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THREE NEW SPECIES AND NEW RECORDS OF CHIGGER MITES (ACARI: TROMBICULIDAE) FROM CUBA

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ABSTRACT: Three new species of chigger mites, *Colicus famulidistalis* sp. n. and *Eltonella macroti* sp. n. from phyllostomid bats, and *Microtrombicula guaurabensis* sp. n. from lizards, are described. Three species, *Eltonella usitata* (Brenann, 1965), *Loomisia univari* (Brennan, 1965), and *Hoffmanniella beltrani* (Hoffmann, 1949) are recorded for the first time in Cuba on new host species.

Key words: Acari, chiggers, taxonomy, parasites, Cuba

INTRODUCTION

Chigger mites were extensively collected in Cuba by Czechoslovak-Cuban and Cuban-Roman joint expeditions in 1965–1985 (de la Cruz and Daniel 1994, Daniel and Stekol'nikov 2002, 2003 a, b, 2004; Feider 1977, 1983 a, b). At present, 27 species of chiggers are known from Cuba (including 6 reported in this work). Four trombiculid species described from Cuban caves from known postlarval stages (Feider 1977, 1983 a, b) remain *incertae sedis.*

MATERIAL AND METHODS

Chiggers were collected into vials containing 96% alcohol by Drs. R. Abreu, R. Borroto, A. Camacho, V. Černý, J. de la Cruz, N. Cuervo, M. Daniel, F. Dusbábek, F. Gregor, J. Ryba, and A.A. Socarrás. Hosts were determined by Drs. O.H. Garrido (reptiles) and G. Silva-Taboada (bats). Mites were mounted in Hoyer or in Faure-Berlese medium. All measurements are given in micrometres (μm). Terminology follows Goff et al. (1982), with some modifications (Daniel and Stekol'nikov 2003 a, b, 2004). Type specimens are deposited in the acarological collections of the Zoological Institute of the Russian Academy of Sciences, Saint-Petersburg (ZIN), the Institute of Parasitology, Academy of Sciences of the Czech Republic, České Budějovice (PaÚ) and in the collection of the senior author.

SYSTEMATICS

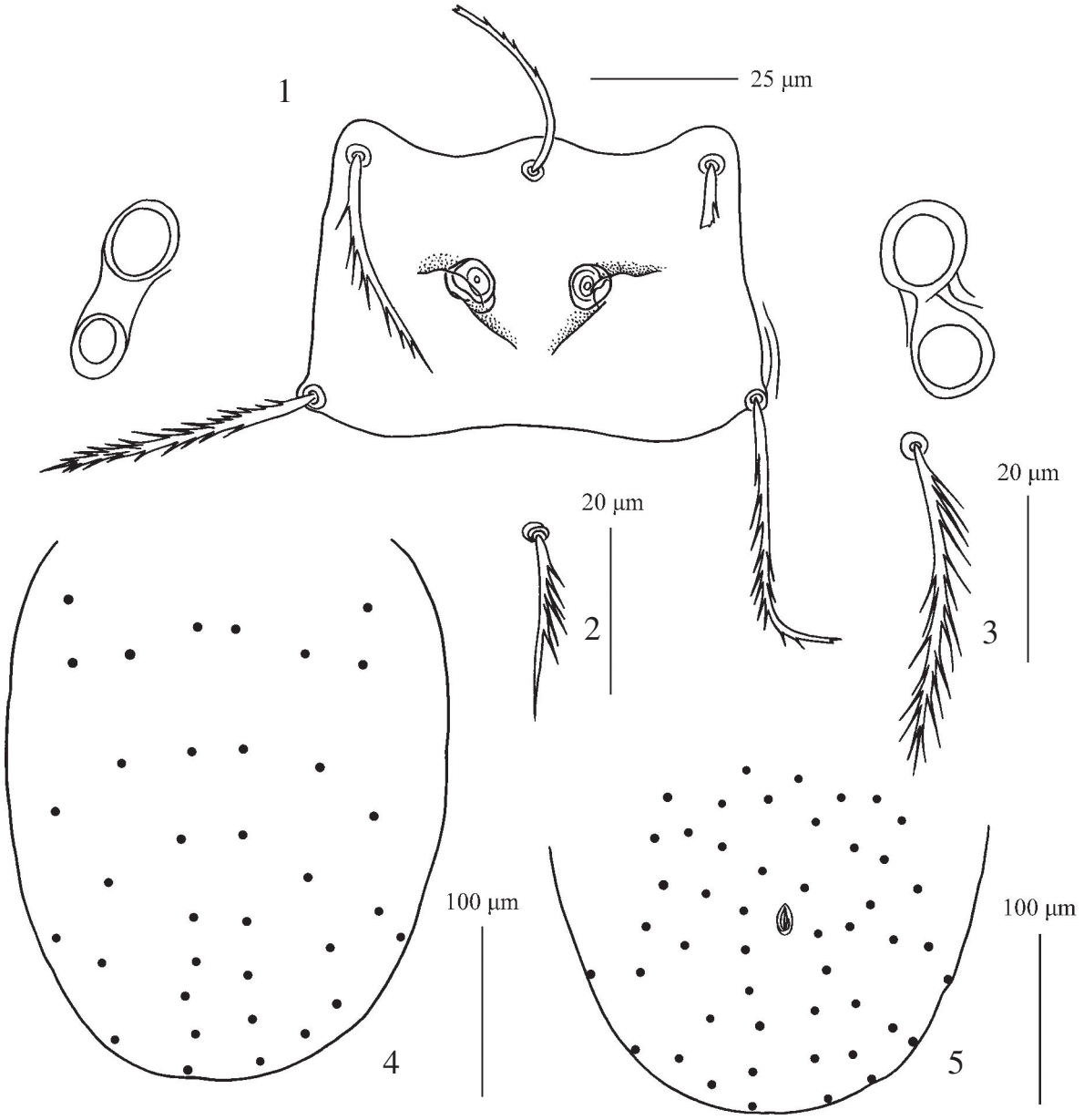
Colicus famulidistalis sp. n.

