Taxonomic studies of trombiculid mites

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TAXONOMIC STUDIES OF TROMBICULID MITES

Publications and Manuscript in lieu of Thesis
Presented to the Department of Zoology Brigham Young University

In Partial Fulfillment of the Requirements for the Degree Master of Science

by
Jack T. Reed
April 19, 1974
These publications and manuscript by Jack T. Reed and co-author are accepted in the present form by the Department of Zoology of Brigham Young University as satisfying the thesis requirement for the degree of Master of Science.

March 29, 1974
Date

Typed by: Pamela N. Zetterquist
ACKNOWLEDGMENTS

Grateful acknowledgment of their support and assistance is tendered Dr. V. J. Tipton, Dr. H. Duane Smith, and Dr. Don H. Larsen, members of my graduate advisory committee. I am most appreciative to Dr. Tipton, my committee chairman, for the financial support provided by research assistantships granted me during the course of study.

Particular recognition is given Dr. James M. Brennan, Research Entomologist, Rocky Mountain Laboratory, Hamilton, Montana, who suggested the course of research and assisted patiently in providing reference specimens, reprints, technical advice, and verification of chigger identifications. The sharing of authorship with Dr. Brennan on several publications is also greatly appreciated.

Dr. Dorald M. Allred and Dr. Stephen L. Wood, Brigham Young University, are held in sincere respect for their willing assistance in answering questions concerning systematics and format. I acknowledge also the patience, interpretive prowess, and excellent typing of Pamela N. Zetterquist who typed the manuscript.

I express my deeply felt love and gratitude to my wife, Carolyn, who patiently assisted in the inking of illustrations and sorting of data.
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The Subfamily Leeuwenhoekinae

in the Neotropics (Acarina: Trombiculidae)

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Abstract: The subfamily Leeuwenhoekinae is reviewed on the basis of neotropical representatives. The genus Odontacarus comprises 66% of the chiggers examined, and 82% of these were identified as O. tubercularis (Brennan). Odontacarus fieldi Brennan and Jones and O. cayolargoensis Brennan are synonomized under O. tubercularis (Brennan), 1952. The following genera are redescribed: Albeckia Vercammen-Grandjean and Watkins, Leeuwenhoekia Oudemans, Odontacarus Ewing, Sasacarus Brennan and Jones, Wagenaaria Brennan, and Whartonia Ewing. New species are: Odontacarus sunnianae, O. schoenesetosus, O. tiptoni, O. dienteslargus, O. tuberculohirsutus, O. comosus comosus, O. c. novemsetus, O. vergrandi, Whartonia angulascuta, and Sasacarus furmani panamensis. Odontacarus fieldi Brennan and Jones, 1961 and O. cayolargoensis Brennan, 1959, are synonomized under O. tubercularis Brennan, 1952. Keys to genera and species are included.
Introduction

The larval trombiculid mites of the subfamily Leeuwenhoekinae are parasitic on small mammals, reptiles, amphibians and occasionally birds. Representatives of the subfamily can be found world-wide and nine genera and subgenera are endemic to the neotropical region.

Since erection of Leeuwenhoekinae in 1944, revisionary works have been restricted either to discrete geographical areas other than the neotropics, or to discussions on the generic level only. A recent study of more than 15,000 chiggers from Venezuela has emphasized the need for a comprehensive review of the leeuwenhoekine chigger fauna from the neotropical region.

This paper is based on examination of more than 1,700 larvae from 8 genera and subgenera including 26 species, 10 of which are new. Supraspecific taxa are redescribed primarily on the basis of neotropical representatives, and specific redescriptions, with 3 exceptions, are based on type material. Figures are included if illustrations accompanying earlier descriptions are considered inadequate. Because of their preference for amphibian hosts, representatives of the genus Hannamania Oudemans, 1911, are not discussed.

Measurements, in addition to the standard measurements, include AMa—length of accessory branch on anterosubmedian scutal setae, AMB—the distance between the two anterosubmedian scutal setae, the distance between the two setae on coxa I, and the total length of the cheliceral blades. The length of the nasus is measured from the point of attachment of the projection to the scutum, and the length of the idiosoma is measured from the posterior margin of the cheliceral bases to the posterior margin of the idiosoma. A genuala formula indicates the number
of genualae per genu for legs I, II and III respectively, i.e. 2+, 1+, 1.
The "+" indicates presence of a microgenuala. A similar formula is
used to indicate the number of tibialae and microtibialae on legs I, II
and III. All measurements are in micrometers.

Acknowledgments

We gratefully acknowledge the assistance of personnel from the
Chicago Field Museum of Natural History, Chicago, and the Rijksmuseum
van Natuurlijke Historie, Leiden, Holland, for the loan of type
specimens. We are also thankful for the willful assistance of
Dr. Richard B. Loomis, California State University, Long Beach, Anita
Hoffmann, Instituto Politecnico Nacional, Mexico, D.F., and Dr. P. H.
Vercammen-Grandjean, G. W. Hooper Foundation, San Francisco, California.
Subfamily Leeuwenhoekiinae Womersley

Leeuwenhoekiinae Womersley, 1944:102 [Type genus: Leeuwenhoekia

Oudemans, 1912, original designation].


Leeuwenhoekiinae: Hsu and Wen, 1963:47; Vercammen-Grandjean et al.,

1973:60.

**Diagnosis:** Trombiculid larvae lacking palpotarsal subterminala,
with two anterosubmedian scutal setae, bisetose coxa I, leg segmentation
6-6-6*, microgenuala II present.

**Redescription:** Trombiculid larvae parasitic on small mammals,
reptiles, and occasionally birds. Scutum with pair of anterosubmedian
setae, 2 anterolateral and 2 posterolateral setae. Nasus present or
absent. Palpotarsus lacking subterminala. Eyes present. Leg
segmentation 6-6-6. Coxa I bisetose. Genu I, II, and III each with 4
branched setae. Leg I usually lacking parasubterminala. Microgenuala
II present. Trachea and spiracles present or absent.

**Key to the Genera**

1. Nasus present, spiracles and tracheae present. 2

Nasus lacking, spiracles and tracheae present or

absent. 3

2(1). Cheliceral blades with tricuspid cap only

*Leeuwenhoekia*

*One North American species of the genus Comatacarus has leg

segmentation 7-6-6, the femur and telefemur fused.*
Cheliceral blades with dorsal and or ventral rows of teeth

3(1). Tracheae and spiracles absent, palpotibial claw bifurcate

Wagenaaria

Tracheae and spiracles present, palpotibial claw with more than two furcations

4

4(3). Cheliceral blades with tricuspid cap only, basal inner margin of palpotibial claw denticulate

Sasacarus

Cheliceral blades with dorsal and or ventral rows of teeth, palpotibial claw not denticulate at base

5

5(4). Microgenualia and microtibialia stubby or clubbed, cheliceral teeth ventral only

Albeckia

Microgenualia and microtibialia spiniform, cheliceral teeth dorsal and ventral

Whartonia

Remarks: The subfamily was originally erected for Leeuwenhoekia verduni, 2 other species placed in that genus by Oudemans, and 5 species placed in the genus by Womersley in 1944. Womersley (1945) elevated the subfamily to full familial rank on the basis of tracheae and spiracles and included the type genus and 6 other genera. Familial rank was questioned by Wharton (1947) who considered the group as a trombiculid subfamily only. The group has recently been interpreted by Vercammen-Grandjean et al. (1973, chart) as having over 27 genera and subgenera, including 7 genera containing species identified from areas of the neotropics. Further division of the subfamily into tribes or assignment of the subfamily to a family other than Trombiculidae will not be discussed.
Genus *Leeuwenhoekia* Oudemans


**Diagnosis:** Larvae with spiracles and tracheae; nasus present, cheliceral blades with dorsal apical tooth only; subterminala and parasubterminala on leg one lacking. *Leeuwenhoekia* separates from the closely related genus *Comatacarus* Ewing, 1942 primarily by possessing tracheae and spiracles.

**Redescription of Genus:** Larvae neotropical, parasitic on small rodents and marsupials. Cheliceral blades with tricuspid cap only; palpotibial claw 5 pronged; palpal formula variable; galeala branched. Tracheae and spiracles present; scutum with broadly rounded posterior margin, sensillae probably flagelliform. 2 genualae I, genuala II and III, 2 tibialae I and II, tibiala III; coxa I bisetose, coxae II and III unisetose; mastisetae lacking, onychotriches present. Dorsal and ventral setae moderately branched, 2 sternals present.

**Key to *Leeuwenhoekia* species**

1. Sensillary bases anterior to posterolateral scutal setae, dorsal setae not bilaterally flattened. . . . . . . . . . . . *verduni*

2. Sensillary bases posterior to posterolateral scutal setae, dorsal setae bilaterally flattened. . . . . . . . . . . . *vercammeni*
Leeuwenhoekia verduni (Oudemans)

(Fig. 1)

Heterothrombidi um verduni Oudemans 1910:88. [Holotype-larva, ex Didelphis opossum, South Brazil; Rijksmuseum van Natuurlijke Historie, Leiden].


Diagnosis: L. verduni differs from L. vercammeni in slender form of, and fewer idiosomal setae, and tuberculate setal bases. Other differences may be noted from the following redescription.

Redescription of holotype: Unassisted redescription of the holotype is restricted by the poor state of preservation (see remarks below). Descriptive information from Oudemans (1912), and Fuller (1952), is therefore included and parenthetically identified. Idiosoma: Broad ovoid, engorged; length and width 520 and 540; eyes 2/2 in ocular plates, diameter: anterior 17, posterior 10. Body setae generally densely branched with short setules, setal bases tuberculate. DF may be considered 2 (humerals) 4-2-4-4-4-2 or 4-4-4-4-4-2. VF, 2 ventrals, 10-10-2 preanals, 2 para-anals, 4 postanals plus 6 similar to dorsals. Spiracles present, tracheae visible to posterior margin of idiosoma. Gnathosoma: Palpal formula BBNpNN (Fuller), palpal claw pentafurcate (Oudemans), trifurcate (Fuller). Palpotarsus with 5 branched setae, 1 nude seta and tarsala (Oudemans, Fuller). Galeala with 3 branches; cheliceral blades obscured but apparently with minute tricuspid cap. Scutum: Shaped as figured by Oudemans (1912, fig. R-3); sparsely punctate, PL stout but
non-clavate, anterior margin relatively straight, posterior margin broadly rounded medially. AW-61, PW-84, SB-38, ASB-ca. 23, PSB-ca. 20, ASMB-10, PL-84 (Fuller). Legs: Specialized setae as figured; coxal puncta small, sparse; tarsal claws with small barbs, empodium slender, lacking barbs. Leg index 818.

Distribution: Known only by the type specimen, South Brazil, E. A. Goldi collector.

Specimens examined: Holotype only.

Other records: None.

Remarks: The holotype, labeled apparently in Oudemans' handwriting, was observed to be in extremely poor condition, due perhaps to some attempt to remount the specimen. Only 2 legs remain attached to the idiosoma (3 others are widely separated in the medium), the palpi are missing, only 3 dorsal setae remain, and only a partial postero-lateral scutal seta remains on an anteriorly tipped scutum. The disputed furcation of the palpotibial claw, pentafurcate (Oudemans 1912:76) vs. trifurcate (Fuller 1952:237) cannot be resolved, nor can the number and kind of palpotarsal setae be verified. Both Oudemans and Fuller reported 5 branched setae and 1 nude seta plus a tarsala on the palpotarsus. Assuming that no nude palpotarsal setae other than the tarsala exist within the subfamily, Vercammen-Grandjean et al. (1973:61) report 6 branched setae plus a tarsala (Vercammen-Grandjean, 1973, personal correspondence). Since phase contrast microscopy was not available to Fuller or Oudemans, the number of setae on the palpotarsus may be in doubt. The difference in number of these setae reported for L. verduni
and *L. vercammeni* Brennan and Dalmat (5 branched and 1 nude as opposed to 7 branched) is therefore not considered grounds to place the 2 species in separate genera.
Leeuwenhoekia vercammeni Brennan and Dalmat

(Fig. 2)

Leeuwenhoekia vercammeni Brennan and Dalmat 1960:183. [Holotype-larva, Heteromys d. desmarestianus, Guatemala; Chicago Natural History Museum, Chicago].

Diagnosis: L. vercammeni is easily distinguished from L. verduni by the bilaterally flattened dorsal setae, atuberculate setal bases, and more numerous idiosomal setae.

Redescription: Idiosoma: Broad ovoid, engorged. Length and width of holotype 723 and 482. Eyes apparently single, diameter 12. Body setae somewhat bilaterally flattened, moderately branched, setal bases atuberculate; dorsal setae total about 87. Dorsal formula of paratype approximately 13-12-10-3-12-4-13-10-4-4-2. Ventral formula 2 sternals, 24 pre-anals, 36 postanals. Spiracles present; portions of tracheae visible to posterior idiosomal margin. Gnathosoma: Cheliceral bases moderately punctate, palpal formula B/B/NNB; palpotarsus 7B plus tarsala; galeala basally stout, with long branches; claw long, penta-furcate. Cheliceral blades 39μm long, apically curved with minute tricuspid cap. Scutum: Shaped as originally figured (Brennan and Dalmat 1960:184, fig. 1); AL's and PL's stout, with long apparently caducous setules. Measurements of holotype (measurements of one paratype given in parentheses): AW-98 (100), PW-93 (96), SB-38 (49), ASB-33, PSB-24, AP-27 (31), AM-38 (45), AL-- (ca. 56), PL-- (58+).

Legs: Coxae and specialized setae as originally figured. Genuala formula 2+,1+,1. Tibiala formula 2+,2,1. Branched setae per leg segment listed sequentially for legs I, II and III: Coxa 2,1,1; trochanter
1,1,1; femur 6,6,5; genu 5,4,4; tibia 8,6,6; tarsus 27,18,17. Leg index (paratype) 885.

**Distribution:** Known only from the holotype and 2 paratypes, Yepocapa, Chimaltenango, Guatemala.

**Specimens Examined:** Holotype and 2 paratypes, ex _Heteromys d. desmarestianus_, Yepocapa, Chimaltenango, Guatemala, 11.V.1948. Luis de la Torre, collector.

**Other Records:** None.

**Remarks:** Although only 3 specimens of the species exist for study, the close relationship of _L. vercammeni_ to _L. verduni_ is indicated by the form of cheliceral blades, stout scutal setae, and the presence of onychotriches.
Genus **Albeckia** Vercammen-Grandjean and Watkins


**Diagnosis:** Leeuwenhoekine larvae lacking nasus; tracheae and spiracles present. Cheliceral teeth ventral only.

**Generic Redescription:** Palpal tarsus 4B plus tarsala; palpal claw pentafurcate. Tricuspid cap on cheliceral blades with ventral row of teeth. Scutum lacking nasus; anterior margin sinuate, lateral margins concave, posterior margin broadly convex; sensillae flagelliform. Onychotriches present.

**Albeckia albecki** Vercammen-Grandjean and Watkins

**Albeckia albecki** Vercammen-Grandjean and Watkins 1966:74 [Holotype-larva, ex Antrozous pallidus pacificus, Salano Co., California; Rocky Mountain Laboratory, Hamilton, Montana].

**Diagnosis:** See generic diagnosis.

**Redescription:** (Based on paratype: Holotype data in parentheses from original description): **Idiosoma:** Ovoid. Length and width of paratype 665 and 427. Eyes 2/2 in plates, anterior 15 posterior 14 µm in diameter. Dorsal setae 43 to 60 µm, anterior rows irregularly placed, arranged approximately: 2 humerals (65 µm)-6-6-6-6-8-10-4-2. Setae densely branched, branches long and slender. Two sternals plus 30 slender pre-anals (including first postanals), shorter but similar to dorsals. Anus at fifth row of setae. Spiracles large, visible to posterior third of idiosoma. **Gnathosoma:** Cheliceral bases sparsely
punctate. Blades 28-40μm long with tricuspid cap and row of ventral anteroventrally. Palpal formula B/B/B/BB; femoral, genual and dorso-tibial densely branched, ventrotibial and laterotibial sparsely branched, branches long. Tibial claw pentafurcate. Tarsus 4B plus tarsala. Galeala sparsely branched. **Scutum**: Shaped as originally figured (one paratype shows minute anteromedian projection). Anterior margin sinuate, lateral margins concave, posterior margin broadly rounded. Scutal setae similar to dorsals, sensillae flagelliform; apical half sparsely branched, branches long, bases slightly anterior to PL's.

Measurements of paratype (measurements of holotype and 9 paratypes in parentheses—from original description) AW-74 (69), PW-85 (80), SB-32 (29), ASB-30 (28), PSB-18 (18), AP-25 (23), AMB-10 (10), AM-49 (44), AL-48 (44), PL-64 (63), S-- (66). **Legs**: All leg segments with few punctae. Genuala formula l+,l+,l; Tibiala formula 2+,2,1; micro-tibialae and microgenualae stubby. Tarsala I (11μm), spiniform micro-tarsala laterad of tarsala, sub- and parasubterminalae absent. Tarsala II (18μm) plus laterodistal spiniform microtarsala. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; Trochanter 1,1,1; Femur 6,5,4; Genu 4,4,4; Tibia 8,6,6; Tarsus 23,17,15. Distance between coxa I setae 34. Leg index 822.

**Distribution**: Venezuela and California.


Remarks: One paratype examined showed a small angulate projection on the scutum which appears to be a rudimentary nasus. According to Vercammen-Grandjean et al. (1966:76), this occurred on "several specimens in the type series of forty." The scuta of the Venezuela specimens did not possess this projection and were rounded laterally instead of possessing "broadly recessed" lateral margins. The Venezuelan specimens compared well with the type material examined in all other respects.
Genus Odontacarus Ewing


Diagnosis: Differs from other leeuwenhoekine genera by possessing nasus, spiracles, tracheae and dorsal and ventral rows of teeth on cheliceral blades.

Redescription: Larvae world-wide, parasitic on mammals, reptiles and birds. Cheliceral blade 30 to 100μm long with a row each of dorsal and ventral teeth, or a row of ventral teeth only (subgenus Tarsalacarus). Palpotibial claw with 3 to 4 prongs. Palpal formula B/B/NN^NN. Palpal tarsus 7B plus tarsala. Trachea and spiracles present. Scutum subpentagonal with broadly rounded to bluntly angulate posterior margin. Sensillae flagelliform. Coxa I bisetose, coxa II variable, coxa III unisetose. Mastitarsala III usually present. Genu I, II, and III with 4 branched setae. Femora I, II and III with 6, 5, and 4 branched setae respectively.
Key to Genera and Species

1. Tarsala III present, cheliceral blades with row of ventral teeth only (subgenus Tarsalacarus) ............ 15
   Tarsala III lacking, cheliceral blades with dorsal row and ventral row of teeth (subgenus Odontacarus) .... 2

2(1). Distance between anterosubmedian scutal setae bases less than or equal to 11µm, distance between coxae I setae less than 40µm ...................... 3
   Distance between anterosubmedian scutal setae bases greater than 11µm, distance between coxa I setae greater than 40µm ...................... 6

3(2). One genuala I, dorsal setae broad, with dorsal and ventral barbs obviously differentiated. ....... sunnianae n. sp.
   Two genualae I, dorsal setae not broader than thick. ... 4

4(3). Sensillae with long branches apically. .............. 5
   Sensillae with short barbs, full length. ... tubercularis

5(4). Host: Lizards, legs slender, onychotriches present, dorsal setae slender with oppressed barbs .. australis
   Host: Rodents and lagomorphs, onychotriches lacking, legs not slender, dorsal setae with stout, obvious barbs .. 
       .......................................................... mastigophorus

6(2). Cheliceral blades longer than 65µm ..................... 7
   Cheliceral blades shorter than 65µm ..................... 9

7(6). About 80 dorsal setae, stout with stout branches, postero- median dorsal setae short, sparsely barbed PL>AL>AM . 
       .......................................................... munchequensis
About 100 to 200 dorsal setae, relatively slender, posteromedian setae similar to lateral setae.

