


Scientific Note

A new case of trombiculiasis caused by *Eutrombicula daemonei* Bassini-Silva & Jacinavicius, 2018 (Trombidiformes: Trombiculidae) in a dog from Brazil

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Abstract. Chiggers are ectoparasites and can cause severe dermatitis in their hosts, known as trombiculiasis. Besides that, these mites can be vectors of bacteria of the genus *Orientia*, in various regions of the world. The genera *Eutrombicula* Ewing, 1938 is currently represented by more than 80 species worldwide. Species of this genus are recorded parasitizing reptiles, birds, and mammals. One of this species, *Eutrombicula daemonei* Bassini-Silva & Jacinavicius, 2018 was recently described causing trombiculiasis in a dog. Our goal is to report a new case of a dog's trombiculiasis, including a new locality record for *E. daemonei* in Brazil. In May 2021, a female Shih-Tzu dog with three years old and with access to the forest of the Santa Tereza municipality, southeastern Brazil, sought veterinary medical attention for intense itching and erythema in the facial region. Mites were collected directly from the face of the dog. These materials were slide-mounted and deposited in the Acarological Collection of the Butantan Institute (IBSP). The material extracted from the dog was examined and identified as *E. daemonei*. Part of the fixation site tissue of the dog was collected, showing the feeding tube produced by the enzymatic reaction of saliva by the mite, known as a stylostome. In this report, we emphasize the occurrence of trombiculiasis in domestic animals that have access to forest regions, places that unfed chigger larvae live. Additionally, this record represents a new locality record for *E. daemonei* to the Espírito Santo State, Brazil.

Keywords: Chiggers, ectoparasites, Espírito Santo State, Carnivora, *Canis lupus familiaris*.

Chigger's larvae (Trombidiformes: Trombiculidae s. l.) are ectoparasites of wild terrestrial vertebrates, and on rare occasions, the unfed larvae can parasitize domestic animals (Takahashi et al. 2004). The genus *Eutrombicula* Ewing, 1938 can cause severe skin reactions in the host, known as trombiculiasis. It is characterized as circular lesions of sizes ranging from 2 to 4 cm in diameter. Scratching the papules cause intense pruritus resulted in large inflamed areas of the skin (Faccini et al. 2017; Bassini-Silva et al. 2019). This genus is currently represented by more than 80 species worldwide and they are recorded parasitizing reptiles, birds, and mammals (Bassini-Silva et al. 2018; 2019). Nine species were recorded in Brazil, *Eutrombicula alfreddugesi* (Oudemans, 1910), *E. batatas* (Linnaeus, 1758), *E. daemonei* Bassini-Silva & Jacinavicius, 2018, *E. bruyanti* (Oudemans, 1910), *E. goeldii* (Oudemans, 1910), *E. ophidica* (Fonseca, 1932), *E. spipi* Brennan & Reed, 1974, *E. tinami* (Oudemans, 1910), and *E. tropica* (Ewing, 1925) (Bassini-Silva 2018; Jacinavicius et al. 2018).

One of these species, *E. daemonei* was originally described in the Minas Gerais State (Santa Bárbara do Monte Verde and Juiz de Fora municipalities, Fig. 1), parasitizing the social flycatcher, *Myiozetetes similis* (Spix, 1825) (Passeriformes: Tyrannidae). Later this same species was collected in a dog (Carnivora: Canidae) (Bassini-Silva et al. 2018; Sampaio et al. 2020). Considering that few cases report trombiculiasis caused by species of the genus *Eutrombicula* in South America, this kind of report is necessary, given the lack of information, especially in places where the fauna is practically unknown. Therefore, the present study describes a case report of a dog with trombiculiasis and a new locality (Santa Tereza municipality, Espírito Santo State, Fig. 1) for the

species *E. daemonei*, in Brazil.

The fauna of chiggers was poorly represented in the Espírito Santo State, there are only two records. One of these records is the rare association with a chigger, *Odontacarus* sp., parasitizing an adult male of a whip spider, *Charinus brasiliensis* Weygoldt, 1972 (Charinidae: Amblypygi) in Santa Tereza municipality (Gonçalves-Souza et al. 2014); the other record is the occurrence of *Eutrombicula alfreddugesi* s. l. on *Tropidurus torquatus* (Wied, 1820) (Squamata: Tropiduridae) in the São Mateus, Guarapari and Presidente Kennedy municipalities (Rocha et al. 2020).

The Butantan Institute has a representative collection of mites and ticks (IBSP) characterized mainly by parasite species associated with humans and wild/domestic animals from the Neotropical Region. Recently, we received six larvae of chiggers, fixed in ethyl alcohol P.A 100%, collected on the face of a dog. On May, 31st 2021, the owner of a female Shih-Tzu dog with three years old and with access to the forest of the Santa Tereza municipality, mountainous region of the Espírito Santo State, southeastern Brazil (19° 56' 07" S, 40° 33' 50" W), sought veterinary medical attention for intense itching and erythema, both in the facial region of the animal (Fig. 2A). This material was slide-mounted with Hoyer's medium according to Barros-Battesti et al. (2021), deposited in the IBSP collection under the access number IBSP 16663. The specimens were imaged using a Leica DFC 500 digital camera coupled to an optical microscope Leica DM4000B, in the Zoological Collection Laboratory, Butantan Institute, São Paulo. All the images were prepared with Adobe Photoshop v. 13.0. The chiggers were identified as *Eutrombicula daemonei* via comparison with the