Figs 1–12.

Diagnosis. SIF = 5BS-N-3-2101.0000; fPp = B/B/NNB; fCx = 1.1.1; fSt = 2.2; fSc: PL > AM >= AL; Ip = 797; fD = 2H-6-6-(6–8)-4-…; DS = 33–36; VS = 43–51; NDV = 79–85.

Description. Larva. *Idiosoma.* Eyes 2+2. One pair of humeral setae; 31–34 dorsal idiosomal setae; in 1st and 2nd posthumeral rows 6 setae, in 3rd row 6–8 setae (7 in holotype), in 4th row 4 setae; 4 sternal setae and 43–51 ventral setae; total number of idiosomal setae 79–85. *Gnathosoma.* Cheliceral blade with tricuspid cap; gnathobase with 1 pair of branched setae; palpal femur and genu with lateral expansions; galeala nude; palpal claw with 3 prongs; setae on palpal femur and genu with few long branches; dorsal and lateral palpal tibial setae nude, ventral palpal tibial seta with few branches; palpal tarsus with thick branched dorsal seta, 2 branched and 2 nude ventral setae, nude subterminala, and tarsala. *Scutum.* Nearly rectangular, with posterior margin slightly concave in middle part; AM base on level of ALs; SB closer to each other than to lateral margins of scutum and far anterior to level of PLs; PL > AM >= AL; sensilla absent in all specimens examined. *Legs.* All 7-segmented, with pair of claws and clawlike empodium. Microchaetae long. Leg I: coxa with 1 non-specialized branched seta (1B); trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 2 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus 22B, tarsala 16–17 long, microtarsala distad of tarsala, subterminala, parasubterminala, pretarsala. Leg II: coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala (sometimes absent); tibia 6B, 2 tibialae; tarsus 16B, tarsala 20–23 long, microtarsala proximad of tarsala, pretarsala. Leg III: coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala absent; tibia 6B, tibiala; tarsus 15B, mastitarsala replaced with branched seta.

Hosts. *Macrotus waterhousii* (Gray, 1843) and *Brachyphylla nana* Miller, 1902 (Chiroptera, Phyllostomidae).