8(6). Nine branched setae on tibia I, 33 branched setae on tarsus I, sensillar bases considerably posterior to bases of posterolateral scutal setae.

\[\textit{schoenesetosus n. sp.}\]

Eight branched setae on tibia I, 23 branched setae on tarsus I, sensillar bases slightly posterior to bases of posterolateral scutal setae.

\[\textit{dienteslargus n. sp.}\]

9(6). Genuala II and III present, eyes subequal, about 15um in diameter.

\[\textit{kofordi}\]

Genuala II and III lacking, posterior eye smaller than anterior eye.

10(9). Scutum striate posteriorly, about 200 densely branched dorsal setae, 40 branched setae on tarsus I.

\[\textit{tuberculohirsutus}\]

Scutum nonstriate, 100-150 dorsal setae.

11(10). Branched tibial setae for legs I, II and III 9,7,7.

Branched tibial setae for legs I, II and III 8,6,6, or 9,6,6.

12(11). Coxa II bisetose, about 60 slender ventral setae (pre-anals).

\[\textit{tiptoni n. sp.}\]

Coxa II unisetose, about 36 slender ventral setae (pre-anals).

\[\textit{vergrandi n. sp.}\]

13(11). Tibia I with 8 branched setae.

\[\textit{comosus comosus n. ssp.}\]

Tibia I with 9 branched setae.

\[\textit{comosus novemsetus n. ssp.}\]
14(1). Palpal and dorsal setae heavily branched. . . . . bakeri

    Palpal and dorsal setae sparsely branched . . chiapanensis
Subgenus Odontacarus (Ewing)

Odontacarus Ewing, 1929:22 [Type species: Trombicula dentata Ewing].


**Diagnosis:** Larvae with dorsal and ventral rows of teeth on cheliceral blades, genuala III lacking, palpotibial claw trifurcate.

**Generic Redescription:** Larvae of medium to large size. Cheliceral blades 30 to 100µm long with dorsal and ventral rows of teeth. Palpotibial claws trifurcate. Palpal formula variable, $B/B/B_{NN/BB}$. Flagellum usually with small barbs. Tarsala III lacking. Mastitarsala present, usually barbed. Dorsal setae usually with 4 rows of branches.
Odontacarus australis (Ewing) (Fig. 3)

Trombicula australis Ewing, 1929b:10 [Holotype-larva, ex Tropidurus peruvianus, Lima, Peru: Rocky Mountain Laboratory, Hamilton, Montana];


Diagnosis: Differs from other members of the genus by the asymmetrically branched sensillae, length and form of idiosomal setae, length and slenderness of the legs, and onychotriches.

Redescription (Based on holotype. Data from Venezuelan specimen parenthetically included): Idiosoma: Ovoid. Length and width of holotype, 538 and 314. Eyes 2/2 in plates, anterior 13, posterior 12µm in diameter. Dorsal setae 34 to 44µm (26 to 38µm) tapering basally, setules delicate; arranged approximately: 2 (humerals, 59µm) -8-5-7-8-10 plus 12 posterior setae and 5 lateral setae per side not continuous with dorsal rows. Lateral setae longest, mid-dorsals shortest. Two sternals plus 50 ventrals, 32-39µm, longer posterolaterally; pre-anals and first postanal row with longer setules. Posterior ventrals similar to dorsals. Anus at fourth row of ventral setae. Spiracles large, adjacent to anterior margin of coxa I. Trachea broad, visible to posterior margin of idiosoma. Gnathosoma: Cheliceral bases moderately punctate, posterior punctae larger. Blades narrow, 47µm long, curved apically with 5 dorsal and 3 or more ventral teeth. Palpal formula B/B/B?, femoral, genual and dorsotibial setae moderately branched. Palpotibial claw of holotype obscured; claw of Venezuelan
specimens quadrifurcate with one large prong. Palpotarsal setae sparsely branched. Galeala with few barbs. **Scutum:** Shaped as figured. Moderately punctate medially, punctae faint. Anterior margin slightly sinuate, posterior margin angulate. Scutal setae moderately branched, similar to dorsals. Sensillae flagelliform with long branches, bases anterior to PL's. Measurements of holotype (measurements of Venezuelan specimens in parentheses): AW-73 (76), PW-90 (87), SB-24 (24), ASB-34 (30-33), PSB-31 (25-27), AP-37 (30), AMB-? (10), AM-52 (42), AL-42 (35), PL-59 (54), S-50+ (60). Nasus 8 x 19 (8 x 19). **Legs:** Coxae moderately to densely punctate; leg segments sparsely punctate, punctae large. Distance between coxae I setae 49µm. Legs long and slender, tarsal claws with onychotriches, empodia possibly with few. Specialized setae as figured. Branched setae per leg segment for legs I, II and III. Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,7,6; tarsus ?,17,15. Mastitarsala III barbed. Leg index 1130.

**Distribution:** Peru, Lima, and Venezuela, Zulia district.

**Specimens Examined:** Holotype, ex *Tropiduras peruvianus*, Lima, Peru, Apr., 1928, and 12 larvae, ex unidentified lizard, Zulia, Venezuela, June, 1968.

**Other Material:** None.

**Remarks:** The collection of *O. australis* in Venezuela is apparently the first record other than that of the type series. As indicated in the description, Venezuelan specimens differ from the type by shorter setae, nude galeala and fewer idiosomal setae. Tracheal configuration conforms well with the holotype. Although Brennan (1959).
described the palpal claw as trifurcate, Venezuelan specimens clearly show one large and three smaller prongs.
Odontacarus kofordi Brennan and Jones

Odontacarus kofordi Brennan and Jones, 1961:175 [Holotype-larva, ex Chinchillula sahamae, Puno, Peru; Rocky Mountain Laboratory, Hamilton, Montana].

**Diagnosis:** Differs from *O. tubercularis* and other species with tuberculate setal bases primarily by the form and number of idiosomal setae and the subequal anterior and posterior eyes.

**Redescription:** *Idiosoma:* Ovoid. Length and width of holotype; 576 and 316. Eyes 2/2, in plates, subequal, about 15µm in diameter. Dorsal and ventral setal bases tuberculate, 32-58µm, longer anterolaterally. Setae thick with stout setules, as figured. Total dorsal setae about 90, in uneven rows, humerals 62µm long. Two sternals and 38 slender pre-anals and postanals plus about 20 posteriorly, similar to dorsals. Anus at third row of ventrals. Spiracles large, adjacent to anterodistal margin of Coxa I. Tracheae visible to posterior margin of idiosoma.

*Gnathosoma:* Cheliceral bases densely punctate. Blades 44µm long with 5-6 small teeth dorsally and 5-6 irregularly spaced ventrally. Palpal formula B/B/BBB; femoral, genual and dorsotibial setae densely branched, latero- and ventrotibial with about 6 branches. Palpal tarsala 12µm, branched tarsal setae long with long setules. Palpotibial claw trifurcate, axial prong largest. Galeala with few barbs.

punctate, coxa II densely punctate, coxa III moderately to densely punctate; other leg segments sparsely punctate. Distance between coxa I setae 47. Parasubterminala I lacking. Femur I and II, genu III and tibia III with 1 or 2 long plumose setae. Specialized setae as originally figured. Genuala formula 2+,1,1; tibia I formula 2+,2,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,6,6; tarsus 22,17,15. Leg index 970.

**Distribution:** Puno, Peru, 4570m.

**Specimens Examined:** Holotype and 1 paratype, ex Chinchillula sahamae, Puno, Peru, May, 1951.

**Other Material:** 14 paratypes ex Chinchillula sahamae, Abrocoma cinerea, Punomys limminus, and Neotomys ebriosus, Puno, Peru, May, 1951 (Brennan and Jones 1961:175).
Odontacarus mastigophorus Brennan and Dalmat

Odontacarus mastigophorus Brennan and Dalmat, 1960:184 [Holotype-larva, unidentified bird, Acatenango, Guatemala; Rocky Mountain Laboratory, Hamilton, Montana].

Diagnosis: Separates from other Odontacarus spp. by possessing a mastitibiala III, and by the differentiated dorsal and ventral setules of the dorsal setae.

Redescription: Idiosoma: Ovoid. Length and width of holotype 189 and 163. Eyes 2/2 in plates, anterior 10, posterior 7µm in diameter. Setal bases normal. Dorsal setae with 2 rows of broad setules dorsally and 2 rows of widely spaced thornlike setules ventrally; 25 to 33µm long, longer posterolaterally; humerals 38; arranged approximately 2 (humerals)-8-6-6-10-10-8 +6 posterior setae and 4 anterolateral setae not continuous with the dorsal rows. Two sternals, 22 slender pre-anals, 26-29µm and 6 postanals similar to dorsals. Anus at third row of ventral setae. Spiracles prominent, adjacent to anterodistal margin of coxa I. Trachea visible to coxa III region (variable among specimens).

Gnathosoma: Cheliceral bases moderately punctate. Blades 36µm long with 5 dorsal teeth and a few small ventral teeth. Palpal formula B/B/BBB, all setae sparsely branched. Palpal tarsalae 6µm; tarsi with at least 5 long, sparsely branched setae. Tibial claws trifurcate, axial prong longest. Galealae with several barbs. Scutum: Shaped as originally figured with slightly sinuate anterior margin and broadly rounded posterior margin, lightly punctate medially. Scutal setae uniformly branched. Sensillae with long branches apically,
bases even with or slightly posterior to PL's. Measurements of holotype: AW-58, PW-71, SB-21, ASB-26, PSB-22, AP-21 to 23, AMB-8, AM-25, AL-32, PL-36, S-51. Nasus 6 x 15. Legs: Coxae apparently apunctate, other leg segments sparsely punctate. Distance between coxa I setae 32. Specialized setae as originally figured. Parasubterminala I lacking. Genuala formula 1+,0+,0. Tibiala formula 2+,2,0. Microsetae on Genu and Tibia stubby. Mastitibialae and Mastitarsalae III with 1 or 2 barbs. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,6,5; tarsus 20,16,13. Claws with pair of onychotriches per claw, empodium nude.

**Distribution:** Guatemala: Finca Armenia, Aldea Los Plantes and Acatenango, Chimaltenango.

**Specimens Examined:** Holotype and 1 paratype, ex bird (chickaroo), Chimaltenango, Mar., 1951; 4 paratypes ex *Sylvilagus floridanus chiapiensis*, Chimaltenango, Feb., 1951.

**Other Material:** Two paratypes and 23 specimens, ex *Sylvilagus floridanus chiapiensis*, and 1 ex unidentified wood rat, Chimaltenango, Guatemala.

**Remarks:** The original description lists 5 branched setae on the palpotarsus. The genus typically has 7. Since none of the 6 specimens observed showed the tarsus clearly, assignment of the species to the genus is not questioned. The difference in the dorsal and ventral setules of the dorsal setae is obvious and diagnostic.
Odontacarus munchiquensis Brennan

Odontacarus munchiquensis Brennan, 1968:679 [Holotype-larva, ex Oryzomys albigularis, Departamento del Cauca, Colombia; Rocky Mountain Laboratory, Hamilton, Montana].

**Diagnosis:** Differs from O. tuberculohirsutus n. sp. and other hirsute, tuberculate Odontacarus species primarily by the stout, sparsely branched posteromedian body setae.

**Redescription:** **Idiosoma:** Broad ovoid. Length and width of holotype: 490 and 407 (idiosoma split—hence measurements inaccurate). Eyes 2/2 in plates; anterior 14, posterior 11µm in diameter. Setal bases tuberculate. About 90 dorsal setae in uneven rows, 49 to 102µm, longer laterally, becoming more stout and with stouter branches posteromedially. Venter with two sternals, 44 slender pre-anals, 38-58µm, plus 28 stout posterior setae similar to dorsals. Spiracle prominent, adjacent to anterior margin of Coxa I. Tracheae traceable to area of Coxa III. **Gnathosoma:** Cheliceral bases densely punctate. Blades 70µm long with 8 teeth in dorsal row and about 19 in ventral row. Palpal formula B/B/BBB, latero- and ventrotibial setae with few branches, others moderately branched. Palpotarsal setae long, sparsely to moderately branched; tarsalae 13-15µm long. Tibial claws trifurcate, axial prong largest. Galeala with 1 or 2 barbs (broken on holotype). **Scutum:** Moderately punctate, punctae large. Shaped as originally figured, anterior margin mildly sinuate, posterior margin bluntly angulate. Scutal setae similar to dorsals. AM's apparently lacking accessory branch. Sensillae delicately barbed entire length, bases
posterior to PL's. Measurements of Holotype: AW-93, PW-116, SB-38, ASB-40, PSB-25, AP-30, AMB-15, AM-64, AL-76, PL-99, S-108. Nasus 19 x 12 (basally). Legs: All leg segments moderately punctate. Distance between Coxa I setae, 41. Parasubterminala I absent. Specialized setae as originally figured. Genuala formula 2+,0+,0; tibiala formula 2+,2,1. Microsetae spineform. Branched setae densely branched or plumose. Mastitarsala III barbed, broken on holotype. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,6,6; tarsus 27,17,14. Leg index 980.

Distribution: Colombia, Departamento del Cauca.

Material Examined: Holotype, ex, Oryzomys albigularis, Pena del Perro, Departamento del Cauca, Colombia, May, 1967.

Other Material: 10 paratypes, ex 4 Thomasomys cinereiventer, same area as holotype.

Remarks: The stubs of Mastisetae on tarsi III are evident on the holotype, and one is long enough to show a few indistinct barbs. The original description listed mastitarsala III as absent. The galeala, although appearing nude, shows nubbins which indicate broken setules.
Odontacarus tubercularis (Brennan)
(Fig. 4)

Acomatacarus tubercularis Brennan, 1952:145 [Holotype-larva, ex Heteromys anomalus anomalus, Araqua, Venezuela; Rocky Mountain Laboratory, Hamilton, Montana].


Odontacarus fieldi Brennan and Jones, 1961:105, New Synonomy: [Holotype-larva, ex Zygodontomys cherriei, Fort Robbe, Panama Canal Zone; Rocky Mountain Laboratory, Hamilton, Montana]. Brennan and Yunker, 1966:224.


Diagnosis: Odontacarus tubercularis differs from all other neotropical species of the nominate subgenus by the following combinations of characters. Distance between coxa I setae less than 40 AMB ≤ 10, 2 genualae I, sensillae with short barbs along entire length.

Redescription: Idiosoma: Ellipsoidal. Length and width of holotype (unengorged): 192 and 162. Eyes 2/2 in plates, anterior 12, posterior 10µm in diameter (paratype). All setae with tuberculate bases. Dorsal setae 40 to 77µm, longer laterally and posteriorly; with 4 rows of barbs, fewer barbs ventrally (inner curve of seta). Arranged
approximately 24 slender pre-anals 24 to 28µm long, plus about 12 post-anals similar to dorsals. Spiracles at anterior margin of coxae I. Tracheae not visible in holotype, visible in some specimens to posterior margin of idiosoma. Gnathosoma: Cheliceral bases moderately punctate. Blades about 43-47µm long with 6-8 dorsal and about 7 ventral teeth, widely spaced. Palpal formula B/B/BNN; branched setae sparsely barbed, ventrotibial and laterotibial occasionally barbed. Tarsala 11µm. Branched tarsal setae sparsely branched. Tibial claws trifurcate, axial prong largest. Galealae with few barbs. Scutum: Shaped as originally figured, posterior margin broadly rounded. Punctae moderate. Scutal setae similar to dorsals. Sensillae sparsely barbed full length, bases slightly posterior to PL's. Measurements of holotype: AW-62, PW-81, SB-29, ASB-30, PSB-23, AP-24, AMB-11, AM-51, AL-50, PL-72, S-90. Nasus 19 x 10. Legs: Coxae sparsely, finely punctate. Leg segments sparsely punctate. Specialized setae as figured, genuala formula 2+,1+,0, tibiala formula 2+,2,1. Branched setae plumose, less densely branched on distal leg segments. Distance between coxa I setae 36-37µm. Parasubterminala I lacking. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,6,6; tarsus 7,17,14 (23,17,14 on other Venezuelan specimens). Leg index (paratype) 710.

Distribution: United States—Florida and Texas, Panama, Surinam, Trinidad and Venezuela.

Material Examined: Holotype and 3 paratypes, ex Heteromys anomalus anomalus, Aragua, Venezuela, summer, 1950; plus more than 1,200 larvae from Venezuela with the following frequency of infected
hosts: Two larvae, ex unidentified lizard; 37, ex 5 Monodelphis brevicaudata; 3, ex 2 Marmosa sp.; 99, ex 14 M. fuscata; 52, ex 13 M. robinsoni; 52, ex 15 Didelphis marsupialis; 15, ex 1 Sylvilagus floridanus; 1, ex Saccopteryx bilineata; 1, ex Micronycteris microtis; 6, ex Phyllostomus hastatus; 5, ex Carollia brevicauda; 2, ex 2 Eptesicus montosus, 3, ex 1 Vampyrus helleri; 16, ex 2 Vampyressa pusilla; 6, ex Sciurus granatensis; 284, ex 40 Heteromys anomalus; 207, ex 40 Oryzomys albicularis; 4, ex 2 O. capito; 15, ex 4 O. concolor; 1, ex O fulvescens; 2, ex 2 O. minutus; 3, ex Nectomys alfari; 1, ex Thomasomys hylophilus; 1, ex T. lugens; 18, ex 5 Akodon urichi; 39, ex 7 Zygodontomys brevicauda; 2, ex Zygodontomys sp.; 10, ex 1 Sigmodon sp.; 104, ex 28 Sigmodon hispidus; 46, ex 9 Sigmodon alstoni; 9, ex Rattus rattus; 1, ex R. norvegicus; 12, ex 1 Agouti sp.; 16, ex 3 Agouti paca; 1, ex Dasyprocta agouti cayana; 1, ex Dasyprocta sp.; 77, ex 27 Proechimys semispinosus; 3, ex 1 Mazama americana.

Above collections were made during every month except September, 1965–1968 from nearly every Venezuelan state. Other material examined includes 89 specimens from the following locations and hosts. North America: 6 ex Liomys irroratus, Brownsville, and Cameron Co., Texas, Oct., 1960, and Nov., 1962; 8, ex Sigmodon hispidus, Monroe Co., Florida, Jan., 1945. PANAMA: Two larvae, ex Didelphis marsupialis; 4, ex 2 Liomys adspersus; 1, ex Zygodontomys cherriei; 21, ex 17 Sigmodon hispidus; 1, ex Proechimys semispinosus; 1, ex Felis pardalis; 3, ex Neomorphus salvini; 2, ex Odontophorus erythrops; collected from Panama Canal Zone, Bocas del Isla, Darien, and Cerro Campana, Dec., 1960; Feb., March, Sept., and Oct., 1961, and Feb., 1962. Surinam: Five larvae, ex Proechimys guyannensis Uitkyjk 4 ex Dasyprocta sp.; Surinam; 1961 and

Other Records: Neomorphus geoffroyi salvini, Odontophorus erythrups, Didelphus marsupialis, Proechimys semispinosus, Liomys adspersus, Sciurus granatensis, Sigmodon hispidus, Zygodontomys microtinus and Felis pardalis from Panama Canal Zone, Darieu, Panama, (Brennan and Yunker 1966:224); Zygodontomys cherriei, and Sigmodon hispidus, Panama Canal Zone (Brennan and Jones 1961:105); Proechimys guyannensis and Nectomys squamipes, Cumaca Trinidad (Brennan and Jones 1960:496); Phillander opossum, Nectomys squamipes melanius, and Proechimys guyannensis, Coronie, Surinam (Brennan and Lukoschus 1971:44).

