



<http://dx.doi.org/10.11646/zootaxa.3734.5.2>

<http://zoobank.org/urn:lsid:zoobank.org:pub:75DB8E6B-670A-4B3B-95F7-27A9B2EBBDF2>

Mites of the superfamily Rhodacaroidea (Acari: Mesostigmata) from Colombia, with a key for the world species of *Desectophis* Karg (Ologamasidae)

DIANA RUEDA-RAMIREZ¹, RAPHAEL C. CASTILHO¹ & GILBERTO J. DE MORAES²

¹Departamento de Entomologia e Acarologia, ESALQ-Universidade de São Paulo, 13418-900 Piracicaba, São Paulo, Brazil.

E-mail: dianaru@gmail.com; rcastilho@outlook.com

²CNPq Researcher, Departamento de Entomologia e Acarologia, ESALQ-Universidade de São Paulo, 13418-900 Piracicaba, São Paulo, Brazil. E-mail: moraesg@usp.br

Abstract

Three species of Rhodacaroidea are reported from soil in Colombia. *Desectophis anthuriumsetis* n. sp. (Ologamasidae) and *Multidentorhodacarus colombianus* n. sp. (Rhodacaridae) are described from newly-collected material. *Multidentorhodacarus triramulus* (Karg, 1998) is redescribed from the holotype and adult females collected in this study. A key for the separation of females of the five recognisable world species of *Desectophis* Karg is provided.

Key words: Edaphic mite, Ologamasidae, Rhodacaridae, taxonomy

Introduction

The Rhodacaroidea (Mesostigmata) is a widespread group of mites that occur in the soil and in accumulations of decaying organic matter. This superfamily includes six families: Digamasellidae, Halolaelapidae, Laelaptonyssidae, Ologamasidae, Rhodacaridae and Teranyssidae (Lindquist *et al.* 2009). Ologamasidae and Rhodacaridae are commonly found in the Neotropics. The former contains 452 species (Beaulieu *et al.*, 2011), of which 129 were originally described from South America, whereas the latter contains 151 species, 15 of which were described from South America (Castilho *et al.*, 2012b). In South America, Ologamasidae and Rhodacaridae are known from Argentina (Berlese, 1888, 1914, 1916; Kramer, 1898; Sheals, 1962; Balogh, 1963; Loots & Ryke, 1967; Lee, 1970; Karg, 1977, 1979), Brazil (Berlese, 1888; Hirschmann, 1966; Silva *et al.*, 2007; Castilho & Moraes, 2010; Castilho *et al.*, 2010; Karg & Schorlemmer, 2009, 2011a; Castilho *et al.*, 2012c), Chile (Lee, 1967; Karg, 1975, 1976a, 1976b, 1976c, 1976d, 1977, 1997), Ecuador (Karg, 1998, 2000a, 2003a, 2003b, 2006, 2007; Karg & Schorlemmer, 2009, 2011b), Paraguay (Karg & Schorlemmer, 2009, 2011a) and Venezuela (Karg & Schorlemmer, 2009, 2011b).

Rhodacaroidea have not been reported from Colombia until now. In a survey recently conducted in that country, two species new to science were collected, as well as specimens identified as *Multidentorhodacarus triramulus* (Karg, 1998). The aim of this study is to describe the new species, and to present an expanded redescription of *M. triramulus*, based on our examination of the holotype and of collected Colombian specimens. This is the first attempt to evaluate the biodiversity of this group of edaphic mites from that country.

Material and methods

Soil samples were collected from a grassland and a forest fragment in “Vereda Mundo Nuevo”, municipality of “La Calera”, Departamento de Cundinamarca, Colombia, at about 2,800 m above sea level. The samples were taken to a laboratory where mites were extracted using modified Berlese funnels. The extracted mesostigmatid mites were mounted in Hoyer’s medium and identified to families. The rhodacaroids collected were examined under phase

Acknowledgements

We thank the Brazilian CNPq (National Council for Scientific and Technological Development) for the scholarship to the first author. We are also grateful to FAPESP (São Paulo Foundation Research) for the postdoctoral fellowship to Raphael de Campos Castilho (Process # 2011/18971-7).

