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SPINTURNICID MITES OF VENEZUELA (ACARINA: SPINTURNICIDAE)

by

C. Selby Herrin¹ and Vernon J. Tipton¹

ABSTRACT

The results of an extensive survey of spinturnicid mites of bats from Venezuela are presented in this paper. Approximately 30,000 bats were collected from a wide variety of life zones and localities. A representative sample was searched for ectoparasites. There are 3 genera of the family Spinturnicidae in Venezuela: *Cameronieta*, *Periglischnus*, and *Spinturnix*. Three previously described species of *Cameronieta* were found in the Venezuelan collection. Of the 7 species of *Spinturnix* previously described from the New World, 4 are reported from Venezuela. The genus *Periglischnus* constitutes by far the

most significant segment of the Venezuelan collection. It is represented by 20 species. Of these, 15 were previously described and reported from Venezuela, and 5 are described here as new. Previously unknown males and immatures of several species are described. Keys on both generic and specific levels are included. Discussions of distinguishing morphological characters and variability, where pertinent, as well as collection data and discussions of host-parasite relationships are given for each species. Complete illustrations of 7 species are provided.

INTRODUCTION

Personnel associated with the Smithsonian Venezuelan Project collected approximately 30,000 bats between July 1965 and August 1968. More than 10,850 spinturnicid mites (over 3,760 collections) were collected from host bats. Bats were collected individually in most instances, and host identifications were provided by Dr. Charles O. Handley, Jr., codirector of the project. Thus, a large number of specimens of mites, individually collected hosts, accurate host determinations and specimens of bats representative of each major ecological subdivision of Venezuela have afforded us a unique opportunity to study spinturnicid mite systematics and ecological parameters, including host-parasite relationships. Primary objectives of this study were to clarify the systematics of Neotropical spinturnicid mites and to provide data on host-parasite associations and geographic distribution in Venezuela.

An excellent review of the systematics and biology of the Spinturnicidae was given by Rudnick (1960). Papers dealing with Neotropical representatives of the family have been published by Hoffmann (1944), Machado-Allison

(1964, 1965a, 1965b, 1967), Machado-Allison and Antequera (1971), Furman (1966), Dusbabeck (1967, 1968), and Dusbabeck and Lukoschus (1971). Rudnick (1960) listed 7 genera of Spinturnicidae (8 genera are currently recognized, inasmuch as one new genus has been described since Rudnick's work). *Spinturnix* von Heyden, the largest genus, is cosmopolitan but is represented in the New World by only 7 species, 4 of which are recorded herein from Venezuela. *Periglischnus* Kolenati, a Neotropical genus associated primarily with bats of the family *Phyllostomidae*, constitutes by far the most significant segment of the Venezuelan collection. Fifteen of the 17 previously described valid Neotropical species of *Periglischnus* are represented in our collection, and, in addition, 5 new species are described. Machado-Allison (1965b) erected a separate genus, *Cameronieta*, for several species previously included in the genus *Periglischnus*. This recently described genus currently includes 6 species, 3 of which have been recorded only from Cuba (Dusbabeck, 1967). The genera *Ancystropus* Kolenati, *Meristaspis* Kolenati, *Eyudhorenia* Rudnick, and *Paraperiglischnus*

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Rudnick are known only from Old World bats. The genus *Paraspinturnix* Rudnick is currently known only from the anal orifice of bats of the genus *Myotis* in North America. This paper thus includes 3 species of the genus *Cameronieta*, 20 species of the genus *Periglischrus* and 4 species of the genus *Spinturnix*.

In the treatment of each previously described species which was collected in Venezuela by the Smithsonian Venezuelan Project, the following are presented: Synonymy, brief description of a female and male, summary of the Venezuelan collection records, and finally a brief discussion of differential diagnostic characters and host-parasite relationships. The measurements given in descriptions of previously described species were made on a single representative specimen for each such species. For each new species described herein, the following are given: complete descriptions, with accompanying illustrations, for each of the life history stages present in the collections; complete collection records for type specimens; a summary of other Venezuelan records; and a brief discussion of differential diagnostic characters and host-parasite relationships. Measurements accompanying the description of each stage of the new species are of type specimens (holotype female, allotype male, and paratype immature stages). Illustrations

were prepared for *P. hopkinsi* Machado-Allison, 1965a, and *P. parvus* Machado-Allison, 1964, which were inadequately illustrated in the original descriptions. Also, comparative illustrations of the sternal plates of all species of *Periglischrus* accompany the descriptions and keys for females.

For each of the new species described, the holotype, allotype (where described), and one or more paratypes are to be deposited in the U. S. National Museum of Natural History, Washington, D.C. Paratypes are to be deposited in the Instituto de Zoología Tropical, Universidad Central de Venezuela, and in the collections of the authors.

We acknowledge with gratitude the assistance of the many people associated with this study. Special thanks are given to Dr. Charles O. Handley, Jr., of the Smithsonian Institution for logistic support and to Dr. Handley and Dr. Deane P. Furman for reviewing the manuscript. The Center for Health and Environmental Studies provided the laboratory space and equipment used in this study, Sheila E. Ford and Jerry N. Norton prepared the illustrations, and Jolyn Smith, Brenda Haymond, Marie Jorgenson, and Gail Blodgett typed several drafts of the manuscript.

TAXONOMY

Proposed Classification of Venezuelan Spinturnicidae

Genus *Cameronieta* Machado-Allison

- C. strandmanni* (Tibbetts, 1957)
- C. elongatus* (Furman, 1966)
- C. thomasi* Machado-Allison, 1965b

Genus *Periglischrus* Kolenati

Group I

Subgroup A

- P. parvus* Machado-Allison, 1964
- P. micronycteridis* Furman, 1966
- P. gameroi* Machado-Allison and Antequera, 1971

Subgroup B

- P. tonatii* n.sp.
- P. paracutisternus* Machado-Allison and Antequera, 1971
- P. acutisternus* Machado-Allison, 1964
- P. dusshabeki* Machado-Allison and Antequera, 1971
- P. grandisoma* n.sp.

Subgroup C

- P. torrealbai* Machado-Allison, 1965a
- P. paratorrealbai* n.sp.

Group II

Subgroup A

- P. caligus* Kolenati, 1857
- P. paracaligus* n.sp.
- P. paravargasi* n.sp.
- P. vargasi* Hoffman, 1944

Subgroup B

- P. hopkinsi* Machado-Allison, 1965a
- P. herrerae* Machado-Allison, 1965a

Group III

- P. ojustii* Machado-Allison, 1964
- P. ramirezi* Machado-Allison and Antequera, 1971
- P. iheringi* Oudemans, 1902

Group IV

- P. natali* Furman, 1966

Genus *Spinturnix* von Heyden

Group I

- S. americanus* Banks, 1902

Group II

S. bakeri Rudnick, 1960

S. surinamensis Dusbabek and Lukoschus, 1971

Group III

S. subacuminatus Furman, 1966

Phenetic and Host-Parasite Relationships

The above proposed classification of Venezuelan Spinturnicidae is based on morphological similarities and host-parasite relationships. The major species groupings follow the classification of the chiropteran hosts quite closely. That is to say, there is a high degree of correlation between the proposed classification of the Spinturnicidae and the currently accepted classification of the Chiroptera. This is illustrated well in Table I, which gives the frequency of occurrence of each species of spinturnicid mite on each family or subfamily of Chiroptera collected by the Smithsonian Venezuelan Project, and in Appendix I, which gives the frequency of occurrence of each species of spinturnicid mite on each species of bat collected in Venezuela. The species of mites

are listed according to the proposed classification and the families of bats are listed according to the currently accepted classification. No spinturnicid mites were collected from bats of the families Furipteridae and Thyropteridae.

Species of the spinturnicid mite genus *Cameronieta* occur primarily on bats of the family Mormoopidae. Prior to Machado-Allison's (1965b) description of the genus *Cameronieta*, *C. strandtmanni* was included in the genus *Periglischrus*. Also, until recently, genera of the Chiroptera family Mormoopidae constituted a subfamily of the family Phyllostomidae.

The genus *Periglischrus* is divided into four major groups, most of which parasitize bats of the family Phyllostomidae. The species of Group I occur primarily on bats of the subfamily Phyllostominae; those of Group II on the subfamily Glossophaginae (with the exception of *P. herrerae*, which occurs primarily on bats of the subfamily Desmodontinae); those of Group III on the subfamilies Carollinae, Sturnirinae, and Stenodermatinae; and the one species of Group IV, *P. natali*, occurs on the family Natalidae. The subgroupings of the mites of Groups I and

Table 1. Frequency of occurrence of spinturnicid mites on families and subfamilies of bats in Venezuela

Species of Mite	Family or Subfamily of Bats				
	Emballonuridae (1062)*	Noctilionidae (622)	Mormoopidae (870)	Phyllostominae (2382)	Glossophaginae (3151)
<i>C. strandtmanni</i>			8(51)**		
<i>C. elongatus</i>			76(338)	2(5)	1(1)
<i>C. thomasi</i>			3(3)		
<i>P. parvus</i>				7(18)	
<i>P. micronycteridis</i>				13(42)	
<i>P. gameroi</i>			1(1)	34(51)	
<i>P. tonatii</i> n. sp.				10(54)	
<i>P. paracutisternus</i>				35(103)	1(11)
<i>P. acutisternus</i>			2(2)	207(566)	
<i>P. dusbabeki</i>				22(68)	
<i>P. grandisoma</i> n. sp.				5(24)	
<i>P. torrealbai</i>	1(1)			161(442)	2(2)
<i>P. paratorrealbai</i> n. sp.				5(46)	
<i>P. caligus</i>			1(2)	1(1)	216(579)
<i>P. paracaligus</i> n. sp.					54(190)
<i>P. paravargasi</i> n. sp.				2(5)	55(154)
<i>P. vargasi</i>					67(191)
<i>P. hopkinsi</i>					8(16)
<i>P. herrerae</i>					1(1)
<i>P. ojustii</i>		1(2)		6(6)	5(7)
<i>P. ramirezi</i>					
<i>P. iheringi</i>	1(4)	2(3)	6(6)	8(11)	9(15)
<i>P. natali</i>					
<i>S. americanus</i>	1(2)				
<i>S. bakeri</i>					
<i>S. surinamensis</i>					
<i>S. subacuminatus</i>					
TOTAL	3(7)	3(5)	97(392)	518(1442)	419(1170)

*The numbers in parentheses beneath the family or subfamily of bats represents the total bats of that family or subfamily collected.

**The number of collections of each species of mite is followed by a number in parentheses which represents the number of specimens collected.

Table 1. - Continued

Species of Mite	Family or Subfamily of Bats			
	Carollinae (4942)	Sturnirinae (3037)	Stenodermatinae (8640)	Desmodontinae (951)
<i>C. strandtmanni</i>				
<i>C. elongatus</i>	1(1)	4(4)		
<i>C. thomasi</i>				
<i>P. parvus</i>				
<i>P. micronycteridis</i>	1(1)			
<i>P. gameroi</i>			1(1)	1(2)
<i>P. tonatii</i> n. sp.				1(1)
<i>P. paracutisternus</i>				
<i>P. acutisternus</i>	1(3)	1(1)	6(13)	2(14)
<i>P. dusbabeki</i>				
<i>P. grandisoma</i> n. sp.				
<i>P. torrcalbai</i>	1(10)		6(7)	1(6)
<i>P. paratorrcalbai</i> n. sp.				
<i>P. caligus</i>		1(1)	2(3)	4(4)
<i>P. paracaligus</i> n. sp.				
<i>P. paravargasi</i> n. sp.				
<i>P. vargasi</i>				
<i>P. hopkinsi</i>				
<i>P. herrerae</i>		3(3)		62(115)
<i>P. ojustii</i>	3(7)	659(1881)	12(33)	4(11)
<i>P. ramirezi</i>	22(78)			
<i>P. iheringi</i>	14(39)	15(37)	1578(4706)	5(6)
<i>P. natali</i>				
<i>S. americanus</i>				
<i>S. bakeri</i>				
<i>S. surinamensis</i>				
<i>S. subacuminatus</i>				
TOTAL	43(139)	683(1927)	1605(4763)	80(159)

Table 1. - Continued

Species of Mite	Family or Subfamily of Bats				
	Natalidae (186)	Furipteridae (6)	Thyropteridae (11)	Vespertilionidae (773)	Molossidae (1583)
<i>C. strandtmanni</i>					
<i>C. elongatus</i>					
<i>C. thomasi</i>					
<i>P. parvus</i>					
<i>P. micronycteridis</i>					
<i>P. gameroi</i>				1(1)	
<i>P. tonatii</i> n. sp.					
<i>P. paracutisternus</i>					
<i>P. acutisternus</i>				1(1)	
<i>P. dusbabeki</i>				1(1)	1(1)
<i>P. grandisoma</i> n. sp.					
<i>P. torrcalbai</i>				1(1)	1(1)
<i>P. paratorrcalbai</i> n. sp.					
<i>P. caligus</i>					
<i>P. paracaligus</i> n. sp.					
<i>P. paravargasi</i> n. sp.					
<i>P. vargasi</i>					
<i>P. hopkinsi</i>					
<i>P. herrerae</i>					
<i>P. ojustii</i>					
<i>P. ramirezi</i>					
<i>P. iheringi</i>				4(4)	2(2)
<i>P. natali</i>	4(5)				
<i>S. americanus</i>				136(381)	1(1)
<i>S. bakeri</i>				19(49)	
<i>S. surinamensis</i>				9(17)	
<i>S. subacuminatus</i>				90(289)	
TOTAL	4(5)	0(0)	0(0)	262(744)	5(5)

II are based primarily on morphological similarities and differences; however, there are also striking correlations between the arrangement based on phenetic similarities and the host-parasite associations. The morphological similarities between the species of the several subgroups may be seen by examining the identification key to females, the illustrations of female sternal

plates (Fig. 1-20), and the descriptions of individual species.

The four species of *Spinturnix* occur almost entirely on Chiroptera of the family Vespertilionidae, subfamily Vespertilioninae. More detailed discussions of host specificity and phenetic relationships will be presented in the treatment of genera and species.

Key to Genera of New World Spinturnicidae

- 1. Two dorsal plates, sometimes very delicately sclerotized; lacking tritosternum; peritremes very long, extending from level of coxa IV to level of coxa I 2
- Single dorsal plate; tritosternum usually present, rarely reduced or lacking; peritremes short, lying over coxa III, usually with anterior end bent ventrad 3
- 2(1). Sternal plate wider than long, either fused to or in contact with coxae I; ventral anterolateral integument with many small thornlike mammalations; anterior and posterior parts of dorsal plate fused by suture or completely separated; anus dorsal and subterminal; camerostome present; from bats of family Mormoopidae *Cameronieta* Machado-Allison (p. 5)
- Sternal plate longer than wide, separated from coxae I; ventral anterolateral integument smooth; anterior and posterior parts of dorsal plate connected by two bridges; anus ventral, terminal; camerostome absent; primarily from bats of family Phyllostomidae *Periglischrus* Kolenati (p. 9)
- 3(1). Peritremes completely dorsal; from anal orifice of *Myotis* spp *Paraspinturnix* Rudnik
- Peritremes with anterior end bent ventrad; from bats of the family Vespertilionidae *Spinturnix* Von Heyden (p. 61)

Genus *Cameronieta* Machado-Allison

Cameronieta Machado-Allison. 1965b, Acta Biol. Venezuelica. 4(10): 243-258.

Type species: *Cameronieta thomasi* Machado-Allison, 1965b.

DESCRIPTION

Dorsal plate divided; anterior and posterior parts fused by suture or completely separated. Five pairs of propodosomal setae lateral to dorsal plate; single metapodosomal seta adjacent to each stigma. Peritremes long, completely dorsal, extending from level between coxae III and IV to level of coxa I. Camerostome present anteriorly over gnathosoma. Dorsal opisthosoma with few to many small setae. Tritosternum absent. Sternal plate wider than long; fused to or in contact with coxae I; with three pairs of setae usually on medial surface of plate rather than on margins. Ventral anterolateral integument with many small thornlike mammalations. One pair of metasternal setae posterior to sternal plate of female. Holventral plate of male with five pairs of setae and two pairs of pores. Genital plate of female small and elongate; with pair of small to large setae on or near posterior margin. Ventral integument, between genital plate

and caudal portion of idiosoma, with several small to moderately large setae. Anal plate dorsal and subterminal. Legs short and stout, with ventral setae medium in size and some pectinate.

