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Trombewingia bakeri (Fonseca, 1955) (Trombidiformes: Trombiculidae): lectotype/ paralectotype designations and new records

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Abstract

We designate the lectotype and paralectotype for *Trombewingia bakeri* based on two cotypes of this species deposited in the Acari Collection of the Instituto Butantan in São Paulo, Brazil (IBSP). New records of hosts and localities for this species are given here, including more details of its morphology.

Key words: Chigger mites, *Trombewingia*, *Caamembecaia*, Taxonomy, Neotropical, Brazil

Introduction

The last revision of the chigger mites from the Neotropical and Nearctic regions was published by Brennan and Goff (1977), who recognized more than 80 genera in the West Hemisphere, including *Trombewingia* described by Fonseca (1955). There are only two species of *Trombewingia* in the world, *Trombewingia bakeri* (Fonseca 1955) and *Trombewingia brasiliensis* Goff and Gettinger 1991, and both are endemic to Brazil. The first one was described from three cotype specimens collected on a wild rodent of the Sciuridae family, *Guerlinguetus brasiliensis* (Gmelin, 1788) (cited as *Guerlinguetus ingrami* Thomas), from São Paulo municipality, São Paulo State, and the second one was described from 9 specimens collected on *Necromys lasiurus* (Lund) (cited as *Bolomys lasiurus*), from Distrito Federal (Goff & Gettinger 1991). Two cotypes of *T. bakeri* (IBSP 344) were found in the depository and they were restored, according to Jacinavicius *et al.* (2013). The third slide was not physically located in the IBSP. Here we designate the two cotypes in IBSP as the lectotype and paralectotype. The Lectotype and Paraletotype are housed in the Acari Collection of Butantan Institute, Laboratório Especial de Coleções Zoológicas, São Paulo, Brazil. Detailed morphology and new records of hosts and localities for this species are given here as well as new records for *T. bakeri*.

Material and Methods

During collecting wild rodents in area of Atlantic Forest from State of São Paulo, Southern Brazil (projects ongoing), specimens of chiggers were found within the inner ears of rodents *Akodon montensis* Thomas, *Delomys dorsalis* (Hensel) and *Sooretamys angouya* (Fischer). Some of the mite

material were mounted in Hoyer's medium for morphological studies by using light microscope. They were identified as *T. bakeri*, after comparisons with the types that were restored in Hoyer's medium. Some specimens were also prepared for scanning electron microscopy according to Krantz & Walter (2009). All mites and hosts have been deposited, respectively, at the Acari Collection of Instituto Butantan (IBSP) and at the Museu de Zoologia da Universidade de São Paulo (MZUSP).

For morphological details, photographs were taken using a Leica microscope DM4000B, as well as the drawings by using a camera lucida. The diagnosis and redescription were based on all examinated material and types. All measurements are in accordance with Stelkonikov (2008) and they are given in µm. The scanning electron micrographs (SEM) were obtained with a Digital Scanning Microscope FEI, Quanta 250, at the Laboratório de Biologia Celular, Instituto Butantan.

The type locality and new records for *T. bakeri* were shown as well as the type localities for two other closely related species.

We followed the terminology proposed by Goff *et al.* (1982), with adaptations proposed by Stekolnikov (2008) and Stekonnikov & Daniel (2012).

The figures were prepared with Adobe Photoshop v. 13.0, and Inkscape V. 2. The Map was prepared by using the program DIVA-GIS 7.5.

The types mounted in slides were restored, according to Jacinavicius *et al.* (2013).

Results

Trombewingia bakeri (Fonseca, 1955) (Figs 1–2)

Syn. *Schoengatia (Trombewingia) bakeri*: Fonseca, 1955: 3.
Euschoengastia (Trombewingia) bakeri: V.-G., 1967: 132 (misalliance).
Guntherana (Trombewingia) bakeri: Vercammen-Grandjean, 1967: 132.
Trombewingia bakeri: Goff & Gettinger, 1991: 401.

Types and material examined : Types: Larva lectotype (IBSP 344 - 1/2; here designated, late "b"); 1 larva paralectotype (IBSP 344 - 2/2; here designated, late "a"), collected in 01.VIII.1935 by F. Fonseca. Type host: *Guerlinguetus brasiliensis* (Rodentia, Sciuridae); Type locality: Horto Florestal de São Paulo, São Paulo, São Paulo State, Brazil.

Other material: 1 larva (IBSP 11226), collected in 14/I/2013, *Akodon montensis*, Parque Estadual dos Mananciais, Campos do Jordão municipality (22 45' 58" S 45 33' 48" W); 1 larva (IBSP 11369A), collected in 18/VI/2013, *Delomys dorsalis*, and 2 larvae (IBSP 11364A), collected in 21/VIII/2013, *Sooretamys angouya*, Morro Grande, Cotia municipality (23º30'07''S e 46º58'04''W).