References

- Balogh, J. (1963) The zoological results of Gy. Topál's collectings in south Argentina. *Annales Historico-Naturales Musei Nationalis Hungarici*, 55, 487–496.
- Beaulieu, F., Dowling, A.P.G., Klompen, H., Moraes, G.J. de & Walter, D.E. (2011) Superorder Parasitiformes Reuter, 1909. In: Zhang, Z.-Q. (Ed.), Animal biodiversity: An outline of higher level classification and taxonomic richness. *Zootaxa*, 3148, 123–128.
- Berlese, A. (1888) Acari Austro-Americani quos collegit Aloysius Balzan. Manipulus primus. Species novas circiter quinquaginta complectens. *Bollettino della Società Entomologica Italiana*, 20, 171–222 + Plates V–XIII.
- Berlese, A. (1914) Acari nuovi. Manipulus IX. *Redia*, 10, 113–150 + Plates X–XIII.
- Berlese, A. (1916) Centuria seconda di Acari nuovi. *Redia*, 12, 125–177.
- Berlese, A. (1920) Centuria quinta di Acari nuovi. *Redia*, 14, 143–195.
- Castilho, R.C. & Moraes, G.J. de. (2010) Rhodacaridae mites (Acari: Mesostigmata: Rhodacaroidea) from the State of São Paulo, Brazil, with descriptions of a new genus and three new species. *International Journal of Acarology*, 36, 387–398. <http://dx.doi.org/10.1080/01647951003766970>
- Castilho, R.C., Moraes, G.J. de & Narita, J.P.Z. (2010) A new species of *Gamasiphis* (Acari: Ologamasidae) from Brazil, with a key to species from the Neotropical Region. *Zootaxa*, 2452, 31–43.
- Castilho, R.C., Jalaeian, M. & Moraes, G.J. de (2012a) Two new species of Rhodacaridae (Mesostigmata: Rhodacaroidea) from Iran. *Zootaxa*, 3248, 35–42.
- Castilho, R.C., Moraes, G.J. de & Halliday, B. (2012b) Catalogue of the mite family Rhodacaridae Oudemans, with notes on the classification of the Rhodacaroidea (Acari: Mesostigmata). *Zootaxa*, 3471, 1–69.
- Castilho, R.C., Narita, J.P.Z. & Moraes, G.J. de (2012c) Three new species of *Gamasiphis* (Acari: Mesostigmata: Ologamasidae) from Brazil, with complementary information about *Gamasiphis plenosestosus* Karg and a key to the world species of the genus. *Journal of Natural History*, 46, 1969–1998. <http://dx.doi.org/10.1080/00222933.2012.700336>
- Evans, G.O. (1963) Observations on the chaetotaxy of the legs in the free-living Gamasina (Acari: Mesostigmata). *Bulletin of the Natural History Museum Zoology*, 10 (5), 277–303.
- Hirschmann, W. (1966) Gangsystematik der Parasitiformes Teil 15. Gänge von Litoralmiten und neue Litoralmitenarten. *Acarologie. Schriftenreihe für Vergleichende Milbenkunde*, 9, 25–44.
- Johnston, D.E. & Moraza, M.L. (1991) The idiosomal adenotaxy and porodotaxy of Zerconidae (Mesostigmata: Zerconina). In: Dusábek, F. & Bukva, V. (Eds.), *Modern Acarology*. Academia, Prague. pp. 349–356.
- Jordaan, L.C., Loots G.C. & Theron, P.D. (1988) A new genus and new species of Rhodacaridae (Acari) from the Afrotropical Region. *Journal of the Entomological Society of Southern Africa*, 51, 275–281.
- Karg, W. (1975) Zur Kenntnis der Gattung *Neogamasellefans* Loots et Ryke, 1967 (Acarina). *Deutsche Entomologische Zeitschrift*, 21, 117–136.
- Karg, W. (1976a) Revision der Milbengattung *Geogamasus* Lee, 1970 (Acarina Parasitiformes). *Zoologische Jahrbücher, Abteilung für Systematik, Oekologie und Geographie der Tiere*, 103, 23–49.
- Karg, W. (1976b) Revision der Milbengattung *Hydrogamasellus* Hirschmann, 1966 (Acarina Parasitiformes). *Deutsche Entomologische Zeitschrift*, 23, 37–55. <http://dx.doi.org/10.1002/mmnd.19760230104>
- Karg, W. (1976c) Revision der Milbengattungen *Ologamasus* Berlese, 1888 und *Heydeniella* Richters, 1907 (Acarina Parasitiformes). *Mitteilungen aus dem Zoologischen Museum in Berlin*, 52, 185–201. <http://dx.doi.org/10.1002/mmzn.19760520202>
- Karg, W. (1976d) Zur Kenntnis der Milbengattungen *Gamasiphoides* Womersley, 1956 und *Laelaptiella* Womersley 1956 (Acarina, Parasitiformes). *Mitteilungen aus dem Zoologischen Museum in Berlin*, 52, 3–24. <http://dx.doi.org/10.1002/mmzn.19760520102>
- Karg, W. (1977) Zur Kenntnis einiger Milbengattungen der Rhodacaridae Oudemans, 1902 (Acarina, Parasitiformes). Teil 1. *Zoologische Jahrbücher, Abteilung für Systematik, Oekologie und Geographie der Tiere*, 104, 327–351.
- Karg, W. (1979) Zur Kenntnis einiger Milbengattungen der Rhodacaridae Oudemans, 1902 (Acarina, Parasitiformes). Teil 2. *Zoologische Jahrbücher, Abteilung für Systematik, Oekologie und Geographie der Tiere*, 106, 197–213.
- Karg, W. (1996) Neue Arten aus Raubmilbengattungen der Gamasina Leach (Acarina, Parasitiformes) mit Indikationen zum Entwicklungsalter. *Mitteilungen aus dem Museum für Naturkunde in Berlin*, 72, 149–195. <http://dx.doi.org/10.1002/mmzn.19960720111>