REMARKS

The genus *Cameronieta* was originally erected and described by Machado-Allison (1965b) to include a single species, *C. thomasi*. Subsequently, there has been controversy regarding the validity of this genus. Furman (1966) concluded that *Cameronieta* was a synonym of *Periglischrus*, and further hypothesized that *C. thomasi* was a heteromorph of *C. elongatus*. A year later, Dusbabek (1967) recognized *Cameronieta* as a valid genus, described three new species from Cuba, and presented keys for identification of five of the six known species; he omitted *C. elongatus* no doubt because Furman's (1966) paper was unknown to him. Machado-Allison and Antequera (1971) issued a rebuttal to Furman's (1966) conclusions and presented additional evidence supporting the validity of the genus *Cameronieta*. The two abnormal female specimens reported by Furman (1966:133) from *Pteronotus parnellii fuscus* in Panama were undoubtedly identical to the adult female of *C. thomasi* as described by Machado-

Allison. On the other hand, it is apparent that Machado-Allison (1965b) also included *C. elongatus* in his forms described as *C. thomasi*. Thus, his "female deutonymph" appears to be an adult of *C. elongatus*. To avoid further confusion, we have chosen to follow Machado-Allison (1965b), Machado-Allison and Antequera (1971), and Dusbabek (1967) in recognizing the validity of the genus *Cameronieta*.

Mites of the genus *Cameronieta* are restricted to the New World tropics and subtropics. Species of this genus have been recorded primarily from bats of the family Mormoopidae. At present the genus *Cameronieta* is known to include six species: *C. machadoi*, *C. torrei*, and *C. tibbettsi*, which were described by Dusbabek (1967)

from bats of the genus *Chilonycteris* (= *Pteronotus*) in Cuba, and *C. elongatus*, *C. strandtmanni*, and *C. thomasi*, which are recorded herein from Venezuela. *C. elongatus* was originally described by Furman (1966) from Panama; *C. strandtmanni* was reported originally by Tibbetts (1957) from *Mormoops megalophylla* in Texas, and later by Furman (1966) from the same host species in Trinidad; and *C. thomasi* is known only from Venezuela. We have not examined specimens of the three Cuban species described by Dusbabek (1967). However, after reviewing original descriptions, illustrations, and host records, we consider it possible that *C. tibbettsi* is a synonym of *C. elongatus*.

Key to Species of Venezuelan *Cameronieta*

Females

1. Venter of legs with simple, smooth to sparsely pectinate setae; from *Mormoops* spp. *C. strandtmanni* (Tibbetts, 1957) (p. 6)
 Venter of legs with prominent palmate setae 2
- 2(1). Small species (less than 1,200 μ long); with idiosoma elongate; width of sternal plate less than two times its length, with second and third pairs of setae located near posterior margin; femur I with two prominent palmate setae ventrally; from *Pteronotus* spp. *C. elongatus* (Furman, 1966) (p. 7)
 Large species (length greater than 1,200 μ); with idiosoma not unusually elongate, width of sternal plate more than three times its length, with second and third pairs of setae at about midlength of plate; femur I with four prominent palmate setae ventrally; from *Pteronotus parnellii* *C. thomasi* Machado-Allison, 1965b (p. 9)

Males

1. Large species (dorsal plate length greater than 300 μ); posterior quarter of dorsal plate separated from anterior portion by suture; from *Pteronotus* spp.
 *C. thomasi* Machado-Allison, 1965b (p. 9)
 Small species (dorsal plate length less than 300 μ); posterior quarter of dorsal plate distinctly separated from anterior portion by nonsclerotized cuticula 2
- 2(1). Distal seta of coxa I normal, slender; proximal anterodorsal seta of femur II small to medium-sized; first and second pairs of podosomal setae close together, distance between first and second about half that between second and third
 *C. elongatus* Furman, 1966 (p. 8)
 Distal seta of coxa I enlarged, robust and spinelike; proximal anterodorsal seta of femur II minute; first and second pairs of podosomal setae rather widely separated, distance between first and second equal to that between second and third
 *C. strandtmanni* Tibbetts, 1957 (p. 7)

Cameronieta strandtmanni (Tibbetts, 1957)

Periglyphus strandtmanni Tibbetts, 1957: 14-19.
Cameronieta strandtmanni Dusbabek, 1967: 149, 158-160.

DESCRIPTION

FEMALE: Idiosomal length, 857 μ ; greatest width, 499 μ . Sternal plate distinctly wider than

long (median length, 88 μ ; greatest width, 127 μ); anterior margin broadly concave; anterolateral corners rounded, in close juxtaposition to coxae I; lateral margins of plate with small acute projections; plate very broadly rounded posteriorly; first sternal setae set in slightly from anterior margin; second sternal setae on posterolateral margins; third setae more medial near

posterior margin; sternal setae small, slender (length 15-17 μ); metasternal setae minute (length less than 13 μ), located directly posterior to sternal plate. Integument lateral and posterior to sternal plate with many small spinelike mammalations. Genital plate enlarged; lightly sclerotized anteriorly; heavily sclerotized, quite narrow and elongate posteriorly. Genital setae slender, medium length (21-22 μ), close together on posterior end of plate. Ventral opisthosoma with 10 pairs of setae; first 3 anteriormost pairs minute (length less than 6 μ); other 7 pairs rather small, slender (length 9-15 μ). Dorsal plate oblong-oval in general overall shape (median length, 302 μ ; greatest width, 208 μ); anterior end narrows to blunt apex; plate distinctly divided posteriorly with smaller posterior section separated by rather broad transverse band of lightly sclerotized integument; plate ornamented with several medium-sized irregularly circular areas. Six pairs of slender podosomal setae lateral to dorsal plate; first pair smaller and more slender (length 24-27 μ), located anterolateral to dorsal plate at level of anterior end of peritremes; other 5 pairs larger (length 41-58 μ), middle 4 pairs located laterally between dorsal plate and peritremes, sixth pair adjacent medially to stigmata. Dorsal opisthosoma with 7 pairs of medium length (15-35 μ) setae. Most dorsal and lateral leg setae of medium length, those of tarsi smaller; proximal setae of femora distinctly longer. Ventral leg setae small to medium-sized, some rather robust with fine slender barbs.

MALE: Median length of idiosoma, 314 μ ; greatest width 255 μ . Holoventral plate spade-shaped (median length, 126 μ ; greatest width, 101 μ); covering large portion of venter between coxae; five pairs of setae of holoventral plate small to medium-sized (length 19-37 μ); first and second pairs considerably longer than others, first pair extends posteriorly beyond level of first pair of pores. Soft integument of venter lateral and posterior to holoventral plate with numerous small, spinelike mammalations. Intercoxa IV area with six pairs of setae plus pair of subterminal adanal setae; first pair quite small (length 17-31 μ). Dorsal plate generally oval with narrower anterior end (median length, 281 μ ; greatest width, 212 μ); posterior quarter distinctly divided and separated from anterior portion by narrow band of soft integument. Six pairs of medium-sized (length 15-39 μ) podosomal setae lateral to dorsal plate; first pair located anterior to peritremes near anterolateral margins of dorsal plate; middle four pairs located laterally between dorsal plate and peri-

tremes; distance between second and third pairs twice that between third and fourth pairs, and between fourth and fifth pairs; sixth pair located adjacent to stigmata. Most coxal setae medium length, slightly enlarged basally, with distal half slender; distal seta of coxa I very robust, spine-like; posterolateral seta of coxa II long, slender. Most ventral leg setae small to medium-sized, slender; some enlarged somewhat basally. Antero- and posterolateral setae slender, mostly small or medium-sized, some recurved. Distal posterodorsal seta of femur I and II unusually long, slender; most other dorsal leg setae medium-sized to moderately long, except proximal anterodorsal seta of femur II minute.

VENEZUELAN RECORDS (49 females, 1 male, and 1 protonymph): Except for one December collection from Yaracuy, all collections (8) were from *Mormoops megalophylla* from Falcón in July.

REMARKS: *C. strandtmanni* differs from all other described species of the genus in the size and form of many ventral leg setae; that is, in the female all ventral leg setae are small, simple, and setaceous; none are prominently palmate. All other species of the genus have larger, prominent, palmate setae on the venter of the legs of the females. In the male of *C. strandtmanni* the distal seta of coxa I is greatly enlarged and spinelike, whereas in all other species this seta is more slender and setaceous. This species has been collected only from *Mormoops megalophylla* in Texas (Tibbetts, 1957), Trinidad (Furman, 1966), and Venezuela.

Cameronieta elongatus (Furman, 1966)

Periglischrus elongatus Furman, 1966: 130-133

DESCRIPTION

FEMALE: Idiosomal length, 941 μ ; greatest width, 415 μ . Sternal plate somewhat wider than long (median length, 99 μ ; greatest width, 106 μ); anterior margin medially concave between first sternal setae, first sternal setae set in from margins on anterolateral portions of plate; anterolateral margins concave, fitting closely contour of coxae I but not joined; posterior margin very broadly rounded with second and third sternal setae set in horizontal row relatively close to posterior margin; sternal setae small, slender (length 12-17 μ); metasternal setae minute (length less than 9 μ); located directly posterior to sternal plate. Integument lateral and posterior to sternal plate with many small, spine-like mammalations. Genital plate enlarged anteriorly; quite narrow, elongate posteriorly; geni-

tal setae slender, medium length (34-35 μ), set close together on posterior end of plate. Ventral opisthosoma with 11 pairs of setae, anterior most 6 pairs small, slender (length 8-14 μ); most set on small platelets bearing pair of posterolaterally directed minute spines; remaining 5 pairs of posterior and posterolateral setae larger (length 18-33 μ), coarsely barbed to slightly palmate. Dorsal plate oblong-oval in general overall shape (median length, 288 μ ; greatest width, 178 μ); anterior end narrows, forming blunt apex; plate distinctly divided posteriorly with small posterior section separated by rather broad transverse band of lightly sclerotized integument. Six pairs of moderately large (length 25-43 μ) podosomal setae lateral to dorsal plate; first pair located anterolateral to plate anterior to end of peritremes; middle 4 pairs located laterally between dorsal plate and peritremes; sixth pair located adjacent to stigmata. Dorsal opisthosoma with 7 pairs of small to medium-lengthed (14-35 μ), slender setae. Most dorsal and lateral leg setae small to medium sized, longer setae with slender recurved ends; one proximal dorsal seta of each femur distinctly longer than other leg setae; one row of ventral leg setae medium in length, distinctly palmate; other ventral leg setae smaller, more slender.

MALE: Median length of idiosoma, 299 μ ; greatest width, 254 μ . Holoventral plate spade shaped (median length, 139 μ ; greatest width, 115 μ); covering most of venter between coxae. Five pairs of holoventral setae small to medium sized (length 18-33 μ); first pair longest, extending posteriorly just beyond level of first pair of pores. Soft integument of venter lateral and posterior to holoventral plate with numerous small, spinelike mammillations. Intercoxa III-IV area with six pairs of setae plus pair of subterminal adanal setae; all seven pairs rather small (length 12-26 μ). Dorsal plate generally oval (median length, 28 μ ; greatest width 207 μ); posterior quarter distinctly divided and separated from anterior portion by narrow band of soft integument. Six pairs of medium-sized (length 24-35 μ) podosomal setae lateral to dorsal plate; first two pairs close together anterior to peritremes near anterolateral margins of dorsal plate; middle three pairs located laterally between dorsal plate and peritremes; sixth pair located adjacent to stigmata. Coxal setae all medium in length, slender, except for slightly enlarged bases on some; most ventral leg setae small to medium in length, some may be enlarged basally; antero- and posterolateral setae small to medium sized, some recurved. Distal posterodorsal seta of each femur I-IV unusually

long, slender; most other dorsal leg setae medium in length, slender to slightly enlarged basally.

VENEZUELAN RECORDS (172 females, 80 males, 17 deutonymphs, 35 protonymphs, and 45 specimens in alcohol): Of the 83 collections, 75 were from bats of the genus *Pteronotus* (*P. parnellii*, 37; *P. davyi*, 28; *P. suapurensis*, 10). Three collections were from *Sturnira lilium*, and one each was from *Macrophyllum macrophyllum*, *Sturnira tildae*, *Anoura geoffroyi*, *Carollia perspicillata*, and *Phylloderma stenops*. Collections were made in the following states and districts: Yaracuy (46), T. F. Amazonas (13), Bolívar (12), Falcón (5), Sucre (3), Nueva Esparta (2), Monagas (1), and Dto. Federal (1), at elevations ranging from 1 to 1524m, with a majority (47) at elevations near 400m. Collections were made in all months of the year except March, August, and October, with most in December (46), April (20), and July (6).

REMARKS: *C. elongatus* is easily distinguished from *C. strandtmanni* and *C. thomasi*. It differs from *C. strandtmanni* in having prominent palmate setae on the venter of the legs in the female and in the male by the simple, setaceous distal seta of coxa I. It differs from *C. thomasi* in being considerably smaller and more elongate (twice as long as wide); in the female, femur I has only two palmate setae ventrally, and the second and third sternal setae are located near the posterior margin of the plate; in the male the posterior quarter of the dorsal plate is distinctly separated from the anterior portion. *C. elongatus* appears to be quite similar to the three species described by Dusbabek (1967) from Cuba. It differs from *C. machadoi* and *C. torrei* in the form of the dorsal plate, particularly the posterior section, which is separated from the anterior portion; also the species of the host differ. Based on Dusbabek's (1967) illustrations and description, *C. tibbettsi* Dusbabek appears to be a synonym of *C. elongatus*. Both are recorded from the same species of host. However, until type specimens of both species can be compared, these two species must be considered valid.

C. elongatus was originally described from material collected from "*Chilonycteris rubiginosa fusca*" (= *Pteronotus parnellii fuscus*) in Trinidad and was also reported from *Pteronotus parnellii fuscus* and *P. suapurensis* in Panamá (Furnan, 1966). As noted previously, Machado-Allison's (1965b) "female deutonymph" of *C. thomasi* is apparently an adult female of *C. elongatus*, and the two abnormal females of

C. elongatus reported by Furman (1966) are identical to the adult female of *C. thomasi*. As noted in the Venezuelan records, most collections were from three species of *Pteronotus*. The other eight collections, from six different hosts, may represent accidental host-parasite associations or contamination of collections.

Cameronieta thomasi Machado-Allison, 1965

Cameronieta thomasi Machado-Allison, 1965b:
244-258

DESCRIPTION

Female: Idiosomal length, 1850 μ ; greatest width, 1106 μ . Sternal plate distinctly broader than long (median length, 306 μ ; greatest width, 239 μ); anterior margin concave between and lateral to first sternal setae; first sternal setae on margin; anterolateral margins appear fused to coxae I; posterior margin very broadly rounded; second sternal setae widely separated posterolaterally on surface of plate; third sternal setae rather close together medially between second sternal setae; metasternal setae located posterior to sternal plate directly behind second sternal setae; sternal setae as well as genital setae medium sized (length 33-59 μ). Integument lateral and posterior to sternal plate with many small, spinelike mammalations. Genital plate enlarged, almost spherical, anteriorly, with elongate narrow posterior portion; genital setae on plate near posterior end. Ventral opisthosoma with 13 pairs of small to moderately large setae; anteriormost 6 or 7 pairs shorter (length 20-34 μ); 5 posteriormost pairs larger (length 54-66 μ); sixth pair of medial setae distinctly barbed. Dorsal plate oval (medial length, 570 μ ; greatest width, 395 μ); greatest width near midpoint; posterior end of dorsal plate superficially divided from anterior portion by narrow transverse suture. Six pairs of rather large (length 59-94 μ) podosomal setae located lateral to dorsal plate in 3 groups of 1, 4, and 1; first pair near anterior end of plate, middle 4 pairs equidistant from each other laterally between dorsal plate and peritremes, sixth pair medial to stigmata. Dorsal opisthosoma with 7 pairs of smaller setae (length 52-94 μ). Dorsal leg setae generally elongate, moderately enlarged basally, attenuate proximally. Many medial ventral leg setae enlarged, flattened, prominently palmate; more lateral ventral setae coarsely barbed, not so enlarged, flattened, and palmate.

VENEZUELAN RECORDS (3 females): All collections (3) were made in April from *Pteronotus parnellii* in Bolívar (2) and T. F. Ama-

zonas (1). Specimens of *C. elongatus* were also taken in these same 3 collections.

REMARKS: *C. thomasi* differs quite strikingly from other species of the genus, primarily in size. It is much larger than any other species in both length and width of the idiosoma. Also, the second and third sternal setae are located near the midway point of the length of the plate, and the posterior quarter of the dorsal plate is not separated from the anterior portion. Collection records reveal that *C. thomasi* and *C. elongatus* may occur on the same species of host. It is now evident that the two abnormal female specimens reported by Furman (1966) as *C. elongatus* are identical to the adult female of *C. thomasi*, and the "female deutonymph" described by Machado-Allison (1965b) as *C. thomasi* is an adult of *C. elongatus*.

