TO THE FAUNA OF CHIGGER MITES (ACARI: TROMBICULIDAE) PARASITIZE BATS IN CUBA

BY M. DANIEL* and A.A. STEKOL'NIKOV**

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TAXONOMY
CHIGGERS
ACARI. PARASITES
BATS. CUBA.

SUMMARY: Three new species, *Microtrombicula cernyi* n. sp., *M. septemsetosa* n. sp. and *Myotrombicula dusbabeki* n. sp., are described from bats collected in Cuba. One species, *M. boneti* (Hoffmann, 1952), is recorded for the first time in Cuba and on several new host genera and species.

TAXINOMIE
TROMBICULIDÉS
ACARI. PARASITES
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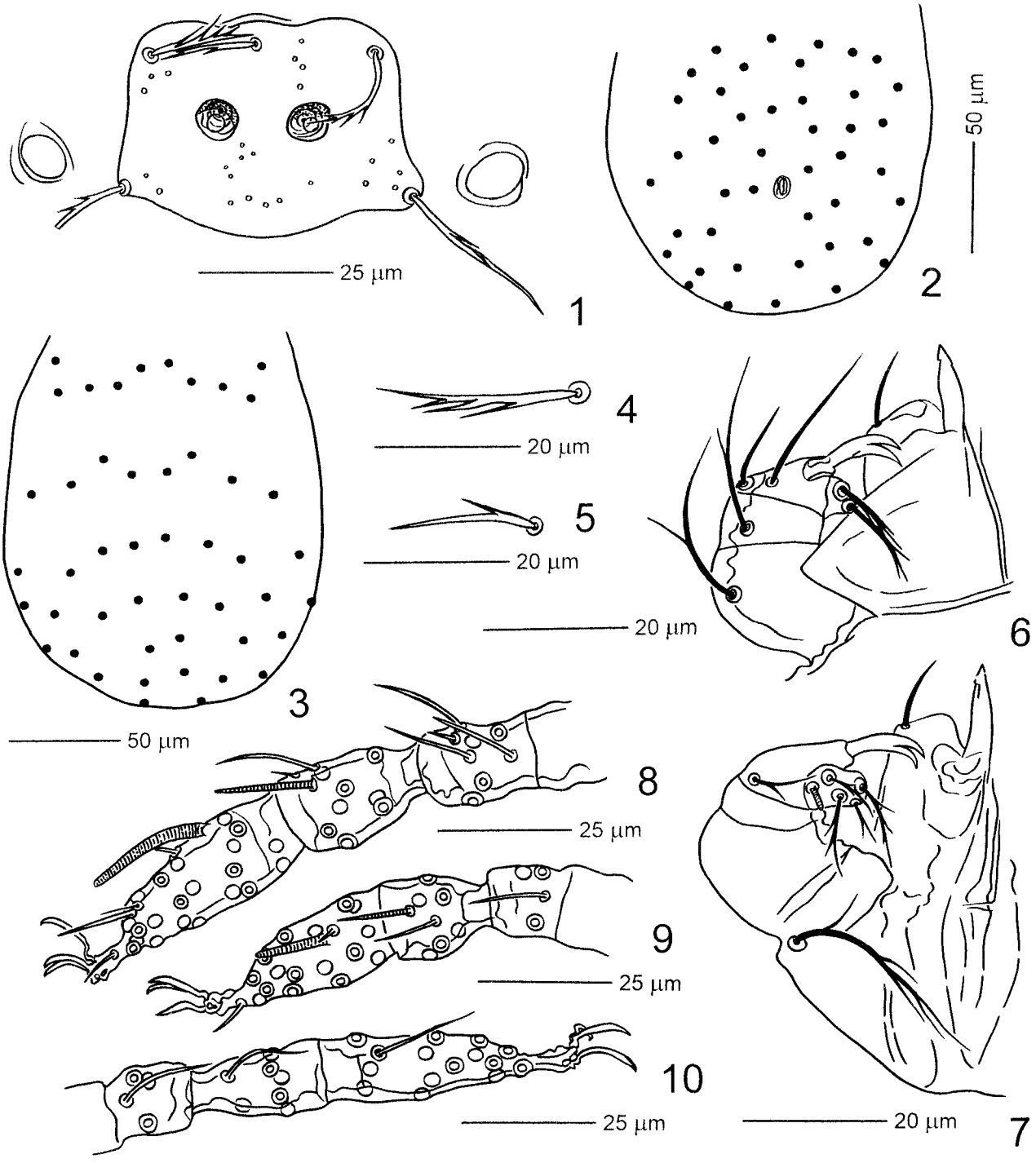
RÉSUMÉ : Trois espèces nouvelles *Microtrombicula cernyi* n. sp., *M. septemsetosa* n. sp. and *Myotrombicula dusbabeki* n. sp. sont décrites sur des chauve souris de Cuba. Une espèce *M. boneti* est signalée de Cuba pour la première fois sur plusieurs nouveaux hôtes (genres et espèces).

