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Redefinition of *Cosmolaelaps* Berlese (Acari: Laelapidae) and description of five new species from Brazil

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Abstract

Cosmolaelaps Berlese, 1903 was originally described as a subgenus of *Laelaps* Koch. More recently, this group has been treated at the generic level or as a subgenus of *Hypoaspis* Canestrini, 1885. One of the objectives of the present paper is to provide a detailed characterisation of *Cosmolaelaps*, here considered at the generic level, a group that was poorly characterised in its original description as well as in subsequent publications. It is most closely related to *Stratiolaelaps* Berlese, from which it can usually be distinguished by the presence of extra paired and unpaired setae on the opisthonotal region of the dorsal shield, as well as by not having hypertrophied chelicerae or corniculi. A total of 108 species belong to *Cosmolaelaps*, including the new species described here. Five other species may also belong to this genus, but the available published information does not allow their conclusive placement. The Brazilian fauna of Hypoaspidinae is poorly known, but *Cosmolaelaps* seems to be well represented in Brazil. Thus, the second objective of this paper is to describe five new species of *Cosmolaelaps* from that country, namely *C. barbatus* **sp. nov.**, *C. busolii* **sp. nov.**, *C. confinisetarum* **sp. nov.**, *C. jaboticabalensis* **sp. nov.** and *C. oliveirai* **sp. nov.**

Key words: Taxonomy, Mesostigmata, *Stratiolaelaps*

Introduction

Cosmolaelaps was described by Berlese (1903) as a subgenus of *Laelaps* Koch, and was raised to generic level by Berlese (1920). More recently, *Cosmolaelaps* has been treated in the literature either as a genus or as a subgenus of *Hypoaspis* Canestrini, 1885 (e.g. Karg 1978, 1981, 1987, 1988, 1993a, 1994, 1997, 2003, 2006; Xu & Liang, 1996; Faraji & Halliday, 2009). In the most recent revision of Laelapidae, Casanueva (1993) raised most of the groups considered as subgenera of *Hypoaspis* by different authors to the generic level, including *Cosmolaelaps* and *Stratiolaelaps* Berlese, 1916, listing them in Hypoaspidinae. *Stratiolaelaps* was considered a junior synonym of *Cosmolaelaps* by Karg (1979, 1993a). This required an expanded concept of *Cosmolaelaps* to include species with a dorsal shield that gradually to sharply tapered posteriorly, with 15 pairs of setae on the opisthonotal region of the dorsal shield (no *px* or unpaired setae) and with hypertrophied corniculi and cheliceral digits. Walter & Campbell (2003) rejected the concept of Karg (1979, 1993a), considering *Cosmolaelaps* and *Stratiolaelaps* as separate genera. Karg & Schorlemmer (2013) also considered both of these taxa at the genus level, and that concept is followed here.

Comprehensive recent efforts to resolve the taxonomy of Laelapidae genera include revisions of *Gaeolaelaps* by Beaulieu (2009), *Hypoaspis* and *Coleolaelaps* by Joharchi & Halliday (2011), *Gymnolaelaps* and *Pseudoparasitus* by Joharchi *et al*. (2011), *Laelaspis* by Joharchi *et al*. (2012) and *Myrmozercon* by Joharchi & Moradi (2013). One of the objectives of the present paper is to do the same for *Cosmolaelaps*, a genus that has been poorly characterised in its original description as well as in subsequent publications.

The Brazilian fauna of Hypoaspidinae is poorly known, but the limited available information suggests that *Cosmolaelaps* is well represented in Brazil. Until recently, five *Cosmolaelaps* species were known from Brazil, all

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have the peritrematic shield fused with exopodal shield near coxa IV; however, *C. kassai* is the only other species of this genus reported to show this characteristic. The incomplete description of many *Cosmolaelaps* species makes it difficult to separate them in species groups, despite some attempts in this sense (e.g. Karg, 1993a; 2003).

The finding of five new species of *Cosmolaelaps* in a relatively restricted area of Brazil indicates a high diversity of this group in that country. Considering the economic important of species of this group as biological control agents (Afifi & Van der Geest, 1984, Al Rehiayani & Fouly, 2005), efforts for a better understanding of these mites in Brazil are justified.

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