Genus *Periglischrus* Kolenati

Periglischrus Kolenati, 1857, Wien. Ent. Monatschr., 1(2): 60.

Type species: *Periglischrus caligus* Kolenati, 1857, by subsequent designation (Oudemans, 1903, Tijdschr. Ent., 45:135).

DESCRIPTION

Dorsal plate usually superficially divided by partial suture line or transverse band of lightly sclerotized integument but with posterior quarter joined to anterior portion by two narrow bridges. Six pairs of podosomal setae lateral to dorsal plate, with sixth pair located slightly posterior to stigmata. Peritremes dorsal in position and long, extending from level of coxa IV to level of coxa I, and lying over coxa II and III. Dorsal opisthosoma with several pairs of minute to medium-length setae.

Opisthosoma of female greatly expansile relatively flat, broad, and fan shaped. Tritosternum absent. Sternal plate of female usually longer than wide, with three pairs of setae on or off margins. Pair of metasternal setae located posterior to sternal plate. Holoventral plate of male covers most of venter between coxae I-III, with five pairs of setae and two pairs of pores. Genital plate of female reduced and narrow, with pair of small setae close to or on posterior margin. Ventral opisthosoma of female has curiously shaped areas of heavy sclerotization. Ventral integument between genital plate and posterior margin bears several small setae. Anal plate small, narrow, terminal, and with pair of small ventral subterminal adanal setae and minute dorsal postanal seta. Intercoxa IV area of male bears several pairs

of setae, including adanal pair. Legs relatively short and stout, with large claws and caruncles. Ventral leg setae short, with dorsal and lateral setae short to long.

Dorsum of deutonymphs (both female and male) similar in most characters to those of adult female and male (*i.e.*, superficially divided dorsal plate, long dorsal peritremes, and 6 pairs of podosomal setae lateral to dorsal plate). Dorsum of protonymph differs from those of adults as follows: peritreme short, about one-third as long as those of deutonymphs and adults; only 5 pairs of podosomal setae (sixth pair absent). Female deutonymph, male deutonymph, and protonymph differ most in ventral characters. All have 3 pairs of sternal setae on sternal plate, but setae somewhat smaller in protonymph and female deutonymph than in male deutonymph. Female and male deutonymphs bear pair of metasternal setae and pair of genital setae, both absent in protonymph. Primary difference between immature forms is in number of intercoxa IV setae: protonymph bears 4 pairs, plus 1 pair of adanal setae; male deutonymph bears from 7 to 9 pairs, plus pair of adanal setae; and female deutonymph bears from 10 to 12 pairs, plus pair of adanal setae. In all immature forms, first pair of intercoxa IV setae distinctly smaller than other pairs. Coxal and leg setae generally similar in all immature stages, except that in protonymph certain leg setae absent.

REMARKS: The genus *Periglischrus* was described by Kolenati (1857) to accommodate a single species, *P. caligus*. Species of this genus have been reported primarily from New World bats belonging to the family Phyllostomidae. The best known and least host-specific species of *Periglischrus* is *P. iheringi* Oudemans, 1902. In 1944 Hoffmann described *Periglischrus vargasi* from *Leptoncyteris nivalis* and *Anoura geoffroyi*. Thus, at the time of Rudnick's (1960) revision of the family Spinturnicidae, only three species which are currently recognized as *Periglischrus* had been described.

Based on collections of more than 1,000 specimens of Chiroptera from Venezuela, Machado-Allison (1964, 1965a) studied the host-parasite relationships of members of the genus *Periglischrus*. As a result of these studies, he described 6 new species. Almost simultaneously, Furman (1966) completed a study of spinturnicid mites of Panamá, and presented descriptions of 6 new species, 4 of which had been described by Machado-Allison (1964, 1965a). The most recent publication on Venezuelan *Periglischrus* is that of Machado-Alli-

son and Antequera (1971) in which 4 more new species were described.

In studies of Cuban spinturnicid mites, Dusbabek (1968) described two new species of *Periglischrus* (*P. delphinadoae* and *P. cubanus*) and one new genus, *Mesoperiglischrus*, with a single new species, *M. nyctiellinus*. We have not had an opportunity to examine specimens of the two new species of *Periglischrus*, but based on Dusbabek's descriptions, illustrations, and host records, we recognize these species as valid until further studies can be made and the types examined. The illustrations of the female of *P. delphinadoae* resemble *P. ojustii* Machado-Allison, 1964, and the illustrations of *P. cubanus* resemble *P. caligus* Kolenati, 1857. Based on the illustrations, descriptions, and host records, *Mesoperiglischrus nyctiellinus* Dusbabek, 1968, is considered here to be a synonym of *P. natali* Furman, 1966.

Of the 17 previously described, valid species of *Periglischrus* of tropical and subtropical America, 15 have been collected from bats in Venezuela. In addition to these 15 species, 5 new species were collected by the Smithsonian Venezuelan Project and are described herein.

Most species of the genus *Periglischrus* are quite host specific, as indeed are most species of other genera of bat mites. Based on morphological similarities and host-parasite associations, *Periglischrus* can be divided into several groups (see Table 1). Group I, parasites primarily on bats of the subfamily Phyllostominae, includes 10 species in 3 subgroups on the basis of phenetic similarities: subgroup A includes *P. parvus*, *P. microncyteridis*, and *P. gameroi*; subgroup B contains *P. tonatii* n. sp., *P. paracutisternus*, *P. acutisternus*, *P. dusbabeki* and *P. grandisona* n. sp.; and subgroup C is composed of *P. torrealbai* and *P. paratorrealbai* n. sp. The second major group is formed by those primarily parasitic on bats of the subfamily Glossophaginae: *P. caligus*, *P. paracaligus* n. sp., *P. paravargasi* n. sp., and *P. vargasi* form a phenetically similar subgroup; and *P. hopkinsi* and *P. herrerae* form another morphologically similar subgroup. However, *P. herrerae* is found primarily on *Desmodus rotundus* of the bat subfamily Desmodontinae. *P. ojustii*, *P. ramirezi*, and *P. iheringi* form another major phenetic group and are primarily parasitic on genera and species of the bat subfamilies Sturnirinae, Caroliniinae, and Stenodermatinae, respectively. *P. natali* is reported only from species of the bat genus *Natalus*, family Natalidae and, based on morphological characters, is not considered to be phenetically similar to any of the other

groups. However, it does possess characters in common with a number of species of *Periglyphschrus*.

The degree of host specificity among the species of this genus is quite striking. Table 2 summarizes the host specificity based on the Venezuelan Project records. Ten of the 20 species are basically monoxenous; that is, each occurs on a single chiropteran species and thus are considered to be highly specific. Eight of the remaining 10 species are considered to be basically stenoxenous, occurring on species of a single genus of bats, and are thus less host specific. Two species, *P. ojasii* and *P. iheringi*, are more or less oligoxenous and polyxenous, occurring on species of bats of two or more genera, and thus seem to have a rather low host specificity. Certain species which are considered to be basically stenoxenous were recorded from hosts of other genera. However, throughout this study the accidental contamination of collections has been considered quite probable, especially in cases where a single specimen of a mite species is recorded from an unusual host for the species (See Appendix I).

The 2 species of the *Periglyphschrus* Group I, subgroup C, *P. torrealbai* and *P. paratorrealbai* n. sp., are synoxenous with 2 species of subgroup B, *P. acutisternus* and *P. grandisoma* n. sp., respectively. That is *P. torrealbai* and *P.*

acutisternus occur on the same host (species of the genus *Phyllostomus*), and *P. paratorrealbai* n. sp. and *P. grandisoma* n. sp. occur on the same host (*Phylliderma stenops*). Of the 217 collections of *P. acutisternus* and 173 collections of *P. torrealbai*, 107 collections contained specimens of both species. That is, 107 of the 217 (49.3 percent) collections of *P. acutisternus* also contained *P. torrealbai*, and 107 of the 173 (61.8 percent) collections of *P. torrealbai* also contained *P. acutisternus*. Of the 5 collections of *P. grandisoma* n. sp. and 5 collections of *P. paratorrealbai* n. sp., 4 contained specimens of both species.

The following keys for identification generally reflect phenetic similarities and host-parasite relationships, but they are restricted to females and males of *Periglyphschrus*; the immature forms (male and female deutonymphs and protonymphs) cannot be easily separated on morphological characters. Identification of immature forms in the present study was made by association with females and males in the same collection and by host-parasite associations. Accompanying the key to females are illustrations (Fig. 1-20) of the sternal plates of all species. It has been found that females of almost all species of *Periglyphschrus* may be easily identified by the relative size and shape of the sternal plate.

Table 2. Host specificity of species of *Periglyphschrus* collected in Venezuela.

Species	Host Specificity ¹				
	Mono-xenous	Steno-xenous	Oligo-xenous	Poly-xenous	Syno-xenous
<i>P. parvus</i>	X				
<i>P. micronycteridis</i>		X			
<i>P. gameroi</i>		X			
<i>P. tonatii</i> n. sp.		X			
<i>P. paracutisternus</i>	X				
<i>P. acutisternus</i>		X			X
<i>P. dusbabeki</i>	X				
<i>P. grandisoma</i> n. sp.	X				X
<i>P. torrealbai</i>		X			X
<i>P. paratorrealbai</i> n. sp.	X				X
<i>P. caligus</i>		X			
<i>P. paracaligus</i> n. sp.	X				
<i>P. paravargasi</i> n. sp.		X			
<i>P. vargasi</i>		X			
<i>P. hopkinsi</i>	X				
<i>P. herrerae</i>	X				
<i>P. ojasii</i>			X	X	
<i>P. ramirezi</i>	X				
<i>P. iheringi</i>			X	X	
<i>P. natali</i>	X				

¹ Monoxenous = occurs on single host species

Stenoxenous = occurs on species of single host genus

Oligoxenous = occurs on hosts of two or more genera

Polyxenous = very low host-specificity

Synoxenous = species of parasites of same genus occurring on same host



Fig. 1-10. Sternal plates of *Periglischrus*, females. (1) *P. parvus* Machado-Allison; (2) *P. micronycteridis* Furman; (3) *P. gameroi* Machado-Allison and Antequera; (4) *P. tonatii* n. sp.; (5) *P. paracutisternus* Machado-Allison and Antequera; (6) *P. acutisternus* Machado-Allison; (7) *P. dusbabeki* Machado-Allison and Antequera; (8) *P. grandisoma* n. sp.; (9) *P. torrealbai* Machado-Allison; (10) *P. paratorrealbai* n. sp., scale = 100 μ .

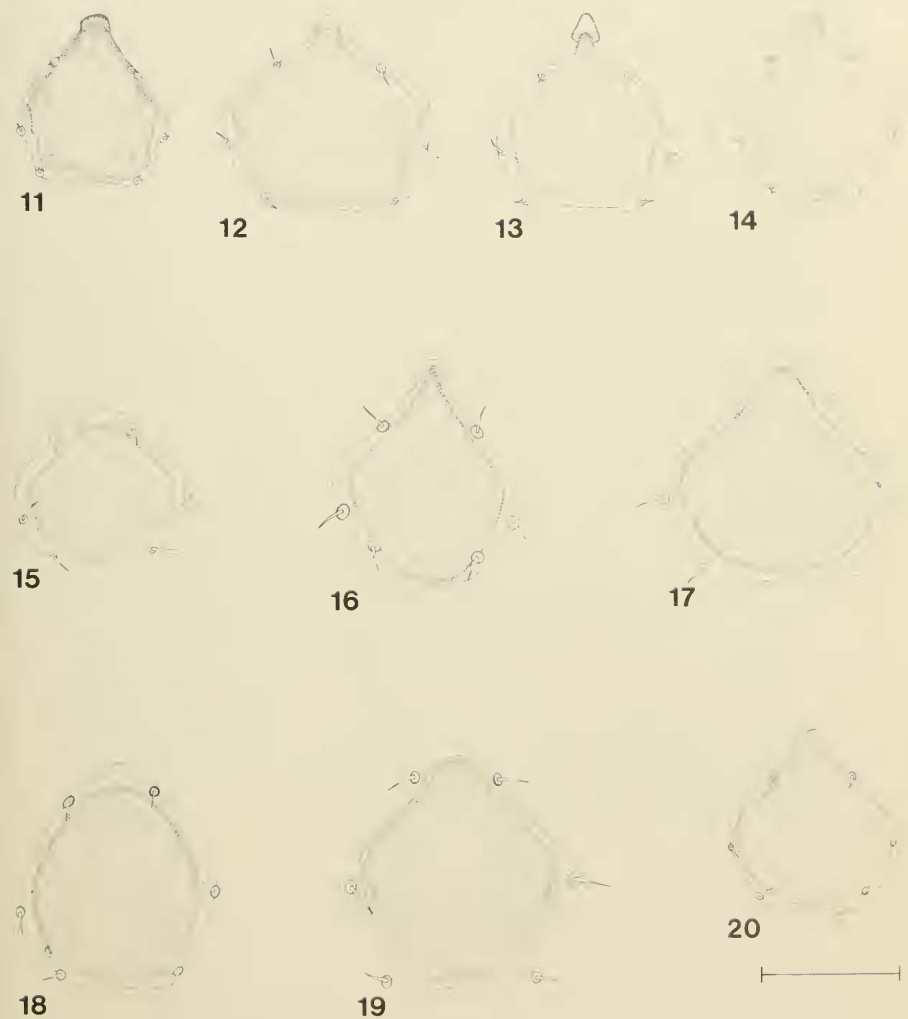


Fig. 11-20. Sternal plates of *Periglischrus*, females. (11) *P. caligus* Kolenati; (12) *P. paracaligus* n. sp.; (13) *P. paravargasi* n. sp., (14) *P. vargasi* Hoffmann; (15) *P. hopkinsi* Machado-Allison; (16) *P. herrerae* Machado-Allison; (17) *P. ojasii* Machado-Allison; (18) *P. ramirezi* Machado-Allison and Antequera; (19) *P. iheringi* Oudemans; (20) *P. natali* Furman, scale = 100 μ .

Key to Species of Venezuelan *Periglischrus*

Females

1. Peritreme of normal size over coxa III and at anterior end, but narrow and threadlike from coxa III to near coxa I; dorsal podosomal setae small to medium sized, with first and second pairs flattened and bladeliike; distance between first and second pairs of podosomal setae distinctly greater than distance between second and third pairs; dorsal opisthosoma posterior to coxa IV with six minute setae; from *Natalus* spp. *P. natali* Furman, 1966 (p. 60)
- Peritreme of normal size throughout; dorsal podosomal setae variable in size and position; however, first and second pairs never flattened and bladeliike; number and size of dorsal opisthosomal setae variable 2
- 2(1). Sternal plate with median anterior projection subtriangular in shape, with distinct constriction anterior to first sternal setae; mediobasal lobe of palpal tibia always large to medium sized and rather prominent; distance between first and second pairs of dorsal podosomal setae always equal to or less than distance between second and third pairs; dorsal podosomal setae all small to medium sized and setaceous 3
- Sternal plate with anterior margin variable but never with subtriangular projection and distinct constriction of plate anterior to first pair of setae; mediobasal lobe of palpal tibia variable, usually small to inapparent; distance between first and second pairs of dorsal podosomal setae and size of all dorsal podosomal setae variable 7
- 3(2). Proximal anterodorsal seta of femur I, patella I, tibia I, femur IV, and proximal posterodorsal setae of femur IV rather large, never small to minute 4
- Proximal anterodorsal seta of femur I, patella I, tibia I, femur IV, and proximal posterodorsal seta of femur IV small to minute in size 5
- 4(3). Very large species (idiosomal length greater than 2,000 μ); one ventral seta on each leg segment, especially legs I and II, flattened with expanded basal portion, slender acute distal portion, and with distinct serrations on side of expansion; one posteroventral seta on each leg segment robust and coarsely serrated on entire surface; mediobasal lobe of palpal tibia medium sized; anterior projection of sternal plate broad (Fig. 8); from *Phylloderma stenops*
..... *P. grandisoma* n. sp. (p. 30)
- Large species (but idiosoma less than 2,000 μ long); legs I and II without flattened, basally expanded, serrated ventral setae; posteroventral setae of tibia and tarsi I and II inflated basally and recurved, appearing blunt and peglike; posteroventral setae of femur and patella I and II robust and finely serrated on entire surface; mediobasal lobe of palpal tibia large and prominent; anterior projection of sternal plate narrow (Fig. 6); from *Phyllostomus* spp.
..... *P. acutisternus* Machado-Allison, 1964 (p. 28)
- 5(3). Larger species (idiosomal length greater than 1,200 μ); sternal plate with large, elongate anterior projection and with broad angular lateral extensions just anterior to constriction to plate (Fig. 7); from *Mimon crenulatum*
..... *P. dusbabeki* Machado-Allison and Antequera, 1971 (p. 30)
- Smaller species (idiosomal length less than 1,200 μ); sternal plate with smaller, shorter anterior projection 6
- 6(5). Sternal plate with broad, short anterior projection, and with angular lateral extensions anterior to constriction (Fig. 5); distal posteroventral seta of femur I, patella I, and femur II flattened, slightly recurved and bearing serrations on posterior concave margin; posteroventral seta of femur IV, patella IV, and tibia IV large, setaceous and recurved; from *Trachops cirrhosus*
..... *P. paracutisternus* Machado-Allison and Antequera, 1971 (p. 27)

