *Bombus lapidarius* [Animalia: Hymenoptera: Apidae]; *P. bombivicinus*: Rovenskoe, Novosibirsk, subterraneous tunnels inhabited by bumblebees [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps connieae* Hunter & Husband, 1973**
Pneumolaelaps connieae Hunter & Husband, 1973: 84.
Pneumolaelaps connieae.—Farrier & Hennessey, 1993: 85; OConnor & Klimov, 2012f: internet page.

Type depository. Acarine Collection, Department of Entomology, University of Georgia, Athens, United States of America.
Type locality and habitat. Grand Rapids, Kent, Michigan, United States of America, on *Bombus americanorum* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps costai* Hunter & Husband, 1973**
Pneumolaelaps costai Hunter & Husband, 1973: 87.
Pneumolaelaps costai.—Farrier & Hennessey, 1993: 85; OConnor & Klimov, 2012f: internet page.

Type depository. Acarine Collection, Department of Entomology, University of Georgia, Athens, United States of America.
Type locality and habitat. Kalamazoo, Michigan, United States of America, in nest of *Bombus americanorum* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps eulinguae* (Karg, 2003)**
Hypoaspis (*Pneumolaelaps*) *eulinguae* Karg, 2003b: 233.
Pneumolaelaps eulinguae.—Moreira, 2014: 349.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Quito, Pichinca (probably Pichincha), Ecuador, in soil and litter in irrigation canal.

***Pneumolaelaps fucorum* (Hull, 1925) new combination**
Hypoaspis fucorum Hull, 1925: 210.
Chamolaelaps fucorum.—Turk & Turk, 1952: 482.

Type depository. Unspecified.
Type locality and habitat. West Allendale, England, in nest of *Bombus smithianus* [Animalia: Hymenoptera: Apidae].
Note. Evans & Till (1966: 362) suggested that this species could be placed in *Hypoaspis* (*Pneumolaelaps*) and we have provisionally accepted that interpretation, with *Pneumolaelaps* at the genus level.

***Pneumolaelaps fuscicolens* (Oudemans, 1903)**

Hypoaspis fuscicolens Oudemans, 1902e: 289 (*nomen nudum*, ICZN Article 12).

Hypoaspis fuscicolens Oudemans, 1903b: 87.

Hypoaspis fuscicolens.—Oudemans, 1904a: 83; Voigts & Oudemans, 1905: 232; Buitendijk, 1945: 295; Evans & Till, 1966: 196; Karg, 1984: 35.

Pneumolaelaps fuscicolens.—Hunter, 1966b: 360; OConnor & Klimov, 2012f: internet page; Babaeian *et al*., 2019a: 329.

Hypoaspis (*Holostaspis*) *fuscicolens*.—Karg, 1971: 177.

Hypoaspis (*Pneumolaelaps*) *fuscicolens*.—Bregetova, 1977b: 519; Karg, 1979: 91, 1982: 245, 1984: 36, 1993a: 150.

Type depository. Unspecified.

Type locality and habitat. Wangeroog island, Germany, North Sea, on *Bombus muscorum* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps groenlandica* (Trägårdh, 1904)**

Hypoaspis bombicolens var. *groenlandica* Trägårdh, 1904b: 34 (in part).

Laelaps nanus? [sic].—Kramer & Neumann, 1883: 529 (misidentification, according to Trägårdh, 1904b: 34).

Hypoaspis bombicolens var. *groenlandica*.—Hunter, 1966b: 359 (in part); Farrier & Hennessey, 1993: 85.

Pneumolaelaps groenlandica.—Hunter & Husband, 1973: 79.

Hypoaspis (*Pneumolaelaps*) ?*groenlandicus* [sic].—Bregetova, 1977b: 519 (part).

Hypoaspis (*Pneumolaelaps*) *groenlandica*.—Karg, 1979: 90, 1982: 244 (part), 1984: 36 (part), 1993a: 148.

Hypoaspis (*Pneumolaelaps*) *arctos* Karg, 1984: 37 (junior synonym of *H. bombicolens* var. *groenlandica* by OConnor & Klimov, 2012f: internet page; Makarova, 2014: 1406).

Pneumolaelaps groenlandicus.—Farrier & Hennessey, 1993: 85; OConnor & Klimov, 2012f: internet page; Makarova, 2014: 1406.

Pneumolaelaps arctos.—Farrier & Hennessey, 1993: 85.

Type depository. *P. bombicolens* var. *groenlandica*: unspecified; *H.* (*P.*) *arctos*: Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.

Type locality and habitat. *P. bombicolens* var. *groenlandica*: Jinretlen, Siberia, Russia, on unspecified substrate; Tigsalŭk, Greenland, on *Bombus* sp. [Animalia: Hymenoptera: Apidae]; *H.* (*P.*) *arctos*: Diskofjord, near Humlebired, Greenland, in nest of *Bombus hyperboreus* [Animalia: Hymenoptera: Apidae].

Note. Hunter & Husband (1973: 79) discussed the uncertainty about the exact year of publication of this species. The holotype of *Pneumolaelaps patae* Hunter & Husband, 1973 bore the same collection data as a specimen designated by Hunter & Husband (1973: 81) as a "paratype" of *P. bombicolens* var. *groenlandica*; according to Hunter & Husband (1973), it belonged to Trägårdh's collection. That and four other specimens of the same series, indicated as paratypes of *P. patae*, had been collected in Greenland. According to OConnor & Klimov (2012f: internet page), part of the specimens reported by Hunter (1966: 359), Bregetova (1977b: 519) and Karg (1982: 244, 1984: 36) probably refer to a different species.

***Pneumolaelaps gumrii* (Arutunjan, 1990) new combination**

Hypoaspis (*Pneumolaelaps*) *gumrii* Arutunjan, 1990b: 138.

Type depository. Acarology Laboratory, Institute of Zoology, Armenian Academy of Science, Armenia; specimen number 529.

Type locality and habitat. Gyumri (reported as Leninakan), Armenia, on *Blaps puella* [Animalia: Coleoptera: Tenebrionidae, Blaptinae].

Note. The new combination proposed for this species results from the promotion of *Pseudoparasitus* from the subgeneric to the generic level.

***Pneumolaelaps hyatti* (Evans & Till, 1966)**

Hypoaspis (*Pneumolaelaps*) *hyatti* Evans & Till, 1966: 198.

Hypoaspis (*Pneumolaelaps*) *hyatti*.—Costa, 1966a: 74, 1966c: 191, 1980: 548; Bregetova, 1977b: 523; Karg, 1979: 91, 1982: 254, 1993a: 150; Yan *et al*., 2008: 2229, 2010: 904.

Hypoaspis hyatti.—Lapinya, 1976: 43; Senotrusova, 1982: 5; Karg, 1984: 35; Chmielewski, 1998: 205; Ren & Guo, 2008: 329, 2009: 101.

Pneumolaelaps hyatti.—Ye & Ma, 1991: 100; Farrier & Hennessey, 1993: 85; Ma, 2006a: 23; OConnor & Klimov, 2012f: internet page; Kazemi & Rajaei, 2013: 94; Nemati *et al*., 2018b: 121; Joharchi *et al*., 2019e: 86.

Qinghailaelaps gui Bai, 1992: 199 [junior synonym of *H*. (*P*.) *hyatti* by Ma, 2006a: 23; Yan *et al*., 2008: 2229, 2010: 904].

Qinghailaelaps gui.—Gu *et al*., 1997: 24; Ren & Guo, 2008: 328, 2009: 100.

Pneumolaelaps hyattl [sic].—Ren & Guo, 2008: 328, 2009: 101.

Pneumolaelaps gui.—OConnor & Klimov, 2012f: internet page.

Type depository. *H*. (*P*.) *hyatti*: Natural History Museum, London, England; specimen number 1965: 12: 29: 11; *Q*. *gui*: Ningxia Institute of Endemic Disease Control, Yinchuan, China.

Type locality and habitat. *H*. (*P*.) *hyatti*: Scarborough, Yorkshire, England, on *Bombus muscorum* [Animalia: Hymenoptera: Apidae]; *Q*. *gui*: Haiyuan (36.2°N, 105.6°E), Ningxia Hui Autonomous Region, China, on *Bombus* sp. [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps longanalis* Hunter & Husband, 1973**

Pneumolaelaps longanalis Hunter & Husband, 1973: 81.

Pneumolaelaps longanalis.—Royce & Krantz, 1989: 161; Farrier & Hennessey, 1993: 86; OConnor & Klimov, 2012f: internet page.

Type depository. Acarine Collection, Department of Entomology, University of Georgia, Athens, United States of America.

Type locality and habitat. Gull Lake Biological Station, Kalamazoo, Michigan, United States of America, on *Bombus griseocollis* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps longipilus* Hunter, 1966**

Pneumolaelaps longipilus Hunter, 1966b: 365.

Pneumolaelaps longipilus.—Husband, 1968: 111; Hunter & Husband, 1973: 78; Farrier & Hennessey, 1993: 86; OConnor & Klimov, 2012f: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Athens, Georgia, United States of America, on *Bombus pennsylvanicus* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps machadoi* Elsen, 1973**

Pneumolaelaps machadoi Elsen, 1973: 181.

Type depository. Museu do Dundo, Dundo, Lunda Norte, Angola.

Type locality and habitat. Dundo, Angola, on *Chalicodoma* (*Carinella*) *torrida* [Animalia: Hymenoptera: Megachilidae].

***Pneumolaelaps marginepilosa* (Sellnick, 1940)**

Hypoaspis marginepilosa Sellnick, 1940: 93.

Pneumolaelaps marginalis Willmann, 1954a: 465 [junior synonym of *H. marginepilosa* by Bregetova, 1977b: 521; Karg, 1993a: 150; Joharchi *et al*., 2019e: 86].

Haemolaelaps montshadskyi Violovich, 1961: 257 [junior synonym of *H.* (*P.*) *marginepilosa* by Bregetova, 1977b: 521].

Pneumolaelaps marginalis.—Evans & Till, 1965a: 269; Hunter, 1966b: 360.

Hypoaspis marginalis.—Evans & Till, 1966: 199.

Hypoaspis (*Holostaspis*) *marginepilosa*.—Karg, 1971: 177.

Hypoaspis marginepilosa.—Lundqvist, 1974: 42; Niedbała *et al*., 1982: 247, 1990: 32; Chmielewski, 1998: 205.

Hypoaspis (*Pneumolaelaps*) *marginepilosa*.—Bregetova, 1977b: 521; Karg, 1979: 91, 1982: 245, 1993a: 150; Arutunjan, 1990b: 139; Marchenko, 2002: 45; Gwiazdowicz & Klemt, 2004: 14; Gwiazdowicz & Gulvik, 2005: 120; Kontschán *et al*., 2016b: 27.

Holostaspis marginalis.—Haragsim *et al*., 1978: 60.

Holostaspis marginepilosa.—Haragsim *et al*., 1978: 60.

Hypoaspis marginipilosa Sellnick, 1938 [sic].—Karg, 1984: 36.

Pneumolaelaps marginepilosus.—OConnor & Klimov, 2012f: internet page.

Pneumolaelaps marginepilosa.—Babaeian *et al*., 2019a: 330; Joharchi *et al*., 2019e: 88.

Type depository. *H. marginepilosa*: Göteborgs Naturhistoriska Museum, Göteborg, Sweden; *P. marginalis* and *H. montshadskyi*: unspecified.

Type locality and habitat. *H. marginepilosa*: Gröf, Skaftártunga, Iceland, in nest of *Bombus jonellus* [Animalia: Hymenoptera: Apidae]; *P. marginalis*: from hillside meadow at Lärchenecks, opposite to Pitzalm, Haller Mauern, on *Bombus mucidus* [Animalia: Hymenoptera: Apidae]; *H. montshadskyi*: in a young *Betula* forest at the vicinity of Yuzhno-Sakhalinsk, Sakhalin island, on the mouse *Apodemus pinsulae* [Animalia: Rodentia: Muridae].

***Pneumolaelaps marmotae* (Gu & Yang, 1984)**

Qinghailaelaps marmotae Gu & Yang, 1984: 371.

Qinghailaelaps marmotae.—Bai, 1992: 201; Deng *et al*., 1993: 136; Gu *et al*., 1997: 24; Ren & Guo, 2008: 328, 2009: 100.

Pneumolaelaps marmotae.—OConnor & Klimov, 2012f: internet page.

Type depository. Research Institute of Endemic Disease Control, Qinghai province, China.

Type locality and habitat. Henan Autonomous County (34°46', 101°30'E), Huangnan Zang Autonomous Prefecture, Qinghai province, China, on *Marmota himalayana* [Animalia: Rodentia: Sciuridae].

***Pneumolaelaps minutissima* (Evans & Till, 1966)**

Hypoaspis minutissima Evans & Till, 1966: 201.

Hypoaspis (*Pneumolaelaps*) *minutissima*.—Bregetova, 1977b: 519; Karg, 1979: 92, 1982: 246, 1993a: 152; Huhta & Karg, 2010: 331.

Hypoaspis minutissima.—Karg, 1984: 35.

Pneumolaelaps minutissima.—OConnor & Klimov, 2012f: internet page; Fan *et al*., 2016: 131.

Type depository. Natural History Museum London, England; specimen number 1965: 12: 29: 6.

Type locality and habitat. Gosforth, Cumberland, England, on *Bombus terrestris* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps mistipilus* Hunter, 1966**

Pneumolaelaps mistipilus Hunter, 1966b: 363.

Pneumolaelaps mistipilus.—Husband, 1968: 111; Hunter & Husband, 1973: 79; Farrier & Hennessey, 1993: 86; OConnor & Klimov, 2012f: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Hartwell, Georgia, United States of America, on *Bombus impatiens* [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps niutirani* Fan & Zhang, 2016**

Pneumolaelaps niutirani Fan & Zhang, in Fan *et al*., 2016: 124.

Type depository. Plant Health & Environmental Laboratory, Auckland, New Zealand.

Type locality and habitat. Waikato, New Zealand, on sticky board in honeybee *Apis mellifera* [Animalia: Hymenoptera: Apidae] hive.

***Pneumolaelaps patae* Hunter & Husband, 1973**

Hypoaspis bombicolens var. *groenlandicus* Trägårdh, 1904b: 34 (in part).

Hypoaspis bombicolens var. *groenlandicus*.—Hunter, 1966: 359 (in part).

Pneumolaelaps patae Hunter & Husband, 1973: 83.

Hypoaspis (*Pneumolaelaps*) ?*groenlandicus*.—Bregetova, 1977: 519 (part) (according to OConnor & Klimov, 2012f: internet page).

Hypoaspis (*Pneumolaelaps*) *groenlandica*.—Karg, 1982: 244 (part), 1984: 36 (part) (according to OConnor & Klimov, 2012f: internet page).

Pneumolaelaps patae.—Farrier & Hennessey, 1993: 86; OConnor & Klimov, 2012f: internet page; Makarova, 2014: 1406.

Pneumolaelaps cf. *patae* [sic].—OConnor & Klimov, 2012f: internet page.

Type depository. Universitetets Zoologiske Museum, Copenhagen, Denmark.

Type locality and habitat. Tigsalŭk, Tlumle, Greenland, on *Bombus* sp. [Animalia: Hymenoptera: Apidae].

Note. The holotype of this species bore the same collection data as a specimen designated by Hunter & Husband (1973: 81) as a "paratype" of the species originally described as *P. bombicolens* var. *groenlandica* by Trägårdh (1904: 34), and that according to Hunter & Husband (1973) belonged to Trägårdh's collection. This and four other specimens of the same series, indicated as paratypes of *P. patae*, had been collected in Greenland.

***Pneumolaelaps qinghaiensis* (Li *et al*., 1998)**

Qinghailaelaps qinghaiensis Li, Yang & Wang, 1998a: 60.

Qinghailaelaps qinghaiensis.—Ren & Guo, 2008: 328, 2009: 100.

Pneumolaelaps qinghaiensis.—OConnor & Klimov, 2012f: internet page.

Type depository. Qinghai Institute for Endemic Disease Control and Research, Qinghai, China.

Type locality and habitat. Tongde (35°25'N, 100°50'E), Qinghai province, China, on *Bombus* sp. [Animalia: Hymenoptera: Apidae].

***Pneumolaelaps richardsi* Hunter & Husband, 1973**

Pneumolaelaps richardsi Hunter & Husband, 1973: 86.

Pneumolaelaps richardsi.—Farrier & Hennessey, 1993: 86; OConnor & Klimov, 2012f: internet page.

Pneumolaelaps nr. *richardsi* [sic].—OConnor & Klimov, 2012f: internet page.

Type depository. Acarine Collection, Department of Entomology, University of Georgia, Athens, United States of America.
Type locality and habitat. 5200 feet [1590 m] above sea level, Prairie Bluff Mountain, Alberta, Canada, on *Bombus bifarius* [Animalia: Hymenoptera: Apidae].

Pneumolaelaps sinhai Hunter & Husband, 1973

Pneumolaelaps sinhai Hunter & Husband, 1973: 82.
Pneumolaelaps sinhai.—Farrier & Hennessey, 1993: 86; OConnor & Klimov, 2012f: internet page.

Type depository. Acarine Collection, Department of Entomology, University of Georgia, Athens, United States of America.
Type locality and habitat. 5200 feet [1590 m] above sea level, Prairie Bluff Mountain, Alberta, Canada, on *Psithyrus suckleyi* [Animalia: Hymenoptera: Apidae].

Pogonolaelaps Nemati & Gwiazdowicz, 2016

Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).
Pogonolaelaps Nemati & Gwiazdowicz, 2016b: 25 [type species: *Laelaps canestrinii* Berlese, 1892, not *Laelaps canestrinii* Berlese, 1903 [sic], as interpreted by Joharchi *et al*., 2020b: 466, by original designation].
Pogonolaelaps.—Joharchi *et al*., 2020b: 466; Nemati *et al*., 2021: 172.

Note. This genus was described in Laelapidae-Laelapinae. In the original description of this genus, "*Laelaps canestrinii* Berlese, 1903", cited as type species, actually referred to specimens that had been identified by Berlese (1903b: 13) as *Laelaps* (*Eulaelaps*) *canestrinii*. Joharchi *et al*. (2016a: 19) considered them to be different from *Laelaps canestrinii* Berlese, 1892, and because of that, they were described as *Laelaspisella berlesei* by Joharchi, in Joharchi *et al*. (2016a: 19). *Laelaspisella berlesei* is considered a *nomen nudum*, for not complying with Article 16.4.1 of the ICZN (type specimens were not designated), hence it cannot be the type species of a genus (ICZN, 1999, Article 67.1).

Pogonolaelaps beaulieui Nemati & Gwiazdowicz, 2016

Pogonolaelaps beaulieui Nemati & Gwiazdowicz, 2016b: 35.
Pogonolaelaps beaulieui.—Saberi *et al*., 2016: 122; Nemati *et al*., 2018b: 148, 2019: 81; Joharchi *et al*., 2020b: 470; Kazemi, 2020: 137.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. 2206 m above sea level, Shahrekord (32°19'39"N, 50°51'35"E), Chaharmahal va Bakhtiari, Iran, in soil.

Pogonolaelaps canestrinii (Berlese, 1892)

Laelaps canestrinii Berlese, 1892d: 1.
Laelaps lignicola.—Canestrini, 1885: 66 (misidentification, according to Berlese, 1892d: 1).
Laelaps canestrinii.—Berlese, 1892f: 35; Leonardi, 1897: 848, 861, 1899: 508.
Loelaps canestrinii [sic].—Wasmann, 1894: 198.
Gamasus Canestrinii.—Moniez, 1894: 202; Leonardi, 1897: 866.
Hypoaspis canestrinii.—Oudemans, 1902d: 24, 1903a: 129; Buitendijk, 1945: 295.
Laelaps (*Eulaelaps*) *canestrinii*.—Berlese, 1903b: 13.

Laelaps (*Hypoaspis*) *canestrinii*.—Berlese, 1904c: 412.
Gymnolaelaps canestrinii.—Vitzthum, 1929: 25; Sellnick, 1931: 695; Schweizer, 1961: 87 [identification questioned by Joharchi *et al*., 2020b: 468]; Costa, 1962: 491 [identification questioned by Joharchi *et al*., 2020b: 468]; Bhattacharyya, 1966: 154; Costa, 1966a: 74; Hunter, 1967: 99; Bernini *et al*., 1995: 28; Joharchi *et al*., 2011: 23; Cheragali *et al*., 2012: 470; Kazemi & Rajaei, 2013: 86; Kordeshami *et al*., 2015: 593.
Hypoaspis (*Gymnolaelaps*) *canestrini* [sic].—Lombardini, 1936: 42.
canestrini [sic]; *non-Laelaps* [sic].—Tipton, 1960: 290.
Hypoaspis (*Gymnolaelaps*) *cannestrini* [sic].—Hunter, 1967: 99.
Hypoaspis (*Gymnolaelaps*) *canestrinii*.—Hunter, 1967: 99; Bregetova, 1977b: 523; Castagnoli & Pegazzano, 1985: 60.
Gymnolaelaps canestrini [sic].—Bhattacharyya, 1968: 539; Joharchi, 2012: 59.
Hypoaspis (*Cosmolaelaps*) *canestrinii*.—Karg, 1979: 71.
Pseudoparasitus (*Gymnolaelaps*) *canestrinii*.—Karg, 1981b: 218, 1989b: 334, 1993a: 135.
Pseudoparasitus canestrinii.—Kůrka, 2005: 26; Kontschán *et al*., 2015b: 65.
Laelaspisella canestrinii.—Joharchi & Halliday, 2013: 46; Ghasemi-Moghadam *et al*., 2014: 964; Hasanvand *et al*., 2014a: 96; Mahjoori *et al*., 2014: 1601; Khalili-Moghadam & Saboori, 2015: 319; Ramroodi *et al*., 2015a: 79; Abbaspour *et al*., 2017: 747; Hajizadeh & Joharchi, 2018: 23.
Laelaspisella berlesei Joharchi, in Joharchi *et al*., 2016a: 19 (*nomen nudum*, ICZN Article 16.4.1).
Laelaspisella berlesei.—Maleki *et al*., 2016: 187.
Pogonolaelaps canestrinii.—Nemati & Gwiazdowicz, 2016b: 28; Saberi *et al*., 2016: 129; Kavianpour *et al*., 2017: 164; Nemati *et al*., 2018b: 148, 2019: 82; Joharchi *et al*., 2020b: 470.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Ponte Molle (Rome) and Portici [Naples], Italy, in nest of unidentified ants [Animalia: Hymenoptera: Formicidae].
Note. This species has had a complex taxonomic and nomenclatural history, which is discussed in detail by Joharchi *et al*. (2020b).

Pogonolaelaps termitophilus Joharchi *et al*., 2020

Pogonolaelaps termitophilus Joharchi, Ramroodi & Halliday, 2020b: 470.

Type depository. Department of Plant Protection, College of Agriculture, University of Zabol, Iran.
Type locality and habitat. 492 m above sea level, Zabol (31°01'N, 61°30'E), Sistan, Sistan and Baluchestan province, Iran, on *Microcerotermes* sp. [Animalia: Blattodea: Termitidae].

Promacrolaelaps Costa, 1971

Promacrolaelaps Costa, 1971: 94 (type species: *Promacrolaelaps hunteri* Costa, 1971, by monotypy).
Promacrolaelaps.—Joharchi *et al*., 2013: 380, 2019d: 346; Gwiazdowicz *et al*., 2020b: 598.

Note. This genus was described in Laelapidae-Hypoaspidinae. Nemati *et al*. (2018b: 177) questioned the validity of this genus, suggesting that it could be a synonym of *Hypoaspis*.

Promacrolaelaps hunteri Costa, 1971

Promacrolaelaps hunteri Costa, 1971: 94.
Promacrolaelaps hunteri.—Joharchi *et al*., 2013: 382.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Tivon, Israel, on *Promacrus bimucronatus* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Promacrolaelaps propomacrus* Joharchi *et al*., 2013**

Promacrolaelaps propomacrus Joharchi, Halliday & Beyzavi, 2013: 380.
Hypoaspis propomacrus.—Nemati *et al*., 2018b: 177.
Promacrolaelaps propomacrus.—Joharchi & Halliday, 2020: 37.

Type depository. Originally at Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran. Presently at Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Iran; specimen number ARS-20191222–4a (according o Joharchi & Halliday, 2020: 40).
Type locality and habitat. Kamfiruz, Fars, Iran, on adult of *Propomacrus bimucronatus* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].

***Pseudoparasitus* Oudemans, 1902**

Hypoaspis.—Canestrini, 1885: 55 (in part); Hull, 1918: 66 (in part).
Pseudoparasitus Oudemans, 1902d: 29 (type species: *Laelaps meridionalis* G. & R. Canestrini, 1882, by original designation).
Laelaps (*Hoplolaelaps*) Berlese, 1903b: 14, not Berlese, 1910a: 259 (type species: *Laelaps meridionalis* G. & R. Canestrini, 1882, by original designation) [junior synonym of *Pseudoparasitus* by Berlese, 1916a: 30; Vitzthum 1942: 757; Baker & Wharton, 1952: 74; Evans, 1957a: 221; Bregetova, 1977b: 535; Karg, 2000: 245].
Hoplolaelaps.—Berlese, 1913b: 10; Turk, 1953: 11; Evans & Till, 1966: 224; Hunter, 1966a: 1; Nemati *et al*., 2019: 91.
Laelaps (*Pseudoparasitus*).—Halbert, 1915: 70.
Pseudoparasitus.—Vitzthum, 1929: 22, 1942: 757; Baker & Wharton, 1952: 74; Evans, 1957a: 221; Schweizer, 1961: 86; Evans & Till, 1965a: 261, 1966: 224, 1979: 201; Hunter, 1966a: 1; Athias-Henriot, 1968: 237; Karg, 1971: 157, 1978a: 203 (in part), 1993a: 133, 2000: 248 (in part); Bregetova, 1977b: 535; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 87; Joharchi *et al*., 2011: 32, 2019d: 347; Shaw, 2012: 27; Kazemi, 2014: 42; Malekshah-koohi *et al*., 2014: 256; Nemati & Gwiazdowicz, 2016b: 29; Hajizadeh & Joharchi, 2018: 23; Joharchi *et al*., 2018a: 37; Halliday, 2019: internet page; Nemati *et al*., 2019: 91, 2021: 172.
Pseudoparasitus (*Pseudoparasitus*).—Vitzthum, 1942: 757; Baker & Wharton, 1952: 74; Karg, 1971: 159, 1978a: 205, 1981b: 209; 1993a: 133, 2000: 248.
Laelapsoides Willmann, 1952a: 150 (type species: *Laelaps dentatus* Halbert, 1920, by monotypy) [junior synonym of *Pseudoparasitus* by Evans, 1957a: 221; Evans & Till, 1966: 224; Hunter, 1966a: 1; Bregetova, 1977b: 535; Farrier & Hennessey, 1993: 87; Nemati *et al*., 2019: 91].
Austrogamasellus Domrow, 1957: 204 (type species: *Mysolaelaps stigmatus* Fox, 1946, by original designation) [junior synonym of *Pseudoparasitus* by Evans & Till, 1966: 224; Hunter, 1966a: 1; Bregetova, 1977b: 535; Nemati *et al*., 2019: 91].
Ololaelaps (*Cypholaelaps*).—Karg, 1965: 271.
Hypoaspis (*Euryaspis*) Bernhard, 1971: 8 (type species: *Laelaspis austriacus* Sellnick, 1935, by monotypy) [junior synonym of *Pseudoparasitus* by Joharchi *et al*., 2011: 33, by synonymising the type species of that subgenus with a *Pseudoparasitus* species; Joharchi *et al*., 2012a: 2012; Babaeian *et al*., 2019a: 328].
Hypoaspis (*Holostaspis*).—Karg, 1971: 171 (in part).
Hypoaspis (*Laelaspis*).—Karg, 1982: 248 (in part).

Note. *Pseudoparasitus* was described in Gamasidae (= Parasitidae) [sic], and was included in Pseudoparasitidae by Vitzthum (1942: 757) and Laelapidae-Laelapinae by Evans & Till (1979: 201); *Laelapsoides* was described in Laelapidae-Laelapinae; *Austrogamasellus* was described in Neoparasitidae. *Austrogamasus* and *Gymnolaelaps* were considered junior synonyms of *Pseudoparasitus* by Halliday (1998: 129), but that decision is not accepted in this publication. Referring to *Laelaspoides ordwayae*, Farrier & Hennessey (1993: 87) inadvertently mentioned the supposed synonymy of *Laelaspoides* under *Pseudoparasitus*, by mistaking that genus with *Laelapsoides* (notice distinction in spelling), which had been synonymised under *Pseudoparasitus* by Evans (1957a: 221). *Hypoaspis* (*Euryaspis*) was raised by Bernhard (1971: 8) to contain *Laelaspis austriacus* Sellnick, without explicitly assigning

it to a family; this species was transferred to *Pseudoparasitus* by Hunter (1966a: 9), a decision supported by Joharchi *et al*. (2011: 33, 2012a: 2012) and Babaeian *et al*. (2019a: 328), turning *Hypoaspis* (*Euryaspis*) junior synonym of *Pseudoparasitus*. At the same time, *Euryaspis* is junior homonym of *Euryaspis* Blanchard, 1851 (Coleoptera, Scarabaeidae), but it does not need to have a replacement name, given that it is a junior synonym of *Pseudoparasitus*.

***Pseudoparasitus aequatorialis* (Berlese, 1905) new combination**
Laelaps (*Pseudoparasitus*) *aequatorialis* Berlese, 1905: 169.
aequatorialis; *non-Laelaps* [sic].—Tipton, 1960: 286.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Buitenzorg, Java, Indonesia, from unspecified substrate.
Note. The new combination proposed for this species results from the promotion of *Pseudoparasitus* from the subgeneric to the generic level, and its close similarity with *Laelaps meridionalis* G. & R. Canestrini, as reported in the original description.

***Pseudoparasitus alpinus* Schweizer, 1961**
Pseudoparasitus alpinus Schweizer, 1961: 86.

Type depository. Schweizer collection, Naturhistorischen Museum Basel, Switzerland.
Type locality and habitat. 2810 m above sea level, National Park, Mount dal Gaier, Switzerland, in moss.

***Pseudoparasitus arculus* Karg, 2003**
Pseudoparasitus (*Pseudoparasitus*) *arculus* Karg, 2003b: 235.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Tenatol, Ecuador, in litter layer of a cocoa [*Theobroma cacao*; Plantae: Malvales: Malvaceae] plantation.

***Pseudoparasitus astriatus* Hunter, 1966**
Pseudoparasitus astriatus Hunter, 1966a: 6.
Pseudoparasitus astriatus.—Farrier & Hennessey, 1993: 87.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Mexico City, Mexico, intercepted at San Ysidro, California, United States of America, in soil.

***Pseudoparasitus brevidentis* (Karg, 1978)**
Hypoaspis (*Holostaspis*) *brevidentis* Karg, 1978b: 12.
Hypoaspis (*Laelaspis*) *brevidentis*.—Karg, 1979: 101, 1982: 249, 1989c: 120.
Laelaspis brevidentis.—Moreira, 2014: 304.
Pseudoparasitus brevidentis.—Babaeian *et al*., 2019a: 328.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Azapa, Tarapaca, Chile, in soil.

***Pseudoparasitus camini* (Domrow, 1957)**
Austrogamasellus camini Domrow, 1957: 204.
Pseudoparasitus camini.—Hunter, 1966a: 13; Halliday, 1998: 129, 2019: internet page; Shaw, 2012: 27.
Austrogamasellus camini.—Monroe, 1972: 295.

Type depository. Queensland Museum, South Brisbane, Australia; specimen number G2338 (Monroe, 1972: 295).
Type locality and habitat. Low Isles (145°34'E, 16°23'S), Great Barrier Reef, Australia, in leaf mould on cay.

***Pseudoparasitus centralis* Berlese, 1920**
Pseudoparasitus centralis Berlese, 1920: 167.
Pseudoparasitus centralis.—Lombardini, 1936: 48; Evans & Till, 1966: 225; Bregetova, 1977b: 536; Castagnoli & Pegazzano, 1985: 69; Bernini *et al*., 1995: 30; Ma, 2004a: 18; Kůrka, 2005: 26; Joharchi *et al*., 2011: 32; Ma *et al*., 2018: 23.
Pseudoparasitus (*Pseudoparasitus*) *centralis*.—Karg, 1971: 162, 1978a: 211, 1981b: 211, 1989b: 335, 1993a: 134, 1997c: 43.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Florence, "Etruria" and Rome, Italy, in humus.
Note. Evans & Till (1966: 225) suspected *P. centralis* to be a junior synonym of *L. meridionalis*, but a definitive conclusion could not be reached because the type specimens of *L. meridionalis* were apparently lost. Joharchi *et al*. (2011: 32) considered them to be different species.

***Pseudoparasitus cunicularis* (Wang & Liao, 1964) new combination**
Mysolaelaps cunicularis Wang & Liao, 1964: 177.
Mysolaelaps cunicularis.—Wang & Liao, 2000: 24.
Gymnolaelaps cunicularis.—Ma, 2016a: 20.

Type depository. Medical College, Sun Yat-Sen University, Guangzhou, China.
Type locality and habitat. Fukien, China, in nest of *Rattus losea exiguous* [Animalia: Rodentia: Muridae].
Note. The new combination proposed for this species is based on the presence of features typical of *Pseudoparasitus*, including the presence of presternal platelets, sternal shield longer than wide, large epigynal shield bearing two pairs of setae away from the shield margin, and strong parapodal plates.

***Pseudoparasitus domrowi* Hunter, 1966**
Pseudoparasitus domrowi Hunter, 1966a: 7.
Pseudoparasitus domrowi.—Farrier & Hennessey, 1993: 87.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Peru, intercepted at Miami, Florida, United States of America, on orchid plants [Plantae: Asparagales: Orchidaceae].

***Pseudoparasitus ennsi* Hunter, 1966**
Pseudoparasitus ennsi Hunter, 1966a: 3.
Pseudoparasitus ennsi.—Farrier & Hennessey, 1993: 87.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Bentsen State Park, Texas, United States of America, under rocks.

***Pseudoparasitus exilis* Karg, 1981**
Pseudoparasitus (*Pseudoparasitus*) *exilis* Karg, 1981b: 217.
Pseudoparasitus (*Pseudoparasitus*) *exilis*.—Karg, 1989b: 335, 1997c: 43.
Pseudoparasitus exilis.—Karg, 1993b: 267, 2007: 128.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. "Faz. Itaquere" [sic], [?São Paulo state], Brazil, in soil.

***Pseudoparasitus germanicus* (Karg, 1965)**
Ololaelaps (*Cypholaelaps*) *germanicus* Karg, 1965: 277.
Pseudoparasitus (*Pseudoparasitus*) *germanicus*.—Karg, 1971: 162, 1978a: 212, 1981b: 212, 1989b: 335, 1993a: 134, 1997c: 43.
Pseudoparasitus germanicus.—Bregetova, 1977b: 536; Karg, 2007: 129; Beaulieu *et al*., 2019: 12.

Type depository. Karg's collection.
Type locality and habitat. Zörbig, near Halle, Sachsen-Anhalt, Germany, on turnip [Plantae: Brassicales: Brassicaceae] of experimental plot.

***Pseudoparasitus guttulae* Karg, 1997**
Pseudoparasitus (*Pseudoparasitus*) *guttulae* 1997c: 44.
Pseudoparasitus guttulae.—Karg, 2007: 128.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Otavolo, Imbabura, Ecuador, in moss on trees.

***Pseudoparasitus hajiqanbari* Kazemi, 2014**
Pseudoparasitus hajiqanbari Kazemi, 2014: 43.
Pseudoparasitus hajiqanbari.—Ghasemi-Moghadam *et al*., 2014: 964; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 149.
Pseudoparasitus talebii Nemati, Malekshah-koohi & Afshari, in Malekshah-koohi *et al*., 2014: 256 [junior synonym of *P. hajiqanbari* by Nemati *et al*., 2018b: 149].