The present paper continues a systematic study of the chigger mites collected in Cuba by joint expeditions of the Institute of Parasitology, Czechoslovak Academy of Sciences and the Institutes of Biology, Zoology, and of Ecology and Systematics, Academy of Sciences of Cuba, briefly characterized by DE LA CRUZ and DANIEL (1994). The team of chiggers collectors included Drs. V. CERNY, M. DANIEL, F. DUSBABEK, F. GREGOR, J. RYBA (Czechoslovak Academy of Sciences), R. ABREU, J. DE LA CRUZ, N. CUERVO, A.A. SOCARRÁS, A. CAMACHO and R. BORROTO (Academy of Sciences of Cuba). But individual collectors are not noted in particular collections in the field protocols. Therefore, the collector names are not individually included also in the present article. The chiggers were collected in 1965–1966 from bats. Hosts were determined by Dr. G. SILVA-TABOADA.

The present paper includes descriptions of 3 species new to science and 1 species new to Cuban fauna. Three of included species belong to the genus *Microtrombicula* Ewing, 1950 and one to the genus *Myotrombicula* Womersley et Heaslip, 1943, although it also has *Microtrombicula*-like face. *Microtrombicula* is large, almost worldwide distributed genus, not found only in Australian zoogeographical region. According to a last review (KUDRYASHOVA, 1998) it includes 114 species, mainly from Ethiopian region. Most part of American *Microtrombicula* parasitize bats. Previously this genus was not reported from Cuba. *Myotrombicula* includes about 15 species, all of which are bat parasites (KUDRYASHOVA, 1998). The question, whether this genus is distributed in the Western Hemisphere, depends on notions of its composition and diagnosis, which are not generally accepted. Previously a non-identified species of *Myotrombicula* was reported from Cuba (DUSBABEK, 1970), but it can be a member of the genus *Perates* Brennan et Dalmat, 1960, which was included

* School of Public Health, Institute for Postgraduate Medical Education, Ruska 85, 100 05 Prague 10, Czech Republic. E-mail: daniel@ipvz.cz.

** Zoological Institute, Russian Academy of Sciences, Universitetskaya emb. 1, Saint-Petersburg, 199034, Russia. E-mail: acari@zin.ru, http://www.zin.ru/labs/parasites.



FIGS 1–10: *Microtrombicula cernyi* n. sp., larva.

1. — Scutum and eyes. 2. — Arrangement of ventral idiosomal setae. 3. — Arrangement of dorsal idiosomal setae. 4. — Dorsal idiosomal seta. 5. — Ventral idiosomal seta. 6. — Dorsal aspect of gnathosoma. 7. — Ventral aspect of gnathosoma. 8. — Leg I. 9. — Leg II. 10. — Leg III.

into *Myotrombicula* by VERCAMMEN-GRANDJEAN (1965b, 1968).

MATERIALS AND METHODS

Mites were mounted in Hoyer's medium or in de Faure-Berlese's medium. All measurements are in micrometres (μm). In the tables, "N" indicates sample size for those structures measured. If some structure is unpaired, this number coincides with the number of specimens measured (excluding those in which the structure was damaged or distorted and could not be measured). In other case N is about twice the number of specimens measured. Terminology follows that of GOFF *et al.* (1982), with some adaptation: "ventral setae" (V) are setae on the ventral surface of idiosoma excluding coxal and sternal setae; VS — number of ventral setae; D — dorsal idiosomal setae; DS — number of dorsal idiosomal and humeral setae; TaIII — length of leg III tarsus; TaW — width of leg III tarsus. The specimens examined are deposited in the Zoological Institute of the Russian Academy of Sciences, Saint-Petersburg (ZIN), the acarological collection of the Institute of Parasitology, Academy of Sciences of Czech Republic, Ceské Budejovice, and in the acarological collection of the senior author.

Genus *Microtrombicula* Ewing, 1950

Microtrombicula cernyi n. sp.

(FIGS 1–10)

Diagnosis: SIF=6B-N-2-3111.1000; fPp=B/B/NNB; fCx= 1.1.1; fSt=2.2; fSc: PL>AM>AL; Ip=534; fD=2H-8-8-8-...; DS=45; VS=43; NDV=88.