- Sternal plate with short broadly rounded anterior projection without lateral angular extensions (Fig. 4); distal posteroventral seta of femur I, patella I, and femur II not flattened and recurved, may bear fine serrations over entire surface; posteroventral seta of femur IV, patella IV, and tibia IV small, straight, and setaceous; from *Tonatia sibiicola* *P. tonatii* n. sp. (p. 23)
- 7(2). Dorsal podosomal setae small to medium in length with distance between first and second pairs always equal to or less than distance between second and third pairs; posteroventral seta of femur IV, patella IV, and tibia IV always setaceous and recurved; one distal posteroventral seta of each tibiae and tarsi I and II inflated basally and recurved, superficially appearing blunt and peglike; proximal posterodorsal seta of femur IV minute 8
- Without above combination of characters 10
- 8(7). Proximal anterodorsal seta of femur I, patella I, and tibia I minute; sternal plate with irregular narrow heavily sclerotized portion, and with wider lateral areas of light sclerotization (Fig. 2); from *Micronycteris* spp. *P. micronycteridis* Furman, 1966 (p. 21)
- Proximal anterodorsal seta of femur I, patella I, and tibia I larger, medium sized; sternal plate with broad, uniformly heavily sclerotized portion, and with narrow, lightly sclerotized areas bordering plate 9
- 9(8). Anterior projection of sternal plate bluntly pointed (Fig. 3); larger species (idiosoma usually 1000 μ or more in length); from *Lonchorhina* spp. *P. gameroi* Machado-Allison and Antequera, 1971 (p. 21)
- Anterior projection of sternal plate broad, angularly pointed (Fig. 1); smaller species (idiosoma usually 900 μ or less in length); from *Micronycteris nicefori* *P. parvus* Machado-Allison, 1964 (p. 19)
- 10(7). Dorsal podosomal setae quite small to minute; at least two pairs of ventral setae posterior to sternal plate grossly expanded basally; some ventral setae of legs I and II short and enlarged (spinelike to peglike) 11
- Dorsal podosomal setae variable, small to large but never all unusually small to minute; ventral body setae setaceous, never grossly enlarged basally; ventral setae of legs I and II setaceous 12
- 11(10). Five pairs of ventral body setae grossly enlarged basally; posteroventral seta of femur IV and patella IV inflated and bladelike; anterior projection of sternal plate broadly rounded (Fig. 9); from *Phyllostomus* spp. *P. torrealbai* Machado-Allison, 1965a (p. 34)
- Only two pairs of ventral body setae grossly enlarged basally; posteroventral seta of femur IV and patella IV setaceous and recurved; anterior projection of sternal plate narrowly rounded (Fig. 10); from *Phylloderma stenops* *P. paratorrealbai* n. sp. (p. 36)
- 12(10). All dorsal podosomal setae large, long, and robust 13
- Dorsal podosomal setae variable, minute to medium in length, first pair usually small to minute 18
- 13(12). Distance between first and second pairs of dorsal podosomal setae distinctly greater than distance between second and third pairs; proximal anterodorsal seta of femur I, patella I, and tibia I small; anterodorsal seta of tibia II minute 14
- Distance between first and second pairs of dorsal podosomal setae equal to or less than distance between second and third pairs; proximal anterodorsal seta of tibia II large 17
- 14(13). Posteroventral seta of femur IV, patella IV, and tibia IV slender, setaceous, and recurved; ornamentation of dorsal plate consisting of numerous small irregularly round globules; five pairs of dorsal opisthosomal setae small to medium sized;

- sclerotized part of sternal plate irregular in shape (Fig. 14); from *Anoura geoffroyi* *P. vargasi* Hoffmann, 1944 (p. 52)
- 15(14). Posteroventral seta of femur IV, patella IV, and tibia IV broadly inflated and recurved; ornamentation of dorsal plate consisting of several large irregularly round globules as well as numerous small ones; five pairs of dorsal opisthosomal setae variable in size; sclerotized part of sternal plate more regular in shape 15
- Dorsal opisthosoma with five pairs of small to minute setae posterior to level of coxae IV; anterior end of sternal plate not narrowing so abruptly (Fig. 11); from *Glossophaga* spp. *P. caligus* Kolenati, 1857 (p. 40)
- Dorsal opisthosoma with six pairs of setae posterior to level of coxae IV, first pair about three times as long as longest of other five pairs, posteriormost two pairs minute, with middle three pairs small to medium length; anterior end of sternal plate narrows abruptly, forming narrow anterior projection 16
- 16(15). Sternal plate unusually broad, as wide as long, with short, narrowly rounded anterior projection (Fig. 12); from *Leptonycteris curasoae* *P. paracaligus* n. sp. (p. 41)
- Sternal plate distinctly longer than wide, with longer, narrow, blunt anterior projection (Fig. 13); primarily from *Anoura caudifer* *P. paravargasi* n. sp. (p. 46)
- 17(13). Anterior end of sternal plate broadly rounded, without narrow anterior projection (Fig. 15); six dorsal opisthosomal setae mostly large to medium sized; (first pair just posterior to coxa IV smallest); from *Lionycteris spurrelli* *P. hopkinsi* Machado-Allison, 1965a (p. 53)
- Anterior end of sternal plate with narrow anterior projection (Fig. 16) extending considerably anterior to first pair of setae; six dorsal opisthosomal setae mostly small in size (first pair just posterior to coxa IV largest); from *Desmodus rotundus* *P. herrerae* Machado-Allison, 1965a (p. 55)
- 18(12). First pair of dorsal podosomal setae subequal in size to other podosomal setae and set on integument off margin of dorsal plate; distance between first and second pairs of podosomal setae equal to or less than distance between second and third pairs; posteroventral seta of femur IV, patella IV, and tibia IV short, straight and bladelike; sternal plate pear shaped (Fig. 17); from *Sturnira* spp. *P. ojustii* Machado-Allison, 1964 (p. 56)
- First pair of dorsal podosomal setae small to minute and set on anterolateral margins of dorsal plate; distance between first and second pairs of podosomal setae distinctly greater than distance between second and third pairs; posteroventral seta of femur IV, patella IV, and tibia IV variable; shape of sternal plate variable 19
- 19(18). First pair of dorsal podosomal setae small (never minute) and other podosomal setae medium sized; posteroventral seta of femur IV, patella IV, and tibia IV long, setaceous, and recurved; sternal plate oval in shape (Fig. 18); proximal setae (ad and pd) of femur II both medium sized; from *Rhinophylla pumilio* *P. ramirezi* Machado-Allison and Antequera, 1971 (p. 57)
- First pair of dorsal podosomal setae minute and other podosomal setae large; posteroventral seta of femur IV, patella IV, and tibia IV straight and bladelike; sternal plate pear shaped (Fig. 19); proximal anterodorsal seta of femur II minute and proximal posterodorsal seta medium sized; from numerous phyllostomid bats, particularly *Artibeus* spp., *Uroderma* spp., and *Vampyrops* spp. *P. iheringi* Oudemans, 1902 (p. 58)

Males

1. Peritreme of normal size over coxa III, but narrow and threadlike from coxa III to near coxa I; first two pairs of dorsal podosomal setae minute; proximal seta

- minute; proximal seta of coxa I minute, much smaller than distal seta; proximal anterodorsal seta of femur IV small; from *Natalus* spp.
P. natali Furman, 1966 (p. 60)
- Peritreme of normal size throughout; dorsal podosomal setae larger, never minute; setae of coxa I variable, but usually longer and subequal in length; proximal anterodorsal seta of femur IV large 2
- 2(1). Large species (idiosoma length greater than 650 μ); dorsal podosomal setae relatively long (first pair greater than 40 μ long but longest pair less than 60 μ long); proximal posterodorsal seta of femur II long; proximal posterodorsal seta of femur IV small to minute 3
- Without above combination of characters 4
- 3(2). Very large species (idiosoma greater than 700 μ long); ventral setae (sternal and intercoxal) long, extending beyond base of adjacent posterior setae; proximal anterodorsal seta of femur II long; proximal posterodorsal seta of femur IV small; from *Phylloderma stenops* *P. grandisoma* n. sp. (p. 32)
- Moderately large species (idiosoma less than 700 μ long); ventral setae (sternal and intercoxal) short, not extending near to base of adjacent posterior setae; proximal anterodorsal seta of femur II short; proximal posterodorsal seta of femur IV minute; from *Mimon crenulatum*
P. dubabeki Machado-Allison and Antequera, 1971 (p. 30)
- 4(2). Dorsal podosomal setae shorter, longest pair less than 40 μ long; proximal posterodorsal seta of femur IV minute; sternal setae usually longer; proximal seta of coxa I subequal to distal seta 5
- Dorsal podosomal setae longer, longest pair usually greater than 40 μ long; proximal posterodorsal seta of femur IV usually small to large; length of sternal setae variable; length of coxa I setae variable 12
- 5(4). Large dorsal setae of tarsi III-IV superficially smooth, without distinct barbs 6
- Large dorsal setae of tarsi III-IV coarsely barbed 9
- 6(5). Smaller species (idiosomal length less than 325 μ); from *Micronycteris nicefori*
P. parvus Machado-Allison, 1964 (p. 19)
- Larger species (idiosomal length greater than 375 μ but less than 425 μ) 7
- 7(6). First sternal setae short, extending only to first pair of pores; first pair of podosomal setae very close to second, considerable distance between second and third pairs, but third, fourth, and fifth pairs close together; proximal anterodorsal seta of femur I small to minute; from *Micronycteris* spp.
P. micronycteridis Furman, 1966 (p. 21)
- First sternal setae longer, extending distinctly beyond first pair of pores; distance between first and second pairs of podosomal setae almost as great as distance between second and third pairs; proximal anterodorsal setae of femur I larger 8
- 8(7). First two pairs of dorsal podosomal setae distinctly shorter than others (third, fourth, and fifth); from *Tonatia silvicola* *P. tonatii* n. sp. (p. 24)
- All dorsal podosomal setae subequal in length; from *Lonchorhina* spp.
P. ganeroi Machado-Allison and Antequera, 1971 (p. 22)
- 9(5). Ventral setae of legs I and II mostly normal, setaceous, and slender (however, some may be enlarged and spinelike); proximal anterodorsal seta of femur I, patella I, tibia I, and patella IV medium to large in size 10
- Some ventral setae of legs I and II distinctly enlarged, blunt, and fusiform; proximal anterodorsal seta of femur I, patella I, tibia I, and patella IV always small 11
- 10(9). First pair of sternal setae long, extending almost to level of second pair of setae; second through fourth pairs of sternal setae extending beyond bases of ad-

- adjacent posterior setae; large dorsal setae of tarsi III and IV coarsely barbed; from *Phyllostomus* spp. *P. acutisternus* Machado-Allison, 1964 (p. 29)
- First pair of sternal setae of medium length, extending slightly beyond first pair of pores; second through fourth pairs of sternal setae of medium length, not extending to bases of adjacent posterior setae; large dorsal setae of tarsi III and IV finely barbed; from *Trachops cirrhosus* *P. paracutisternus* Machado-Allison and Antequera, 1971 (p. 28)
- 11(9). Some setae of ventral intercoxa IV area enlarged and expanded basally; many ventral setae of legs I and II blunt and fusiform; first pair of sternal setae longer, extending well beyond first pair of pores; second through fourth sternal setae longer, extending beyond bases of adjacent posterior setae; from *Phyllostomus* spp. *P. torrealbai* Machado-Allison, 1965a (p. 35)
- Setae of ventral intercoxa IV area distinctly slender, never expanded basally; only anterior ventral seta of femur I blunt and fusiform; first pair of sternal setae short, extending only to level of first pair of pores; second through fourth sternal setae shorter, not extending to bases of adjacent posterior setae; from *Phylloderma stenops* *P. paratorrealbai* n. sp. (p. 37)
- 12(4). Sternal setae short, with first pair not extending to first pair of pores; proximal seta of coxa I small to minute, usually much smaller than distal seta; proximal antero- and posterodorsal setae of femur II both minute 13
- Sternal setae longer, with first pair extending at least to or beyond first pair of pores; proximal and distal setae of coxa I longer and subequal in length; proximal posterodorsal seta of femur II never minute, but anterodorsal seta may or may not be minute 15
- 13(12). Distance between first and second pairs of dorsal podosomal setae greater than distance between second and third pairs; intercoxa IV area with nine pairs of setae; proximal anterodorsal seta of femur I, patella I, tibia I, and both proximal antero- and posterodorsal setae of femur IV large; from *Anoura geoffroyi* *P. vargasi* Hoffmann, 1944 (p. 52)
- Distance between first and second pairs of dorsal podosomal setae less than distance between second and third pairs; intercoxa IV area with seven or eight pairs of setae; proximal anterodorsal seta of femur I, patella I, tibia I, and both proximal antero- and posterodorsal setae of femur IV small to minute 14
- 14(13). Sternal setae slender and longer, first pair extending posteriorly to or slightly beyond level of first pair of pores; intercoxa IV area posterior to holoventral plate with eight pairs of small, slender setae; posterolateral seta of coxa II long, length equal to width of coxa II; primarily from *Anoura caudifer* *P. paravargasi* n. sp. (p. 48)
- Sternal setae small, first pair not extending posteriorly to level of first pair of pores; intercoxa IV area posterior to holoventral plate with seven or eight pairs of small more robust setae; posterolateral seta of coxa II much shorter than width of coxa II 15
- 15(14). Intercoxa IV area posterior to holoventral plate with seven pairs of setae; from *Leptonycyteris curasoae* *P. paracaligus* n. sp. (p. 43)
- Intercoxa IV area posterior to holoventral plate with eight pairs of setae; from *Glossophaga* spp. *P. caligus* Kolenati, 1857 (p. 41)
- 16(12). Smaller species (idiosomal length less than 450 μ); ventral setae (sternal and intercoxal) noticeably slender; sternal setae short, not extending to or near bases of adjacent posterior setae, and first pair extending no further than level of first pair of pores; intercoxa IV area with seven pairs of setae; from *Lionycyteris spurrelli* *P. hopkinsi* Machado-Allison, 1965a (p. 54)
- Larger species (idiosomal length greater than 500 μ); ventral setae more robust; sternal setae longer, extending to or beyond bases of adjacent posterior setae,

and first pair extending beyond first pair of pores; number of setae on inter-coxa IV area variable 7

17(16). First pair of setae posterior to sternal plate long and slender, distinctly more than half as long as posterior setae of sternal plate; intercoxa IV area with 9 to 10 pairs of setae; from *Desmodus rotundus* ... *P. herrerae* Machlado-Allison, 1965a (p. 55)

First pair of setae posterior to sternal plate short to minute; intercoxa IV area with seven or eight pairs of setae 18

18(17). Distance between first and second pairs of dorsal podosomal setae no more than half the distance between second and third pairs; spermatophore process short, shaped as shepherd's crook; proximal anterodorsal seta of femur I minute, much smaller than posterodorsal seta; from *Sturnira* spp.
..... *P. ojustii* Machado-Allison, 1964 (p. 56)

Distance between first and second pairs of dorsal podosomal setae almost as great as distance between second and third pairs; spermatophore process long, extensively recurved; proximal antero- and posterodorsal setae of femur I sub-equal and medium in length 19

19(18). Sternal setae shorter, first pair extending beyond first pair of pores but not near level of second pair of setae; intercoxa IV area with seven pairs of setae; proximal posterodorsal seta of femur IV small, much smaller than anterodorsal seta; from *Rhinophylla pumilio*
..... *P. ramirezi* Machado-Allison and Antequera, 1971 (p. 57)

Sternal setae longer, first pair extending to or beyond level of second pair of setae; intercoxa IV area with eight pairs of setae; proximal antero- and posterodorsal setae long, subequal in length, from numerous phyllostomid bats, particularly *Artibeus* spp., *Uroderma* spp., and *Vampyrops* spp.
..... *P. iheringi* Oudemans, 1902 (p. 58)

Group I

The 10 species comprising this first group of mites of the genus *Periglischrus* (see proposed classification on page 2 are primarily parasitic on bats of the subfamily Phyllostominae (family Phyllostomidae). The inclusion of these species of *Periglischrus* in Group I is based principally on their host-parasite association. The overall phenetic similarity among these 10 species is closely correlated with the host-parasite relationships. However, there are no specific morphological characters shared by all of them which can be used to distinguish the mites as a group. Such distinguishing characters are more evident and useful on the subgroup level.