Remarks: Odontacarus fieldi and O. cayolargoensis were originally separated on the basis of the genuala configuration of legs I and II. Examination of 56 specimens from Panama, topotypes for O. fieldi, showed only 16 (29%) with a typical O. fieldi configuration of 2-0-0 genualae on legs I, II and III, respectively. Twenty-three specimens (41%) lacked a genuala II on one leg and 7 specimens possessed genualae II on both legs. In addition, 8 specimens had both genualae II and III and 2 possessed both genualae III but lacked 1 of the genualae II. Comparison of the holotypes of O. fieldi and O. cayolargoensis with the comparison microscope showed setae and scutal characteristics to be identical, with slight differences in the thickness of the dorsal setae.

The relation of O. tubercularis to O. cayolargoensis and O. fieldi was suspected when approximately 160 specimens from Venezuela could not be assigned to any of the three species with any certainty.
Two hundred and eighty five specimens were found to possess both genualae II and III, and over 900 specimens lacked genuala III including 3 specimens which lacked genuala III on one side only. Three specimens lacked both genualae II and III.

Other characteristics differed considerably. The length of setae, as indicated by the length of the posterolateral scutal setae, varied for those with genualae III from 55 to 68um, and for those lacking genuala III from 60 to 88um. Numbers of idiosomal setae differed slightly as indicated by a variation of 22 to 34 pre-anal setae. Stoutness of idiosomal setae was as variable as the length. No correlation was determined from distributional, host, or seasonal data.
Odontacarus comosus comosus n. ssp.

(Fig. 5)

Type data: Holotype and 3 paratypes, RML#53639 ex Thomasomys hylophilus, Venezuela, Tachira, 52 km SSW San Cristobal (Buena Vista), 2350 m, 23, Mar., 1968; other paratypes: one larva each, RML#'s 52993, 55977, 55983 and 56007. 2 each, RML#'s 52962, 53629, 53643, and 56006; 3 each, RML#'s, 52963, 52964, 53659 and 53664. 4, RML# 55930 ex T. hylophilus, Venezuela, Tachira, 52 km SSW San Cristobal, (Buena Vista), 2350 to 2420 m, 5-27, Mar., 1968. N. E. Peterson, F. Brown, and J. Matson, collectors.

Holotype and paratypes: Rocky Mountain Laboratory. Other paratypes: Chicago Field Museum of Natural History and California State University, Long Beach.

Diagnosis: Differs from closely related O. munchiquensis, Brennan, by the undifferentiated posterior setae, shorter cheliceral blades, and scutal shape. Other differences may be noted in the following description.

Description: Idiosoma: Broad ovoid. Length and width of holotype (unengorged) 283 and 228. Eyes 2/2 in plates. Diameter: Anterior 15, Posterior 14. Dorsal and ventral setal bases tuberculate. Dorsal setae 45 to 101 μm, with 4 rows of setules; arranged approximately: 2 humerals (93 μm)-13-10-9-8-8 +14 posterior and 8 long lateral setae not continuous with dorsal rows. Dorsal setae 45 to 101 μm, longer laterally and posteriorly. Venter with two sternals and 50 slender, long branched pre-anals and para-anals in uneven rows, 1 pair of slender postanals,
plus 10 posterior setae similar to dorsals. Anus at fourth row of ventral setae. Spiracles very large, adjacent to anterior margin of coxa I. Trachea visible to posterior margin of idiosoma. **Gnathosoma:** Cheliceral bases moderately punctate. Blades 43-54µm long, with 5 to 6 dorsal teeth and about 8 ventral teeth. Palpal formula B/B/B/BB; genual and femoral setae moderately barbed, dorsotibial densely barbed. Laterotibial setae usually with 1 barb, ventrotibial with 3 to 6. Palpal tarsalae 13µm; branched tarsal setae long, moderately branched. Tibial claws trifurcate, axial prong largest. Galealae sparsely barbed. **Scutum:** Moderately punctate. Shaped as figured with posterior margin broadly rounded to bluntly angulate. AM's with accessory branch, AL's apparently with 2 rows of setules, other setae similar to dorsals. Sensillae sparsely barbed, bases slightly posterior to PL's. Measurements of holotype: AW-80, PW-111, SB-34, ASB-41, PSB-23, AP-32, AMB-13, AM-60, AMa-12, AL-73, PL-85, S-101+. Nasus 12 x 23. **Legs:** Coxae II and III, densely punctate, coxa I moderately punctate, leg segments moderately punctate. Distance between coxa I setae 47. Parasubterminala I lacking, mastitarsala on leg III barbed. Specialized setae as figured. Branched setae plumose; Femur I and II with moderately long plumose setae. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 5,5,4; genu 4,4,4; tibia 8,6,6; tarsala 29-30,18,15. Leg index 900.

**Distribution:** Venezuela, Tachira.

**Specimens Examined:** Types plus: One larva ex Marmosa dryas, 1, ex Oryzomys albigularis, 3, ex O. minutus, 2, ex Rhipidomys venustus, and 2, ex unidentified bird, Venezuela, Tachira, Mar., 1968.
Remarks: Variation was noted in the number of dorsal setae which varied from 60-70, length of scutal setae and in the number of barbs on the ventrotibial and laterotibial palpal setae. The name was derived from the Latin "comosus", meaning long hair.
Odontacarus comosus novemsetus n. ssp.

(Fig. 6)

**Type data:** Holotype and 3 paratypes, RML#48752, ex Oryzomys albicularis, Venezuela, Distrito Federal, 9.4 km N Caracas, 2172m, 28, Aug., 1965. Other paratypes: 1 larva, RML#48889, ex Marmosa fuscata, Venezuela, Distrito Federal, 20 km W Caracas, 1780m, 21, Dec., 1965; 1, RML#48746, ex Heteromys anomalus and 1 each, RML#48715 and 48728, 2, RML#48729, and 3, RML#48753, ex O. albicularis, Venezuela, Distrito Federal, 9.4 km N Caracas, 2104 to 2172m, 25, Aug., to Nov., 1965; 2, RML#48888, ex O. albicularis, 20 km W Caracas (Alto Nuevo Leon), 1950m, 20, Dec., 1965. N. E. Peterson, collector.

Holotype and paratypes: Rocky Mountain Laboratory. Other paratypes: Chicago Field Museum of Natural History and California State University, Long Beach.

**Diagnosis:** Differs from the nominate subspecies primarily by having 9 branched setae on tibia I, and 6 on tibia II and III. Other differences may be noted in the following description.

**Description:** Idiosoma: Broad ovoid. Length and width of holotype (unengorged) 288 and 230. Eyes 2/2 in plates, diameter: anterior 14, posterior 13. Dorsal and ventral setal bases large tuberculate. Dorsal setae 55 to 91µm with 4 rows of setules. Arranged approximately: 2 humerals (86µm)-10-9-8-8-8 +16 posterior and 10 long lateral setae not continuous with dorsal rows, longer laterally and posteriorly. Venter with two sternals and 50 slender, long branched pre-anals and para-anals in uneven rows, 1 pair of slender postanals
and 6-10 posterior setae similar to dorsals. Anus at fourth row of ventral setae. Spiracles very large, adjacent to anterior margin of coxa I. Trachea convolutant, visible to posterior margin of idiosoma. **Gnathosoma:** Cheliceral bases densely punctate. Blades 53µm long with 6 dorsal teeth and 9-10 ventral teeth. Palpal formula B/B/BBB; genual, femoral and dorsotibial setae moderately barbed, branches short; laterotibial setae nude or with 1-2 barbs. Ventrotibial with 3-4 barbs. Palpal tarsalae 13µm; branched setae long, moderately branched with long setules. Tibial claws trifurcate; axial prong largest. Galealae with few barbs. **Scutum:** Moderately punctate. Shaped as figured. Accessory branch on AM short, other setae similar to dorsals. Sensillae sparsely barbed, bases slightly posterior to PL's. Measurements of holotype: AW-77, PW-101, SB-33, ASB-46, PSB-23, AP-31, AMB-12, AM-72, AMA-7, AL-75, PL-96, S-106. Nasus 12 x 25. **Legs:** Coxae densely punctate, leg segments moderately punctate. Distance between coxa I setae 48. Parasubterminala I lacking, mastitarsala III barbed. Branched setae plumose. Femur I, and II, genu and tibia III with moderately long plumose setae as figured. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 9,6,6; tarsus 27,16,15. Leg index 1070.

**Distribution:** Venezuela, Distrito Federal.

**Specimens Examined:** Type specimens.

**Remarks:** Variations were less obvious in *O. novemsetus* than in the nominate subspecies. Variational overlap noticed in the diagnostic characters separating the two subspecies was the presence of
7 branched tibial setae on one leg of a single specimen. The name was derived from the Latin, "comosus" = long hair, "novem" = nine, plus "seta" = hair, referring to the long dorsal setae and the 9 branched tibial I setae.
**Odontacarus dienteslargus**

*(Fig. 7)*

**Type data:** Holotype, RML#52661, and 24 paratypes: 3 each-RML#53211 and 56066, 2 each-RML#52964, 53629 and 55988, 4-RML#54984 and 1 each-RML#52962, 56001, 55939, 53685, 53639, 53637 and 53230, ex *Thomasomys hylophilus*, Venezuela, Tachira, 41-52 km SSW San Cristobal, 2350 to 2423m, 2 to 24, Mar., 1966. N. E. Peterson, F. Brown, and J. Matson.

**Diagnosis:** Differs from the closely related *O. munchiquensis* primarily by PL > AM > AL, little variation in dorsal setae from anterior to posterior, and fewer ventral teeth on the cheliceral blades.

**Description:** **Idiosoma:** Broad ovoid to circular, length and width of holotype 257 and 228. Eyes 2/2, anterior 15, posterior 13µm in diameter, plate present. About 130 dorsal setae, 36 to 86µm long midlaterals longest, arranged in uneven rows. Setae stout, with 4 rows of stout barbs, posterior setae stoutest. Two sternals plus about 90 ventrals, 35-70µm in uneven rows; pre-anals slender with long setules, postanals like dorsals. Anus located approximately at fourth row of setae. Spiracles large, trachea visible to coxa III. **Gnathosoma:** Cheliceral bases densely punctate. Cheliceral blade length, 74; 6-8 dorsal teeth; 12-13 ventral teeth, posterior teeth largest. Palpal formula B/B/BBB, femoral and genual setae moderately branched with long branches, dorsotibial densely branched with short branches, laterotibial with 1-2 barbs, ventrotibial with 3-4 branches. Palpotibial claws trifurcate, axial prong longest, para-axial prongs subequal. Palpotarsus 7B; tarsala 18µm. Galeala sparsely branched. **Scutum:**
Subpentagonal; moderately punctate, anterior and lateral margins slightly sinuate, apex of posterior margin bluntly angulate. Scutal setae similar to dorsals, AL's less stout than AM's and PL's. AM's lacking accessory branches. Proximal 2/3 of sensillae barbed, sensillar bases slightly posterior to PL's. Measurements of Holotype: AW-99. PW-118, SB-47, ASB-43, PSB-27, AP-26, AMB-15, AM-77, AL-65, PL-77, S-116. Nasus 20 x 12. Legs: Coxae and leg segments moderately punctate. Distance between coxa I setae 37. Specialized setae as figured. Leg III with barbed mastitarsala. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; Trochanter 1,1,1; Femur 6,5,4; Genu 4,4,4; Tibia 8,6,6; Tarsus 23,17,16. Leg index 931. Onychotriches absent.

Distribution: Venezuela: Merida and Tachira.

Specimens examined: Type specimens plus the following Venezuela material: 3, ex Cryptotis thomasi, 2, ex Oryzomys albigularis, 1, ex Chilomys instans, 2, ex Akodon bogotensis, 4, ex Thomasomys laniger, Merida and Tachira, Feb. and Mar. 1966.

Other material: None.

Remarks: The species very closely resembles O. munchiquensis and separates by the form of the posterior dorsal and ventral setae. No significant variations were noted. The name is Spanish meaning large teeth.
Odontacarus schoenestosus n. sp.
(Fig. 8)

Type data: Holotype and one paratype, RML#49029, ex Thomasomys vestitus, Venezuela, Trujillo, 15 km E Trujillo, 2230m, 29, Jan., 1966; other paratypes: 1, RML#49040 and 8, RML#52813, ex T. laniger, Venezuela, Merida, 3 km W Timotes, 3206 to 3230m, 14 and 16, Feb., 1966; 1 each RML#s48918 and 48920, ex T. lugens, Venezuela, Trujillo, 15 km E Trujillo, 2350 to 2360m, 25 and 26, Jan., 1966; 11, RML#52808, ex Lonchorhina aurita, Venezuela, Trujillo, 25 km N Valera, 131m, 21, Oct., 1965; 1, ex Artibeus jamaicensis, Venezuela, Trujillo, 23 km NW Valera, 90m, 22, Octo., 1965. N. E. Peterson.

Deposition of types: Holotype and paratypes: Rocky Mountain Laboratory. Other paratypes: Chicago Field Museum of Natural History and California State University, Long Beach.

Diagnosis: Cheliceral blades longer than 80um, scutum wide with posterolateral setae far anterad of the sensillar bases and deeply sinuate anterior margin.

Description: Idiosoma: Broad ovoid to circular; length and width of holotype (unengorged): 288 and 283. Eyes 2/2 in a plate, anterior 18, posterior 17um in diameter. Approximately 150-200 dorsal setae in uneven rows 38-86um long, longer laterally and posteriorly. Seta bases large tuberculate. Setae stout with 4 rows of short, stout barbs. Venter with two sternals plus about 100 ventral setae, 42 to 86um. Anterior ventrals slender with long branches, posterior ventrals similar to dorsals; bases tuberculate. Anus at about the fifth row of
ventral setae.  

**Gnathosoma:** Cheliceral bases densely punctate. Blades 80-100µm; teeth large numbering 7 to 8 dorsally and about 18 ventrally. Palpal formula B/B/BBB, the femoral, genual and dorsotibial setae moderately branched; laterotibial and ventrotibial with 1 to few barbs, laterotibial occasionally nude. Palpotarsalae 14µm; branched tarsal setae long, moderately branched. Tibial claws trifurcate, axial prong largest. Galealae sparsely branched with short barbs.  

**Scutum:** Moderately punctate. Shaped as figured, anterior margin deeply sinuate, posterior margin broadly rounded. Setae similar to dorsals but more heavily branched. AM with short accessory branch. Sensillae sparsely barbed entire length, bases considerably posterior to PL's.  


**Legs:** Coxae and leg segments moderately punctate. Distance between coxa I setae 48. Parasubterminala I lacking, mastitarsala III barbed. Specialized setae as figured. Branched setae plumose; femur I and II, tibia III, and genu III with very long plumose setae. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 9,7,7; tarsus 33,22,19. Tarsal claws nude. Leg index 1133.  

**Distribution:** Venezuela, Trujillo and Merida districts.  

**Specimens Examined:** Type specimens.  

**Remarks:** Variation noted within the species include 10 instead of 9 branched setae on tibia I, malformed cheliceral blades on one specimen and very long cheliceral blades on another. The average length of the cheliceral blades is 84µm.
Odontacarus sunnianae n. sp.
(Fig. 9)

**Type data:** Holotype and 6 paratypes, RML#53580 and 16 paratypes as follows: 3 each RML#53581 and 53595, 2 each RML#53582 and 53583, 1 each RML#53584 and 53579, ex Proechimys semispinosus, Venezuela, Lara, 10 km N El Tocuyo, 518m, 15, June, 1968; 2 RML#43270, ex P. semispinosus, Venezuela, Yaracuy and Carabobo, 20 km NW Urarma, 5 to 25m, 2, Oct., 1965. N. E. Peterson, D. B. and R. B. Peacock.

**Diagnosis:** Separates from other species of the genus by the short broad dorsal setae, a single genuala I, and the distance between the setae on coxa I being less than 30µm.

**Description:** Idiosoma: Broad ovoid (engorged), length and width of holotype, 157 and 138. Eyes 2/2 in indistinct plate, anterior llu, posterior 9µm in diameter. Dorsal setae 28-52µm, longer laterally and posteriorly, with 2 rows of setules dorsally. Approximate dorsal formula: 2 humerals (52µm) -8-8-8-10-8-6-2. Venter with 2 sternals plus about 42 ventral setae; pre-anals slender, with delicate barbs, becoming stouter laterally, 26-41µm long. Postanals similar to dorsals. Anus located between rows 2 and 3. Spiracles large and conspicuous, adjacent to anterodistal margin of coxa I; tracheae visible for short distance only. Gnathosoma: Cheliceral bases moderately punctate, puncta indistinct; Cheliceral blades 38µm long, teeth small, numbering 5-6 dorsally and 5-6 ventrally. Palpal formula B/B/BBB, dorsotibial and ventrotibial setae with 1 or 2 barbs. Palpotarsalae about 8µm long. Palpotibial claw trifurcate, axial prong largest. Galealae sparsely branched. Scutum: Small, lightly punctate, subpentagonal, the
posterior margin broadly rounded to bluntly angulate. Scutal setae densely branched, laterals, broadly curved with fewer setules on the inner side. Sensillae heavily barbed, branches more numerous and longer apically; sensillar bases even with PL's. Measurements of holotype: AW-65, PW-82, SB-23, ASB-27, PSB-18, AP-23, AMB-10, AM-42+, AL-42, PL-51, S-62. Nasus 9 x 12. Legs: Coxae and leg segments with a few scattered punctae. Distance between coxa I setae 27-28. Legs short, parasubterminala on leg I lacking. Mastitarsala III present, nude, apparently fragile. Tarsal claws with a pair of minute onychotriches visible in some specimens. Specialized setae as figured. Branched setae per leg segment for legs I, II, and III; Coxa 2,1,1; trochanter 1,1,1; femur 5,5,4; genu 4,4,4; tibia 8,6,6; tarsus 22,16,14. Leg index 790. Onychotriches lacking.

Distribution: Venezuela; Barinas, Falcon, Lara and Miranda districts.


Remarks: Named for the wife of the senior author "Sunny" for her excellent assistance in inking the drawings for this work and for her moral support.
Odontacarus tiptoni n. sp.

(Fig. 10)

Type data: Holotype and 7 paratypes, RML#49029, and 9 paratypes RML#48925, ex Oryzomys vestitus; 1 paratype, RML#48898, O. albigularis; 1, O. minutus; and 1, Thomasomys lugens; all from Venezuela, Trujillo, 15 km E Trujillo, 2350-2360m, 19 to 29, Jan., 1966.

Holotype and paratypes: Rocky Mountain Laboratory. Paratypes: Chicago Field Museum of Natural History and California State University, Long Beach.

Diagnosis: Separates from the closely related O. schoenesetosus, n. sp. by the following combination of characters. AM, AL, and PL sub-equal. Two coxa II setae, short accessory branch on AM, and the stout, idiosomal setae.