Description. *Larvae*. Idiosoma. Eyes 2. One pair of humeral setae; 41–45 dorsal idiosomal setae having few strong barbs, arranged 8-8-8-... (in holotype 8-8-8-11-4-2, in paratype 8-8-8-8-6-5-2); 2 pairs of sternal setae and 42–43 ventral setae; total idiosomal setae 85–90. Gnathosoma. Cheliceral blade with tricuspid cap; cheliceral base with lateral angle; gnathobase with a pair of branched setae; galeala nude; palpal claw 2-pronged; setae on palpal femur and genu each with one branch; palpal tibial setae: dorsal and lateral setae nude, ventral seta with one branch; palpal tarsus with 6 branched setae and tarsala. Scutum. Sparsely punctate, subpentagonal, with biconcave anterior margin and rounded posterior margin; AM base slightly anterior to level of AL bases; SB between levels of AL and PL bases; PL>AM>AL; sensilla broken in both specimens examined. Legs. All 7-segmented, terminating in a pair of claws and a clawlike empodium. Non-specialized setae of legs with few barbs or sometimes nude. Leg I: coxa with 1 non-specialized seta (1B); trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus 21B, tarsala, microtarsala, subterminala, parasubterminala, pretarsala. Leg II: coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus 16B, tarsala, microtarsala, pretarsala. Leg III: coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus 14B, mastitarsala.

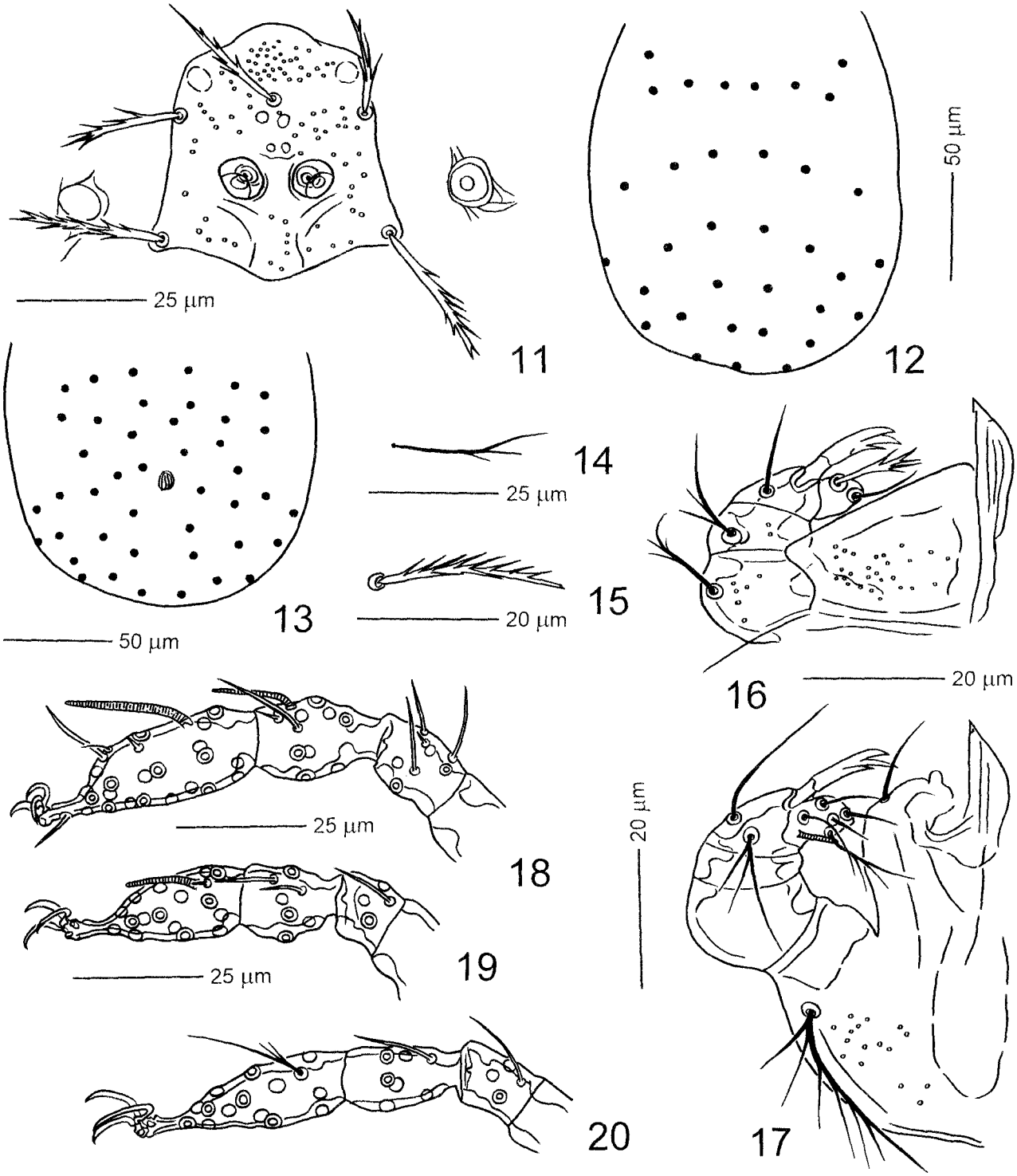
Standard measurements

	AW	PW	SB	ASB	PSB	SD	P-PL	AP	AM	AL	PL	H
Holotype	41	53	16	16	22	38	11	26	-	20	30	32
Paratype	43	56	15	18	25	40	12	28	24	-	32	31