Subgroup A

This subgroup is composed of three species, *P. parvus*, *P. micronycteridis*, and *P. gameroi*. These species are similar in size and in the general form of the female sternal plates (Fig. 1-3). They differ from the five species of subgroup B in the form of the anterior end of the sternal plates (i.e., no distinct anterior projection or constriction anterior to first sternal setae) and in the reduction of the mediobasal lobe on

the palpal tibia. Also, they differ from the two species of subgroup C in having all normal, setaceous setae posterior to the sternal plate and ventrally on the legs. The three species of this subgroup are parasitic primarily on two closely related bat genera, *Micronycteris* and *Lonchorhina*.

Periglischrus parvus Machado-Allison, 1964
Fig. 1, 21-22

Periglischrus parvus Machado-Allison, 1964: 195-197.

DESCRIPTION

FEMALE: Idiosomal length, 854 μ ; greatest width 575 μ . Ventral idiosomal setae slender, small to minute (length 6-13 μ). Sternal plate generally oval in shape (median length, 113 μ ; greatest width, 89 μ); posterior end and lateral sides broadly rounded; anterior projection broad and angularly pointed (Fig. 1). Dorsal plate oblong-oval (median length, 344 μ ; greatest width, 245 μ); posterior quarter superficially divided from anterior portion; plate only slightly ornamented with several medium-sized dark areas and a number of small pores or setal bases. Six pairs of medium-sized (length 19-26 μ) dor-

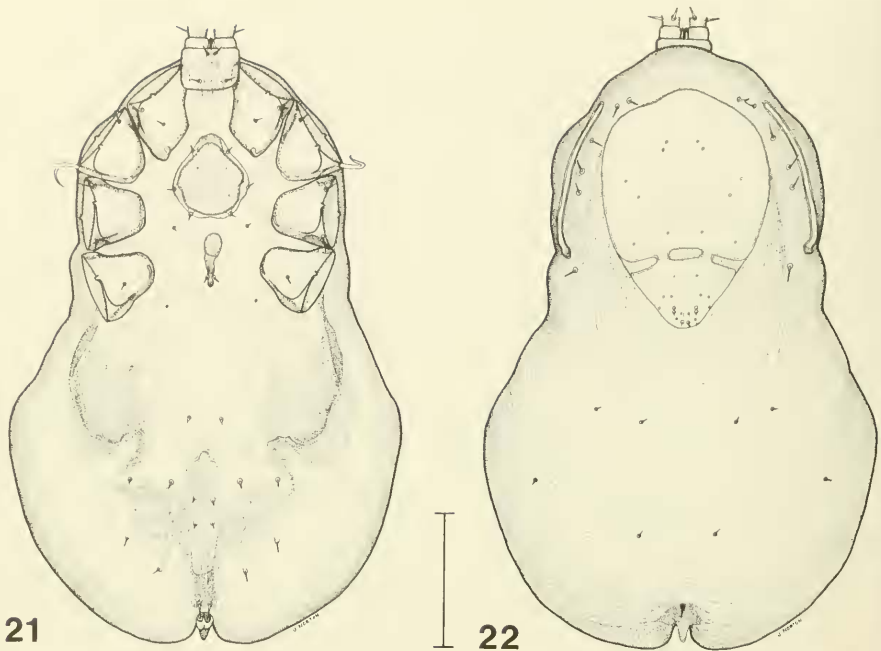


Fig. 21-22. *Periglischrus parvus* Machado-Allison, female. (21) venter; (22) dorsum, scale = 200 μ .

sal podosomal setae located lateral to dorsal plate; first and second pairs close together anterior to peritremes; middle three pairs located laterally between dorsal plate and peritremes with second and third pairs close together; sixth pair adjacent to stigmata. Dorsal opisthosoma with four or five pairs of minute setae. Dorsal leg setae generally large to medium sized, except proximal anterodorsal seta of femur I, femur II, patella II, and proximal posterodorsal seta of femur III and femur IV minute to rather small. Posterolateral setae of legs I-II, IV and anterolateral setae of legs III-IV rather large, recurved. Most ventral leg setae small to minute; one distal posteroventral seta on each tibia I-II and tarsus I-II superficially short, blunt; distal posteroventral seta of each femur I-II, patella I-II, and distal anteroventral seta of each femur III-IV, patella III-IV and tibiae III-IV somewhat enlarged and spinelike.

MALE: No specimens available for examination.

FEMALE DEUTONYMPH: Unknown

MALE DEUTONYMPH: Unknown

VENEZUELAN RECORDS (18 females): Only 7 collections were made, all from *Micronycteris nicefori*, in Bolivar (4), T.F. Amazonas (12), and Miranda (1), during January, April, July, and September.

REMARKS: *P. parvus* most closely resembles *P. gameroi* and *P. micronycteridis*; all three species comprising subgroup A, group I. Phenetically, these three species are similar in the following major characters: size and shape of female sternal plate (Fig. 1-3); dorsal podosomal setae small to medium in length; proximal posterodorsal seta of femur IV minute; and general size of idiosoma smaller than other species. Both male and female of *P. parvus* are distinctly smaller than those of *P. gameroi*; and in the female of *P. parvus* the anterior projection of the sternal plate is broader and more angularly pointed. *P. parvus* differs from *P. micronycteridis* in the shape of the female sternal plate; the general size of the idiosoma is smaller in the female and male of the former; and the proximal anterodorsal seta of each femur I, patella I, and tibia I is medium in length rather than minute.

The close phenetic relationship between *P. parvus* and *P. micronycteridis* is correlated well with host-parasite relationships. *P. parvus* has been recorded only from Venezuela on bats of the genus *Micronycteris*, (*M. hirsuta* and *M. nicefori*); *P. micronycteridis* is also known only from *Micronycteris*. However, the host species are *M. megalotis* and *M. minuta*. *P. gameroi* has been reported from species of *Lonchorhina* (a genus which is closely related to *Micronycteris*).

Periglischrus micronycteridis Furman, 1966
Fig. 2

Periglischrus micronycteridis Furman, 1966: 147-149.

DESCRIPTION

FEMALE: Idiosomal length, 1077 μ ; greatest width, 945 μ . Ventral idiosomal setae slender, small to minute (length 8-17 μ). Sternal plate somewhat pear shaped (median length, 128 μ ; greatest width, 82 μ); sclerotization of margins rather irregular and anterior projection truncate (Fig. 2). Dorsal plate oblong oval (median length, 364 μ ; greatest width, 252 μ); posterior quarter superficially divided from anterior portion by narrow band of lightly sclerotized integument; plate ornamented with large to medium-sized circular dark areas and small pores or setal bases. Six pairs of medium-sized (length 19-21 μ) podosomal setae located lateral to dorsal plate; first and second pairs close together anterior to peritremes; sixth pair located adjacent to stigmata. Dorsal opisthosoma with four or five pairs of small to minute setae. Dorsal leg setae generally large to medium sized, except proximal anterodorsal seta of each femur I-III, patella I-II, tibia I-II, and proximal posterodorsal seta of femur III-IV minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV rather large, recurved. Most ventral leg setae small to minute, except distal posteroventral seta of each tibia I-II and tarsus I-II superficially blunt, and distal posteroventral seta of each femora I-II, patella I-II, and distal anteroventral seta of each femur III-IV, patella III-IV, and tibia III-IV somewhat enlarged and spinelike.

MALE: Median length of idiosoma, 386 μ ; greatest width, 316 μ . Holovenral plate somewhat pear shaped (median length, 183 μ ; greatest width, 129 μ); greatest width at level of second sternal setae; five pairs of setae on holovenral plate rather slender, small to medium in length (15-39 μ); first sternal setae extend posteriorly to level of first pair of pores. Intercoxa IV area with seven pairs of setae plus pair

of subterminal adanal setae; first pair minute (length less than 12 μ); all others small (length 20-25 μ). Dorsal plate oblong-oval (median length, 346 μ ; greatest width, 243 μ), with posterior end narrower; posterior quarter superficially divided from anterior portion by narrow transverse strip of lightly sclerotized integument. Six pairs of medium-sized (length 20-28 μ) podosomal setae lateral to dorsal plate; first two pairs close together anterior to peritremes; middle three pairs close together laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae medium sized, except posterolateral seta of coxa II somewhat larger. Most ventral leg setae small to medium sized, some robust and spinelike. Posterolateral setae of legs I-II and anterolateral setae of legs II and IV medium in length and recurved; other antero- and posterolateral leg setae smaller. Distal dorsal setae of trochanters II-IV, femora I-IV, and patella I-IV distinctly longer than all other dorsal leg setae; proximal anterodorsal seta of each femur I-III and posterodorsal seta of femur III-IV minute.

VENEZUELAN RECORDS (38 females, 4 males, and 1 protonymph): *P. micronycteridis* is almost totally restricted to bats of the genus *Micronycteris*. There were nine collections from *M. megalotis*, three from *M. minuta*, and one from *M. microtis* (an exceptional collection came from *Carollia* sp.). Collections were from T. F. Amazonas (3), Barinas (3), Zulia (2), Apure (1), Bolívar (1), Falcón (1), Lara (1), Miranda (1), and Trujillo (1). Collections were made during every month except February, April, May, and August.

REMARKS: As noted in the treatment of *P. parvus*, *P. micronycteridis* most closely resembles that species. This phenetic resemblance is well correlated with host-parasite relationships. Both species are known from bats of the genus *Micronycteris*, although the host species differ. The Venezuelan specimens of *P. micronycteridis* closely resemble those reported from the same host in Panamá by Furman (1966).

Periglischrus gameroi Machado-Allison and
Antequera, 1971
Fig. 3

Periglischrus gameroi Machado-Allison and Antequera 1971: 6-9.

DESCRIPTION

FEMALE: Idiosomal length, 1019 μ ; greatest width, 968 μ . Ventral idiosomal setae small to minute (length 8-19 μ). Sternal plate generally

pear shaped (median length, 130 μ ; greatest width, 102 μ); posterior margin truncate, however it may appear invaginated; lateral margins irregularly rounded; anterior projection rather broad with narrowly rounded apex (Fig. 3). Dorsal plate oblong-oval (median length, 323 μ ; greatest width, 243 μ), with posterior end narrowing more sharply than anterior end; posterior quarter faintly appears divided from anterior portion by narrow suture laterally and medially; plate ornamented with large circular darker areas and small pores or setal bases. Six pairs of medium sized (length 23-34 μ) podosomal setae located lateral to dorsal plate; first and second pairs located anterior to peritremes; middle three pairs laterally between dorsal plate and peritremes; distance between first five setae subequal; sixth pair located just posterior to stigmata. Dorsal opisthosoma with five pairs of minute setae. Dorsal leg setae generally large to medium sized, except proximal anterodorsal seta of each femur II, patella II, anterodorsal seta of femur III and femur IV small to minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV rather large and recurved. Most ventral leg setae small to minute, except one distal posteroventral seta of each tibia I-II and tarsus I-II superficially short, blunt; distal posteroventral seta of each femur I-II, patella I-II, distal anteroventral seta of femur III-IV, patella III-IV, and tibia III-IV somewhat enlarged and spinelike.

MALE: Median length of idiosoma 400 μ ; greatest width, 310 μ . Holovertral plate broadly spade shaped (median length, 180 μ ; greatest width, 166 μ); greatest width at level just anterior to second sternal setae; five pairs of setae on holovertral plate medium sized (length 35-49 μ); first sternal setae extend posteriorly slightly beyond level of first pair of pores. Intercoxa IV area with seven pairs of setae plus pair of subterminal adanal setae; first pair minute (length less than 8 μ); all others rather robust, small to medium sized (length 20-26 μ). Dorsal plate oval (median length, 367 μ ; greatest width, 257 μ); posterior quarter superficially divided from anterior portion by narrow, transverse strip of lightly sclerotized integument. Six pairs of medium sized (length 28-40 μ) podosomal setae lateral to dorsal plate; first two pairs located just anterior to peritremes; middle three pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae medium length, with posterolateral seta of coxa II largest and anterolateral seta of coxa III smallest. Most ventral

leg setae small to medium sized, some rather robust and spinelike. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV medium in length and recurved; other antero- and posterolateral leg setae smaller. Certain distal dorsal setae of leg segments rather large and long; however, most dorsal leg setae small to medium sized, except proximal anterodorsal seta of femur II and proximal posterodorsal seta of each femur III-IV minute.

VENEZUELAN RECORDS (47 females, 13 males, 2 deutonymphs, and 4 protonymphs): Of the 38 collections of *P. gameroi*, 34 were from bats of the genus *Lonchorhina*: *L. auritta* (21) and *L. orinocensis* (13). The other 4 collections included 1 each from *Pteronotus parnellii*, *Artibeus jamaicensis*, *Eptesicus furinalis*, and *Desmodus rotundus*. Machado-Allison and Antequera (1971) reported 7 collections (14 females, 2 males) from *L. aurita* and 7 (9 females, 1 male, and 1 protonymph) from *Lonchorhina* sp. nov. (= *L. orinocensis*), from the Smithsonian Venezuelan Project, all included in the total figures presented here. Collections were made in the following states and districts: Carabobo (11), Apure (8), Trujillo (7), T. F. Amazonas (5), Zulia (2), Dto. Federal (2), Miranda (2), and Sucre (1). Collections were made during the months of January (7), April (2), June (1), July (1), August (3), September (5), October (4), November (10), and December (5).

REMARKS: As noted previously, *P. gameroi* resembles *P. parvus* and *P. micronycteridis*. However, it differs in the following characters: distinctly larger than *P. parvus*, shape of female sternal plate rather distinctive (see Fig. 3), and proximal anterodorsal seta of each femur I, patella I, and tibia I of moderate size rather than minute as in *P. micronycteridis*. *P. gameroi* has been reported from two species of the genus *Lonchorhina* in Venezuela. The *Lonchorhina* sp. nov. reported by Machado-Allison and Antequera (1971) was subsequently determined to be *L. orinocensis*. Bats of the genera *Lonchorhina* and *Micronycteris* are closely related.

Subgroup B

This subgroup is composed of five species: *P. tonatii* n. sp., *P. paracutisternus*, *P. acutisternus*, *P. dusbabeki*, and *P. grandisoma* n. sp. These species are arranged in order of increasing size and consecutive similarity of female sternal plates (Figs. 4-8). The species of this subgroup differ from those of subgroups A

and C in the form of the anterior end of the sternal plate (i.e., with distinct median anterior projection, subtriangular in shape, and with distinct constriction anterior to first sternal setae) and in the presence of a medium-sized to prominent mediobasal lobe on the palpal tibia. The separation of the two species of subgroup C, *P. torrealbai* and *P. paratorrealbai* n. sp., from this subgroup is based only on morphological characters rather than host-parasite associations. As noted previously, *P. torrealbai* is found in association with *P. acutisternus* on bats of the genus *Phyllostomus*, and *P. paratorrealbai* n. sp. is found in association with *P. grandisoma* n. sp. on *Phylloderma stenops*. The five species of this subgroup are parasitic primarily on several closely related genera: *Tonatia*, *Trachops*, *Phyllostomus*, *Mimon*, and *Phylloderma*.

Periglischrus tonatii n. sp.