Diagnosis: SIF: 4B-N-3-3111-0000; fPp: B/B/BBB; fCx: 1.1.1; fSt: 2/2; fSC: PL > AL > AM; Ip: 750–835; fD: 2H-8-6-6-6-2; DS: 30; VS: 31–35; NDV: 61 - 65.

Redescription: Larva (engorged specimen).

Idiosoma: 398–405 x 243–254, "in original description length is 356–514 x 160–293". Eyes 2/2, anterior larger, on ocular plate; 1 pair of humeral setae foliated, 46–63 x 9 and plus 28 dorsal idiosomal setae, foliated, 25–85 x 7–11, arranged in subsequent rows 2H-8-6-6-6-2; 2 pairs of ciliated sternal setae, anterior measuring 39 and posterior measuring 33; 31–37 ventral setae, 25–29 preanals, length 16–36, 6–9 postanal like dorsal setae, 19–26 x 4–6. *Scutum*: rectangular, deeply punctate from the level of the sensillary insertion to the anterior and lateral margins; 1 pair of AL, 28–41 x 6–8, 1 pair of PL setae like foliate structures, 61–77 x 7–14, and AM seta tiny; PL > AL> AM; PW/SB 3.23; 2 sensillae (S) are missing, in the original description they are globose and flattened, length 33.

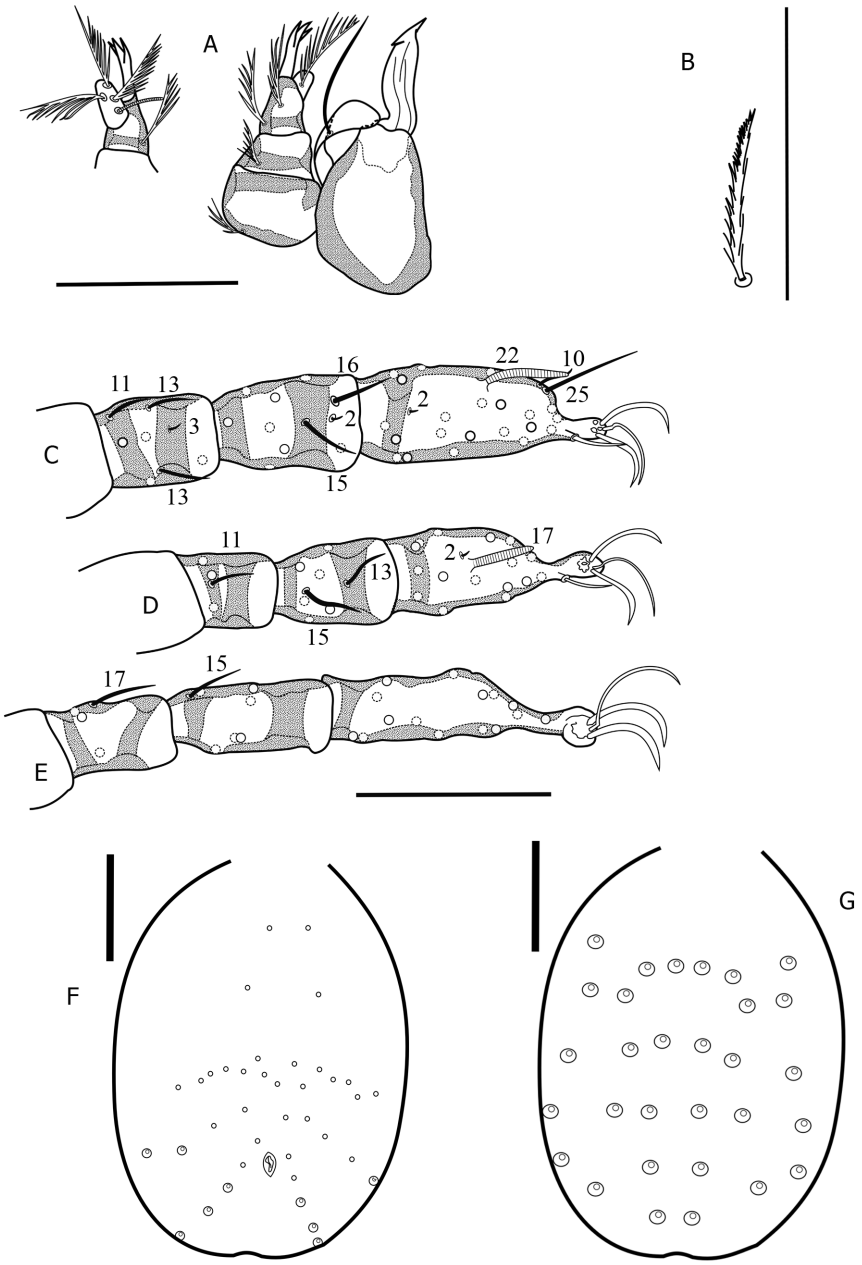

FIGURE 1. *Trombewingia bakeri* (larva). A. gnathosoma; B. ventral preanal seta; C. leg I; D. leg II; E. leg III; F. arrangement of ventral idiosomal setae; G. arrangement of dorsal idiosomal setae. Scale bar: A–E. 50 μm; F–G: 100 μm.