D	V	pa	pm	pp	Ip	DS	VS	NDV	TaIII	TaW
20-29	14-23	194	164	184	542	43	42	85	48	11
20-29	14-23	193	157	176	526	47	43	90	49	11

Differential diagnosis: The new species is similar to *M. carmenae* (Brennan et Jones, 1960) and differs from this species in fPp=B/B/NNB against B/B/BNB, palpal claw 2-pronged against 3-pronged, eyes 2 against 2 + 2, fPp=2H-8-8-8-... against 2H-6-6-6-4-2-2 and greater number of idiosomal setae (NDV= 85-90 against 58). Morphometric features are lesser than in type material of *M. carmenae,* but are in good agreement with those ones in the material of this species from Costa Rica (WEBB, LOOMIS, 1971). ***M. cernyi*** n. sp. is also similar to *M. paralios* Webb et Loomis, 1970 and differs from this species in fPp= B/B/NNB against B/B/BBB, eyes 2 against 2 + 2, scutum sparsely punctate against moderately punctate, fPp=2H-8-8-8-... against 2H-6-6-6-4-4-2 and greater number of idiosomal setae (NDV=85-90 against 70).

Host: *Pteronotus quadridens* (Gundlach, 1840).



FIGS 11–20: *Microtrombicula septemsetosa* n. sp., larva.

11.— Scutum and eyes. 12.— Arrangement of dorsal idiosomal setae. 13.— Arrangement of ventral idiosomal setae. 14.— Sensillum. 15.— Dorsal idiosomal seta. 16.— Dorsal aspect of gnathosoma. 17.— Ventral aspect of gnathosoma. 18.— Leg I. 19.— Leg II. 20.— Leg III.

Type data: Holotype (C-454, T-Tr.-16) and 1 paratype (larvae), Habana Province, Guanajay, Cueva de William Palmer, 12 Aug. 1965, from *Pt. quadridens*. The both type specimens are deposited in ZIN.

Etymology: The species is named in honor of Dr. V. CERNY, one of the main collectors.

Microtrombicula septemsetosa n. sp.

(FIGS 11–20)

Diagnosis: SIF=6BS(7B?)-N-3-3111.1000; fPp= B/B/NNB; fCx= 1.1.1; fSt=2.2; fSc: PL>AM>AL; Tp=495; fD=2H-6-6-6-4-...; DS=35; VS=46; NDV =81.

Description. *Larvae*. Idiosoma. Eyes 2. One pair of humeral setae; 26–40 dorsal idiosomal setae covering with barbs of medium size, arranged 6-6-6-4-... (in holotype 6-6-6-4-8-3); 2 pairs of sternal setae and 37–57 ventral setae; total idiosomal setae 69-93. Gnathosoma. Cheliceral blade with tricuspid cap; cheliceral base sparsely punctate, with lateral angle; gnathobase sparsely punctate, bearing a pair of branched setae; galeala nude; palpal claw 3-pronged; setae on palpal femur and genu with few branches; palpal tibial setae: dorsal and lateral setae nude, ventral seta with few branches; palpal tarsus with tarsala, thick branched dorsal seta and other 6 setae (one of which probably is a subterminala), nude or having 1–2 ciliae. Scutum. Sparsely punctate, subhexagonal, with convex rounded anterior and angular posterior margins, having anterolateral shoulders; AM base anterior to level of AL bases; SB between levels of AL and PL bases; PL>AM>AL; sensilla flagelliform with 2 branches. Legs. All 7-segmented, terminating in a pair of claws and a 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 (24 μm long), microtarsala, subterminala, parasubterminala, pretarsala. Leg II: coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus 16B, tarsala (14 μm long), microtarsala; pretarsala absent. Leg III: coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B; genu 3B, genuala; tibia 6B, tibiala; tarsus 15B (mastitarsala replaced with branched seta). Standard measurements of holotype: AW=35, PW=42, SB=12, ASB=27, PSB=20, SD=47, P-PL=8, AP=23, AM=25, AL=20, PL=28, H=27, D=16-27, DS=35, VS=42, NDV=77.