Fig. 4, 23-31

DESCRIPTION

FEMALE (Holotype): (Fig. 4, 23-25). *Venter*: Sternal plate somewhat diamond shaped; posterior margin slightly rounded to slightly invaginated; anterior end narrowly rounded with small quarter-moon-shaped platelet just anterior to sternal plate margin (Fig. 4). First 3 pairs of sternal setae on margin of plate, with fourth pair (metasternal) posterior to sternal plate. Two pairs of small pores present on sternal plate. Genital plate oblong, both ends rounded and bearing 1 pair of small setae near posterior end. Ventral opisthosoma with 10 pairs of minute to moderately long, slender setae (smallest setae near genital plate and longest near posterior of ventral idiosoma). Pair of medium length adanal setae present im-

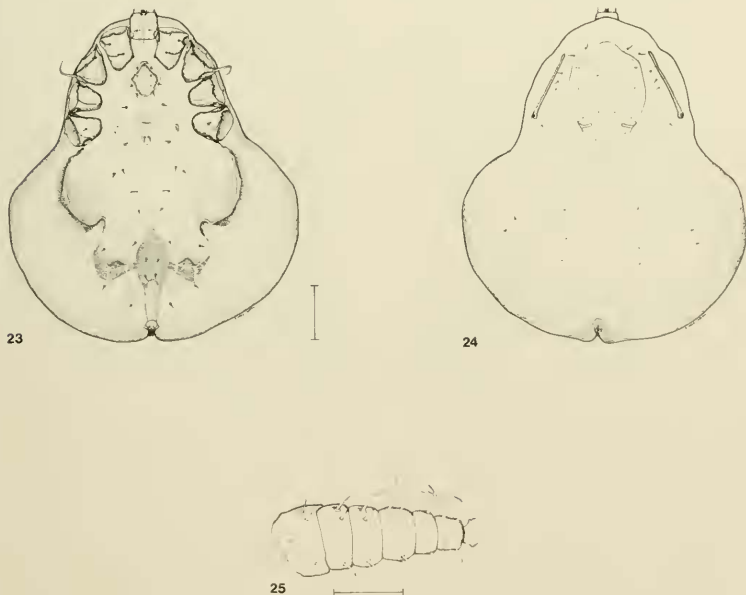
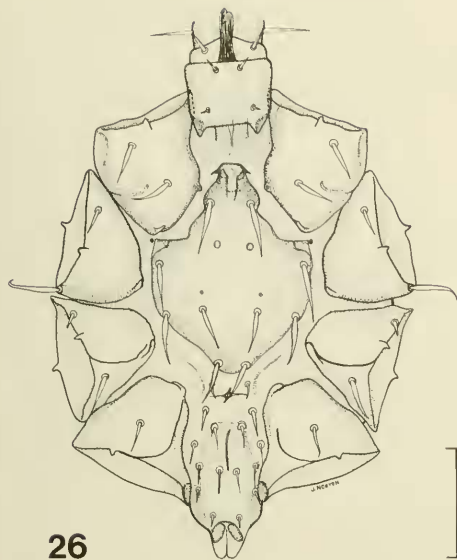


Fig. 23-25. *Periglischrus tonatii* n. sp., female. (23) venter; (24) dorsum, scale = 200 μ ; (25) ventral view of leg IV, scale = 100 μ .

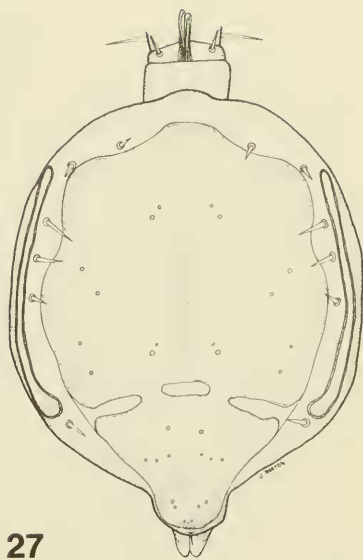
mediately ventral to anal orifice; anal orifice located dorsally and terminally. Ventral opisthosoma with curiously shaped, heavily sclerotized bilateral areas. *Dorsum*: Peritreme dorsal, lying over coxae II and III; of normal length and width for genus. Dorsal plate oblong-oval in general shape; broader anteriorly with prominent shoulders, and narrower posteriorly; posterior quarter superficially appearing divided by narrow transverse band of lightly sclerotized integument; plate ornamented with darker areas of various shapes and sizes and small pores or setal bases. Dorsal podosoma with 6 pairs of medium-sized setae lateral to dorsal plate; first 2 pairs anterior to peritremes; third, fourth, and fifth pairs form linear group between dorsal plate and peritremes; sixth pair posterior to stigmata. Dorsal opisthosoma bears 5 pairs of minute setae in vertical rows of 3 medial pairs and 2 more lateral pairs. *Legs*: Each coxa with elongate ridge, usually posteroventral longitudinal or diagonal; coxa I with 2 small setae, proximal and distal in location; coxa II with 1 small anterolateral seta and 1 rather large postero-marginal seta; coxa III with 1 small inapparent anterolateral seta and 1 medium-sized posterolateral seta; coxa IV with 1 minute medial seta. Proximal posteroventral seta of each tibia I-II, patella II, and 1 medial ventral seta of each tarsus I-II short, blunt, peglike; some posteroventral setae of trochanter II, femora I-II, patella I, and some anteroventral setae of femora III-IV and tibiae III-IV medium in length, enlarged, and spinelike; all other ventral leg setae small to minute. Some posterolateral setae of legs I-II and some anterolateral setae of legs III-IV large, recurved; all other antero- and posterolateral setae of legs small, straight and setaceous. Proximal anterodorsal seta of each femur I-IV, patella I-III, tibia I-III, proximal posterodorsal seta of femur II-IV, patella I-III, tibia I-III, and some dorsal setae of tarsi I-IV rather small to minute; all other dorsal setae medium to large in size. *Gnathosoma*: gnathosomal and median hypostomal setae small; lateral and distal hypostomal setae inapparent. Mediodistal lobe of palpal tibia medium sized. Two pairs of blunt, peglike setae on laterodistal margin of palpal tibia. Other gnathosomal features normal for genus. *Measurements*: Idiosoma length, 1120 μ ; greatest width 983 μ . Sternal plate length, 139 μ ; greatest width, 113 μ . Sternal setae length, 15-23 μ ; ventral opisthosomal setae length, 8-28 μ . Peritreme length 250 μ . Dorsal plate length, 408 μ ; greatest width, 275 μ . Podosomal setae length, 13-27 μ . Dorsal opisthosomal setae length, 6-10 μ . Length of

legs (base of trochanter to end of tarsus): Leg I, 314 μ ; leg II, 267 μ ; leg III, 253 μ ; leg IV, 257 μ .

MALE: (Allotype). (Fig. 26-27). *Venter*: Holoventral plate covers almost entire venter between coxae I-III; anterior end abruptly narrower between coxae I. Five pairs of moderately large setae present on holoventral plate; first pair extending to or almost to level of second setal bases; two pairs of circular pores present medially between setae; anterior end of plate bears hat-shaped sclerites. Intercoxa IV area bears eight pairs of small to medium-sized, adanal setae included; first pair small, less than half length of genital setae; anal orifice located terminally just posterior to adanal setae, with single minute postanal seta located dorsotermi-nally. *Dorsum*: peritreme dorsal, lying over coxae II and III; of normal length and width for genus. Dorsal plate oval with posterior end narrower; posterior quarter superficially appears divided by narrow transverse band of lightly sclerotized integument; plate slightly ornamented with lighter and darker areas, especially single narrow, elongate median lightly sclerotized area, and some small pores or setal bases. Dorsal podosoma bears six pairs of medium-sized setae lateral to dorsal plate; first two pairs anterior to peritremes; next three pairs located laterally between dorsal plate and peritremes; sixth pair located posterior to stigmata. *Legs*: Each coxa bears elongate, longitudinal or diagonal ventral ridge; coxa I with two moderately large setae, proximal and distal in position; coxa II with one medium-sized anteromarginal seta and one rather long posteromarginal seta; coxa III with one small anteromarginal seta and one rather large posteromarginal seta; coxa IV with one medium-sized ventral seta. Ventral leg setae small to medium sized, some enlarged and spinelike. Some posterolateral setae of legs I-IV and some anterolateral setae of legs III-IV large, recurved; other antero- and posterolateral setae smaller, setaceous. Proximal anterodorsal seta of femur II and posterodorsal seta of each femur III-IV minute; distal dorsal setae of femora I-IV, patella I-IV, and proximal dorsal setae of tarsi III-IV large, long; other dorsal leg setae of medium length. *Gnathosoma*: Gnathosomal and median hypostomal setae small; lateral and distal hypostomal setae inapparent or absent. No mediodistal lobe present on palpal tibia; two pairs of blunt peglike setae on laterodistal margin of palpal tibia, some other palpal setae spinelike. *Measurements*: Idiosoma length, 393 μ ; greatest width 261 μ . Holoventral plate length, 196 μ ; greatest width,

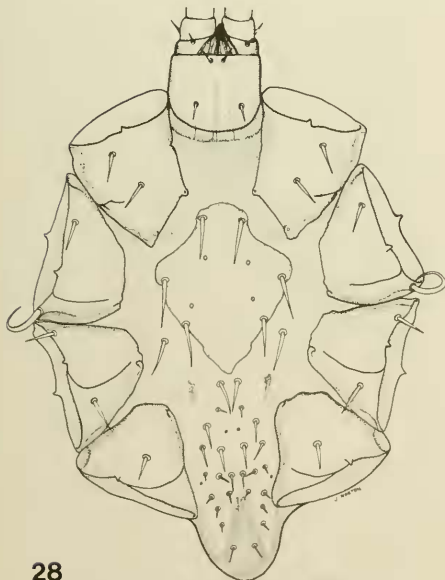


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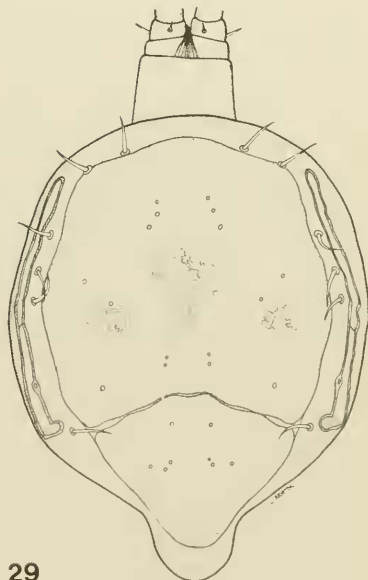


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Fig. 26-27. *Periglischrus tonatii* n. sp., male. (26) venter; (27) dorsum, scale = 100 μ .



28



29

Fig. 28-29 *Periglischrus tonatii* n. sp., female deutonymph. (28) venter; (29) dorsum, scale = 200 μ .

144 μ ; sternal and genital setae length, 37-54 μ ; ventral intercoxa IV area setae length, 11-34 μ . Peritreme length, 222 μ . Dorsal plate length, 387 μ , greatest width, 254 μ . Podosomal setae length, 17-20 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 315 μ ; leg II, 266 μ ; leg III, 263 μ ; leg IV, 298 μ .

FEMALE DEUTONYMPH: (Fig. 28-29). *Venter*: Sternal plate spade shaped; with 3 pairs of moderately large sternal setae and 2 pairs of circular pores; metasternal setae (1 pair) flank third pair sternal setae; genital setae located just posterior to plate. Intercoxa IV area with 12 pairs of small to medium-sized setae (1 pair adanal setae included), first pair behind genital setae smallest. *Dorsum*: Peritreme dorsal, of normal length and width; lying over coxae II and III. Dorsal plate oval, with posterior end narrower; posterior quarter divided from anterior portion by distinct suture. Dorsal podosoma bears 6 pairs of moderately large setae lateral to dorsal plate; first 2 pairs anterior to peritreme on margin of plate; next 3 pairs close together located between lateral margin of plate and peritremes; sixth pair posterior to stigmata. *Legs*: Each coxa I-III with 2 medium-sized to large setae, and coxa IV with 1 seta; each coxa with slightly developed posteroventral longitudinal or diagonal ridge. Ventral leg setae small to medium sized, some spinelike. Some posterolateral setae of legs I-IV and anterolateral setae of legs III-IV rather large. Distal dorsal setae of femora I-IV, patella I-IV, and proximal dorsal setae of tarsi III-IV rather long; proximal anterodorsal seta of femur II and femur III, and proximal posterodorsal seta of femur III and femur IV minute; other dorsal leg setae small to medium in length. *Gnathosoma*: Gnathosomal and median hypostomal setae small; lateral and distal hypostomal setae absent or inapparent. No mediobasal lobe present on palpal tibia. Palpal setae small to medium in length, some spinelike; 2 pair laterodistal seta of palpal tibia peglike. *Measurements*: Idiosoma length, 535 μ ; greatest width, 403 μ . Sternal plate length, 186 μ ; greatest width, 147 μ . Sternal setae length, 41-55 μ ; genital setae length, 36 μ ; intercoxa IV area setae length, 11-32 μ . Peritreme length, 284 μ . Dorsal plate length, 531 μ ; greatest width, 323 μ . Podosomal setae length, 37-45 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 360 μ ; leg II, 337 μ ; leg III, 313 μ ; leg IV, 340 μ .

MALE DEUTONYMPH: UNKNOWN

PROTONYMPH: (Fig. 30-31). *Venter*: Sternal plate spade shaped; bearing three pairs of

moderately large sternal setae. Intercoxa IV area with four pairs of small setae plus one pair of adanal setae. *Dorsum*: Peritreme dorsal, short, lying over coxa III. Dorsal plate generally oblong-oval; posterior quarter partially divided from anterior portion by lateral incisions. Dorsal podosoma with five pairs of small setae lateral to dorsal plate; two pairs anterolaterally at level of coxae I; two pairs laterally at level of coxae II; one pair posterior to stigmata. *Legs*: Each coxa I-III with two medium-sized setae; coxa IV with one small seta. Ventral leg setae mostly small, many spinelike. Some posterolateral setae of legs I-III and anterolateral setae of legs III medium in length; most antero- and posterolateral setae of leg IV rather large. Distal dorsal setae of femora I-IV, patella I-IV, and proximal setae of tarsi III-IV, rather long; all other ventral setae small to minute. *Gnathosoma*: Gnathosomal and medial hypostomal setae small; lateral and distal hypostomal setae absent or inapparent. No mediobasal lobe on palpal tibia; palpal setae small, some spinelike; two pairs laterodistal setae of palpal tibia peglike. *Measurements*: Idiosoma length, 391 μ , greatest width, 299 μ . Sternal plate length, 164 μ ; greatest width, 110 μ . Sternal setae length, 10-41 μ ; intercoxa IV setae length, 14-19 μ . Peritreme length, 113 μ . Dorsal plate length, 374 μ ; greatest width, 278 μ . Podosomal setae length, 14-26 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 227 μ ; leg II, 222 μ ; leg III, 219 μ ; leg IV, 215 μ .

TYPE MATERIAL: Holotype female and 20 paratype females, (SVP-30751) from *Tonatia silvicola*, 25 km S Pto. Ayacucho (114 m), T. F. Amazonas, Venezuela, 19 September 1967; allotype male, 1 paratype male, 2 paratype females, 1 paratype deutonymph, and 1 paratype protonymph (SVP-28813) from *Tonatia carrikeri* San Juan, Rio Manapiare (155 m), 163 km ESE Pto. Ayacucho, T. F. Amazonas, Venezuela, 24 July, 1967; 1 paratype male (SVP-29911) from *Tonatia brasiliensis*, same locality as SVP-28813, 28 July 1967; 1 paratype deutonymph (SVP-30067) from *Tonatia bidens*, and 1 paratype female (SVP-30068) from *Tonatia brasiliensis*, with same collection data as SVP-29911.

VENEZUELAN RECORDS (46 females, 5 males, 2 deutonymphs, and 1 protonymph): This spin-turicid mite is almost totally restricted to bats of the genus *Tonatia*. The single exception in the Venezuelan records was a female from *Desmotus rotundus*. There were 5 collections from *Tonatia silvicola*, 2 each from *Tonatia brasiliensis* and *Tonatia carrikeri* and 1 from

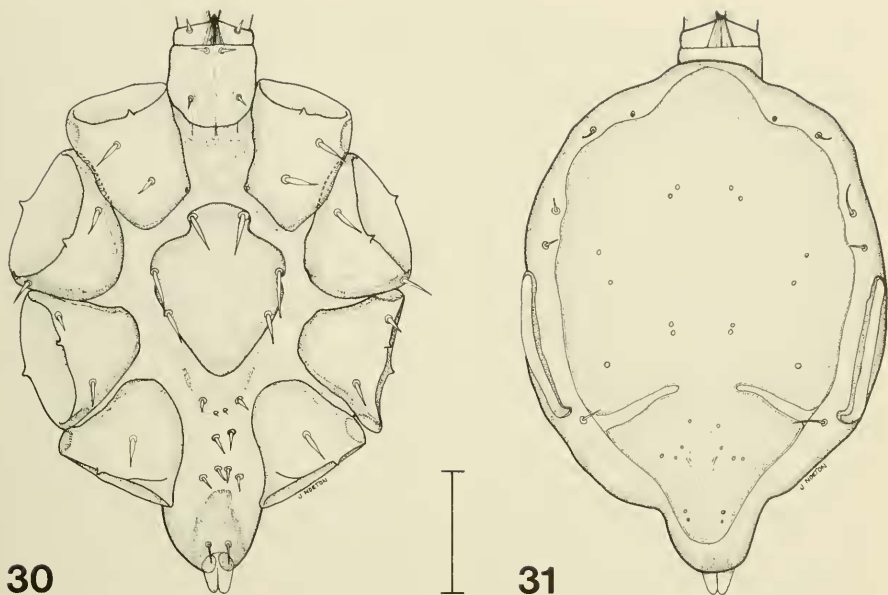


Fig. 30-31. *Periglischrus tonatii* n. sp., protonymph. (30) venter; (31) dorsum, scale = 100 μ .

