Systematics and biogeography of *Marsikomerus* Attems, 1938, a misunderstood genus of centipedes (Geophilomorpha: Schendylidae)

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Abstract

Marsikomerus (Attems 1938) is transferred from Geophilidae to Schendylidae, and shown to be a senior synonym of *Simoporus* (Chamberlin 1940) and *Lanonyx* (Chamberlin 1953). The type species *M. pacificus* is redescribed and illustrated in detail from the holotype; similar but less extensive treatment is provided for *M. lanaius* and *M. texanus*. The value of some traditionally used characters and the distribution of the genus (Hawaii, southwestern United States, northern Mexico) are discussed.

Introduction

In his 1938 report on myriapods from the Hawaiian Islands, C. Attems described a new genus and species of geophilomorph centipede under the name *Marsikomerus pacificus*. Although Attems referred his genus to the family Geophilidae, various details in both the description and drawings suggested to us that *M. pacificus* was actually a schendylid. Resolution of the problem, sufficiently desirable in itself, was also mandated by the possibility of an error in identification or labeling - the Hawaiian Islands not being notable as a center for chilopod differentiation.

Toward this end the holotype of *M. pacificus* was obtained for study. Anybody familiar with the tangled skein of chilopod taxonomy will not be surprised to learn that establishment of the taxonomic position of *Marsikomerus*, easy enough as the first step, immediately led into a labyrinth of systematic problems only partially amenable to solution at the present time. Nonetheless, we have followed the trail as far as existing materials permit, and present here results of our inquiries: at least some questions have been answered and some contingent difficulties defined for future attention.

Taxonomy

Family Schendylidae Cook
Genus *Marsikomerus* Attems

Marsikomerus Attems, 1938, Proc. Zool. Soc. London, (B) 108(II): 372. Type species, *M. pacificus* Attems, by monotypy.

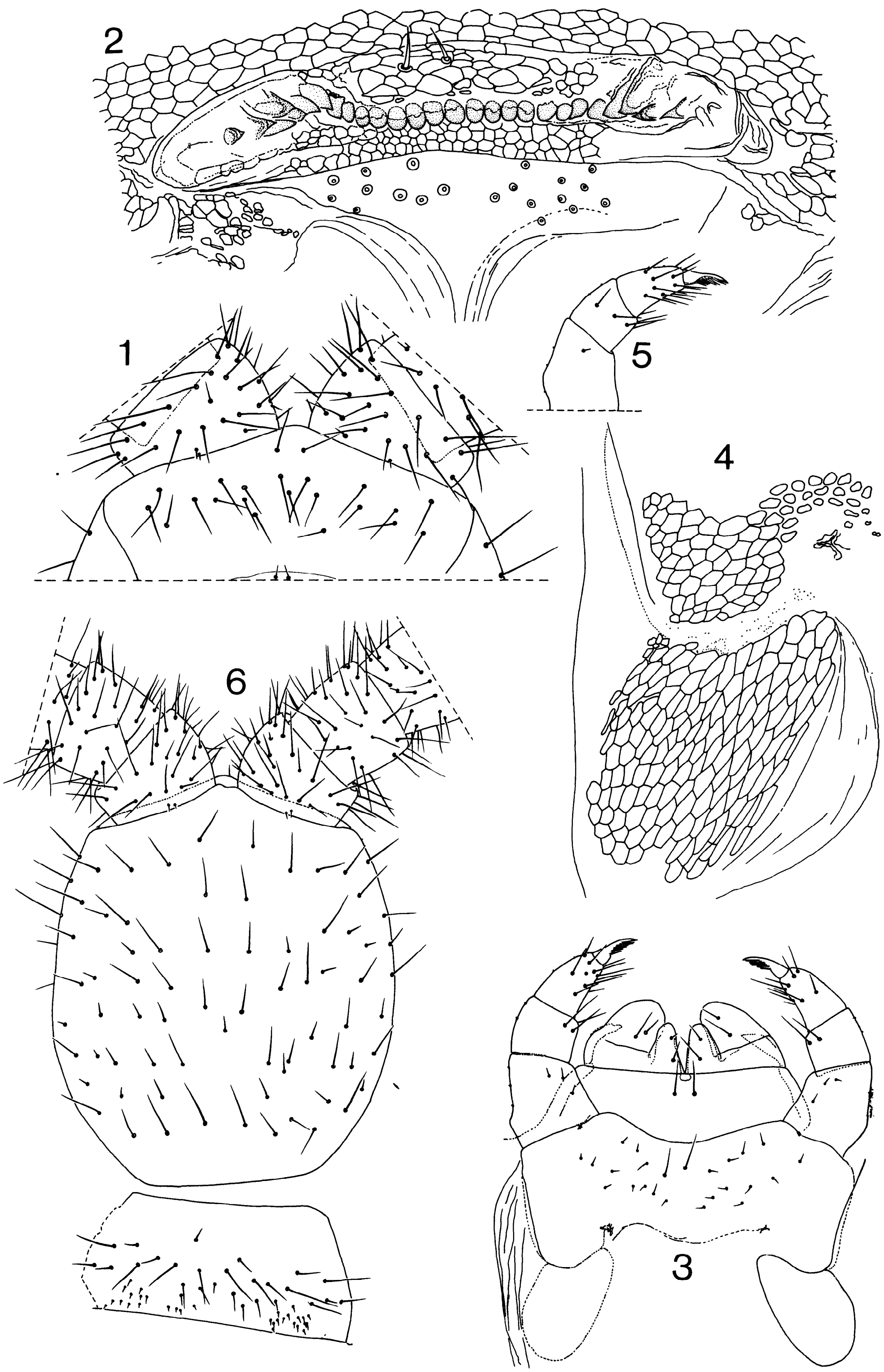
?*Mexiconyx* Chamberlin, 1922, Psyche 29(1):9. Type species, *M. hidalgoensis* Chamberlin, by original designation.

?*Holitys* Cook, 1899, Proc. Ent. Soc. Washington, 4:304. Type species, *H. neomexicana* Cook, by monotypy.

Simoporus Chamberlin, 1940, Ent. News, 51:109. Type species, *S. texanus* Chamberlin, by original designation. NEW SYNONYMY!

Simoporus: Chamberlin, 1943, Bull. Univ. Utah, 33(6): 12, 15.

?*Morunguis* Chamberlin, 1943, Bull. Univ. Utah, 33(6):15. Type species, *M. morelus* Chamberlin, by original designation.



Figures 1 - 6. *Marsikomerus pacificus* Attems, female holotype. 1. Clypeus and first antennomere. 2. Labrum. 3. lst and 2nd maxillae, ventral surface. 4. Right lateroposterior sector of 2nd maxillae, ventral surface. 5. Left telopodite of 2nd maxillae, dorsal surface. 6. Head, proximal antennomeres, and tergum of prehensorial segment, dorsal surface.

Simoporus: Chamberlin, 1947, Ent. News, 58(6):147.

Marsicomerus [*sic*] Attems, 1947, Annln Naturh. Mus. Wien, 55:107, 128.

Lanonyx Chamberlin, 1953, Great Basin Natur., 13(3-4):75. Type species, *L. lanaius* Chamberlin, by original designation. NEW SYNONYMY!

Marsukomerus [*sic*]: Chamberlin, 1953, Great Basin Natur., 13 (3-4):85.

Simoporus: Crabill, 1961, Ent. News, 72:31, 36, 78.

Diagnosis: Pleurites of 2nd maxillae not fused with coxosternum; apical claw of 2nd maxillae pectinate on both dorsal and ventral edges; sterna with ventral pore fields; last pair of legs with seven podomeres (the pretarsus in the form of a well-developed claw); coxopleurae of last pedal segment each with an internal gland of simple structure ("homogeneous" in the terminology of Brolemann & Ribaut, 1912), not ramose or lobed.