- Karg, W. (1997) Zur Kenntnis der Raubmilbencohors Gamasina Leach (Acarina, Parasitiformes) tropischer und subtropischer Gebiete. *Mitteilungen aus dem Zoologischen Museum in Berlin*, 73, 63–88.
<http://dx.doi.org/10.1002/mmnz.19970730110>
- Karg, W. (1998) Zur Kenntnis der Eugamasides Karg mit neuen Arten aus den Regenwäldern von Ecuador (Acarina, Parasitiformes). *Mitteilungen aus dem Museum für Naturkunde in Berlin, Zoologische Reihe*, 74, 185–214.
<http://dx.doi.org/10.1002/mmnz.19980740204>
- Karg, W. (2000a) Zur Systematik der Raubmilbenfamilien Hypoaspidae v. Vitzthum, 1941 und Rhodacaridae Oudemans, 1902 (Acarina, Parasitiformes) mit neuen Arten aus Süd- und Mittelamerika. *Mitteilungen aus dem Museum für Naturkunde in Berlin, Zoologische Reihe*, 76, 243–262.
<http://dx.doi.org/10.1002/mmnz.20000760207>
- Karg, W. (2000b) Die euedaphische Raubmilbengattung *Multidentorhodacarus* Shcherbak, 1980 mit einer neuen Art aus Mittelamerika. *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 72, 143–149.
- Karg, W. (2000c) Neue Raubmilbenarten der Pionierartengruppe Rhodacaridae Oudemans (Acarina, Parasitiformes). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 72, 207–213.
- Karg, W. (2003a) Neue Raubmilbenarten aus dem tropischen Regenwald von Ecuador mit einem kritischen Beitrag zur Merkmalsevolution bei Gamasina (Acarina, Parasitiformes). *Mitteilungen aus dem Museum für Naturkunde in Berlin, Zoologische Reihe*, 79, 229–251.
<http://dx.doi.org/10.1002/mmnz.20030790203>
- Karg, W. (2003b) Die Raubmilbengattungen *Afrogamasellus* Loots et Ryke und *Oloopticus* Karg mit zwei neuen Arten - Ein Beitrag zur Evolution der Bodenmilben (Acarina, Gamasina). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 75, 23–33.
- Karg, W. (2006) The systematics of Parasitiformes, especially of Gamasina Leach (Acarina), with new species from Ecuador. *Mitteilungen aus dem Museum für Naturkunde in Berlin*, 82, 140–169.
<http://dx.doi.org/10.1002/mmnz.200600002>
- Karg, W. (2007) New taxonomic knowledge of soil-inhabiting predatory mites (Acarina, Gamasina: Rhodacaroidea, Dermanyssoidea, Ascoidea). *Abhandlungen und Berichte des Naturkundemuseums Görlitz*, 78, 113–139.
- Karg, W. & Schorlemmer, A. (2009) New insights into predatory mites (Acarina, Gamasina) from tropical rain forests with special reference to distribution and taxonomy. *Zoosystematics and Evolution*, 85, 57–91.
<http://dx.doi.org/10.1002/zoos.200800016>