Tonatia bidens. Collections were made in T. F. Amazonas (10) and Trujillo (1), during the months of April, June, July, and September.

REMARKS: In the proposed classification, this new species is the first of five species comprising subgroup B, group I of the genus. This group differs from other species of the genus in having a heavily sclerotized subtriangular median anterior projection of the sternal plate (with a distinct construction anterior to the first sternal setae) and in having the mediobasal lobe of the palpal tibia rather prominent and medium sized. *P. tonatii* most closely resembles *P. paracutisternus* in overall size and in the general shape of the female sternal plate; both species are distinctly smaller mites than the other three species of the group, *P. acutisternus*, *P. dusbabeki*, and *P. grandisoma* n. sp. *P. tonatii* differs from other closely related species in the following characters: posteroventral setae of femur IV, patella IV, and tibia IV of females small, straight, and setaceous rather than large and recurved; female sternal plate with short broadly rounded anterior projection, without lateral angular extensions; and first two pairs of dorsal podosomal setae of males distinctly

shorter than other three pairs. *P. tonatii* is recorded typically from bats of the genus *Tonatia*.

Periglischrus paracutisternus
Machado-Allison and Antequera, 1971
Fig. 5

Periglischrus paracutisternus Machado-Allison and Antequera, 1971: 12-15.

DESCRIPTION:

FEMALE: Idiosomal length, 1004 μ ; greatest width, 927 μ . Ventral idiosomal setae mostly small to medium sized (length 8-20 μ); however, several pairs just behind genital plate reduced and minute. Sternal plate oval in general shape (median length, 139 μ ; greatest width, 104 μ) with double hat-shaped anterior projection (Fig. 5); anterior projection moderately broad with two pairs of short lateral extensions anterior to first sternal setae. Dorsal plate oblong-oval (median length, 403 μ ; greatest width, 309 μ); posterior quarter superficially divided from anterior portion by narrow transverse suture; plate ornamented with darker areas of irregular shape and variable size. Six pairs of medium-sized (length 17-27 μ) podosomal setae located lateral to dorsal plate in three groups of two, three, and one.

Dorsal opisthosoma with four or five pairs of minute setae. Dorsal leg setae large to medium sized, except proximal anterodorsal seta of each femur I-IV, patella II-III, and proximal posterodorsal seta of each femur III-IV rather small to minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV mostly large, recurved. Distal posterolateral seta of each patella II, tibia I-II, and tarsi I-II superficially appears short and blunt. Distal posterolateral seta of each femur I-II, patella I, and trochanter II enlarged, flattened with posterior margin serrated. Distal anterolateral seta of each femur III-IV, patella III-IV, and tibia III-IV and distal posterolateral seta of each femur III, patella III, and tibia III enlarged, spinelike. All other ventral leg setae slender, small or minute.

MALE: Median length of idiosoma, 429 μ ; greatest width, 359 μ . Holoventral plate generally spade shaped (median length, 188 μ ; greatest width, 165 μ); place of greatest width at level of second sternal setae; five pairs of setae on holoventral plate slender, moderately long (44-56 μ); first sternal setae extend posteriorly just beyond level of first pair of pores. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair slender, quite small (length 16 μ); others small to medium sized (length 22-37 μ). Dorsal plate broadly oval (median length, 377 μ ; greatest width, 292 μ); posterior quarter superficially divided from anterior portion by narrow transverse band of lightly sclerotized integument. Six pairs of rather small podosomal setae located lateral to dorsal plate; first two pairs close together anterior to peritremes; middle three pairs close together laterally between dorsal plate and peritremes; sixth pair located posterior to stigmata. Coxal setae medium sized, except rather large, long posterolateral seta of coxa II and small spinelike anterolateral seta of coxa III. Ventral leg setae small to medium in length, many robust and spinelike. Most posterolateral setae of legs I-II, IV, and anterolateral seta of legs III-IV moderately large, some slightly recurved; other antero- and posterolateral setae of legs smaller. Most dorsal leg setae medium sized to large; many distal setae of leg segments very large; however, proximal anterodorsal seta of femur II and proximal posterodorsal seta of femur III and femur IV minute. Large dorsal setae of legs III-IV distinctly serrated.

VENEZUELAN RECORDS (53 females, 44 males, 9 deutonymphs, and 9 protonymphs): 35 of the 37 collections were from *Trachops cirrhosus*; 1 was from *Rhogeessa tumida*, and 1 from *Anoura*

geoffroyi. Machado-Allison and Antequera (1971) reported 9 of the above collections of *P. paracutisternus* (10 females, 16 males, and 2 deutonymphs) from *Trachops cirrhosus* (8) and 1 from *Anoura geoffroyi*. Collections were made in: T.F. Amazonas (18), Bolívar (6), Apure (5), Guárico (4), Zulia (1), Yaracuy (2) and 1 unknown. Collections were made during every month, except February and November, with most during April, May, July, and August.

REMARKS: *P. paracutisternus* resembles *P. tonatii* in several characters: i.e., overall size, general shape of sternal plate, and size of proximal anterodorsal seta of each femur I, patella I, tibia I, femur IV, and proximal posterodorsal seta of femur IV (all small to minute). The male of this species is phenetically similar to *P. acutisternus* in having the large dorsal setae of tarsi III-IV rather coarsely barbed. However, it differs in having shorter ventral setae. This species is recorded primarily from *Trachops cirrhosus* in Venezuela. The one collection each from *Anoura geoffroyi* and *Rhogeessa tumida* are probably accidental or collection contaminants.

Periglischrus acutisternus Machado-Allison, 1964
Fig. 6

Periglischrus acutisternus Machado-Allison, 1964:
200-202.

Periglischrus tiptoni Furman, 1966: 144-147.

DESCRIPTION

FEMALE: Idiosomal length, 1418 μ ; greatest width, 1076 μ . Most ventral idiosomal setae small to medium sized (length 15-22 μ); first pair just posterior to genital plate slender and minute; second and third pairs rather small, basally expanded and spinelike; remaining seven pairs of ventral opisthosomal setae small to medium sized, with some slightly expanded basally. Sternal plate generally flask shaped (median length, 266 μ ; greatest width, 146 μ); posterior margin almost truncate; lateral margins rounded; anterior end narrows forming rather narrow projection, arrow-shaped apex (constricted anterior to first sternal setae with rounded lateral extensions and narrowly rounded apex) (Fig. 6). Dorsal plate oblong-oval (median length, 549 μ ; greatest width, 378 μ). Posterior quarter superficially divided from anterior portion by narrow transverse suture; plate ornamented with numerous irregularly round, dark areas of variable size and small pores or setal bases. Six pairs of medium sized (length 20-35 μ) podosomal setae located lateral to dorsal plate in groups of two, three, and one. Dorsal opisthosoma with four

pairs of minute setae. Dorsal leg setae medium to large in size, except proximal anterodorsal seta of each femur II and femur III, and proximal posterodorsal seta of femur III rather small to minute. Posterolateral setae of legs I-III and anterolateral setae of legs III-IV large and recurved, most of which bear fine to coarse serrations. Distal posteroventral seta on each tibia I, tarsus I, patella II, tibia II, tarsus II, and distal anteroventral seta on each patella II, tibia II, and tibia III short, blunt, peglike. Distal posteroventral setae of femur I, patella I, trochanter II, femur II, and distal anteroventral setae of trochanters III-IV, femora III-IV, patella III-IV, and tibia IV medium sized, enlarged and serrated. Palpal tibia bear very prominent mediobasal lobes.

MALE: Median length of idiosoma, 599 μ ; greatest width, 450 μ . Holovenal plate generally spade shaped (median length, 275 μ ; greatest width, 217 μ), with greatest width at level of second sternal setae; five pairs of setae on holovenal plate rather large (length 64-80 μ), first pair extend posteriorly beyond first pair of pores to level of second sternal setae. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair minute (length less than 15 μ); all others medium sized (length 30-46 μ). Dorsal plate oval (median length, 514 μ ; greatest width, 353 μ); posterior quarter superficially divided from anterior portion by narrow transverse band of lightly sclerotized integument. Six pairs of medium-sized (length 28-37 μ) podosomal setae located lateral to dorsal plate; first two pairs located anterior to peritremes; middle three pairs located laterally between dorsal plate and peritremes; sixth pair set posterior to stigmata. Coxal setae medium to large in size; posterolateral seta of coxa II not distinctly larger than other coxal setae; however, anterolateral seta of coxa III smaller and spinelike. Ventral leg setae small to medium sized, many robust, spinelike. Antero- and posterolateral setae vary from small to moderately large. Most dorsal leg setae medium to large in size; distal dorsal setae of most leg segments larger with proximal setae smaller; proximal anterodorsal seta of femur II and proximal posterodorsal seta of femur III and femur IV minute; large dorsal setae of legs III-IV usually rather coarsely serrated.

VENEZUELAN RECORDS (184 females, 154 males, 68 deutonymphs, 87 protonymphs, and about 80 specimens in alcohol); of the 213 collections, 197 were from bats of the genus *Phyllostomus* (*P. hastatus*, 101; *P. discolor*, 76;

P. elongatus, 20). There were 2 collections each from *Artibeus jamaicensis* and *Desmodus rotundus*, and 1 each from *Pteronotus parnellii*, *Pteronotus suapurensis*, *Carollia perspicillata*, *Carollia* sp., *Sturmira lilium*, *Uroderma magnirostrum*, *Vampyrops* sp., *Chiroderma villosus*, *Artibeus cinereus*, *Artibeus fuliginosus*, *Myotis albescans*, and *Molossops planirostris*. Collections were made in: T. F. Amazonas (83), Falcón (31), Sucre (22), Zulia (21), Monagas (18), Trujillo (7), Carabobo (7), Bolívar (7), Miranda (4), Guárico (4), Apure (3), Yaracuy (1), Barinas (1), and 4 unknown. Although collections were made every month of the year, the majority were made during March, April, May, June, and July.

REMARKS: *P. acutisternus* is generally similar to the other four species of subgroup B, particularly in the form of the female sternal plate and setae of the dorsum and venter. It most closely resembles *P. dusbabek* and *P. grandisoma* n. sp. in overall size and shape of the sternal plate. *P. acutisternus* and *P. grandisoma* n. sp. both have a rather large proximal anterodorsal seta of femur IV, patella I, tibia I, femur IV, and the proximal posterodorsal seta of femur IV. However, the female of *P. grandisoma* n. sp. is considerably larger than that of *P. acutisternus* and possesses flattened, serrated setae ventrally on some leg segments, whereas *P. acutisternus* lacks such specialized setae. The male of *P. acutisternus* most closely resembles the male of *P. paracutisternus* in having the large dorsal setae of tarsi III-IV distinctly barbed or serrated. However, these two differ in that the sternal setae of *P. acutisternus* is distinctly longer and the large dorsal setae of tarsi III-IV are more coarsely barbed.

Machado-Allison (1964, 1965a), who originally described this species, reported collections from *Phyllostomus elongatus*, *P. hastatus* and *Trachops cirrhosus* in Venezuela. Furman (1966), who described this species as *P. tiptoni*, in Panamá, reported collections from *P. hastatus*, *P. discolor*, *P. elongatus*, and *Trachops cirrhosus*. It has been determined in the present study that those specimens from *Trachops cirrhosus* are *P. paracutisternus* and that *P. acutisternus* is primarily parasitic on the three species of *Phyllostomus*. As noted previously in this paper, *P. acutisternus* is frequently found in association with *P. torrealbai*. Furman (1966) noted this same phenomenon among collections of these two species in Panamá. The occasional (one or two) collections of *P. acutisternus* from other chiropteran hosts are considered to be

accidental host associations or work table contaminations.

Periglischrus dusbabeki Machado-Allison and Antequera, 1971

Fig. 7

Periglischrus dusbabeki Machado-Allison and Antequera, 1971: 9-13.

DESCRIPTION

FEMALE: Idiosomal length, 1558 μ ; greatest width, 1353 μ . Most ventral idiosomal setae small to medium sized (length 8-23 μ), except three pairs of minute setae just posterior to genital plate. Sternal plate large and robust (median length, 222 μ ; greatest width, 145 μ); generally elongate rectangular in shape, with irregular margins and with anterior end bearing hat-shaped projection; anterior projection with lateral extensions projecting out anterior to first sternal setae (Fig. 7). Dorsal plate oblong-oval (median length, 518 μ ; greatest width, 376 μ); posterior quarter superficially divided from anterior portion by narrow transverse suture; plate ornamented with small to large darker areas irregularly rounded. Six pairs of medium-sized (length 38-49 μ) podosomal setae located lateral to dorsal plate in groups of two, three, and one. Dorsal opisthosoma bears four or five pairs of small to minute setae. Dorsal leg setae medium to large in size, except proximal antero-dorsal seta of each femur I-II, patella II, tibia II, and proximal posterodorsal seta of each femur III-IV rather small to minute. Posterodorsal setae of legs I-II, IV, and anterolateral setae of legs III-IV large, recurved. Distal posteroven-tral seta of each patella II, tibia I-II, and tarsus I-II superficially appears short and blunt. Most other ventral leg setae small to medium in length, some somewhat enlarged.

MALE: Median length of idiosoma, 628 μ ; greatest width, 484 μ . Holoventral plate somewhat spade shaped (median length, 280 μ ; greatest width, 218 μ); greatest width just anterior to second sternal setae; five pairs of setae on holoventral plate medium sized (length, 47-64 μ); first sternal setae extend posteriorly just beyond first pair of pores; genital setae set rather close together. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair setae minute (length less than 15 μ), but all others short, robust (length 25-28 μ). Dorsal plate oblong-oval (median length, 557 μ ; greatest width, 381 μ), with posterior end narrower; posterior quarter superficially divided from anterior portion by narrow transverse band of lightly sclerotized integu-

ment; dorsal plate ornamented with moderately large, circular, darker and lighter areas, and small pores or setal bases. Six pairs of robust, medium-sized (length 42-58 μ) podosomal setae located lateral to dorsal plate; first two pairs anterior to peritremes; middle three pairs close together laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae medium in length and rather robust, except large posterolateral seta of coxa II. Most ventral leg setae small to medium sized, robust and spinelike. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV relatively large; other antero- and posterolateral leg setae smaller. Most dorsal leg setae medium sized to large, except proximal antero-dorsal seta of femur II small, and proximal posterodorsal seta of each femur III-IV minute.

VENEZUELAN RECORDS (10 females, 5 males, and 3 protonymphs): the 3 collections of *P. dusbabeki* were from *Mimon crenulatum*, 2 in T. F. Amazonas in June, and the other in Apure in January. In addition, Machado-Allison and Antequera (1971) reported on 19 collections of *P. dusbabeki* (45 females, 3 males, and 2 deutonymphs) from the Smithsonian Venezuelan Project collection of *Mimon crenulatum*, all from Yaraeuy. Of 72 specimens of *Mimon crenulatum* examined by the Smithsonian Venezuelan Project, 22 were parasitized with *P. dusbabeki*.

REMARKS: In general size, *P. dusbabeki* resembles *P. acutisternus* and *P. grandisoma* n. sp. However, in other characters it is most closely related phenetically to *P. tonatii* and *P. paracutisternus* e. g., proximal anterodorsal seta of femur I, patella I, tibia I, femur IV, and proximal posterodorsal seta of femur IV are small to minute in size rather than large as in *P. acutisternus* and *P. grandisoma* n. sp.; and in the male the ventral setae (sternal and intercoxae IV) are small. The form of the sternal plate in *P. dusbabeki* is quite distinctive (see Fig. 7). This species has been recorded only from *Mimon crenulatum* in Venezuela.

Periglischrus grandisoma n. sp.