Distribution: Southwestern United States (Arkansas, Texas), Mexico (Nuevo Leon), Hawaiian Islands (Fig. 60), see also discussion under the heading "Biogeography", p. 56.

Synonymy: The direct comparison of holotypes of the type species of the three nominal genera listed above shows that all are congeneric.

In the original description of *Marsikomerus*, Attems placed the genus in the subfamily Geophilinae without any comparison with possible relatives, making only the comment that "Diese Gattung unterscheidet sich von den mir bekannten Geophilinae durch die eigentümliche Drüse der Endbeine..." Curiously he neither described nor figured the mandibles; had he done so their obviously schendylid form (cf. out Figs. 7 and 8) would have precluded his astonishing familial misidentification. *Simoporus* was, of course, established with no reference whatever to *Marsikomerus*. For unknown reasons Chamberlin later (1953: 85) considered the latter to be a genus in the Pachymeriidae, and in any event, it is inconceivable that he would have ever suspected a Texan geophilomorph to be congeneric with one found in Hawaii. *Lanonyx* was diagnosed as a new genus distinct from *Mexiconyx* and *Plesioschendyla* in lacking sternal pore fields.

Since our study of the holotype of *L. lanaius* shows that such pores do occur on the anterior sterna, the basis for separation from *Plesioschendyla* becomes the nonpectinate 2nd maxillary claw and absence of an unguiform ultimate pretarsus in the latter. According to Chamberlin, *Mexiconyx hidalgoensis* differs by having longer prehensors.

It is perhaps not too harsh a judgement of our predecessor to note that many of his "new" geophiloid taxa were based on single characters later found to be the result of faulty observation. The term "mirage taxonomy" has some appeal as a descriptor of Chamberlinian methodology.

The next reference to *Marsikomerus* appeared in 1947, in Attems' attempt to update his 1929 "Tierreich" treatment. Here the genus was entered in the second couplet of a key to genera of the Geophilinae, and cataloged on a subsequent page with literature reference; in both cases the invalid emendation "*Marsicomerus*" was used, without explanation. In the key, *Marsikomerus* was set off from other genera by the combination of unipartite labrum, pectinate second maxillary claw, and large coxal gland of the ultimate legs, all such obviously schendylid characters that one can scarcely credit the idea of an Attemsian mistake. The omission of any reference to mandibular structure, normally a *sine qua non* in Attems' chilopod work, even suggests the possibility of a deliberate legerdemain put forth to test the perception of his colleagues and successors.

Finally, in 1953, Chamberlin listed *M. pacificus* in his paper on geophiloids of the Pacific region, consistently with the misspelling *Marsukomerus*, placing the genus in the "Pachymerinidae" with only the comment that the genus resembled *Honuaphilus* "in having a single large coxal pit on each side..."

Three other possible synonyms of *Marsikomerus* remain to be accounted through future studies. First is *Holitys* (Cook, 1899), based on a specimen from the Organ Mountains, New Mexico, which Cook named *Holitys neomexicanus*. This is obviously a schendylid but the original description fails to mention a number of important points, and the type is no longer available. Geographically, *Holitys* falls into the right area for consideration as congeneric with *Marsikomerus*, and the possibility of their identity was raised already by Crabill in

1961. However, no further action on this situation can be taken until somebody is able to collect topotypic material of *neomexicanus* at Dripping Springs in the Organ Mountains. If *H. neomexicanus* is found to be congeneric with *M. pacificus*, obviously *Holitys* must be resurrected as the senior name with 40 years priority.

The original description of *Mexiconyx hidalgoensis* (Chamberlin, 1922) suggests that this species, also, might be congeneric with *M. pacificus*, but it too fails to provide necessary structural details. To carry the parallelism with *Holitys* one step further, the type of *M. hidalgoensis* cannot be found at the Museum of Comparative Zoology, so this case cannot be further investigated at the present even though close relationship - if not identity - with *Marsikomerus* seems very probable. As the species was based on specimens from "Guerrero Mill", Hidalgo, Mexico, perhaps topotypical material will eventually be found.

Lastly, there remains the problem of *Morunguis* Chamberlin, 1943, of which only one species, *M. morelus* Chamberlin, 1943, is known. This genus was distinguished from *Simoporus* [= *Marsikomerus*] solely on the absence of sternal pores from the single known specimen. Recent examination of the holotype of *morelus* (USNM) confirms the absence of pores, but also suggests that the specimen is immature. In all other respects it agrees closely with our concept of *Marsikomerus*, and, if sternal pores were present, would be most similar to *M. lanaius* in terms of segment number (47) and prehensor structure (tooth on inner surface of trochanteroprefemur). Two considerations impact the case of *Morunguis*. One is the fact that complete development of sternal pores in at least some schendylids does not occur until maturity is attained, if this were demonstrated for *M. morelus*, the justification advanced for the genus could be seriously questioned. Second, the defensibility of basing genera on single characters which may be expressed along a spectrum of variability is open to question on philosophical grounds. Traditionally in chilopod systematics, the presence or absence of a given character has often been the premise upon which genera are proposed. Yet, as in the case of sternal pore fields, the character itself may be more complex than simply "present or absent." If present, the pores may occur only on the anteriormost sterna, or may occur on all or nearly all, and one is justified to wonder if a "genus" embracing such heterogeneity is any more "natural" than one in which pores may be missing or present only on a few segments. If there are no other substantiating differences, perhaps the pore field character distinguishes only species, not genera.

For the present, we defer to previous practice, and retain *Morunguis* until an adequate series of topotypes is available for study, but with the prediction that such material will provide the demise of this genus.

Key to the recognized species of *Marsikomerus*

1. Prehensorial trochanteroprefemur with a well-developed tooth on the internal apical border (Hawaii) .... *lanaius* (Chamberlin)
   None of the prehensorial segments with inner tooth 2

2. Body with 55-61 pairs of legs (Texas) .... *texanus* (Chamberlin)
   Body with 39-53 pairs of legs 3

3. Prosternal margin anteromedially with a pair of small and flat but distinct denticles. Males with 39 pairs of legs (Arkansas) .. .. *arcanus* (Crabill)
   Prosternal margin without anteromedial denticles 4