Standard measurements

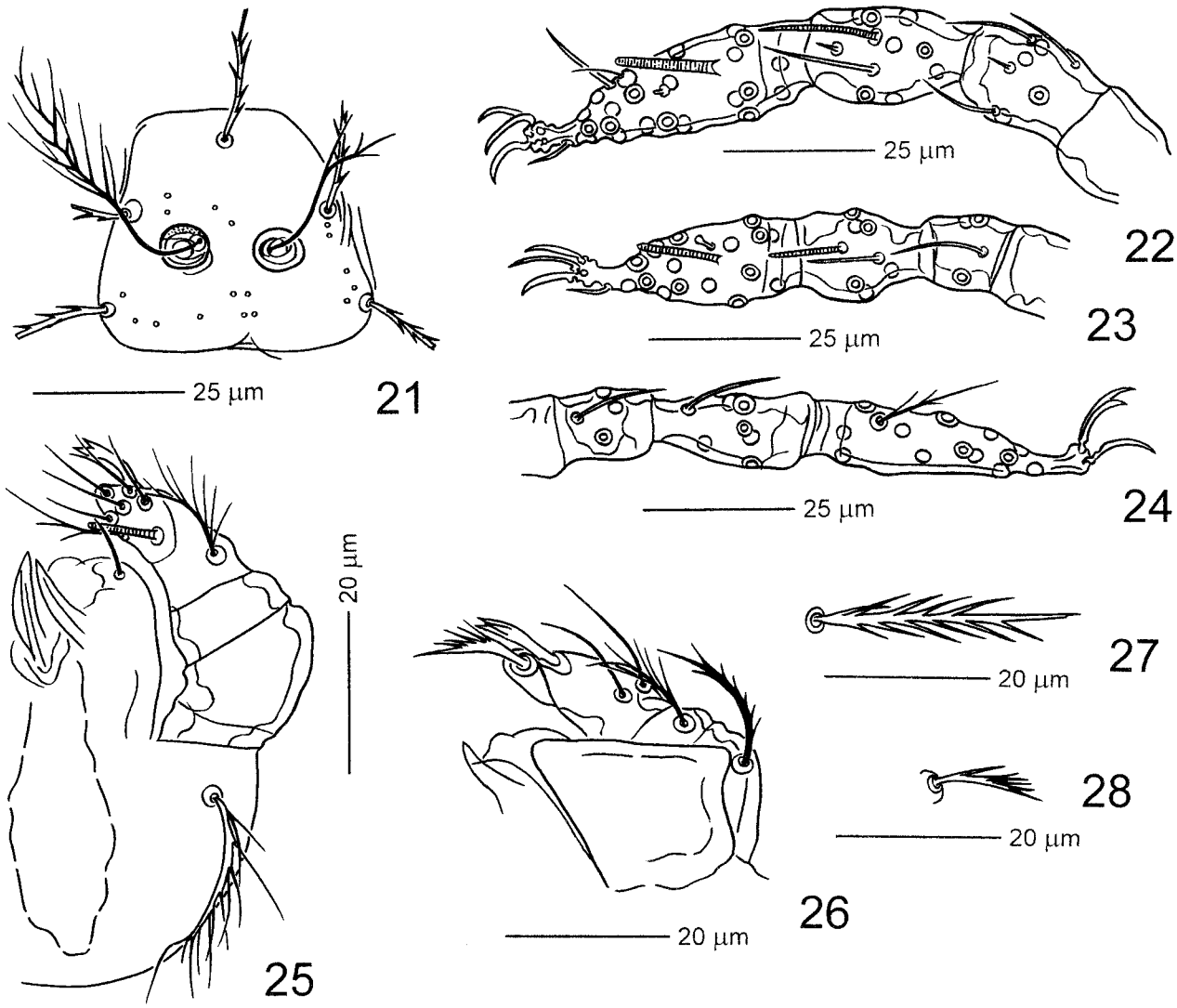
	AW	PW	SB	ASB	PSB	SD	P-PL	AP	AM	AL	PL	H
Min	34	42	11	25	20	45	8	18	20	18	27	27
Max	39	44	14	29	24	53	11	26	25	21	30	31
m	36	43	12	28	22	50	10	23	22	19	28	29
N	7	7	7	7	7	7	7	14	7	12	14	12

D	V	pa	pm	pp	Ip	DS	VS	NDV	TaIII	TaW
16-27	12-20	176	142	151	470	28	37	69	43	11
21-29	-	191	158	171	520	42	57	93	47	11
19-28	-	182	149	164	495	35	46	81	46	11
7	1	4	4	4	4	8	8	8	3	3

Differential diagnosis: *M. septemsetosa* n. sp. differs from all other *Microtrombicula* in having additional seta on palpal tarsus (fT=6BS or 7B against 6B). The new species is similar to *M. sturnirae* Webb et Loomis, 1971 and differs from this species in absence of pretarsala II, much longer tarsala I (24 against 12–15), eyes 2 against 2 + 2, very convex anterior margin of scutum, nude dorsal and lateral palpal tibial setae (fPp=B/B/NNB against B/B/BBB), 4 setae in 4th row of D (against 6) and shorter legs (Ip=470–520 against 518–580). *M. septemsetosa* n. sp. is also similar to the members of the genus *Cypticula* Webb et Loomis, 1970, in having no pretarsala II, but differs in 3 genualae I (against 1–2), scutum not reticulate, and palpotibial claw 3-pronged (against 2-pronged).