Type depository. *P. hajiqanbari*: Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran; *P. talebii*: Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. *P. hajiqanbari*: 48 m above sea level, Sisangan Forest Park (36°34'N, 51°48'E), Mazandaran, Iran, in litter; *P. talebii*: 152 m above sea level, Ghorogh Forest (54°40'912", 36°52'248"[sic]), Gorgan, Golestan province, Iran.

***Pseudoparasitus indicus* Bhattacharyya, 1977**
Pseudoparasitus indicus Bhattacharyya, 1977: 2.
Pseudoparasitus indicus.—Kůrka, 2005: 26; Malekshah-Koohi *et al*., 2014: 256.

Type depository. Assumed to be at Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India.
Type locality and habitat. Kalyani, Nadia, West Bengal, India, in litter under *Shorea* sp. [Plantae: Malvales: Dipterocarpaceae].

***Pseudoparasitus jiangxiensis* Ma, 2007**
Pseudoparasitus jiangxiensis Ma, 2007b: 10.
Pseudoparasitus jiangxiensis.—Ren & Guo, 2008: 329, 2009: 101; Ma, 2011: 85.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Lushan Mountain (29°32'N, 115°55'E), Jiangxi province, China, in humus and soil under tree.

***Pseudoparasitus jilinensis* Ma, 2004**
Pseudoparasitus jilinensis Ma, 2004a: 18.
Pseudoparasitus jilensis Ma, 2004a: 21 (*lapsus calami*).
Pseudoparasitus jilinensis.—Karg, 2007: 129; Ma, 2007 b: 11; Ren & Guo, 2008: 329, 2009: 101.
Reticulolaelaps jilinensis.—Moraza, 2019: 374; Nemati *et al*., 2019: 93.

Type depository. National Base of Plague and Brucellosis Control, Baicheng, Jilin province, China.
Type locality and habitat. Changchun (43°54'N, 125°18'E), Jilin province, China, in forest soil.
Note. The placement of this species in *Reticulolaelaps* Costa by Nemati *et al*. (2019: 93) was provisional. Moraza (2019: 374) was not supportive of that new combination. Thus, we maintain the original combination, pending future elucidation of the correct generic placement.

***Pseudoparasitus juvencus* Berlese, 1916**
Pseudoparasitus juvencus Berlese, 1916b: 164.
Pseudoparasitus juvencus.—Lombardini, 1936: 48; Castagnoli & Pegazzano, 1985: 206; Bernini *et al*., 1995: 30.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Bosa, Oristano, Sardinia, Italy, in moss [cited as "muscis"].

***Pseudoparasitus maior* Berlese, 1916**
Pseudoparasitus maior Berlese, 1916b: 164.
Pseudoparasitus major [sic].—Lombardini, 1936: 48.
Pseudoparasitus maior.—Castagnoli & Pegazzano, 1985: 236.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, from unspecified substrate.

***Pseudoparasitus marginatus* Karg, 1997**
Pseudoparasitus (*Pseudoparasitus*) *marginatus* Karg, 1997c: 44.
Pseudoparasitus marginatus.—Karg, 2007: 129

Type depository. Museums für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Antisana, Pichincha, Ecuador, in litter.

***Pseudoparasitus meridionalis* (G. & R. Canestrini, 1882)**
Laelaps meridionalis G. & R. Canestrini, 1882b: 922.
Laelaps meridionalis.—Berlese, 1883b: 217, 1886b: 8; 1892f: 35.
Hypoaspis meridionalis.—Canestrini, 1885: 88.
Pseudoparasitus meridionalis.—Oudemans, 1902d: 29; Berlese, 1916a: 30; Hull, 1918: 63; Vitzthum, 1929: 27;

Lombardini, 1936: 48; Turk, 1953: 11; Castagnoli & Pegazzano, 1985: 246; Luxton, 1998: 20; Kůrka, 2005: 26; Karg, 2007: 128; Joharchi *et al*., 2011: 32.

Laelaps (*Hoplolaelaps*) *meridionalis*.—Berlese, 1903b: 14.

Laelaps (*Pseudoparasitus*) *meridionalis*.—Halbert, 1915: 70.

meridionalis; *non-Laelaps* [sic].—Tipton, 1960: 300.

Pseudoparasitus (*Pseudoparasitus*) *meridionalis*.—Karg, 1981b: 212, 1989b: 335, 1993a: 134, 1997c: 43.

Pseudoparasitus meridionalis meridionalis.—Bernini *et al*., 1995: 30.

Type depository. Unspecified.

Type locality and habitat. Civitavecchia and Messina, Italy, in moss under rock.

Note. Evans & Till (1966: 225) suspected *P. centralis* to be a senior synonym of *L. meridionalis*, but a definitive conclusion could not be reached because the type specimens of *L. meriodionalis* were apparently lost. Joharchi *et al*. (2011: 32) considered them as different species.

***Pseudoparasitus missouriensis* (Ewing, 1909)**

Hyletastes missouriensis Ewing, 1909: 66.

Pseudoparasitus obsoletus Berlese, 1916b: 164 [junior synonym of *H. missouriensis* by Hennessey & Farrier, 1988: 30; Farrier & Hennessey, 1993: 74; Joharchi *et al*., 2011: 33, 2018: 37, 2019d: 347, 2020e: 492].

Laelaspis austriacus Sellnick, 1935: 351 [junior synonym of *H. missouriensis* by Hennessey & Farrier, 1988: 30; Farrier & Hennessey, 1993: 74; Joharchi *et al*., 2011: 33, 2012a: 2012, 2018: 37, 2019d: 347, 2020e: 492; Makarova, 2014: 1406].

Pseudoparasitus obsoletus.—Lombardini, 1936: 48; Castagnoli & Pegazzano, 1985: 284.

Laelaspis austriacus.—Willmann, 1951: 113; Piryanik, 1959: 100, 1962: 73; Reitblat, 1963: 81; Osipova, 1969: 1739; Solomon, 1969b: 22; Lapinya, 1970: 278, 1976: 52.

Gymnolaelaps missouriensis.—Ellis, 1955: 16; Hennessey & Farrier, 1988: 30; Farrier & Hennessey, 1993: 74; Makarova, 2014: 1406.

Gymnolaelaps austriacus.—Hunter, 1961: 680; Ma & Lin, 2013: 80.

Gymnolae [sic] *missouriensis*.—Dowdy, 1965: 205.

Pseudoparasitus austriacus.—Hunter, 1966a: 9; Babaeian *et al*., 2019a: 328.

Hypoaspis austriacus.—Solomon, 1969b: 22; Kůrka, 2005: 24.

Hypoaspis (*Euryaspis*) *austriacus*.—Bernhard, 1971: 8.

Hypoaspis (*Holostaspis*) *austriaca*.—Karg, 1971: 176, 1978b: 11.

Hypoaspis (*Gymnolaelaps*) *austriacus*.—Bregetova, 1977b: 526; Sklyar, 2001: 101.

Hypoaspis (*Laelaspis*) *austriaca*.—Karg, 1979: 101, 1982: 249, 1989c: 120, 1993a: 161; Tenorio, 1982: 264; Tenorio *et al*., 1985: 300; Skorupski *et al*., 2013: 11.

Pseudoparasitus missouriensis.—Kůrka, 2005: 26; Joharchi *et al*., 2011: 32, 2018a: 37, 2019d: 347, 2020e: 492; Shaw, 2012: 27; Kazemi & Rajaei, 2013: 96; Hasanvand *et al*., 2014a: 96; Khalili-Moghadam & Saboori, 2015: 323; Ramroodi *et al*., 2015a: 79; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237.

Hypoaspis (*Laelaspis*) *misoriensis* [sic].—Babaeian *et al*., 2010: 328.

Pseudoparasitus missuriensis [sic].—Kazemi, 2014: 47; Hajizadeh & Joharchi, 2018: 24.

Hypoaspis austriaca.—Kontschán *et al*., 2014: 341, 2015b: 61, 2016a: 28.

Laelaspis missouriensis.—Kordeshami *et al*., 2015: 593.

Laelaspis austriaca.—Hajizadeh & Joharchi, 2018: 25.

Hypoaspis s. l. *missouriensis*.—Nemati *et al*., 2018b: 176.

Type depository. *H. missouriensis*: Illinois State Laboratory of Natural History, Urbana, Illinois, United States of America; *P. obsoletus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *L. austriacus*: unspecified.

Type locality and habitat. *H. missouriensis*: Columbia, Missouri, United States of America, under bark and in trash; *P. obsoletus*: "Columbia", United States of America, in moss [cited as "muscis"]; *L. austriacus*: Anninger, Austria, in nest of *Formica rufa* [Animalia: Hymenoptera: Formicidae].

Note. Nemati *et al*. (2018b: 176) questioned the generic placement of *H. missouriensis*.

***Pseudoparasitus nasipodaliae* Karg, 1993**
Pseudoparasitus nasipodaliae Karg, 1993b: 267.
Pseudoparasitus nasipodaliae.—Karg, 2007: 129.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 360 m above sea level, north Bellavista, Santa Cruz, Galapagos Islands, decaying leaves and fruits of avocado [*Persea americana*; Plantae: Laurales: Lauraceae] in a grove.

***Pseudoparasitus ocularis* Karg, 1981**
Pseudoparasitus (*Pseudoparasitus*) *ocularis* Karg, 1981b: 212.
Pseudoparasitus (*Pseudoparasitus*) *ocularis*.—Karg, 1989b: 335, 1997c: 43.
Pseudoparasitus ocularis.—Kůrka, 2005: 26; Karg, 2007: 128.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Venezuela, in soil.

***Pseudoparasitus orientalis* (Osipova, 1969)**
Laelaspis orientalis Osipova, 1969: 1739.
Pseudoparasitus orientalis.—Joharchi *et al*., 2012a: 2013.

Type depository. Zoological Museum, Moscow University, Moscow, Russia; specimen number Td-1.
Type locality and habitat. Chuisky Valley, Kyrgyzstan, on unspecified rodents [Animalia: Rodentia].

***Pseudoparasitus ovatulus* (Halbert, 1915)**
Laelaps (*Hypoaspis*) *ovatulus* Halbert, 1915: 71.
Hypoaspis ovatulus.—Hull, 1918: 67.
Laelaps dentatus Halbert, 1920: 123 [junior synonym of *L*. (*H*.) *ovatulus* by Luxton, 1998: 18].
Gymnolaelaps anomalus Willmann, 1951: 116 [junior synonym of *L*. *dentatus* by Karg, 1971: 163, 1993a: 135; Bregetova, 1977b: 536].
Halbertia ovatula.—Turk & Turk, 1952: 483; Turk, 1953: 11.
Laelapsoides dentatus.—Willmann, 1952a: 150.
Pseudoparasitus anomalus.—Hunter, 1966a: 13.
Pseudoparasitus dentatus.—Hunter, 1966a: 2; Evans & Till, 1966: 227; Solomon & Roznovăţ, 1969: 289; Bregetova, 1977b: 536; Castagnoli & Pegazzano, 1985: 110; Karg, 2007: 129; Kazemi & Rajaei, 2013: 96; Kazemi, 2014: 47; Mahjoori *et al*., 2014: 1603; Ramroodi *et al*., 2015a: 79; Mohammad-Dustar-Sharaf *et al*., 2016a: 91, 2016b: 237; Kavianpour *et al*., 2017: 165; Hajizadeh & Joharchi, 2018: 24; Nemati *et al*., 2018b: 149.
Pseudoparasitus (*Pseudoparasitus*) *dentatus*.—Karg, 1971: 162, 1978a: 212, 1981b: 212, 1989b: 335, 1993a: 135, 1997c: 44.
Gymnolaelaps anomalis [sic].—Karg, 1993a: 135.
Pseudoparasitus ovatulus.—Luxton, 1998: 19.

Type depository. *L*. (*H*.) *ovatulus* and *L*. *dentatus*: National Museum, Dublin, Ireland; *G*. *anomalus*: in Willmann's collection.
Type locality and habitat. *L*. (*H*.) *ovatulus*: Mulranny, Clare Island, Ireland, in flowers of *Campanula* sp. [Plantae: Asterales: Campanulaceae]; *L*. *dentatus*: seashore of Malahide, Dublin and Ardfry, Galway Bay, Ireland, in the Orange Lichen, Pelvetia and Spiralis zone, in soil; *G*. *anomalus*: 386 m above sea level, Marzer Kogel, Marz-Rohrbach, Pannonian Basin, Austria, in soil.
Note. Evans & Till (1966: 362) suggested that *L*. (*H*.) *ovatulus* could be placed in *Pseudoparasitus*, an interpretation accepted by several author and also in this publication.

***Pseudoparasitus ovulum* Berlese, 1920**
Pseudoparasitus ovulum Berlese, 1920: 167.
Pseudoparasitus ovulum.—Castagnoli & Pegazzano, 1985: 296; Farrier & Hennessey, 1993: 87.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Columbia (cited as N. A.), United States of America, in moss [cited as "muscis"].

***Pseudoparasitus paucidentis* (Karg, 1989)**
Hypoaspis (*Laelaspis*) *paucidentis* Karg, 1989c: 125.
Hypoaspis (*Laelaspis*) *paucidentis*.—Karg, 1993b: 266, 1994: 185.
Hypoaspis paucidentis.—Karg, 1994: 182.
Pseudoparasitus paucidentis.—Joharchi *et al*., 2012a: 2013.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Pseudoparasitus porulatus* Karg, 1989**
Pseudoparasitus (*Pseudoparasitus*) *porulatus* Karg, 1989b: 338.
Pseudoparasitus (*Pseudoparasitus*) *porulatus*.—Farrier & Hennessey, 1993: 87; Karg, 1997c: 44.
Pseudoparasitus porulatus.—Karg, 1993b: 268, 2007: 129.

Type depository. Hungarian Natural History Museum, Budapest, Hungary and Institut fur Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Vigie-Point, near Castries, Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.

***Pseudoparasitus puellus* Berlese, 1916**
Pseudoparasitus puellus Berlese, 1916b: 165.
Pseudoparasitus puellus.—Lombardini, 1936: 48; Castagnoli & Pegazzano, 1985: 337.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Olavarría, near Buenos Aires, Argentina, from unspecified substrate.

***Pseudoparasitus quadrisetatus* Karg, 1981**
Pseudoparasitus (*Pseudoparasitus*) *quadrisetatus* Karg, 1981b: 212.
Pseudoparasitus (*Pseudoparasitus*) *quadrisetatus*.—Karg, 1989b: 335, 1997c: 43; Farrier & Hennessey, 1993: 87.
Pseudoparasitus quadrisetatus.—Karg, 2007: 128.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Sierra Esperon, Cuba, in soil.

***Pseudoparasitus quinquepara* (Karg, 2000)**
Hypoaspis (*Laelaspis*) *quinquepara* Karg, 2000: 246.
Pseudoparasitus quinquepara.—Joharchi *et al*., 2012a: 2013.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Antisana, Pichincha, Ecuador, in dry moss.

***Pseudoparasitus rencornis* Karg, 2007**
Pseudoparasitus rencornis Karg, 2007: 127.

Type depository. Staatlichen Museum für Naturkunde Görlitz, Görlitz, Germany.
Type locality and habitat. Near Flavio Alfaro, Ecuador, in litter of a cacao [*Theobroma cacao*; Plantae: Malvales: Malvaceae] plantation.

***Pseudoparasitus reniculus* Karg, 1981**
Pseudoparasitus (*Gymnolaelaps*) *reniculus* Karg, 1981b: 218.
Pseudoparasitus (*Gymnolaelaps*) *reniculus*.—Karg, 1989b: 334, 2003b: 235.
Gymnolaelaps reniculus.—Joharchi *et al*., 2011: 25.
Pseudoparasitus reniculus.—Nemati & Gwiazdowicz, 2016b: 42.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Barueri, São Paulo state, Brazil, in soil with *Camponotus rufipes* [Animalia: Hymenoptera: Formicidae].
Note. The position of *Jv*1 and *Jv*2 in this species, only slightly away from the epigynal shield margin, makes dubious its generic placement in *Pseudoparasitus* instead of in *Gymnolaelaps*.

***Pseudoparasitus schatzi* Karg, 1993**
Pseudoparasitus schatzi Karg, 1993b: 268.
Pseudoparasitus (*Pseudoparasitus*) *schatzi*.—Karg, 2003b: 235.
Pseudoparasitus schatzi.—Kůrka, 2005: 26; Karg, 2007: 129.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. 2 km north of Bellavista, Santa Cruz, Galapagos Islands, in agricultural zone.

***Pseudoparasitus schusteri* Hirschmann, 1966**
Pseudoparasitus schusteri Hirschmann, 1966: 35.
Hypoaspis schusteri.—Kůrka, 2005: 25.

Type depository. Unspecified.
Type locality and habitat. Cananeia, São Paulo state, Brazil, in the tidal range of a mangrove.

***Pseudoparasitus spathulatus* Berlese, 1920**
Pseudoparasitus spathulatus Berlese, 1920: 168.
Pseudoparasitus spathulatus.—Lombardini, 1936: 48; Castagnoli & Pegazzano, 1985: 387; Bernini *et al*., 1995: 30.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Sardinia, Bosa and Golfo Aranci, Italy, in moss [cited as "muscis"].

***Pseudoparasitus stigmatus* (Fox, 1946)**
Mysolaelaps stigmatus Fox, 1946a: 449.
Austrogamasellus stigmatus.—Domrow, 1957: 204.
Pseudoparasitus stigmatus.—Hunter, 1966a: 11; Farrier & Hennessey, 1993: 87.
Pseudoparasitus stigmaticus [sic].—Tenorio, 1982: 270.

Pseudoparasitus (*Pseudoparasitus*) *stigmaticus* [sic].—Tenorio *et al*., 1985: 301.

Type depository. Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico.
Type locality and habitat. Camp O'Reilly, Gurabo, Puerto Rico, on *Rattus rattus* [Animalia: Rodentia: Muridae].

***Pseudoparasitus strictior* Berlese, 1916**
Pseudoparasitus meridionalis var. *strictior* Berlese, 1916b: 163.
Pseudoparasitus meridionalis var. *strictior*.—Castagnoli & Pegazzano, 1985: 398.
Pseudoparasitus meridionalis strictior.—Bernini *et al*., 1995: 30.
Pseudoparasitus strictior.—Freire, 2007: 182.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Palermo, Sicilia, Italy, in moss [cited as "muscis"].

***Pseudoparasitus thatcheri* Hunter & Moser, 1968**
Pseudoparasitus thatcheri Hunter & Moser, 1968: 119.
Pseudoparasitus thatcheri.—McGraw & Farrier, 1969: 148; Farrier & Hennessey, 1993: 87; Shaw 2012: 27.
Hypoaspis (*Laelaspis*) *thatcheri*.—Karg, 1982: 249, 1989c: 120.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Elizabeth, Louisiana, United States of America, in boring dust from *Pinus taeda* [Plantae: Pinales: Pinaceae] containing *Dendroctonus frontalis* [Animalia: Coleoptera: Curculionidae, Scolytinae] and wood borers.

***Pseudoparasitus trincisus* Hunter, 1966**
Pseudoparasitus trincisus Hunter, 1966a: 4.
Pseudoparasitus trincisus.—Tenorio, 1982: 271; Farrier & Hennessey, 1993: 88.
Pseudoparasitus (*Pseudoparasitus*) *trincisus*.—Tenorio *et al*., 1985: 301.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Costa Rica, intercepted at Brownsville, Texas, United States of America, on orchid plants [Plantae: Asparagales: Orchidaceae].

***Pseudoparasitus triquetrus* Karg, 2003**
Pseudoparasitus (*Gymnolaelaps*) *triquetrus* Karg, 2003b: 234.
Gymnolaelaps triquetrus.—Moreira, 2014: 281.
Pseudoparasitus triquetrus.—Nemati & Gwiazdowicz, 2016b: 42.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Quito, Pichinca [probably Pichincha], Ecuador, in soil and litter in irrigation canal.
Note. The position of *Jv*1 and *Zv*1 in this species, on the epigynal shield but only slightly away from the shield margin, is atypical for *Pseudoparasitus*.

***Raymentia* Womersley, 1956**

Raymentia Womersley, 1956a: 570 (type species: *Raymentia anomala* Womersley, 1956, by monotypy).

Raymentia.—Walter *et al*., 2002: 132; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page; Halliday, 2019: internet page.

Note. This genus was described in Laelapidae-Laelapinae. Walter *et al*. (2002: 134) discussed the relationship of this genus to both Hypoaspidinae and Melittiphidinae, without unequivocally assigning it to any of them.

***Raymentia anomala* Womersley, 1956**

Raymentia anomala Womersley, 1956a: 571.

Raymentia anomala.—Halliday, 1998: 129, 2019: internet page; Walter *et al*., 2002: 135; Klimov *et al*., 2016: internet page.

Type depository. South Australian Museum, Adelaide, Australia.

Type locality and habitat. Jameroo, New South Wales, Australia, associated with unidentified native bees [Animalia: Hymenoptera].

***Raymentia eickwortiana* Walter & Beard, 2002**

Raymentia eickwortiana Walter & Beard, in Walter *et al*., 2002: 135.

Raymentia eickwortiana.—Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Canberra, Australia.

Type locality and habitat. Armidale, New South Wales, Australia, on *Lasioglossum lacthium* [Animalia: Hymenoptera: Halictidae].

***Raymentia walkeriana* Walter & Beard, 2002**

Raymentia walkeriana Walter & Beard, in Walter *et al*., 2002: 137.

Raymentia walkeriana.—Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia.

Type locality and habitat. Lorien Wildlife Refuge, near Lansdowne, New South Wales, Australia, on *Lasioglossum atronitens* [Animalia: Hymenoptera: Halictidae].

***Reticulolaelaps* Costa, 1968**

Reticulolaelaps Costa, 1968: 26 (type species: *Reticulolaelaps faini* Costa, 1968, by monotypy).

Reticulolaelaps.—Bregetova, 1977b: 553; Nemati *et al*., 2013: 74, 2019: 79; Joharchi & Babaeian, 2015: 34; Moraza, 2019: 378; Nemati *et al*., 2021: 172.

Reticulaelaps [sic].—Hajizadeh & Joharchi, 2018: 23.

Note. This genus was described in Laelapidae-Laelapinae.

***Reticulolaelaps caditanus* Moraza, 2019**

Reticulolaelaps caditanus Moraza, 2019: 375.

Type depository. Museum of Zoology, University of Navarra, Pamplona, Spain.

Type locality and habitat. La Alcaidesa, San Roque, Cádiz, Spain, on ootheca of *Mantis religiosa* [Animalia: Mantodea: Mantidae].

***Reticulolaelaps costai* Joharchi & Babaeian, 2015**
Reticulolaelaps costai Joharchi & Babaeian, 2015: 34.
Reticulolaelaps costai.—Nemati *et al*., 2018b: 149, 2019: 90; Moraza, 2019: 381.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Tehran, Iran.
Type locality and habitat. 1595 m above sea level, Khoznan (36.71°N, 50.32° E, Savojbolagh, Qazvin, Iran, in nest of *Tapinoma* sp. [Animalia: Hymenoptera: Formicidae].

***Reticulolaelaps elsae* (Joharchi *et al*., 2016)**
Laelaspisella elsae Joharchi, Babaeian & Jalalizand, 2016a: 16.
Hypoaspis s. l. *elsae*.—Nemati *et al*., 2018b: 175.
Reticulolaelaps elsae.—Moraza, 2019: 381; Nemati *et al*., 2019: 80.

Type depository. Acarological Collection, Department of Plant Protection, Yazd Branch, Islamic Azad University, Yazd, Iran.
Type locality and habitat. Isfahan, Iran, on bark of elm [*Ulmus* sp.; Plantae: Rosales: Ulmaceae] trees.
Note. The authors of this species considered provisional its placement in *Laelaspisella*. Nemati *et al*. (2018b: 175) questioned its original generic placement.

***Reticulolaelaps faini* Costa, 1968**
Reticulolaelaps faini Costa, 1968: 26.
Reticulolaelaps faini.—Bregetova, 1977b: 553; Okáli 1991: 201; Nemati *et al*., 2013: 74, 2019: 88; Hasanvand *et al*., 2014a: 96; Joharchi & Babaeian, 2015: 40; Nemati *et al*., 2018b: 149; Moraza, 2019: 381.
Reticulaelaps faini [sic].—Hajizadeh & Joharchi, 2018: 23.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mishmar Ha'Emeq, Israel, in litter.

***Reticulolaelaps hallidayi* Joharchi *et al*., 2013**
Reticulolaelaps hallidayi Joharchi, Nemati & Babaeian, in Nemati *et al*., 2013: 76.
Reticulolaelaps hallidayi.—Joharchi & Babaeian, 2015: 39; Nemati *et al*., 2018b: 150; 2019: 94; Moraza, 2019: 381.

Type depository. Acarological Laboratory, Department of Plant Protection, Agricultural College, Shahrekord University, Shahrekord, Iran.
Type locality and habitat. 845 m above sea level, Izeh, Khuzestan, Iran, in soil.

***Reticulolaelaps lativentris* Karg, 1978**
Reticulolaelaps lativentris Karg, 1978b: 26.
Pseudoparasitus lativentris.—Nemati *et al*., 2013: 79, 2019: 92; Joharchi & Babaeian, 2015: 37.
Reticulolaelaps lativentris.—Moraza, 2019: 381.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near La Union, on the road to Valdivia, Valdivia, Chile, in muddy soil.

***Scissuralaelaps* Womersley, 1945**

Scissuralaelaps Womersley, 1945: 225 (type species: *Scissuralaelaps novaguinea* Womersley, 1945, by original designation).

Scissuralaelaps.—Radford, 1950b: 32; Baker & Wharton,1952: 96; Ryke, 1959: 21; Rosario, 1981: 73; Fain, 1992: 109; Casanueva, 1993: 41; Halliday, 1993: 347; Seeman & Alberti, 2015: 708; Halliday, 2019: internet page.

Note. *Scissuralaelaps* was described in Laelapidae, and recently included in Laelapidae-Iphiopsidinae by Seeman & Alberti (2015: 719).

***Scissuralaelaps bipartitus* Ishikawa, 1988**

Scissuralaelaps bipartitus Ishikawa, 1988: 174.

Scissuralaelaps bipartitus.—Fain, 1992: 110; Halliday, 1993: 348; Farfan & Klompen, 2012: 72; Seeman & Alberti, 2015: 715.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac 10269.

Type locality and habitat. Mindopok, South Cotabato, Mindanao Island, Philippines, on *Acladocricus philippinus* [Animalia: Spirobolida: Rhinocricidae].

***Scissuralaelaps breviseta* Ishikawa, 1988**

Scissuralaelaps breviseta Ishikawa, 1988: 176.

Scissuralaelaps breviseta.—Fain, 1992: 110; Halliday, 1993: 348; Farfan & Klompen, 2012: 72.

Type depository. Department of Zoology, National Science Museum (Natural History), Tokyo, Japan; specimen number NSMT-Ac 10271.

Type locality and habitat. Mindopok, South Cotabato, Mindanao Island, Philippines, on *Trigoniulus* sp. [Animalia: Spirobolida: Trigoniulidae].

***Scissuralaelaps grootaerti* Fain, 1992**

Scissuralaelaps grootaerti Fain, 1992: 110.

Scissuralaelaps grootaerti.—Halliday, 1993: 348.

Scissuralaelaps grootaeri [sic].—Farfan & Klompen, 2012: 72.

Type depository. Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.

Type locality and habitat. Bunapas Forest, Madang, Papua New Guinea, on an unidentified julid [Animalia: Julida].

***Scissuralaelaps hirschmanni* Fain, 1992**

Scissuralaelaps hirschmanni Fain, 1992: 113.

Scissuralaelaps hirschmanni.—Halliday, 1993: 348; Farfan & Klompen, 2012: 72.

Type depository. Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.

Type locality and habitat. Lae, Papua New Guinea (cited as New Guinea), on *Polyconoceras* sp. [Animalia: Spirobolida: Rhinocricidae].

***Scissuralaelaps huberi* Seeman & Alberti, 2015**
Scissuralaelaps huberi Seeman & Alberti, 2015: 708.

Type depository. San Carlos University, Cebu, Philippines.
Type locality and habitat. Near Busay Cave (9°54'57.5"N, 123°26'13.2"E), Moalbal, south-west Cebu, Philippines, on *Acladocricus* sp. [Animalia: Spirobolida: Rhinocricidae].

***Scissuralaelaps innotensis* Halliday, 1993**
Scissuralaelaps innotensis Halliday, 1993: 348.
Scissuralaelaps innotensis.—Halliday, 1998: 129, 2019: internet page; Faraji & Halliday, 2009: 262.

Type depository. Australian National Insect Collection, Canberra, Australia.
Type locality and habitat. 8 km west of Innot Hot Springs, Queensland, Australia, on *Macropanesthia rhinoceros* [Animalia: Blattodea: Blaberidae].

***Scissuralaelaps irianensis* Fain, 1992**
Scissuralaelaps irianensis Fain, 1992: 114.
Scissuralaelaps irianensis.—Halliday, 1993: 348; Farfan & Klompen, 2012: 72.

Type depository. Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.
Type locality and habitat. Sentani, Irian New Guinea, on an unidentified myriapod [Animalia: Myriapoda].

***Scissuralaelaps joliveti* Fain, 1992**
Scissuralaelaps joliveti Fain, 1992: 114.
Scissuralaelaps joliveti.—Halliday, 1993: 348; Farfan & Klompen, 2012: 72.

Type depository. Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium.
Type locality and habitat. Lae, Papua New Guinea (cited as New Guinea), on *Polyconoceras* sp. [Animalia: Spirobolida: Rhinocricidae].

***Scissuralaelaps novaguinea* Womersley, 1945**
Scissuralaelaps nova-guinea Womersley, 1945: 226.
Scissuralaelaps nova-guinea.—Radford, 1950b: 32; Ryke, 1959: 21.
Scissuralaelaps novaguinea.—Fain, 1992: 110; Halliday, 1993: 348.

Type depository. Unspecified.
Type locality and habitat. New Guinea, intercepted at Burnley Gardens Research Station, Melbourne, Australia, on an unidentified millipede [Animalia: Myriapoda].

***Scissuralaelaps philippinensis* Rosario, 1981**
Scissuralaelaps philippinensis Rosario, 1981: 73.
Scissuralaelaps philippinensis.—Halliday, 1993: 348.

Type depository. Unspecified.
Type locality and habitat. Mount Apo, Baracatan, Davao del Norte, Philippines, on an unidentified millipede [Animalia: Myriapoda].

***Scissuralaelaps queenslandica* Womersley, 1945**
Scissuralaelaps queenslandica Womersley, 1945: 228.
Scissuralaelaps queenslandica.—Fain, 1992: 110; Halliday, 1993: 348, 1998: 130, 2019: internet page; Faraji & Halliday, 2009: 262.

Type depository. Unspecified.
Type locality and habitat. Bardon, Brisbane, Queensland, Australia, from unspecified substrate.

***Scolopendracarus* Evans, 1955**
Scolopendracarus Evans, 1955: 358 (type species: *Scolopendracarus brevipilis* Evans, 1955, by monotypy).
Scolopendracarus.—Ryke, 1959: 7; Casanueva, 1993: 41.

Note. This genus was described in Laelapidae-Iphiopsinae.

***Scolopendracarus brevipilis* Evans, 1955**
Scolopendracarus brevipilis Evans, 1955: 358.

Type depository. Natural History Museum, London, England; specimen number 1954: 6: 14: 28.
Type locality and habitat. Arru Island (west of New Guinea) [Aru Islands, Indonesia], on *Scolopendra morsitans* [Animalia: Scolopendromorpha: Scolopendridae].

***Scorpionyssus* Fain & Rack, 1988**
Scorpionyssus Fain & Rack, 1988: 99 (type species: *Scorpionyssus heterometrus* Fain & Rack, 1988, by monotypy).

Note. This genus was described in Laelapidae.

***Scorpionyssus heterometrus* Fain & Rack, 1988**
Scorpionyssus heterometrus Fain & Rack, 1988: 102.

Type depository. Zoological Museum of the University of Hamburg, Germany.
Type locality and habitat. Hiniduma, Sri Lanka, on *Heterometrus* aff. *swammerdami* [Animalia: Scorpiones: Scorpionidae] from a rubber tree plantation.

***Spatholaelaps* Silvestri, 1917**
Spatholaelaps Silvestri, 1917: 297 (type species: *Spatholaelaps termitophilus* Silvestri, 1917, by original designation).
Spatholaelaps Silvestri, 1918: 13 (objective synonymy).

Note. This genus was described in Gamasidae - Laelapinae. Silvestri referred to *Spatholaelaps* as new genus in his publication of 1918, after having published it as a new genus the year before; hence, the name published in 1918 is considered an objective synonym.

***Spatholaelaps termitophilus* Silvestri, 1917**
Spatholaelaps termitophilus Silvestri, 1917: 298.
Spatholaelaps termitophilus Silvestri, 1918: 14 (objective synonymy).

Type depository. Unspecified.
Type locality and habitat. Victoria, Cameroon, in underground gallery of *Basidentitermes aurivillii* [Animalia: Blattodea: Termitidae].
Note. As reported for the genus *Spatholaelaps*, Silvestri referred to *Spatholaelaps termitophilus* as new species in his publication of 1918, after having published it as a new species the year before; hence, the name published in 1918 is considered an objective synonym.

Sphaeroseius Berlese, 1904

Sphaeroseius Berlese, 1904c: 433 (type species: *Laelaps ecitonis* Wasmann, 1900, by original designation).
Brucharachne Mello-Leitão, 1925: 234 (type species *Brucharachne ecitophila* Mello-Leitão, 1925, by monotypy) [junior synonym of *Sphaeroseius* by Krantz & Platnick, 1995: 3].
Sphaeroseius.—Sellnick, 1925: 5; Vitzthum, 1942: 756; Radford, 1950b: 12; Baker & Wharton, 1952: 73; Krantz & Platnick, 1995: 3.

Note. *Sphaeroseius* was described in Laelapidae, being included in Neoparasitidae by Vitzthum (1942: 756) and in Laelapidae-Hypoaspidinae by Krantz & Platnick (1995: 8). *Brucharachne* was described as a spider, within the then newly created family Brucharachnidae Mello-Leitão, 1925.

Sphaeroseius comes (Moniez, 1894)

Lælaps comes [sic] Moniez, 1894: 205.
Loelaps comes [sic].—Wasmann, 1894: 198.
Laelaps comes.—Leonardi, 1897: 864.
Sphaeroseius comes.—Sellnick, 1925: 8.

Type depository. Unspecified.
Type locality and habitat. Lorena, São Paulo state, Brazil, in nest of *Formica omnivora* [cited as *Eciton omnivorum*; Animalia: Hymenoptera: Formicidae].
Note. Berlese (1904c: 433) suspected this species to be a junior synonym of *Laelaps ecitonis* Wasmann.

Sphaeroseius ecitonis (Wasmann, 1900)

Loelaps ecitonis [sic] Wasmann, 1900: 256.
Sphaerolaelaps ecitonis.—Berlese, 1903a: 244 (probably *lapsus calami*).
Sphaeroseius ecitonis.—Berlese, 1904c: 433; Sellnick, 1925: 9; Lombardini, 1936: 49; Radford, 1950b: 12; Castagnoli & Pegazzano, 1985: 121.
ecitonis; *non-Laelaps* [sic].—Tipton, 1960: 293.

Type depository. Unspecified.
Type locality and habitat. Joinville, Santa Catarina, Brazil, on *Eciton coecum* [Animalia: Hymenoptera: Formicidae].
Note. Berlese (1904c: 433) suspected this species to be a senior synonym of *L. comes*. The report of this species under *Sphaerolaelaps* (a recognised genus name in Pachylaelapidae) was probably a *lapsus calami*, given that in an immediately subsequent paper Berlese (1904c) mentioned it several times under *Sphaeroseius*, designating it as type species.

Sphaeroseius ecitophila (Mello-Leitão, 1925)

Brucharachne ecitophila Mello-Leitão, 1925: 234.
Sphaeroseius ecitophilus.—Krantz & Platnick, 1995: 4.