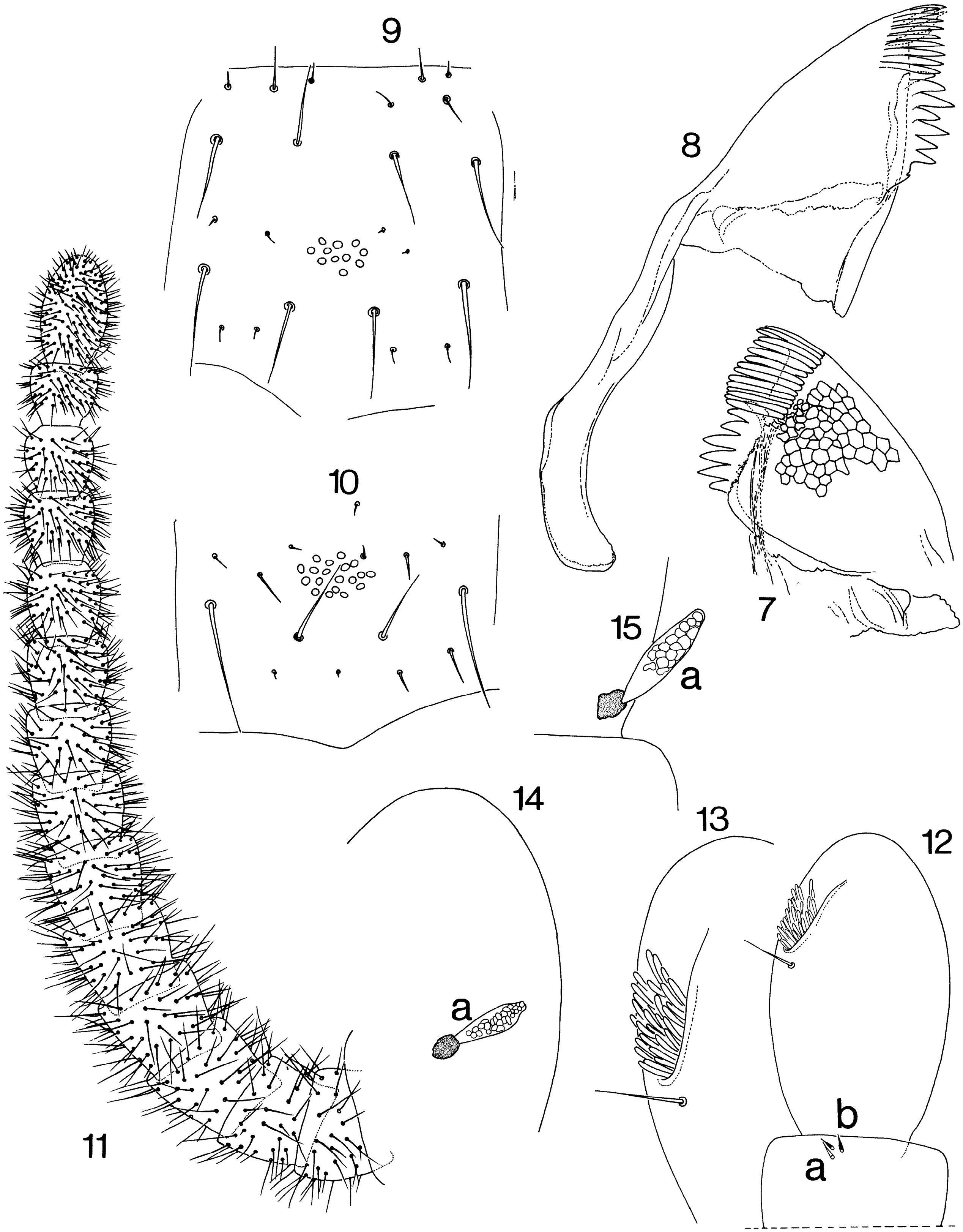
4. Male (types) with 41 pairs of legs; 1st maxillary telopodites reportedly without lappets (Mexico) .... *koestneri* (Chamberlin)
   Female (holotype) with 53 pairs of legs; 1st maxillary telopodites with distinct lappets (Hawaii) .... *pacificus* (Attems).

Marsikomerus pacificus Attems
Figs. 1-37.

Marsikomerus pacificus Attems, 1938; Proc. Zool. Soc. London, B. 108: 372, figs. 1-6.

Marsicomerus pacificus Attems, 1947; Annln Naturh. Mus. Wien, 55: 128.

Marsukomerus [*sic*] *pacificus* Chamberlin, 1953; Great Basin Nat., 13: 85.



Figures 7 - 15. *Marsikomerus pacificus* Attems, female holotype. 7. Distal structures of mandible, enlarged. 8. Entire mandible. 9. Sternum of 4th segment. 10. Sternum of 7th segment. 11. Left antenna, ventral surface. 12. 13th and 14th antennomeres of left antenna, dorsal aspect, showing specialized and claviform setae respectively. 13. Claviform seta of 14th antennomere, much enlarged 14. Dorsal side of 14th antennomere of left antenna showing possible ectoparasite (**a**). 15. Ventral side of the same antennomere, likewise with possible ectoparasite (**a**).

Type material: Holotype female (NMH) labeled "Hawaii: Nanhi Gulch [sic, see "Notes"]." This specimen was prepared by Attems as a whole mount using glycerine jelly medium which contains the cephalic capsule with the prehensorial tergum attached, the mouthparts, and the last 14 pedal segments of the body. The preparation carries a label with the name inscribed by Attems, and the word "Holotype" added in the handwriting of Dr. R. E. Crabill. The remainder of the specimen (prehensorial segment and the first 39 pedal segments) is preserved in alcohol.

Diagnosis: This species shares with *M. arcanus* and *M. koestneri* the fusion of the mandibular teeth into a lamella, but differs from these species by the greater number of leg pairs: 53 (female) as opposed to 39 in *arcanus* (male) and 41 in *koestneri* (male).

Description of holotype: Length 23 mm, maximum width approximately 0.8 mm, 53 pairs of legs. The material preserved in alcohol and on the preparation is uniformly clear yellow at present (color in life unknown but probably not much different).

Right antenna incomplete, lacking the five distal articles. Left antenna complete, approximately 2.7 times as long as cephalic capsule (form and pilosity as shown in Fig. 11). Distalmost article with claviform setae only on external border (Figs. 12, 13), extreme apex of this article with a group of six specialized setae, very small and elongated, apparently not bifurcated (Fig. 27). Articles 2, 5, 9 and 13 with a seta similar to the preceding located lateroapically on the internal-ventral side (Fig. 30). Dorsally the specialized setae are present only articles, 5, 9, and 13; they are placed in an external apicolateral area of the articles mentioned and are of the two types "a" and "b" (Figs. 12, 28 and 29). Those of type "a" are similar to those present at the apex of 14th article and ventral side of 2, 5, 9 and 13 articles: those of type "b" are of form and size similar to preceding but are distinctly darker (ocher) in coloration. The number of specialized setae is as follows: left 5th article with two setae of type "a' and one of type "b", right 5th article with one of each type; articles 9 and 13 with one of type "a" and two of type "b". Form of these setae, relative size, and distribution on antennomeres shown in Figs. 28 and 29. 8th left article bears one seta of type "a" dorsally, perhaps an abnormality as no similar seta occurs on right 8th article.

Cephalic plate of the shape and chaetal pattern as shown in Fig. 6. Length/width ratio approximately 1.2:1.

Prebasal sclerite completely exposed, according to present state of preservation on the microscope preparation.

Clypeal chaetotaxy represented by 1+1 post-antennal, 11+9 medial, and 1+1 prelabral setae (Fig. 1).

Median part of labrum provided with 13 teeth with blunt apices; lateral pieces with 8+6 apically acute teeth (Fig. 2).

Dentate lamella of mandible not divided into blocks; provided with seven large and one small teeth; pectinate lamella with approximately 19 simple hyaline teeth (Figs. 7, 8).