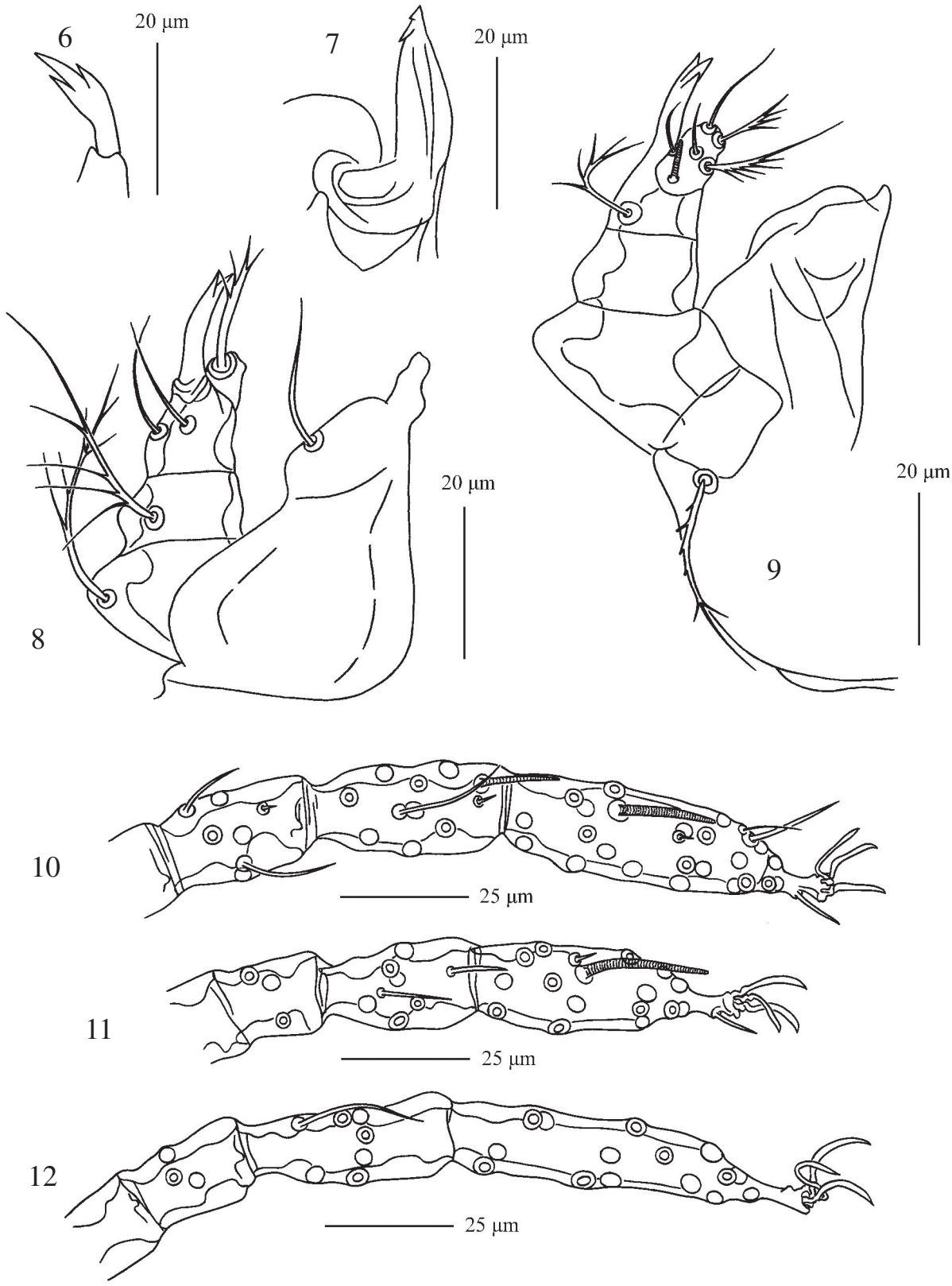


Figs 1–5. *Colicus familidistalis* sp.n. 1 — scutum and eyes; 2 — ventral preanal seta; 3 — dorsal idiosomal seta of 1st row; 4 — arrangement of dorsal idiosomal setae in holotype; 5 — arrangement of ventral idiosomal setae in holotype.

Standard measurements of the type series (n = 5)

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	H
Holotype	57	73	17	23	23	46	38/39	35	32	41	43
Minimum	52	63	12	22	22	45	36	33	25	34	36
Maximum	60	77	19	24	29	53	41	35	39	52	57
Mean	56	70	15	23	24	47	38	34	31	43	45

D	V	pa	pm	pp	Ip	DS	VS	NDV	TaIII	TaW
23–45	–	283	218	265	766	35	48	83	74	14
20–36	18–27	239	205	243	688	33	43	79	67	13
29–49	20–32	308	256	317	878	36	51	85	88	17
24–44	19–30	284	233	280	797	35	48	82	76	14



Figs 6–12. *Colicus familidistalis* sp.n. 6 – palpal claw; 7 – cheliceral blade; 8 – dorsal aspect of gnathosoma; 9 – ventral aspect of gnathosoma; 10 – leg I; 11 – leg II; 12 – leg III.

Type material. Holotype larva (no. C-579, T-Tr.-34), Isla de Pinos, Punta del Este, 25 June 1965, ex *M. waterhousii*. 12 paratypes: 2 larvae, same data as holotype; 1 larva, Isla de Pinos, Punta del Este, Cueva de los Cayamos, 17 Jan. 1966, ex *B. nana*; 9 larvae, Camaguey Province, Cairije, Sierra Cubites, Cueva Bonita, 30 Oct. 1965, ex *M. waterhousii*.

Type depositories. The holotype and 8 paratypes (nos. C-598, C-634, and C-607) are deposited in ZIN; 2 paratypes (no. C-509) are deposited in PaÚ; 2 paratypes (no. C-572) are deposited in the collection of the senior author.

Etymology. Specific epithet refers to the position of famulus f_1 (microtarsala of leg I) distad of tarsala.

Differential diagnosis. The new species differs from all other species of *Colicus* Brennan, 1970 in having microtarsala of leg I distad of tarsala, versus to proximad, and by the absence of genuala III (present in other species of *Colicus*).