Type depository. Author's collection (number 892 and slide preparation 101), according to original description, and in Museu Nacional, Rio de Janeiro, Rio de Janeiro, according to Krantz & Platnick (1995: 4).
Type locality and habitat. Córdoba, Argentina, under a rock with *Neivamyrmex raptor* [cited as *Eciton raptans*; Animalia: Hymenoptera: Formicidae].

***Sphaeroseius praedatoris* Sellnick, 1925**
Sphaeroseius praedatoris Sellnick, 1925: 5.

Type depository. E. Wasmann's collection.
Type locality and habitat. Passa Quatro, Minas Gerais, Brazil, from *Eciton praedator* [Animalia: Hymenoptera: Formicidae].

***Stevelus* Hunter, 1963**
Stevelus Hunter, 1963: 8 (type species: *Stevelus amiculus* Hunter, 1963, by monotypy).
Stevelus.—Casanueva, 1993: 40; Farrier & Hennessey, 1993: 88; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Stevelus amiculus* Hunter, 1963**
Stevelus amiculus Hunter, 1963: 10.
Stevelus amiculus.—Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 87; Klimov *et al*., 2016: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Barro Colorado Island, Canal Zone, Panama, on and in stingless bee cells [sic] [Animalia: Hymenoptera: Apidae].

***Stigmatolaelaps* Krantz, 1998**
Stigmatolaelaps Krantz, 1998b: 292 [type species: *Hypoaspis greeni* Oudemans, 1903 ("morphotype 2" - see comments on *S. greeni* below), by original designation].
Stigmatolaelaps.—Walter *et al*., 2002: 132; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Stigmatolaelaps greeni* (Oudemans, 1902)**
Hypoaspis greeni Oudemans, 1902a: 37.
Hypoaspis greeni Oudemans, 1903a: 128 (objective synonymy).
Hypoaspis (*Pneumolaelaps*) *greeni*.—Berlese, 1920: 151; Lombardini, 1936: 42.
Hypoaspis greeni.—Vitzthum, 1921: 22; Buitendijk, 1945: 295.
Pneumolaelaps greeni.—Hunter, 1966b: 360; Hunter & Husband, 1973: 77.
Stigmatolaelaps greeni.—Krantz, 1998b: 295; Klimov *et al*., 2016: internet page.

Type depository. Unspecified (according to Krantz, 1998b: 295 in Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands).
Type locality and habitat. India, on *Xylocopa tenuiscapa* (cited as *Koptorthosoma tenuiscapa*) [Animalia: Hymenoptera: Apidae].

Note. Despite listing this species in *Pneumolaelaps*, Hunter & Husband (1973: 77) suspected it to belong to a different genus. According to Krantz (1998b: 292), this species was described based on two different morphotypes. He identified what he called "morphotype 2" as *P. greeni*, assigning it as the type species of a new genus he then described as *Stigmatolaelaps*. The other morphotype, that he called "morphotype 1", was described as *Stigmatolaelaps hunteri* Krantz.

***Stigmatolaelaps hunteri* Krantz, 1998**

Stigmatolaelaps hunteri Krantz, 1998b: 295.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. North Talawa, 9 miles south-southwest of Annaradhapura, Sri Lanka, on *Xylocopa* (*Mesotrichia*) *tenuiscapa* [Animalia: Hymenoptera: Apidae].

Note. According to Krantz (1998b: 292), *Hypoaspis greeni* was described based on two different morphotypes. *Stigmatolaelaps hunteri* was described based on his "morphotype 1".

***Stigmatolaelaps sumatrensis* Krantz, 1998**

Stigmatolaelaps sumatrensis Krantz, 1998b: 297.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Kampong Silau, Maradja Asaham [probably Asahan], Sumatra, Indonesia, on *Xylocopa* (*Mesotrichia*) *latipes* [Animalia: Hymenoptera: Apidae].

***Stratiolaelaps* Berlese, 1916**

Hypoaspis (*Stratiolaelaps*) Berlese, 1916b: 168 [type species: *Laelaps* (*Iphis*) *miles* Berlese, 1892, by original designation].

Laelaps (*Eulaelaps*) Berlese, 1903b: 13 (in part).

Stratiolaelaps.—Vitzthum, 1931c: 143; Radford, 1950b: 20; Trägårdh, 1952: 66; Evans, 1957a: 221; Hughes, 1961: 217; Athias-Henriot, 1968: 239; Evans & Till, 1979: 201; Rosario, 1981: 76; Zaher, 1986: 198; Domrow, 1988: 825; Casanueva, 1993: 40; Walter & Campbell, 2003: 256; OConnor & Klimov, 2012a: internet page; Karg & Schorlemmer, 2013: 202; Gwiazdowicz *et al*., 2014: 441; Klimov *et al*., 2016: internet page; Nemati & Gwiazdowicz, 2016a: 548; Hajizadeh & Joharchi, 2018: 25; Halliday, 2019: internet page.

Hypoaspis (*Stratiolaelaps*).—Vitzthum, 1942: 763; Baker & Wharton, 1952: 94; Evans & Till, 1966: 160; Aswegen & Loots, 1970: 202; Bregetova, 1977b: 510.

Davisiella Zumpt & Patterson, 1951: 78 (type species: *Davisiella reticulata* Zumpt & Patterson, 1951, by monotypy) [junior synonym of *Hypoaspis* (*Stratiolaelaps*) by Evans & Till, 1966: 159, 1979: 201; Bregetova, 1977b: 510; Rosario, 1981: 76; Walter & Campbell, 2003: 256].

Hypoaspis (*Cosmolaelaps*).—Schweizer, 1961: 149; Karg, 1979: 71 (in part), 1981a: 213 (in part), 1988: 510 (in part), 1989a: 107 (in part); Karg & Schorlemmer, 2009: 61; Huhta & Karg, 2010: 330 (in part).

Cosmolaelaps.—Bregetova, 1955b: 290 (in part); Zhang *et al*., 1963: 191.

Hypoaspis.—Hughes, 1976: 292 (in part).

Note. *Hypoaspis* (*Stratiolaelaps*) was not assigned to a family in the original description, but was included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763) and in Laelapidae-Laelapinae by Evans & Till (1979: 201); *Davisiella* was originally described in Laelapidae-Hypoaspidinae. Karg (1979: 72) transferred *Laelaps* (*Iphis*) *miles* Berlese to *Hypoaspis* (*Cosmolaelaps*). Given that this is the type species of *Stratiolaelaps*, the latter became a junior synonym of *Cosmolaelaps*, as adopted by Farrier & Hennessey (1993: 67) and Karg (1971: 163, 1993a: 137). However, that proposed generic change was not accepted by subsequent authors (Casanueva, 1993: 40; Walter &

Campbell, 2003: 256; Gwiazdowicz *et al*., 2014: 441; Moreira *et al*., 2014: 318; Nemati & Gwiazdowicz, 2016b: 29) and neither by Karg & Schorlemmer (2013: 202). In this publication, *Cosmolaelaps* and *Stratiolaelaps* are considered different entities.

***Stratiolaelaps afer* (Berlese, 1916)**
Hypoaspis (*Stratiolaelaps*) *gryllotalpae* var. *afer* Berlese, 1916b: 168.
Hypoaspis (*Stratiolaelaps*) *gryllotalpae* var. *afer*.—Castagnoli & Pegazzano, 1985: 6.
Stratiolaelaps afer.—Moreira, 2014: 376.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.
Note. Available information does not eliminate the possibility that this species would be better placed in *Cosmolaelaps*; it is placed in the genus *Stratiolaelaps* mostly based on its original description in the subgenus *Stratiolaelaps* rather than in the subgenus *Cosmolaelaps*, by Berlese, author of both subgenera.

***Stratiolaelaps brasiliensis* (Berlese, 1918) new combination**
Hypoaspis (*Stratiolaelaps*) *brasiliensis* Berlese, 1918: 119.
Hypoaspis (*Stratiolaelaps*) *brasiliensis*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 48.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Santos, [São Paulo state], Brazil, in soil under palm log.
Note. The new combination proposed for this species results from the promotion of *Stratiolaelaps* from the subgeneric to the generic level and the presence of features typical of the genus, including large chelicerae, epistome with sharp median process, and knife-shaped idiosomal setae.

***Stratiolaelaps bregetovae* (Fonseca, 1960)**
Cosmolaelaps bregetovae Fonseca, 1960b: 94.
Cosmolaelaps bregetovae.—Botelho *et al*., 2002: 52.
Stratiolaelaps bregetovae.—Moreira *et al*., 2014: 322.

Type depository. Unspecified (in Instituto Butantan, São Paulo, São Paulo state, Brazil, according to D. M. Barros-Battesti, pers. comm.; specimen number 3481).
Type locality and habitat. 1500 m above sea level, Valleabajo, Bolivia, on *Oxymycterus doris* [Animalia: Rodentia: Muridae].
Note. *Cosmolaelaps bregetovae* Fonseca, 1960 is a junior primary homonym of *Cosmolaelaps bregetovae* Piryanik, 1959. However we refrain from providing a replacement name until a detailed taxonomic revision of *C. bregetovae* Fonseca, 1960 can be completed.

***Stratiolaelaps cardiophorus* (Berlese, 1916)**
Hypoaspis (*Stratiolaelaps*) *cardiophorus* Berlese, 1916b: 169.
Hypoaspis (*Stratiolaelaps*) *cardiophorus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 65.
Hypoaspis (*Cosmolaelaps*) *cardiophora*.—Karg, 1981a: 216, 1987: 294, 1988: 512; Huhta & Karg, 2010: 330.
Stratiolaelaps cardiophorus.—Moreira *et al*., 2014: 322.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, in nests of *Acromyrmex lundi* [Animalia: Hymenoptera: Formicidae].

***Stratiolaelaps corpulentus* (Berlese, 1920)**
Hypoaspis (*Stratiolaelaps*) *corpulentus* Berlese, 1920: 153.
Hypoaspis (*Stratiolaelaps*) *corpulentus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 92.
Cosmolaelaps corpulentus.—Bernini *et al*., 1995: 28.
Hypoaspis corpulentus.—Kůrka, 2005: 24.
Stratiolaelaps corpulentus.—Moreira, 2014: 377.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Type series, Florence and Pontedera, Italy, in moss [cited as "muscis"].

***Stratiolaelaps dani* (Grokhovskaya & Huan-Hoe, 1969)**
Cosmolaelaps dani Grokhovskaya & Huan-Hoe, 1969: 818.
Hypoaspis (*Cosmolaelaps*) *dani*.—Karg, 1988: 513.
Stratiolaelaps dani.—Moreira *et al*., 2014: 322.

Type depository. Institute of Epidemiology and Microbiology, Russian Academy of Medical Sciences, Moscow, Russia.
Type locality and habitat. Cao Bang, Namkep, Tintuk, Vietnam, in substrate of poultry houses.

***Stratiolaelaps fuscus* (Berlese, 1916)**
Hypoaspis (*Stratiolaelaps*) *fuscus* Berlese, 1916b: 168.
Hypoaspis (*Stratiolaelaps*) *fuscus*.—Berlese, 1918: 131; Lombardini, 1936: 42; Aswegen & Loots, 1970: 207; Castagnoli & Pegazzano, 1985: 155.
Hypoaspis (*Cosmolaelaps*) *fusca*.—Karg, 1981a: 216, 1987: 295, 1988: 512; Huhta & Karg, 2010: 330.
Stratiolaelaps fuscus.—Moreira *et al*., 2014: 322.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.

***Stratiolaelaps gibbosus* (Koyumdzhieva, 1979)**
Hypoaspis (*Stratiolaelaps*) *gibbosus* Koyumdzhieva, 1979: 71.
Stratiolaelaps gibbosus.—Moreira, 2014: 378.

Type depository. Institute of Zoology, Bulgarian Academy of Sciencies, Sofia, Bulgaria.
Type locality and habitat. Unspecified type locality (probably Bulgaria), in abandoned nests of *Picus viridis* and *Sturnus vulgaris* [cited as *vilgaris*] [Animalia: Piciformes: Picidae; Passeriformes: Sturnidae] on a tree.

***Stratiolaelaps gryllotalpae* (Berlese, 1910)**
Laelaps (*Hypoaspis*) *gryllotalpae* Berlese, 1910a: 259.
Hypoaspis (*Stratiolaelaps*) *gryllotalpae* Berlese, 1916b: 168.
gryllotalpae; *non-Laelaps* [sic].—Tipton, 1960: 296.
Hypoaspis (*Geolaelaps*) *gryllotalpae*.—Bregetova, 1977b: 504.
Hypoaspis (*Stratiolaelaps*) *gryllotalpae*.—Castagnoli & Pegazzano, 1985: 173.
Cosmolaelaps gryllotalpae.—Sklyar, 2012: 87; Joharchi & Trach, 2019: 492.
Stratiolaelaps gryllotalpae.—Moreira, 2014: 378.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Java, Indonesia, on *Gryllotalpa vulgaris* [Animalia: Orthoptera: Gryllotalpidae].

Note. Available information does not eliminate the possibility that this species would be better placed in *Cosmolaelaps*; it is placed in the genus *Stratiolaelaps* mostly based on its placement in the subgenus *Stratiolaelaps* rather than in the subgenus *Cosmolaelaps*, by Berlese, author of both subgenera. Joharchi & Trach (2019: 492) suspected *L*. (*H*.) *gryllotalpae* to be a senior synonym of *Hypoaspis angustiscutatus* Willmann, in turn considered by those authors as a senior synonym of *Cosmolaelaps mirificus* Sklyar, 2012.

***Stratiolaelaps hirtipes* (Berlese, 1920)**
Hypoaspis (*Stratiolaelaps*) *hirtipes* Berlese, 1920: 154.
Hypoaspis (*Stratiolaelaps*) *hirtipes*.—Lombardini, 1936: 42.
Stratiolaelaps hirtipes.—Moreira, 2014: 378.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Samarang, Java, Indonesia, from unspecified substrate.

***Stratiolaelaps lamington* Walter & Campbell, 2003**
Stratiolaelaps lamington Walter & Campbell, 2003: 260.
Hypoaspis miles.—Halliday, 1998b: 2171, 2001: 302 (misidentifications, according to Walter & Campbell, 2003: 260).
Stratiolaelaps lamington.—Beaulieu *et al*., 2010: Table S1; Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia.
Type locality and habitat. Lamington National Park (28°13'S, 153°08'E), Queensland, Australia, in *Asplenium* sp. [Plantae: Polypodiales: Aspleniaceae] litter, in subtropical rainforest canopy.

***Stratiolaelaps longicostalis* (Karg, 1978)**
Hypoaspis (*Cosmolaelaps*) *longicostalis* Karg, 1978b: 5.
Hypoaspis (*Cosmolaelaps*) *longicostalis*.—Karg, 1979: 72, 1981a: 216, 1987: 295, 1988: 512, 1996: 151, 1997b: 83; Huhta & Karg, 2010: 331.
Stratiolaelaps longicostalis.—Moreira *et al*., 2014: 322.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. Near Misituni, Tarapaca, Chile, on algae.

***Stratiolaelaps lorna* Walter & Campbell, 2003**
Stratiolaelaps lorna Walter & Campbell, 2003: 265.
Stratiolaelaps lorna.—Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia.
Type locality and habitat. Bauple State Forest, Gympie, Queensland, Australia, from colony established with mites from tree hollow used by brush-tailed possums [*Trichosurus*; Animalia: Diprotodontia: Phalangeridae] and gliders [*Petaurus*; Animalia: Diprotodontia: Petauridae].

***Stratiolaelaps marianuchi* (Arutunjan, 1990) new combination.**
Hypoaspis marianuchi Arutunjan, 1990a: 95.

Type depository. Acarology Laboratory, Institute of Zoology, Armenian Academy of Science, Armenia; specimen number

Type locality and habitat. Gugarskiy region, Armenia, in soil.
Note. The new combination proposed for this species results from the presence of features typical of *Stratiolaelaps*, including the elongate cheliceral digits, the abruptly tapering posterior end of the dorsal shield, most dorsal shield setae spatulate, presternal platelets anastomosed, and the sternal shield longer than wide and with distinct extensions between coxae I–II.

***Stratiolaelaps marilyn* Walter & Campbell, 2003**
Stratiolaelaps marilyn Walter & Campbell, 2003: 265.
Stratiolaelaps marilyn.—Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia.
Type locality and habitat. University of Queensland, Saint Lucia Campus (27°30'S, 153°01'E), Queensland, Australia, in bamboo [Plantae: Poales: Poaceae] litter.

***Stratiolaelaps miles* (Berlese, 1892)**
Laelaps (*Iphis*) *miles* Berlese, 1892b: 9.
Iphis miles.—Berlese, 1892f: 35.
Laelaps miles.—Berlese, 1892f: 35.
Hypoaspis miles.—Oudemans, 1902d: 24, 1903a: 129; Berlese, 1904a: 261; Costa, 1966a: 74; Evans & Till, 1966: 222; Bhattacharyya, 1967: 129; Solomon, 1968b: 675; Allred, 1969: 242, 1975: 127; Garrett & Allred, 1971: 294; Shcherbak, 1973: 446; Beron, 1974: 165; Whitaker & Wilson, 1974: 9; Hughes, 1976: 299; Koyumdjieva, 1979: 72; Halliday, 1998: 125; Kůrka, 2005: 25; Whitaker *et al*., 2007: 20; Ren & Guo, 2008: 329, 2009: 101.
Laelaps (*Eulaelaps*) *miles*.—Berlese, 1903b: 13.
Hypoaspis (*Stratiolaelaps*) *miles*.—Berlese, 1916b: 168; Lombardini, 1936: 42; Aswegen & Loots, 1970: 205; Bregetova, 1977b: 511; Nasr, 1978: 47; Koyumdzhieva, 1979: 71; Ishikawa, 1982: 94; Castagnoli & Pegazzano, 1985: 250; Chelebiev, 1988: 11; Karg, 1993b: 262; Sklyar, 2001: 101.
Cosmolaelaps gurabensis Fox, 1946a: 449 [junior synonym of *L*. (*I*.) *miles* by Costa, 1966a: 74; Evans & Till, 1966: 222; Bhattacharyya, 1967: 131; Karg, 1971: 178; Hughes, 1976: 299; Bregetova, 1977b: 511; Rosario, 1981: 76; Tenorio, 1982: 264; Farrier & Hennessey, 1993: 69; Yan *et al*., 2008: 2230; Moreira *et al*., 2014: 322; Meng *et al*., 2021: 4].
Cosmolaelaps gurabensis.—Thurman *et al*., 1949: 1; Ellis, 1955: 16; Bregetova, 1955b: 292, 1956: 75; Hays & Guyton, 1958: 260; Valle, 1958: 186; Piryanik, 1962: 81; Reitblat, 1963: 76; Goncharova & Buyakova, 1964: 281; Grokhovskaya & Huan-Hoe, 1969: 819.
Laelaps (*Iphis*) *miles*.—Radford, 1950b: 20.
Hypoaspis gurabensis.—Allred & Beck, 1956: 39; Allred, 1958: 28.
miles; *non-Laelaps* [sic].—Tipton, 1960: 301.
Stratiolaelaps gurabensis.—Hughes, 1961: 217; Costa, 1962: 489; Kazemi & Rajaei, 2013: 97.
Cosmolaelaps gurbensis [sic].—Zhang *et al*., 1963: 192.
Stratiolaelaps miles.—Evans & Till, 1965a: 288; Athias-Henriot, 1968: 235; Domrow, 1974: 16, 1988: 846; Rosario, 1981: 76; Zaher, 1986: 199; Strong & Halliday, 1994: 87; Halliday, 2001: 302; Walter & Campbell, 2003: 267; Beaulieu, 2009: 34; Kazemi & Rajaei, 2013: 97; Moreira *et al*., 2014: 322; Hajizadeh & Joharchi, 2018: 25; Halliday *et al*., 2018: 52; Kazemi, 2020: 136.
Hypoaspis (*Stratiolaelaps*) *milescuneifer* Greim, in Hirschmann *et al*., 1969: 139 [junior synonym of *L*. (*I*.) *miles* by Bregetova, 1977b: 511; Karg, 1981a: 217, 1988: 513, 1993a: 139; Farrier & Hennessey, 1993: 69].
Hypoaspis (*Cosmolaelaps*) *miles*.—Karg, 1971: 163, 1978b: 9, 1979: 72, 1981a: 217, 1988: 513, 1993a: 139; Tenorio, 1982: 264; Tenorio *et al*., 1985: 300; Deng *et al*., 1993: 173; Faraji *et al*., 2008: 207; Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10; Meng *et al*., 2021: 4.
Hypoaspis (*Striatolaelapa*) *miles* [sic].—Hafez *et al*., 1982: 3.
Cosmalaelaps gurbensis [sic].—[junior synonym of *Stratiolaelaps miles* by Zaher, 1986: 199].
Cosmolaelaps miles.—Farrier & Hennessey, 1993: 69; Bernini *et al*., 1995: 28; Ma, 1995a: 432, 1998: 163.

Type depository. *L*. (*I*.) *miles*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *C*. *gurabensis*: Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico; *H*. (*S*.) *milescuneifer*: unspecified.
Type locality and habitat. *L*. (*I*.) *miles*: Padua, Italy, in stable and in hay; *C*. *gurabensis*: type series, Camp O'Reilly, Gurabo, Puerto Rico, on "*Rattus* sp. or *Mus musculus musculus*" [sic] [Animalia: Rodentia: Muridae]; *H*. (*S*.) *milescuneifer*: Erlangen, Germany, on *Lasius niger* [Animalia: Hymenoptera: Formicidae].
Note. Domrow (1974: 16, 1988: 846), Rosario (1981: 76) and Halliday (1998: 125) considered *Cosmolaelaps scimitus* Womersley to be a junior synonym of *L*. (*I*.) *miles*, but Walter & Campbell (2003: 266) considered them to be different species; the latter interpretation is accepted in this publication. Specimens reported by Domrow (1988: 846) and Shaw (1999: 45) as *S*. *miles* were re-identified as *S*. *scimitus* by Walter & Campbell (2003: 266).

***Stratiolaelaps misellus* (Berlese, 1918) new combination**
Hypoaspis (*Stratiolaelaps*) *misellus* Berlese, 1918: 121.
Hypoaspis (*Stratiolaelaps*) *misellus*.—Lombardini, 1936: 42.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Somalia (cited as Somalia italiana), on rotting wood in woods by Juba River.
Note. Available information does not eliminate the possibility that this species would be better placed in *Cosmolaelaps*; it is placed in the genus *Stratiolaelaps* mostly based on its placement in the subgenus *Stratiolaelaps* rather then in the subgenus *Cosmolaelaps*, by Berlese, author of both subgenera.

***Stratiolaelaps ornatissima* (Aswegen & Loots, 1970)**
Hypoaspis (*Stratiolaelaps*) *ornatissima* Aswegen & Loots, 1970: 203.
Hypoaspis (*Cosmolaelaps*) *ornatissima*.—Karg, 1981a: 216, 1987: 294, 1988: 512; Huhta & Karg, 2010: 330.
Hypoaspis (*Stratiolaelaps*) *ornatissima*.—Karg, 1993b: 262.
Stratiolaelaps ornatissima.—Walter & Campbell, 2003: 257; Moreira *et al*., 2014: 322.

Type depository. Unspecified.
Type locality and habitat. Ngorong, Tanzania (cited as Tanganyika), from unspecified substrate.

***Stratiolaelaps reticulata* (Zumpt & Patterson, 1951)**
Davisiella reticulata Zumpt & Patterson, 1951: 78.
Stratiolaelaps reticulata.—Moreira, 2014: 382.

Type depository. South African Institute for Medical Research, Johannesburg, South Africa.
Type locality and habitat. Vumba, Umtali, Zimbabwe [cited as South Rhodesia], on *Crocidura luna* [Animalia: Soricomorpha: Soricidae].

***Stratiolaelaps rugosissimus* (Berlese, 1916) new combination**
Hypoaspis (*Stratiolaelaps*) *rugosissimus* Berlese, 1916b: 169.
Hypoaspis (*Stratiolaelaps*) *rugosissimus*.—Lombardini, 1936: 42; Castagnoli & Pegazzano, 1985: 366.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Java, Indonesia, from unspecified substrate.
Note. The new combination proposed for this species results from the promotion of *Stratiolaelaps* from the subgeneric to the generic level, and the presence of features typical of the genus, including the truncate epistome, spatulate and tricarinate dorsal idiosomal setae, and large sternal shield.

***Stratiolaelaps scimitus* (Womersley, 1956)**

Cosmolaelaps scimitus Womersley, 1956a: 580.

Hypoaspis (*Stratiolaelaps*) *miles elsi* Aswegen & Loots, 1970: 205 [junior synonym of *C. scimitus* by Walter & Campbell, 2003: 266; Moreira *et al*., 2014: 322].

Hypoaspis (*Cosmolaelaps*) *scimitus*.—Karg, 1978b: 8.

Hypoaspis (*Cosmolaelaps*) *scimita*.—Karg, 1979: 71, 1981a: 216, 1987: 293, 1988: 512; Tenorio, 1982: 267; Tenorio *et al*., 1985: 300; Huhta & Karg, 2010: 330.

Hypoaspis (*Cosmolaelaps*) *elsi*.—Karg, 1981a: 216, 1987: 294, 1988: 512; Huhta & Karg, 2010: 331.

Stratiolaelaps miles.—Domrow, 1988: 846; Shaw, 1999: 45 (misidentifications, according to Walter & Campbell, 2003: 266).

Cosmolaelaps scimitus.—Farrier & Hennessey, 1993: 69.

Hypoaspis (*Stratiolaelaps*) *elsi*.—Karg, 1993b: 262.

Hypoaspis (*Stratiolaelaps*) *antennata* Karg, 1993b: 262 [junior synonym of *C. scimitus* by Walter & Campbell, 2003: 266; Moreira *et al*., 2014: 322].

Stratiolaelaps scimitus.—Strong & Halliday, 1994: 87; Walter & Campbell, 2003: 266; Faraji & Halliday, 2009: 260; Kazemi *et al*., 2014: 510; Moreira *et al*., 2014: 322; Kontschán *et al*., 2016a: 25; Nemati *et al*., 2018b: 150; Halliday, 2019: internet page.

Hypoaspis (*Cosmolaelaps*) *antennata*.—Huhta & Karg, 2010: 331.

Type depository. *C. scimitus*: South Australian Museum, Adelaide, Australia; H. (*S.*) *miles elsi*: Institute for Zoological Research, Potchefstroom University, South Africa; *H.* (*S.*) *antennata*: Museum für Naturkunde, Berlin, Germany.

Type locality and habitat. *C. scimitus*: Sansapore, Indonesia (referred to as Dutch New Guinea), on *Rattus concolor* [Animalia: Rodentia: Muridae]; *H.* (*S.*) *miles elsi*: ?Namibia [cited as S.W.A., probably South West Africa], from unspecified substrate; *H.* (*S.*) *antennata*: Academy Bay, Santa Cruz, Galapagos Islands, supralittoral zone, on decaying leaves.

Note. Domrow (1974: 16, 1988: 846), Rosario (1981: 76) and Halliday (1998: 125) considered *C. scimitus* to be a junior synonym of *L.* (*I.*) *miles*, but Walter & Campbell (2003: 266) considered them to be different species. The latter interpretation is accepted in this publication.

***Stratiolaelaps womersleyi* Walter & Campbell, 2003**

Stratiolaelaps womersleyi Walter & Campbell, 2003: 264.

Stratiolaelaps womersleyi.—Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia.

Type locality and habitat. Cement Creek (37°43'S, 145°42'E), Central Highlands,Victoria, Australia, in cool-temperate rainforest litter.

***Stratiolaelaps xiajiangensis* (Liu & Ma, 2000)**

Cosmolaelaps xiajiangensis Liu & Ma, in Liu *et al*., 2000: 381.

Cosmolaelaps retirugi Ma, Yang & Zhang, 2004: 93 [junior synonym of *C. xiajiangensis* by Ma, 2016b: 95].

Cosmolaelaps xiajiangensis.—Ma *et al*., 2004: 93; Ren & Guo, 2008: 328, 2009: 101; Ma & Lin, 2009: 35; Ma, 2016b: 95.

Cosmolaelaps retirugi.—Ren & Guo, 2008: 328, 2009: 101; Moreira *et al*., 2014: 320.

Hypoaspis (*Cosmolaelaps*) *retirugi*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Hypoaspis (*Cosmolaelaps*) *xiajiangensis*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Stratiolaelaps retirugi.—Moreira *et al*., 2014: 322.

Stratiolaelaps xiajiangensis.—Moreira *et al*., 2014: 322.

Type depository. *C. xiajiangensis*: Institute of Parasitic Diseases, Hubei Academy of Medical Sciences, Hubei, China; *C. retirugi*: Institute for Endemic Disease Prevention and Control of Qinghai province, Qinghai, China.

Type locality and habitat. *C. xiajiangensis*: about 1600–1800 m above sea level, Shennongjia Forest region (31°15'–31°57'N, 109°56'–110°58'E), Hubei, China, on unidentified insectivora; *C. retirugi*: Zongzhai, Huangzhong (36°27'N, 101°30'E), Qinghai, China, on *Rattus norvegicus* [Animalia: Rodentia: Muridae].

***Stratiolaelaps yeruiyuae* (Ma, 1995)**
Cosmolaelaps yeruiyuae Ma, 1995a: 432.
Cosmolaelaps yeruiyuae.—Ma, 1998: 163; Liu *et al*., 2000: 381.
Hypoaspis yerusyuae [sic].—Ren & Guo, 2008: 330, 2009: 101.
Cosmolaelaps yerulyuae [sic].—Ren & Guo, 2008: 328, 2009: 101.
Hypoaspis (*Cosmolaelaps*) *yeruiyuae*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.
Stratiolaelaps yeruiyuae.—Moreira *et al*., 2014: 322.

Type depository. First Institute of Endemic Disease Research, Jilin province, China.
Type locality and habitat. Qianguoerluosi (45°N, 125°E), Mongolian Autonomous County, Jilin province, China, on *Cricetulus barabensis* [Animalia: Rodentia: Cricetidae].

***Suracarus* Flechtmann, 2005**
Suracarus Flechtmann, 2005: 39 (type species: *Suracarus inusitatus* Flechtmann, 2005, by monotypy).

Note. This genus was described in Laelapidae, within Suracarinae, described in the same publication. We provisionally accept it in Laelapidae, following Flechtmann (2005), although many attributes suggest that it belongs elsewhere in Dermanyssina.

***Suracarus inusitatus* Flechtmann, 2005**
Suracarus inusitatus Flechtmann, 2005: 39.

Type depository. Escola Superior de Agricultura "Luiz de Queiroz", Universidade de São Paulo, Piracicaba, São Paulo state, Brazil.
Type locality and habitat. Caruari, Amazonas, Brazil, in nest of *Trigona albipennis* [Animalia: Hymenoptera: Apidae].

***Tropilaelaps* Delfinado & Baker, 1961**
Tropilaelaps Delfinado & Baker, 1961: 53 (type species: *Tropilaelaps clareae* Delfinado & Baker, 1961, by monotypy).
Tropilaelaps.—Casanueva, 1993: 40; Deng *et al*., 1993: 154; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae *sensu lato* [sic].

***Tropilaelaps clareae* Delfinado & Baker, 1961**
Tropilaelaps clareae Delfinado & Baker, 1961: 53.
Tropilaelaps clareae.—Krantz & Kitprasert, 1990: 13; Deng *et al*., 1993: 155; Chmielewski, 1998: 208; Anderson & Morgan, 2007: 20; Ren & Guo, 2008: 328, 2009: 101; Anderson & Roberts, 2013: 8; Guzman *et al*., 2017: 320; Nemati *et al*., 2018b: 121.

Type depository. Chicago Natural History Museum, Chicago, Illinois, United States of America.
Type locality and habitat. Mataas-na-Kahoy, Lipa, Batangas, Philippines, on field rats [Animalia: Rodentia].

***Tropilaelaps koenigerum* Delfinado-Baker & Baker, 1982**
Tropilaelaps koenigerum Delfinado-Baker & Baker, 1982: 416.
Tropilaelaps koenigerum.—Chmielewski, 1998: 209; Anderson & Morgan, 2007: 20; Anderson & Roberts, 2013: 8.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America; specimen number 4011.
Type locality and habitat. Anuradhapura, Sri Lanka, on *Apis dorsata* [Animalia: Hymenoptera: Apidae].

***Tropilaelaps mercedesae* Anderson & Morgan, 2007**
Tropilaelaps mercedesae Anderson & Morgan, 2007: 21.
Tropilaelaps mercedesae.—Anderson & Roberts, 2013: 8; Guzman *et al*., 2017: 319; Halliday *et al*., 2018: 52.

Type depository. Australian National Insect Collection, Canberra, Australia.
Type locality and habitat. Hanoi, Vietnam, in a colony of *Apis mellifera* [Animalia: Hymenoptera: Apidae].

***Tropilaelaps thaii* Anderson & Morgan, 2007**
Tropilaelaps thaii Anderson & Morgan, 2007: 22.
Tropilaelaps thaii.—Anderson & Roberts, 2013: 8.

Type depository. Australian National Insect Collection, Canberra, Australia.
Type locality and habitat. Sonla province, Vietnam, in a colony of *Apis laboriosa* [Animalia: Hymenoptera: Apidae].

***Ulyxes* Shaw, 2014**
Ulyxes Shaw, 2014b: 263 (type species: *Haemolaelaps ulysses* Domrow, 1961, by original designation).
Ulyxes.—Halliday, 2019: internet page.

Note. This genus was described in Laelapidae. It includes the species that Domrow (1964) placed in his *ulysses* group (Shaw, 2014a: 290).

***Ulyxes anticlea* (Domrow, 1972)**
Haemolaelaps anticlea Domrow, 1972b: 290.
Haemolaelaps anticlea.—Domrow, 1981a: 222, 1987: 829.
Androlaelaps anticlea.—Halliday, 1998: 122.
Ulyxes anticlea.—Shaw, 2014b: 266; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Tanjil Bren, Victoria, Australia, on *Gymnobelideus leadbeateri* [Animalia: Diprotodontia: Petauridae].

***Ulyxes autolycus* Shaw, 2014**
Ulyxes autolycus Shaw, 2014b: 266.

Type depository. Bernice Pauahi Bishop Museum, Honolulu, Hawaii.
Type locality and habitat. Collin's Sawmill, Mount Otto, Papua New Guinea, 2215 m above sea level, in nest of *Pseudochirops cupreus* [Animalia: Diprotodontia: Pseudocheridae].

***Ulyxes calypso* (Domrow, 1965)**
Haemolaelaps calypso Domrow, 1965: 173.
Haemolaelaps calypso.—Domrow, 1972a: 109, 1977: 186; 1981a: 222, 1987: 829.
Androlaelaps calypso.—Halliday, 1998: 122.
Ulyxes calypso.—Shaw, 2014b: 268; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Bearii, north of Strathmerton, Victoria, Australia, on *Petaurus breviceps* [Animalia: Diprotodontia: Phalangeridae].

***Ulyxes euryclea* Shaw, 2014**
Ulyxes euryclea Shaw, 2014b: 269.
Ulyxes euryclea.—Halliday, 2019: internet page.

Type depository. Queensland Museum, Brisbane, Australia.
Type locality and habitat. Candlebark Park (37°31'56"S, 145°06'39"E), Templestowe, Victoria, Australia, in nestbox recently occupied by *Cacatua longirostris* [Animalia: Psittaciformes: Cacatuidae].

***Ulyxes laertes* (Domrow, 1972)**
Haemolaelaps laertes Domrow, 1972a: 109.
Haemolaelaps laertes.—Domrow, 1972b: 291, 1981a: 221, 1988: 831.
Androlaelaps laertes.—Halliday, 1998: 123.
Ulyxes laertes.—Shaw, 2014b: 276; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Canungra, Queensland, Australia, on *Rattus fuscipes* [Animalia: Rodentia: Muridae].