Description: Idiosoma: Broad, ovoid, length and width of holotype, 230 and 192. Eyes 2/2, anterior 18, posterior 13μm in diameter, plate indistinct. About 110 dorsal setae in uneven rows, 44 to 90μm becoming longer laterally and posteriorly. Humerals not distinguishable. Seta bases tuberculate, setae stout with 4 rows of setules. Two sternals plus about 60 slender pre-anals and 20 posterior ventral setae in uneven rows. Pre-anals more slender with longer setules, postanals and lateral ventral setae similar to dorsals; 40 to 70μm long. Anus at fourth row of ventral setae. Spiracles large and conspicuous, adjacent to anterodistal margin of coxa I. Tracheae obvious, traceable throughout the idiosoma. Gnathosoma: Cheliceral bases densely punctate, punctae large and obvious. Cheliceral blade length 50μm. Teeth small, about 7 dorsal, and about 10 ventral. Palpal formula B/B/BBB, the
latero- and ventrotibial setae with 1 to several barbs; other setae densely branched. Palpotarsala about 11μm long; branched tarsal setae long, moderately branched. Tibial claws trifurcate, axial prong largest. Galeala moderately branched. Scutum: Moderately punctate, subpentagonal, anterior margin slightly sinuate, posterior margin broadly rounded. Setae similar to dorsals. Sensillae lightly barbed along entire length, accessory branch present. Sensillar bases slightly posterior to PL's. Measurements of holotype: AW-93, PW-133, SB-47, ASB-43, PSB-33, AP-32, AMB-14, AM-83, AMA-12, AL-78, PL-84, S-95+. (AM, AL, and PL variable). Nasus 27 x 13. Legs: Coxae and leg segments moderately punctate. Distance between coxa I setae 50. Mastitarsala III barbed. Parasubterminala I lacking. Specialized setae as figured. Femur, genu, and tibia of legs I, II and III with long densely plumose setae. Branched setae per leg segment for legs I, II, and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 9,7,7; tarsus 34,21,19. Leg index 1147. Onychotriches lacking.

Distribution: Venezuela, Trujillo district.

Specimens Examined: Type specimens.

Remarks: Named for Dr. Vernon J. Tipton, Department of Zoology, Brigham Young University in honor of his contributions to the field of Entomology.
Odontacarus tuberculohirsutus n. sp.

(Fig. 11)

Type data: Holotype and 8 paratypes, RML#49049 and 32 paratypes: 3, RML#49045, 7, RML#51851, 6, RML#51850, 5, RML#48116, 2, RML#49044, 1 each, RML#s51854, 49046, 52774, 52771, 52769, 51863, 51861, 51849, 49042, ex Thomasomys laniger, Venezuela, Merida, 8-10 km SE Tabay, 3160 to 5360m, 11-21, Mar., 1966, N. E. Peterson.

Holotype and paratypes: Rocky Mountain Laboratory. Paratypes: Chicago Field Museum of Natural History and California State University, Long Beach.

Diagnosis: O. tuberculohirsutus differs from other Odontacarus species by the combination of large tuberculate setal bases, number and form of body setae, and large accessory branches on the antero-submedian scutal setae.

Description: Idiosoma: Ovoid, length and width of Holotype: 451 and 336. Eyes 2/2 in plates, diameter; anterior 20, posterior 17. About 200 slender dorsal setae 60 to 105µm, densely barbed, basal branches 6-8µm. Posterior setae stouter, with short appressed barbs; lateroposterior setae longest. Humerals not distinguished from dorsal setae. Ventral setae 45-85µm, 2 sternals, plus about 130 ventrals in uneven rows. All setal bases large, tuberculate. Spiracles large, adjacent to anterodistal margin of coxa I; tracheae obvious, visible to posterior margin of idiosoma. Gnathasoma: Cheliceral bases densely punctate. Blades 64µm long with 5-6 dorsal teeth and 9-10 ventral teeth. Palpal formula B/B/BNB; femoral, genual and dorso-
tibial setae densely branched, laterotibial with an occasional barb, ventrotibial 3-4 branched. Palpotibial claws trifurcate. Galealae sparsely barbed. Scutum: Moderately punctate, pentagonal; lateral margins sinuate, posterior margins sunken with striations encroaching to raised portion of scutum. Scutal setae stout, AM's with prominent, nude accessory branch. AM's and AL's sparsely branched, with short appressed barbs. Posterior setae densely branched with longer branches. Sensillae slender, with few minute barbs; bases slightly posterior to PL's. Measurements of holotype: AW-103, PW-138, SB-35, ASB-62, PSB-42, AP-45, AMB-19, AM-82, AMa-24, AL-105, PL-107, S-135. Nasus 64 x 18μm. Legs: Coxae densely punctate, leg segments moderately punctate. Distance between setae of coxa I, 57-65. Specialized setae as figured. Branched setae per leg segment, sequentially for legs I, II and III: Coxa 2,2,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 9,8,8; tarsus 40,30,28. Leg index 1245.

Distribution: Venezuela, Guarico and Merida.

Specimens Examined: Type material plus the following

Other Material: None.

Remarks: Coxa II occasionally possessed three instead of 2 setae, and the degree of striation on the posterior margin of the scutum varied considerably among specimens. None of the material examined appeared to be engorged. The name was chosen in reference
to the large, tuberculate setal bases and the large number of idiosomal setae.
Odontacarus vergrandi n. sp.

(Fig. 12)

Type data: Holotype and 8 paratypes, RML#52811, ex Thomasomys laniger, Venezuela, Merida, 3 km W Timotes (near Paramito), 3147m, 15, Feb., 1966; other paratypes: 2, RML#52813, ex T. laniger, 1, RML#52812 and 3, RML#52810, ex Oryzomys minutus, Venezuela, Merida 3 and 4 km W Timotes (near Paramito), 3140 to 3230m, 15 and 16, Feb., 1966; 4, RML#42808, ex Lonchorina aurita, Venezuela, Trujillo, 25 km N Valera (Aqua Santa), 131m, 21, Oct., 1965. N. E. Peterson, collector.

Holotype and paratypes: Rocky Mountain Laboratory. Paratypes: Chicago Field Museum of Natural History and California State University, Long Beach:

Diagnosis: Differs from O. comosus, comosus, n. ssp. by the slightly different shape of the scutum, more and stouter idiosomal setae and the branched setae for tibiae I, II and III numbering 9-7-7, respectively.

Description: Idiosoma: Broad ovoid. Length and width of Holotype (unengorged) 288 and 252. Eyes 2/2 in plates, diameter: anterior 16, posterior 14. Dorsal and ventral setal bases large, tuberculate. Dorsal setae 45 to 96µm, longer laterally and posteriorly, with 4 rows of setules. Total dorsal setae about 110 in uneven rows. Humerals not distinguishable. Venter with two sternals and 35 slender pre-anals (40-50µm), plus about 20 postanals and laterals similar to dorsals. Anus at fourth row of ventral setae. Spiracles prominent, adjacent to anterior margin of coxa I. Tracheae convoluted, visible
throughout idiosoma. **Gnathosoma**: Cheliceral bases moderately punctate. Blades 54μm long with 7 dorsal and 6-7 ventral teeth, widely spaced. Palpal formula B/B/BBB; latero- and ventrotibial sparsely branched, others moderately branched. Palpal tarsala about 12μm branched tarsal setae long and slender with long branches. Tibial claws trifurcate, axial prong largest. Galealae with few barbs. **Scutum**: Sparsely punctate. Shaped as figured with slightly sinuate anterior margin and broadly rounded posterior margin. Scutal setae similar to dorsals; AM's with short, stout accessory branch; AL's apparently lacking barbs on concave side of curvature. Sensillae delicately barbed; barbs longer apically; bases slightly posterior to PL's. Measurements of holotype: AW-92, PW-132, SB-38, ASB-40, PSB-29, AP-32, AMB-15, AM-86, AMa-10, AL-67, PL-77, S-116. Nasus 12 x 21. **Legs**: Coxa I sparsely punctate, punctae coarse; coxae II and III moderately punctate, punctae fine. Leg segments sparsely punctate. Distance between coxa I setae 45 to 47. Parasubterminala I lacking. Femur I, II and III, genu II and Tibia III each with 1 or 2 long plumose setae. Mastitarsala III minutely barbed. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 9,7,7; tarsus 30,20,16-17. Leg index 1060.

**Distribution**: Venezuela, Merida and Trujillo districts.

**Specimens Examined**: Type specimens.

**Remarks**: Named in respect to Dr. P. H. Vercammen-Grandjean for his work in the systematics of chiggers.
Subgenus Tarsalacarus Vercammen-Grandjean

Odontacarus (tarsalacarus) Vercammen-Grandjean 1968:121 [Type species: Acomatacarus bakeri (Hoffmann), original designation];

Diagnosis: Odontacarus larvae with tarsala III, cheliceral blades with ventral row of teeth only.

Odontacarus (Tarsalacarus) bakeri (Hoffmann)

(Fig. 13)

Acomatacarus bakeri Hoffmann, 1951:31 [Holotype-larva, Peromyscus truei gratas, Mexico; Hoffmann collection, Mexico, D.F.]
Greenberg 1952:477 and 482.
Odontacarus bakeri, Brennan 1959:1; Brennan and Dalmat 1960:184;
Wharton and Fuller 1952:97.

Diagnosis: Differs from other members of the genus by the subquadrate scutal shape, long-branched scutal and idiosomal setae, densely branched galeal setae, and tarsala III.

Redescription (Based on RML#112, determined by Hoffmann, see Remarks below. Data from original description parenthetically included). Idiosoma: Broad ovoid, length and width (engorged) 911 and 625 (type series: 426-790 and 220-373, Hoffmann, 1951). Eyes 2/2, anterior 16, posterior 12µm in diameter. Setal bases apunctate. Dorsal setae 42 to 65µm, (variable) arranged approximately 2-10-11-12-2-15-12-8 +24. Venter with two sternals, 34 pre-anals, and about 70 postanals. Anus at about fifth row of ventrals. Spiracles prominent, adjacent to anterodistal margin of coxa I. Tracheae obvious to posterior margin of idiosoma, not densely convoluted as original figures indicate. Gnathosoma: Cheliceral bases moderately punctate. Blades about 45µm long with 1 apical dorsal tooth and 4 or 5 small ventral teeth. Palpal formula B/B/B/BB, all setae moderately to densely branched. Palpotibial claws trifurcate; Branched palpotarsal setae long, heavily branched. Tarsalae 8µm. Galealae densely branched. Scutum: Shaped as figured, sparsely punctate, punctae indistinct. Posterior margin broadly
rounded, anterior margin mildly sinuate PL's on lateral extension of
scutum. Scutal setae similar to dorsals. Sensillae minutely barbed
along basal fourth; bases slightly posterior to PL's. Measurements:
AW-80, PW-93, SB-28, ASB-39, PSB-26, AP-32, AMB-11, AM-64, AL-48,
Distance between coxae I setae 47µm. Parasubterminala I absent.
Specialized setae as figured. Mastitarsala III absent. Branched setae
per leg segment: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu
4,4,4; tibia 9,6,6; tarsus 28,16,15. Leg index 1060.

_Distribution:_ Distrito Federal, Mexico, and Jalapa, Guatemala.

_Specimens Examined:_ 1 larva, ex *Peromyscus truei* gratus,
Distrito Federal, Mexico, Mar., 1951; 4, ex *Reithrodontomys* sp., and
5, ex *Peromyscus guatemalensis*, Jalapa, Guatemala, Mar., 1952.

_Other Material:_ Reported off *Peromyscus guatemalensis*,

_Remarks:_ The type material was unavailable at the time of
writing, hence the redescriotion is based on a specimen identified by
Dr. Hoffmann as *O. bakeri*. Considerable variation is apparent in the
specimens examined. Length of setae varied from 35 to 52 in one
specimen to 42-65 in another, and the number of dorsal setae in the
series RML#31460 varied from 60± to 90± total.

Contradictions between these findings and the original descrip-
tion include the number of branched tibial and tarsal setae (8,6,6, and
25,14,16 respectively in original description), and minute barbs on the
sensillae which were described as nude.
Odontacarus (Tarsalacarus) chiapanensis (Hoffmann)

(Fig. 14)

Acomatacarus chiapanensis Hoffmann, 1948:179 [Holotype-larva, ex undetermined rodent species, Chiapa, Mexico; Hoffmann collection, Mexico City]; Greenberg, 1952:482.


Diagnosis: Separates from O. bakeri by fewer dorsal setae and the sparsely branched palpal setae.

Description of Panamanian specimens (see remarks): Idiosoma: Ovoid. Length and width, 245 to 535 and 192 to 324, (Type material 519-618 and 330-357, Hoffmann, 1948). Eyes 2/2 in plates, anterior 12, posterior 9μm in diameter. Setal bases normal. Dorsal setae 34 to 50μm, longer laterally and posteriorly, arranged approximately: 2 humerals (60μm)-8-4-6-8-6-6-2 plus 5 lateral setae not continuous with dorsal rows (original description [6, 4, 2]-6-10-8-6-6). Venter with two sternals, 28 slender pre-anals, (26-34μm), and 22 postanals similar to dorsals. Anus at fourth row of ventral setae. Gnathosoma: Cheliceral bases moderately punctate posteriorly. Blades 45μm long with a single apical dorsal tooth and a row of 5 or 6 ventral teeth. Palpal formula B/B/BBB; genual setae moderately branched, laterotibial nude or with few branches, others sparsely branched. Palpal tarsala 7μm long, branched tarsal setae sparsely branched. Tibial claws quadrifurcate, inner prong largest. Galeala sparsely branched. Scutum: Sparsely punctate. Shaped as figured, posterior margin broadly rounded to semi-truncate medially. Scutal setae similar to dorsals. AM with accessory

Distribution: Chiapas and Yucatan Peninsula, Mexico; Bocas del Torro, Panama.


Other Material: Holotype and paratypes, ex unidentified badger, Chiapas, Mexico (Hoffmann 1960:182). Also reported off Ototylomys phyllotis and Peromyscus yucantanicus (sic), Yucatan Peninsula, Mexico (Loomis 1969:5), and Proechimys semispinosus, Bocas del Toro, Panama (Brennan and Yunker 1966:224).

Remarks: Type specimens were unavailable at the time of writing, hence a description of a Panamanian specimen may serve to enlarge upon the previous description. The presence of a quadrafurcate palpal claw is confirmed by unpublished notes made by Brennan while observing a paratype, and the branched galeal and palpal laterotibial seta was noted by Greenberg (1952:482), who also stated that a paratype possessed a branched parasubterminala I.
Genus Sasacarus Brennan and Jones

Sasacarus Brennan and Jones 1959:8 [Type species: Chatia furmani Hoffmann, 1954, original designation]; Vercammen-Grandjean et al. 1973:64.

Diagnosis: Separates from Chatia Brennan by possessing spiracles and tracheae, fewer than 30 setae on tarsus I, and anterolateral projections of the scutum.


Key to Species

1. Scutal setae very stout, PL's about 60µm. ... S. furmani panamensis
2. Scutal setae not obviously stout, PL's about 45µm ...........

Remarks: Sasacarus closely resembles the subgenus Chatia shunsennia Jameson and Toshioka, in the number of branched setae on the femora of the legs, the form of the palpal setae (femoral and genual setae plumose) and the genuala configuration 2+, 1+, 1 for legs I, II,
and III. Vercammen-Grandjean et al. groups *Sasacarus* with the genus *Chatia* on the basis of the branched femoral setae and considers it a valid generic entity. Addition of *S. panamensis* n. ssp. contributes to the generic status.
Sasacarus furmani furmani (Hoffmann)

(Fig. 15)

Chatia furmani Hoffmann, 1954:17 [Holotype-larva, ex Baiomys musculus musculus, Oaxaca, Mexico; Rocky Mountain Laboratory, Hamilton, Montana];

Sasacarus furmani, Brennan and Jones 1959:8; Brennan and Yunker 1966: 224.

Diagnosis: Differs from the panamanian species by the shorter more slender dorsal setae and branched setae on legs.

Redescription: Idiosoma: Ovoid. Length and width of holotype 568 and 408 (idiosoma ruptured, measurements approximate). Eyes single, 14µm in diameter. Dorsal setae 35 to 54µm, longer antero-laterally, sparsely barbed ventrally and densely barbed dorsally. Arranged in uneven rows approximately: 11-9-12-2 (lateral) -10-2 (lateral) -10 plus 24 posteriorly. Two sternals and 56 ventrals, 25 to 38µm, longest laterally, in uneven rows; anterior setae shorter and somewhat more slender than posterior setae. Anus between fourth and fifth rows of ventral setae. Spiracles large, adjacent to anterior margin of coxa I. Tracheae traceable to posterior third of idiosoma. Gnathosoma: Cheliceral bases apparently unpunctate. Blades 39µm long with tricuspid cap only. Palpal formula B/B/BBB, moderately to densely branched. Tarsi 7B plus tarsala, setae long, moderately branched. Tibial claws forming a cupped-shape with one large prong, 7 or 8 smaller prongs outer and dorsally, becoming more slender proximally plus row of 6 slender prongs ventrally. Galealae moderately branched with long slender branches. Scutum: Shaped as originally
figured by Hoffmann. Sparsely punctate. PL's far anterior, AL's on anterolateral extractions of scutum. Anterior margin sinuate, posterior margin broadly rounded. Setae similar to dorsals, densely branched. Sensillae nude. Measurements of holotype: AW-82, PW-84, SB-41, ASB-36, PSB-21, AP-15, AMB-9, AM-27, AL-34, PL-44, S-60. Legs: Coxae and leg segments with few punctae. Distance between coxa I setae 44μm. Specialized setae as figured for Sasacarus furmani panamensis n. ssp., sub- and parasubterminala lacking. Branched setae moderately plumose, with stiff branches. Apical setae with fewer branches. Tarsal claws with a pair of onychotriches, empodia apparently nude. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,7,5; genu 4,4,4; tibia 8,6,6; tarsus 28,17,15. Leg index 846.

**Distribution:** Oaxaca, Mexico.

**Material Examined:** Holotype only.

**Other Records:** One paratype, ex Baiomys musculus musculus, Oaxaca, Mexico. Panamanian records (Brennan and Yunker 1966) are S. panamensis n. ssp.
Sasacarus furmani panamensis n. ssp.

(Fig. 15

Type data: Holotype, RML#44965, ex Proechimys semispinosus, France Field, Panama Canal Zone, 8, Sept., 1961; Paratypes: 2, RML#40125, ex P. semispinosus, Pina, Panama Canal Zone, 13, Dec., 1960; 2 RML#44105, ex P. semispinosus, France Field, Panama Canal Zone, 16, Nov., 1961; 1, RML#35276, ex P. semispinosus panamensis, Panama, 7, Jan., 1954; 1, RML#44401, ex Tylomys watsoni, Pina, Panama Canal Zone, 7, Feb., 1954. All collected by C. M. Keenan.

Diagnosis: Separates from nominate subspecies primarily by stouter idiosomal, scutal, and leg setae, and longer scutal setae.

Description: Idiosoma: Broad ovoid to circular (engorged). Length and width of holotype: 452 and 399. Eyes present 12 to 13µm (not seen on holotype). Setal bases not tuberculate, setae stout, 45 to 51µm, longer laterally with 3 to 4 rows of stout branches, arranged approximately 12-8-8-10-9-6-4-2. Two sternals plus about 66 ventrals, 24 to 41µm, shorter and more slender anteriorly, becoming gradually like dorsals posteriorly. Anus between second and third row of ventral setae. Spiracles obvious, between coxa I and palpal coxa. Tracheae visible to mid-idiosoma in some specimens. Gnathosoma: Cheliceral bases moderately, lightly punctate. Blades 36µm long, with tricuspid cap only. Palpal formula B/B/BBB, moderately branched; laterotibial seta slender, sparsely to moderately barbed. Tibial claws with large axial prong, 4 outer prongs, and apical row of smaller prongs dorsally and ventrally. Galealae moderately barbed with long branches.
Scutum: Shaped as figured, similar to that of S. furmani. Sparsely punctate. Setae stouter than dorsals. Sensillae not seen, bases located posterior to PL's. Measurements of holotype AW-70, PW-71, SB-31, ASB-34, PSB-14, AP-18, AMB-9, AM-36, AL-48, PL-62, S--. Legs: Coxae moderately punctate, other leg segments sparsely punctate. Distance between coxa I setae 36-38 µm. Specialized setae as figured, sub- and parasubterminala lacking. Branched setae stout, moderately branched, setules apparently caducous. Tarsal claws with at least a pair of onychotriches. Empodia nude. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,7,5; genu 4,4,4; tibia 8,6,6; tarsus 28,17,15. Tarsal claws with long onychotriches; empodia nude. Leg index 776.