Gnathosoma: palpalsetal formula B/B/BBB/4B; palpal claw trifurcate, two external weaker and the middle stronger; cheliceral blade with tricuspid cap; gnathobase punctate, with a pair of nude galealae. *Legs*: 7-7-7, terminating in a pair of claws and a claw-like empodium. Onychotriches absent, IP 746. *Leg I*. coxa with 1 branched seta (1B); trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, genualae 3, microgenuala 1; tibia 8B, tibialae 2, microtibiala 1; tarsus 21, 60–67 x 24–31, tarsala 1, microtarsala 1, subterminala 1, parasubterminala 1 and pretarsala 1. *Leg II*. coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala 1; tibia 6B, tibialae 2; tarsus 16B, 48-54 x 20–26, tarsala 1, microtarsala 1, and pretarsala 1. *Leg III*. coxa 1B; trochanter 1B; basifemur

2B; telofemur 3B; genu 3B, genuala 1; tibia 6B, tibiala 1; tarsus 15B, 45–63 x 16–22. The measurements of the new collected materials (4 specimens), the types and the original measure by Fonseca (1955) are shown on Table 1.

TABLE 1. Standard measurements of *Trombewingia bakeri.*

	AW	PW	SB	ASB	PSB	SD	P-PL	AP	AM	AL
(Fonseca, 1955)	68–77	82–92	25–33	27–37	20–24	46–57	-	26–30	-	37–41
Lectotype	76	86	28	33	23	56	31	24	3	37
Paralectotype	73	85	26	39	22	61	28	29	3	38
Minimum	66	79	26	25	19	44	28	24	3	28
Maximum	76	86	28	39	23	61	32	29	3	41
Mean	70	82	26	31	22	53	30	26	3	34
SD	3.9	2.5	0.7	5.1	1.2	5.7	1.4	1.8	0	4.1

TABLE 1 (Continued)

PL	S	H	DMIN	DMAX	VMIN	VMAX	pa	pm	pp	Ip	TaIII	TaW
74–85	33	41–66	81	84	22	40	-	-	-	-	-	-
74	33	61	35	83	17	36	268	238	270	762	53	20
74	33	60	37	85	19	36	261	228	262	746	60	22
61	30	46	25	71	16	19	261	222	254	746	45	16
77	33	63	37	85	34	36	304	255	291	835	63	22
70	32	56	32	79	20	29	280	237	270	787	52	19
5.6	1.7	5.1	4.6	6.1	7.0	6.8	13.1	11.5	10.2	34.7	4.9	2.0

Note: For S (n= 3 specimens), for other variables (n=6 specimens).

The morphological details of *T. bakeri* are presented in the Figures 1–2.

Remarks: The species *T. bakeri* could also be easily separated from *T. brasiliensis* by the unusual morphology of the dorsal idiosomal and PL setae (foliated in *T. bakeri*), and by the setae of the palpal tibia (BBB in *T. bakeri* and BNB in *T. brasiliensis*). The idiossomal measurements of the types differ from the original description. We believe that these differences could not be attributed to the recovery technique. If that were possible, certainly, all other measures would be different, which did not happen. It is more likely that there was some equivoque in the measurements of type specimens in the original description. The species *T. bakeri* is also closely related to a monotypic genus *Caamembecaia* reported from the State of Rio de Janeiro (Gazêta *et al*., 2006), although they belong to two different genera. The species *T. bakeri* could be separated from *Caamembecaia gratiosus* Gazêta, Amorim, Bossi, Linhares & Serra-Freire, 2006 by having 3 genualae I (2 genualae I in *C. gratiosus*), extrascutal eyes (intrascutal eyes in *C. gratiosus*), and BBB setation of the palpal tibia (BNB in *C. gratiosus*). According to Stekolnikov (2013) interspecific hybridization between species of chigger mites is possible, since this has been revealed for the genus *Leptotrombidium* (Liao 1988, Kadosaka *et al.* 1994) under laboratory conditions. Gazêta *et al.* (2006) examined 546 small wild mammals collected from São Paulo and Rio de Janeiro states, but just one of them had a unique larva of *C. gratiosus*. Considering that this species is known only by this larva (examined by one of us), perhaps this could be a case of hybridism, assuming that hybridization among different species of chiggers can take place in natural conditions (Stekolnikov 2013).