Hosts: *Natalus lepidus* (Gervais, 1837), *Phyllonycteris poeyi* Gundlach, 1860, *Pteronotus macleayii* (Gray, 1839), *Pt. quadridens*.

Type data: Holotype larva (C-366, T-Tr.-17), Pinar del Rio Province, Vinales, Cueva del Indio, 20 Aug. 1965, from *Pt. quadridens*. 34 paratypes: 12 larvae, same data; 5 larvae, Habana Province, Guanajay, Cueva de William Palmer, 12 Aug. 1965, from *Pt. quadridens*, 3 larvae from *Nat. lepidus*, other data same; 11 larvae, Isla de Pinos, 26 June 1965, from *Ph. poeyi;* 1 larva, Sancti Spiritus Province, Yaguajay, Cueva de Colón, 25 Apr. 1965, from *Pt. macleayii*, 1 larva, Matanzas Province, Camarioca, Cueva de Santa Catalina, 3 Aug. 1965, from *Ph. poeyi*; 1 larva, Habana Province, Tapaste, Cueva del Indio, 24 May 1965, from *Ph. poeyi*.



Figs 21–28: *Myotrombicula dusbabeki* n. sp., larva.

21. — Scutum. 22.— Leg I. 23.— Leg II. 24.— Leg III. 25. — Ventral aspect of gnathosoma. 26. — Dorsal aspect of gnathosoma. 27. — Dorsal idiosomal seta. 28. — Ventral idiosomal seta.

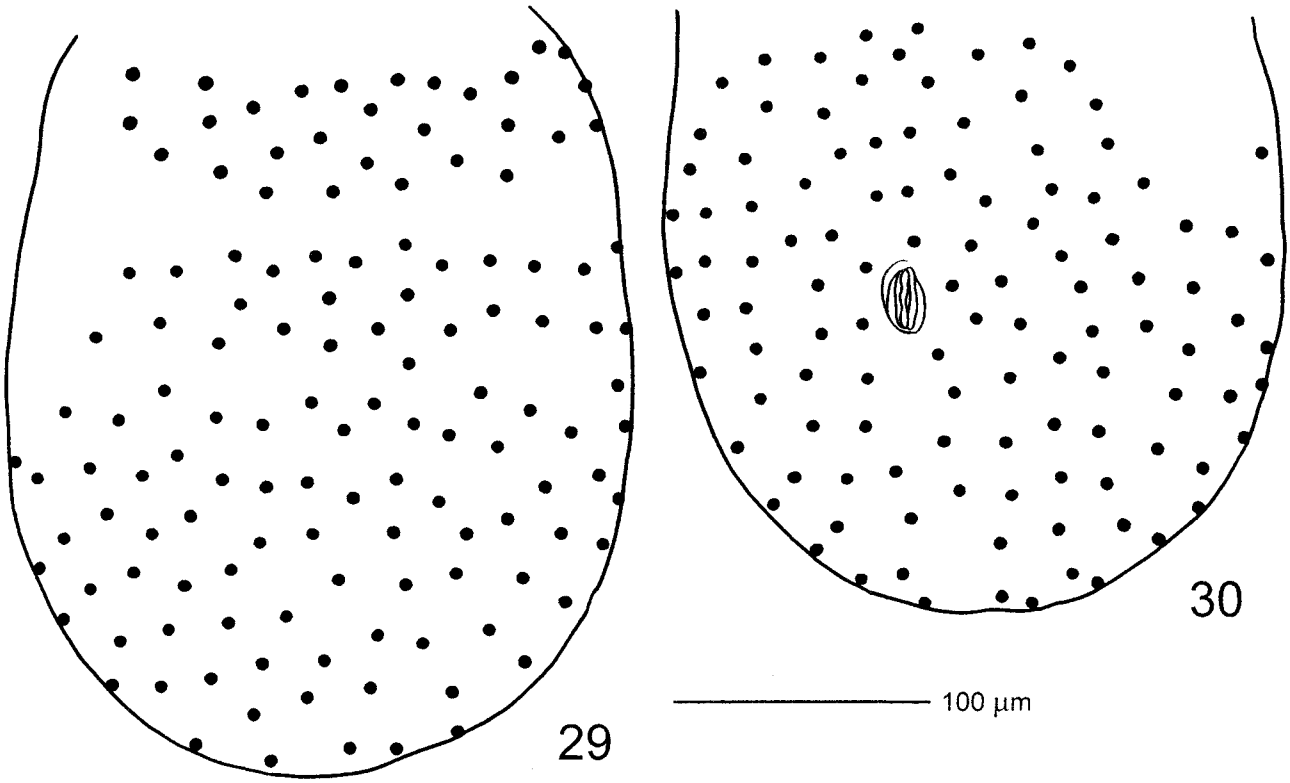
The holotype and 29 paratypes are deposited in ZIN; three paratypes are deposited in the Institute of Parasitology, Academy of Sciences of Czech Republic; two paratypes are deposited in the collection of the senior author.