Distribution: Panama.

Material Examined: Type material.

Genus Wagenaaria Brennan

Wagenaaria Brennan, 1967:148 [Type species: Wagenaaria similis

Brennan, original designation]; Vercammen-Grandjean et al.,
1973:64.

Diagnosis: Leeuwenhoekine larvae lacking spiracles, trachea
and nasus; onychotriches present. Coxae II and III unisetose.

Redescription: Parasitic on bats. Palpal tarsus 7B plus
tarsala. Palpotibial claws with several slender prongs. Cheliceral
blades with small tricuspid cap. Scutum with a pair each of antero-
submedian, anterolateral and posterolateral setae. Sensillae flagelli-
form, bases far posterad of posterolateral scutal setae. Coxa I
bisetose, coxae II and III unisetose. Tarsal claws with long onychotriches,
empodia nude.
Wagenaaria similis Brennan

(Fig. 16)


Diagnosis: Parasitic on bats. Differs from Sasacarus furmani (Hoffmann) by the pentafurcate tarsal claws, and absence of eyes.

formula 2+, 2, 1. Microgenualae and microtibialae 6 to 7µm long. Branched setae per leg segment for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,7,5; genu 4,4,4; tibia 8,6,6; tarsus 29,17,17. Branched setae stout, sparsely to moderately branched. Onychotriches long, empodium nude. Leg index 892.

**Distribution:** Mexico, Curacao, Venezuela.

**Specimens Examined:** Holotype and 4 paratypes, ex Mormoops megalophylla, Hato, Curacao, Sept., Oct., and Nov., 1948; 1, ex Pteronotus davyi and 1, ex P. parnellii, Sucre, Venezuela, June and Dec., 1948.

**Other Records:** Reported off Mormoops megalophylla (paratypes), Hato, Curacao (Brennan, 1967:148), and Pteronotus davyi, Yucatan Peninsula, Mexico (Loomis 1969:5).

**Remarks:** The Venezuelan specimens agree closely with the holotype as did the Mexican specimens (according to Loomis, 1969). The palpal claw is re-illustrated to indicate differences from the original illustration. In addition the microtarsala I is correctly placed laterad of tarsala I.

Vercammen-Grandjean et al. place Wagenaaria as a subgenus of Chatia Brennan, 1946 on the basis of the number of branched setae on the femora of the legs (6, 7, 5 for legs I, II, and III).
Genus Whartonia Ewing

Whartonia Ewing 1944:102 [Type species: Hannemania nudosetosa
Wharton, original designation]; Gould, 1956:19; Chen and Hsu
1959:549; Wharton and Fuller 1952:104; Domrow 1962:1;
Vercammen-Grandjean 1968:126; Vercammen-Grandjean et al.
1973:64.

Diagnosis: Leeuwenhoekine larvae with spiracles and trachea.
Cheliceral blades with a row each of large dorsal and ventral teeth.
Scutum lacking nasus.

Generic Redescription: Larvae parasitic on bats and occasion-
ally rodents. Cheliceral blades 50 to 110μm long with dorsal and ventral
rows of teeth. Palpotibial claws with three to several prongs. Palpal
formula variable, B/B/B NN BB; Palpal tarsi 7B plus tarsala. Galealae
branched. Tracheae and spiracles present. Scutum subrectangle,
often much broader than deep. Sensillae flagelliform, nude or
sparsely barbed. Genualae and tibialae variable. Tarsala III present
or absent, coxa I bisetose, coxa II unisetose. Mastisetae absent.
Idiosomal setae with short, barb-like setules, sparsely to moderately
branched.

Key to Subgenera and Species

1. Coxa III bisetose, parasubterminala on leg I absent, tarsala

   III present---(Subgenus Whartonia) . . . . . . . . . . . 2

   Coxa III unisetose, parasubterminala on leg I present,

   tarsala III lacking---(Subgenus Asolentria) . . . . . . 4

2. Three genualae I, anterolateral angles of scutum acute . .

   . . . . . . . . . . . . . . . . . . W. (W.) angulascuta n. sp.
Two genualae I, anterolateral angles of scutum not acute. 3

3(2). Dorsal setae number about 30 with very oppressed, short barbs, nearly nude.  W. (W.) nudosetosa

Dorsal setae number about 60 densely barbed, setules thorn-like.  W. (W.) pachywhartonii


Palpotibial claw pectinate, Palpal formula B/B/BNN, setules of scutal setae about 8µm long, slender.  W. (A.) womersleyi

Remarks: Although tracheae and spiracles are reportedly absent in the subgenera Whartonia and Asolentria (Vercammen-Grandjean 1968:119), neotropical representatives of these taxa were found to possess both spiracles and tracheae. The spiracles are small and located adjacent to the anterior margin of coxa I. Lack of scutal nasus is therefore not coincident with the absence of spiracles and trachea in these subgenera.
Subgenus *Whartonia* Vercammen-Grandjean


**Diagnosis:** Larvae with bisetose coxa III, tarsala III, and lacking parasubterminala on leg I.

**Subgeneric Description:** Larvae large, broad ovoid to circular when engorged. Cheliceral blades about 100μm long with large dorsal and ventral teeth. Palpal formula B/B/BBB; galealae branched; palpotibial claws pentafurcate to pectinate. Scutum much wider than deep, sensillae barbed or nude. Coxa III bisetose, tarsala III present; parasubterminala I lacking.
Whartonia (Whartonia) nudosetosa (Wharton)

Hannemania nudosetosa Wharton 1938:142 [Holotype-larva, ex Peteropteryx (sic) canina canina and Artibeus jamaicensis, Yucatan, Mexico: Rocky Mountain Laboratory, Hamilton, Montana]; Hoffmann 1944:56; Vercammen-Grandjean 1968:126.


Diagnosis: W. nudosetosa separates from W. angulascuta n. sp. by the form and pattern of dorsal setae by palpal formula B/B/BNN, and non-acute anterolateral angles of scutum.

Redescription: Idiosoma: Nearly circular. Length and width of holotype 710 and 620, eyes 2/2, plate lacking; diameter, anterior 11, posterior 10. Dorsal setae appearing almost nude, with minute nubbins. Dorsal setae 40 to 50 µm, longer anteriorly; 2 humerals (62 µm)-8-2(lateral)-6-2(lateral)-8-6-2; ventral setae, 2 sternals with long setules (broken in most specimens), 30-34 slender pre- and para-anals, 30-40 µm, with long slender setules or stubs of broken setules, and about 16 postanals similar to dorsals. Anus just posterad of third row of setae. Spiracles small, adjacent to anterior margin of coxa I (not visible in holotype). Tracheae visible in some specimens to posterior third of idiosoma. Gnathosoma: Cheliceral bases moderately punctate, punctae fine. Palpal formula B/B/BBB, the femoral and genual setae
slender with a few branches, the dorsotibial much heavier with numerous, very small branches. Galealae sparsely branched. Palpotibial claw pentafurcate. Cheliceral blades about 87µm, absent on holotype; teeth large and curved, numbering about 21 dorsally and 20 ventrally. Scutum: Shaped as figured by Brennan and Dalmat (1960:185, Fig. 3), much broader than deep, subquadrate with sinuate posterior margins sensillae posterior to PL's. Scutal setae similar to dorsals.

Measurements of Holotype (measurements of Venezuela specimens in parentheses): AW-138 (130), PW-148 (140), SB-54 (50), ASB-41 (48), PSB-10 (8), AP-22 (22), AMB-13 (11), AM-89 (79), AL-58 (56), PL-67 (67), S-- (--). Legs: Coxae lightly punctate. Distance between coxa I setae 40. Legs relatively long, not heavily sclerotized. Specialized setae as figured by Brennan and Dalmat (1960:185, Fig. 3). Genuala formula 2+,1,1. Tibiala formula 2+,2,1. Microsetae 3 to 11µm long. Branched setae per leg segment, sequentially for legs I, II and III: Coxa 2,1,2; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,6,6; tarsus approximately 24,21,24 (33,29,27 Venezuelan specimen). Tarsal claws nude. Leg index 1075.

Distribution: Mexico, West Indies, Trinidad, Colombia, Guatemala.

Specimens Examined: Holotype and 2 paratypes, ex Artibeus jamaicensis and Peteropteryx (sic) canina canina, Yucatan, Mexico, Aug., 1936; 1, Glossophaga soricina, Sinaloa, Mexico July, 1964; 1, Mimon cozumelae, Yucatan, Mexico, July, 1962; larvae off 88 bats, Venezuela, as follows: 25, ex 4 Peropteryx kappleri; 2, ex 1 P. macrotis; 3, ex 1 Noctilio labialis; 5, ex 1 Chrotopterus auritus;
1, ex Glossophaga longirostris; 109, ex 21 G. coricina; 28, ex 9
Lionycteris spurrelli; 9, ex 4 Anoura caudifera; 2, ex 2 A. geoffroyi;
6, ex 2 Anoura sp., 38, ex 12 Carollia brevicauda; 68, ex 23
C. perspicillata; 2, ex 2 Sturnira lilium; 2, ex 1 Vampyrops sp;
1, ex 1 Chiroderma villosum; 1, ex Artibeus jamaicensis; 7, ex 3
Desmodus rotundus. Collected throughout the year except Dec. and Jan.,
1966-1968, from Amazonas, Apure, Barinas, Bolivar, Carabobo, Distrito
Federal, Falcon, Merida, Miranda and Zulia.

Other Records: Recorded off: Carollia perspicillata azteca,
Alta Vera Paz, Guatemala (Brennan and Dalmat 1960:185); Leaf-nosed
bat, Jamaica (Brennan 1953:3); Carollia perspicillata, Quintana Roo,
and Artibeus jamaicensis, Desmodus rotundus, Mimon cozumelae and
Glossophaga soricina; Yucatan, Mexico (Loomis 1969:6); Nycteris
borealis and unidentified bats, Puebla, Mexico, (Hoffmann 1948:189);
Desmodus rotundus, La Fontaine Cave, Trinidad. (Brennan and Jones
1960:486); and C. perspicillata, Tamana Bat Cave, Trinidad (Brennan

In addition, specimens from Meta, Colombia off Molossus major
are on deposit in the Rocky Mountain Laboratory, Hamilton, Montana.

Remarks: The large amount of material from Venezuela verifies
the presence of 2 coxa III setae as is present on the holotype. Specimens
examined indicated an increase in size of the South American specimens
over the original specimens from Yucatan, Mexico, and also showed an
increase in the number of setae on the tarsi of the legs. Comparison of
the leg index and number of branched setae on the tarsi of legs I, II
and III for specimens from Yucatan, Costa Rica and Venezuela follows:
Yucatan (holotype), leg index 1075, branched setae 24,21,24; Costa Rica, leg index 1280, branched setae 33,27,23-24; Venezuela, leg index 1390, branched setae 33,29,27. A specimen from Sinaloa, Mexico, collected in 1960, had a leg index of 1080 and approximately 30,22,20 branched setae on legs I, II and III, respectively. Although the type material seen is too poor to accurately count the branched setae of the legs, it is evident that the Mexican material examined has fewer branched tarsal setae than the specimens from Costa Rica and Venezuela. This variation may be contributed to the increase in size as referred to by Vercammen-Grandjean et al. (1973:54), "Gigantism often favors an increase in the number of barbed setae, predominantly on tarsus and tibia".

Whartonia (Whartonia) pachywhartoni Vercammen-Grandjean


Diagnosis (based on original description): W. pachywhartoni differs from other neotropical Whartonia species by the densely barbed dorsal setae and the six-pronged palpotibial claws.

Distribution: Brazil: Lagoa Ltd.

Specimens Examined: none.

Records: Holotype and 5 specimens only; ex Micronycteris megalotis, Lagoa Ltd., Brazil, 10 Apr., 1962, M. G. Sceva.

Remarks: Specimens of this species could not be located. Apparently the author's shipment of type material to the United States National Museum corresponded with the transfer of the U.S.N.M. chigger collection to the Rocky Mountain Laboratory and was misplaced. For descriptive information refer to the original description.
Whartonía (Whartonía) angulascuta n. sp.

(Fig. 18)

Type data: Holotype and 3 paratypes, RML#52990, 1 paratype 52784, ex Carollia perspicillata, Venezuela, Falcon, 17 km NE Mirimire, (Lapastora), 230m, 21, Nov., 1967. Eleven paratypes: 1, RML#52752, ex C. brevicauda, Venezuela, Monagas, 5 km NW Carípe (San Agustín), 1160m, 26, June, 1967; 2, RML#54829, 5, RML#55886, ex Chrotoperus auritus, Venezuela, Falcon, 12 km NE Mirimire (La Pastora), 220m, 14, Nov., 1967; 2, RML#52712, Diphylla ecaudata, Venezuela, Monagas, 3 km SW Carípe (Hacienda Tucusito), 854m, 11, July, 1967; N. E. Peterson, F. Brown, J. Matson, R. B. and P. B. Peacock.

Holotype and 5 paratypes: Rocky Mountain Laboratory. Paratypes: Chicago Field Museum of Natural History and California State University, Long Beach.

Diagnosis: W. (W.) angulascuta n. sp. differs from other neotropical species by acute anterolateral scutal angles and by numerous genualae on leg III.

Description: Idiosoma: Broadly ovoid, length and width of holotype 736 and 435. Eyes 2/2, diameter: anterior 20, posterior 17; plates lacking. Dorsal setae moderately barbed, setules very short and appressed, appearing as nubbins; humerals 66μm, others 58-78, arranged approximately 2-11-2-9-2-9-6-2 (variable). Ventral setae: 2 sternals, about 40 slender pre-anal and para-anal setae with longer setules, 37-60μm, para-anals longest, plus about 32 postanals similar to dorsals. Anus located at 4th row of ventral setae. Spiracles small; tracheae apparent in less engorged specimens. Gnathosoma:
Cheliceral bases moderately punctate; palpal formula B/B/BBB, setae long with few long setules; palpotarsus 7B plus tarsala; galealae sparsely branched; palpotibial claws apparently pentafurcate; cheliceral blades 111μm long, with about 8 dorsal and 15 ventral teeth. **Scutum**: Shaped as figured, anterolateral angles acute; sensillae nude, bases posterior to PL's. Other scutal setae similar to dorsals, with longer setules. Measurements of holotype: AW-170, PW-146, SB-58, ASB-59, PSB-11, AP-29, AMB-12, AM-67, AL-55+, PL-95, S-131. **Legs**: Long and slender with little intermedullary space. Specialized setae as figured, parasubterminala absent. Branched setae per leg segment, sequentially for legs I, II and III: Coxa 2,1,2; trochanter 1,1,1; femur 6,6,4; genu 4,4,4; tibia 8,6,6; tarsus about 53-60,56,45. Number of tibialae and genualae variable among specimens.

**Distribution**: Venezuela; Monagas and Falcon districts, at elevations from 220 to 260m.

**Specimens Examined**: Type specimens.

**Other Records**: None.

**Remarks**: Variations were noted in the number of genualae on legs II and III which varied from 3 to 4 on leg II and from 7 to 11 on leg III. The distal tibiala III was absent from 1 specimen. No differences in the number of branched setae were noted on segments where variations in specialized setae were found. The heavy sclerotization of the legs is similar to that described for *W. pachywhartoni*. 
Subgenus Asolentria Vercammen-Grandjean

Whartonia (Asolentria) Vercammen-Grandjean 1968:126 [Type species: Whartonia trinidadensis Brennan and Jones, original designation]; Vercammen-Grandjean et al., 1973:64.

**Diagnosis:** Larvae separate from the nominate subgenus by unisetose coxa III, parasubterminala on leg I, and absence of tarsala III.

**Subgeneric Redescription:** Larvae large, parasitic on bats. Idiosoma semicircular when engorged. Cheliceral blades about 50µm long, with dorsal and ventral teeth, and dorsal, subapical hook. Palpal claws trifurcate to pentafurcate. Palpal formula variable. Galealae branched. Scutum deep, subrectangular; sensillae flagelliform. Tracheae and spiracles present, minute. Coxa III unisetose; subterminala and parasubterminala present on leg I; Tarsala III lacking.
Whartonia (Asolentria) querrerrensis Hoffmann


Whartonia trinidadensis Brennan and Jones, 1960:496 [Type species: Whartonia trinidadensis, ex Mormoops megalophylla, Tamana Cave, Trinidad; Rocky Mountain Laboratory, Hamilton, Montana].


Diagnosis: W. querrerrensis differs from W. (A.) womersleyi by the trifurcate palpotibial claw and short thorn-like barbs on scutal setae.

Redescription (Based on Venezuelan specimens. See Remarks below): Idiosoma: Nearly circular when engorged, length and width of one engorged specimen: 550 and 475. Eyes 2/2 in indistinct plates; diameter: anterior 10, posterior 6. Humerals 54µm; dorsal setae 44-58µm longer laterally and posteriorly, sparsely branched, with short thorn-like setules. Dorsal formula approximately 2 (humerals) -8-10-4 (lateral) -11-4 (lateral) -13-2-10-6-2-2. Ventral setae: 2 sternals, 30 pre-anals in uneven rows, (37-43µm), the first 3 rows with longer setules, and 28 postanals similar to dorsals. Spiracles minute, visible in most specimens only as small portion of trachea adjacent to or under anteromedian margin of coxa I. Tracheae traceable for only few microns. Gnathosoma: Cheliceral blades prominent, about 58µm long with about 13 large ventral teeth, 8 smaller dorsal teeth plus one large dorsolateral subapical tooth. Palpal formula B/B/BNN; the femoral
and genual setae with 1 or 2 barbs, genual very long and slender; dorsotibial thicker and densely branched with short fine branches. Palpotarsus 7B plus tarsala; setae sparsely barbed, ventral setae usually appearing nude. Galealae with a few inconspicuous barbs.

**Scutum**: Shape conforms to original illustration. Subrectangular, anterior and posterior margins slightly sinuate; punctae light and sparse. Scutal setae similar to, but stouter than dorsals; sensillae with 1 or 2 barbs. Measurements of Venezuelan specimen (measurements of holotype in parentheses according to Hoffmann, 1960): AS-81 (78), PW-84 (81), SB-26 (28), ASB-25 (26) PSB-17 (15), AP-30 (28), AM-49 (40), AMB-8 (---), AL-38 (36), PL-53 (46), S-76+ (m'as de 60). **Legs**: Coxae moderately punctate, all other segments lightly punctate. Specialized setae as originally figured. Genuala formula 2+,1+,1; tibiala formula 2+,2,1. Branched setae sparsely branched; number per segment listed sequentially for legs I, II and III: Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; genu 4,4,4; tibia 8,6,6; tarsus 20,17,15. Leg index 874.

Tarsal claws with a pair of onychotriches, apparently easily broken.

**Distribution**: Bahamas, Curacao, Colombia, Mexico, Venezuela.

**Specimens Examined**: Eleven larvae, ex 4 Mormoops megalophylla, Venezuela, Sucre, May, 1967.

**Other Records**: Holotype and a paratype, ex Mormoops megalophylla, Guerrero, Mexico (Hoffmann, 1960:7). Also reported off: Mormoops megalophylla, Tamana Cave, Trinidad (Brennan and Jones 1960:496); M. megalophylla, Hato, Curacao, and Cueba di Quadirikiri, Aruba; Erophylla sezekorni, New Province Bahamas; and Peropteryx macrotis,
Margarita, Venezuela (Brennan 1967:153). In addition, the Rocky Mountain Laboratory collection includes specimens of *Mormoops megalophylla*, April, 1967, Macarequa, Colombia.