***Ulyxes penelope* (Domrow, 1964)**
Haemolaelaps penelope Domrow, 1964: 156.
Haemolaelaps penelope.—Domrow, 1972a: 110, 1979b: 192, 1981a: 222, 1988: 832.
Androlaelaps penelope.—Halliday, 1998: 123; Kůrka, 2005: 23.
Ulyxes penelope.—Shaw, 2014b: 279; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. 2000 feet [610 m] above sea level, rainforest, Mount Glorious, southeast Queensland, Australia, on *Trichosurus caninus* [Animalia: Diprotodontia: Phalangeridae].

***Ulyxes sisyphus* (Domrow, 1981)**
Haemolaelaps sisyphus Domrow, 1981a: 222.
Haemolaelaps sisyphus.—Domrow, 1988: 832.
Androlaelaps sisyphus.—Halliday, 1998: 124; Kůrka, 2005: 23.
Ulyxes sisyphus.—Shaw, 2014b: 281; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.

Type locality and habitat. Timbilica State Forest, New South Wales, Australia, in nasal passages of *Trichosurus vulpecula* [Animalia: Diprotodontia: Phalangeridae].

***Ulyxes telemachus* (Domrow, 1964)**
Haemolaelaps telemachus Domrow, 1964: 160.
Haemolaelaps telemachus.—Domrow, 1972a: 110, 1977: 198, 1981a: 221, 1988: 832.
Androlaelaps telemachus.—Halliday, 1998: 124.
Ulyxes telemachus.—Shaw, 2014b: 282; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Glenlofty, Victoria, Australia, on *Antechinus flavipes* [Animalia: Dasyuromorphia: Dasyuridae].

***Ulyxes theoclymenus* Shaw, 2014**
Ulyxes theoclymenus Shaw, 2014b: 283.
Ulyxes theoclymenus.—Halliday, 2019: internet page.

Type depository. Berrnice Pauahi Bishop Museum, Honolulu, Hawaii.
Type locality and habitat. May River, West Sepik province, Papua New Guinea, in nest of *Lorius lorry* [Animalia: Psittaciformes: Psittaculidae].

***Ulyxes ulixes* (Domrow, 1972)**
Haemolaelaps ulixes Domrow, 1972a: 112.
Haemolaelaps ulixes.—Domrow, 1981a: 222, 1988: 833.
Androlaelaps ulixes.—Halliday, 1998: 124; Kůrka, 2005: 23.
Ulyxes ulyxes.—Shaw, 2014b: 285; Halliday, 2019: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Brindabella Range, Australian Capital Territory, Australia, on *Schoinobates volans* [Animalia: Diprotodontia: Petauridae].
Note. Species described based on part of the specimens previously reported as *Haemolaelaps ulysses* Domrow by Domrow (1964: 156).

***Ulyxes ulysses* (Domrow, 1961)**
Haemolaelaps ulysses Domrow, 1961: 63.
Haemolaelaps ulysses.—Domrow, 1964: 156 (in part), 1965: 173, 1972a: 111, 1981a: 222, 1988: 833; Monroe, 1972: 298.
Androlaelaps ulysses.—Halliday, 1998: 124.
Ulyxes ulysses.—Shaw, 2014b: 285; Halliday, 2019: internet page.

Type depository. Queensland Museum, South Brisbane, Australia; specimen number G2461 (Monroe, 1972: 298).
Type locality and habitat. Warramate Hills, near Lilydale, Victoria, Australia, on *Pseudocheirus peregrinus laniginosus* [Animalia: Diprotodontia: Phalangeridae].
Note. Part of the specimens reported by Domrow (1964: 156) as *H. ulysses* were described as *Haemolaelaps ulixes* by Domrow (1972a: 112).

***Urozercon* Berlese, 1901**

Urozercon Berlese, in Berlese & Leonardi, 1901: 13 (type species: *Urozercon paradoxus* Berlese, 1901, by monotypy).

Urozercon.—Silvestri, 1903: 172, 1917: 299, 1918: 15; Berlese, 1913b: 10; Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Baker & Wharton,1952: 95; Casanueva, 1993: 40; Farrier & Hennessey, 1993: 88; OConnor & Klimov, 2012a,b: internet page.

Termitacarus Trägårdh, 1906: 875 (type species: *Termitacarus cuneiformis* Trägårdh, 1906, by monotypy) [junior synonym of *Urozercon* by Silvestri, 1917: 299, 1918: 15; Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Farrier & Hennessey, 1993: 88].

Termitacarus.—Berlese, 1913b: 10.

Myrmozercon (non Berlese, 1902: 699).—Rosario & Hunter, 1988: 466 (in part).

Uronyssus Halliday, 2006: 35 (type species: *Uronyssus watsoni* Halliday, 2006, by original designation) [junior synonym of *Urozercon* by OConnor & Klimov, 2012b: internet page].

Not *Termitacarus* Kurosa, 1994: 207 (type species: *Termitacarus ishiharai* Kurosa, 1994, by monotypy) [junior homonymy of *Termitacarus* Trägårdh, 1906: 875]. Renamed as *Nipponophorus* Kurosa, 2001: 123, and classified in Pygmephoridae (Acari: Heterostigmata).

Note. *Urozercon* and *Termitacarus* were not assigned to a family in the original description, both being included in Laelapidae-Hypoaspidinae by Vitzthum, 1942: 764; *Uronyssus* was assigned to Uronyssidae, described by Halliday (2006: 35).

***Urozercon angustatus* Silvestri, 1911**

Urozercon melittophilus var. *angustatus* Silvestri, 1911a: 71.

Urozercon angustatus.—OConnor & Klimov, 2012b: internet page.

Type depository. Unspecified.

Type locality and habitat. Coxipó, [Cuiabá], Mato Grosso, Brazil, on larvae of *Centris thoracica* [Animalia: Hymenoptera: Apidae].

***Urozercon cuneiformis* (Trägårdh, 1906)**

Termitacarus cuneiformis Trägårdh, 1906: 875.

Urozercon cuneiformis.—Silvestri, 1917: 300, 1918: 16; OConnor & Klimov, 2012b: internet page.

Type depository. Unspecified.

Type locality and habitat. Avoca, Natal, South Africa, in nest of *Eutermes* sp. [Animalia: Blattodea: Termitidae].

***Urozercon melittophilus* Silvestri, 1911**

Urozercon melittophilus Silvestri, 1911a: 70.

Urozercon melittophilus.—OConnor & Klimov, 2012b: internet page.

Type depository. Unspecified.

Type locality and habitat. Coxipó, [Cuiabá], Mato Grosso, Brazil, on *Trigona cupira* (cited as *Trigonae cupirae*) [Animalia: Hymenoptera: Apidae].

***Urozercon milleri* (Halliday, 2006)**

Uronyssus milleri Halliday, 2006: 35

Urozercon milleri.—OConnor & Klimov, 2012b: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Darwin, Northern Territory, Australia, in nest of *Nasutitermes graveolus* [Animalia: Blattodea: Termitidae].

***Urozercon modestus* Silvestri, 1917**
Urozercon modestus Silvestri, 1917: 301.
Urozercon modestus Silvestri, 1918: 17 (objective synonymy).
Urozercon modestus.—OConnor & Klimov, 2012b: internet page.

Type depository. Unspecified.
Type locality and habitat. Kindia, "Gallorum Guinea" [Guinea], on *Armitermes evuncifer* (cited as *Hamitermes evuncifer*) [Animalia: Blattodea: Termitidae].

***Urozercon paradoxus* Berlese, 1901**
Urozercon paradoxus Berlese, in Berlese & Leonardi, 1901: 13.
Urozercon paradoxus.—Silvestri, 1903: 173; Lombardini, 1936: 51; Radford, 1950b: 23; Castagnoli & Pegazzano, 1985: 303; Farrier & Hennessey, 1993: 88; OConnor & Klimov, 2012b: internet page.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. According to the original description, in nest of *Eutermes* sp., Cingalà, South America; according to OConnor & Klimov (2012: internet page), on *Nasutitermes brevioculatus* [Animalia: Blattodea: Termitidae), Mato Grosso, Brazil.

***Urozercon robustisetae* (Rosario & Hunter, 1988)**
Myrmozercon robustisetae Rosario & Hunter, 1988: 466.
Myrmozercon robustisetae.—Farrier & Hennessey, 1993: 83; Dunlop *et al*., 2014: 2.
Urozercon robustisetus [sic].—OConnor & Klimov, 2012b: internet page.

Type depository. National Museum of Natural History of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Puerto Rico, in termite nests [Animalia: Blattodea].
Note. Included in Varroidae by OConnor & Klimov, 2004: internet page; Lindquist *et al*., 2009: 154).

***Urozercon watsoni* (Halliday, 2006)**
Uronyssus watsoni Halliday, 2006: 36.
Urozercon watsoni.—OConnor & Klimov, 2012b: internet page.

Type depository. Australian National Insect Collection, Commonwealth Scientific and Industrial Research Organisation, Canberra, Australia.
Type locality and habitat. Urimbirra, 20 km north of Canberra, New South Wales, Australia, in nest of *Nasutitermes exitiosus* [Animalia: Blattodea: Termitidae].

***Xylocolaelaps* Royce & Krantz, 2003**
Xylocolaelaps Royce & Krantz, 2003: 108 (type species: *Xylocolaelaps burgetti* Royce & Krantz, 2003, by monotypy).
Xylocolaelaps.—OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Note. This genus was described in Laelapidae-Hypoaspidinae.

***Xylocolaelaps burgetti* Royce & Krantz, 2003**
Xylocolaelaps burgetti Royce & Krantz, 2003: 110.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Chiang Mai, Thailand, in nest of *Xylocopa* (*Nyctomelitta*) *tranquebarica* [Animalia: Hymenoptera: Apidae].

Taxa *incertae sedis*

In this section we record information about species that have been placed in the family Laelapidae at some time, but whose correct generic placement cannot be determined. The taxonomic ambiguity regarding these species usually arises from the lack of important diagnostic information in the original description. The large number of species listed here also reflects the incomplete knowledge of the taxonomy of the group, more precisely the poorly understood boundaries of many genera. For instance, many species have been described in the genus *Hypoaspis*, but are not consistent with the modern, narrower concept of the genus as defined by Costa (1971) and Joharchi & Halliday (2011). We have at least provisionally transferred some of those species into *Gaeolaelaps*, while others remain unplaced. Note that *Gaeolaelaps* remains a genus of uncertain boundaries.

***Atricholaelaps clippertonensis* Wharton, 1941**
Atricholaelaps clippertonensis Wharton, 1941: 6.
Hypoaspis clippertonensis.—Strandtmann, 1949: 348.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America, specimen number 1376.
Type locality and habitat. Clipperton Island, in debris of *Sula leucogaster nesiotes* nests [Animalia: Suliformes: Sulidae].
Note. The information shown in the description of this species justifies its placement in the Laelapidae, but not a reliable generic placement. *Atricholaelaps* is now considered a junior synonym of *Androlaelaps*; however, the female pilus dentilis and the male chelicerae are not typical of *Androlaelaps*. Strandtmann (1949) placed the species in *Hypoaspis sensu lato*, but nothing has been added to the original description. The absence of macrosetae on the dorsal shield and legs excludes it from *Hypoaspis sensu stricto*.

***Berlesia styligera* Berlese, 1911**
Berlesia styligera Berlese, 1911b: 434.
Berlesia styligera.—Berlese, 1913a: 80; Castagnoli & Pegazzano, 1985: 400.

Type depository. Berlese Acaroteca, Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.resinosus
Type locality and habitat. Java, Indonesia, on unidentified insect [Animalia: Insecta].
Note. This species was provisionally placed in the Laelapidae but its generic and subfamilial placement cannot be determined (Lindquist *et al*., 2020: 39).

***Blattisocius trigonae* Radhakrishnan & Ramaraju, 2017**
Blattisocius trigonae Radhakrishnan & Ramaraju, 2017: 842.

Type depository. Department of Agricultural Entomology, Acarology Lab, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India.
Type locality and habitat. Coimbatore, Tamil Nadu, India, on *Trigona iridipennis* [Animalia: Hymenoptera: Apidae].

Note. The information shown in the description of this species justifies its placement in the Laelapidae, but its generic placement cannot be determined. The anal shield has long anterolateral projections associated with a concave anterior margin, which are typical of certain hypoaspidines associated with Hymenoptera.

***Coleolaelaps dasygaster* (Berlese, 1910)**
Laelaps (*Hypoaspis*) *dasygaster* Berlese, 1910a: 259.
Hypoaspis (*Coleolaelaps*) *dasygaster*.—Berlese, 1913b: 199.
Coleolaelaps dasygaster.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 105.
dasygaster non-Laelaps.—Tipton, 1960: 292.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Africa, on *Diastocera trifasciata* [Animalia: Coleoptera: Cerambycidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Coleolaelaps grandipes* (Berlese, 1905)**
Laelaps (*Hypoaspis*) *grandipes* Berlese, 1905: 169.
Hypoaspis (*Coleolaelaps*) *grandipes*.—Berlese, 1913b: 199.
grandipes non-Laelaps [sic].—Tipton, 1960: 295.
Coleolaelaps grandipes.—Castagnoli & Pegazzano, 1985: 170.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Tjibodas, Java, Indonesia, unspecified substrate.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Cosmolaelaps reconditus* (Berlese, 1905)**
Laelaps (*Cosmolaelaps*) *reconditus* Berlese, 1905: 170.
reconditus; *non-Laelaps*.—Tipton, 1960: 305.
Hypoaspis (*Cosmolaelaps*) *recondita*.—Karg, 1981a: 218, 1988: 516, 1987: 290.
Cosmolaelaps reconditus.—Castagnoli & Pegazzano, 1985: 351.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Buitenzorg, Java, Indonesia, unspecified substrate.
Note. The published information about the morphology of this species is not sufficient to confirm its generic placement, as indicated by Moreira *et al*. (2014: 322).

***Cypholaelaps* Berlese, 1916**
Ololaelaps (*Cypholaelaps*) Berlese, 1916b: 166 (type species: *Ololaelaps* (*Cypholaelaps*) *haemisphaericus* Berlese, 1916, by monotypy).
Cypholaelaps.—Vitzthum, 1935: 68.

Note. Beaulieu *et al*. (2019: 12) considered the taxonomic status of *O.* (*C.*) *haemisphaericus* to be uncertain, which makes the identification of the whole genus *Cypholaelaps* uncertain. *Cypholaelaps* Berlese, 1918 (type species *Laelaps ampullula* Berlese, 1910, Ameroseiidae) is a junior homonym, and was replaced by *Neocypholaelaps* Vitzthum.

***Cypholaelaps semiglobulus* Vitzthum, 1935**
Cypholaelaps semiglobulus Vitzthum, 1935: 68.
Cypholaelaps semiglobulus.—Beaulieu *et al*., 2019: 12.

Type depository. Unspecified.
Type locality and habitat. 2000 m above sea level, Tovii, Nuku Hiva, Marquesas Islands, under dead leaves.
Note. See note under *Cypholaelaps* Berlese, 1916. The available information on the morphology of this species does not allow its placement in a known genus with any confidence.

***Donia* Oudemans, 1939**
Donia Oudemans, 1939a: 197 (type species: *Hypoaspis gehennalis* Oudemans, 1916: 308, by monotypy).
Donia.—Vitzthum, 1942: 756.

Note. *Donia* was described in the Neoparasitidae and maintained there by Baker & Wharton (1952: 73), but it may be better placed in the Laelapidae (see note under *Donia gehennalis* Oudemans).

***Donia gehennalis* (Oudemans, 1916)**
Hypoaspis gehennalis Oudemans, 1916: 308.
Donia gehennalis.—Buitendijk, 1945: 295; Oudemans, 1939a: 197; Radford, 1950b: 12; Naturalis, 2020: internet page.

Type depository. Unspecified.
Type locality and habitat. "German East Africa", on *Zonabris bizonata* [Animalia: Coleoptera: Meloidae].
Note. An illustration made available by Naturalis (2020), attributed to Oudemans, suggests that this species may belong to the Laelapidae. Its original description as a species of *Hypoaspis* supports that possibility.

***Gymnolaelaps kabitae* Bhattacharyya, 1968**
Gymnolaelaps kabitae Bhattacharyya, 1968: 537.
Gymnolaelaps kabitae.—Prasad, 1974: 150; Kazemi & Rajaei, 2013: 86; Nemati & Gwiazdowicz, 2016b: 45; Joharchi *et al*., 2020b: 477.
Pseudoparasitus (*Gymnolaelaps*) *kabitae*.—Karg, 1989b: 334.
Pseudoparasitus (*Gymnolaelaps*) *hospes*.—Nemati *et al*., 2000: 381 (misidentification, according to Joharchi & Halliday, 2013: 47).
Laelaspisella kabitae.—Joharchi & Halliday, 2013: 47; Joharchi *et al*., 2016a: 21; Nemati *et al*., 2019: 82.
Hypoaspis s. l. *kabitae*.—Nemati *et al*., 2018b: 176.

Type depository. Author's collection.
Type locality and habitat. Sonarpur, Sitala, 24 Parganas, West Bengal, India, in soil and litter under decaying water cabbage, *Pistia stratiotes* [Plantae: Alismatales: Araceae] at the sides of a pond.
Note. In their recent revisions of *Gymnolaelaps*, Joharchi & Halliday (2013: 47) and Nemati & Gwiazdowicz (2016b) disagreed on the generic placement of *G. kabitae*. Nemati *et al*. (2018b: 176) questioned the generic placement of this species, referring to it as *Hypoaspis* s. l. *kabitae*. Nemati *et al*. (2019: 82) and Joharchi *et al*. (2020b: 477) considered it as *incertae sedis*.

***Haemolaelaps thompsoni* Turk, 1950**
Haemolaelaps thompsoni Turk, 1950: 67.
Laelaps thompsoni.—Zumpt, 1950: 77.
thompsoni; *non-Laelaps* [sic].—Tipton, 1960: 308.

Type depository. G. Thompson and F.A. Turk personal collections.
Type locality and habitat. Gammaduwa, Mousekande, Sri Lanka (reported as Ceylon), on *Rattus rattus kandyianus* [Animalia: Rodentia: Muridae].
Note. According to Tipton (1960: 308), this species lacks many features characteristic of *Laelaps*.

***Holostaspis comelicensis* (Lombardini, 1962)**
Laelaps (*Oolaelaps*) *comelicensis* Lombardini, 1962: 198.
Holostaspis comelicensis.—Bernini *et al*., 1995: 28; Freire, 2007: 203.

Type depository. Unspecified.
Type locality and habitat. 1900 m above sea level, Belluno, Malga Controndo Italy, in soil.
Note. Babaeian *et al*. (2019: 302) considered *Laelaps* (*Oolaelaps*) as a junior synonym of *Holostaspis* but reported this species as *incertae sedis*. Available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis contigua* Müller, 1860**
Holostaspis contigua Müller, 1860b: 181.

Type depository. Author's collection.
Type locality and habitat. Near Brno, Moravia, Czech Republic, on *Onthophagus coenobita* [Animalia: Coleoptera: Scarabaeidae, Scarabaeinae].
Note. Babaeian *et al*. (2019a: 328) questioned the familial classification of this species. Müller's illustration appears to show a hologastric shield similar to that of *Ololaelaps*.

***Holostaspis dealbatus* (Koch, 1840)**
Gamasus dealbatus Koch, 1840a: 20.
Holostaspis dealbatus.—Müller, 1860a: 51.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. This species was placed in the Phytoseiidae by Oudemans (1936: 261) and Babaeian *et al*. (2019a: 328). It was cited as *incertae sedis* in the Phytoseiidae catalogue of Demite *et al*. (2019). The illustration provided in the original description suggest that it does not belong to the Phytoseiidae.

***Holostaspis horticola* (Koch, 1840)**
Gamasus horticola Koch, 1840b: 18.
Holostaspis horticola.—Müller, 1860a: 51.
Hypoaspis? *horticola* [sic].—Oudemans, 1936: 208; Babaeian *et al*., 2019a: 329.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. Babaeian *et al*. (2019a: 329) questioned the generic classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis infernalis* (Müller, 1859)**
Gamasus infernalis Müller, 1859: 32.
Holostaspis infernalis.—Müller, 1860a: 51, 1860b: 183.

Type depository. Kaiserlich Königliche Hof Naturalienkabinett, Vienna, Austria.
Type locality and habitat. Natal, South Africa, on *Scarabaeus* (*Kheper*) *lamarcki* (cited as *Ateuchus infernalis*) [Animalia: Coleoptera: Scarabaeidae, Scarabaeinae].
Note. Babaeian *et al*. (2019a: 329) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis leucogastra* Müller, 1860**
Holostaspis leucogastra Müller, 1860a: 50.

Type depository. Naturaliencabinett der Kaiserliche Königlich Technische Lehranstalt, Brünn, Czech Republic.
Type locality and habitat. Altvater, Moravia, Czech Republic, on moss on decomposing trunks and on rocks.
Note. Babaeian *et al*. (2019a: 330) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis niveus* Joseph, 1882**
Holostaspis niveus Joseph, 1882: 14.
Holostaspis niveus.—Wolf, 1938: 645.

Type depository. Unspecified.
Type locality and habitat. Seller mountain, Kočevje (cited as Gotshée), Slovenia, in soil of a cave and on *Anophtalmus bilimekii* [Animalia: Coleoptera: Carabidae, Trecchinae].
Note. Babaeian *et al*. (2019a: 331) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis pallescens* (Koch, 1840)**
Gamasus pallescens Koch, 1840b: 11.
Holostaspis pallescens.—Müller, 1860a: 51.
Hypoaspis pallescens.—Oudemans, 1936: 211.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. Babaeian *et al*. (2019a: 331) questioned the generic classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis pellucidulus* (Koch, 1840)**
Gamasus pellucidulus Koch, 1840a: 23.
Holostaspis pellucidula.—Müller, 1860a: 51.
Typhlodromus pellucidulus.—Oudemans, 1936: 265.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. Moraes *et al*. (2004) considered the taxonomic position of this species as uncertain. Based on Oudemans (1936: 265), Babaeian *et al*. (2019a: 331) considered it to be of uncertain generic placement in the Phytoseiidae.

***Holostaspis spinitarsus* Canestrini, 1897**
Holostaspis spinitarsus Canestrini, 1897: 420.

Type depository. Unspecified [probably Museo Cívico di Storia Naturale di Genova, Italy].
Type locality and habitat. Lake Cadù Kyaung (cited as Ciaung) and Tienzò, northeast of Bhamo (cited as Bamò), Myanmar (cited as Birmania), on leaf.
Note. Babaeian *et al*. (2019a: 332) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Holostaspis testudo* Müller, 1860**
Holostaspis testudo Müller, 1860b: 181.

Type depository. Author's collection; Franzensmuseum Brno, Moravia, Czech Republic; and Naturaliencabinett der Kaiserliche Königlich Technische Lehranstalt, Moravia, Czech Republic.
Type locality and habitat. Near Brünn, Moravia and Sudeten, Czech Republic, in moss and rotting tree trunks.
Note. Babaeian *et al*. (2019a: 332) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis alphabeticus* (Berlese, 1904)**
Laelaps (*Hypoaspis*) *alphabeticus* Berlese, 1904b: 17.
Hypoaspis alphabeticus.—Buitendijk, 1945: 295; Turk, 1948: 113; Castagnoli & Pegazzano, 1985: 10.
alphabeticus non-Laelaps.—Tipton, 1960: 286.
Hypoaspis alphabetica.—Klimov *et al*., 2016: internet page.
Hypoaspis alfabetica [sic].—Da-Costa *et al*., 2021: 4.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Brazil, in nest of *Melipona mandacaia* (cited as *Meliponae mandaçaiae*) [Animalia: Hymenoptera: Apidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). It is very similar to *Hypoaspis meliponarum* Vitzthum, in respect to the morphology of the venter of the idiosoma, distribution and host association.

***Hypoaspis amanuensis* Vitzthum, 1922**
Hypoaspis amanuensis Vitzthum, 1922: 22.

Type depository. Zoologische Staatssammlung, München, Germany.
Type locality and habitat: Amani, Tanzania (cited as East-Africa), in nest of *Xylocopa* (*Koptorthosoma*) *nigrita* (cited as *Koptorthosoma nigrita*) [Animalia: Hymenoptera: Apidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), and its generic placement is uncertain.

***Hypoaspis anila* Pramanik & Raychaudhuri, 1968**
Hypoaspis anila Pramanik & Raychaudhuri, 1968: 353.
Hypoaspis anila.—Prasad, 1974: 150.

Type depository. Entomology Laboratory, Department of Zoology, Kolkata University, Kolkata (cited as Calcutta), India.
Type locality and habitat. Ramkishorpur, 24 Parganas, West Bengal, India, in litter.

Note. Although clearly a laelapid, this species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The reported presence of 71 pairs of bifid setae on the dorsal shield and the insufficient details prevent its placement in any known laelapid genus.

***Hypoaspis armatus* Ewing, 1917**
Hypoaspis armatus Ewing, 1917: 499.

Type depository. Unspecified.
Type locality and habitat. Whittier, California, United States of America, on lemon leaves.
Note. This species was described based on a single adult male, making its generic placement uncertain.

***Hypoaspis australis* Hull, 1923.**
Hypoaspis australis Hull, 1923: 610.
Hypoaspis australis.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019.

Type depository. Unspecified.
Type locality and habitat. Crawley, Western Australia, Australia, with *Camponotus chalceus* [Animalia: Hymenoptera: Formicidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Hull (1923: 610) only had two specimens of poor quality, and his illustration of an oval-shaped epigynal shield with three pairs of setae is very questionable.

***Hypoaspis bakeri* Feider & Solomon, 1963**
Hypoaspis bakeri Feider & Solomon, 1963: 239.

Type depository. Author's collection.
Type locality and habitat. Agiges, region of Dobrudja, Romania, on *Microtus arvalis laevis* [Animalia: Rodentia: Cricetidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it lacks macrosetae on the dorsal shield and legs. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis baloghi* Shereef & Afifi, 1980**
Hypoaspis baloghi Shereef & Afifi, 1980: 127.
Hypoaspis baloghi.—Zaher, 1986: 194; Nawar *et al*., 1993: 347.

Type depository. Faculty of Agriculture, Cairo University, Cairo, Egypt.
Type locality and habitat. Giza, Egypt, in organic manure.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The enlarged epigynal shield suggests a possible relationship with *Gymnolaelaps*.

***Hypoaspis cadaverinus* (Hermann, 1804)**
Acarus cadaverinus Hermann, 1804: 79.
Hypoaspis cadaverinus.—Oudemans, 1929a: 393, 1929d: 88, 1929e: 88, 1936: 206; Sellnick, 1940: 28; Buitendijk (1945: 295).

Type depository. Unspecified.

Type locality and habitat. Strasbourg, France, on the cadaver of a shad [Animalia: Actinopterygii: Clupeidae].
Note. Oudemans (1929a: 393, 1929e: 88) and Buitendijk (1945: 295) apparently considered this name to be a senior synonym of *Gaeolaelaps aculeifer* (Canestrini), without any explanation. Strandtmann (1963: 3) did not accept that synonymy, and his interpretation is adopted in this publication. The placement of *Acarus cadaverinus* cannot be determined on the basis of the available information.

***Hypoaspis calcarata* Halliday, 2005**
Hypoaspis calcarata Halliday, 2005: 30.

Type depository. National Collection of Mites, ARC Plant Protection Research Institute, Pretoria, South Africa.
Type locality and habitat. Hermanus, Western Cape province, South Africa, on clover [Plantae: Fabales: Fabaceae] and weeds.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The very long pilus dentilis suggests that it may belong to *Androlaelaps* or *Haemolaelaps*.

***Hypoaspis cavernicola* (Packard, 1888)**
Laelaps (= *Iphis*?) *cavernicola* [sic] Packard, 1888: 42.
Laelaps cavernicola.—Banks, 1907: 610.
Hypoaspis cavernicola.—Oudemans, 1914d: 85; Wolf, 1938: 644; Farrier & Hennessey, 1993: 77; Babaeian *et al*., 2019: 328.
cavernicola non-Laelaps.—Tipton, 1960: 290.

Type depository. Museum of Comparative Zoology, Cambridge, Massachusetts, United States of America.
Type locality and habitat. Mammoth Cave, Kentucky, United States of America, on fungus mycelium.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis celeripediformis* Oudemans, 1902**
Hypoaspis celeripediformis Oudemans, 1902b: 10.
Hypoaspis celeripediformis.—Oudemans, 1902d: 22, 1903a: 130.
Coleolaelaps celeripediformis.—Oudemans, 1929e: 83, 1936: 256; Buitendijk, 1945: 298.

Type depository. Unspecified.
Type locality and habitat. The Netherlands, unspecified substrate.
Note. The available information on the morphology of this species does not allow its place in a known genus with confidence.

***Hypoaspis*? [sic] *curtus* (Koch, 1840)**
Gamasus curtus Koch, 1840b: 10.
Hypoaspis? *curtus* [sic].—Oudemans, 1936: 207.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis decellei* Van Driel *et al*., 1977**
Hypoaspis decellei Van Driel, Loots & Marais, 1977: 321.

Type depository. Koninklijk Museum voor Midden Afrika, Tervuren, Belgium; specimen number M.T.133.548.
Type locality and habitat. Diana's Peak, Saint Helena Island, in soil.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26), because it lacks macrosetae on the dorsal shield and legs. Van Driel *et al*. (1977: 321) stated this species to belong to the *Gaeolaelaps* species group of Aswegen *et al*. (1970: 182), while Kazemi *et al*. (2014: 519) suspected it may belong to *Androlaelaps* or a related genus.

***Hypoaspis decemsetae* Karg, 1994**
Hypoaspis decemsetae Karg, 1994: 185.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Baltra road, 6 km north of Servicio Parque Nacional Galápagos, Santa Cruz, Galapagos Islands, unspecified substrate.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The very large epigynal shield with five pairs of setae suggests a relationship with *Pseudoparasitus*.

***Hypoaspis disparatus* (Banks, 1916)**
Parasitus disparatus Banks, 1916: 229.
Hyspoaspis disparatus.—Womersley, 1942: 142; Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 24.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.
Type locality and habitat. Latrobe, Tasmania, Australia, with *Polyrhachis hexacantha* [Animalia: Hymenoptera: Formicidae].
Note. Womersley (1942: 142) examined specimens that had been previously identified as belonging to *Parasitus disparatus*, and concluded that they actually belonged to *Hypoaspis*. The syntype specimens are in poor condition, but they appear to belong to the Laelapidae (BH personal observations). They do not agree with the concept of *Hypoaspis* provided by Joharchi & Halliday (2011: 26), but their correct genus cannot be determined.

***Hypoaspis distans* Banks, 1914**
Hypoaspis distans Banks, 1914a: 686.
Hypoaspis distans.—Farrier & Hennessey, 1993: 77.

Type depository. Academy of Natural Science of Philadelphia, United States of America.
Type locality and habitat. Costa Rica, on *Dynastes hercules* [Animalia: Coleoptera: Scarabaeidae, Dynastinae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis favosus* Turk, 1948**
Hypoaspis favosus Turk, 1948: 113.
Hypoaspis favosus.—Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 77; Smiley *et al*., 1996: 201.
Hypoaspis favosa.—Klimov *et al*., 2016: internet page.

"Hypoaspis" favosus [sic].—OConnor & Klimov, 2012a.

Type depository. Unspecified.
Type locality and habitat. Saint Augustine, Trinidad, in nest of *Melipona favosa favosa* [Animalia: Hymenoptera: Apidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The sternal shield is transversely divided into two sections, with *st*1 on a separate platelet, a feature otherwise observed only in *Melittiphisoides* and *Bisternalis*. Both of these genera are also associated with meliponine bees, but *H. favosus* differs significantly from both, and we are unable to place it in a known genus with any confidence.

***Hypoaspis fortis* Berlese, 1920**
Hypoaspis fortis Berlese, 1920: 151.

Type depository. Missing from Istituto Sperimentale per la Zoologia Agraria, Florence, Italy (Castagnoli & Pegazzano, 1985).
Type locality and habitat. Java, Indonesia, unspecified substrate.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis globulus* (Koch, 1840)**
Iphis globulus Koch, 1840c: 17.
Iphis globulus.—Koch, 1841: 447; Walckenaer, 1847: 544; Oudemans, 1936: 221; Radford, 1950b: 27.
Eumaeus globulus.—Koch, 1842: 95.
Hypoaspis globulus.—Oudemans, 1902e: 289.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. Oudemans (1902e: 289) considered this species to be a senior synonym of *Laelaps placentula* Berlese, currently placed in *Ololaelaps*. Subsequent authors considered them to be distinct species, and that interpretation is adopted here. Oudemans (1936: 217) and Evans (1957a: 220) considered *Hyletastes* Gistel, 1848 (referred to by Evans as *Hyletastea* Gistel, 1884) to be a possible senior synonym of *Ololaelaps*. However, Vitzthum (1942: 765) designated *Iphis globulus* as type species of *Hyletastes* Gistel, 1848, and established the subfamily Hyletastinae in the family Laelapidae. Bregetova (1973, 1977c) then placed Hyletastinae in Eviphididae. Beaulieu *et al*. (2019: 12) considered the taxonomic status of this species to be uncertain.

***Hypoaspis haemisphaericus* (Koch, 1840)**
Iphis haemisphaericus Koch, 1840c: 16.
Hypoaspis haemisphaericus.—Oudemans, 1906: 99, 1916: 309; Buitendijk, 1945: 296.
Ololaelaps haemisphaericus.—Sellnick, 1940: 69; Willmann, 1951: 113; Haarlov, 1957: 19.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. The usage of the specific name *haemisphaericus* is very confusing, as discussed by Bregetova & Koroleva (1964: 63). The name *Iphis haemisphaericus* Koch has been interpreted by various authors as two different entities, on one hand as a species of *Ololaelaps* in Laelapidae (*e.g.* Sellnick, 1940), and on the other hand as a species now classified as *Stylochirus* in Ologamasidae (Berlese, 1914: 142; Sellnick, 1958: 18; Castilho *et al*., 2016: 104). To reduce the confusion, further complicated by the existence of the name *Ololaelaps* (*Cypholaelaps*) *haemisphaericus* Berlese, 1916 (also listed below as *incertae sedis*), Bregetova & Koroleva (1964) proposed the name "*O. sellnicki* nom. nov." to apply to Sellnick's (1940) concept of *Iphis haemisphaericus* Koch, which Sellnick (1940) had

redescribed based on specimens from Iceland. Beaulieu *et al*. (2019: 11) reviewed the confusion surrounding the specific name *haemisphaericus* and proposed a possible nomenclatural solution. We agree that a Case to ICZN is required to stabilise the names *Stylochirus haemisphaericus* (Koch, 1939) in the Ologamasidae and *Ololaelaps sellnicki* (representing the concept of *O*. *haemisphaericus* Koch) in the Laelapidae.

As more secondary notes, Oudemans (1906: 99) considered the name *Iphis haemisphaericus* Koch to be a junior synonym of *Iphis pyrobolus* Koch (as discussed by Mašán & Halliday, 2010: 54, considered by some authors as the type species of *Eviphis*, Eviphididae), and also a senior synonym of *Laelaps placentula* Berlese. Finally, Ryke (1962: 125) inadvertently reported Sellnick (1940: 69) as having redescribed *Ololaelaps hemisphaera* Berlese, whereas Sellnick was actually referring to *I*. *haemisphaericus* Koch.

Hypoaspis heselhausi Oudemans, 1912

Hypoaspis heselhausi Oudemans, 1912a: 216.
Hypoaspis heselhausi.—Oudemans, 1914a: 183, 1914b: 65; Buitendijk, 1945: 296; Bregetova, 1955b: 295, 1956: 78; Piryanik, 1962: 87; Zhang *et al*., 1963: 188; Goncharova & Buyakova, 1964: 277; Sheals, 1964: 15; Evans & Till, 1966: 177; Athias-Henriot, 1968: 237; Costa, 1969a: 165; Lundqvist, 1974: 42; Keum *et al*., 2016: 478.
Hypoaspis (*Holostaspis*) *heselhausi*.—Karg, 1971: 176.
Hypoaspis heselhauusi [sic].—Mrciak & Brelih, 1972: 343.
Hypoaspis (*Geolaelaps*) *heselhausi*.—Bregetova, 1977b: 500.
Hypoaspis (*Laelaspis*) *heselhausi*.—Karg, 1979: 101, 1982: 249, 1993a: 159; Gabryś *et al*., 2008: 48.
Laelaspis heselhausi.—Farrier & Hennessey, 1993: 81.
Hypoaspis (*Laelaspis*) *haselhausi* [sic].—Gwiazdowicz & Klemt, 2004: 14.
Gymnolaelaps heselhausi.—Joharchi *et al*., 2012a: 2013.
Geolaelaps heselhausi.—Sklyar, 2012: 80.
Gaeolaelaps heselhausi.—Trach, 2016: 7.
Hypoaspis (*Gaeolaelaps*) *heselhausi*.—Keum *et al*., 2016: 481.
Hypoaspis s. l. *heselhausi*.—Klimov *et al*., 2016: internet page; Babaeian *et al*., 2019a: 329.