- Karg, W. & Schorlemmer, A. (2011a) New insights into the systematics of Parasitiformes (Acarina) with new species from South America. *Acarologia*, 51, 3–29.
<http://dx.doi.org/10.1051/acarologia/201111995>
- Karg, W. & Schorlemmer, A. (2011b) The predatory mite family Ologamasidae Ryke, 1962 and its position within the higher groups of Parasitiformes (Acarina) with new species from South America. *Zoosystematics and Evolution*, 87, 205–219.
<http://dx.doi.org/10.1002/zoos.201100003>
- Kramer, P. (1898) *Acariden. Hamburger Magalhaensische Sammelreise*. L. Friederichsen & Co., Hamburg, 40 pp + 1 Plate.
- Lee, D.C. (1967) *Heterogamasus* Tragardh (Acari: Rhodacaridae), including the subgenus *Evanssellus* Ryke, stat. n. *Records of the South Australian Museum*, 15 (3), 497–512.
- Lee, D.C. (1970) Rhodacaridae (Acari: Mesostigmata); classification, external morphology and distribution of genera. *Records of the South Australian Museum*, 16 (3), 1–219.
- Lindquist, E.E. & Evans, G.O. (1965) Taxonomic concepts in the Ascidae, with a modified setal nomenclature for the idiosoma of the Gamasina (Acarina: Mesostigmata). *Memoirs of the Entomological Society of Canada*, 47, 1–64.
<http://dx.doi.org/10.4039/entm9747fv>
- Lindquist, E.E., Krantz, G.W. & Walter, D.E. (2009) Order Mesostigmata. In: Krantz, G.W. & Walter, D.E. (Eds.), *A Manual of Acarology*, Third Edition, Texas Tech University Press, Lubbock, Texas, pp. 124–232.
- Loots, G.C. (1969) Notes on *Rhodacarus* Oudemans and its related genera with descriptions of new species from the Ethiopian Region. *Publicações Culturais da Companhia de Diamantes de Angola*, 81, 45–82.
- Loots, G.C. & Ryke, P.A.J. (1967) *Neogamasellewans*, a new genus of Rhodacaridae (Acari) from Argentina. *Neotropica, Notas Zoológicas Sudamericanas*, 13 (40), 13–18.
- Ryke, P.A.J. (1962) The interpretation of the genus *Rhodacarus* Oudemans with descriptions of new species from South Africa (Acarina: Rhodacaridae). *Revista de Biologia: Revista Brasileira e Portuguesa de Biologia em Geral*, 3, 81–86.
- Shcherbak, G.I. (1980) *Kleschi Semeistva Rhodacaridae Palearktiki*. Naukova Dumka, Kiev, 216 pp.
- Sheals, J.G. (1962) Mesostigmata: Gamasina (Acari). In: Deboutteville, D. & Rapoport, E. (Eds.), *Biologie de l'Amérique Australe (Etudes sur la faune du sol)*. Centre National de la Recherche Scientifique, Paris, v. 1, 84–110.
- Silva, E.S., Moraes G.J. de & Krantz, G.W. (2007) A new species of *Ologamasus* (Acari: Ologamasidae) from Brazil. *Zootaxa*, 1462, 61–68.