**Remarks:** Type material for *W. guerrerrensis* was not obtainable at the time of writing. The description of a Venezuela specimen therefore, was used primarily to enlarge upon the original description. Measurements of the Venezuelan specimen are overall larger than those of the holotype. Brennan's description of the synonym, *W. trinidadensis* also shows some increase in size over the scutal measurements listed by Hoffmann in the original description. A similar increase in size of Venezuela specimens in comparison with Mexican representatives was also noticed in *W. nudosetosa*. 
Whartonia (Asolentria) womersleyi Brennan and Dalmat

Whartonia womersleyi Brennan and Dalmat, 1960:185 [Holotype-larva, ex Balantiopteryx io, Guatemala: Chicago Natural History Museum].

Diagnosis: W. womersleyi differs from other neotropical Whartonia species by the pectinate palpal claws and single dorsal teeth on the cheliceral blades

Redescription (based on paratypes and original description):

Idiosoma: Nearly circular. Length and width of one paratype, 924 and 721. Eyes 2/2. Body setae moderately branched, setules barb-like. DF approximately: 2 humerals (70μm) 6-10-2 (lateral) 8-12+24, (62-69μm). Two sternals, plus about 48 ventral setae; pre-ansals and postanals similar to dorsals (49-66μm). Spiracles visible only as opening to tracheae adjacent to anterior margin of coxa I. Tracheae visible only near coxa I. Gnathosoma: Cheliceral blades 50μ, as shown in original description with large dorsal tooth, several small anteroventral teeth and large ventral teeth posteriorly. Galealae apparently branched. Palpal formula B/B/??? (B/B/BNB, Brennan and Dalmat, 1960); palpotarsi 7B plus tarsala. Scutum: Not completely visible on 2 paratypes observed. Shape conforms to original illustrations, nearly quadrate, sparsely punctate, deep, posterior margin broadly rounded. Sensillae branched with few very long slender branches. Scutal setae similar to dorsals with longer setules. Measurements of one paratype with measurements of holotype in parentheses (from Brennan and Dalmat, 1960). AW-81 (83), PW-87 (88), SB-28 (30), ASB-40 (40), PSB-16 (22), A)-32 (33), AMB-10 (--), AM-77 (72), AL-56 (61), PL-57 (61), S-about 81. Legs:
Specialized setae as originally figured, sclerotization not obvious. Genuala formula 2,1,1; Tibiala formula 2+,2,1. Parasubterminala I present and may have a few barbs; branched setae not plumose, moderately branched with moderately long, stiff setules; branched setae per segment, listed sequentially for legs I, II, and III. Coxa 2,1,1; trochanter 1,1,1; femur 6,5,4; tibia ?,6,6; tarsus 20,15,14. Tarsal claws paired with onychotriches apparent on some claws; empodium nude. Leg index 1113 (paratype).

**Distribution:** Guatemala: Alta Vera Paz.

**Specimens Examined:** Two paratypes ex *Balantiopteryx io*, Alta Vera Paz, May, 1948.

**Other Material:** Holotype and 1 paratype, (Brennan and Dalmat, 1960:185).

**Remarks:** The 2 paratypes observed were in poor condition, making accurate scutal measurements and setal counts difficult. Differences from the original description noted in the paratypes were the presence of onychotriches, slightly different counts of the branched setae on tarsi of the legs, and branched sensillae.
Host Parasite List

Class Reptilia

Order Squamata

Tropiduras peruvianus

Odontacarus australis

Unidentified Lizard

Odontacarus australis

Class Aves

Order Galliformes

Odontaphorus erythrops

Odontacarus tubercularis

Order Cuculiformes

Neomorphis geoffroyi salvini

Odontacarus tubercularis

Unidentified bird

Odontacarus comosus comosus

Class Mammalia

Order Marsupiala

Monodelphis brevicaudata

Odontacarus tubercularis

Mormosa fuscata

Odontacarus comosus novemsetus

O. sunnianae

O. tubercularis
Marmosa dryas
   Odontacarus comosus comosus
Marmosa robinsoni
   Odontacarus tubercularis
Marmosa megalophylla
   Wagenaaria similis
Philander opossum
   Odontacarus tubercularis
Didelphis marsupialis
   Odontacarus surnlanae
   O. tubercularis
Didelphis opossum
   Leeuwenhoekia verdunni

Order Insectivora

Cryptotis thomasi
   Odontacarus dienteslargus

Order Chiroptera

Saccopteryx bilineata
   Odontacarus tubercularis
Peropteryx macrotis
   Whartonia nudosetosa
Peropteryx kappleri
   Whartonia nudosetosa
Balantiopterxx io
   Whartonia womersleyi
Noctilio labialis

Whartonia nudosetosa

Nycteris borialis mexicana

Whartonia nudosetosa

Pteronotus davyi

Wagenaaria similis

Pteronotus parnelli

Wagenaaria similis

Mormoops megalophylla

Whartonia guerrerensis

Micronycteris microtus

Odontacarus tubercularis

Lonchorhina aurita

Odontacarus schoenesetosus

O. vergrandi

Mimon cozumelae

Whartonia nudosetosa

Phyllostomus hastatus

Odontacarus tubercularis

Chrotopterus auritus

Whartonia angulascuta

Glossophaga soricina

Whartonia nudosetosa

Glossophaga longirostris

Whartonia nudosetosa

Lionycterus spurrelli

Whartonia nudosetosa
Anoura caudifera
Whartonia nudosetosa

Anoura geoffroyi
Whartonia nudosetosa

Carollia brevicauda
Odontacarus tubercularis
Whartonia angulascuta
W. nudosetosa

Carollia perspicillata
Whartonia angulascuta
W. nudosetosa

Carollia perspicillata azteca
Whartonia nudosetosa

Sturnira lilium
Whartonia nudosetosa

Vampyrops helleri
Whartonia nudosetosa

Vampyrops sp.
Whartonia nudosetosa

Vampyressa pusilla
Odontacarus tubercularis

Chiroderma villosum
Whartonia nudosetosa

Artibeus jamaicensis
Odontacarus schoenesetosus n. sp.
Whartonia nudosetosa
Ametrida centurio

Whartonia nudosetosa

Desmodus rotundus

Whartonia nudosetosa

Diphylla ecaudata

Whartonia angulascuta

Eptesicus montosus

Albeckia albecki

Odontacarus tubercularis

Histiotus sp.

Albeckia albecki

Antrozous pallidus pacificus

Albeckia albecki

Order Lagomorpha

Sylvilagus floridanus chiapanensis

Odontacarus mastigophorus

Order Rodentia

Sciuris granatensis

Odontacarus sunnianae

O. tubercularis

Liomys irroratus

Odontacarus tubercularis

Liomys adspersus

Odontacarus tubercularis

Heteromys desmeristianus

Sasacarus furmani panamensis
Heteromys desmeristianus desmeristianus

Leeuwenhoekia vercammeni

Heteromys anomalus

Odontacarus comosus novemsetus

Heteromys anomalus anomalus

Odontacarus tubercularis

Oryzomys albigularis

Odontacarus comosus comosus

O. comosus novemsetus

O. dienteslargus

O. munchiquensis

O. sunnianae

O. tiptoni

O. tubercularis

Oryzomys minutus

Odontacarus comosus comosus

O. tiptoni

O. tubercularis

O. tuberculohirsutus

O. vergrandi

Oryzomys capito

Odontacarus tubercularis

Oryzomys concolor

Odontacarus tubercularis

Oryzomys fulvescens

Odontacarus tubercularis

Nectomys ebriosus

Odontacarus kofordi
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Peromyscus yucantanicus
  Odontacarus chiapanensis
Reithrodontomys
  Odontacarus bakeri
Baiomys taylori
  Odontacarus bakeri
Baiomys musculus musculus
  Sasacarus furmani furmani
Akodon bogotensis
  Odontacarus dienteslargus
  O. tuberculohirsutus
Akodon urichi
  Odontacarus tubercularis
Zygodontomys brevicauda
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Chinchillula sahamae
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Sigmodon hispidus
  Odontacarus sunnianae
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Sigmomys alstoni
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Odontacarus mastigophorus
Chickaroo
Odontacarus mastigophorus
Rattus rattus
Odontacarus tubercularis
Rattus norvegicus
Odontacarus tubercularis
Agouti paca
Odontacarus tubercularis
Dasyprocta aguti
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Abracoma cinerea
Odontacarus kofordi
Proechimys semispinosus
Odontacarus chiapanensis
O. sunnianae
O. tubercularis
Sasacarus furmani panamensis
Proechimys semispinosus panamensis
Sasacarus furmani panamensis
Proechimys guyannensis
Odontacarus tubercularis
Unidentified rodent
Odontacarus chiapanensis

Order Carnivora
Felis pardalis

Odontacarus tubercularis


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LOOMISIA GEN. N. WITH DESCRIPTIONS OF THREE NEW VENEZUELAN SPECIES (ACARINA: TROMBICULIDAE)

James M. Brennan and Jack T. Reed

Reprinted from the JOURNAL OF PARASITOLOGY
Vol. 58, No. 4, August 1972
p. 796–800
Made in United States of America
LOOMISIA GEN. N. WITH DESCRIPTIONS OF THREE NEW VENEZUELAN SPECIES (ACARINA: TROMBICULIDAE)*

James M. Brennan† and Jack T. Reed‡


Loomis (1969), in recording Euschoengastia desmodus off bats from Yucatan, noted that it, as well as the allied bat chiggers Trombicula sprocssi and T. univari from southwestern United States were misplaced generically and that these three belong to an unnamed genus. The recent discovery of three new species on bats in Venezuela, clearly of this same group, has prompted the erection of a new genus Loomisia and a résumé of the six species assigned to it.

Unless otherwise stated, all collections which provide new records were made by personnel under the supervision of Dr. Charles O. Hundleby, Smithsonian Institution, and Lt. Col. Vernon J. Tipton, U. S. Army (retired), now Brigham Young University.

The new genus is named for Dr. Richard B. Loomis, Department of Biology, California State College, Long Beach, in recognition of his many significant contributions both in research and in students to the science of chiggers.

Loomisia gen. n.

Trombiculine larvae parasitic on bats, principally Neotropical, but also in southwestern United States. Scutum roughly trapezoidal, sparsely to moderately punctate, wider than long, posterior margin mildly sinuous to broadly convex, PL > AL, SB anterior to PL; the readily deciduous sensillae of various bizarre shapes: branched flagelliform, broadly branched and rebranched, expanded broomlike, etc. Eyes 2/2, fairly conspicuous, in a plate. Cheliceral blade wide and rather short, with tricuspid cap only. Galeal setae nude. Palpal tarsus with 6 setae, 1 or 2 of these apparently nude, and a tarsala; palpal tibial claw slender, tris furcate. Dorsal formula begins 2-6-6-6. Legs with 2 genua I, no genua II and III, a long, flexible tibiala III, no mastisetae, microtarsala I distad of tarsala I; coxal III seta at anterior third, proximad of center. Nonspecialized setae moderately to sparsely branched, in type species distributed on legs I to III as follows: coxa 1-1-1, trochanter 1-1-1, basifemur 1-2-2, telofemur 5-4-3, genu 4-3-3, tibia 8-6-6, tarsus 21-16-15.

Type species: Euschoengastia desmodus Brennan and Dalmat, 1960.


The following synoptic key to species of Loomisia has been constructed without regard to sensillae which are more often missing than not. Their deciduous nature is indeed unfortunate, because characteristics derived from these structures alone are specifically diagnostic.

The length of tibiala III appears to have some diagnostic value, but this specialized seta is long and pliant, thus is frequently curled, arched, or nearly looped so that measurement is not always feasible. Where its length can be obtained with reasonable accuracy it has been observed to vary from about 20 to 60 μ among the different species.

Key to larvae of Loomisia

1. Subterminala and parasubterminala absent, microtarsala II distad of elongate and lobed tarsala II _________ sprocssi Brennan Subterminala and parasubterminala present, microtarsala II proximad of tarsala II _______ 2

Received for publication 28 March 1972.

* This work was supported in part by Department of the Army Contract DA-49-193-MD-2788 with the Smithsonian Institution (Ecology and distribution of mammalian ectoparasites, arboviruses, and their hosts in Venezuela).


‡ Department of Zoology and Entomology, Brigham Young University, Provo, Utah 84601.

AM > AL, SB anterior to PL; the readily deciduous sensillae of various bizarre shapes: branched flagelliform, broadly branched and rebranched, expanded broomlike, etc. Eyes 2/2, fairly conspicuous, in a plate. Cheliceral blade wide and rather short, with tricuspid cap only. Galeal setae nude. Palpal tarsus with 6 setae, 1 or 2 of these apparently nude, and a tarsala; palpal tibial claw slender, tri furcate. Dorsal formula begins 2-6-6-6. Legs with 2 genua I, no genua II and III, a long, flexible tibiala III, no mastisetae, microtarsala I distad of tarsala I; coxal III seta at anterior third, proximad of center. Nonspecialized setae moderately to sparsely branched, in type species distributed on legs I to III as follows: coxa 1-1-1, trochanter 1-1-1, basifemur 1-2-2, telofemur 5-4-3, genu 4-3-3, tibia 8-6-6, tarsus 21-16-15.

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2. Tarsala I considerably longer than tarsala II
   yunkerti sp. n.
   Tarsala I shorter than or subequal to tarsala II
   3
3. Tarsala II with bulbous tip, palpal laterotibial seta branched
   bulbocalcar sp. n.
   Tarsala II tapered to tip, palpal laterotibial seta nude
   4
4. Tarsala I markedly shorter than tarsala II,
   tibiala III about 20 μ long
   univari Brennan
   Tarsala I slightly shorter or subequal to tarsala II,
   tibiala III more than 30 μ long
   5
5. Scutum deep (AP/SB = 3)
   alcithoeae sp. n.
   Scutum not so deep (AP/SB = 1.5 to 2)
   desmodus Brennan and Dalmat

Loomisia alcithoeae sp. n.
(Fig. 1)

Type data: Holotype and 2 paratypes, RML 55770, off Carollia sp.; Venezuela, Barinas, Altamira, La Bellaca; 14 December 1967.

Holotype and a paratype in the Rocky Mountain Laboratory, a paratype in the British Museum (Natural History).

Diagnosis: The broad obovate sensillae with long apical branches and bristling setules in addition to key characteristics distinguish L. alcithoeae.

Idiosoma: Holotype, well engorged, broad-ellipsoidal. Length and width, 612 by 408 μ. Eyes
comparative, anterior larger, diameter 11 μ. Anus between third and fourth rows of ventral setae.


_Legs:_ Puncta small, sparsely distributed, more on coxae. Specialized setae as figured. Non-specialized setae lightly to sparsely branched. Leg index of holotype 782.

**Idiosomal setae:** Dorsal formula 2-6-6-6-4-4-2; humeral setae 47 μ, posthumerals 29 to 46 μ. Ventral setae 2-2 + 42, postanal setae similar to dorsals.

**Loomisia bulbocalcar sp. n.**

*(Fig. 2)*

_Type data:_ Holotype and 6 paratypes, RML 55744, off _Peropteryx kapperi;_ Venezuela, Carabobo, 4.5 km NNW Montalbán (Cucuyal); 14 November 1967; 33 paratypes off 8 _P. kapperi;_ same location and date.

_Holotype and some paratypes in the Rocky Mountain Laboratory, other paratypes in the British Museum (Natural History), Field Museum of Natural History, and Bernice P. Bishop Museum._

_Other material:_ 1 larva off _Peropteryx macrotis;_ Yaracuy, 20 km NE San Felipe (Minas de Aroa); 12 December 1967; 55 off 6 _P. macrotis;_ Carabobo, 4.5 km NNW Chirgua (Cucuyal); 14 November 1967; 3 off _Monodelphis brevicauda;_ Carabobo, 1 km SE Montalbán (El Merry); 8 November 1967.

This last constitutes the only record of a species of _Loomisia_ on a host other than bat; in this case, a short bare-tailed opossum.

_Diagnosis:_ Elongate, rather narrow, clavate sensilla with barbs increasing in size from basal area of stem to setules up to 15 μ on head plus 2 long rebranching branches near apex along with bulbiform tarsala II and other key characters differentiate this species.

**Idiosoma:** Holotype, partly engorged, broad-ellipsoidal. Length and width, 693 by 510 μ. Eyes conspicuous, diameter of anterior 13 μ, posterior 7 μ. Anus between third and fourth rows of ventral setae.

**Gnathosoma:** Puncta small and sparsely distributed, 5 puncta and 4 modest setae as figured. Palpal setae B/B/NNB, 1 or 2 of the 6 tarsal setae seemingly nude.

_Scutum:_ As figured. Measurements of holotype: AW 46, PW 61, SB 18, ASB 20, PSB 17, AP 50, AM 41, AL 36, PL 45, S 53 × 7. About one-fourth of the series examined have at least 1 sensilla intact.

_Legs:_ Specialized setae as figured, non-specialized setae lightly to moderately branched. Leg index of holotype 732.

**Idiosomal setae:** Dorsal formula 2-6-6-6-4-4-2; humeral setae 42 μ, posthumerals 25 to 47 μ. Ventral setae 2-2 + 38.

_Note:_ All larvae of _L. yunkeri_ collected were orange in life and attached to ears or base of ears of host species.

_Named for the collector, Dr. Conrad E. Yunker, Scientist Director, U. S. Public Health Service, Rocky Mountain Laboratory._

**Loomisia yunkeri** sp. n. 

*(Fig. 3)*

_Type data:_ Holotype and 17 paratypes, RML 49833, off _Peropteryx kapperi;_ Venezuela, Bolivar, near Icaború; 8 May 1968; Conrad E. Yunker, collector.

_Holotype and paratypes in the Rocky Mountain Laboratory, paratypes in the British Museum (Natural History), Field Museum of Natural History, and Bernice P. Bishop Museum._

_Other material:_ 34 larvae off 8 _P. kapperi;_ Yaracuy, 6 to 9 May 1968; 33 off 6 _P. macrotis;_ near Icaború, 6 to 9 May 1968; 1 off _Cormura brevicornis;_ near Icaború, 8 May 1968; 5 off _Carollia sp.,_ Barinas, 2 km SW Altamira (La Vega del Rio, Santo Domingo), 1 January 1968; C. E. Yunker, collector; 5 off _P. kapperi;_ Bolivar, 85 km SSE El Dorado, 29 May 1966.

_Diagnosis:_ The only species of _Loomisia_ with tarsala I markedly longer than tarsala II. Sensilla somewhat as in _L. bulbocalcar_ but with 3 larger apical rebranching branches.

**Idiosoma:** Holotype, well engorged, broad-ellipsoidal. Length and width, 693 by 510 μ. Eyes conspicuous, diameter of anterior 13 μ, posterior 7 μ. Anus between third and fourth rows of ventral setae.

**Gnathosoma:** Sparsely punctate. Palpal setae B/B/NNB, 1 of 6 tarsal setae nude.


_Legs:_ Puncta small, sparsely distributed, more on coxae. Specialized setae as figured. Non-specialized setae lightly to sparsely branched. Leg index of holotype 782.

**Idiosomal setae:** Dorsal formula 2-6-6-6-4-4-2; humeral setae 47 μ, posthumerals 29 to 46 μ. Ventral setae 2-2 + 42, postanal setae similar to dorsals.