Type depository. F. Heselhaus' collection.
Type locality and habitat: Sittard, The Netherlands, in nest of *Talpa europaea* [Animalia: Eulypotyphla: Talpidae].
Note. Authors have differed in the generic placement of this species, and it does not fit easily into any of the proposed genera as they are presently defined. The species has a peculiar trapezoidal epigynal shield, almost abutting anal shield, and bearing two pairs of setae on its margins (Evans & Till, 1966: 178). This excludes it from *Gaeolaelaps* (Beaulieu, 2009: 37), *Holostaspis* (Babaeian *et al*., 2019a: 329), *Hypoaspis* (also lacking elongate setae on dorsal shield), *Laelaspis*, *Pseudoparasitus* and *Gymnolaelaps* (in part by having a 2-tined palp tarsal claw, and lacking presternal platelets) (Kazemi 2015; Nemati & Gwiazdowicz, 2016). The illustration provided by Bregetova (1977: 500), including a more rounded epigynal shield, slightly more distant from the anal shield, makes the species somewhat compatible with *Hypoaspisella*, especially for its epistome with smooth anterior margin, deutosternum with few denticles in each transverse row, and peritrematal plate fused to expodal plate near coxa IV (Evans & Till, 1966: 177). Nevertheless, on the basis of this analysis and the uncertainty about the morphology of the type specimens (given conflicting descriptions), we were unable to place this species in a known genus, and consider it as *incertae sedis*.

Hypoaspis hoffmannae Smiley *et al*., 1996

Hypoaspis hoffmannae Smiley, Baker & Delfinado-Baker, 1996: 198.
Hypoaspis hoffmannae.—Klimov *et al*., 2016: internet page.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Puchong, Selangor, Malaysia, in nest of *Trigona iridipennis* [Animalia: Hymenoptera: Apidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). It has some unusual character states such as a sternal shield desclerotised anteriorly, an edentate movable cheliceral digit, a thick pilus dentilis, and a single file of deutosternal denticles. The anal shield has large anterolateral projections, which are typical of some hypoaspidines associated with Hymenoptera, such as *Bisternalis*, *Holostaspis* or *Myrmozercon* (the first also associated with meliponine bees), but it does not undoubtedly fit in any of these genera. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis hospes* Berlese, 1923**
Hypoaspis hospes Berlese, 1923a: 254.
Hypoaspis (*Pneumolaelaps*) *hospes*.—Aswegen & Loots, 1970: 209.
Pseudoparasitus (*Gymnolaelaps*) *hospes*.—Karg, 1981b: 218, 1989b: 334.
Hypoaspis hospes.—Castagnoli & Pegazzano, 1985: 187.
Gymnolaelaps hospes.—Joharchi *et al*., 2011: 23; Kazemi & Rajaei, 2013: 86.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, in termite [Animalia: Blattodea: Termitidae] nests.
Note. Hunter & Husband (1973: 77) suspected this species to belong to *Androlaelaps*. Specimens reported by Nemati *et al*. (2000: 381) as *P*. (*G*.) *hospes* were re-identified as *Laelaspisella kabitae* (Bhattacharyya) by Joharchi & Halliday (2013: 47), and the placement of *H*. *hospes* in *Gymnolaelaps* by Joharchi *et al*. (2011 23) was based on these specimens. Our present knowledge about this species does not allow its reliable placement in any genus; nothing is known about its palp tarsal claw or epistome; the drop-shaped epigynal shield and the very long extention of the peritrematic plate behind the stigma shown by Aswegen & Loots (1970: 209) are not typical of *Gymnolaelaps*.

***Hypoaspis incisus* Oudemans, 1903**
Hypoaspis incisus Oudemans, 1903b: 86.
Hypoaspis incisus.—Oudemans, 1904a: 82; Buitendijk, 1945: 296.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. This species is known only from the deutonymphal stage. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis inepilis* Banks, 1916**
Hypoaspis inepilis Banks, 1916: 227.
Hypoaspis inepilis.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 24.

Type depository. Unspecified.
Type locality and habitat. Sydney, New South Wales, Australia, with *Camponotus* sp. [Animalia: Hymenoptera: Formicidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis inermis* (Berlese, 1910)**
Laelaps (*Hypoaspis*) *inermis* Berlese, 1910b: 370.
Hypoaspis (*Haemolaelaps*) *inermis*.—Lombardini, 1936: 42.

inermis; *non-Laelaps* [sic].—Tipton, 1960: 298.
Hypoaspis inermis.—Castagnoli & Pegazzano, 1985: 195.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Java, Indonesia, on unidentified insect.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis inversus* (Banks, 1916)**
Parasitus inversus Banks, 1916: 229.
Hypoaspis inversus.—Womersley, 1942: 142; Micherdziński, 1969: 610; Strong & Halliday, 1994: 87; Kůrka, 2005: 24; Halliday, 1998: 125, 2019: internet page.

Type depository. Unspecified.
Type locality and habitat. Portland, Victoria, Australia, associated with *Ectatomma metallicum* [Animalia: Hymenoptera: Formicidae].
Note. This species does not agree with the concept of *Hypoaspis* of Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis invertus* Banks, 1914**
Hypoaspis invertus Banks, 1914: 161.

Type depository. Unspecified.
Type locality and habitat. Abuná, Rio Madeira, Brazil, on unidentified scarabid beetle [Animalia: Coleoptera: Scarabaeidae].
Note. This species has not been mentioned since its original description. The description is vague and not illustrated, and its generic placement cannot be determined.

***Hypoaspis kirinensis* Zhang *et al*., 1963**
Hypoaspis kirinensis Zhang, Zheng, Yin & Wang, 1963: 188.
Hypoaspis (*Laelaspis*) *kirinensis*.—Deng *et al*., 1993: 168; Yan *et al*., 2008: 2230.
Hypoaspis kirinensis.—Ren & Guo, 2008: 329, 2009: 101.

Type depository. Department of Biology, Jilin Medical University, Changchun, Jilin province, China.
Type locality and habitat. Dunhua, Jilin province, China, on *Myodes rufocanus* [Animalia: Rodentia: Cricetidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence. It may belong to *Gaeolaelaps*.

***Hypoaspis kseroffilus* Osipova, 1970**
Hypoaspis kseroffilus Osipova, 1970: 71.

Type depository. Museum of the Lomonosov Moscow State University, Moscow, Russia.
Type locality and habitat. Kyrgyzstan, on *Meriones tamaricinus*, *Cricetulus migratorius* and *Mus musculus* [Animalia: Rodentia: Cricetidae, Muridae].
Note. Originally described in Laelapidae. The shape of the ventral shields support its placement in this family, but the brief description does not allow its generic placement with certainty.

***Hypoaspis latisternus* (Halbert, 1923)**
Laelaps latisternus Halbert, 1923: 367.
Hypoaspis latisternus.—Turk & Turk, 1952: 482.
Hyletastes latisternus.—Turk & Turk, 1952: 482; Turk, 1953: 12.
Proctolaelaps latisternus.—Athias-Henriot, 1959: 192.

Type depository. Irish National Museum, Dublin, Ireland.
Type locality and habitat. Lucan Demesne, Dublin, Ireland, under stones.
Note. This species was transferred by Athias-Henriot (1959: 192) from *Laelaps* to *Proctolaelaps* Berlese without any justification. The available information on the morphology of this species does not allow its placement in a known genus with confidence (Luxton, 1998: 26).

***Hypoaspis lepta* Oudemans, 1902**
Hypoaspis lepta Oudemans, 1902c: 53.
Hypoaspis lepta.—Oudemans, 1903d: 12; Buitendijk, 1945: 296; Bernini *et al*., 1995: 28; Kůrka, 2005: 24.

Type depository. Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands.
Type locality and habitat. Italy, dead leaves.
Note. The illustration of this species in Oudemans (1903d: 12) and on the *Naturalis* web site (Naturalis, 2020) shows an elongate epigynal shield abutting a wide triangular anal shield. There are no macrosetae on the legs or the dorsal shield, so it cannot be placed in *Hypoaspis*. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis*? *litura* [sic] (Koch, 1839)**
Sejus litura Koch, 1839: 9.
Hypoaspis? *litura* [sic].—Oudemans, 1936: 210.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis longicaudus* Keum *et al*., 2017**
Hypoaspis longicaudus Keum, Jung & Joharchi, 2017: 495.

Type depository. Department of Plant Medicine, Andong National University, Republic of Korea.
Type locality and habitat. 148 m above sea level, Uiseong-gun (36°27'N, 128°23'E), Gyeongbuk province, Republic of Korea, in soil of organic apple orchard.
Note. The authors of this species placed it provisionally in *Hypoaspis sensu lato*. It does have some features of *Hypoaspis sensu stricto* (Joharchi & Halliday, 2011: 26), such as leg macrosetae and epistome with a slightly projecting apex, but it otherwise differs from it by having elongate post-anal seta and *Z*4 shorther than *Z*5 and *S*5. So, its generic placement cannot be confirmed.

***Hypoaspis lyratus* (Banks, 1916)**
Parasitus lyratus Banks, 1916: 229.
Hypoaspis lyratus.—Womersley, 1942: 142; Micherdziński, 1969: 610; Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 24.

Type depository. National Museum of Natural History, Washington, District of Columbia, United States of America.

Type locality and habitat. Dunorlan, Tasmania, Australia, with *Amblyopone australis* [Animalia: Hymenoptera: Formicidae].
Note. Womersley (1942: 142) evaluated additional specimens that had been previously identified (apparently by Banks) as of that species, concluding that they actually belonged to *Hypoaspis*. The type specimens are in poor condition, but an examination of those specimens (by B. Halliday) showed that they belong to the Laelapidae, but do not fit the present concept of *Hypoaspis* provided by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis macrocheles* Vitzthum, 1931**
Hypoaspis macrocheles Vitzthum, 1931a: 66.
Hypoaspis macrocheles.—Fonseca, 1960b: 97.

Type depository. Unspecified.
Type locality and habitat. Durian Cave, Fort de Kock, Sumatra, in chiropteran excrement.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). In the original description, the author mentions its similarity with *Stratiolaelaps* species. That possibility is supported by its posteriorly tapering dorsal shield and very long corniculi.

***Hypoaspis maximus* (Berlese, 1904)**
Laelaps (*Laelaps*) *maximus* Berlese, 1904a: 259.
Laelaps versteegii Oudemans, 1904c: 223 [junior synonym of *Laelaps maximus* by Berlese, 1916a: 67].
Hypoaspis maximus.—Buitendijk, 1945: 296.
Laelaps (*Laelaps*) *maximus*.—Castagnoli & Pegazzano, 1985: 243.

Type depository. *L*. (*L*) *maximus*: Istituto Sperimentale per la Zoologia Agraria, Florence, Italy; *L*. *versteegii*: Rijksmuseum van Natuurlijke Historie (Naturalis), Leiden, The Netherlands.
Type locality and habitat. *L*. (*L*) *maximus*: Montevideo, Uruguay, on *Hesperomys vulpinus* [Animalia: Rodentia: Cricetidae]; *L*. *versteegii*: Surinam, on *Mus sp*. [Animalia: Rodentia: Muridae].
Note. Buitendijk (1945: 296) transferred *L. versteegii* to *Hypoaspis* without any explanation, but it does not fit the present concept of *Hypoaspis* provided by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis meliponarum* Vitzthum, 1930**
Hypoaspis meliponarum.—Salt, 1929: 447 (*nomen nudum*; ICZN Article 12).
Hypoaspis meliponarum Vitzthum, 1930a: 290.
Hypoaspis meliponarum.—Turk, 1948: 113; Baker *et al*., 1983: 10; Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 78; Smiley *et al*., 1996: 201; OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page.

Type depository. Unspecified.
Type locality and habitat. Rio Frio, Magdalena, Colombia, in nest of *Melipona interrupta* [Animalia: Hymenoptera: Apidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). It is very similar to *Hypoaspis alphabetica* (Berlese) in the morphology of the venter of the idiosoma, distribution and host association. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis minimus* (Kramer, 1876)**
Gamasus minimus Kramer, 1876: 102.
Hypoaspis minimus.—Kramer, 1886: 243.

Type depository. Unspecified.
Type locality and habitat. Schleusingen, Thüringen (or Thuringia), Germany, unspecified substrate.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis minusculus* Banks, 1916**
Hypoaspis minusculus Banks, 1916: 227.
Hypoaspis minusculus.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page; Kůrka, 2005: 25.

Type depository. Unspecified.
Type locality and habitat. Sydney, New South Wales, Australia, with unspecified ants [Animalia: Hymenoptera: Formicidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis muellerae* Halliday, 2005**
Hypoaspis muellerae Halliday, 2005: 32.

Type depository. National Collection of Mites, ARC Plant Protection Research Institute, Pretoria, South Africa.
Type locality and habitat. Plettenberg Bay, Western Cape province, South Africa, on clover [Plantae: Fabales: Fabaceae] and capeweed [*Arctotheca* sp.; Plantae: Asterales: Asteraceae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). It was considered *incertae sedis* by Joharchi *et al*. (2020b: 477).

***Hypoaspis nanus* (Mégnin, 1876)**
Gamasus nanus Mégnin, 1876: 332.
Laelaps nanus.—G. & R. Canestrini, 1882a: 69.
Hypoaspis nanus.—Canestrini, 1885: 89.
nanus; *non-Laelaps*.—Tipton, 1960: 302.
Hypoaspis nana.—Bernini *et al*., 1995: 29; Kůrka, 2005: 25.

Type depository. Unspecified.
Type locality and habitat. Unspecified locality, from pulverulent matter from holes of dead or hollow trees.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis nitidissimus* Hull, 1918**
Hypoaspis nitidissimus Hull, 1918: 67.
Hypoaspis nitidissimus.—Falconer, 1923: 275; Hill & Gordon, 1945: 51; Turk, 1953: 11.

Type depository. Unspecified.
Type locality and habitat. West Allendale, Leicestershire, England, in barns.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence. According to Evans & Till (1966: 362), it may be a synonym of *Haemogamasus pontiger* (Berlese).

***Hypoaspis obscurus* Costa, 1968**
Hypoaspis obscurus Costa, 1968: 11.
Hypoaspis (*Laelaspis*) *obscura*.—Karg, 1979: 101, 1982: 249, 1989c: 119.

Type depository. Natural History Museum, London, England.
Type locality and habitat. Mishmar Ha'Emeq, Israel, in garden litter.
Note. Although it shares features with *Pseudoparasitus* and *Gymnolaelaps*, the very broad epigynal shield bearing 2–3 pairs of setae on its margin in addition to *st*5, peritrematal shield extending beyond coxa IV, parapodal plate poorly developed, smooth epistome and 2-tined palp tarsal claw prevent us from placing it in either genus.

***Hypoaspis orientalis* Bhattacharyya, 1968**
Hypoaspis orientalis Bhattacharyya, 1968: 543.
Hypoaspis orientalis.—Prasad, 1974: 151.

Type depository. Zoological Survey of India, Kolkata (cited as Calcutta), West Bengal, India.
Type locality and habitat. Near Netra railway station, Netra, 24 Parganas, West Bengal, India, in litter and soil under *Adina cordifolia* [Plantae: Gentianales: Rubiaceae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence. The name *Hypoaspis orientalis* Bhattacharyya, 1968 is a senior primary homonym of *Hypoaspis* (*Hypoaspis*) *orientalis* Hafez *et al*., 1982 and *Hypoaspis orientalis* Bei & Yin, 2000.

***Hypoaspis orientalis* Bei & Yin, 2000**
Hypoaspis orientalis Bei & Yin, 2000: 288.
Hypoaspis orientalis.—Kůrka, 2005: 25; Yan *et al*., 2018: 262.

Type depository. Department of Plant Protection, Shenyang Agricultural University, Shenyang, Liaoning province, China.
Type locality and habitat. Fengcheng, Liaoning province, China, on *Hoplosternus incanus* [Animalia: Coleoptera: Scarabaeidae, Melolonthinae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). It could belong to *Gaeolaelaps*, despite the very unusual presence of 50 pairs of setae on the dorsal shield. *Hypoaspis orientalis* Bei & Yin, 2000 is a junior primary homonym of *Hypoaspis orientalis* Bhattacharyya, 1968, and must be replaced. We refrain from doing that here, to give the original authors a chance to propose a replacement name.

***Hypoaspis paradoxus* (Kramer, 1876)**
Gamasus paradoxus Kramer, 1876: 101.
Hypoaspis paradoxus.—Oudemans, 1939b: 303.

Type depository. Unspecified.
Type locality and habitat. Schleusingen, Thüringen (or Thuringia), Germany, unspecified substrate.
Note. This species was described based on a single adult male. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis passali* Hyatt, 1964**
Hypoaspis passali Hyatt, 1964: 472.
Hypoaspis (*Geolaelaps*) *passali*.—Karg, 1979: 82, 1982: 241, 1987: 299, 1989c: 118, 1989d: 5.
Gaeolaelaps passali.—Moreira, 2014: 260.

Type depository. Natural History Museum, London, England; specimen number 1963.10.3.20.
Type locality and habitat. Rio Caura, Bolivar, Venezuela, on unidentified passalid beetle [Animalia: Coleoptera: Passalidae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). Beaulieu (2009) provisionally excluded *Hypoaspis passali* from *Gaeolaelaps* because of its broad, axe-shaped epigynal shield and the slight hypertrichy on the dorsal shield (9–10 *Jx* setae) and on the unsclerotised lateral membrane of idiosoma (about 20 pairs of *R* and *UR* setae).

***Hypoaspis pellucidus* (Berlese, 1904)**
Laelaps (*Hypoaspis*) *pellucidus* Berlese, 1904b: 18.
pellucidus; *non-Laelaps*.—Tipton, 1960: 304.
Hypoaspis pellucidus.—Castagnoli & Pegazzano, 1985: 312.
Hypoaspis pellucida.—Bernini *et al*., 1995: 29; Kůrka, 2005: 25.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Tiarno, Trento, Italy, in litter.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis* (*Geolaelaps*) *pugni* Karg, 1979**
Hypoaspis (*Geolaelaps*) *pugni* Karg, 1979: 85.
Hypoaspis (*Geolaelaps*) *pugni*.—Karg, 1982: 242, 1989c: 116; Kazemi *et al*., 2020: 1976.
Gaeolaelaps pugni.—Nemati & Mohseni, 2013: 75.

Type depository. Magyar Természettudományi Múzeum/ Hungarian Natural History Museum, Budapest, Hungary.
Type locality and habitat. 700 m above sea level, Mount Piltriquitron, near El Bolsón, [Rio Negro], Argentina, in rat [Animalia: Rodentia] nest.
Note. Several features of this species are unusual for *Gaeolaelaps*, but most importantly, *st*4 and *iv*3 appear to be on metasternal platelets. If this is correct, it is possible that the species is not even a Laelapidae. We keep it here as *incertae sedis* until the type specimens are re-examined.

***Hypoaspis quinquelongisetis* Ryke, 1963**
Hypoaspis quinquelongisetis Ryke, 1963: 1.
Hypoaspis quinquelongisetus [sic].—Ryke, 1963: 3.
Hypoaspis (*Hypoaspis*) *quinquelongisetus* [sic].—Aswegen & Loots, 1970: 189.
Hypoaspis (*Pneumolaelaps*) *quinquelongisetis*.—Karg, 1979: 88, 1982: 244.
Hypoaspis quinquelongisetis.—Karg, 1984: 39; Halliday, 2005: 35.

Type depository. Institute for Zoological Research, Potchefstroom University, Potchefstroom, South Africa.
Type locality and habitat. Agricultural College, Potchefstroom, South Africa, in soil in sheep fold.
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The long epigynal shield, almost abutting the anal shield, the very long *Z5*, *Jv5* and post-anal seta contrasting with short setae on the rest of the idiosoma, smooth epistome and a normal pilus dentilis (excluding it from *Androlaelaps* and *Haemolaelaps*) is hardly compatible with any genus treated here. The available information on the morphology of this species do not allow its placement in a known genus with confidence.

***Hypoaspis relictovi* Senotrusova, 1982**
Hypoaspis relictovi Senotrusova, 1982: 6.
Hypoaspis relictovi.—Kůrka, 2005: 25.

Type depository. Institute of Zoology, Almaty, Kazakhstan; specimen number 5067.
Type locality and habitat. 2200–2400 m above sea level, Terskey Alatau mountain, central Tyan Shan, Kazakhstan, in nest of *Spermophilus relictus* (cited as *Citellus relictus*) [Animalia: Rodentia: Sciuridae].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26) because setae *Z4* are short. It is similar to some species of *Gaeolaelaps*, but it cannot be placed there because the lateral and opisthogastric integument is hypertrichous, which makes it even more similar to *Pneumolaelaps*. However, nothing is mentioned in the original description about the characteristics of the tectum or the deutosternum. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis*? [sic] *resinosa* (Presl, 1822)**
Acarus resinosus Presl in Presl & Presl, 1822: 210.
Hypoaspis? *resinosus* [sic].—Oudemans, 1936: 212.
Acarus resinosus.—Dunlop & Jekel, 2008: 90.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. The available information on the morphology of this fossil species, lacking details and without any supporting image, does not allow its placement in a known genus with confidence. Even its placement at the family level is questionable.

***Hypoaspis reticulatus* Chaudhury *et al*., 2010**
Hypoaspis reticulatus Chaudhury, Gupta & Saha, 2010: 135.

Type depository. Entomology and Wildlife Biology Research Laboratory, Calcutta University, Kolkata, India.
Type locality and habitat. Swarup Nagar, North 24 Parganas, West Bengal, India, in nest of *Bandicoota bengalensis* [Animalia: Rodentia: Muridae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence. It does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). *Hypoaspis reticulatus* Chaudhury *et al*., 2010 is a junior primary homonym of *Hypoaspis reticulatus* Sheals, 1962, and must be replaced. We refrain from doing that here, to give the original authors a chance to propose a replacement name.

***Hypoaspis rhinarius* Vitzthum, 1935**
Hypoaspis rhinarius Vitzthum, 1935: 583.

Type depository. Unspecified.
Type locality and habitat. West Indies [Caribbean area], on *Sericoles holosericeus* [Animalia: Apodiformes: Trochilidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence. It does not appear to be a species of *Hypoaspis*.

***Hypoaspis richiardii* (Canestrini & Fanzago, 1877)**
Dermanyssus richiardii Canestrini & Fanzago, 1877: 125.
Laelaps richiardii.—Berlese, 1892f: 21.

Hypoaspis richiardii.—Oudemans, 1939b: 303.

Type depository. Unspecified.
Type locality and habitat. Italy, on *Xylocopa violacea* [Animalia: Hymenoptera: Apidae] and *Cossuscossus* (cited as *Cossus ligniperda*) [Animalia: Lepidoptera: Cossidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence. Roy & Chauve (2007: 97) pointed out that its occurrence on insects excludes it from the Dermanyssidae.

***Hypoaspis*? [sic] *sciarae* (Dufour, 1839)**
Pteroptus sciaræ Dufour, 1839: 276.
Hypoaspis? *sciarae* [sic].—Oudemans, 1936: 213.

Type depository. Unspecified.
Type locality and habitat. On unidentified fungus gnat, Sciaridae.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis sentifer* Berlese, 1918**
Hypoaspis sentifer Berlese, 1918: 118.
Hypoaspis sentifer.—Castagnoli & Pegazzano, 1985: 374.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Samarang, Java, Indonesia, unspecified substrate.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis similis* (Moniez, 1894)**
Laelaps similis Moniez, 1894: 203.
Loelaps similis [sic].—Wasmann, 1894: 199.
Laelaps similis.—Banks, 1907: 610.
Lealaps similis [sic].—Leonardi, 1897: 862.
similis; *non-Laelaps* [sic].—Tipton, 1960: 307.
Hypoaspis similis.—Farrier & Hennessey, 1993: 78.

Type depository. Unspecified.
Type locality and habitat. Washington, District of Columbia, United States of America, associated with *Formica neorufibarbis* [cited as *Formica fusca* var. *sunsericea*; Animalia: Hymenoptera: Formicidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis simplex* (Halbert, 1923)**
Laelaps simplex Halbert, 1923: 368.
Chamolaelaps simplex.—Hull, in Turk & Turk, 1952: 482; Turk, 1953: 11.
Hypoaspis simplex.—Turk & Turk, 1952: 482.
?*Arctoseius simplex* [sic].—Athias-Henriot, 1959: 192.
Laelaps simplex.—Luxton, 1998: 26.

Type depository. Irish National Museum, Dublin, Ireland.

Type locality and habitat. Glendalough, Wicklow, Ireland, under rotten wood.
Note. Luxton (1998: 26) questioned the generic classification of this species, pointing out that the type specimens do not seem to be in Halbert's collection. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis sinensis* Bai & Gu, 1999**
Hypoaspis sinensis Bai & Gu, 1999 [reference not seen].
Hypoaspis sinensis.—Ren & Guo, 2008: 329, 2009: 101.

Note. We have been unable to locate even the reference of the publication providing the original description of this species; hence, it could not be mentioned in the reference section of this catalogue.

***Hypoaspis solimani* Shereef *et al*., 1992**
Hypoaspis solimani Shereef, Nawar & Ahmed, 1992: 1124.
Hypoaspis solimani Nawar, Shereef & Ahmed, 1993: 344 (objective homonym).
Hypoaspis solomani.—Nawar, Shereef & Ahmed, 1993: 344 (*lapsus calami*).
Hypoaspis solimani.—Kůrka, 2005: 25.

Type depository. Agricultural Zoology Department, Faculty of Agriculture, Cairo University, Giza, Egypt.
Type locality and habitat. Faculty of Agriculture, Cairo University, Giza, Egypt, in compost.
Note. Kazemi *et al*. (2014: 519) suggested that this species does not belong to Laelapidae, in part because the male has a ventrianal shield. However, characteristics of the female idiosoma and gnathosoma are not incompatible with Laelapidae-Hypoaspidinae. This conflicting information and the relative lack of details in the description prevents us to assign to any genus.

***Hypoaspis soricinus* Hull, 1925**
Hypoaspis soricinus Hull, 1925: 210.
Chamolaelaps soricinus.—Hull, in Turk & Turk, 1952: 482; Turk, 1953: 11.

Type depository. Unspecified.
Type locality and habitat. West Allendale, England, on unidentified shrew [Animalia: Soricomorpha: Soricidae].
Note. This species was described based on a single adult male. As Evans & Till (1966: 362), we consider the generic classification of this species uncertain.

***Hypoaspis spiniferus* (Berlese, 1904)**
Laelaps (*Hypoaspis*) *spiniferus* Berlese, 1904a: 260.
Hypoaspis spiniferus.—Buitendijk, 1945: 297; Castagnoli & Pegazzano, 1985: 391.
spiniferus; *non-Laelaps* [sic].—Tipton, 1960: 307.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. West Africa, unspecified substrate.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis stilosus* (Canestrini, 1884)**
Laelaps stilosus Canestrini, 1884: 711.
Laelaps stilosus.—Berlese, 1892f: 43; Rainbow, 1906: 173.
stilosus; *non-Laelaps*.—Tipton, 1960: 308.

Hypoaspis stilosus.—Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019 internet page; Kůrka, 2005: 25.

Type depository. Unspecified
Type locality and habitat. Australia, on unidentified beetle aff. *Cerambyx* sp. [sic] [Animalia: Coleoptera: Cerambycidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis tenuipes* Berlese, 1918**
Hypoaspis tenuipes Berlese, 1918: 117.
Hypoaspis tenuipes.—Castagnoli & Pegazzano, 1985: 412.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Samarang, Java, Indonesia, in humus.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis trispinosus* Berlese, 1920**
Hypoaspis trispinosus Berlese, 1920: 151.
Hypoaspis trispinosa.—Bernini *et al*., 1995: 29; Kůrka, 2005: 25.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Florence, Italy, in humus.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis troglodytes* (Packard, 1888)**
Gamasus (or *Hypoaspis* ?) [sic] *troglodytes* Packard, 1888: 42.
Gamasus (or *Hypoaspis*) [sic] *troglodytes*.—Kingsley, 1890: 357.
Gamasus troglodytes.—Banks, 1907: 610.

Type depository. Museum of Comparative Zoology, Cambridge, Massachusetts, United States of America.
Type locality and habitat. Mammoth Cave, Kentucky, United States of America, on fungus mycelium.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis uncinatus* (G. & R. Canestrini, 1882)**
Gamasus hamatus G. & R. Canestrini, 1881: 1085.
Laelaps uncinatus G. & R. Canestrini, 1882a: 60 [replacement name given the existence of *Gamasus hamatus* Koch)].
Hypoaspis uncinatus.—Canestrini, 1885: 81.
Laelaps uncinatus.—Berlese, 1892e: 15.

Type depository. Unspecified.
Type locality and habitat. Cervarece, Padua, Italy, in litter.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis womersleyi* Domrow, 1957**
Hypoaspis womersleyi Domrow, 1957: 205.
Hypoaspis womersleyi.—Monroe, 1972: 299; Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019; Kůrka, 2005: 25.

Type depository. Queensland Museum, South Brisbane, Australia; specimen number G2349 (Monroe, 1972: 299).
Type locality and habitat. Low Isles (145°34'E, 16°23'S), Great Barrier Reef, Australia, on leaf mould on cay.
Note. Kazemi *et al*. (2014: 519) considered this species similar to *Gaeolaelaps*, except for the apparently edentate fixed cheliceral digit and the elongate epigynal shield. Yet, a short pilus dentilis is not compatible with *Androlaelaps* or *Haemolaelaps*. Available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis* (*Gymnolaelaps*?) [sic] *acanthopus* Berlese, 1923**
Hypoaspis (*Gymnolaelaps*?) [sic] *acanthopus* Berlese, 1923b: 123.
Hypoaspis (*Gymnolaelaps*) *acanthopus*.—Castagnoli & Pegazzano, 1985: 1.
Gymnolaelaps acanthopus.—Moreira, 2014: 272.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Netché, Maré, Loyalty Island, New Caledonia, associated with unidentified ants [Animalia: Hymenoptera: Formicidae].
Note. This species was described based on a single adult male; hence is generic classification is uncertain.

***Hypoaspis* (*Hypoaspis*) *polydesmoides* Evans, 1955**
Hypoaspis (*Hypoaspis*) *polydesmoides* Evans, 1955: 362.
Hypoaspis (*Hypoaspis*) *polydesmoides*.—Ryke, 1959: 7; Farfan & Klompen, 2012: 72.
Hypoaspis polydesmoides.—Farfan & Klompen, 2012: 72.

Type depository. Unspecified.
Type locality and habitat. 3000 feet [914 m] above sea level, Fraser's Hill, Pahang, Malaysia (cited as Malaya), on a giant polydesmid [Animalia: Polydesmida].
Note. This species does not agree with the concept of *Hypoaspis* presented by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis* (*Laelaspis*) *latodentis* Karg, 1993**
Hypoaspis (*Laelaspis*) *latodentis* Karg, 1993b: 265.
Laelaspis latodentis.—Moreira, 2014: 308.

Type depository. Museum für Naturkunde, Berlin, Germany.
Type locality and habitat. Near Puntudo, Santa Cruz, Galapagos Islands, in wet moss on rocks, Pteridophyta-Cyperaceae zone.
Note. Kazemi (2015: 415) excluded this species from *Laelaspis* on the grounds that presternal platelets are present, and three pairs of ventral setae are inserted well inside the epigynal shield. It is similar to *Reticulolaelaps*, except that metasternal setae *st4* are present. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Hypoaspis* (*Laelaspisella*) *cavitatis* Karg, 1982**
Hypoaspis (*Pneumolaelaps*) *cavitatis* Karg, 1982: 253.
Hypoaspis cavitatis.—Karg, 1984: 39; Joharchi *et al*., 2020b: 476.
Hypoaspis (*Laelaspisella*) *cavitatis*.—Karg, 1989a: 110.
Laelaspisella cavitatis.—Karg & Schorlemmer, 2013: 200.
Hypoaspis (*Laelaspisella*) *cavitatis*.—Joharchi & Halliday, 2013: 46; Joharchi *et al*., 2016: 14; Nemati *et al*., 2019: 81.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Barueri, São Paulo state, Brazil, in soil with *Camponotus rufipes* [Animalia: Hymenoptera: Formicidae].
Note. Karg (1989a: 107) considered *Laelaspisella* as a subgenus of *Hypoaspis*, while Karg & Schorlemmer (2013: 194) re-instated *Laelaspisella* at the generic level and included this species as a member of that group. While re-evaluating *Laelaspisella*, Joharchi & Halliday (2013: 46) stated that this species, along with *Hypoaspis* (*Laelaspisella*) *foramenis* Karg, appear to belong to an "unknown Neotropical genus". It was considered of *incertae sedis* by Joharchi *et al*. (2020b: 476), and we agree with that assessment.

***Hypoaspis* (*Laelaspisella*) *foramenis* Karg, 1989**
Hypoaspis (*Laelaspisella*) *foramenis* Karg, 1989a: 108.
Laelaspisella foramenis.—Farrier & Hennessey, 1993: 82; Karg & Schorlemmer, 2013: 203.
Hypoaspis foramenis.—Joharchi *et al*., 2020b: 477.

Type depository. Institut für Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany.
Type locality and habitat. Saint Lucia, Lesser Antilles [Caribbean area], unspecified substrate.
Note. See note for *H*. (*L*.) *cavitatis* above. It was considered of *incertae sedis* by Joharchi *et al*. (2020b: 477), and we agree with that assessment.

***Laelaps berlesii* G. & R. Canestrini, 1882**
Laelaps Berlesii G. & R. Canestrini, 1882: 73.
Iphis berlesii.—Canestrini, 1885: 97.
berlesei; *non-Laelaps*.—Tipton, 1960: 288.

Type depository. Unspecified.
Type locality and habitat. Botanic garden [cited as Orto Botanico]; according to Canestrini (1885: 97), Padova, Modena, Italy; uspecified substrate.
Note. The original spelling of the specific name was *Berlesii*. Apart from converting the first letter to lower case, the original spelling must be retained (ICZN Article 32.5). Tipton (1960) pointed out that this species does not belong in *Laelaps*, but did not suggest an alternative genus. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Laelaps complanatus* Moniez, 1892**
Lælaps complanatus Moniez, 1892: 383.
Loelaps complanatus [sic].—Wasmann, 1894: 198.
Laelaps complanatus.—Leonardi, 1897: 864.
complanatus; *non-Laelaps* [sic].—Tipton, 1960: 291.

Type depository. Unspecified.
Type locality and habitat. Chaumont-en-Bassigny, France, in nest of *Formica fusca* [Animalia: Hymenoptera: Formicidae].

Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Laelaps* (*Cosmolaelaps*) *androgynus* Berlese, 1905**
Laelaps (*Cosmolaelaps*) *androgynus* Berlese, 1905: 170.
androgynous; *non-Laelaps*.—Tipton, 1960: 287.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Tjiompea, Java, Indonesia, unspecified substrate.
Note. Moreira *et al*. (2014: 322) questioned the generic placement of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Laelaps* (*Eugynolaelaps*) Berlese, 1918**
Laelaps (*Eugynolaelaps*) Berlese, 1918: 128 (type species: *Laelaps* (*Eugynolaelaps*) *coriaceus* Berlese, 1918: 129).
Eugynolaelaps.—Ewing, 1929: 10.
Laelaps (*Eugynolaelaps*).—Zumpt & Patterson, 1951: 68; Strandtmann & Wharton, 1958: 196.