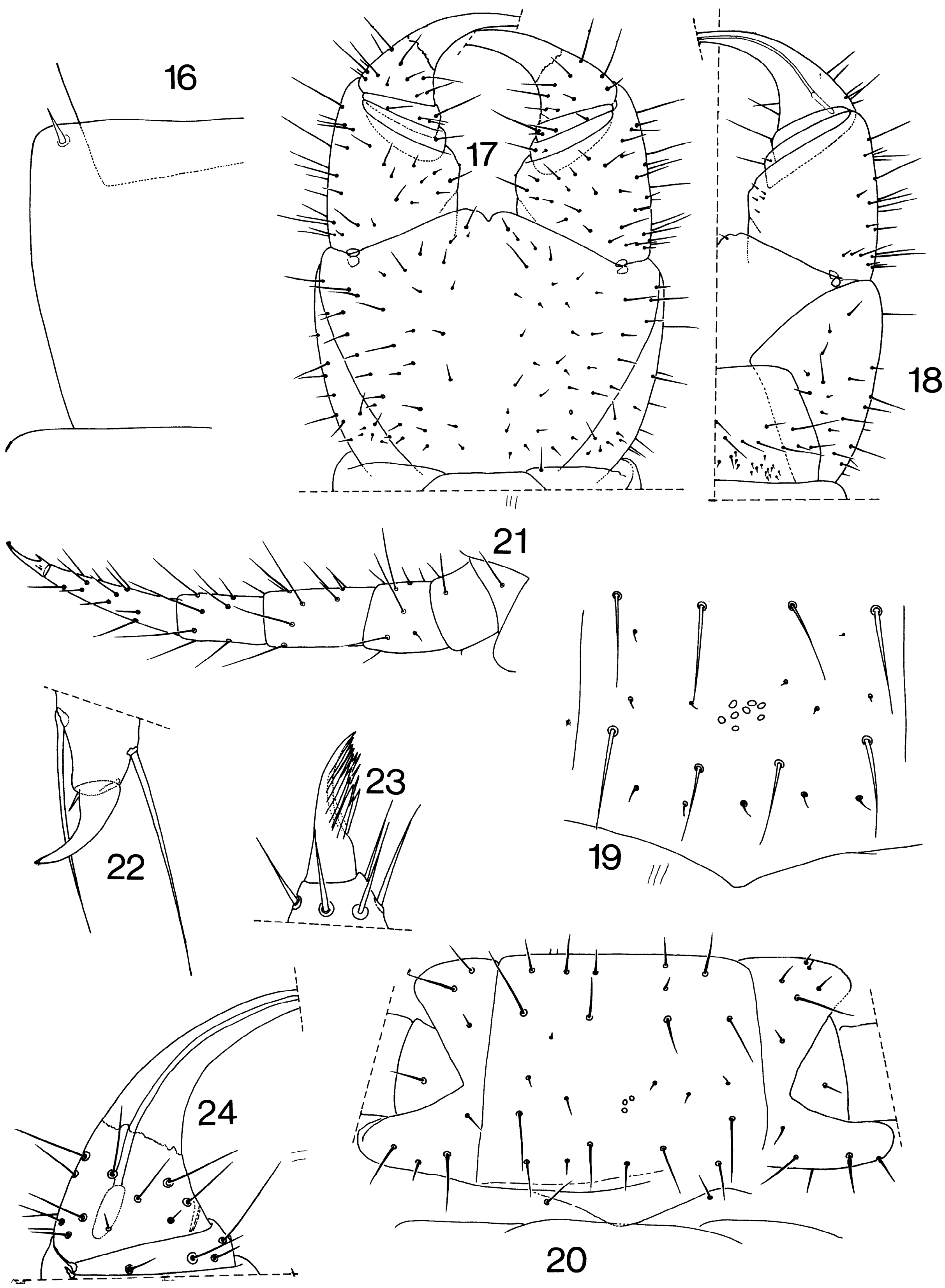
Coxosternum of 1st maxillae with 1+1 setae and very small palpal lobes; median prolongations with 2+2 setae. Telopodites biarticulate, palpal lobes of 1st article extending no further than the middle of the 2nd article, latter provided with 2+2 setae on ventral side and approximately 5+5 pores on the dorsal (Fig. 3).

Coxosternum of 2nd maxillae with 12+12 setae arranged as shown in Fig. 3. Apical claw of telopodite well developed, both dorsal and ventral edges with a comb of 7+8 teeth (Fig. 23). Form and pilosity of telopodite segments as in Figs. 3 and 5.

Prehensorial segment with flexed telopodites not attaining anterior border of cephalic plate. Basal sclerite provided with approximately 21 large setae, as well as additional very small setae near posterior border (Fig. 18). Coxosternal setation somewhat irregular (Fig. 17). Telopodites somewhat convex on internal apical border of trochanteroprefemur which, in common with femur and tibia, bears a minuscule unpigmented tubercle on internal edge (Figs. 17, 18); tarsungula without either teeth or tubercles on internal border and not serrulate on either edge. Toxicodene with cylindrical short calyx (Fig. 24).

Pedal chaetotaxy uniform throughout length of body (Fig. 21). Terminal claw with two principal spines on its ventrobasal part, one anterior and one posterior of the same size, a much smaller third located internally close to latter (Fig. 31).

Sternal pores present only in anterior region of body (segments 2-17 inclusive). Pore fields are all simple, pores not numerous, represented as follows: 2nd, 3 pores; 3rd, 8-9; 4th, 12; 5th, 8; 7th, 19; 9th,



Figures 16 - 24. *Marsikomerus pacificus* Attems, female holotype. 16. 8th antennomere of left antenna, dorsal side, showing a specialized seta of type "**a**". 17. Prehensorial segment, ventral aspect. 18. Right side of prehensorial segment, dorsal surface. 19. Median and posterior sectors of 5th sternite. 20. 2nd sternite. 21. Right 14th leg, ventral side. 22. Apex of left ultimate leg, ventral side. 23. Apex of right telopodite of 2nd maxillae, ventral side. 24. Apex of right prehensorial telopodite, ventral side.

17; 10th, 18; 13th, 14; 14th, 14; 15th, 3; 16th, 3; 17th, 1. Form and size relative of pore fields as in Figs. 9, 10, 19, 20, and 32-37.

Last pedal segment and postpedal segments deformed by the microscope preparation of Attems, rendering impossible a precise description of their structure.

Each coxopleuron with a single subovoid coxal organ debouching through an enlarged pore near lateral border of sternum (Fig. 26). Terminal legs with 7 articles. Metatarsus with well-developed terminal claw. Form, relative size, and chaetotaxy as shown in Figs. 25 and 26. Gonopods uniarticular, provided with scattered setae (Fig. 26).

Males of this species are unknown.

Notes: Fig. 2 possibly does not represent the true orientation of the labrum in the living animal as it has been modified by the preparation medium. Moreover, Figs. 25 and 26 do not show the actual structure of the posteriormost segments which have obviously been distorted during the mounting process.

The original description is insufficient in lacking information about important diagnostic characters such as pilosity of various structures, number of sternal pores, dentation of the mandibles, number and type of specialized setae of the antennae. Moreover the figures are schematic and not very precise, mandating a detailed redescription.

Attems stated that the sternal pores are present on segments 2-15, but in fact they occur also on segment 16. Moreover Fig. 3 of his description is erroneous in not showing the pleurites as separate from the coxosternum of maxillae II.

The original description of this species did not mention a type locality. The spelling "Nanhi Gulch" on the preparation label, and as used elsewhere in Attems' 1938 paper is a misspelling of the correct name Nauhi Gulch, according to Sabina F. Swift of the Bishop Museum, who noted (in litt.) also that this locality is on the northeastern slope of Mauna Kea, on the Island of Hawaii. No collector nor date is specified with the *pacificus* labels, although almost certainly the specimen was taken by Francis X. Williams in 1933 (Attems consistently misspelled the collector's name as "Willians").

Marsikomerus lanaius (Chamberlin) new combination
Figs. 38-42.

Lanonyx lanaius Chamberlin, 1953, Great Basin Nat., 13:76.

Type material: Male holotype (USNM) labeled "Hawaii: Lanai Id., Lanai Mtns." (the original description adds "One male taken Nov. 1, 1947, by N.L.H. Krauss"). This specimen is represented by the entire trunk mounted as a microscope preparation, the head capsule and mouth parts are not present and must be presumed lost. Body 12 mm long, with 47 pairs of legs. The preparation label is marked "type" by Chamberlin, which in this case is construed to be "holotype".

Diagnosis: This species differs from all other members of the genus by the presence of a well-developed tooth on the internoapical border of the prehensorial trochanteroprefemur.

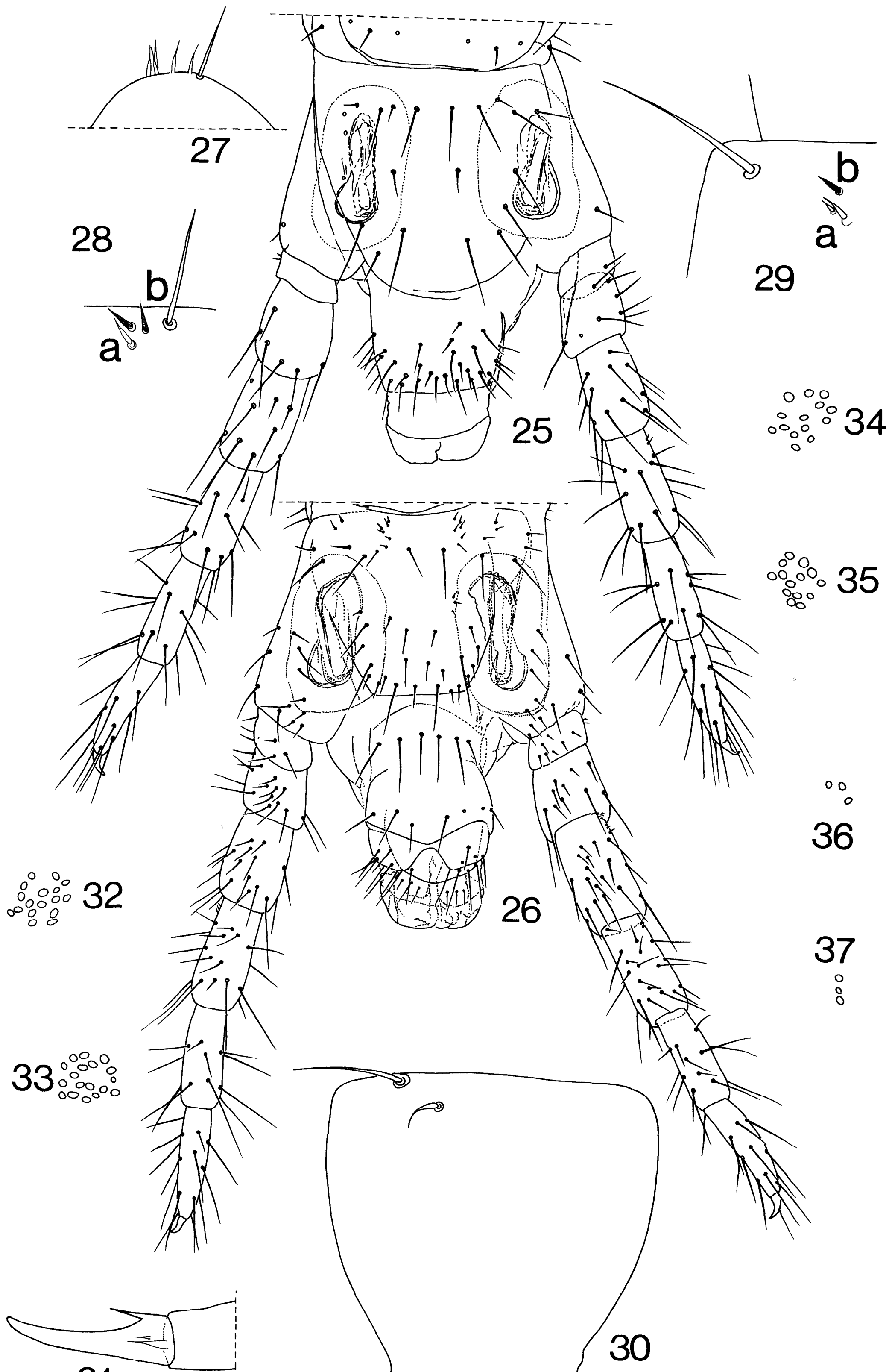
Description of holotype: Length, 12 mm; maximum width, 0.3 mm; body with 47 pairs of legs. The slide-mounted specimen is of an orange coloration, with subepithelial pigmentation present throughout the body.

The original description states "Head short, with antennae relatively long, filiform; head fully covering the prehensors in dorsal view." No information was provided concerning the maxillae and mandibles.

Chamberlin stated "Prehensors when closed not attaining front margin of head." Basal sclerite provided with about 21 large setae, disposed in a transversal median series with others very small and sparsely distributed over the rest of its surface. Coxosternum provided with setae of variable size distributed as in Fig. 39. Prehensorial telopodites with a well-developed tooth on the interoapical border of the trochanteroprefemur, the femur and tibia also each with a very much smaller tooth (Fig. 39); tarsungula with neither teeth nor tubercle internobasally, and not serrulate. Venom gland (toxicodene) with very small calyx.

Chaetotaxy of legs uniform through body; tarsal claw with a large anterior and two much smaller posterior spines ventrobasally.

Sternal pores present only on anterior region of body, commencing on segment 2, posterior limit uncertain owing to poor condition of the preparation. Pore areas are all simple pores, with the following representative distributions: 2nd sternum, 2 pores; 3rd, 7; 5th, 17 (Figs. 40, 41 and 42 respectively).



Figures 25 - 37. *Marsikomerus pacificus* Attems, female holotype. 25. Last pedal segment and postpedal segments, dorsal side. 26. The same segments, ventral side. 27. Apex of 14th article of left antenna. 28. External apical sector of left 13th antennal article, dorsal side, showing specialized setae **a** and **b.** 29. External apical sector of 5th left antennal article, showing specialized setae. 30. 13th antennomere of left antenna, ventral side showing specialized setae. 31. Apex of right 14th leg, posteroventral view. 32. Ventral pore field of 9th sternite. 33. The same, 10th sternite. 34. The same, 13th sternite. 35. The same, 14th sternite. 36. The same, 15th sternite. 37. The same, 16th sternite.

Last pedal segment and postpedal segments distorted on the microscope preparation, making an adequate description of their structure impossible.

Each coxopleuron with a single subovoid coxal organ, the pore of which is concealed by the sternum (Fig. 38). Terminal legs with 7 articles, metatarsus with a well-developed apical claw. Shape, relative size, and chaetotaxy of these podomeres shown in Fig. 38. Gonopods (Fig. 38) biarticulate, with scattered setae.

Female unknown.

Distribution: Known so far only from the type locality.

Notes: Fig. 38 does not represent the actual structure of the posteriormost segments, which were apparently distorted during preparation of the specimen. The original description contains several erroneous statements: that ventral sternal pores are absent (in fact present), that the prehensorial segments are "unarmed" (each does have a denticle), and that the specimen has 43 segments (actually there are 47).

Marsikomerus arcanus (Crabill), new combination

Simoporus arcanus Crabill, 1961, Ent. New 72(2):32, Figs. 1-4.

Type material: Male holotype and male paratype (USNM) from 4 miles west of Farmington, Washington Co., Arkansas, Nell B. Causey leg. 16 June 1950.

Diagnosis: This species is distinguished by its small size (length 10 mm) and by the presence of "a pair of flat and small but distinct denticles" on the anterior border of the prehensorial coxosternum.

Notes: The holotype is represented by two microscope preparations, one of them containing the body in three pieces and the other with the head and dissected mouthparts. The paratype is similarly disposed. All of the parts of both specimens are at present deformed as the result of having been prepared in a chloral hydrate medium (Hoyer's mountant), and for this reason we are unable to provide illustrations of *arcanus* comparable to those given for other species. The precise original description may be consulted for details.

Distribution: This species is known only from the type locality.

Marsikomerus koestneri (Chamberlin) new combination

Simoporus koestneri Chamberlin, 1940, Proc. Biol. Soc. Washington, 53:65.

Simoporus koestneri: Crabill, 1961, Ent. News 72(3):79.

Type material: Male holotype (present location unknown) from Cerro Potosi, Nuevo Leon, Mexico.

Diagnosis: This species is similar to *Marsikomerus arcanus* but differs by the absence of denticles on the anterior border of the prehensorial coxosternum.

Notes: The unique male holotype of this species, originally in Dr. Chamberlin's personal collection, was not found following transfer of that material to the National Museum. It may be irretrievably lost or simply misplaced under a different name (a by-no-means uncommon situation with Chamberlin type specimens). Until this specimen, or authentic topotypes, can be studied, the status of *koestneri* remains in doubt.

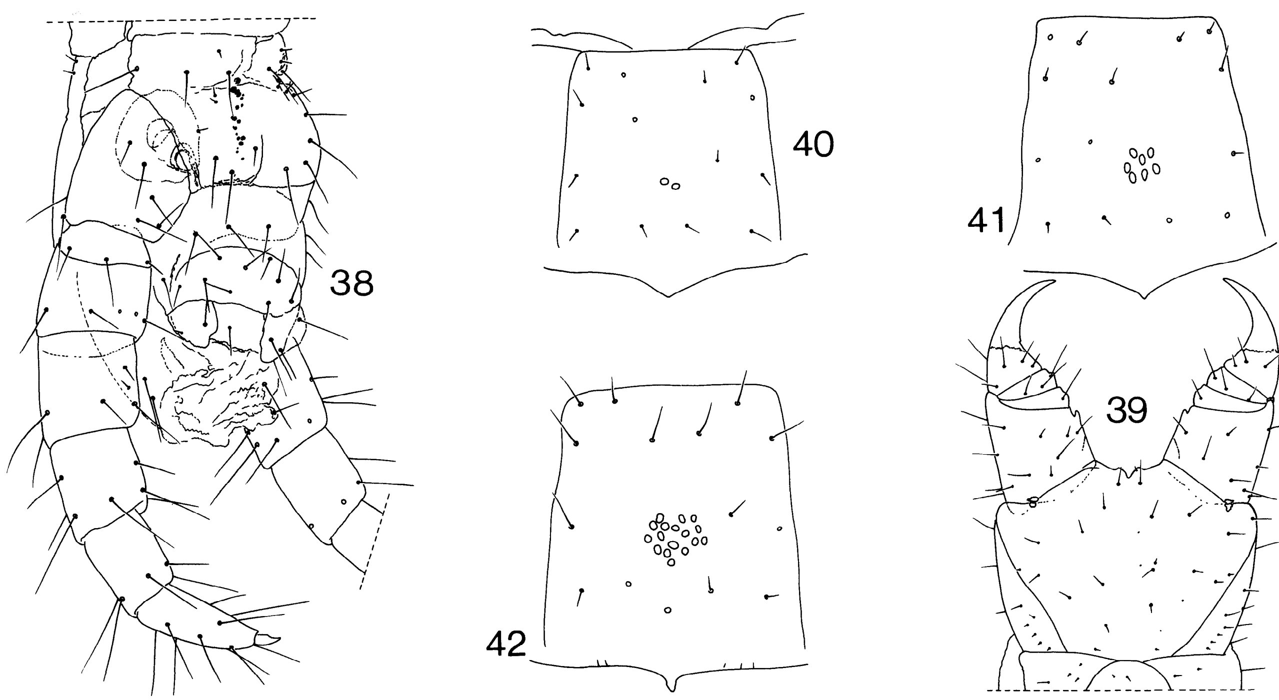
Distribution: This species is known only from the type locality.

Marsikomerus texanus (Chamberlin) new combination
Figs. 43-59.

Simoporus texanus Chamberlin, 1940, Ent. News 51:109.

Simoporus texanus Crabill, 1961, Ent. News 72(3):79.

Type material: Holotype female, allotype male, four male and three female paratypes (USNM) from 2 miles north of Medina, Bandera County, Texas, Stanley and Dorothea Mulaik leg. 16 December 1939. The holotype and male 'allotype' are represented by the trunk, head, and maxillae in



Figures 38 - 42. *Marsikomerus lanaius* (Chamberlin), male holotype. 38. Ultimate pedal segment and postpedal segments, ventrolateral aspect. 39. Prehensorial segment, ventral side. 40. Sternite of 2nd segment. 41. The same, 3rd segment. 42. The same, 5th segment.

alcohol and the mandibles in a microscope preparation. The remaining specimens are in alcohol in individual vials.

Diagnosis: The species differs from the others of the genus in having a larger number of pedal segments and by the presence of biarticulated gonopods in both sexes.

Description (male allotype): length 22mm; body with 55 pairs of legs. The alcohol-preserved material is at present a clear orange.

Antennae approximately 3.1 times longer than head capsule. Proximal four articles with few setae, others with setation becoming gradually short, small, and abundant. Terminal article with claviform setae present only on exterior surface; apex of this article with a group of about five very small, apparently not subdivided, specialized setae. Ventro-internal surface of articles 2, 5, 9 and 13 with a very small, trifurcate setae placed lateroapically. Specialized setae present dorsally, only on articles 5, 9 and 13; located in a lateroapical external position with two setae on the 5th, four on the 9th, and three on the 13th.

Cephalic plate with the form shown in Fig. 50, its length/width ratio as 1.1:1.

Clypeal chaetotaxy represented by 0+0 postantennal, 4+7 medial, and 1+1 prelabral setae (Fig. 53).

Medial part of labrum with 13 robust teeth; lateral pieces with 4+4 apically acute teeth (Fig. 46).

Dentate lamella of mandible composed of two blocks (3+9) of teeth (Figs. 47-48); pectinate lamella with about 25 simple hyaline teeth.

Coxosternum of 2st maxilla with 1+1 setae and well-developed palps (Fig. 52), median prolongations with 2+2 setae. Telopodite biarticulate, with palps of the proximal article exceeding midlength of distal, latter provided with 3+3 setae on ventral side and 6+5 pores on dorsal (Figs. 49, 52).

Coxosternum of 2nd maxillae with 8+8 setae (Fig. 49). Apical claw of telopodite well developed, with a comb of about six teeth on dorsal and ventral edges (Fig. 54).

Telopodites of prehensors not attaining anterior border of cephalic capsule when flexed. Basal plate with about 11 large setae. Coxosternum with setae of variable size distributed as shown in Fig. 51. Telopodites somewhat convex on the internal apical border of the trochanteroprefemur but without teeth, remaining articles likewise mutic (Fig. 51), tarsungula not serrulate. Toxicodene with short, cylindrical calyx.

Chaetotaxy of legs similar throughout body length. Terminal claw with two equal spines ventrobasally, one anterior, the other posterior.

Sternal pores present only on anterior region on body (segments 2-17). Pore fields all simple, subcircular in shape, distributed on selected sterna as follows: 2nd, 14 pores; 3rd, 24; 5th, 30; shape and relative size of pore fields as shown by Figs. 55 and 56.

Pretergite of ultimate pedal segment without visible sutures between its pleurites, presternite not medially divided, tergite and sternite both trapezoidal with chaetotaxy as in Figs. 44 and 43 respectively. Each coxopleuron contains a single coxal gland with its pore covered by the sternite (Fig. 43), vestiture represented by numerous short setae ventroapically and large setae dispersed over remainder of surface. Form, relative size, and chaetotaxy of podomeres as shown by Figs. 43 and 44.

Form and setation of postpedal segments shown in Figs. 43 and 44. Gonopods biarticulate, proximal article with 10 setae and distal with 8.

Male paratypes: All characters coincide with those of male allotype as described above.

Females: Holotype and female paratypes all with 57 pairs of legs, peripheral characters agree in general with those of male. Coxopleura of ultimate pedal segment without small numerous setae on the ventroapical region. Setae of podomeres relatively larger and less numerous. Gonopods biarticulate, proximal article much larger than distal (Fig. 57).