**Loomisia desmodus** (Brennan and Dalmat) _comb. n._

**Euschongastia desmodus** Brennan and Dalmat, 1960, p. 188

*(Fig. 4)*

This species, described from Guatemala off vampire bat, _Desmodus rotundus_, has been recorded from Trinidad off _Carollia perspicillata_ (Brennan and Jones, 1960); from Panama off _Saccopteryx bilineata, Glossophaga soricina, Carollia subrufa, Carollia castanea_, and _Micronycteris megalotis_ (Brennan and Yunker, 1966); from the Bahamas off _Erophylla sezekorni_ (Brennan, 1967);
Figures 3–4. Morphology of Loomisia spp. cont’d. 3. L. yukneri, specialized setae of legs, eyes, and scutum. 4. L. desmodus, eyes, scutum, and specialized setae of legs.

from Yucatan off Glossophaga soricina and Mimon cozamelae (Loomis, 1969).

First Venezuelan records are given alphabetically by states.

Apure: 2 larvae off 2 Carollia sp., 3 km N Nula (San Camilo), 23 and 25 January 1968.

Aragua: 2 off Glossophaga soricina, Rancho Grande, 30 March 1960, 2 off Carollia subrufa, Rancho Grande, 1,100 m, 7 August 1965.

Barinas: 10 off 6 Carollia sp., Altamira, La Bellaca, 14 December 1967; 12 off 5 Carollia sp., Altamira and 2 to 5 km SW, 13, 19, and 31 December 1967, 4 and 10 January 1968; 1 off Sturnira lilium 2 km SW Altamira, 27 December 1967; 4 off Glossophaga soricina, 2 km SW Altamira, 27 December 1967.


Carabobo: 3 off 4 Carollia subrufa, 4 km NW Montalbán (La Copa), 26 to 29 November 1967; 5 off Carollia sp., 9 km NE Montalbán (Cumbre Canoabo), 1 November 1967; 1 off Carollia sp., 13.3 km NE Montalbán, 2 November 1967; 7 off Peropteryx kiepferi, 4.5 km NNW Montalbán (Cucuyal), 14 November 1967.

Falcón: 2 off Carollia subrufa, 36 km SE Maracaibo (Cerro Scopolo), 17 May 1968; 10 off Peropteryx kiepferi, 11 km NE Mirimiter (La Pastora), 14 November 1967; 10 off Saccopterix bilineata, same general locality, 23 November 1967.

Miranda: 2 off Carollia sp., 19 km E Caracas (Curapao), 5 October 1966.

Monagas: 3 off Peropteryx kiepferi, 3 km SW Caripe (Hacienda Tucusito), 11 July 1967.

Sucre: 5 off Carollia perspicillata, 13 km NE Guiria (Hacienda Santa Rosa), 17 June 1967.

Trujillo: 1 off Glossophaga longirostris, 20 km N Valera (Agua Viva), 1 September 1965; 2 off Glossophaga soricina, 23 km NW Valera (Agua Santa), 6 September 1965.
Yaracuy: 4 off Saccopteryx bilineata, 19 km NW Urama, 6 and 5 November 1965; 1 off Peropteryx macrotis, 20 km NE San Felipe (Minas de Aroa), 12 December 1967.

Zulia: 8 off Anoura geoffroyi, near Sierra de Perija, 30 April 1968; 1 off Desmodus rotundus, same location, 20 April 1968; 2 off Carollia perspicillata, same location and date; 2 off Carollia sp., same location, 19 April 1968; 1 off Lonchophylla robusta, same location and date; 3 off Peropteryx kappleri, same location, 15 April 1968; Dr. Conrad E. Yunker, collector.

Remarks
A first record of L. desmodus from Colombia is, unfortunately, based on incomplete data: one larva off “bat,” west central Colombia, 31 July 1965. This specimen has one sensilla intact.

Of about 150 specimens examined since its description, only five have been observed with sensilla and only one of these with both intact (Fig. 4).

The specimens off Erophylla from the Bahamas, and from Zulia, Venezuela, off Carollia, Desmodus, and Loncho phylla differ from typical L. desmodus in having palpal femur and genu laterally angulate.

Loomisia sprocssi (Brennan) comb. n. Trombicula sprocssi Brennan, 1965, p. 109
No records other than those of the original description, from Pipistrellus hesperus and Macrotus californicus, Arizona, and from P. hesperus, M. californicus, Antrozous pallidus, and Eptesicus fuscus, southern California.

L. sprocssi is the only member of the genus without subterminala and parasubterminala, and with branched flagelliform sensilla (Brennan, 1960, fig. 3) and microtarsala II distal of tarsala II, wrongly placed in illustration.

Loomisia univari (Brennan) comb. n. Trombicula univari Brennan, 1960, p. 110
In addition to records of the original description from Pipistrellus hesperus, Plecotus townsendii, and Antrozous pallidus, Arizona, are two larvae off P. hesperus near Mercury, Nevada, 29 July 1960, Dr. Donald M. Allred, collector.
The sensilla of this species seemingly depict a first step toward expansion within the group: elongate, coarsely barbed stems spreading fan-like into three main branches which rebranch (Brennan, 1960, fig. 4). Also, tibiala III is shorter than observed in any of the other forms.

LITERATURE CITED

TWO NEW VENEZUELAN CHIGGERS OF THE GENUS POLYLOPADIUM
(ACARINA: TROMBICULIDAE)1

By James M. Brennan2 and Jack T. Reed3

Abstract: Polylopadium chaetolecanium, n. sp. off Proechimys guyannensis, Sucre, and P. tricholecanium, n. sp. off Proechimys sp., Falcon, are described and figured.

Eight species were included in the Neotropical genus Polylopadium Brennan & Jones, 1961 at the time of its redescription by Brennan (1969). Two additional species, providing first records of the genus in Venezuela, are described below. Only rodents are hosts for these as well as the earlier described species from Panama, Colombia and northern Brazil. No species have been found in abundance.

An outstanding characteristic of the larvae of this unique genus is dorsal platelets whose shape, number and arrangement are diagnostically specific. Postlarval stages are unknown. Both new species differ from all others by a seta arising from each dorsal platelet and by extrascutal posteralateral setae.

Polylopadium chaetolecanium, n. sp.

Type data: Holotype and 2 paratypes, larvae, RML 53053, off Proechimys guyannensis, Venezuela, Sucre, 26 km SE Carúpano (Manacal), 2.VIII. 1967; 1 paratype off Heteromys anomaluus, same location and data; N. E. Peterson, R. B. and D. B. Peacock, collectors.

Holotype and a paratype in the Rocky Mountain Laboratory, a paratype each in the British Museum (Natural History) and Field Museum of Natural History.

Diagnosis: With 18 subcircular dorsal platelets of approximately equal diameter, from each of which arises a seta; 1 genuala I, no genuala II and III. Body: Broad-ellipsoidal. Ocular plates distinct, but eyes absent, at least obsolescent. Dorsum with 18 platelets, as figured, arranged 4-4-4-4-2. Length and width of holotype, partly engorged, 313 by 205 \( \mu \). Anus at 4th row of ventral setae.

Gnathosoma: With characteristics of the genus, i.e., moderately punctate, blades rather small, with tricuspid cap; Galeal setae nude; palpal setae B/B/BBB, tarsus with 5 branched setae and a tarsala, tibial claw trifurcate.

Scutum: As figured, deep trapezoidal, broadly rounded at posteralateral region, with numerous fine puncta; sensillae obovate, with coarse, rather short setules; setae small, the PL's extrascutal. Measurements of holotype: AW 46, SB 34, ASB 22, PSB 42, AM 7, AL 15, PL 16, S 32 \( \times \) 13; greatest width of scutum 79.

Legs: Coxal I seta forked, coxal II seta nude (or apparently so), coxal III seta forked, approximately centered. Coxal III as figured, about as long as wide. Leg index 549.

Body setae: Dorsals with few short barbs, 16 to 19 \( \mu \), arranged (including those arising from the platelets) 2-2-6-6-4-4-2. Ventral setae 2-2 (ternstals)-8-8-6-4-4 or 2. Sternal setae appear nude, those of 1st row 20 \( \mu \), of 2nd row 17 \( \mu \).

Polylopadium tricholecanium, n. sp.


Holotype deposited in the Rocky Mountain Laboratory.

Diagnosis: With 26 dorsal platelets (including those arising from scutum at posterior margin) of various shapes but mostly subcircular, from each of which arises a seta; 2 genualae I, a genuala II and III.

Body: Broad-ellipsoidal. Eyes absent. Dorsum with 26 platelets, as figured, arranged 2-2-6-6-4-4-2. Length and width of holotype, partly engorged, 323 by 212 \( \mu \). Anus at 4th (next to last) row of ventral setae.

Gnathosoma: As described for P. chaetolecanium.

Scutum: As figured, shaped as in P. chaetolecanium except for the 2 platelets merged with posterior margin; puncta small and fairly densely distributed; PL's extrascutal and arising basally from lanceolate platelets. Measurements: AW 43, SB 31, ASB 18, PSB 60, AM (tip broken), AL 11, PL 9, S (missing); greatest width of scutum 82.

Legs: As in P. chaetolecanium, except for a genuala added to each leg. Specialized setae and coxa III as figured. Leg index 590.

Body setae: Dorsal setae 10 to 12 \( \mu \) arranged (including those in platelets) 4-6-6-6-4-4-2. Ventral setae 2-2 \( \pm \) 20. First pair of sternals with 2 or 3 barbs, 2nd pair forked, about 15 \( \mu \).

LITERATURE CITED


1This work was supported in part by Department of the Army Contract DA-49-193-MD-5788 with the Smithsonian Institution (Ecology and distribution of mammalian ectoparasites, arboviruses, and their hosts in Venezuela).

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FIG. 1. *Polylopodium chaetolecanium*. Dorsum showing scutum and distribution of platelets.

FIG. 2. *Polylopodium tricholecanium*. Dorsum showing scutum and platelets.
FIG. 3. (A) *Polylopodium chaetolecanium*. Specialized setae of legs; measurements in microns; coxa III. (B) *P. tricholecanium*. Specialized setae of legs; coxa III.
COMATACARUS, FORMERLY SUBGENUS OF LEEUWENHOEKIA, RESTORED TO GENERIC STATUS, WITH DESCRIPTION OF A NEW SPECIES (ACARINA: TROMBICULIDAE)

By Jack T. Reed

Abstract: Comatacarus Ewing, 1942 is reinstated as a genus and Comatacarus inconspicuus, n. sp. is described from Peromyscus maniculatus from Utah. The genus is briefly redescribed, a new diagnostic character is noted and a key to the 4 species is included.

Ewing (1942) described Comatacarus americanus as the type species for a new genus based on 6 larvae from "western mole," Portland, Oregon, and 1 larva from "cotton mouse," Dale County, Alabama. As originally described, Comatacarus differed from Leeuwenhoekia Oudemans, 1911 primarily by having nonclavate posterolateral scutal setae and by possessing numerous "sessile" dorsal setae instead of setae on tubercles.

Ewing (1950) later recognized the lack of spiracles and tracheae in the type species and redescribed the genus to include this character. Wharton et al. (1951) suggested that lack of spiracles and tracheae was of subgeneric value only and reduced Comatacarus to subgeneric status.

The description of 2 additional species of the genus by Gould (1956), the description of C. inconspicuus, n. sp., and the discovery of accessory branches on the anterosubmedian scutal setae of all 4 species support the reinstatement of Comatacarus to its original generic rank.

COMATACARUS Ewing, 1942


Leeuwenhoekia (Comatacarus): Wharton et al., 1951: 30.

Type species: Comatacarus americanus Ewing, 1942.

Referred species: Leeuwenhoekia (Comatacarus) dolosa Gould, 1956, Leeuwenhoekia (Comatacarus) stewarti Gould, 1956, Comatacarus inconspicuus, n. sp.

Diagnosis: Comatacarus is distinguished from Leeuwenhoekia Oudemans, 1911 chiefly by its having a Nearctic distribution as opposed to Neotropical, lacking spiracles and tracheae, possessing more numerous dorsal and ventral setae, and having posterolateral scutal setae similar to other scutal setae. Other differences between Comatacarus and Leeuwenhoekia or other closely related genera may be noted in the following redescription:

Larvae, parasitic on small rodents and insectivores; cheliceral blades with tricuspid cap only; palpal claw trifurcate, axial prong largest, palpotarsus 7B plus tarsala; palpal formula variable, galeala branched or nude; tracheae and spiracles absent; scutum roughly rectangular, nasus present, anterior margin slightly sinuate, posterior margin ranging from broadly rounded to sinuate; 2 anterosubmedian setae with small accessory branches, posterolateral scutal setae similar to anterolaterals; sensillae flagelliform, nude or minutely barbed; leg segmentation 6-6-6, subterminala and parasubterminala present, tarsi with 2 claws and a slender medial empodium, onychieterae lacking; genuerar variable, 2 tibialae I and II, tibia III present or absent, mastisetae lacking; coxae moderately punctate, coxa I bisetose, coxae II and III unisetose; dorsal setae moderately branched, 70-100 in uneven rows; 2 sternals plus 70-120 ventral setae in uneven rows.

Comatacarus inconspicuus, n. sp. FIG. 1


Holotype and paratypes in the Rocky Mountain Laboratory. Other paratypes in the Field Museum of Natural History, California State University, Long Beach, and Brigham Young University.

Diagnosis: Resembles Comatacarus americanus Ewing, 1942, but differs by having only 1 genuala I, more numerous and more slender body setae, branched palpal laterotibial setae, larger eyes and longer legs.

Description of holotype: Idiosoma creamy white in life (partially engorged). Eyes double, in plates. Diameter of eyes: anterior, 14 µ; posterior 11 µ. Length and width: 440 µ and 250 µ. Gnathosoma: Palpal formula B/B/BBB; laterotibial seta sparsely branched, genual seta longer than all others. Palpal claw trifurcate, largest prong medial; tarsus 7B plus tarsala. Cheliceral blades edentate, but with tricuspid cap. Galeala moderately branched. Setae: Sparsely punctate; wider than long, SW/SW about 1.6; sensillae nude; AM's and PL's subequal, shorter than AL's, nasus elliptoidal, about 15 µ long. Scutal measurements of holotype in microns (mean and extremes of holotype and 9 specimens given in parentheses): AW 73(77, 74-81), PW
FIG. 1. (A) Comatacarus inconspicuus, n. sp., dorsal and ventral aspects of palpal setation. (B) Cheliceral blades and galeala of C. inconspicuus. (C) Anterosubmedian dorsal setae of C. americanus (left), and C. inconspicuus (right). (D) Scutum and eyes of C. inconspicuus. (E) Specialized setae of legs with measurements in microns, C. inconspicuus. (F) Anterosubmedian scutal setae of (left to right): C. dolosus, C. stewarti, C. americanus, and C. inconspicuus.

91 (88, 83-92), SB 27 (27, 25-31), ASB 40 (37, 35-40), PSB 25 (25, 23-26), AP 36 (38, 33-40) AM 49 (49, 47-54), AL 61 (59, 55-62), PL 53 (50, 48-55), S 83 (85, 80-90). AM with slender accessory branch arising submedially. Legs: Coxae densely punctate, all other segments sparsely punctate; coxa I bisetose, coxae II and III unisetose. Specialized setae as figured (FIG. 1, E). Branched setae becoming gradually less branched and shorter towards distal portion of legs. Each tarsus with a slender empodium and 2 claws without tenent hairs. Distribution of branched setae per leg segment for legs I, II, and III: Coxa, 2, 1, 1; Trochanter, 1, 1, 1; Femur, 6, 6, 5; Genu, 5, 4, 4; Tibia, 8, 6, 6; Tarsus, 45, 23, 18. Body setae: Similar
to scutal setae, moderately plumose with slender setules; about 110 dorsal setae in uneven rows, becoming longer laterally and posteriorly (37 to 65 µ), each seta bearing fewer and shorter setules ventrally, setal bases small, tuberculate. Two sternals plus about 120 ventral setae with tuberculate bases. Anus located at about 4th row of ventral setae.

Remarks: Variations found among specimens of the new species include 2 genualae I on 1 leg only (3 specimens), 2 coxa II setae (1 specimen) and 2 or 3 coxa III setae (2 specimens). In addition, 3 specimens have a nude palpal laterotibial seta; however, no specimens were found with both laterotibial setae nude.

DISCUSSION

Examination of the lectotype of C. americanus (Ewing, 1942), together with the holotype and some paratypes of both C. dolosus Gould, 1956 and C. stewarti Gould, 1956, revealed the previously overlooked characteristic of an accessory branch arising from the basal 1/2 of the anterosubmedian scutal setae (Fig. 1, F). Forty-two specimens of C. americanus, 6 of C. dolosus, and 6 of C. stewarti were examined and accessory branches were observed on all specimens having unobscured and entire anterosubmedian setae (36, 6, and 5 specimens, respectively). Because of the inconspicuous nature of the accessory branch of C. inconspicuus, branches were seen on only 23 of 34 specimens having readily visible anterosubmedian scutal setae. All branches observed on specimens of a single species appear taxognomonic for that species, and although not easily seen or observed on all specimens, still provide a diagnostic character of heuristic value.

In addition, extremely minute barbs were observed on the sensillae of C. americanus and C. dolosus. Gould (1956) figured those of C. dolosus as nude and redescribed C. americanus as having nude sensillae.

KEY TO SPECIES OF Comatacarus

1. Two genualae I..............................Americanus
One genuala I..............................................2
2. Genuala II and III absent, galeala nude........Dolosus
Genuala II and III present, galeala branched........3
3. Tibiala III present, posterior eye smaller than anterior
   eye and less than 12 µ in diameter...Inconspicuus, n. sp.
   Tibiala III absent, posterior eye subequal to anterior
   eye and more than 18 µ in diameter..............Stewarti

Acknowledgments: I wish to acknowledge the assistance of Dr. James M. Brennan, Rocky Mountain Laboratory, Hamilton, Montana for his thoughtful aid in verification of specimens, loan of reference material and critical review of the manuscript. I appreciate greatly the suggestions of Mrs. Glenn N. Smith, scientific illustrator at the Rocky Mountain Laboratory, as well as the comments of Dr. Richard B. Loomis and Lee Goff, California State University, Long Beach, and the assistance of Dr. Stephen L. Wood, Brigham Young University.

LITERATURE CITED


THE NEOTROPICAL GENUS AITKENIUS: THREE NEW SPECIES AND OTHER RECORDS FROM VENEZUELA (ACARINA: TROMBICULIDAE)

James M. Brennan and Jack T. Reed
The Neotropical Genus Aitkenius: Three New Species and Other Records from Venezuela (Acari: Trombiculidae)*

James M. Brennan† and Jack T. Reed‡

Abstract: The genus Aitkenius Brennan, 1970, is redescribed with emphasis on the idiosomal setae. A. hystricosus off Proechimys semispinosus, A. ciscunctatus holotype off Zygodontomys breviceuda, and A. sentientosus off Oryzomys minutus and other cricetids are described as new. A key to the 6 included species is given.

The discovery of three new species of Aitkenius in Venezuela further supports the concept of this peculiarly hirsute Neotropical group of chiggers (Brennan, 1970). Six species, readily separable by the curious structure of the idiosomal setae alone, now constitute the genus. By virtue of scutal characteristics, number of genualae I, and nature of palpal dorsotibial seta, five species (3 Venezuelan, 1 Colombian, and 1 Panamanian) form a compact group distinct from a north Brazilian species as shown in the accompanying synoptic key.

Despite the recent characterization of Aitkenius, salient generic features are repeated in the following redescription.

Aitkenius Brennan


Type species: Euschoengastia cunctata Brennan and Jones, 1961, p. 108.