Etymology: The species name "*septemsetosa*" is referred to the presence of 7 setae on palpal tarsus, except tarsala.

Remarks: The placing of this species into the genus *Microtrombicula* is provisional. The presence of 7 setae on palpal tarsus, except tarsala, and shape of anterior scutal margin are unique within this genus. Possibly, after next revision *M. septemsetosa* n. sp. will be selected from *Microtrombkula* to form a separate genus.

Microtrombicula boneti (Hoffmann, 1952)

HOFFMANN, 1952: 87 [*Trombicula (Trombicula)*]; VERCAMMEN-GRANDJEAN, 1965a: 55, Pl. B [*Eltonella*



FIGS 29-30: *Myotrombicula dusbabeki* n. sp., larva.
29. — Arrangement of dorsal idiosomal setae. 30.— Arrangement of ventral idiosomal setae.

(Coecicula)]; WEBB, LOOMIS, 1971: 9; HOFFMANN, 1990: 89, fig. 51. — *tibbettsi* Brennan et White, 1960: 348 *(Trombicula)*; VERCAMMEN-GRANDJEAN, 1965a: 56, Pl. HH [*Eltonella (Coecicula)*].

Diagnosis: SIF=6B-B-3-3111.0000; fPp=B/B/NNB; fCx= 1.1.1; fSt=2.2; fSc: PL>AM>AL; Ip=662; fD=2H-6-6-6-4-6(8)-...; DS=35; VS=40; NDV=75.

Standard measurements

	AW	PW	SB	ASB	FSB	SD	P-PL	AP	AM	AL	PL	H
Min	51	65	17	21	23	44	18	18	31	21	31	32
Max	55	73	21	24	28	52	22	27	39	27	43	44
m	53	70	19	23	26	48	20	21	35	24	38	39
N	6	6	6	6	6	6	6	12	6	9	12	12

D	V	pa	pm	pp	Ip	DS	VS	NDV	TaIII	TaW
22-33	17-26	218	185	198	603	33	36	72	50	13
25-41	18-26	250	216	238	702	37	45	82	63	14
24-37	18-26	239	204	219	662	35	40	75	58	13
6	3	6	6	6	6	6	6	6	6	6

Distribution: Alabama, Texas, Mexico, Costa Rica, Panama, Venezuela, Curacao, Trinidad, Bahamas. Recorded in Cuba for the first time.

Hosts: Previously reported from many species of mormoopid, natalid, phyllostomid and vespertilionid bats (HOFFMANN, 1990). New host genera: *Bvachyphylla* Gray, 1834 and *Phyllonycteris* Gundlach, 1860. New host species: *B. nana* Miller, 1902, *Natalus lepidus*, *Nat. micropus* Dobson, 1880, *Ph. poeyi*, *Pteronotusmacleayii*, *Pt.quadridens*.

Material examined: 8 larvae, Sancti Spiritus Province, Yaguajay, Cueva de Colón, 25 Apr. 1965, from *Pt. macleayii;* 4 larvae, Habana Province, Guanajay, Cueva de William Palmer, 12 Aug. 1965, from *Nat. lepidus;* 3 larvae from *Pt. quadridens* and 1 larva from *Ph. poeyi*, other data same; 6 larvae, Matanzas Province, Camarioca, Cueva de Santa Catalina, 3 Aug. 1965, from *Ph. poeyi;* 5 larvae, Isla de Pinos, Cerro de Guanabana, Cueva de los Lagos, 15 Jan. 1966, from *Pt. macleayii;* 4 larvae, Habana Province, Tapaste,

Cueva del Indio, 24 May 1965, from *Pt. quadridens;* 1 larva from *Nat. lepidus* and 1 larva from *Ph. poeyi*, other data same; 5 larvae, Sancti Spiritus Province, Yaguajay, Cueva Nova Caguane, 11 June 1965, from *Pt. quadridens;* 1 larva from *Pt. macleayii*, other data same; 1 larva, Sancti Spiritus Province, Mayajigua, Cueva de Colon, 9 June 1965, from *Ph. poeyi*; 1 larva, Isla de Pinos, Cuevas de Punta del Este, 16 Jan. 1966, from *Nat. micropus*; 1 larva, Isla de Pinos, 26 June 1965, from *Ph. poeyi*; *2* larvae, Habana Province, Tapaste, Cueva del Indio, 28 Dec. 1965, from *B. nana*.

Remarks: *M. boneti* exposes significant variations in morphometric features and some qualitative diagnostic characters. For palpal setae in this species the following conditions were reported: fPp=N/N/NNB (HOFFMANN, 1990), B/B/NNB (VERCAMMEN-GRANDJEAN, 1965a), B/B/BNB (WEBB, LOOMIS, 1971). In our material fPp=B/B/NNB. Sum of legs lengths, according to literary data, varied from 554 up to 826; width of scutum: PW=70–89; lengths of setae: PL=38–48; number of idiosomal setae: NDV=60–88. Thus, thorough taxonomic revision of this species is desirable.