Notes: The type series at present consists of nine specimens, which have been distinguished alphabetically as follows:

Holotype (female) 27 mm, 57 legpairs
Allotype (male) 22 mm, 55 legpairs
Paratype A (male) 22 mm, 55 legpairs
Paratype B (male) 25 mm, 55 legpairs (head and mouthparts missing)
Paratype C (female) 18 mm, 57 legpairs
Paratype D (male) 19 mm, 55 legpairs
Paratype E (female) 13 mm, 57 legpairs
Paratype F (female) 11 mm, 57 legpairs
Paratype G (male) 11 mm, 55 legpairs

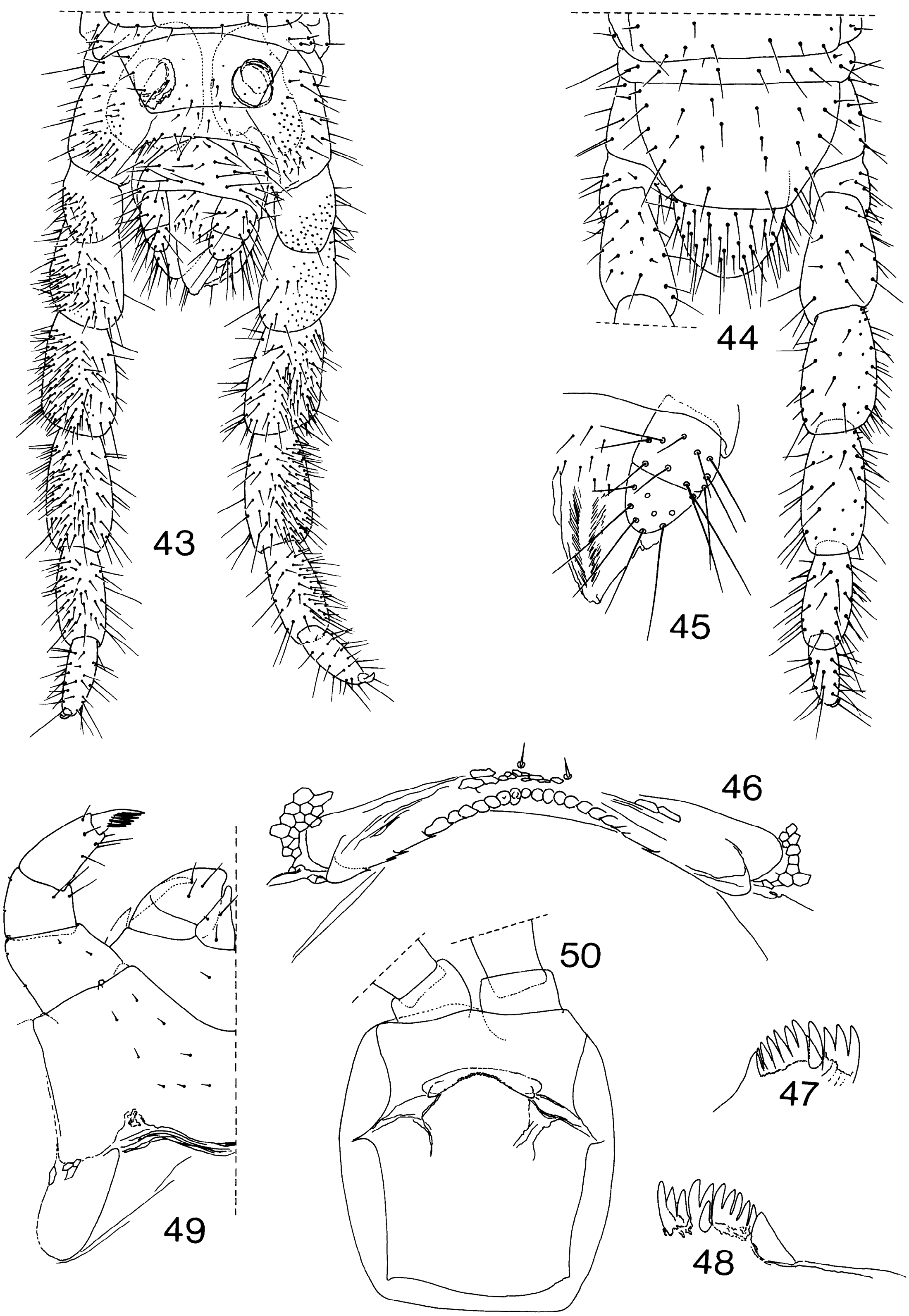
Chamberlin stated in the original description that the number of legpairs is "... 55-61, but mostly 57 or 59.", in a series of "... six specimens, males and females." Since the nine types examined have only 55 and 57 pedal segments, we cannot explain the higher counts, nor the discrepancy in number of individuals.

With respect to the occurrence of sternal pores, Chamberlin wrote "... ventral pores numerous, in a median circular area on the sternite" without mentioning that they are present only at the anterior part of the body. The original description contains the statement "Mandible bearing typically five long teeth not united into distinct blocks" which is erroneous on two points: firstly, the number of teeth is actually much greater (3 and 8); and secondly, as shown in our Figs. 47 and 48, the teeth are in fact grouped into well-differentiated blocks. Not having had the opportunity to personally study typical material of *texanus*, Crabill (1961) was compelled to accept Chamberlin's statements at face value when drawing up his key to the species of *Simoporus* and the first couplet of that key should be corrected by deletion of the second statement in option 1a.

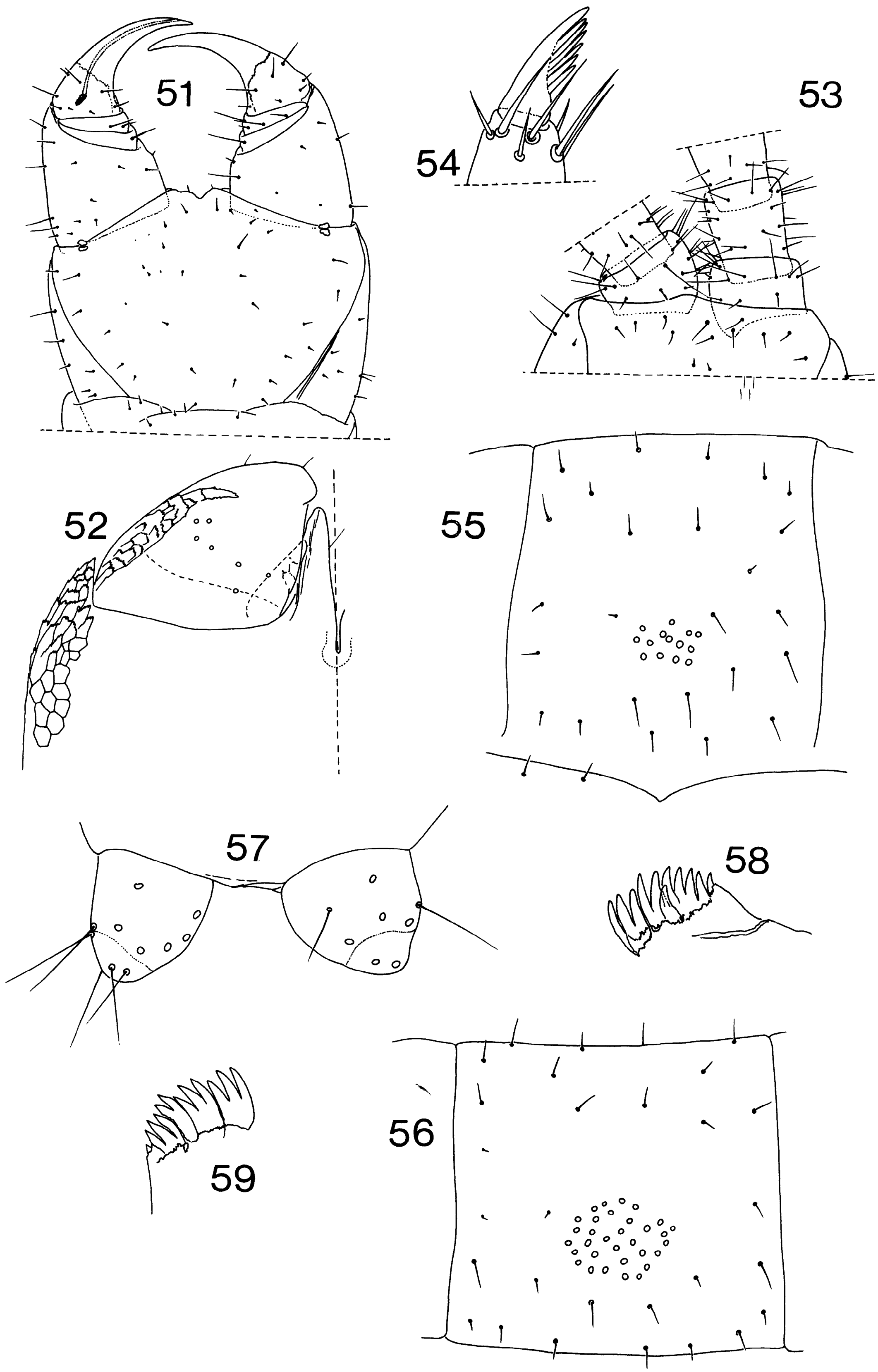
Biogeography

The occurrence of congeneric species of centipedes in southwestern North America and the Hawaiian Islands (Fig. 60) is noteworthy and surprising. It is tempting to suspect anthropochoric introduction as the most plausible explanation of the pattern, but the possibility of "natural" overwater immigration cannot be discounted.

Attems (1938:369) tabulated a substantial number of Hawaiian centipedes supposed to be endemic. Several others were added by Chamberlin in 1953, giving a total of four supposedly



Figures 43-50. *Marsikomerus texanus* (Chamberlin), male paratype. 43. Ultimate pedal segment and postpedal segments, ventral side. 44. The same, dorsal side. 45. Left gonopod and apex of 2nd genital segment. 46. Labrum. 47. Dentate lamella of mandible. 48. The same, opposite mandible. 49. Right side of lst and 2nd maxillae, ventral side. 50. Cephalic capsule and basal antennomeres, ventral side.



Figures 51 - 57. *Marsikomerus texanus* (Chamberlin), male paratype. 51. Prehensorial segment, ventral side. 52. Left side of lst maxillae, ventral side. 53. Clypeus and basal antennomeres. 54. Apex of right telopodite of 2nd maxillae, ventral side. 55. Sternite of 2nd segment. 56. The same, 5th segment. Figures 57 -59. *M. texanus*, female holotype. 57. Gonopods. 58. Dentate lamella of mandible. 59. The same, opposite mandible.

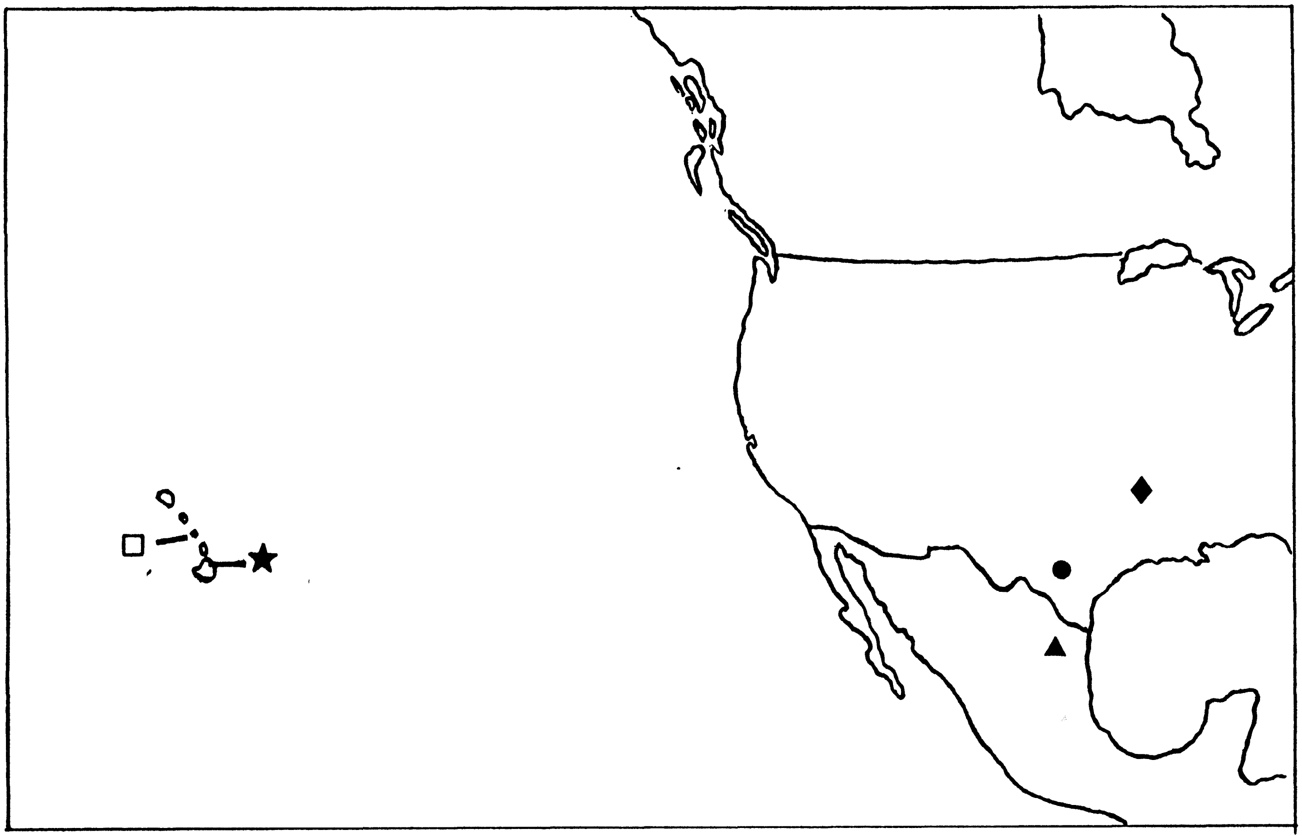


Figure 60. Distribution of the known species of *Marsikomerus*.

endemic geophilomorph genera and another whose single species had been found also on other Pacific Islands. We have here disposed of one of these nominal taxa (*Lanonyx*) and have little reason to think any of the others will be maintained. It is well-known that a prodigious diversity of pantropical plants has been brought to Hawaii, and a number of synanthropic millipeds and centipedes thus introduced by this medium. For example, the widely dispersed European julid *Allajulus latestriatus* (Curtis) was mentioned by Attems (under the name *Cylindroiulus frisius*) from the type locality of *Marsikomerus pacificus*.

On the other hand, the known species of *Marsikomerus* have not been implicated as synanthropes, indeed most are known from native biotopes in the mainland part of the generic range. Since *M. pacificus* (Hawaii) and *M. lanaius* (Lanai) are quite distinct species, introduction into the islands would have to have occurred at least twice, to account for their presence. Assuming a much earlier, pre-human access to Hawaii, we have an interesting analogy in the milliped genus *Nannolene*, which is widely distributed in California (? and Washington) with about a dozen apparently native species also known from Hawaii. Until all of these species have been carefully revised, it may be premature to draw any conclusions from assumed congenericity, but in any event the relationship between mainland and insular taxa is a close one and the number of Hawaiian species would seem to argue against synanthropic dissemination from the West Coast to the islands.

The distribution of the species of *Marsikomerus* is represented on the accompanying map (Fig. 60).

Acknowledgements

The type material of *M. pacificus* was very kindly searched out and loaned for study by Dr. Jürgen Gruber, Naturhistorisches Museum, Wien. Types of several other species accounted here (*Simoporus texanus* Chamberlin, *Lanonyx lanaius* Chamberlin, *Morunguis morelus* Chamberlin, and *Simoporus arcanus* Crabill) are in the U.S. National Museum of Natural History and were made available, along with facilities for their study, by Dr. Jonathan Coddington of that institution. We express our best thanks to these helpful colleagues. A penultimate draft of the present manuscript enjoyed the benefit of careful review by Dr. R.M. Shelley and Professor W.A. Shear.

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