Hirsute trombiculine larvae ectoparasitic on rodents. Idiosomal setae numerous, with 2 discrete kinds of barbs or branches (coarse and fine, long and short, rigid or flexile, etc.), their distribution and numbers tending to vary from anterior to posterior rows; ventral setae extend anteriorly to gnathosoma, frequently obscuring sternal setae. Leg segmentation 7-7-7; 2 or 3 genualae I, genuala II and III, no mastisetae, sub- and para-subterminala, microtarsala I proximad of tarsala I; coxa III multisetose. Scutum with 5 setae and broadly expanded sensilla. Eyes small, 2/2.

Cheliceral blade with tricuspid cap and subapical lateroventral tooth. Palpal tibial claw slender, trifurcate; palpal tarsus with 4 branched setae and tarsala.

Remarks

The peculiar setation characteristic of Aitkenius (strikingly differentiated and numerous idiosomal setae, multiple coxal III setae, and ventral setae encroaching far into sternal area) is practically sufficient for generic recognition. Also, as indicated earlier, the diversity in differential branching of body setae among the six species known suffices to identify them.

Key to species of Aitkenius

1. Three genualae I, sensillae anterior to posterolateral setae, palpal dorsotibial seta nude (northern Brazil) vellosus Brennan .............................................. 2
2. AL > AM, telofemoral I setae subplumose
   AL < AM, telofemoral I setae moderately branched .............................................. 3
3. Coxa III with 6 to 7 setae, about 450 idiosomal setae, coarse branches of dorsal setae up to 25 µ long (Venezuela) sentientosus sp. n. .............................................. 4
   Coxa III with 2, rarely 3 or 4, setae, 180 to 225 idiosomal setae, coarse branches of dorsal setae up to 17 µ long (Panama, Venezuela) .............................................. 5
4. ASB > PSB, posteriormost idiosomal setae bear 2 or 3 coarse and 8 to 12 finer branches (Panama) .............................................. 6
   ASB = PSB, posteriormost idiosomal setae .............................................. cunicatus (Brennan and Jones)

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* This work was supported in part by Department of the Army Contract DA-49-193-MD-2788 with the Smithsonian Institution (Ecology and distribution of mammalian ectoparasites, arboviruses, and their hosts in Venezuela).

† Received for publication 22 December 1972.
Type data: Holotype and 6 paratypes, RML 55954, off Proechimys semispinosus; Venezuela, Apure, 3 km N Nula; 28 January 1968; A. L. Tuttle.

In the Rocky Mountain Laboratory.

Diagnosis: Coxa III with 3 setae. About 500 thornlike idiosomal setae with several elongate coarse branches, attenuate and curving.

Body: Ellipsoidal. Length and width, partly engorged, 412 by 253 µ. Eyes small, 2/2, in a plate, diameter of anterior eye 6 µ. About 9 rows of setae posterior to anus and 12 rows anterior.

Gnathosoma: Sparsely punctate. Caleal setae nude. All palp setae lightly branched.


Legs: Lightly punctate. Specialized setae as figured, 2 genualae I, genuala and tibiala III, tarsala I longer than tarsala II, and microtarsala I proximal. Nonspecialized setae sparsely to moderately branched, coxa III with 3 setae. Leg index 730.

Idiosomal setae: Dorsal setae as figured, 27 to 37 µ, about 250, with 1 or 2 coarse and many finer branches in anterior region to 7 coarse and sometimes no finer branches posteriorly. Coarse branches flexible and attenuate, straight or curving, up to 25 µ long in posterior region; finer branches generally straight and shorter. Humerals indistinguishable from anterior setae. Ventral setae, about 250, extending to gnathosoma, sternals practically indistinguishable, setae of posterior area similar to posterodorsal setae.

Aitkenius senticosus sp. n.

(Figs. 3, 6)

Type data: Holotype and 5 paratypes, RML 55936, off Oryzomys minutus; Venezuela, Tachira, 42 km SW San Cristobal (Buena Vista), 2,400 m; 17 March 1968; 2 paratypes, same data, but 2 and 7 March 1968; 1 paratype, same data, but Oryzomys albicollaris; 2 paratypes off 2 Thoma-
somys hylophilus, same locality, 2 and 19 March 1968; A. L. Tuttle, collector.

Holotype and some paratypes in the Rocky Mountain Laboratory; other paratypes to be deposited in the British Museum (Natural History), Field Museum of Natural History, and Bernice P. Bishop Museum.

Diagnosis: Coxa III with 6 to 7 setae. About 450 idiosomal setae having usually 2 long coarse branches, stiff and pointed.

Body: Ellipsoidal. Length and width of holotype, nearly engorged, 545 by 420 µ. Eyes 2/2, in a plate, diameter of anterior 7 µ. About 6 rows of setae posterior to anus and 12 anterior.
Gnathosoma: Moderately punctate. Galeal seta nude. All palpal setae moderately branched.
Scutum: As figured, sparsely punctate with shallow convex posterior margin. Anterolateral and posterolateral setae approximate. Setae fairly long, anterolaterals about twice as long as the anteromedian. Sensillae broad ovate and considerably posterior to posteralaterals. Since scutum of holotype is tipped forward measurements are not feasible, but measurements in microns of...
2 paratypes are: AW 68, 68; PW 71, 72; SB 15, 15; ASB 34, 30; PSB 30, 27; AP 15, 15; AM 38, 40; AL 80, 77; PL 89, 86; S 35 X 20, 35 X 20.

Legs: Moderately punctate. Specialized setae as figured, 2 genualae I, genuala and tibiala III, tarsalae I and II subequal, the latter barely longer, and microtarsala I proximad. Nonspecialized setae moderately branched to subplumose, coxa III with 6 to 7 setae. Leg index 855.

Idiosomal setae: Dorsal setae as figured, 37 to 50 µ, about 240, with not more than 2 coarse branches, stiff and pointed, up to 25 µ in posterior region, and with few to many finer branches. Ventral setae, about 220, extending anteriorly to gnathosoma, sternals distinguished in having branches only of the finer kind. Ventral setae quite similar to dorsals.

Aitkenius cunctatus (Brennan and Jones)
(Fig. 4)

Euschoengastia cunctata Brennan and Jones, 1961, p. 108.

Remarks
This species, not recorded since described from Panama off Oryzomys capito (= talamancae), has its counterpart in A. ciscunctatus, Venezuela.

Aitkenius trapidoi (Brennan)
(Fig. 8)


Remarks
No records other than the original from Colombian cricetid and heteromyid rodents.

Aitkenius vellosus Brennan
(Fig. 7)


Remarks
No records other than those from north Brazilian rodents as reported in the original description.

The disparity between coarse and fine branches of the idiosomal setae, while evident, is not so marked as in other species of the genus.

LITERATURE CITED


MORE NEW GENERA AND SPECIES OF CHIGGERS
(ACARINA: TROMBICULIDAE) FROM VENEZUELA

James M. Brennan and Jack T. Reed

Reprinted from THE JOURNAL OF PARASITOLOGY
Vol. 59, No. 4, August 1973
p. 706–710
Made in United States of America
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MORE NEW GENERA AND SPECIES OF CHIGGERS
(ACARINA: TROMBICULIDAE) FROM VENEZUELA*

James M. Brennant† and Jack T. Reed‡

ABSTRACT: New genera and species described are Atelepalme (type species, A. smarma off Zygodontomys brevicauda, Guarico); Phalcophila (type species, P. antica off Pteronotus psilotis, Bolivar) and P. postica off P. psilotis, Bolivar; Nycterinastes (type species, N. primus, holotype off Desmodus rotundus, Bolivar) and N. secundus, holotype off Anoura geoffroyi, Miranda.

Five new species of chiggers distributed among three new genera from Venezuelan bats and a rodent are described. All collections were made by personnel under the direction of Dr. Charles O. Handley, Smithsonian Institution, and Lt. Col. Vernon J. Tipton, U. S. Army (retired), now Brigham Young University.

The holotype and some paratypes of each species are in the Rocky Mountain Laboratory. Other paratypes will be distributed to the British Museum (Natural History), Field Museum of Natural History, and Bernice P. Bishop Museum.

Atelepalme gen. n.

Neotropical trombiculine larvae parasitic on rodents. Scutum wider than long, pentagonal with rounded angles, sparsely punctate, 5 setae, posteralaterals extrascutal, PL > AL ≥ AM; sensillae flagelliform, thick, barbed to bases. Eyes 2/2, conspicuous, no plate. Cheliceral blade with tricuspoid cap and minute dorsal tooth. Galeal seta branched. Palpal tarsus with 7 branched setae, no subterminala, and a tarsala; palpal tibial claw trifurcate. Legs 7-7-7, with full complement of specialized setae including mastitibialae III and mastitarsalae III; microtarsalae I and II almost contiguous with their respective tarsalae.

Idiosoma: Long ellipsoidal. Length and width of holotype, partly engorged, 480 by 240 µ. Eyes 2/2, no plate, diameter of anterior eye 12 µ, of posterior, 10 µ. Anus at fourth row of ventral setae.

Gnathosoma: Sparsely punctate. Cheliceral blade with tricuspoid cap plus small dorsal tooth. Galeal seta thickly branched. Palpal setae B/B/BBB, tarsus with 7 branched setae and a tarsala; tibial claw trifurcate.

Scutum: As figured, pentagonal with curving sides forming rounded angles, very few puncta. PL’s off, PL > AL ≥ AM; sensillae flagelliform, thickened, densely barbed to base, the longer barbs on apical half. Measurements of holotype: AW 50, SB 19, ASB 24, PSB 20, AM 27, AL 29, PL 32, S 50.

Legs: Very sparsely punctate. Specialized setae as figured, 3 genulalae I, gemuallae II and III, tibiala III, sub- and parasubterminala, 2 mastitibialae III, 3 mastitarsalae III; microtarsalae I laterodistad, its base nearly contiguous with tarsala base, microtarsalae II proximad with its base almost contiguous with base of tarsala. Non-specialized setae semi-plumose to sparsely branched, coxal III setae at anterior margin. Leg index 766.

Idiosomal setae: Dorsal formula 2-6-6-4-4-2; humeralae 31 µ, posthumerala 27 to 31 µ. Ventral setae 2-2 + 36.

Phalcophila gen. n.

Neotropical trombiculinae larvae parasitic on bats. Scutum wider than long, roughly trapezoidal with rounded angles and shallow concave posterior margin, moderately punctate; 5 scutal setae,
Figure 1. *Atelepalme smarma* sp. n. Specialized setae of legs with measurements in microns, scutum, and eyes.

Figure 2. *Phalcophila antica* sp. n. Scutum, 3 dorsal setae of first posthumeral row, and specialized setae of legs.

The anterolaterals set back from margin; sensillary bases widely separated, sensillae nude, flagelliform. Eyes present or absent. Cheliceral blade with tricuspid cap and small dorsal tooth. Galeal seta nude. Palpal tarsus with 5 branched and 1 nude setae, no subterminala, and a tarsala; palpal tibial claw bifurcate, deeply cleft, accessory prong outer. Idiosomal setal bases encircled by thin plates. Legs 7-7-7, lacking mastisetae, otherwise with the usual specialized setae, microsetae short and peglike, microtarsala I distad of tarsala I; nonspecialized setae distributed in type species on legs I to III: coxa 1-1-1, trochanter 1-1-1, basifemur 1-2-2, tefemur 5-4-3, genu 4-3-3, tibia 8-6-6, tarsus 20-15-14.

Type species: *Phalcophila antica* sp. n.

Other species: *Phalcophila postica* sp. n.

*Phalcophila* resembles *Microtrombicula* in palpal tarsal setation, but differs in scutal characteristics, peglike microsetae, and lacking mastitarsalae III.
**Phalcophila antica** sp. n.

*(Fig. 2)*

*Type data:* Holotype and 8 paratypes, RML 48161, off *Pteronotus psilotis*, Bolivar, 28 km SE El Manteco (Los Patos), 150 m, 11 April 1966, M. D. and A. L. Tuttle.

*Diagnosis:* Absence of eyes, first pair of sternal setae nude, and coxal III seta anterolateral distinguish this species from *P. postica*.


*Gnathosoma:* Moderately punctate. Palpal setae B/N/N/NN.


*Legs:* Moderately punctate. Specialized setae as figured; 3 genua I, genua II and III, tibiala III, no mastisetae, microsetae stubby, peglike. Non-specialized setae moderately branched, coxal III seta anterolateral. Leg index of holotype 615.

*Idiosomal setae:* Dorsal formula 2-6-6-8-8-6-6-
setae

Ventral setae 2-2 plus about 60, first sternals forked. Platelets surrounding setal bases become indistinct with engorgement.

Phalophila postica sp. n.

Type data: Holotype, RML 48151, off Pteronotus pilosus, Bolivar, 28 km SE El Manteco (Los Patos), 150 m, 11 April 1966, M. D. and A. L. Tuttle.

This one specimen in the same series with P. caica is specifically distinct.

Diagnosis: One pair of eyes, first pair of sternal setae forked, coxal III seta postosubmarginal, anteromedian scutal seta much longer than either antero- or posterolateral seta, and more numerous ventral setae readily separate this form from P. antica.

Idiosoma: Holotype, nearly engorged, broad elipsoidal, 539 by 397 µ. Eyes 1/1, diameter, 6 µ. Anus at fourth row of ventral setae.

Gnathosoma: Very similar to that of P. antica.

Scutum: Approximately as figured for its congener, somewhat differently proportioned as shown in its measurements, AM > AL = PL. Measurements: AW 45, PW 67, SB 36, ASB 24, PSB 15, AP 24, AM 54, AL 30, PL 30, S 69.

Legs: As in P. antica, but with these differences, ratio of tarsala I and II not so great (21 and 16 µ), coxal III seta postosubmarginal. Leg index 761.

Idiosomal setae: Dorsal formula 2-6-6-6-8-8-7-7, with full complement of specialized setae, posthumerals 25 to 35 µ, humerals 104 to 195 µ, or may be interpreted 2-8-4...; humerals ventral setae readily separate this form from P. antica.

Nycterinastes gen. n.

Large structured Neotropical trombiculine larvae parasitic on bats. Scutum wider than long, densely punctate, margins sinuous, posterior margin binate; posteraleral setae extrascutal and anterolateral setae far behind anterior margin, PL > AM > AL; sensillary bases widely separated and posterior, sensillae long, flagelliform with few branches. Eyes 2/2, punctate, no plate. Cheliceral blade with tricuspid cap only. Galeal setae nude, large. Palpal tarsus with 7 branched setae, a subterminala, and long tarsala; palpal tibial claw deeply bifurcate, the prongs subequal. Idiosomal setae long, dorsal formula begins 2-6. Legs long, 7-7-7, with full complement of specialized setae, but lacking mastisetae, microtarsala I distad of tarsala I, microgenuala I and microtibiala I long and thin; nonspecialized setae moderately branched, in type species numbering on legs I to III: coxa 1-1-1, trochanter 1-1-1, basilemurus 1-2-2, tefemur 5-4-3, genu 4-3-3, tibia 8-6-6, tarsus 22-16-15.

Type species: Nycterinastes primus sp. n.

Other species: Nycterinastes secundus sp. n.

Nycterinastes primus sp. n.  
(Fig. 3)

Type data: Holotype and a paratype, RML 49848, off Desmodus rotundus, Bolivar, 21 km NE Icabarú (El Pauji), 851 m, 8 May 1968, C. E. Yunker; 2 paratypes off 2 Liomycteris spurrelli, same data, but 7 May; 2 off 2 Glossaphaga soricina and 1 off Anoura geoffroyi, Bolivar, 59 km SE El Dorado, 150 m, 13 to 23 June 1966; 3 off 3 Carollia perspicillata, 2 off D. rotundus, 1 off A. geoffroyi, and 1 off Lonchorhina aurita, T. F. Amazonas, 20 to 33 km SSE Puerto Ayacucho, 114 to 195 m, 12 September to 6 October 1967; 1 off Pteronotus purnelli, T. F. Amazonas, Rio Cununuma, Belén, 150 m, 9 February 1967; 1 off P. purnelli, Bolivar, 53 km SE Caicara, 50 m, 3 May 1967; 2 off Anoura sp. A, Bolivar, 85 km SSE El Dorado, 1,032 m, 18 May 1966; collectors: M. D. Tuttle, A. L. Tuttle, and F. L. Harder.

Diagnosis: Distinguished from N. secundus by 3 genualae I, no striae encroaching on posterior area of scutum, and much longer palpal tarsala and tarsala I.

Idiosoma: Holotype, very slightly engorged, ovate, length and width 345 by 235 µ. Eyes 2/2, subequal, diameter about 11 µ, punctate. Anus at next to last row of ventral setae.

Gnathosoma: Densely punctate. Palpal setae B/N/NNN; palpal tarsala 25 to 30 µ long.

Scutum: As figured, densely punctate, PL > AM > AL. Measurements of holotype: AW 90, SB 39, ASB 46, PSB 16, AL 91, PL 112, S 102 (a specimen).

Legs: Long, densely to moderately punctate. Specialized setae as figured, 3 genualae I, genuala II and III, tibiala III, sub- and parasubterminala, microgenuala I and microtibiala I long and thin. Nonspecialized setae moderately to sparsely branched; coxal III seta about midway between anterior and posterior margins. Leg index of holotype 1438.

Idiosomal setae: Dorsal formula 2-6-6-4-2 or 2-6-6-2-2; humerals 104 µ, posthumerals 90 to 100 µ. Ventral formula 2-2-6-2-2-2 or 2-2-6-2-2-2. Total idiosomal setae: 36.

Nycterinastes secundus sp. n.  
(Fig. 4)

Type data: Holotype and 5 paratypes, RML 48396, off Anoura geoffroyi, Miranda, 19 km E Caracas, 1,180 m, 14 October 1966, N. E. Peterson, D. B. and R. B. Peacock, collectors; 13 off 3 Anoura geoffroyi, Bolivar, 21 km NE Icabarú (El Pauji), 7 and 8 May 1968, C. E. Yunker, collector; 2 off A. geoffroyi, Barinas, 2 km SW Altamira (La Vega del Rio Santo Domingo), 31 December 1967, A. L. Tuttle and N. E. Peterson, collectors.

Diagnosis: Two genualae I, striae encroaching on posterior area of scutum, shorter palpal tarsala than in N. primus.

Idiosoma: Holotype, partly engorged, ovate, length and width, 826 by 530 µ. Eyes 2/2, punctate, anterior 10 µ, posterior 12 µ. Anus at next to last row of ventral setae.

Gnathosoma: Densely punctate. Palpal setae B/N/NNN; palpal tarsala 14 to 15 µ long.

Scutum: As figured, densely punctate, PL >
TAXONOMIC STUDIES OF TROMBICULID MITES

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M.S. Degree, April 19, 1974

ABSTRACT

Five publications and one manuscript concerning the taxonomic studies of trombiculid mites are submitted. Publications include a revision of the North American genus Comatacarus Ewing, the erection of the following genera by Brennan and Reed: Loomisia, Atelepalme, Phalcophila, and Nycterinastes. Discussions of the genera Aitkenius Brennan and Polylopadium Brennan and Jones are also included.

The subfamily Leeuwenhoekinae is reviewed on the basis of neotropical representatives (unpublished manuscript). The genus Odontacarus comprises 66% of the chiggers examined, and 82% of these were identified as O. tuberculatus (Brennan). Odontacarus fieldi Brennan and Jones and O. cayolargoensis Brennan are synonymized under O. tuberculatus (Brennan), 1952. The following genera are redescribed: Albeckia Vercammen-Grandjean and Watkins, Leeuwenhoekia Oudemans, Odontacarus Ewing, Sasacarus Brennan and Jones, Wagenaaria Brennan, and Whartonia Ewing. Eight species and subspecies of Odontacarus, one species of Sasacarus, and one species of Whartonia are described as new.

COMMITTEE APPROVAL: