

Scientific Note

First record of *Trichotrombidium muscarum* (Riley, 1878) (Trombidiformes: Microtrombidiidae) in South America, with morphometric data and host association

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Abstract. The genus *Trichotrombidium* Kobulej, 1951 (Microtrombidiidae) includes ectoparasitic mites associated with dipteran species. However, their life cycle remains poorly understood, as only immature stages have been described. In this study, we report the first record of *Trichotrombidium muscarum* (Riley, 1878) in South America, specifically in Brazil, parasitizing the stable fly, *Stomoxys calcitrans* (L., 1758) (Diptera: Muscidae). The mites were collected using a pan-trap near a poultry farm in Nepomuceno, Minas Gerais State, Brazil. Morphometric data are provided, expanding the knowledge of this species.

Keywords: Parasitengona, ectoparasite, stable fly, host-parasite interaction, new record.

The genus *Trichotrombidium* Kobulej, 1951 belongs to the family Microtrombidiidae and is one of the most diverse within the Parasitengona group. Traditionally, it included three species: *Trichotrombidium muscarum* (Riley, 1878), described based on both larval and deutonymph stages; *Trichotrombidium vercammeni* (André, 1963), known only in the deutonymph form; and *Trichotrombidium rafieiae* Saboori, 2002, described from the larval stage (Beron 2008; Mąkol & Wohltmann 2012). However, more recent studies by Hakimitabar & Saboori (2018) indicated that *T. muscarum*, *Trichotrombidium muscae* Kobulej, 1951 (synonymized by Feider 1955), *Trichotrombidium hemistriatum* Womersley, 1942 (synonymized by Gabrys 1999), and *T. rafieiae* are actually taxonomic synonyms of the first one. As a result, only two species are currently recognized within the genus: *T. muscarum* and *T. vercammeni*.

A distinctive feature of *Trichotrombidium* is that, unlike many mites whose developmental stages are well documented, this genus is known only from its immature forms, such as larvae and deutonymphs (Southcott 1994). This knowledge gap makes the study of these mites particularly relevant, as their complete life cycle remains poorly understood.

The species *T. muscarum* has already been documented in different biogeographic regions of the Earth, such as the Nearctic, Palearctic, Afrotropical, Indomalayan, and Australasian regions, with the exception of the Neotropical, Oceanian, and Antarctic regions. Thus, in this study, we report for the first time the occurrence of *T. muscarum* in the Neotropical region, specifically in Brazil, collected while parasitizing the stable fly, *Stomoxys calcitrans* (L., 1758) (Diptera: Muscidae). Additionally, we provide morphometric data to contribute to the knowledge of this species.

The flies were collected using a pan-trap installed near a conventional layer poultry farm (latitude: 21°12'40.6"S, longitude: 45°14'06.3"W) in the municipality of Nepomuceno, Minas Gerais State, Brazil, in April 2020.

During the screening of the collected material, mites were observed attached to the flies. The flies were then separated and sent for identification. Host fly identification was performed using the Carvalho et al. (2002).

The mites were removed from their hosts, preserved in 100% ethanol, and slide-mounted using Hoyer's medium, following the protocol described by Krantz & Walter (2009). The examination of morphological characteristics and measurements of the specimens was carried out using a Leica DFC 500 digital camera coupled to a Leica DM4000B optical microscope with phase contrast. Measurements are given in micrometers.

The terminology for the dorsal opisthosomal setae and setae on the prodorsal sclerite follows Grandjean (1939), with adaptations by Kethley (1990) and Grandjean (1935; 1947) for the specialized setae on the legs and palps.

Order Trombidiformes Reuter, 1909

Family Microtrombidiidae Thor, 1935

Genus *Trichotrombidium* Kobulej, 1951

Species *Trichotrombidium muscarum* (Riley, 1878) (Figure 1)

Diagnosis. Larvae. Opisthosomal setae *d*₁ each positioned on well-separated sclerites. Prodorsal sclerite exhibits only lateral longitudinal striations, while the scutellum is distinctly striate. Lophotrix is long, with elongated setules. Average measurements of Brazilian specimens: IL 326, IW 224, L 101, W 114, AW 92, PW 105, AP 49, AA 51, SB 84, ISD 66, *ve* (AL) 39, *se* (PL) 46, *vi* (AM) 24, *si* (S) 56, DS 30-55, VS 24-45, *1a* 20, *1b* 25, *2b* 35, *3a* 38, *3b* 25, GL 60, PaGe (L) 26, PaGe (W) 13, OD 10, *cs* 13, *Pw* 5, *Cx* I 54, *Tr* I 34, *Fe* I 40, *Ge* I 20, *Ti* I 38, *Ta* I (L) 72, *Ta* I (W) 22, *Cx* II 55, *Tr* II 32, *Fe* II 40, *Ge* II 22, *Ti* II 36, *Ta* II (L) 58, *Ta* II (W) 16, *Cx* III 52, *Tr* III 28, *Fe* III 44, *Ge* III 15, *Ti* III 38, *Ta* III (L) 52, *Ta* III (W) 20, *Leg* I 258, *Leg* II 243, *Leg* III 229, *IP* 730, *σ* I 45, *k* 3, *φ* I' 20, *φ* I'' 25, *ω* I 15, *ε* 3, *ζ*' 23, *ζ* 14, *σ* II 31, *φ* II' 9, *φ* II'' 16, *ω* II 12, *ε* 3, *ζ* 14, *σ* II 21 and *φ* 43.

Material examined: thirteen larvae, ectoparasite on two *S. calcitrans* by pan-trap in the city of Nepomuceno, Minas Gerais, Brazil (21°12'40.6"S, 45°14'06.3"W) in April 2020.

Distribution: Hungary, Romania, Spain, United States (Deutonymph); Australia, India, Madagascar, Iran, Turkey, Montenegro, Libya, Republic of the Congo, Hungary (Larva); Rwanda (undescribed stage) (Riley 1878; Feider 1955; McGarry et al. 1992; Gabrys 1999; Saboori 2002; Mąkol & Wohltmann 2012; Karakurt & Sevsay 2013;

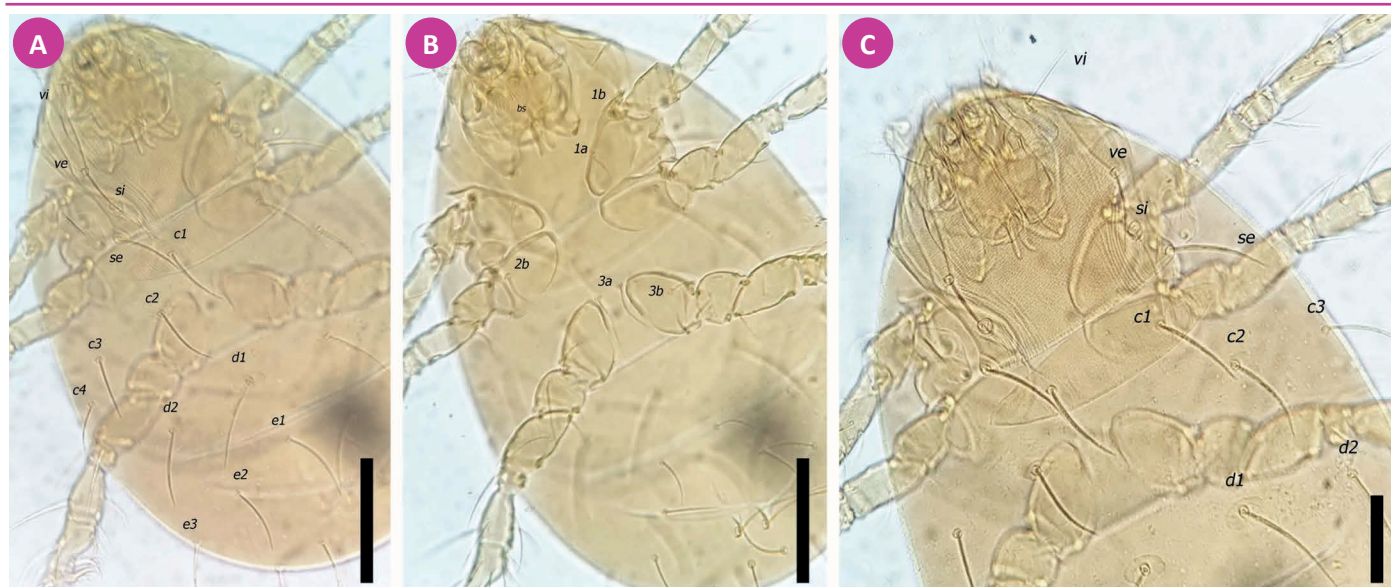


Figure 1. *Trichotrombidium muscarum* (Riley, 1878). **A.** Dorsal view of idiosoma; **B.** Ventral view of idiosoma; **C.** Prodorsal sclerite. Symbols: bs = subcapitular setae; 1a = anterior sternal setae inside the coxal field I; 3a = posterior sternal setae; c1-c4 = C row setae; d1-d2 = D row setae; e1-e3 = E row setae; 1b = coxal field I seta; 2b = coxal field II seta; 3b = coxal field III seta; ve = external vertical setae; se = external scapular setae; vi = internal vertical setae; si = internal scapular setae (trichobothria). Scales: A and B 200 µm, C 50 µm.

Hakimitabar & Saboori 2018; Kontschán & Hornok 2019) and Brazil (this study).

Remarks: In the present study, mites were observed attaching to different regions of the host flies' bodies, including abdominal segments and the posterior spiracle.

The results of this study confirm that the mite species analyzed has a broad global distribution, with this being the first record in both Brazil and South America. Among the documented host flies for this species are *Musca domestica* (L., 1758) (Saboori 2002; Karakurt & Sevsay 2013; Buğa & Sevsay 2019), *Cochliomyia hominivorax* (Coquerel, 1858) (McGarry et al. 1992; Felska et al. 2018), and *S. calcitrans* (Kontschán & Hornok 2019; Valério et al. 2024).

Although it is considered an obligate parasite of Muscidae (Kontschán & Hornok 2019), this species has also been documented in a specimen of the family Ulidiidae (Diptera) in Iran (Hakimitabar & Saboori 2018). The mite primarily parasitizes adult flies, feeding on their hemolymph, but it can also cosume their eggs (McGarry et al. 1992; Felska et al. 2018).

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Authors' Contributions

BPV: Writing – original draft, Investigation, Methodology; LFOB: Investigation, Writing – review & editing; LMSA: Writing – review & editing; RBS: Methodology, Investigation, Writing – review & editing.

Conflict of Interest Statement

All authors have declared that there is no conflict of interest.

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