Note. This taxon was described as a subgenus in Laelapidae. *Eugynolaelaps* was considered a junior synonym of *Laelaps* by Zumpt (1961: 25) and El-Kammah *et al*. (1994: 170), but it was considered as a possible Hypoaspidinae by Yunker, in Tipton (1960: 251).

***Laelaps* (*Eugynolaelaps*) *coriaceus* Berlese, 1918**
Laelaps (*Eugynolaelaps*) *coriaceus* Berlese, 1918: 129.
Laelaps (*Eugynolaelaps*) *coriaceus*.—Strantmann & Wharton, 1958: 196; Castagnoli & Peggazano, 1985: 89.
coriaceus; *non-Laelaps* [sic].—Tipton, 1960: 291.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Durba [sic; possibly Durban, South Africa].
Note. See note under *Laelaps* (*Eugynolaelaps*).

***Laelaps* (*Hypoaspis*) *intermedius* Karawajew, 1909**
Laelaps (*Hypoaspis*) *intermedius* Karawajew, 1909: 234.

Type depository. Unspecified.
Type locality and habitat. Ashkhabad, Turkmenistan, on *Messor excursionis* [Animalia: Hymenoptera: Formicidae].
Note. Karawajew (1909: 235) considered this species to resemble *L. myrmecophilus*, and *L. myrmophila*, both currently in *Gymnolaelaps*, which suggests that it also belongs to that genus. It does not fit the present concept of *Hypoaspis*, provided by Joharchi & Halliday (2011: 26). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Laelaps* (?*Oolaelaps*) [sic] *moderatus* Silvestri, 1917**
Laelaps (?*Ooloelaps*) [sic] *moderatus* Silvestri, 1917: 296.

Type depository. Unspecified.
Type locality and habitat. Thiès, Senegal, in nest of *Eutermes trinervius* [Animalia: Blattodea: Termitidae].

Note. In the original description, the author reported this species to have characteristics of *Oolaelaps* and *Hypoaspis*, in the concepts then adoped for those genera. Given that *Oolaelaps* is a junior synonym of *Holostaspis*, Babaeian *et al*. (2019: 329) assessed the characteristics of this species, considering it of uncertain generic placement, and we agree with that view.

***Oolaelaps parvulus* (Berlese, 1904)**
Laelaps (*Oolaelaps*) *parvulus* Berlese, 1904c: 431.
Holostaspis parvulus.—Vitzthum, 1929: 26; Sellnick, 1931: 695; Schweizer, 1949: 40; Bregetova, 1977b: 549; Keum *et al*., 2017: 490.
parvulus; *non-Laelaps* [sic].—Tipton, 1960: 303.
Ololaelaps parvulus.—Castagnoli & Pegazzano, 1985: 306.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Russia, in ant nests [Animalia: Hymenoptera: Formicidae].
Note. Babaeian *et al*. (2019a: 331) questioned the generic classification of this species. Berlese's illustrations show a hypoaspidine laelapid, but its generic placement cannot be determined.

***Laelantennus* Berlese, 1916**
Laelantennus Berlese, 1916a: 30 (type species: *Laelantennus lagena* Berlese, 1916, by original designation).
Laelantennus.—Vitzthum, 1942: 764; Nemati *et al*., 2021: 170.

Note. This genus was described for a single species and remains monotypic. Vitzthum (1942: 764) placed *Laelantennus* in the Laelapidae-Hypodaspidinae based solely on the original description of the type species, which is brief and lacks some important details. We consider the genus and its type species to be *incertae sedis*.

***Laelantennus lagena* Berlese, 1916**
Laelantennus lagena Berlese, 1916a: 30.
Laelantennus lagena.—Castagnoli & Pegazzano, 1985: 211; Nemati *et al*., 2021: 170.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, on unspecified substrate.
Note. See note for the genus (above).

***Laelaspis equitans unguiculata* (Berlese, 1904)**
Laelaps (*Laelaspis*) *equitans* var. *unguiculata*? [sic] Berlese, 1904c: 424.
Laelaps (*Laelaspis*) *equitans* var. *unguiculata*.—Castagnoli & Pegazzano, 1985: 428.
Laelaspis equitans unguiculata.—Bernini *et al*., 1995: 29.
Hypoaspis unguiculata.—Kůrka, 2005: 25.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Cison di Valmarino, Treviso, Italy, on *Tetramorium caespitum* [Animalia: Hymenoptera: Formicidae].
Note. This species was described only from a male, which makes its generic placement uncertain with available information.

***Laelaspis zuluensis* Trägårdh, 1906**
Laelaps (*Laelaspis*) *zuluensis* Trägårdh, 1906: 873.
Laelaspis zuluensis.—Hunter, 1961: 675; Kazemi, 2015: 415.

Type depository. Unspecified.
Type locality and habitat. Umfolozi, Zululand, KwaZulu-Natal, South Africa, with *Pheidole* sp. [Animalia: Hymenoptera: Formicidae] under a rock.
Note. Kazemi (2015: 415) excluded the possibility that this species belonged to *Laelaspis*, without referring it to another genus. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Myrmeciphis* Hull, 1923**
Myrmeciphis Hull, 1923: 612 (type species: *Myrmeciphis crawleianus* Hull, 1923, by monotypy).
Myrmeciphis.—Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23.

Note. This genus was described as belonging to the section Laelaptinae of the family Gamasidae. Vitzthum (1931c: 143) placed it in the Laelapidae and Vitzthum (1942: 764) placed it in the Hypoaspidinae, Laelapidae. The genus is known only from the type species, which was inadequately described. The morphological information available in the literature does not allow its reliable classification.

***Myrmeciphis crawleianus* Hull, 1923**
Myrmeciphis crawleianus Hull, 1923: 612.
Myrmeciphis crawleianus.—Radford, 1950b: 23; Halliday, 1998: 127.

Type depository. Unspecified.
Type locality and habitat. Western Australia, Australia, in nest of *Bothriomyrmex* sp. [Animalia: Hymenoptera: Formicidae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Myrmolaelaps* Trägårdh, 1906**
Myrmolaelaps Trägårdh, 1906: 874 (type species: *Myrmolaelaps equitans* Trägårdh, 1906, by monotypy).
Myrmolaelaps.—Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Casanueva, 1993: 40; Nemati *et al*., 2021: 170.

Note. The monotypic genus was not assigned to a family in the original description, and was placed in Laelapidae-Hypoaspidinae by Vitzthum (1942: 764). It is known only from the type species, which was inadequately described. The morphological information available in the literature does not allow its reliable classification.

***Myrmolaelaps equitans* Trägårdh, 1906**
Myrmolaelaps equitans Trägårdh, 1906: 874.
Myrmolaelaps equitans.—Radford, 1950b: 23.

Type depository. Unspecified.
Type locality and habitat. Umfolozi, Zululand, KwaZulu-Natal, South Africa, with *Pheidole* sp. [Animalia: Hymenoptera: Formicidae] under a rock.
Note. See note for the genus (above).

***Neoberlesia mexicana* Banks, 1915**
Neoberlesia mexicana Banks, 1915b: 61.
Gymnolaelaps mexicana.—Farrier & Hennessey, 1993: 74.
Pseudoparasitus mexicana.—Kůrka, 2005: 26.

Type depository. Unspecified.
Type locality and habitat. San Miguel, Hidalgo, Mexico, in nest of *Pheidole vasliti acolhua* [Animalia: Hymenoptera: Formicidae].
Note. The original description and illustrations of this species lack important details. It is not consistent with our concept of *Neoberlesia* because it has separate epigynal and anal shields. The expanded epigynal shield suggests *Gymnolaelaps* or *Pseudoparasitus*, or perhaps *Laelaspis*, but we are unable to place it in a genus with any confidence.

***Ololaelaps festivus* (Koch, 1840)**
Zercon festivus Koch, 1840c: 8.
Ololaelaps festivus.—Oudemans, 1936: 216.
Hyletastes festivus.—Turk, 1953: 12.

Type depository. Unspecified.
Type locality and habitat. Unspecified.
Note. Oudemans (1936: 216) suspected this species may be a senior synonym of *Iphis haemisphaericus* Koch, which is presently in the Ologamasidae. Turk (1953: 12) considered this species to be a senior synonym of *I. haemisphaericus* and *Laelaps placentula* Berlese. Beaulieu *et al*. (2019: 12) considered its taxonomic status uncertain, and we agree with that assessment.

***Ololaelaps inornatus* (Johnston, 1849)**
Eumaeus inornatus Johnston, 1849: 305.
Ololaelaps inornatus.—Falconer, 1923: 274.
Hyletastes inornatus.—Turk, 1953: 12.

Type depository. Unspecified.
Type locality and habitat. Berwickshire, Scotland, in moss (cited as "muscis").
Note. Turk (1953: 12) considered this species to be a senior synonym of *Ololaelaps confinis* Berlese, 1904a, whereas Beaulieu *et al*. (2019: 12) considered it a *nomen dubium*. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Ololaelaps* (*Cypholaelaps*) *haemisphaericus* Berlese, 1916**
Ololaelaps (*Cypholaelaps*) *haemisphaericus* Berlese, 1916b: 166.
Ololaelaps (*Cypholaelaps*) *haemisphaericus*.—Lombardini, 1936: 45; Castagnoli & Pegazzano, 1985: 174.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. La Plata, Argentina, unspecified substrate.
Note. See (above) note under *Cypholaelaps* Berlese, 1916. According to Vitzthum (1935: 68), *O*. (*C*.) *haemisphaericus* Berlese, 1916 does not belong to *Ololaelaps*, but a decision on that question will depend on re-examination of Berlese's type. Beaulieu *et al*. (2019: 12) considered *Ololaelaps* (*Cypholaelaps*) *haemisphaericus* to be a *nomen dubium*, and refered to its similarity with *Cypholaelaps semiglobulus* Vitzthum, as considered by Vitzthum (1935). The name *O*. (*Cypholaelaps*) *haemisphaericus* Berlese, 1916 should not be mistaken for *Ololaelaps haemisphaericus* Koch, 1840, which is a distinct species with a complicated history.

***Oolaelaps mucronatus* Berlese, 1923**
Oolaelaps mucronatus Berlese, 1923a: 253.
Oolaelaps mucronatus.—Castagnoli & Pegazzano, 1985: 264.
Holostaspis mucronatus.—Moreira, 2014: 285.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.
Note. Babaeian *et al*. (2019a: 331) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Oolaelaps orientalis* Berlese, 1923**
Oolaelaps orientalis Berlese, 1923a: 253.
Oolaelaps orientalis.—Castagnoli & Pegazzano, 1985: 288.
Holotaspis orientalis.—Moreira, 2014: 286.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, from unspecified substrate.
Note. Babaeian *et al*. (2019a: 331) questioned the familial classification of this species. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Pneumolaelaps kaibaeus* Rosario, 1981**
Pneumolaelaps kaibaeus Rosario, 1981: 72.

Type depository. Unspecified.
Type locality and habitat. Carranglan, Nueva Ecija, Philippines, in litter.
Note. This species does not fit the concept of *Pneumolaelaps* adopted in this publication, and its known morphological characteristics do not allow its reliable placement in any genus.

***Pneumolaelaps saana* (Huhta & Karg, 2010)**
Hypoaspis (*Pneumolaelaps*) *saana* Huhta & Karg, 2010: 331.
Pneumolaelaps saana.—Moreira, 2014: 359.

Type depository. Zoological Museum, University of Helsinki, Finland.
Type locality and habitat. Saana Moutain, northwestern corner of Lapland Enontekiö, Finland, from a birch [*Betula* sp.; Plantae: Fagales: Betulaceae] stand.
Note. The description of this species is very incomplete, with no description of epistome and legs.

***Phytojacobsonia* Vitzthum, 1925**
Phytojacobsonia Vitzthum, 1925: 26 (type species: *Phytojacobsonia irregularis* Vitzthum, 1925: 26, by monotypy).
Phytojacobsonia.—Vitzthum, 1931c: 143, 1942: 763; Radford, 1950b: 22; Baker & Wharton 1952: 95.

Note. Vitzthum (1942: 763) placed this genus in the Laelapidae-Hypoaspidinae. The genus is known only from the original description of the type species, which is considered not to be sufficiently detailed to allow its reliable taxonomic placement.

***Phytojacobsonia irregularis* Vitzthum, 1925.**
Phytojacobsonia irregularis Vitzthum, 1925: 26.
Phytojacobsonia irregularis.—Radford, 1950b: 22.

Type depository. Zoologisches Museum, Berlin, Germany.
Type locality and habitat. Sumatra, Indonesia, on leaves of *Ficus fistulosa* [Plantae: Rosales: Moraceae].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Pililaelaps* Radford, 1947**
Banksia Radford, 1942b: 299 (type species: *Laelaps longiseta* Banks, 1909, by monotypy).
Pililaelaps Radford, 1947: 229 [replacement name given the existence of *Banksia* Oudemans & Voigts, in Voigts & Oudemans, 1905: 248].
Rad Baker & Wharton, 1952: 97 [unnecessary replacement name for *Banksia* Radford, 1924b: 299].

Note. This genus is known only from the original description of the type species, which is considered not to be sufficiently detailed to allow the validity of the genus and its reliable taxonomic placement.

***Pililaelaps longiseta* (Banks, 1909)**
Laelaps longiseta Banks, 1909: 137.
Banksia longiseta.—Radford, 1942b: 299, 1943: 63.
Pililaelaps longiseta.—Radford, 1947: 229.
Rad longiseta.—Baker & Wharton, 1952: 97.

Type depository. Ontario Agricultural College, Guelph, Canada.
Type locality and habitat. Guelph Ontario, Canada, on carrion beetle [Animalia: Coleoptera: Silphidae].
Note. The available information on the morphology of this species, the type species of *Pililaelaps*, does not allow the determination of the validity of the genus and its reliable taxonomic placement.

***Podolaelaps* Berlese, 1888**
Podolaelaps Berlese, 1888: 207 (type species: *Podolaelaps ambulacralis* Berlese, 1888: 208, by monotypy).
Podolaelaps.—Vitzthum, 1942: 763.

Note. Vitzthum (1942: 763) placed this genus in the Laelapidae-Hypoaspidinae. The genus is known only from the original description of the type species, which is considered insufficiently detailed to allow its reliable taxonomic placement.

***Podolaelaps ambulacralis* Berlese, 1888**
Podolaelaps ambulacralis Berlese, 1888: 208.
Podolaelaps ambulacralis.—Castagnoli & Pegazzano, 1985: 12.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. Mato Grosso (cited as Matto-grosso), Brazil, under tree bark.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Pseudoparasitus* (*Gymnolaelaps*) *tonsilis* Karg, 1989**
Pseudoparasitus (*Gymnolaelaps*) *tonsilis* Karg, 1989b: 335.
Gymnolaelaps tonsilis.—Farrier & Hennessey, 1993: 74; Nemati & Gwiazdowicz, 2016b: 45.
Laelaspisella tonsilis.—Joharchi *et al*., 2016a: 18.
Pseudoparasitus tonsilis.—Joharchi *et al*., 2020b: 481.

Type depository. Hungarian Natural History Museum, Budapest, Hungary and Institut fur Pflanzenschutzforschung, Kleinmachnow, Brandenburg, Germany [sic].
Type locality and habitat. Vigie-Point, near Castries, Saint Lucia, Lesser Antilles [Caribbean area], from unspecified substrate.
Note. This species was considered of *incertae sedis* by Nemati *et al*. (2019: 82) and Joharchi *et al*. (2020b: 481). The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Pseudoparasitus* (*Praeparasitus*) Berlese, 1920**
Pseudoparasitus (*Praeparasitus*) Berlese, 1920: 169 (type species: *Pseudoparasitus* (*Praeparasitus*) *collaris* Berlese, by monotypy).
Pseudoparasitus (*Praeparasitus*).—Vitzthum, 1942: 758.

Note. Vitzthum (1942: 758) placed this genus in the family Pseudoparasitidae. The subgenus is known only from the original description of the type species, which is considered not to be sufficiently detailed to allow its reliable taxonomic placement.

***Pseudoparasitus* (*Praeparasitus*) *collaris* Berlese, 1920**
Pseudoparasitus (*Praeparasitus*) *collaris* Berlese, 1920: 169.
Pseudoparasitus (*Praeparasitus*) *collaris*.—Castagnoli & Pegazzano, 1985: 80.

Type depository. Istituto Sperimentale per la Zoologia Agraria, Florence, Italy.
Type locality and habitat. East Africa, unspecified substrate.
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

***Stamfordia* Trägårdh, 1906**
Stamfordia Trägårdh, 1906: 874 (type species: *Stamfordia carabicola* Trägårdh, 1906: 875, by monotypy).
Stamfordia.—Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Baker & Wharton 1952: 95.

Note. *Stamfordia* was not assigned to a family in the original description. Vitzthum (1942: 764) placed this genus in the Laelapidae-Hypoaspidinae. The genus is known only from the original description of the type species, which is considered not to be sufficiently detailed to allow its reliable taxonomic placement.

***Stamfordia carabicola* Trägårdh, 1906**
Stamfordia carabicola Trägårdh, 1906: 875.
Stamfordia carabicola.—Radford, 1950b: 23.

Type depository. Unspecified.
Type locality and habitat. Stamford Hill, Durban, Natal, South Africa, on unidentified Carabidae beetle [Animalia: Coleoptera].
Note. The available information on the morphology of this species does not allow its placement in a known genus with confidence.

Taxa excluded

Babaeian *et al*. (2019) listed the names of 74 taxa that have been placed in the genus or subgenus *Holostaspis* in the past, but which are now in other genera or families that are outside of the scope of this catalogue. The details provided in that publication will not be repeated here, except for listing the names of the species (as originally described) and the reference to the original description followed by references concerning their more recent placement in other families (Table 2). In addition, we here list additional taxa that have been transferred to other families or, to a minor extent, to groups of Laelapidae outside the scope of the present catalogue, for being putatively parasitic on vertebrates.

TABLE 2. Species placed in the genus *Holostaspis* at some time but now outside the scope of the present study.

Original description	Current placement	Reference to current placement
Acarus marginatus Hermann, 1804: 76	*Macrocheles* (Macrochelidae)	Evans & Browning (1956: 12)
Gamasus (*Holostaspis*) *pisentii* Berlese, 1882a: 637	*Macrocheles* (Macrochelidae)	Evans & Browning (1956: 13)
Gamasus arcualis Koch, 1840b[1]: 14	*Haemogamasus* (Laelapidae)	Strandtmann (1963: 6)
Gamasus badius Koch, 1840b: 9[2]	*Celaenopsis* (Celaenopsidae)	Evans (1957a: 250)
Gamasus carinatus Koch, 1839: 16	*Nothrholaspis* (Macrochelidae)	Emberson (2010: 47)
Gamasus cepuricus Koch, 1840a: 12	*Eugamasus* (Parasitidae)	Oudemans (1936: 136)
Gamasus decoloratus Koch, 1840a: 14	*Macrocheles* (Macrochelidae)	Evans & Browning (1956: 32)
Gamasus galactinus Koch, 1840a: 19	*Parasitus* (Parasitidae)	Oudemans (1936: 126)
Gamasus gnavus Koch, 1840a: 13 (sic, = *gilvus*)	*Eugamasus* (Parasitidae)	Oudemans (1936: 139)
Gamasus hamatus Koch, 1840b: 2	*Amblygamasus* (Parasitidae)	Karg (1993a: 397)
Gamasus latus Koch, 1844: 16	*Macrocheles* (Macrochelidae)	Oudemans (1936: 179)
Gamasus limbatus Koch, 1840c: 2[3]	*Eulaelaps* (Laelapidae)	Oudemans (1936: 240)
Gamasus litus Koch, 1840a: 4	*Eugamasus* (Parasitidae)	Oudemans (1936: 129)
Gamasus longispinosus Kramer, 1876: 100	*Geholaspis* (Macrochelidae)	Evans & Browning (1956: 42)
Gamasus lunatus Koch, 1840b: 8	*Holoparasitus* (Parasitidae)	Oudemans (1936: 167)
Gamasus marginatus Koch, 1841: 442	*Eulaelaps* (Laelapidae)	Oudemans (1936: 235)
Gamasus marginellus Koch, 1840b: 21	*Pergamasus* (Parasitidae)	Oudemans (1936: 162)
Gamasus monachus Koch, 1835: 8	*Pergamasus* (Parasitidae)	Oudemans (1936: 153)
Gamasus opacus Koch, 1940a: 24	*Macrholaspis* (Macrochelidae)	Emberson (2010: 48)
Gamasus ovatus Koch, 1840b: 15	*Pergamasus* (Parasitidae)	Oudemans (1936: 153)
Gamasus pilipes Koch, 1840a: 15	*Pergamasus* (Parasitidae)	Oudemans (1936: 147)
Gamasus pygmaeus Müller, 1859: 30[4]	*Proctolaelaps* (Melicharidae)	Moraes *et al*. (2016: 223)
Gamasus stabularis Koch, 1840c: 1[5]	*Eulaelaps* (Laelapidae)	Evans & Till (1966: 260)
Gamasus tardus Koch, 1844: 14	*Nothrholaspis* (Macrochelidae)	Emberson (2010: 47)
Gamasus terreus Canestrini & Fanzago, 1877: 116	*Macrholaspis* (Macrochelidae)	Emberson (2010: 49)
Gamasus tumidulus Koch, 1840b: 7	*Holoparasitus* (Parasitidae)	Oudemans (1936: 167)
Gamasus vegetus Koch, 1840b: 16	*Eulaelaps* (Laelapidae)	Oudemans (1936: 238)
Holostaspis (*Gamasholaspis*) *gamasoides* Berlese, 1904a: 265	*Gamasholaspis* (Parholaspididae)	Petrova (1977: 339)

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TABLE 2. (Continued)

Original description	Current placement	Reference to current placement
Holostaspis (*Holaspulus*) *tenuipes* Berlese, 1904a: 266	*Holaspulus* (Parholaspididae)	Petrova (1977: 335)
Holostaspis (*Holostaspella ornatus* Berlese, 1904a: 277	*Holostaspella* (Macrochelidae)	Filipponi & Pegazzano (1967: 227)
Holostaspis (*Holostaspella sculpta* Berlese, 1903a: 241	*Holostaspella* (Macrochelidae)	Filipponi & Pegazzano (1967: 222)
Holostaspis adulescens Berlese, 1910a: 252	*Macrocheles* (Macrochelidae)	Filipponi & Pegazzano (1963: 83)
Holostaspis aemulans Berlese, 1905: 163	*Macrocheles* (Macrochelidae)	Berlese (1918: 146)
Holostaspis alpinus Berlese, 1887c: 10	*Geholaspis* (Macrochelidae)	Valle (1953: 335)
Holostaspis asperrimus Berlese, 1905: 163	*Glyptholaspis* (Macrochelidae)	Filipponi & Pegazzano (1960: 166)
Holostaspis caligynius Berlese, 1910a: 250	*Macrocheles* (Macrochelidae)	Walter (1984: 202)
Holostaspis confusa Foà, 1900: 137	*Glyptholaspis* (Macrochelidae)	Filipponi & Pegazzano (1960: 154)
Holostaspis cordiger Berlese, 1888: 195	*Macrocheles* (Macrochelidae)	Berlese (1918: 146)
Holostaspis dispar Berlese, 1910a: 251	*Macrocheles* (Macrochelidae)	Hartini & Takaku (2003: 1262)
Holostaspis echinatus Berlese, 1904b: 20	*Macrholaspis* (Macrochelidae)	Berlese (1918: 189)
Holostaspis exilis Banks, 1900: 485	*Paracarpais* (Parasitidae)	Farrier & Hennessey (1993: 148)
Holostaspis favosa Müller, 1860b: 180	Inquerenda	–
Holostaspis fimetaria Müller, 1860b: 182	*Stylochirus* (Ologamasidae)	Mašán & Kalúz (2001: 484)
Holostaspis glabra Müller, 1860b: 178	*Macrocheles* (Macrochelidae)	Filipponi & Pegazzano (1962a: 215)
Holostaspis hamadryadis Berlese, 1910a: 251	*Macrocheles* (Macrochelidae)	Krantz (1998a: 128)
Holostaspis humeratus Berlese, 1908: 13	*Macrocheles* (Macrochelidae)	Hyatt & Emberson (1988: 106)
Holostaspis isidis Berlese, 1910a: 252	*Macrocheles* (Macrochelidae)	Berlese (1918: 146)
Holostaspis kraepelini Berlese, 1905: 164	*Macrocheles* (Macrochelidae)	Krantz & Filipponi (1964: 40)
Holostaspis longipes Berlese, 1910a: 251	*Macrocheles* (Macrochelidae)	Krantz (1988: 972)
Holostaspis longispinosus var. *asper* Berlese, 1904a: 264	*Geholaspis* (Macrochelidae)	Valle (1953: 341)
Holostaspis longulus Berlese, 1882d: unpaginated	*Longicheles* (Macrochelidae)	Emberson (2010: 45)
Holostaspis longulus var. *hortorum* Berlese, 1904a: 265	*Longicheles* (Macrochelidae)	Emberson (2010: 41)
Holostaspis mandibularis Berlese, 1904a: 263	*Longicheles* (Macrochelidae)	Emberson (2010: 41)
Holostaspis marginatus var. *americanus* Berlese, 1888: 195	*Glyptholaspis* (Macrochelidae)	Filipponi & Pegazzano (1960: 148)
Holostaspis marginatus var. *littoralis* Halbert, 1915: 67	*Macrocheles* (Macrochelidae)	Luxton (1998: 18)
Holostaspis marginedentatus Trägårdh, 1908: 45	*Glyptholaspis* (Macrochelidae)	Babaeian *et al*. (2019a: 330)
Holostaspis merdarius Berlese, 1889a: 1	*Macrocheles* (Macrochelidae)	Filipponi & Pegazzano (1963: 83)
Holostaspis moestus Banks, 1898: 265	*Macrocheles* (Macrochelidae)	Farrier & Hennessey (1993: 96)
Holostaspis montivagus Berlese, 1887d: 4	*Nothrholaspis* (Macrochelidae)	Berlese (1918: 169)
Holostaspis penicilliger Berlese, 1904a: 264	*Macrocheles* (Macrochelidae)	Evans & Browning (1956: 27)
Holostaspis posteroarmatus Berlese, 1904a: 263	*Macrocheles* (Macrochelidae)	Krantz & Filipponi (1964: 36)

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TABLE 2. (Continued)

Original description	Current placement	Reference to current placement
Holostaspis punctulatus Berlese, 1910a: 250	*Macrocheles* (Macrochelidae)	Castagnoli & Pegazzano (1985: 341)
Holostaspis sita Trojan, 1908: 6	*Macrocheles* (Macrochelidae)	Berlese (1918: 189)
Holostaspis subbadius Berlese, 1904a: 264	*Macrocheles* (Macrochelidae)	Filipponi & Pegazzano (1963: 73)
Holostaspis subbadius var. *robustulus* Berlese, 1904a: 264	*Macrocheles* (Macrochelidae)	Costa (1966d: 533)
Holostaspis subbadius var. *scutatus* Berlese, 1904a: 264	*Macrocheles* (Macrochelidae)	Filipponi & Pegazzano (1962a: 228)
Holostaspis submarginatus Foà, 1900: 135	*Macrocheles* (Macrochelidae)	Filipponi & Pegazzano (1962b: 187)
Holostaspis terrestris Berlese, 1889a: 7	*Geholaspis* (Macrochelidae)	Babaeian *et al*. (2015: 426)
Holostaspis tridentinus G. & R. Canestrini, 1882a: 30	*Nothrholaspis* (Macrochelidae)	Emberson (2010: 47)
Holostaspis vagabundus Berlese, 1889a: 8	*Glyptholaspis* (Macrochelidae)	Filipponi & Pegazzano (1960: 148)
Holostaspis vernalis Berlese, 1887e: 1	*Macrocheles* (Macrochelidae)	Evans & Hyatt (1963: 375)
Laelaps? (or *Holostaspis*?) *wyandottensis* Packard, 1888: 42	*Veigaia* (Veigaiidae)	Hennessey & Farrier (1988: 18)
Porrhostaspis subterranea Müller, 1860b: 176	*Poecilochirus* (Parasitidae)	Micherdziński (1969: 664)

Also cited as: [1]*Hypoaspis arcualis*.—Oudemans, (1903d: 13); Kůrka (2005: 24); [2]?*Hypospis badius* [sic].—Oudemans, (1936: 205); [3]*Hypoaspis limbata*.—Voigts & Oudemans (1905: 230); [4]*Hypoaspis pygmaeus*.—Wo1f (1938: 644); [5]*Hypoaspis stabularis*.—Canestrini (1885: 86), Oudemans (1902e: 289, 1912c: 244, 1913a: 7, 1913b: 189, 1913c: 64).

Andregamasus Costa, 1965

Andregamasus Costa, 1965: 160.

Note. Originally described in Laelapidae, but later, Costa (1972: 47) pointed out its similarities with the Phytoseioidea and the Otopheidomenidae and suggesting it could belong to a new family, while Karg (1986: 47) placed *Andregamasus* in Podocinidae. Dowling & OConnor (2010: 304) mentioned an unidentified species of this genus as an Ascidae *sensu stricto*, reporting its close molecular relation with *Gamasellodes* Athias-Henriot. Moraes *et al*. (2016: 238) considered it possible that the species mentioned in *Andregamasus* are highly modified members of the Blattisociidae, pointing out that the confirmation would require the examination of their spermathecal structures, presently unavailable.

Andregamasus conchylicola (Andre, 1937)

Hydrogamasus conchylicola Andre, 1937: 62.
Andregamasus conchylicola.—Costa, 1965: 7; 1972: 48.

Note. Originally described in Gamasidae (= Parasitidae), but later designated as the type species of *Andregamasus*. See note under *Andregamasus*.

Andregamasus steinitzii Costa, 1965

Andregamasus steinitzii Costa, 1965: 9.

Note. Originally described in Laelapidae. See note under *Andregamasus*.

***Antennoseius* Berlese, 1916**
Antennoseius Berlese, 1916c: 303 (type species: *Antennoseius delicatus* Berlese, 1916c: 303, by original designation).

Note. Originally described in Laelapidae and presently in Ascidae (Moraes *et al*., 2016: 65).

***Antennoseius delicatus* Berlese, 1916**
Antennoseius delicatus Berlese, 1916c: 303.

Note. See note under *Antennoseius*.

***Arctoseiopsis* Evans, 1954**
Arctoseiopsis Evans, 1954a: 796 (type species: *Seiulus minutus* Halbert, 1915, by original designation).

Note. Considered a junior synonym of *Arctoseius* Thor, 1930, presently in Ascidae (Lindquist, 1964: 83; Moraes *et al*., 2016: 77).

***Arctoseiopsis minutus* (Halbert, 1915)**
Seiulus minutus Halbert, 1915: 76.

Note. See note under *Arctoseiopsis*.

***Anystipalpus* Berlese, 1911**
Anystipalpus Berlese, 1911: 184 (type species: *Anystipalpus percicola* Berlese, 1911, by original designation).

Note. Described in Laelapidae, included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 764) and transferred to Ascidae by Lindquist & Walter (1989: 1293).

***Anystipalpus percicola* Berlese, 1911**
Anystipalpus percicola Berlese, 1911: 185.

Note. See note under *Anystipalpus*.

***Ayersacarus* Hunter, 1964**
Ayersacarus Hunter, 1964a: 121 (type species: *Ayersacarus plumapilus* Hunter, 1964a: 122, by original designation).

Note. Originally described in Laelapidae and presently in Leptolaelapidae (Karg, 1983: 390, 1997a: 215).

***Ayersacarus gelidus* Hunter, 1964**
Ayersacarus gelidus Hunter, 1964b: 631.

Note. See note under *Ayersacarus*.

***Ayersacarus gressitti* Hunter, 1964**
Ayersacarus gressitti Hunter, 1964a: 124.

Note. See note under *Ayersacarus*.

***Ayersacarus plumapilus* Hunter, 1964**
Ayersacarus plumapilus Hunter, 1964a: 122.

Note. See note under *Ayersacarus*.

***Ayersacarus strandtmanni* Hunter, 1964**
Ayersacarus strandtmanni Hunter, 1964b: 635.

Note. See note under *Ayersacarus*.

***Berlesia cultrigera* Berlese, 1910**
Berlesia cultrigera Berlese, 1910a: 260.
Orthopteroseius cultrigerum.—Lindquist *et al*., 2020: 38.

Note. Presently in *Orthopteroseius* (Otopheidomenidae) (Lindquist *et al*., 2020: 38).

***Berlesia nuda* Berlese, 1910**
Berlesia nuda Berlese, 1910b: 370.
Prasadiseius nudum.—Lindquist *et al*., 2020: 38.

Note. Presently in *Prasadiseius* (Otopheidomenidae) (Lindquist *et al*., 2020: 38).

***Blattilaelaps* Womersley, 1956**
Blattilaelaps Womersley, 1956a: 566 (type species: *Blattilaelaps nauphoetae* Womersley, 1956).

Note. Originally described in Laelapidae and presently in Melicharidae, as a synonym of *Proctolaelaps* Berlese (Moraes *et al*., 2016: 203).

***Blattilaelaps nauphoetae* Womersley, 1956**
Blattilaelaps nauphoetae Womersley, 1956a: 566.
Proctolaelaps nauphoetae.—Moraes *et al*., 2016: 218.

Note. See note under *Blattilaelaps*.

Blattisociinae Garman, 1948
Blattisociinae Garman, 1948: 18.

Note. This subfamily was described in Laelapidae and later raised to the family level (Chant, 1963: 243; Moraes *et al*., 2016: 131).

***Blattisocius* Keegan, 1944**
Blattisocius Keegan, 1944: 181 (type species: *Blattisocius triodon* Keegan, 1944, by original designation).

Note. This genus was described in Parasitidae. See note under Blattisociinae.

***Blattisocius triodon* Keegan, 1944**
Blattisocius triodon Keegan, 1944: 181

Note. See note under *Blattisocius* and Blattisociinae.

***Cerambylaelaps* Costa, 1978**
Cerambylaelaps Costa, 1978: 188 (type species: *Cerambylaelaps nadchatrami* Costa, 1978, by monotypy).

Note. This genus was described from adult males and deutonymphs, and it could not be assigned to any family on the basis of that information alone. Although it was placed in Laelapidae by Trach & Joharchi (2018: 217), we accept the interpretation of Karg (1983: 390, 1997a: 211), who considered it to belong to Leptolaelapidae. The validity of Leptolaelapidae was questioned by Lindquist *et al*. (2009: 147), who referred to *Cerambylaelaps*, together with other related genera, as "Leptolaelapidae sensu Karg (1983, 1997a)", within the section of Eviphidoidea (Lindquist *et al*., 2009: 214). *Cerambylaelaps* was not mentioned in the revision of Pachylaelapidae by Mašán & Halliday (2014), and its correct placement cannot be decided until the female is described.

***Cerambylaelaps nadchatrami* Costa, 1978**
Cerambylaelaps nadchatrami Costa, 1978: 189.

Note. This species was not assigned to a family in the original description. See note for *Cerambylaelaps*.

***Chamolaelaps* Hull, 1952**
Chamolaelaps Hull, in Turk & Turk, 1952: 482 (type species, *Hypoaspis hypudaei* Oudemans, 1902, by original designation).

Note. Originally described in Laelaptidae and presently in Melicharidae, as a synonym of *Proctolaelaps* Berlese (Moraes *et al*., 2016: 203).

***Copriphis* Berlese, 1910**
Copriphis Berlese, 1910a: 261 (type species *Iphis pterophilus* Berlese, 1882b: 344, by original designation).
Copriphis.—Berlese, 1913b: 11; Mašán & Halliday, 2010: 39.

Note. This genus was not assigned to a family in the original description. It was included in Laelapidae-Eviphidini by Berlese (1913b: 11) and is presently placed in Eviphididae (Mašán & Halliday, 2010: 39).