Microtrombicula guaurabensis sp. n.

Figs 13–21.

Diagnosis. SIF = ???-N-3-3111.1000; fPp = B/B/NNB; fCx = 1.1.1; fSt = 2.2; fSc: AM >= PL > AL; Ip = 587; fD = 2H-6-6-6-4-2; fV = 4-6-(2–4)-…; DS = 26; VS = 21–23; NDV = 47–49.

Description. Larva. *Idiosoma.* Eyes 2+2. One pair of humeral setae; 24 dorsal idiosomal setae, arranged as 6-6-6-4-2; 4 sternal setae and 21–23 ventral setae, arranged as 4-6-(2–4)-… (4-6-3-4-4-2 in holotype); total number of idiosomal setae 47–49. *Gnathosoma.* Cheliceral blade with tricuspid cap; gnathobase with a pair of branched setae; galeala nude; palpal claw with 3 prongs; setae on palpal femur and genu with few branches; dorsal and lateral palpal tibial setae nude, ventral palpal tibial seta with few branches; chaetome of palpal tarsus indistinct in all specimens (in holotype only tarsala, 2 branched setae, and 2 setal bases visible). *Scutum.* Small, nearly pentagonal, with sparse large puncta, indistinct anterolateral shoulders and angulate posterior margin; AM base on level of ALs; SB anterior to level of PLs; PLs situated on scutal projections; AM >= PL > AL; sensilla flagelliform with about 7–8 branches in distal half. *Legs.* All 7-segmented, with pair of claws and clawlike empodium. Leg I: coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus 21B, tarsala 17 long, microtarsala distad of tarsala, subterminala, parasubterminala, pretarsala. Leg II: coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus 16B, tarsala 15 long, with inflated apex, microtarsala proximad of tarsala, pretarsala. Leg III: coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus 13B, mastitarsala.

Host. *Leiocephalus cubensis* (Gray, 1840) (Reptilia, Squamata, Iguanidae).

Type material. Holotype larva (no. C-133, T-Tr.-35), Trinidad Province, Rio Guaurabo, Ceiba de Hernan Cortez, 1 March 1965, ex *L. cubensis*. 2 paratypes larvae, same data as holotype.

Type depositories. The holotype and paratypes are deposited in ZIN.

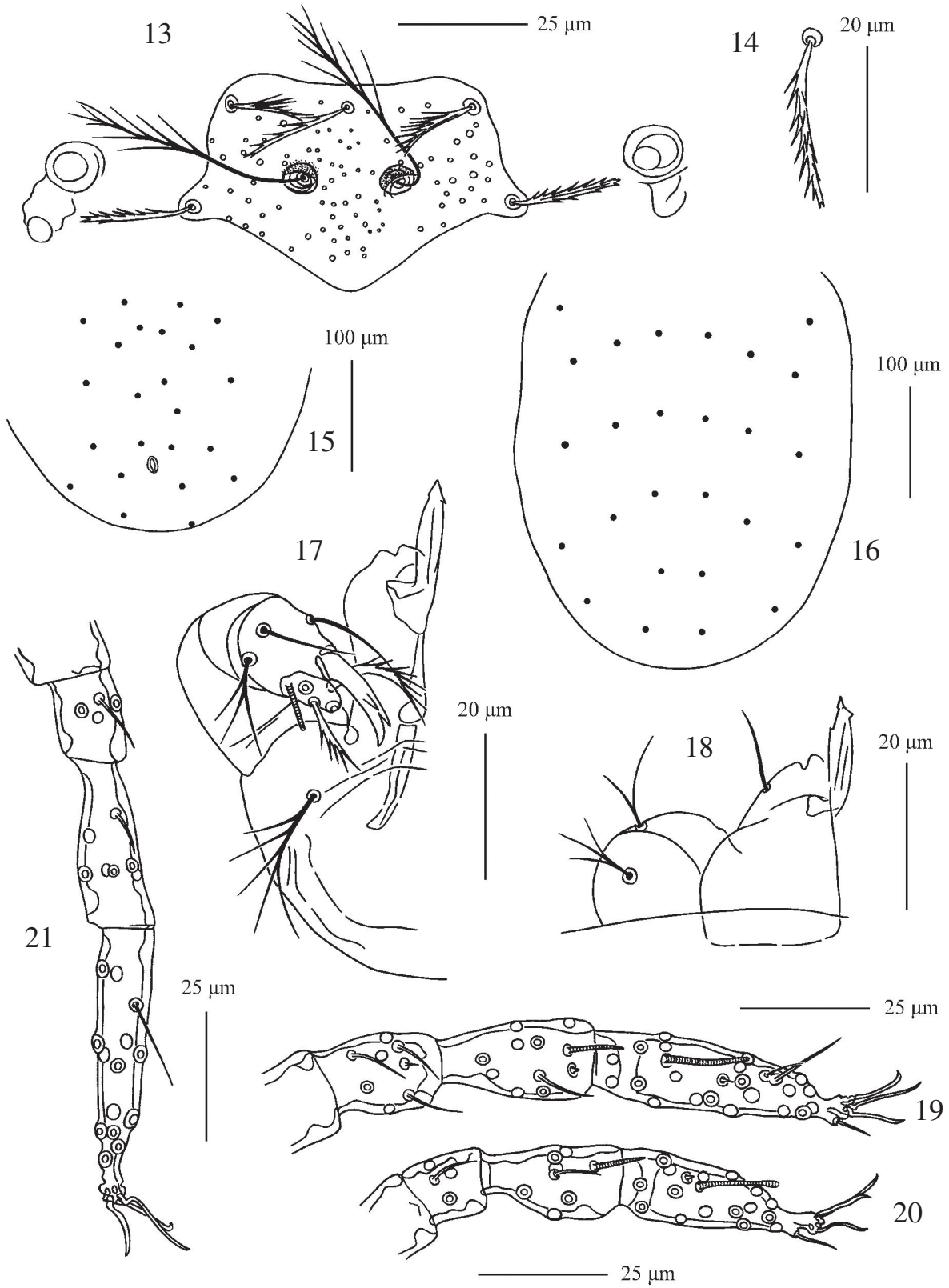
Etymology. Specific epithet refers to the *terra typica* (near the Guaurabo River).