holotype and paratypes of this species (access number IBSP 12374B). In agreement with Bassini-Silva et al. (2019) and Sampaio et al. (2020) we confirm the set of morphological characters that separate *E. daemoni* from others *Eutrombicula*: Palptibia with dorsal and lateral setae nude; and ventral seta branched; nude adoral setae; bifurcate odontus (Odo); the first dorsal opisthosomal row (C) with ten setae; the second row (D) with eight setae; tarsus of the legs I with a famulus (ϵ) positioned distal to solenidion (ω); tibia of the legs III with two mastisetae and tarsus of the leg III with four mastisetae.



Figure 1. Distribution of *Eutrombicula daemoni* Bassini-Silva & Jacinavicius, 2018. The red circles are literature records, while the orange triangle is the new record.

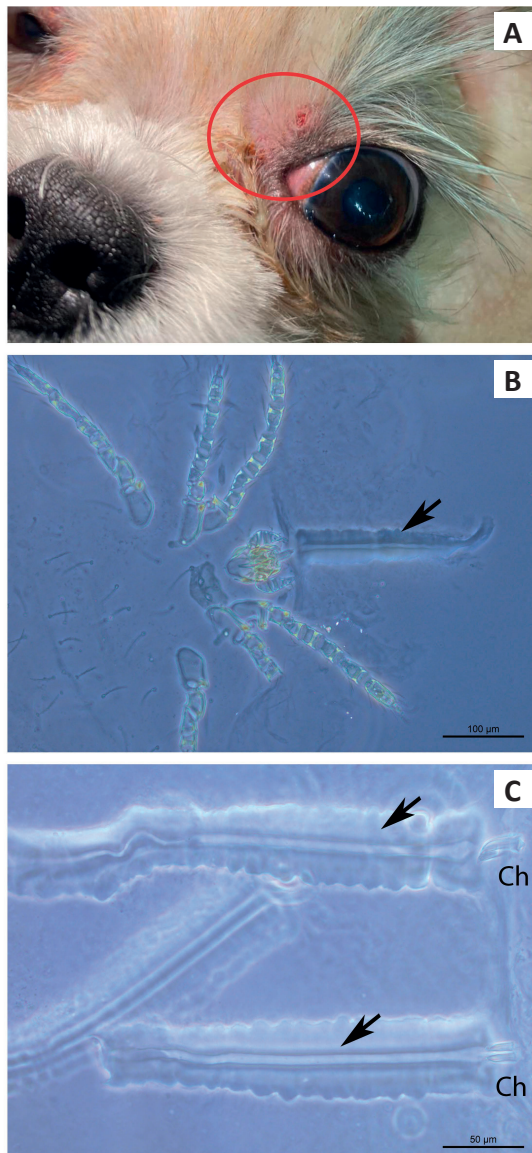


Figure 2. *Eutrombicula daemoni* Bassini-Silva & Jacinavicius, 2018 larvae. (A) Host parasitism site. (B) Mite overview and stylostome formation in the host skin. (C) Detail of the stylostome. Symbols: Arrows indicate de stylostome; Ch = Cheliceral blade.

During clinical examination of the host, rostral pruritus was observed due to a single papular erythematous lesion with mild dekeratinization in the right periocular and labial commissure region. In the center of the lesion, orange mites were collected by skin scraping. During parasitism, it fixes on the host's skin, and the enzymatic reaction of saliva produces a feeding tube known as a stylostome (Figs. 2B and 2C). According to Shatrov & Antonovskaia (2021), pathogens can be transmitted to their host, depending on the inflammation degree resulting from the parasitism. Treatment was carried out with Sarolaner (Simparic-zoetis) at a single dose of 2 mg/kg, and after seven days, treatment efficiency was observed. A few mites had remained in the animal, but they were already dead.

Despite the number of chiggers in the world, Zhang et al. (2011) estimated the existence of approximately 3,700 chiggers species. However, trombiculiasis in dogs have been reported in several places, as in Europe (Fain & Net 2000; Giannouloupoulos 2012; Stekolnikov et al. 2016; Lecru 2019; Apesteguía et al. 2019), Asia (Chung et al. 2015; Kaufman et al. 2015), Africa (Vercammen-Grandjean & Brennan 1957; Heyne et al. 2001), Oceania (McCulloch 1946), and America (Floch & Abonnenc 1941; Michener 1946; Jenkins 1949; Brennan & Yunker 1964; Sampaio et al. 2020), still few records when compared to the diversity of this family. In the present study, we provide the second record of trombiculiasis on a dog from Brazil. Emphasizing the importance of trombiculiasis records in national territory and in the world, since dermatitis caused by chiggers is understudied due to the difficulty of finding the mites or obtaining the correct identification.

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Authors' Contributions

KMQA, FCGC and GB detected the mite in association with the dog and performed the treatment. FCJ and RB-S performed the study and confirmed the identification of the mites. RS-R and MH-B performed the mite's preparations and wrote the manuscript with input from all authors.

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