***Copriphis pterophilus* (Berlese, 1882)**
Iphis pterophilus Berlese, 1882b: 344.
Copriphis pterophilus.—Berlese, 1910a: 261; Mašán & Halliday, 2010: 42.

Note. See note under *Copriphis*.

***Cosmetolaelaps* Womersley, 1959**
Cosmetolaelaps Womersley, 1959: 340 (type species: *Laelaps dolicacanthus* Canestrini, 1884: 709, by monotypy).

Note. Originally described in Laelapidae and transferred to Leptolaelapidae by Karg (1997a: 211).

***Cosmetolaelaps desecti* Costa, 1981**
Cosmetolaelaps desecti Costa in Costa & Allsopp, 1981: 277.

Note. Originally described in Laelapidae. See note for *Cosmetolaelaps*.

***Cosmetolaelaps dolicacanthus* (Canestrini, 1884)**
Laelaps dolicacanthus Canestrini, 1884: 709.
Cosmetolaelaps dolicacanthus.—Womersley, 1959: 341.

Note. See note for *Cosmetolaelaps*.

***Cosmetolaelaps microsetus* Costa, 1981**
Cosmetolaelaps microsetus Costa in Costa & Allsopp, 1981: 272.

Note. Originally described in Laelapidae.See note for *Cosmetolaelaps*.

***Cosmetolaelaps oligosetus* Costa, 1981**
Cosmetolaelaps oligosetus Costa in Costa & Allsopp, 1981: 277.

Note. Originally described in Laelapidae. See note for *Cosmetolaelaps*.

***Cosmetolaelaps reticulatus* Costa, 1981**
Cosmetolaelaps reticulatus Costa in Costa & Allsopp, 1981: 276.

Note. Originally described in Laelapidae. See note for *Cosmetolaelaps*.

***Cosmetolaelaps wallacei* Costa, 1981**
Cosmetolaelaps wallacei Costa in Costa & Allsopp, 1981: 278.

Note. Originally described in Laelapidae. See note for *Cosmetolaelaps*.

***Cosmolaelaps* ? *novus* [sic] Lombardini, 1960**
Cosmolaelaps ? *novus* [sic] Lombardini, 1960: 256.
Proctolaelaps novus.—Moraes *et al*., 2016: 219.

Note. Presently in *Proctolaelaps* Berlese, Melicharidae (Moraes *et al*., 2016: 219).

***Cosmolaelaps tridentata* (Pearse *et al*., 1936)**
Macrocheles tridentata Pearse, Patterson, Rankin & Wharton, 1936: 473.
Cosmolaelaps tridentatus.—Dowdy, 1965: 202.
Macrocheles tridentata.—Farrier & Hennessey, 1993: 99; Taylor, 2015: internet page.

Note. Presently in *Macrocheles* Latreille, Macrochelidae (Farrier & Hennessey, 1993: 99; Taylor, 2015: internet page).

***Cyclothorax latronis* Vitzthum, 1937**
Cyclothorax latronis Vitzthum, 1937: 639.
Vitzthumegistus latronis.—Kethley, 1977: 139.

Note. Placed in *Vitzthumegistus* Kethley, within Cercomegistidae, according to the understanding of Johnston (1960: 444), a genus later transferred to Vitzthumegistidae by Kim (2015: 203).

***Dianolaelaps* Gu & Duan, 1990**
Dianolaelaps Gu & Duan, 1990: 436 (type species: *Dianolaelaps gryllus* Gu & Duan, by original designation).

Note. Junior synonym of *Laelaps* Koch (Ma, 2006a: 23), Laelapinae.

***Dianolaelaps gryllus* Gu & Duan, 1990**
Dianolaelaps gryllus Gu & Duan, 1990: 436.

Note. Junior synonym of *Laelaps echidninus* Berlese, 1887 (Ma, 2006a: 23), Laelapinae.

***Euvarroa* Delfinado & Baker, 1974**
Euvarroa Delfinado & Baker, 1974: 8.

Note. Originally described in Varroidae. Although Klimov *et al*. (2016) placed in Laelapidae, we follow Lindquist *et al*. (2009: 155) in maintaining it in its distinct family, Varroidae.

***Evansolaelaps* Marais & Loots, 1969**
Evansolaelaps Marais & Loots, 1969b: 283 (type species: *Evansolaelaps punctissima* Marais & Loots, 1969: 285, by original designation).

Note. Originally described in Dermanyssidae, Laelapinae (our present concept of Laelapidae). We accept the interpretation of Karg (1983: 390, 1997a: 211), who considered it to belong to Leptolaelapidae. The validity of Leptolaelapidae was questioned by Lindquist *et al*. (2009: 147), who referred to Leptolaelapidae, together with other related genera, as "Leptolaelapidae sensu Karg (1983, 1997a)", citing it in the same section as Pachylaelapidae (Lindquist *et al*., 2009: 214)

***Evansolaelaps angolaensis* Marais & Loots, 1969**
Evansolaelaps angolaensis Marais & Loots, 1969b: 296.

Note. See note for *Evansolaelaps*.

***Evansolaelaps curtipilus* Marais & Loots, 1969**
Evansolaelaps curtipilus Marais & Loots, 1969b: 298.

Note. See note for *Evansolaelaps*.

***Evansolaelaps kaboboensis* Marais & Loots, 1969**
Evansolaelaps kaboboensis Marais & Loots, 1969b: 302.

Note. See note for *Evansolaelaps*.

***Evansolaelaps leleupi* Marais & Loots, 1969**
Evansolaelaps leleupi Marais & Loots, 1969b: 304.

Note. See note for *Evansolaelaps*.

***Evansolaelaps lingulatus* Marais & Loots, 1969**
Evansolaelaps lingulatus Marais & Loots, 1969b: 290.
Evansolaelaps lungulatus [sic].—Karg, 1983: 393.

Note. See note for *Evansolaelaps*.

***Evansolaelaps punctissima* Marais & Loots, 1969**
Evansolaelaps punctissima Marais & Loots, 1969b: 285.

Note. See note for *Evansolaelaps*.

***Evansolaelaps trisetosus* Marais & Loots, 1969**
Evansolaelaps trisetosus Marais & Loots, 1969b: 294.

Note. See note for *Evansolaelaps*.

***Eviphis* Berlese, 1903**
Eviphis Berlese, 1903a: 242 (type species *Iphis ostrinus* Koch, 1835, by original designation).
Eviphis.—Berlese, 1913b: 11; Mašán & Halliday, 2010: 53.

Note. This genus was not assigned to a family in the original description. It was included in Laelapidae-Eviphidini by Berlese (1913b: 11) and is presently placed in Eviphididae (Mašán & Halliday, 2010: 53).

***Eviphis ostrinus* (Koch, 1835)**
Iphis ostrinus Koch, 1835: 6.
Eviphis ostrinus.—Berlese, 1903a: 242; Mašán & Halliday, 2010: 54.

Note. See note under *Eviphis*.

***Gamasus frontalis* Banks, 1910**
Gamasus frontalis Banks, 1910: 3.
Androlaelaps sinuosa Furman, 1954: 120 [junior synonym of *G. frontalis* by Johnston, 1959: 61; Radovsky, 1969: 456; Farrier & Hennessey, 1993: 66].
Androlaelaps frontalis.—Johnston, 1959: 61; Whitaker & Wilson, 1974: 5; Farrier & Hennessey, 1993: 66.
Androlaelaps (*Androlaelaps*) *sinuosa*.—Barrera, 1979: 477; Bassols, 1981: 12; Light *et al*., 2020: 84.

Ischyropoda frontalis.—Radovsky, 1969: 456.

Note. Presently in *Ischyropoda* Kolenati, 1858, Laelapidae-Haemogamasinae (Radovsky, 1969: 456).

***Haemolaelaps nuttalli* (Hirst, 1915)**
Laelaps nuttalli Hirst, 1915: 183.
Haemolaelaps nuttalli.—Turk, 1950: 67; Buitendjik, 1945: 299.

Note. Presently in *Laelaps*, Laelapinae (Zumpt, 1950a: 77).

***Haemolaelaps qinghaiensis* Yang & Gu, 1985**
Haemogamasus qinghaiensis Yang & Gu, 1985: 54.
Haemogamasus qinghaiensis.—Yang *et al*., 1993: 253.
Haemolaelaps qinghaiensis.—Yang *et al*., 1993: 253.

Note. Presently in *Haemogamasus* Berlese, Haemogamasinae (Yang *et al*., 1993: 253).

***Hunteracarus* Costa, 1975**
Hunteracarus Costa, 1975: 263 (type species: *Hunteracarus womersleyi* Costa, 1975: 264, by monotypy).

Note. Originally described in Laelapidae and presently in Leptolaelapidae (Karg, 1997a: 212).

***Hunteracarus womersleyi* Costa, 1975**
Hunteracarus womersleyi Costa, 1975: 264.
Hunteracarus womersleyi.—Monteith & Storey, 1981: 267; Halliday, 1998: 124.

Note. See note for *Hunteracarus*.

***Hypoaspis acme* Womersley, 1955**
Hypoaspis acme Womersley, 1955: 414.
Hypoaspis (*Geolaelaps*) *acme*.—Karg, 1979: 84, 1982: 242, 1989c: 115.
Hypoaspis acme.—Domrow, 1987: 833; Strong & Halliday, 1994: 87; Halliday, 1998: 125, 2019: internet page.
Gaeolaelaps acme.—Moreira, 2014: 238.

Note. Originally described in Laelapidae, but excluded from the family by the presence of metasternal platelets bearing *st*4 and *iv*3.

***Hypoaspis alamedinus* Osipova, 1970**
Hypoaspis alamedinus Osipova, 1970: 71.

Note. Originally described in Laelapidae, but excluded from the family based on the presence of metasternal platelets bearing *st*4; the widend peritrematic plate next to the stigma and the truncate epigynal plate removed from the anal shield are also not typical of Laelapidae. The shape of the ventral shields, the broadened peritrematic plate next to the stigma, the apparently columnar basal section of the tritosternum and reduced number of dorsal shield setae suggest it could be an Eviphididae.

***Hypoaspis ambulans* (Thorell, 1873)**
Dermanyssus ambulans Thorell, 1873: 164.
Hypoaspis ambulans.—Trägårdh, 1904b: 33.
Haemogamasus ambulans.—Williams *et al*., 1978: 238; Herrin & Sage, 2012: 58.

Note. Presently in *Haemogamasus*, Haemogamasinae (Williams *et al*., 1978: 238; Herrin & Sage, 2012: 58).

***Hypoaspis bandicoota* Womersley, 1956**
Hypoaspis bandicoota Womersley, 1956a: 573.
Mesolaelaps bandicoota.—Domrow, 1958: 359.

Note. Presently in *Mesolaelaps*, Laelapinae (Domrow, 1958: 359).

***Hypoaspis coleoptratus* Berlese, 1888**
Hypoaspis coleoptratus Berlese, 1888: 198.
Laelaps (*Hypoaspis*) *coleoptratus*.—Berlese, 1903b: 14.
Ololaelaps coleoptrata.—Berlese, 1904a: 261.
Ologamasellus coleoptratus.—Castagnoli & Pegazzano, 1985: 79.
Hydrogamasellus coleoptratus.—Berlese, 1916b: 162; Castilho *et al*., 2016: 82; Beaulieu *et al*., 2019: 12.

Note. Presently in *Hydrogamasellus* Hirschmann, Ologamasidae (Berlese, 1916b: 162; Castilho *et al*., 2016: 82; Beaulieu *et al*., 2019: 12).

***Hypoaspis corniger* (Berlese, 1891)**
Epicrius corniger Berlese, 1891: 2.
Hypoaspis corniger.—Oudemans, 1903b: 87.
Lasioseius (*Lasioseius*) *corniger*.—Castagnoli & Pegazzano, 1985: 89.

Note. Presently in *Cheiroseius* Berlese, Blattisociidae, as a synonym of *C. viduus* (Koch) (Moraes *et al*., 2016: 155).

***Hypoaspis cossi* (Dugès, 1834)**
Gamasus cossi Dugès, 1834: 25.
Hypoaspis cossi.—Oudemans, 1902d: 19; 1903a: 130.
Proctolaelaps cossi.—Moraes *et al*., 2016: 208.

Note. Presently in *Proctolaelaps* Berlese, Melicharidae (Moraes *et al*., 2016: 208).

***Hypoaspis glaber* (Berlese, 1886)**
Epicrius glaber Berlese, 1886a: 9.
Hypoaspis glabra.—Oudemans, 1903b: 87; 1904a: 86.
Lasioseius (*Lasioseius*) *glaber*.—Castagnoli & Pegazzano, 1985: 163.
Cheiroseius glaber.—Moraes *et al*., 2016: 143.

Note. Presently in *Cheiroseius*, Blattisociidae (Moraes *et al*., 2016: 143).

***Hypoaspis holostaspoides* (Canestrini, 1884)**
Laelaps holostaspoides Canestrini, 1884: 700.
Hypoaspis holostaspoides.—Canestrini, 1885: 85; Oudemans, 1902d: 23.
Hypoaspis holaspidoides [sic].—Oudemans, 1903a: 129.
Laelaps (*Hypoaspis*) *holostaspoides*.—Berlese, 1903b: 14.
Oolaelaps holostaspoides.—Berlese, 1904a: 261.
Sessiluncus holostaspoides.—Bregetova, 1977a: 313; Castilho *et al*., 2016: 101; Beaulieu *et al*., 2019: 12.

Note. Presently in *Sessiluncus* G. Canestrini, Ologamasidae (Bregetova, 1977a: 313; Castilho *et al*., 2016: 101; Beaulieu *et al*., 2019: 12).

***Hypoaspis horridus* (Kramer, 1876)**
Gamasus horridus Kramer, 1876: 82.
Laelaps horridus G. & R. Canestrini, 1882a: 59.
Hypoaspis horridus.—Canestrini, 1885: 80; Kramer, 1886: 245.
Epicriopsis horridus.—Berlese, 1916a: 48; Mašán, 2017: 61.

Note. Presently in *Epicriopsis* Berlese, Ameroseiidae (Mašán, 2017: 61).

***Hypoaspis hypudaei* Oudemans, 1902**
Hypoaspis hypudaei Oudemans, 1902b: 10; 1902d: 21.
Hypoaspis hypudaei.—Oudemans, 1913: 6, 1914a: 130; Hull, 1918: 67.
Laelaps hypudaei.—Buitendijk, 1945: 296.

Note. Presently in *Proctolaelaps*, Melicharidae, as a synonym of *P*. *pygmaeus* (Müller) (Moraes *et al*., 2016: 223).

***Hypoaspis kirgisicus* Osipova, 1970**
Hypoaspis kirgisicus Osipova, 1970: 70.

Note. Originally described in Laelapidae; the brief description of the species does not allow its conclusive identification to family. The truncate epigynal shield and the apparent presence of metasternal platelets bearing *st*4 do not support its placement in Laelapidae. The shape of the ventral shields and of the chelicera suggest it could be a Melicharidae.

***Hypoaspis laelaptoides* (Berlese, 1887)**
Epicrius laelaptoides Berlese, 1887b: 10.
Hypoaspis laelaptoides.—Oudemans, 1903b: 87; 1904a: 86.
Lasioseius (*Lasioseius*) *laelaptoides*.—Castagnoli & Pegazzano, 1985: 210.
Cheiroseius laelaptoides.—Moraes *et al*., 2016: 146.

Note. Presently in *Cheiroseius*, Blattisociidae (Moraes *et al*., 2016: 146).

***Hypoaspis longipes* (Halbert, 1915)**
Laelaps (*Hypoaspis*) *longipes* Halbert, 1915: 72.
Hypoapsis longipes.—Hull, 1918: 67.

Note. Evans & Till (1966: 362) considered the taxonomic position of this species as uncertain, and suggested it may

be a synonym of *Haemogamasus horridus* Michael. According to Luxton (1998: 19) it should indeed be included in Haemogamasinae.

***Hypoaspis luteus* (Oudemans, 1917)**
Hypochthonius luteus Oudemans, 1917: 343.
Hypoaspis luteus.—LifeWatch, 2020.
Hypochthonius luteus.—Bayartogtokh & Akrami, 2000: 134; Subias, 2020: 31.

Note. This is an Oribatida species; the entry in LifeWatch should be *Hypochthonius luteus* Oudemans, 1917: 343 (Oribatida).

***Hypoaspis magnisetae* Ma, 1988**
Hypoaspis magnisetae Ma, 1988: 147.
Hypoaspis magnisetae.—Ren & Guo, 2008: 329.
Hypoaspis (*Holostaspis*) *magnisetae*.—Deng *et al*., 1993: 172; Yan *et al*., 2008: 2230; Ren & Guo, 2009: 101.

Note. Probably belonging to Eviphididae (Babaeian *et al*., 2019: 330).

***Hypoaspis mexicanus* (Banks, 1904).**
Laelaps mexicanus Banks, 1904: 58.
Laelaps mexicanus Banks, 1905: 138 (objective synonymy).
Hypoaspis mexicanus.—Banks, 1915a: 86.
Lasioseius mexicanus.—Evans, 1958a: 224.

Note. An illustration of this species was published by Banks (1904: 58) and reproduced by Banks (1915b: 86) both supporting the proposal of Evans (1958a: 224) to transfer it to *Lasioseius*, in Blattisociidae. It was inadvertently omitted in Moraes *et al*. (2016).

***Hypoaspis mollis* (Kramer, 1876)**
Not *Gamasus mollis* Kramer, 1876: 82.
Hypoaspis mollis.—Oudemans, 1903b: 87; 1904a: 84.

Note. Both citations by Oudemans (1903b, 1904a) are considered misidentifications of *Epicriopsis horridus* (Kramer), Ameroseiidae (Mašán, 2017: 61).

***Hypoaspis necorniger* Oudemans, 1903**
Hypoaspis necorniger Oudemans, 1903b: 87.
Cheiroseius necorniger.—Moraes *et al*., 2016: 148.

Note. Presently in *Cheiroseius*, Blattisociidae (Moraes *et al*., 2016: 148).

***Hypoaspis nemorensis* (Koch, 1839)**
Gamasus nemorensis Koch, 1839: 18.
Hypoaspis nemorensis.—Canestrini, 1885: 82.
Veigaia nemorensis.—Oudemans, 1905: 6, Farrier, 1957: 18.

Note. Presently in *Veigaia* Oudemans, Veigaiidae (Oudemans, 1905: 6, Farrier, 1957: 18).

***Hypoaspis ometes* Oudemans, 1903**
Hypoaspis ometes Oudemans, 1903c: 100.
Cosmolaelaps ometes.—Buitendijk, 1945: 298.
Lasioseius ometes.—Moraes *et al*., 2016: 178.

Note. Presently in *Lasioseius* Berlese, Blattisociidae (Moraes *et al*., 2016: 178).

***Hypoaspis ovatus* Ma, Ning & Wei, 2003**
Hypoaspis ovatus Ma, Ning & Wei, 2003a: 256.

Note. Presently in *Proctolaelaps*, Melicharidae, as a synonym of *P. pygmaeus* (Müller) (Moraes *et al*., 2016: 223).

***Hypoaspis pavidus* (Koch, 1839)**
Zercon pavidus Koch, 1840c: 10.
Hypoaspis pavidus.—Oudemans, 1902d: 19; 1903a: 129; Berlese, 1904a: 276; Buitendijk, 1945: 296.
Kleemania pavida.—Mašán, 2017: 91.

Note. Presently in *Kleemania* Oudemans, Ameroseiidae (Mašán, 2017: 91).

***Hypoaspis pectinifer* (G. & R. Canestrini, 1881)**
Gamasus pectinifer G. & R. Canestrini, 1881: 1082.
Hypoaspis pectinifer.—Canestrini, 1885: 83.
Pachylaelaps pectinifer.—Berlese, 1892f: 73; Mašán & Halliday, 2014: 30.

Note. Presently in *Pchylaelaps* Berlese, Pachylaelapidae (Berlese, 1892f: 73; Mašán & Halliday, 2014: 30).

***Hypoaspis pyrobolus* (Koch, 1840)**
Iphis pyrobolus Koch, 1840c: 15.
Hypoaspis pyrobulus.—Oudemans, 1906: 99.

Note. Presently in Eviphididae, but of unknown generic placement, as it is known only from the original description (Berlese, 1903a: 242; Shoemake, 1970: 45).

***Hypoaspis scutalis* Banks, 1914**
Hypoaspis scutalis Banks, 1914: 161.
Lasioseius scutalis.—Moraes *et al*., 2016: 186.

Note. Presently in *Lasioseius* Berlese, Blattisociidae (Moraes *et al*., 2016: 186).

***Hypoaspsis semiscissus* (Berlese, 1892)**
Laelaps (*Iphis*) *semiscissus* Berlese, 1892c: 7.
Hypoaspis semiscissus.—Oudemans, 1902d: 24; 1903a: 129; Berlese, 1904a: 261.
Laelaps (*Eulaelaps*) *semiscissus*.—Berlese, 1903b: 13.

Lasioseius semiscissus.—Castagnoli & Pegazzano, 1985: 374.
Arctoseius semiscissus.—Moraes *et al*., 2016: 84.

Note. Presently in *Arctoseius* Thor, Ascidae (Moraes *et al*., 2016: 84).

***Hypoaspis subglabra* Oudemans, 1903**
Hypoaspis subglabra Oudemans, 1903b: 87.

Note. Presently in *Platyseius* Berlese, Blattisociidae, as a synonym of *Platyseius tendens* (Schrank) (Moraes *et al*., 2016: 196).

***Hypoaspis* (*Leptolaelaps*) Berlese, 1918**
Hypoaspis (*Leptolaelaps*) Berlese, 1918: 122.
Leptolaelaps.—Vitzthum, 1931c: 142; Vitzthum, 1942: 763; Evans, 1957c: 45.

Note. The genus *Leptolaelaps* was placed in the Macrochelidae by Karg (1978c: 361), and in the Leptolaelapidae by Karg (1983: 390, 1997a: 212). The validity of this family was questioned by Lindquist *et al*. (2009: 147), who referred to it, together with other related genera, as "Leptolaelapidae sensu Karg (1983, 1997a)", citing it in the same section as Pachylaelapidae (Lindquist *et al*., 2009: 214). In the revision of Pachylaelapidae by Mašán & Halliday (2014), *Leptolaelaps* was mentioned for *Leptolaelaps macquariensis* (Womersley, 1937) because that species was originally described as *Pachylaelaps macquariensis*. Mašán & Halliday (2014: 53) considered it to belong to Leptolaelapidae.

***Hypoaspis* (*Leptolaelaps*) *elegans* Berlese, 1918**
Hypoaspis (*Leptolaelaps*) *elegans* Berlese, 1918: 123.
Hypoaspis (*Leptolaelaps*) *elegans*.—Castagnoli & Pegazzano, 1985: 123.
Hypoaspis (*Haemolaelaps*) *elegans*.—Lombardini, 1936: 42.

Note. See note under *Hypoaspis* (*Leptolaelaps*).

***Laelaps calcariger* Berlese, 1902**
Laelaps calcariger Berlese, 1902: 699.
Laelaps (*Hoplolaelaps*) *calcariger*.—Berlese, 1903b: 14.
Pseudoparasitus calcariger.—Berlese, 1916a: 30.

Note. Described in Gamasidae. Designated as the type species of *Pachysphaerolaelaps* Mašán, 2007: 159, in Pachylaelapidae (Mašán, 2007: 159, Mašán & Halliday, 2014: 53).

***Laelaps* (*Hypoaspis*) *ahngeri* Karawajew, 1909**
Laelaps (*Hypoaspis*) *ahngeri* Karawajew, 1909: 235.

Note. The description and illustrations of this species show it is not correctly placed in the Laelapidae. It appears to belong in the Eviphididae, probably in the genus *Copriphis* (Peter Mašán, personal communication).

***Laelapsella* Womersley, 1955**
Laelapsella Womersley, 1955: 416.
Laelapsella.—Domrow, 1987: 824; Shaw, 2012: 40; Halliday, 2019: internet page; Nemati *et al*., 2021: 170.

Note. Described in Laelapidae-Hypoaspidinae. Tipton (1960: 253) considered that it does not belong to Laelapinae. Nothing has been reported about the feeding habits of the sole species of this genus. Its morphological similarity with species of genera consisting of vertebrate parasites and its association with bird burrow (*Puffinus tenuirostris*; Animalia: Procellariiformes: Procellariidae) suggest that it might also be a vertebrate parasite. Hence, it was not included in the main species list of this catalogue.

***Laelapsella humi* Womersley, 1955**
Laelapsella humi Womersley, 1955: 417.
Hypoaspis (*Laelaspis*) *humi*.—Karg, 1979: 99, 1982: 248.
Laelapsella humi.—Domrow, 1977: 187, 1987: 841; Halliday, 1998: 127; 2019: internet page.

***Laelaptoseius* Womersley, 1960**
Laelaptoseius Womersley, 1960a: 31 (type species: *Laelaptoseius novaezelandiae* Womersley, 1960: 31, by monotypy).
Laelaptoseius.—Lindquist & Evans, 1965a: 54.

Note. This genus was described for a single species and remains monotypic (see below). It was originally placed it in the Ascidae (= Aceosejidae), but Lindquist & Evans (1965: 54) added information from the male and nymphs and transferred the genus to the hypoaspidine Laelapidae. Besides having strongly hypertrophied, reticulate peritrematal shield and a truncate epigynal shield, the presence of metasternal platelets bearing *st*4 and *iv*3 exclude this genus from Laelapidae. It seems to have affinities with Leptolaelapidae.

***Laelaptoseius novaezelandiae* Womersley, 1960**
Laelaptoseius novaezelandiae Womersley, 1960a: 31.

Note. See note for *Laelaptoseius*.

***Laelaspis levis* (Oudemans & Voigts, 1904)**
Seiulus levis Oudemans & Voigts, in Voigts & Oudemans, 1904: 655.
Laelaspis laevis [sic].—Buitendijk, 1945: 297.
Neojordensia levis.—Moraes *et al*., 2016: 122.

Note. Presently in *Neojordensia* Evans, Ascidae (Moraes *et al*., 2016: 122).

***Ligialaelaps* Radford, 1942**
Ligialaelaps Radford, 1942b: 298 (type species: *Eulaelaps ewingi* Pearse, 1930: 6, by original designation).

Note. Junior synonym of *Thinoseius* Halbert, 1920, which was placed in the Laelapidae by Vitzthum (1931c: 143) and in the Eviphididae by Bregetova (1977c: 564) and Mašán & Halliday (2010: 82).

***Ligialaelaps ewingi* (Pearse, 1930)**
Eulaelaps ewingi Pearse, 1930: 6.
Ligialaelaps ewingi.—Radford, 1942b: 299.

Note. See note about *Ligialaelaps*.

***Myrmoleichus* Berlese, 1903**
Myrmoleichus Berlese, 1903a: 244 (type species: *Myrmoleichus coronatus* Berlese, 1903, by monotypy).
Myrmoleichus.—Berlese, 1904c: 434, 1913b: 10; Vitzthum, 1931c: 143, 1942: 764; Radford, 1950b: 23; Baker & Wharton, 1952: 94.

Note. This genus was not assigned to a family in the original description, but was included in Laelapidae-Laelaptini [sic] by Berlese (1913b: 10) and Laelapidae-Hypoaspidinae by Vitzthum (1942: 764). The holotype of the type species of this genus (the only known specimen) is damaged, but it appears to be a species of Macronyssidae (Peter Mašán, personal communication).

***Myrmoleichus coronatus* Berlese, 1903**
Myrmoleichus coronatus Berlese, 1903a: 244.
Myrmoleichus coronatus.—Berlese, 1904c: 435; Lombardini, 1936: 45; Radford, 1950b: 23; Castagnoli & Pegazzano, 1985: 91; Bernini *et al*., 1995: 29.

***Myrmozercon reidi* Gunther, 1951**
Myrmozercon reidi Gunther, 1951: 155.

Note. Junior synonym of *Varroa jacobsoni* Oudemans (Delfinado & Baker, 1974: 6), Varroidae (Delfinado, 1963: 113; Lindquist *et al*., 2009: 154).

***Paradoxiphis* Berlese, 1910**
Paradoxiphis Berlese, 1910a: 255 (type species: *Paradoxiphis tenuibrachiatus* Berlese, 1910, by monotypy).
Paradoxiphis.—Vitzthum, 1942: 763.
Schizolaelaps Womersley, 1956a: 567 [junior synonymy by Costa & Allsopp, 1979: 826; type species: *Schizolaelaps bolboceras* Womersley, 1956 and *Schizolaelaps armstrongi* Womersley, 1956 designated as "genotypes"].

Note. *Paradoxiphis* was not assigned to a family in the original description, and included in Laelapidae-Hypoaspidinae by Vitzthum (1942: 763); *Schizolaelaps* was originally described in Laelapidae. Costa & Allsop (1979) described nine species in this genus, without referring to the family to which they belonged. *Paradoxiphis* was placed in Leptolaelapidae by Karg (1997a: 211).

***Paradoxiphis armstrongi* (Womersley, 1956)**
Schizolaelaps armstrongi Womersley, 1956a: 569.
Paradoxiphis armstrongi.—Costa & Allsopp, 1979: 847.

Note. Originally described in Laelapidae. It was not cited by Karg (1997a) among the species of this genus, when he transferred the genus to Leptolaelapidae.

***Paradoxiphis bolboceras* (Womersley, 1956)**
Schizolaelaps bolboceras Womersley, 1956a: 568.
Paradoxiphis bolboceras.—Costa & Allsopp, 1979: 841.

Note. Originally described in Laelapidae and transferred to Leptolaelapidae by Karg (1997a: 214).

***Pelethiphis* Berlese, 1911**
Copriphis (*Pelethiphis*) Berlese, 1911a: 185 (type species: *Copriphis* (*Pelethiphis*) *insignis* Berlese, 1911, by original designation).
Pelethiphis.—Berlese, 1913b: 11; Mašán & Halliday, 2010: 68.

Note. *Copriphis* (*Pelethiphis*) was not assigned to a family in the original description. *Pelethiphis* was included in Laelapidae-Eviphidini by Berlese (1913b: 11) and is presently placed in Eviphididae (Mašán & Halliday, 2010: 68).

***Pelethiphis insignis* (Berlese, 1911)**
Copriphis (*Pelethiphis*) *insignis* Berlese, 1911a: 185.
Pelethiphis insignis.—Mašán & Halliday, 2010: 70.

Note. See note under *Pelethiphis*.

Podocinini Berlese, 1916
Podocinini Berlese, 1916a: 33.

Note. This tribe was created in Laelapidae to include seven genera presently included in other families: Ameroseiidae (*Ameroseius* Berlese and *Epicriopsis* Berlese), Ascidae (*Iphidozercon* Berlese), Asternoseiidae (*Asternoseius* Berlese), Phytoseiidae (*Amblyseius* Berlese and *Iphiseius* Berlese) and Podocinidae (*Podocinum* Berlese).

***Pseudolaelaps* Berlese, 1916**
Laelaps (*Hoplolaelaps*) Berlese, 1910a: 259 (type species: *Laelaps* (*Hoplolaelaps*) *doderoi* Berlese, 1910a: 259, by original designation).
Pseudolaelaps Berlese, 1916a: 30 [replacement name given the existence of *Laelaps* (*Hoplolaelaps*) Berlese, 1903b: 14].
Pseudolaelaps.—Vitzthum, 1931c: 143; Bregetova, 1977b: 553.

Note. Presently in Pseudolaelapidae (Mašán, 2014: 283; Mašán & Halliday, 2014: 53).

***Pseudolaelaps doderoi* (Berlese, 1910)**
Laelaps (*Hoplolaelaps*) *doderoi* Berlese, 1910a: 259.
Pseudolaelaps doderoi.—Berlese, 1916a: 30.

Note. Automatically placed in Laelapidae, given its original description in *Laelaps*. Presently in *Pseudolaelaps* Berlese, 1916a, Pseudolaelapidae (see note under *Pseudolaelaps*).

***Pseudolaelaps paulseni* (Berlese, 1910)**
Laelaps (*Hoplolaelaps*) *paulseni* Berlese, 1910a: 259.
Pseudolaelaps paulseni.—Berlese, 1916a: 30.

Note. Automatically placed in Laelapidae, given its original description in *Laelaps*. Presently in *Pseudolaelaps* Berlese, 1916a, Pseudolaelapidae (see note under *Pseudolaelaps*).

***Scamaphis equestris* (Berlese, 1911)**
Copriphis (*Pelethiphis*) *equestris* Berlese, 1911: 186.
Copriphis (*Pelethiphis*) *equestris*.—Castagnoli & Pegazzano, 1985: 130.
Hypoaspis evansi Arutunjan, 1993: 115 (synonymy by Mašán & Halliday, 2010: 76).

Note. The name *Hypoaspis evansi* Arutunjan is a junior primary homonym of *Hypoaspis evansi* Hunter, 1964 (currently *Stevacarus evansi*). Mašán & Halliday (2010: 76) transferred *Hypoaspis evansi* Arutunjan to Eviphididae, as a synonym of *Scamaphis equestris* (Berlese, 1911), so the name does not need to be replaced (ICZN, Article 60.2).

***Scarabaspis* Womersley, 1956**
Scarabaspis Womersley, 1956a: 590 (type species: *Scarabaspis aspera* Womersley, 1956, by monotypy).

Note. Originally described in Laelaptidae, Hypoaspidinae and presently in Eviphididae (Mašán & Halliday, 2010: 79).

***Scarabaspis aspera* Womersley, 1956**
Scarabaspis aspera Womersley, 1956a: 590.

Note. See note about *Scarabaspis*.

***Sphaerolaelaps* Berlese, 1903**
Spherolaelaps Berlese, 1903a: 243 (type species: *Laelaps holothyroides* Leonardi, by original designation).

Note. For the interest of stability, Mašán & Halliday (2014: 26) retained the name of the genus as *Sphaerolaelaps*. This genus was described in Laelapidae but it is presently placed in Pachylaelapidae (Mašán & Halliday, 2014: 26).

***Sphaerolaelaps holothyroides* (Leonardi, 1897)**
Laelaps holothyroides Leonardi, 1897: 863.
Spherolaelaps holotyroides[sic].—Berlese, 1903a: 244.

Note. Automatically placed in Laelapidae when designated as type species of *Sphaerolaelaps* Berlese, a genus originally placed in Laelapidae (Berlese, 1903a: 244), transferred to Gamasidae by Berlese (1904c: 304), and presently in Pachylaelapidae (Mašán & Halliday, 2014: 26).

***Stevacarus* Hunter, 1970**
Stevacarus Hunter, 1970: 52 (type species: *Stevacarus claggi* Hunter, 1970: 52, by monotypy).

Note. Originally described in Laelapidae and presently in Leptolaelapidae (Karg, 1997a: 215). See note on Leptolaelapidae under *Cerambylaelaps*.

***Stevacarus claggi* Hunter, 1970**
Stevacarus claggi Hunter, 1970: 52.

Note. Originally described in Laelapidae and presently in Leptolaelapidae (Karg, 1997a: 216). See note on Leptolaelapidae under *Cerambylaelaps*.

***Stevacarus evansi* (Hunter, 1964)**
Hypoaspis evansi Hunter, 1964b: 638.
Stevacarus evansi.—Hunter, 1970: 23; Karg, 1997a: 212.
Hypoaspis evansi.—Spain & Luxton, 1971: 186; Pugh, 1993: 333.

Note. The genus *Stevacarus* is presently in Leptolaelapidae (Karg, 1997a: 212). See note on Leptolaelapidae under *Cerambylaelaps*.

***Termitacarus* Kurosa, 1994**
Termitacarus Kurosa, 1994: 207.
Nipponophorus Kurosa, 2001: 123 [replacement name given the existence of *Termitacarus* Trägårdh, 1924 (Laelapidae)].

Note. *Termitacarus* Kurosa was described in Pygmephoridae, where it remains.
Termitacarus Trägårdh is a junior synonym of *Urozercon*, according to Silvestri (1917: 299, 1918: 15), Vitzthum (1931c: 143, 1942: 764), Radford (1950b: 23) and Farrier & Hennessey (1993: 88).