Differential diagnosis. The new species is similar to *Microtrombicula phyllodactyli* Webb et Loomis, 1970 but differs from it by 4 sternal setae versus 6 (fSt = 2.2 versus 2.2.2), lesser numbers of idiosomal setae (DS = 26 versus 28, VS = 21–23 versus 26), and much shorter PL, H, and D (18–22, 20–24, and 17–24 versus 34–38, 30, and 23–30 respectively).

Standard measurements of the type series

	AW	PW	SB	ASB	PSB	SD	P-PL	AP	AM	AL	PL	S	H
Holotype	47	63	19	20	22	42	17	20/22	23	17	21/22	45	23/24
Paratype C-129	45	66	20	18	22	40	14	22/23	20	16	18	–	20
Paratype C-130	47	61	18	18	22	40	18	20/22	21	–	19/22	–	23

D	V	pa	pm	pp	Ip	DS	VS	NDV	TaIII	TaW	m-t
20–24	–	221	182	209	612	26	23	49	56	11	0.268
17–21	15–18	202	167	200	569	26	21	47	50	10	0.268
18–23	–	214	173	193	580	26	22	48	52	10	0.276



Figs 13–21. *Microtrombicula guaurabensis* sp.n., holotype. 13 — scutum and eyes; 14 — dorsal seta of 1st row; 15 — arrangement of ventral idiosomal setae; 16 — arrangement of dorsal idiosomal setae; 17 — ventral aspect of gnathosoma; 18 — dorsal aspect of gnathosoma; 19 — leg I; 20 — leg II; 21 — leg III.

Eltonella macroti sp. n.

Figs 22–32.

Diagnosis. SIF = 6B(5BS?)-N-3-3111.0000; fPp = B/B/NNB; fCx = 1.1.1; fSt = 2.4; fSc: PL >= AM > AL; Ip = 776; fD = 2H-8-8-(8–10)-(10–12)-(11–19); DS = 49–58; VS = 74–91; NDV = 123–147.

Description. Larva. *Idiosoma.* Eyes 2+2. One pair of humeral setae; 47–56 dorsal idiosomal setae; in 1st and 2nd posthumeral rows 8 setae, in 3rd row 8–10 setae, in 4th row 10–12 setae; 2 anterior and 4 posterior sternal setae, and 74–91 ventral setae; total idiosomal setae 123–147. *Gnathosoma.* Cheliceral blade with tricuspid cap and small additional medial tooth; cheliceral base with sparse puncta; gnathobase with sparse puncta and 1 pair of branched setae; palpal femur and genu with well-developed lateral expansions; galeala nude; palpal claw with 3 prongs; seta on palpal femur branched; seta on palpal genu with few long branches; dorsal and lateral palpal tibial setae nude, ventral palpal tibial seta with few branches; palpal tarsus with strongly branched dorsal seta and 5 weakly branched or nude ventral setae (one of them may be tarsala). *Scutum.* Nearly rectangular, with sparse moderate puncta and posterior margin straight in middle part; AM base on level of ALs; SB closer to each other than to lateral margins of scutum and far anterior to level of PLs; PL >= AM > AL; sensilla flagelliform with about 10–12 branches in distal half. *Legs.* All 7-segmented, with pair of claws and clawlike empodium. Microchaetae long. Leg I: coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus 22B, tarsala 19–20 long, microtarsala distad of tarsala, subterminala, parasubterminala, pretarsala. Leg II: coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus 16B, tarsala 18 long, with slightly inflated apex, microtarsala proximad of tarsala, pretarsala. Leg III: coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus 15B, mastitarsala replaced with branched seta.