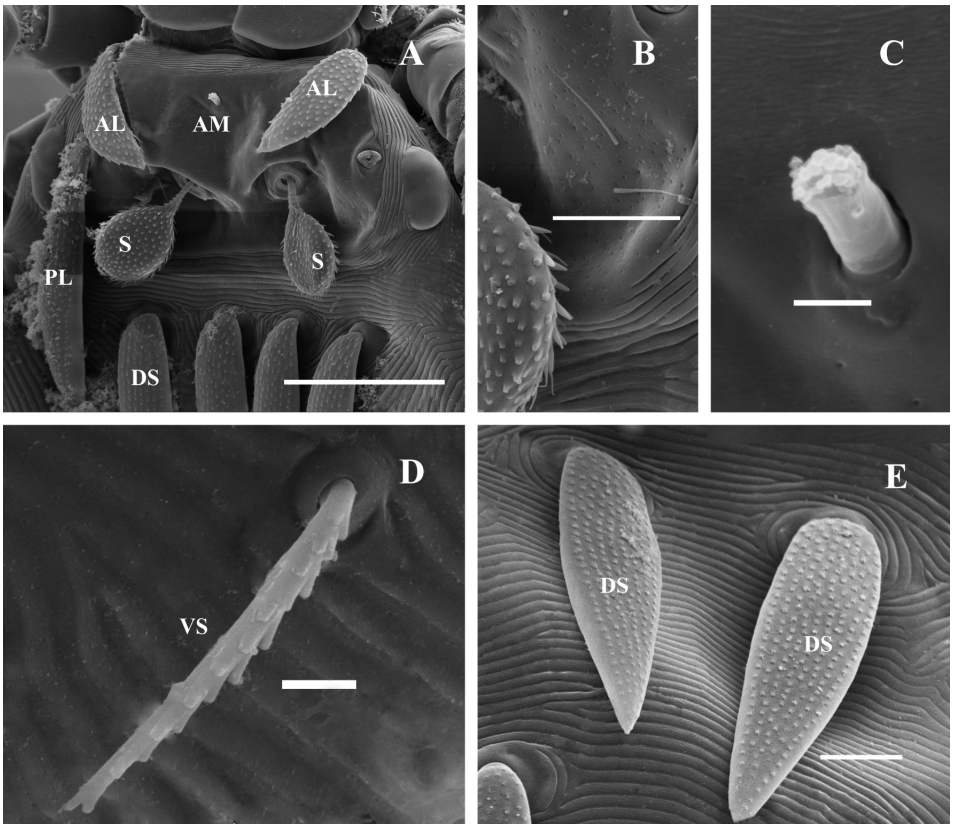

FIGURE 2. *Trombewingia bakeri.* A. scutum; B. punctate on scutum; C. anteromedian seta; D. ventral preanal setae; E. dorsal idiosomal setae. Abbreviations: AM, anteromedian seta; AL, anterolateral setae; PL, posterolateral setae; S, sensilla; DS, dorsal setae; VS, ventral setae. Scale bar: 40 µm, 10µm, 2 µm, 4 µm, 11 µm.

All examined material collected in the present study are new host records for the family Cricetidae (Rodentia) and also they are new locality records in Sao Paulo state (Figure 3).

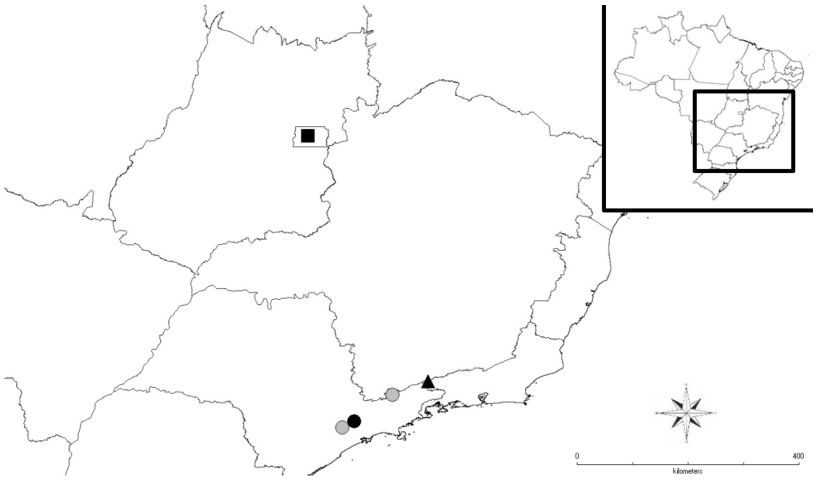

FIGURE 3. Geographical distribution of *Trombewingia bakeri* (Circle), *T. brasiliensis* (square) and *Caambemecaia gratiosus* (triangle). In black, literature records, in gray new records.

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