***Termitacarus ishiharai* Kurosa, 1994**
Termitacarus ishiharai Kurosa, 1994: 209.
Nipponophorus ishiharai Kurosa, 2001: 123.
Urozercon ishiharai.—Freire, 2007: 228 (unjustified combination for overlooking the homonymy between *Termitacarus* Trägårdh and *Termitacarus* Kurosa).

Note. See note under *Termitacarus*.

***Uroiphis* Berlese, 1903**
Uroiphis Berlese, 1903a: 245 (type species: *Uroiphis scabratus*, by original designation).
Uroiphis.—Berlese, 1913b: 11; Mašán & Halliday, 2010: 84.

Note. This genus was described in Laelapidae, included in Laelapidae-Eviphidini by Berlese (1913b: 11) and presently placed in Eviphididae (Mašán & Halliday, 2010: 84).

***Uroiphis scabratus* Berlese, 1903**
Uroiphis scabratus Berlese, 1903a: 245.
Uroiphis scabratus.—Mašán & Halliday, 2010: 91.

Note. See note under *Uroiphis*.

***Uroiphis striatus* Berlese, 1903**
Uroiphis striatus Berlese, 1903a: 245.
Crassicheles striatus.—Mašán & Halliday, 2010: 47.

Note. This species was described in Laelapidae, then placed as *U. striatus* in Laelapidae-Eviphidini by Berlese (1913b: 11) and it is presently placed as *C. striatus* in Eviphididae (Mašán & Halliday, 2010: 47).

***Varroa* Oudemans, 1904**
Varroa Oudemans, 1904b: 161 (type species: *Varroa jacobsoni* Oudemans, 1904b: 161, by monotypy).
Varroa.—OConnor & Klimov, 2012a: internet page; Klimov *et al*., 2016: internet page. (Laelapidae).

Note. Originally described in Laelaptinae and presently in Varroidae (Lindquist *et al*., 2009: 155).

***Varroa jacobsoni* Oudemans, 1904**
Varroa jacobsoni Oudemans, 1904b: 161.

Note. Originally described in Laelaptinae and presently in Varroidae (Lindquist *et al*., 2009: 155).

***Zontia* Turk, 1948**
Zontia Turk, 1948: 115 (type species: *Zontia meliponensis* Turk, 1948, by monotypy).
Zontia.—Radford, 1950b: 23; Farrier & Hennessey, 1993: 88; OConnor & Klimov, 2012a: internet page.

Note. This genus was described in Laelaptidae. However, it is removed from this family because it has charateristics highly unusual for Laelapidae, especially a discrete ventral shield and strange posterior elongations of the sternal shield, which appear more complex than the simple fusion of this shield with endopodal plates.

***Zontia meliponensis* Turk, 1948**
Zontia meliponensis Turk, 1948: 116.
Zontia meliponensis.—Radford, 1950b: 23; Delfinado-Baker & Baker, 1988: 135; Farrier & Hennessey, 1993: 88.

Note. See note under *Zontia*.

Nomina nuda

We list here species that have been assigned to one of the genera contained in the catalogue, whose names are not available under the *International Code of Zoological Nomenclature* and which have not been resolved in the listings above. The reason for non-compliance with the *Code* is explained for each species. The heading for each species refers to the first form of the name as found in the literature. Other combinations and later usages of the name are also provided. Many other species of Laelapidae (not included in this publication) have been described and named in unpublished theses, but their names are *nomina nuda* because these do not satisfy the criteria for publication in Article 8.1 of the ICZN.

***Androlaelaps* (*Haemolaelaps*) *bakeri* Mabrouk, 1988**
Androlaelaps (*Haemolaelaps*) *bakeri* Mabrouk, 1988: 72.
Androlaelaps bakeri.—Basha & Yousef, 2001: 396.

Note. Mabrouk (1988) does not make the name *Androlaelaps bakeri* available because the PhD thesis fails the criteria for publication (ICZN Article 8.1.3). Basha & Yousef (2001) does not make the name available either because they did not designate type specimens (ICZN Article 72.3).

***Androlaelaps sharkiensis* Ahmed, 1987**
Androlaelaps sharkiensis Ahmed, 1987: page unknown.
Androlaelaps sharkiensis.—Basha & Yousef, 2001: 395.

Note. *Androlaelaps sharkiensis* Ahmed, 1987 is a *nomen nudum*, because the species was described in an unpublished thesis (ICZN Article 8.1.3).

***Coleolaelaps modestus* Berlese**
Coleolaelaps modestus Berlese.—Castagnoli & Pegazzano, 1985: 259.

Note. Castagnoli & Pegazzano (1985: 259) referred to this species as "species in pectore", meaning that it was not described (ICZN Article 13.1).

***Coleolaelaps pinguis* Berlese, 1920**
Coleolaelaps pinguis Berlese, 1920: 155.
Coleolaelaps pinguis Berlese.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 324.

Note. Berlese (1920) mentioned this name but did not describe the species. Castagnoli & Pegazzano (1985: 324) mentioned the presence of the types of this species in Berlese's collection, but referred to the species as "ubi descriptum?", suggesting that the description of this species might not exist (ICZN Article 13.1).

***Cosmolaelaps cuneiformis* Berlese**
Cosmolaelaps cuneiformes.—Lombardini, 1936: 39; Castagnoli & Pegazzano, 1985: 101.

Note. Castagnoli & Pegazzano (1985: 101) referred to this species as "species in pectore", meaning that it was not described (ICZN Article 13.1).

***Cosmolaelaps hastatus* Wang & Liao, 2000**
Cosmolaelaps hastatus Wang & Liao, 2000: 28.
Hypoaspis (*Cosmolaelaps*) *hastatus*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 557; Bai *et al*., 2016: 9.

Note. This species was described in 2000 but the description did not state where the type specimens were deposited (ICZN Article 16.4.2).

***Cosmolaelaps obtusisetosus* Wang & Liao, 2000**
Cosmolaelaps obtusisetosus Wang & Liao, 2000: 28.
Hypoaspis (*Cosmolaelaps*) *obtusisetosus*.—Yan *et al*., 2008: 2230; Bai & Ma, 2012: 558; Bai *et al*., 2016: 10.

Note. This species was described in 2000 but the description did not state where the type specimens were deposited (ICZN Article 16.4.2).

***Dinogamasus punensis* Andhale *et al*., 2020**
Dinogamasus punensis Andhale *et al*., 2020: 982.

Note. This species was described in 2020 in a journal published only electronically and not registered in ZooBank, not satisfying the requirements of validity (ICZN Article 8.5).

***Haemolaelaps asahinai* Asanuma**
Haemolaelaps asahinai.—Asanuma, 1952: 89.

Note. Asanuma (1952: 89) reported the name of this species followed by "(MS)", apparently indicating that this was an unpublished name. We have been unable to find a description of this species in the literature (ICZN Article 13.1).

***Hypoaspis edentatus* Berlese**
Hypoaspis edentatus Berlese.—Castagnoli & Pegazzano, 1985: 122.

Note. Castagnoli & Pegazzano (1985: 122) referred to this species as "species in pectore", meaning that it was not described (ICZN Article 13.1).

***Hypoaspis fujianensis* Wang & Liao, 2000**
Hypoaspis fujianensis Wang & Liao, 2000: 27.
Hypoaspis fujianensis.—Yan *et al*., 2008: 2230.

Note. This species was described in 2000 but the description did not state where the type specimens were deposited (ICZN Article 16.4.2). Ma (2016: 95) considered this species to be the same as *Hypoaspis aculeiferoides* Tseng.

***Hypoaspis gratus* Sklyar, 2004**
Hypoaspis gratus Sklyar, 2004: 101.

Note. Sklyar (2004) referred to *Hypoaspis gratus* Sklyar sp.n. without presenting a description or referring to the type specimens. We were unable to find the description of this species.

***Hypoaspis heselhausoides* Seo**
Hypoaspis heselhausoides Seo.—KSSZ, 1997: 150; Keum *et al*., 2016: 478.

Note. We were unable to find the description of this species.

***Hypoaspis heyi* var. *latvicus* Lapinya, 1976**
Hypoaspis heyi var. *latvicus* Lapinya, 1976: 46.

Note. The name *latvicus* Lapinya, 1976 is not available, because a new name published after 1960 expressly as the name of a "variety" or "form" is deemed to be infrasubspecific, and is not available for nomenclatural purposes (ICZN, Article 15.2).

***Hypoaspis*? *johnstoni* Oudemans, 1936**
Hypoaspis? *johnstoni* Oudemans, 1936: 209.
Gamasus testudinarius.—Dugès, 1834: 27; Johnston, 1849: 302.
Hypoaspis johnstoni.—Turk, 1953: 11.

Note. Johnston (1849) provided detailed information about the morphology of *Gamasus testudinarius*, and referred to its description by Dugès (1834). In turn, Dugès (1834: 27) referred to *Acarus testudinarius* Hermann, 1804. Johnston's specimens were described as having an elongate triangular sternal shield, widest posteriorly, which could refer to the epigynal shield of an adult female parasitid. Mégnin (1876: 289) suggested that *Acarus coleoptratorum*

Linnaeus, 1758 is the nymph, *Acarus crassipes* Linnaeus, 1758 is the male, and *G. testudinarius* Hermann, 1804 is the female, of a single species of Parasitidae. Oudemans (1936: 209) thought Johnston had described the sternal shield of *G. testudinarius* incorrectly, and it was actually widest anteriorly—that would make it more likely a deutonymph of some unknown species, possibly a laelapid. Oudemans (1936) appears to show that *Gamasus testudinarius* sensu Johnston was a misidentification of *Gamasus testudinarius* Latreille, 1806, so he established the new name *Hypoaspis*? *johnstoni* nom. nov. for Johnston's specimens. However, Latreille did not describe *testudinarius* as new, but referred to *testudinarius* Hermann, 1804 (now a junior synonym of the parasitid *Pergamasus crassipes* L.). We conclude that *Hypoaspis*? *johnstoni* Oudemans probably refers to some unknown species of Parasitidae. If this interpretation is correct, the specific name *johnstoni* Oudemans is a *nomen nudum*, because a replacement name can only be established for an existing available name, not for specimens that had been previously misidentified. The confused descriptions of Johnston's specimens make it impossible to place his species in a genus or family with any confidence.

***Hypoaspis kimunwani* Che & Seo**
Hypoaspis kimunwani Che & Seo—KSSZ, 1997: 150; Keum *et al*., 2016: 478.

Note. We were unable to find the description of this species.

***Hypoaspis lucidus* Sklyar, 2004**
Hypoaspis lucidus Sklyar, 2004: 101.

Note. Sklyar (2004) referred to *Hypoaspis lucidus* Sklyar sp.n. without presenting a description or referring to the type specimens. We were unable to find the description of this species.

***Hypoaspis ovalis* C.L. Koch, 1836**
Hypoaspis ovalis C.L. Koch, 1836.—Coulson & Refseth, 2004: 89.

Note. This name was apparently used by mistake, and we have been unable to find the original description of this species (ICZN Article 13.1). Coulson & Refseth (2004: 89) referred to three reports of this species in Svalbard, Norway. The first (Holm, 1937) actually concerned only spiders; the second (Summerhayes & Elton, 1923: 222) reported *Hypoaspis ovalis* Koch (probably referring to *Gamasus ovalis* L. Koch, 1878: 121); and the third (Thor, 1930: 114) referred to the occurrence of *Eulaelaps ambulans* (Thorell, 1873), which, along with Trägårdh (1904b: 33), he considered a senior synonym of *Gamasus ovalis* L. Koch, 1878, which had been transferred to *Hypoaspis* by Trägårdh (1904b: 33). *Eulaelaps ambulans* is presently placed in *Haemogamasus* Berlese, Haemogamasinae (Williams *et al*., 1978: 263).

***Hypoaspis spinifer* Canestrini**
Hypoaspis spinifer Canestrini.—Castagnoli & Pegazzano, 1985: 390.

Note. Castagnoli & Pegazzano (1985: 390) referred to a specimen of this species present in Berlese's collection, but did not refer to a description. We have been unable to find a description of this species (ICZN Article 13.1).

***Hypoaspis takiensis* Bhatthacharyya, 1966**
Hypoaspis takiensis Bhatthacharyya, 1966.—Ghosh & Mandal, 1997: 4.

Note. Ghosh & Mandal (1997) mentioned *H. takiensis* as one of the most abundant mesostigmatid mite in a survey of soil mites conducted in Darjeeling, India. The name of the species has been mentioned several times in that publication. However, we have been unable to find a description of this species (ICZN Article 13.1).

***Hypoaspis tropicus* Oudemans, 1924**
Hypoaspis tropicus Oudemans, 1924.—Buitendijk, 1945: 297.

Note. According to Buitendijk (1945: 297), this species was collected at Bogor, Indonesia (cited as Buitenzorg, Oost Indië) on *Bromelia* received from "Columbia" (probably Colombia). A specimen that could be the holotype of this species is deposited at Naturalis Biodiversity Centre, Leiden, The Netherlands (number RMNH.ACA.P.3475, according to Naturalis, 2020). This name is not included in the list of publications and new taxa described by Oudemans (van Eyndhoven, 1944). We have been unable to locate a description of this species in the literature (ICZN Article 13.1).

***Hypoaspis* (*Geolaelaps*) *aculeiferoformis* Sklyar, 2001**
Hypoaspis (*Geolaelaps*) *aculeiferoformis* Sklyar, 2001: 100.

Note. Sklyar (2001) referred to *Hypoaspis* (*Geolaelaps*) *aculeiferoformis* sp.n. without presenting a description or referring to the type specimens. We were unable to find the description of this species.

***Hypoaspis* (*Haemolaelaps*) *brevis* Berlese**
Hypoaspis (*Haemolaelaps*) *brevis*.—Castagnoli & Pegazzano, 1985: 52.
Haemolaelaps brevis.—Castagnoli & Pegazzano, 1985: 52.
Laelaps (*Haemolaelaps*) *brevis*.—Castagnoli & Pegazzano, 1985: 52.

Note. Castagnoli & Pegazzano (1985: 52) referred to this species as "species in pectore", meaning that it was not described (ICZN Article 13.1).

***Hypoaspis* (*Haemolaelaps*) *opacus* Berlese**
Hypoaspis (*Haemolaelaps*) *opacus*.—Castagnoli & Pegazzano, 1985: 286.

Note. Castagnoli & Pegazzano (1985: 286) referred to this species as "species in pectore", meaning that it was not described (ICZN Article 13.1).

***Laelaspis georgiae* Hunter, 1960**
Laelaspis georgiae Hunter, 1960: 698.

Note. This name was given in a note about a laboratory technique for a species initially thought to be new and later identified by Hunter (1961: 676) as *Laelaspis vitzthumi* (Womersley). We were unable to find a description of this species in the literature (ICZN Article 13.1).

***Ololaelaps pergibbus* Berlese**
Ololaelaps pergibbus.—Castagnoli & Pegazzano, 1985: 316.
Ololaelaps? *pergibbus*.—Castagnoli & Pegazzano, 1985: 316.

Note. As reported by Beaulieu *et al*. (2019: 12), Castagnoli & Pegazzano (1985: 286) referred to this species as "species in pectore", meaning that it was not described (ICZN Article 13.1).

Discussion

Basic statistics

This catalogue includes a total of 1088 species (in addition to three subspecies) from 73 recognised genera of primarily free-living and arthropod-associated laelapids. Many of the descriptions of genera and species published before *ca*. 1960 were brief and accompanied by rather generalised illustrations or none (especially around 1900), which makes it very hard to place species in their appropriate genera or to detect affinities between genera. We have tried to place these inadequately described species into presently accepted genera as much as possible. Despite that effort, 121 species, one subspecies, ten genera and one subgenus are still included as *incertae sedis*. About 70% of these species were described in *Hypoaspis* or *Laelaps* (*Hypoaspis*), a genus/subgenus in which most of the non-parasitic laelapids have been traditionally placed by many authors, and sometimes referred to as "*Hypoaspis sensu lato*". About 70 years ago, Turk & Turk (1952) had pointed out the heterogeneity of the species attributed to *Hypoaspis*. A major problem that we face is the lack of detail in old descriptions, compounded by the difficulty in finding the type specimens for conducting complementary studies, which together hamper reliable re-evaluation of generic placement of those species.

Fortunately, many of the more recent publications have been very detailed, providing much more information than found in older literature, including on the gnathosoma and legs. Nevertheless, even with modern descriptions, opinions about generic boundaries may differ (*e.g*. Joharchi *et al*., 2016a and Nemati & Gwiazdowicz, 2016b). This may be due to several factors, including existing concepts being based on poorly known type species, description methods still improving, with some morphological attributes (*e.g*. pore-like structures, internal malae) yet to be scrutinised and compared between broader ranges of taxa, and not least because of rampant homoplasies, which obscure true relationships. This high level of homoplasy includes features that are otherwise extremely useful in distinguishing species and some genera, such as the size of the epigynal shield. For instance, species within some genera show strong divergence in the size and shape of epigynal shields, of the dorsal shields and dorsal chaetotaxy (*e.g*. *Jacobsonia*, *Myrmozercon*, *Scissuralaelaps*), as well as of other shields of the opisthogaster (*e.g*. metapodal plates in *Eumellitiphis*, *Ulyxes*). It is however possible that for given characters, similarity between some (but not all) species within current genera reflects the existence of species groups, or other times (more distant) relationships between genera. Morphological variations within genera appear to be significant, and these also include leg chaetotaxy, the shape of the anal shield, setation on idiosomal unsclerotised cuticle, and gnathosomal characters such as cheliceral dentition, deutosternal denticles and the epistome. Such homoplasies and morphological divergences within genera may in part be the result of associations with arthropods, which may favour regression of characters (*e.g*. hypotrichy of legs or idiosoma) but also their augmentation (*e.g*. hypertrichy), and this may occur within taxa of primarily free-living species.

Of all the genera included in this catalogue, only about 15 have a high proportion of species collected from soil-litter (Table 3). Even so, some of these comprise many species associated with arthropods (*e.g*. *Gaeolaelaps*, *Gymnolaelaps*, *Laelaspis*). This prevalence in association with arthropods was also evident in the analysis of a subset of laelapid (mostly hypoaspidine) genera by Moreira & Moraes (2015). In some cases, it may be unclear if the habitat (*e.g*. soil) or the host (*e.g*. ants) represents the primary association of a given species because the host is living in soil or rotting wood, such as ants. As many as 25 genera are primarily associated with Hymenoptera, including ants (nine genera; four other genera occasionally associated with them), meloponine bees (eight genera), and other types of bees such as xylocopine bees (three), halictids (two), bumblebees (one) and honeybees (two). A total of 12 genera are primarily associated with scarab beetles or relatives (*e.g*. lucanids), four with cockroaches, three with termites. Less common insect hosts are moths (one genus) and orthopterans (two genera). Other arthropod hosts include crabs (two mite genera), spiders (one), scorpions (one), but more important, myriapods (eight genera). Finally, five genera are frequently associated with mammals or their nests, including at least three genera that are otherwise primarily found in soil-litter (*Gaeolaelaps*, *Ololaelaps*, *Stratiolaelaps*). A few species of other genera (*e.g*. *Cosmolaelaps*) were also collected from mammals (*e.g*. rodents), but represent a very minor portion of all congeneric species.

TABLE 3. Currently valid genera of free-living and arthropod-associated Laelapidae, the type species, number of valid species, main habitats or hosts and distribution, based on type habitats/hosts and type localities of constituent species, including junior synonyms. *Genera also containing one subspecies each; ** For Asia, we used the regions defined in https://en.wikipedia.org/wiki/Asia except for Western Asia, which we called Middle East. "Widespread" indicates that it was found in most main world regions, but not necessarily all.

Genus	Type species	Species	Main habitats / hosts	Distribution**
Acantholaelaps	*A. strategus* Joharchi *et al*., 2019	1	Dynastine scarabs	Caribbean
Alloparasitus	*Laelaps* (*Hypoaspis*) *oblongus* Halbert, 1915	7	Moss, soil-litter, under rotting tree bark	Caribbean, Central and South America, Europe
Androlaelaps	*Laelaps* (*Iphis*) *hermaphrodita* Berlese, 1887	217*	Small mammals or their nests, birds, litter	Widespread
Angosomaspis	*A. multisetosus* Costa, 1971	1	Dynastine scarabs	Africa
Apolaelaps	*A. mexicanus* Silvestri, 1911	1	Ant nests	North America
Berlesia	*B. rapax* Canestrini, 1884	4	Gryllacridid crickets	Oceania, Southeast Asia
Bisternalis	*B. rettenmeyeri* Hunter, 1963	6	Meliponine bee nests and wasp nests	North, Central and South America
Blaberolaelaps	*B. matthiesensis* Costa, 1980	2	Blaberid cockroaches	South America
Chapalaelaps	*Coleolaelaps granulatus* Hyatt, 1964	3	Scarabs, litter	South America
Chapalania	*C. cifuentesi* Hoffmann & López-Campos, 1995	2	Passalids, dynastine scarabs	North and South America
Coleolaelaps	*Laelaps* (*Iphis*) *agrestis* Berlese, 1887	33	Melolonthine scarabs	Widespread
Conolaelaps	*Laelaps coniferus* Canestrini, 1884	1	Unidentified insect (type specimen; presently also known from millipedes)	Oceania
Cosmolaelaps	*Laelaps claviger* Berlese, 1882	135	soil-litter, ant nests	Widespread
Cyclothorax	*C. carcinicola* von Frauenfeld, 1868	3	Hermit crabs	Oceania, Southeast Asia
Dicrocheles	*Myrmonyssus phalaenodectes* Treat, 1954	5	Noctuid moths	Africa, East Asia, Oceania
Dinogamasus	*D. crassipes* Kramer, 1898	44	Xylocopine bees	Africa; Middle East; East, South and Southeast Asia
Dynastaspis	*D. walhallae* Costa, 1971	2	Dynastine scarabs	Caribbean, North America
Dynatochela	*D. primus* Keegan, 1950	1	Melolonthine scarabs	North America
Dyscinetonyssus	*D. hystricosus* Moss & Funk, 1965	1	Dynastine scarabs	North America
Euandrolaelaps	*Laelaps* (*Androlaelaps*) *sardous* Berlese, 1911	6	Small mammals and their nests, ant nests, soil	Europe, North and East Asia
Eumellitiphis	*E. mellitus* Turk, 1948	3	Meliponine bee and their nests	Caribbean, Southeast Asia

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TABLE 3. (Continued)

Genus	Type species	Species	Main habitats / hosts	Distribution**
Gaeolaelaps	*Laelaps aculeifer* Canestrini, 1884	160	Soil-litter; occasionally beetles, cockroaches, ant nests, rodent nests	Widespread
Gecarcinolaelaps	*Laelaps cancer* Pearse, 1929	1	Crabs	North America
Gromphadorholaelaps	*G. schaeferi* Till, 1969	1	Blaberid cockroaches	North America
Gymnolaelaps	*Laelaps myrmecophilus* Berlese, 1892	30*	Ant nests, soil-litter	Widespread
Haemolaelaps	*Laelaps* (*Haemolaelaps*) *marsupialis* Berlese, 1910	6	Marsupials	Oceania
Holostaspis	*H. isotricha* Kolenati, 1858	10	Ants and their nests	Europe, East Asia, Middle East
Hunteria	*H. brasiliensis* Delfinado-Baker *et al*., 1984	1	Meliponine bee nests	South America
Hypoaceus	*Hypoaspis eugenitalis* Karg, 1978	2	Soil-litter	South America
Hypoaspis	*Gamasus krameri* G. & R. Canestrini, 1881	40	Dynastine and melolonthine scarabs	Widespread
Hypoaspisella	*Hypoaspis* (*Hypoaspisella*) *heyi* Karg, 1962	25	Soil-litter; occasionally rodents, ant nests	Widespread
Hyposternus	*H. ceylonicus* Joharchi & Halliday, 2021	1	Soil-litter	South Asia
Iphiolaelaps	*I. myriapoda* Womersley, 1956	1	Millipedes	Oceania
Iphiopsis	*Iphis mirabilis* Berlese, 1882	2	Millipedes, soil	Europe, North America
Jacobsonia	*Iphiopsis* (*Greeniella*) *submollis* Berlese, 1910	9	Centipedes, millipedes	Africa, East and Southeast Asia
Julolaelaps	*J. dispar* Berlese, 1916	22	Millipedes	Africa; Middle East; East, South and Southeast Asia
Katydiseius	*K. nadchatrami* Fain & Lukoschus, 1983	1	Tettigoniid crickets	Southeast Asia
Laelaspis	*Iphis astronomicus* Koch, 1839	48*	Ants and their nests, soil-litter	Widespread
Laelaspisella	*L. epigynialis* Marais & Loots, 1969	2	Soil	Africa
Laelaspoides	*L. ordwayae* Eickwort, 1966	1	Halictid bee nests	North America
Ljunghia	*L. selenocosmiae* Oudemans, 1932	16	Mygalomorph and liphistiid spiders	Africa, Europe, East and Southeast Asia, Middle East, Oceania
Lucanaspis	*L. brachypedes* Costa, 1971	1	Lucanid beetles	Africa
Meliponaspis	*M. debilipes* Vitzthum, 1930	1	Meliponine bees	Africa
Melittiphis	*Laelaps* (*Iphis*) *alvearius* Berlese, 1895	1	Honey bees	Europe (but now widespread)

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TABLE 3. (Continued)

Genus	Type species	Species	Main habitats / hosts	Distribution**
Melittiphisoides	*M. apiarium* Delfinado-Baker *et al*., 1984	1	Meliponine bee nest	South America
Mumulaelaps	*M. ammochostos* Clark, 2012	1	Dynastine scarabs	Oceania
Myrmozercon	*M. brevipes* Berlese, 1902	27	Ants and their nests	Widespread
Narceolaelaps	*N. annularis* Kethley, 1978	4	Millipedes	North America
Neoberlesia	*N. equitans* Berlese, 1892	1	Ants and their nests	Europe
Neohypoaspis	*N. ampliseta* Delfinado-Baker, Baker & Roubik, 1983	1	Meliponine bee nests	Central America (presently also known from South America)
Nidilaelaps	*Gymnolaelaps annectans* Womersley, 1955	3	Bird and mammal nests, litter	Oceania
Ololaelaps	*Laelaps* (*Hypoaspis*) *venetus* Berlese, 1903	25	Soil-litter; occasionally moss and rodents and their nests	Widespread
Oloopticus	*O. costalis* Karg, 1978	12	Soil-litter	Africa, Central and South America
Persicolaelaps	*P. hallidayi* Kazemi & Beaulieu, 2016	1	Rotten wood	Middle East
Pneumolaelaps	*Iphis bombicolens* Canestrini, 1885	25	Bumblebees and their nests	Widespread
Pogonolaelaps	*Laelaps canestrinii* Berlese, 1892	3	Nests of ants and termites, soil (also known from small mammal nests)	Europe, Middle East
Promacrolaelaps	*P. hunteri* Costa, 1971	2	Melolonthine scarabs	Middle East
Pseudoparasitus	*Laelaps meridionalis* G. & R. Canestrini, 1882	42	Soil-litter, moss	Widespread
Raymentia	*R. anomala* Womersley, 1956	3	Halictid bees	Oceania
Reticulolaelaps	*R. faini* Costa, 1968	6	Ant nests, soil-litter, tree bark	Europe, Middle East, South America
Scissuralaelaps	*S. novaguinea* Womersley, 1945	11	Millipedes, blaberid cockroaches	Africa, Oceania, Southeast Asia
Scolopendracarus	*S. brevipilis* Evans, 1955	1	Centipedes	Southeast Asia
Scorpionyssus	*S. heterometrus* Fain & Rack, 1988	1	Scorpions	South Asia
Spatholaelaps	*S. termitophilus* Silvestri, 1917	1	Termite nests	Africa
Sphaeroseius	*Laelaps ecitonis* Wasmann, 1900	4	Ants and their nests	South America
Stevelus	*S. amiculus* Hunter, 1963	1	Meliponine bee nest	South America
Stigmatolaelaps	*Hypoaspis greeni* Oudemans, 1903	3	Xylocopine bees	South and Southeast Asia
Stratiolaelaps	*Laelaps* (*Iphis*) *miles* Berlese, 1892	24	Rodents, soil-litter	Widespread

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TABLE 3. (Continued)

Genus	Type species	Species	Main habitats / hosts	Distribution**
Suracarus	*S. inusitatus* Flechtmann, 2005	1	Meliponine bee nest	South America
Tropilaelaps	*T. clareae* Delfinado & Baker, 1961	4	Honey (*Apis*) bees and their nests	South and Southeast Asia
Ulyxes	*Haemolaelaps ulysses* Domrow, 1961	11	Nests of birds and small mammals, especially marsupials	Oceania
Urozercon	*U. paradoxus* Berlese, 1901	8	Termites and their nests; occasionally apid bees	Africa, Caribbean, Oceania and South America
Xylocolaelaps	*X. burgetti* Royce & Krantz, 2003	1	Xylocopine bee nests	Southeast Asia

The three largest genera included here, namely *Androlaelaps*, *Cosmolaelaps* and *Gaeolaelaps*, include almost half of the total number of species (Table 3). *Coleolaelaps*, *Dinogamasus*, *Gymnolaelaps*, *Hypoaspis*, *Laelaspis* and *Pseudoparasitus* are also large genera, with 30–48 species each. However, 50 genera, more than two thirds of the total number of genera, contain only 1–6 species each, and 27 of these genera, more than a third of the genera, are represented by a single species. It should be noted that the largest genus included, *Androlaelaps*, will require revision (Shaw 2014a). The same could probably be said about the other two giant genera, *Cosmolaelaps* and *Gaeolaelaps*, and more efficiently with the support of molecular data.

Evans & Till (1966) concluded that "The present classification of the *Hypoaspis* complex is largely based on palaearctic forms and requires radical revision. It appears to be well represented in the nearctic, tropical and subtropical regions and we feel that a knowledge of the extra-palaearctic forms is an essential prerequisite to any attempt at a "generic" classification of the complex." It is instructive to re-assess the state of knowledge of the group since that crucially important publication. We now have extensive data from outside the Palaearctic region, and hundreds of new species have been described. Many new species were described in existing genera. In addition, 32 new genera have been described after 1965, with half of them being monotypic—*Acantholaelaps*, *Angosomaspis*, *Gecarcinolaelaps*, *Gromphadorholaelaps*, *Hunteria*, *Hyposternus*, *Katydiseius*, *Laelaspoides*, *Lucanaspis*, *Melittiphisoides*, *Mumulaelaps*, *Neohypoaspis*, *Persicolaelaps*, *Scorpionyssus*, *Suracarus* and *Xylocolaelaps*. That number is higher than the number of existing monotypic genera that were described before 1966 (11 genera, namely *Apolaelaps*, *Conolaelaps*, *Dynatochela*, *Dyscinetonyssus*, *Iphiolaelaps*, *Meliponaspis*, *Melittiphis*, *Neoberlesia*, *Scolopendracarus*, *Spatholaelaps* and *Stevelus*). Six other post-1965 genera have only two species each (*Blaberolaelaps*, *Chapalania*, *Dynastaspis*, *Hypoaceus*, *Laelaspisella* and *Promacrolaelaps*). Other genera described after 1965 have 3–12 species (*Chapalaelaps*, *Euandrolaelaps*, *Narceolaelaps*, *Nidilaelaps*, *Oloopticus*, *Pogonolaelaps*, *Reticulolaelaps*, *Stigmatolaelaps* and *Ulyxes*). *Gaeolaelaps* was the only genus officially described after 1965 that contains a very large number of species (160 species).

Although many generic names have been synonymised in the past, it would seem that currently, most monotypic or very small genera are actually morphologically unique and probably will remain valid in the future. Among those morphologically exceptional taxa, we could mention *Cyclothorax* on hermit crabs, *Berlesia* and *Katydiseius* on orthopterans and with very distinctive chelicerae (along with *Dicrocheles* on moths), *Scorpionyssus* on scorpions, *Dyscinetonyssus* on scarabs, and *Urozercon* on termites (and bees), although the latter already has eight species. Small and larger genera symbiotic on myriapods are diverse morphologically and each relatively distinct, although some trends exist in this ecological guild (*e.g.* minute idiosomal setae, short peritremes and other morphological reductions). The same may be true for the numerous genera associated with ants and bees, with some small genera being remarkable morphologically but still poorly studied (*e.g. Sphaeroseius*, *Suracarus*) and with obscure affinities. The monotypic *Gromphadorholaelaps* is not so distinct from mammal-associated *Androlaelaps*, but their larvae may differ, and overall are biologically distinct and intimately associated with their cockroach hosts (Gerdeman *et al*., 1998) and may therefore represent a distinct lineage from *Androlaelaps*, unless they arose from within *Androlaelaps*.

Despite recent research having shed more light on the concepts of many genera, the morphological boundaries of most of them remain uncertain. For instance, the genus *Myrmozercon* benefited from a dozen studies since 2009, including the redescription of the type species (Kontschán & Seeman 2015), but the surprising morphological diversity in the genus as currently defined is calling for an analysis of character states and of relationships within the genus and with apparently related genera. A long-recognised genus (or subgenus) like *Pseudoparasitus* also present difficulties, with its concept unsettled by newly included species (Kazemi, 2014). As Shaw (2014a, 2014b) did for *Haemolaelaps* and *Ulyxes*, the first one resurrected from synonymy with *Androlaelaps* and the second erected to genus level from a mere species group within *Androlaelaps* (or *Haemolaelaps*), careful scrutiny of characters within large genera could lead to the resolution of natural groups. Although the best practice may be to examine all species from a given genus, piecemeal definition of taxa is significant progress, but ideally without creating paraphyletic genera. Despite the broad phylogenetic analysis of Casanueva (1993), the taxonomic structure within Laelapidae, including the diverse iphiopsidines, is yet to be elucidated. Needless to say, a taxonomic position will need to be determined for each of the above-mentioned taxa of uncertain placement after their morphology is redescribed.

We proposed a total of 61 new combinations (*ca*. 43% under *Gaeolaelaps*), many of which are provisional and likely to be revised in future work. We proposed *Hypoaspis* (*Osmodermus*) as a new synonym of *Gaeolaelaps* and *Trichoaspis* as a new synonym of *Jacobsonia*. Nine cases of homonymy were detected, including six primary homonyms, one secondary homonym (in *Androlaelaps*, first requiring taxonomic assessment of the senior homonym before deciding about the need for a replacement name) and one objective homonym. The ninth case is a secondary homonym of a genus presently placed in a different family. Replacement names have not been proposed for the primary homonyms, because it would require a careful search for available synonyms, and also to allow the respective authors to have the chance to do so themselves.

Our study of the literature showed that 89 species previously associated with genera treated in this catalogue, as well as 30 genera, one subgenus, one tribe and one subfamily previously associated with Laelapidae, are now placed in 16 other families or, to a minor extent, in four laelapid genera not considered in this catalogue for being putatively parasitic on vertebrates. Such changes in taxonomic placement are in part due to the previously ambiguous and unstable definition of the family, which is still not fully resolved. An additional 26 specific names (one cited as a "variety") have been mentioned in the literature as belonging to taxa treated in this catalogue, but their names are unavailable (*nomina nuda*) for various reasons.

Caveats

We may have overlooked some species that should have been included in this catalogue, especially those whose descriptions are not detailed enough, or species collected in association with vertebrates and that may have been wrongly deemed parasitic. We may also have missed some species described in journals with more restricted circulations. We would be very grateful for information about species we overlooked, so they can be included in future versions of this catalogue.

Although a detailed revision of genera based on examination of specimens was not within the scope of this work, the revised generic diagnoses and the dichotomous key that we developed should help in their identification. Naturally, descriptions of new species, re-examination of already described species and generic revisions will require adaptations of the key. We hope this compiled taxonomic information, including the morphological review in the early section of this publication, will serve as a basis for future work. Given the remarkable taxonomic and ecological diversity of free-living and arthropod-associated Laelapidae, and their potential for pest control, efforts in systematics of these taxa are warranted. A better understanding of these taxa will also facilitate, and depend on, the study of their phylogenetic relationships with laelapid genera and related dermanyssoid families that are vertebrate parasites.

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