Host. *Macrotus waterhousii*.

Type material. Holotype larva (no. C-563, T-Tr.-33), Isla de Pinos, Punta del Este, 25 June 1965, ex *M. waterhousii*. 25 paratypes: 3 larvae, same data as holotype; 22 larvae, Camaguey Province, Cairije, Sierra Cubites, Cueva Bonita, 30 Oct. 1965, ex *M. waterhousii*.

Type depositories. The holotype and 18 paratypes (nos. C-539 to C-634) are deposited in ZIN; 4 paratypes (nos. C-537, C-538, and C-509) are deposited in PaÚ; 3 paratypes (nos. C-498 and C-572) are deposited in the collection of the senior author.

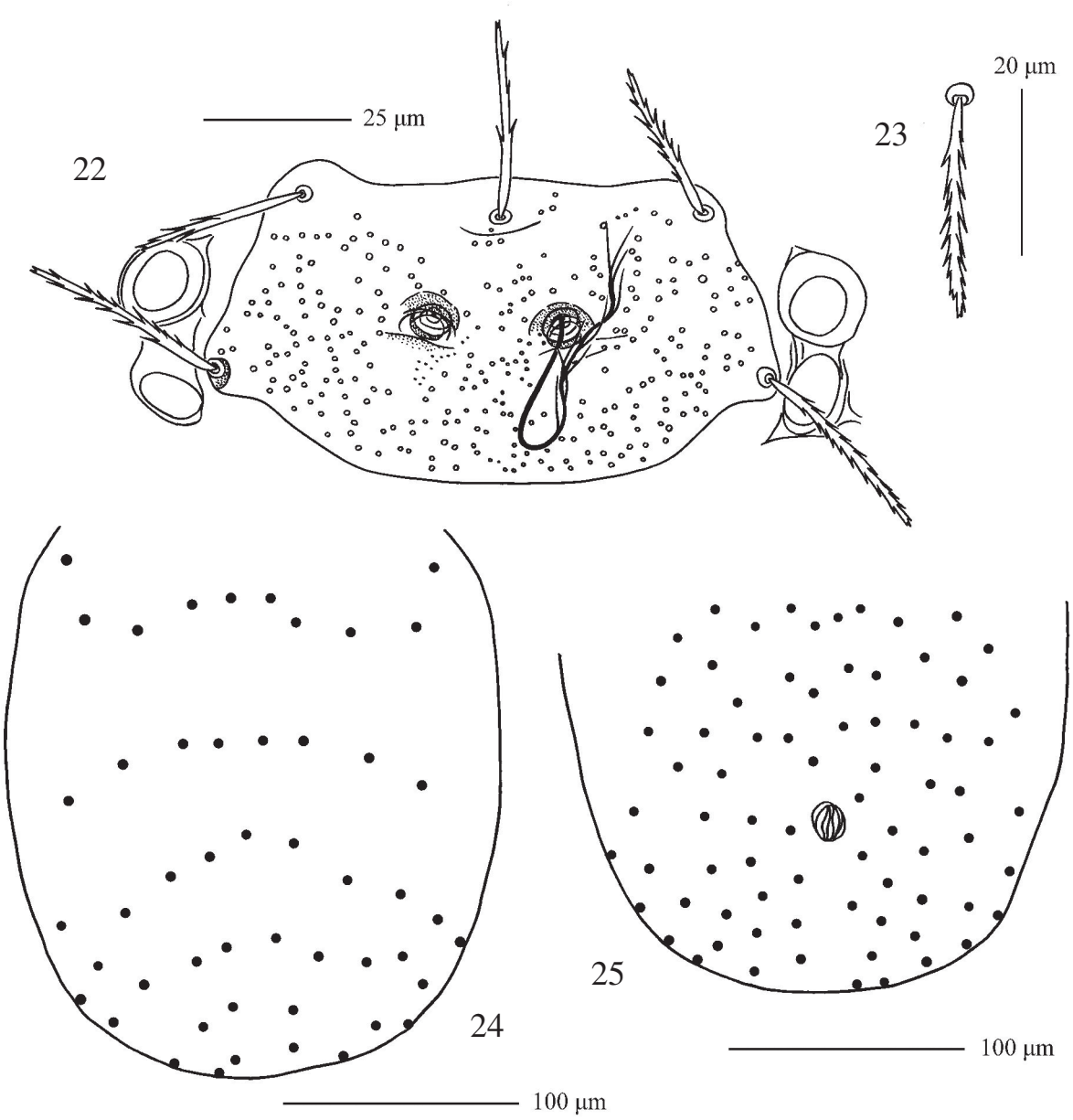
Etymology. The specific epithet is derived from the generic name of the host.