Genus *Myotrombicula* Womersley et Heaslip, 1943

This genus is considered here as equal to subgenus *Myotrombicula* sensu Vercammen-Grandjean, 1968. Other taxa been included in this genus by the mentioned author (VERCAMMEN-GRANDJEAN, 1965b, 1968), namely *Alexfainia* Yunker et Jones, 1961, *Vergrandia* Yunker et Jones, 1961 and *Perates* Brennan et Dalmat, 1960, are considered as separate genera by many other authors (LOOMIS, 1969; BRENNAN, GOFF, 1977; HOFFMANN, 1990; KUDRYASHOVA, 1998).

Myotrombiculadusbabeki n. sp.

(FIGS 21–30)

Diagnosis: SIF=7B-N-3-3111.1000; fPp=B/B/NNB; fCx=1.1.1; fSt=2.4; fSc: PL>=AM>AL; Ip=513; fD=29-26-75; DS=130; VS=113; NDV=243.

Description. *Larvae*. Idiosoma. Eyes absent. 130 dorsal idiosomal setae densely covering with long barbs, arranged irregularly (only 1st and 2nd double rows consisting of, consequently, 29 and 26 setae can be separated); humeral setae not separated from dorsal setae; 1 pair of anterior and 2 pairs of posterior sternal setae, and 113 ventral setae; total idiosomal setae 243. Gnathosoma. Cheliceral blade simple; cheliceral base with lateral angle; gnathobase with a pair of branched setae; galeala nude; palpal claw 3-pronged; seta on palpal femur barbed, seta on palpal genu branched; palpal tibial setae: dorsal and lateral setae nude, ventral seta branched; palpal tarsus with tarsala, thick branched dorsal seta and other 6 non-specialized setae, nude or having 1–2 branches. Scutum. With few little punctae, trapezoidal, as wide as long, its anterior margin straight, posterior margin straight with small middle notch; AM base far anterior to level of AL bases; SB between levels of AL and PL bases, nearer to AL, than to PL; PL>=AM>AL; sensilla flagelliform with 12 long branches in distal 2/3. Legs. All 7-segmented, terminating in a pair of claws and a clawlike empodium. Leg I: coxa 1B; trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 3 genualae, microgenuala; tibia 8B, 2 tibialae, microtibiala; tarsus 22B, tarsala, microtarsala, subterminala, parasubterminala, pretarsala. Leg II: coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu 3B, genuala; tibia 6B, 2 tibialae; tarsus 16B, tarsala, microtarsala phalliform (with inflated apex), pretarsala. Leg III: coxa 1B; trochanter 1B; basifemur 2B; telofemur 2B; genu 3B, genuala; tibia 6B, tibiala; tarsus 15B (mastitarsala replaced with branched seta). Standard measurements of holotype: AW= 33, PW= 42, SB=12, ASB=22, PSB=18, SD=40, P-PL=7, AP= 16, AM=22, AL=16, PL must be about 20–25 (both setae with broken tips), S= 45, H= 28, D=12–22, V=11–19, pa= 189, pm= 155, pp= 169, Ip= 513, TaIII=44, TaW=9.

Differential diagnosis: The new species differs from all other *Myotrombicula* in the absence of eyes, simple cheliceral blade, greater number of idiosomal setae (NDV=243 against about 130–150), very small scutum, as wide as long (against scutum wider than long), small gnathosoma and short legs. These features, except lacking eyes, also differ this species from *Perates*. *M. dusbabeki* n. sp. resembles *M. aselliae* Vercammen-Grandjean, 1963 in phalliform microtarsala II and shape of scutum, but differs, in addition to the above features, in nude galeala, fPp=B/B/NNB against B/B/BBB, sensilla with 12 branches (against 4–5) and in other characters.

M. dusbabeki n. sp. resembles the single species of the genus *Vergrandia, V. galei* Yunker et Jones, 1961, in having most part of tarsal palpal setae nude and in size of scutum. The new species also resembles representatives of the genus *Microtrombicula*, in small size of most structures (scutum, gnathosoma, legs), and *Sasatrombicula (Traubiella) multisternalae* (Vercammen-Grandjean, 1963), in shape of scutum and sensilla, nude galeala, fPp=B/B/NNB and numerous setae (186 in *S. multisternalae).*

Host: *Pteronotus quadrìdens.*

Type data: Holotype (C-555, T-Tr.-18) larva, Habana Province, Guanajay, Cueva de William Palmer, 12 Aug. 1965, from *Pt. quadridens.* Holotype is deposited in ZIN.

Etymology: The species is named in honor of Dr. F. DUSBABEK, one of the main collectors.

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