Differential diagnosis. The new species is similar to *Eltonella usitata* (Brennan, 1965) comb. n. and differs from it in having 4 posterior sternal setae versus 2 (fSt = 2.4 versus 2.2), 8 setae in 1st posthumeral row versus 6, more numerous idiosomal setae (DS = 49–58, VS = 74–91, NDV = 123–147 versus 40, 60, and 100 respectively), and somewhat wider scutum (AW = 65–71 versus 60, PW = 86–94 versus 80).

Standard measurements of the type series (n = 9)

	AW	PW	SB	ASB	PSB	SD	P-PL	AP	AM	AL	PL	H
Holotype	68	94	22	25	29	54	18	31/33	32	29	34/35	35
Minimum	65	86	22	24	24	50	15	25	30	25	31	34
Maximum	71	94	26	30	29	55	19	35	36	31	38	39
Mean	68	90	25	27	26	52	17	31	33	28	35	36

D	V	pa	pm	pp	Ip	DS	VS	NDV	TaIII	TaW
14−28	14−20	275	243	263	781	49	74	123	71	12
14−28	14−20	266	218	247	731	49	74	123	61	12
19−36	16−22	290	252	266	806	58	91	147	72	14
17−32	16−21	277	239	259	776	53	84	137	69	13



Figs 22–25. *Eltonella macroti* sp.n., holotype. 22 — scutum and eyes; 23 — dorsal idiosomal seta of 1st row; 24 — arrangement of dorsal idiosomal setae; 25 — arrangement of ventral idiosomal setae.

Eltonella usitata (Brennan, 1965), comb. n.

Brennan 1965b: 81–83, fig. 2 (*Trombicula*; Texas; holotype and paratype in the chigger collection of the US National Museum).

Hosts. *Mormoops megalophylla* (Peters, 1864) (Chiroptera, Mormoopidae), *Phyllonycteris poeyi* Gundlach, 1860 (Chiroptera, Phyllostomidae) (first record).

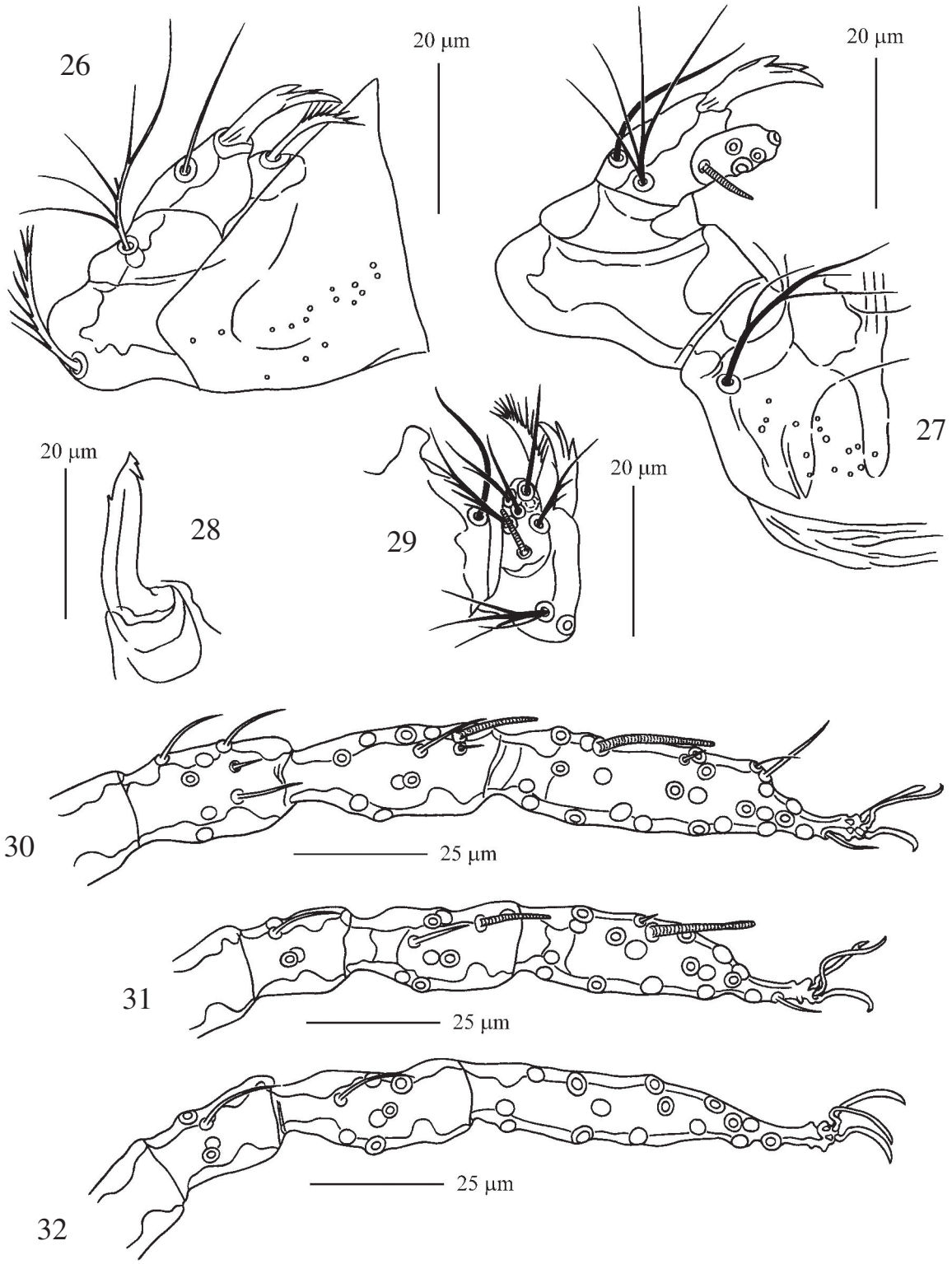
Distribution. USA: Texas (Brennan 1965b); Netherlands Antilles: Curaçao (Brennan 1967); Cuba (first record).

Material examined. 1 larva, Sancti Spiritus Province, Mayajigua, Cueva de Colón, 9 June 1965, ex *Ph. poeyi*.

Remark. We place the species *Trombicula usitata* Brennan, 1965 into the genus *Eltonella* Audy, 1956 following the classification proposed by Vercammen-Grandjean (1965). The cited work contains a statement that it is not to be regarded as a publication, thus, according to the International Code of Zoological Nomenclature (4th ed., Articles 8.2 and 11.1), all nomenclatural acts contained in it (including the combination *Eltonella usitata*) are not available.

Loomisia univari (Brennan, 1965)

Brennan 1965a: 110–112, fig. 4 (*Trombicula*; Arizona; holotype in the chigger collection of the US National Museum, paratypes in the Natural



Figs 26–32. *Eltonella macroti* sp.n. 26 — dorsal aspect of gnathosoma; 27 — ventral aspect of gnathosoma; 28 — cheliceral blade; 29 — ventral aspect of palpal tibia and tarsus, galeal seta; 30 — leg I; 31 — leg II; 32 — leg III.

History Museum, London, Australian National Insect Collection, and in other depositories).

Hosts. *Pipistrellus hesperus* (Allen, 1864), *Plecotus townsendii* Cooper, 1837, *Antrozous pallidus* (Conte, 1856) (Chiroptera, Vespertilionidae) (Brennan 1965a), *Macrotus waterhousii* (Chiroptera, Phyllostomidae) (first record).

Distribution. USA: Arizona (Brennan 1965a) and Nevada (Brennan and Reed 1972); Cuba (first record).

Material examined. 2 larvae, Camaguey Province, Cairije, Sierra Cubites, Cueva Bonita, 30 Oct. 1965, ex *M. waterhousii*.

Hoffmanniella beltrani (Hoffmann, 1949)

Hoffmann 1949: 186–189, figs 1–5 (*Trombicula*; Mexico; holotype and paratypes in Colección Nacional de Ácaros, Instituto de Biología, UNAM, México, D.F.). — *tincali* Vercammen-Grandjean 1964: 305–307, fig. (*Pseudoschoengastia*; Guatemala; holotype in the chigger collection of the US National Museum).

Hosts. *Lasiurus borealis* (Müller, 1776) (Chiroptera, Vespertilionidae), *Balantiopteryx plicata* Peters, 1867 (Chiroptera, Emballonuridae), *Mormoops megalophylla* (Peters, 1864) (Chiroptera, Mormoopidae), *Artibeus aztecus* Andersen, 1906, *A. hirsutus* Andersen, 1906, *Glossophaga soricina* (Pallas, 1766), *Macrotus californicus* Baird, 1858 (Chiroptera, Phyllostomidae) (Hoffmann 1990), *Macrotus waterhousii* (Chiroptera, Phyllostomidae) (first record).

Distribution. USA: Arizona and California (Webb and Loomis 1977); Mexico (Hoffmann 1949, 1990); Guatemala (Goff and Brennan 1982); Cuba (first record).

Material examined. 4 larvae, Camaguey Province, Cairije, Sierra Cubites, Cueva Bonita, 30 Oct. 1965, ex *M. waterhousii*.

Remark. The emendation *tiucali* proposed by Brennan (1969) for *tincali* and accepted by Goff and Brennan (1982) is an unjustified emendation, according to the International Code of Zoological Nomenclature (4th ed., Article 32.5.1).

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