Fig. 8, 32-41

DESCRIPTION

FEMALE: (Holotype). (Fig. 8, 32-37). *Venter:* Sternal plate jug shaped; posterior end broad, truncate; lateral sides broadly rounded; anterior end narrows sharply between first sternal setae with narrowly rounded anterior projection. Three pairs of sternal setae in close lateral proximity to plate margins, with metasternal setae just posterior to third sternal setae; sternal

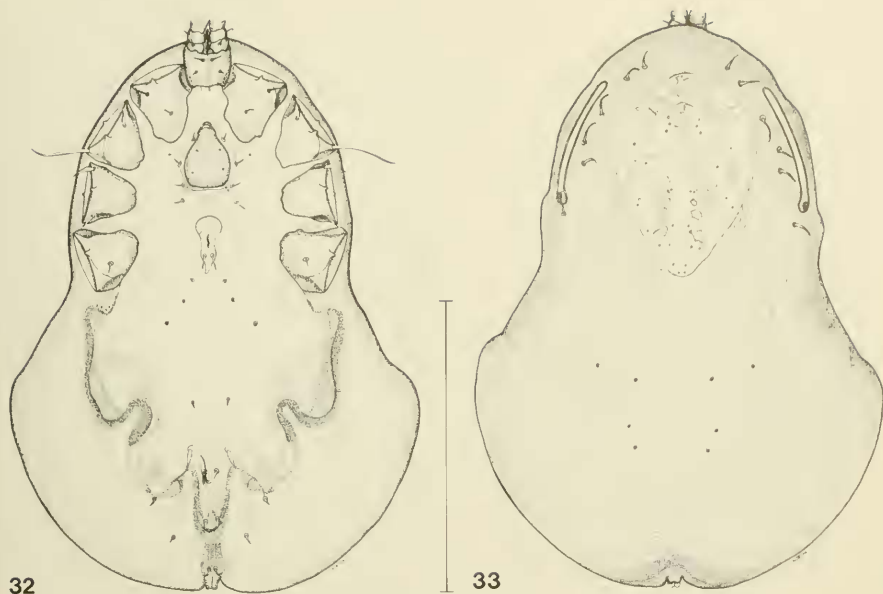


Fig. 32-33. *Periglischrus grandisoma* n. sp., female. (32) venter; (33) dorsum, scale = 1000 μ .

plate with narrow dark border; two pairs of circular pores located near lateral margins. Genital plate with greatly expanded anterior portion and narrow blunt or acute posterior end; plate slightly expanded at level of genital setae; genital setae of medium size and set on plate. Three pairs of setae behind genital plate minute, bifid, or rudimentary and appearing absent except for setal bases. Remaining seven pairs of ventral opisthosomal setae small and broad to relatively large and slender, some with distinct serrations; pair of medium-sized adanal setae just anterior to terminal anal orifice. Ventral opisthosoma with curiously shaped, heavily sclerotized bilateral areas. *Dorsum*: Peritreme dorsal, lying over coxae II and III; of normal length and width for genus. Dorsal plate oblong-oval with posterior end narrower; posterior quarter superficially appearing divided from anterior portion by narrow transverse band of lightly sclerotized integument; plate ornamented with mostly large irregularly circular, darker areas and small circular pores or setal bases. Dorsal podosoma with six pairs of medium-sized to large setae lateral to dorsal plate; first two pairs anterolateral to plate and anterior to peritremes; middle three pairs between dorsal plate and peritremes; sixth pair posterior to stigmata. Dorsal opistho-

soma with four or five pairs of minute to rudimentary setae. *Legs*: Coxae variously sculptured with suture lines; coxa I with two small to medium-sized setae, distal one larger than proximal; coxa II with small, anterolateral seta and large, long posterolateral seta; coxa III with medium-length, somewhat enlarged, serrated anterolateral seta and smooth, medium-sized posterolateral seta; coxa IV with small median seta. Anteroventral seta of each trochanter I-II, femur I-II, patella I-II, and tibia I-II flattened, greatly expanded basally on anteriorly directed side, with distinct coarse serration on expanded side, and abruptly narrowing with relatively long, slender apex; posterolateral setae of legs I-IV and anterolateral setae of legs III-IV relatively long with enlarged basal half, some flattened with distinct rather coarse serrations on all sides. Some posterolateral setae of legs I-II and anterolateral setae of legs III-IV quite large and long; other antero- and posterolateral setae small to medium sized. Most dorsal leg setae large to medium in length. *Gnathosoma*: Gnathosomal and median hypostomal setae small; ventral seta of palpal trochanter and lateroventral seta of palpal femur short, robust, and serrated; distal dorsal seta of palpal femur short, robust, spine-

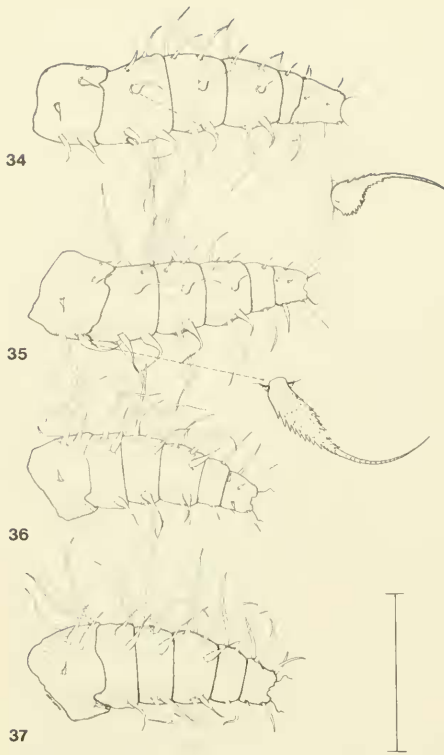


Fig. 34-37. *Periglischrus grandisoma* n. sp., female. (34) ventral view of leg I; (35) ventral view of leg II; (36) ventral view of leg III; (37) ventral view of leg IV, scale = 300 μ .

like or peglike; two laterodistal setae of palpal tibia short, peglike; other palpal setae small, setaceous. Mediosternal lobe of palpal tibia small, not prominent. **Measurements:** Idiosomal length, 1832 μ ; greatest width, 1341 μ . Sternal plate length, 212 μ ; greatest width, 157 μ . Sternal setae length, 28-37 μ ; genital setae length, 37-38 μ ; ventral opisthosomal setae length, 19-51 μ . Peritreme length, 331 μ . Dorsal plate length, 703 μ ; greatest width 471 μ . Podosomal setae length, 40-85 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 545 μ ; leg II, 503 μ ; leg III, 415 μ ; leg IV, 444 μ .

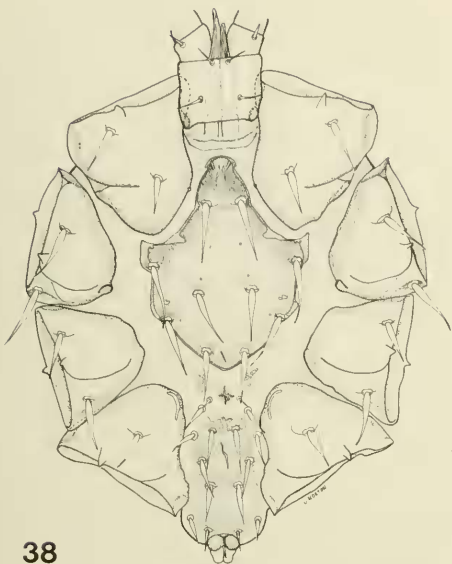
MALE: (Allotype) (Fig. 38-39). **Venter:** Holoverventral plate covers most of venter between coxae I-III; anterior end abruptly narrows between coxae I. Five pairs of large setae (three sternal, one metasternal, one genital) on holo-

ventral plate; third pair of setae in medial position on plate, with other setae on or very near margins; first pair sternal setae extend posteriorly to level of second pair, well beyond first pair of pores; plate bears four or five pairs of small pores. Intercoxa IV area with seven pairs of medium-sized to large setae, except first pair behind holoverventral plate small, plus pair of medium-sized adanal setae just in front of terminal anal orifice. **Dorsum:** Peritreme dorsal, lying over coxae II-III; of normal length and width for genus. Dorsal plate oval with posterior end narrower than anterior; plate with prominent anterolateral shoulders at level between coxae I-II; posterior quarter partially divided by narrow transverse band of lightly sclerotized integument; plate slightly ornamented with medium-sized, irregularly round, lighter areas and small circular pores or setal bases. Dorsal podosoma with six pairs of medium-sized setae lateral to dorsal plate; first two pairs anterolateral to dorsal plate and anterior to peritremes; next three pairs located between dorsal plate and peritremes; sixth pair set posterior to stigmata. **Legs:** Each coxa with prominent posteroventral longitudinal or diagonal ridge; all coxal setae of medium length (comparable to sternal setae) with somewhat enlarged proximal half. Most ventral leg setae short to medium in length, robust and spinelike; some anterolateral, posterolateral and dorsal setae rather large and long, most others medium in length, except proximal posterodorsal seta on femur IV rather small; most large leg setae finely serrated. **Gnathosoma:** Gnathosomal and median hypostomal setae of medium length, gnathosomal setae rather robust; some palpal setae enlarged and spinelike. No mediosternal lobe present on palpal tibia. **Measurements:** Idiosoma length, 794 μ ; greatest width, 605 μ . Holoverventral plate length, 368 μ ; greatest width, 293 μ . Sternal and genital setae length 93-113 μ ; ventral intercoxa IV setae length 41-83 μ . Peritreme length, 431 μ . Dorsal plate length, 714 μ ; greatest width, 479 μ . Podosomal setae length, 34-90 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 736 μ ; leg II, 606 μ ; leg III, 620 μ ; leg IV, 578 μ .

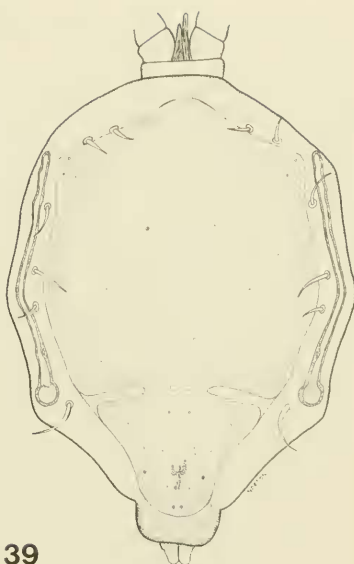
FEMALE DEUTONYMPH: Unknown

MALE DEUTONYMPH: Unknown

PROTONYMPH: (Fig. 40-41). **Venter:** Sternal plate somewhat diamond shaped, with anterior end and posterior end rather narrowly rounded; with three pairs of rather large basally expanded setae and two pairs of small pores. Intercoxa IV area with four pairs of medium-

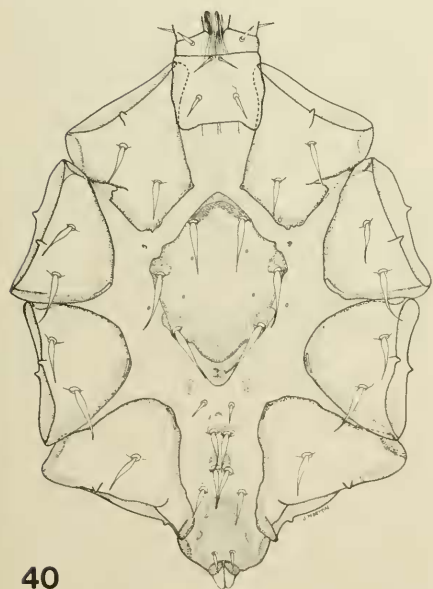


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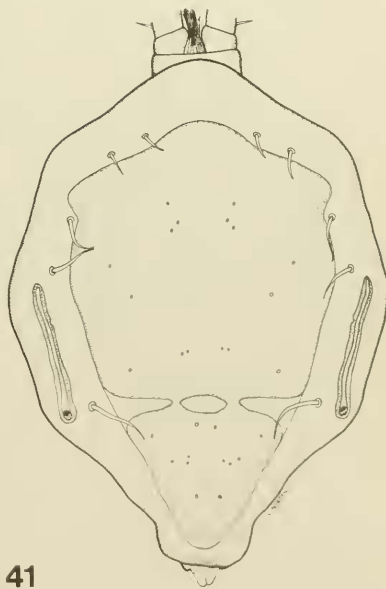


39

Fig. 38-39. *Periglischrus grandisoma* n. sp., male. (38) venter; (39) dorsum, scale = 200 μ .



40



41

Fig. 40-41. *Periglischrus grandisoma* n. sp., protonymph. (40) venter; (41) dorsum, scale = 200 μ .

sized setae plus one pair of adanal setae; first pair small and slender but other three pairs moderately large and basally expanded. *Dorsum*: Peritreme dorsal, short, lying over coxa III. Dorsal plate oblong-oval with posterior end much narrower than anterior; posterior quarter superficially divided from anterior portion by narrow transverse strip of lightly sclerotized integument. Dorsal podosoma with five pairs of medium to large setae; first two pairs anterolateral to dorsal plate at level of coxa I; next two pairs lateral to dorsal plate just anterior to peritremes and at level of coxa II; fifth pair just medial to stigmata. *Legs*: All coxal setae moderately large with expanded basal half. Most ventral leg setae relatively short to medium in length, enlarged (some only basally), spinelike or peglike. Some anterolateral, posterolateral, and dorsal setae large and long; proximal dorsal setae of femur III and posterodorsal seta of femur IV small to minute; other leg setae of medium length. *Gnathosoma*: Gnathosomal and median hypostomal setae of medium length, with gnathosomal setae somewhat enlarged; lateral and distal hypostomal setae absent. Palpal setae short to medium in length with most somewhat enlarged, some spinelike; two laterodistal setae on tibia peglike. *Measurements*: Idiosoma length, 776 μ ; greatest width, 583 μ . Sternal plate length, 266 μ ; greatest width, 224 μ . Sternal setae length, 89-97 μ ; intercoxa IV setae length, 31-64 μ . Peritreme length, 215 μ . Dorsal plate length, 697 μ ; greatest width, 486 μ . Dorsal podosomal setae length, 39-100 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 581 μ ; leg II, 529 μ ; leg III, 460 μ ; leg IV, 485 μ .

TYPE MATERIAL: Holotype female, allotype male, 15 paratype females, 1 paratype male, and 1 paratype protonymph (SVP-26298) from *Phylloderma stenops*, San Juan Río Maniapiere (155 m), 163 km ESE Pto. Ayacucho, T. F. Amazonas, Venezuela, 13 July 1967.

VENEZUELAN RECORDS (16 females, 4 males, and 4 protonymphs): Only 5 collections of *P. grandisoma* were recorded, all from the bat, *Phylloderma stenops*, in T. F. Amazonas, during the months of January, March, April, and July. This spinturnicid mite was recorded from 5 of 28 *Phylloderma stenops* specimens collected.

REMARKS: *P. grandisoma* is most similar to *P. acutisternus* and *P. dusbabeki* in overall size and the general form of the sternal plate. However, it differs from all other species in several significant characters. It is a very large species (female idiosomal length greater than 2000 μ),

and one ventral seta on each leg segment is flattened, with the basal portion expanded on one side, with the distal portion slender and acute, and with distinct serrations on the expanded side; also each leg segment bears one posteroventral seta which is robust and coarsely serrated on all sides. The male of *P. grandisoma* lacks these specialized leg setae, but the general body size and the dorsal and ventral setae are quite distinctive.

P. grandisoma is known only from *Phylloderma stenops* in Venezuela. In four of the five collections it was found in association with *P. paratorrealbai* n. sp. This synoxenous association between these two species seems to be identical to that between *P. acutisternus* and *P. torrealbai*. Of particular interest is the phenetic similarity between *P. grandisoma* and *P. acutisternus* and between *P. torrealbai* and *P. paratorrealbai* n. sp.

Subgroup C

The formation of this subgroup is based entirely on phenetic characters rather than host-parasite associations. The two species of this subgroup, *P. torrealbai* and *P. paratorrealbai* n. sp., are easily distinguished by the two or five grossly enlarged ventral setae posterior to the sternal plate and by the short spinelike or peglike ventral setae on legs I and II. *P. torrealbai* parasitizes species of the genus *Phyllostomus* in association with *P. acutisternus*, and *P. paratorrealbai* n. sp. is found on *Phylloderma stenops* in association with *P. grandisoma*.

Periglischrus torrealbai Machado-Allison, 1965
Fig. 9

Periglischrus torrealbai Machado-Allison, 1965a:
276-279.

Periglischrus inflatiseta Furman, 1966: 134-135.

DESCRIPTION

FEMALE: Idiosomal length, 779 μ ; greatest width, 513 μ . First three pairs of sternal setae slender, small to medium sized (length 17-24 μ); metasternal setae, genital setae, and three pairs of ventral opisthosomal setae greatly expanded basally but with finely acute tips (length 30-44 μ); first pair of setae posterior to genital plate and posteriormost opisthosomal setae mostly slender, small (length 10-17 μ). Sternal plate broadly pear shaped (median length, 117 μ ; greatest width, 113 μ); posterior margin slightly invaginated; lateral sides and anterior end broadly rounded (Fig. 9). Dorsal plate broadly oval (median length, 331 μ ; greatest width, 247 μ); posterior quarter widely di-

vided from anterior portion but joined by two median bridges; plate ornamented with darker circular areas, one median longitudinal light strip, and several small pores or setal bases. Six pairs of small to minute (length 10-12 μ) podosomal setae present lateral to dorsal plate; first pair anterior to dorsal plate; second pair at anterior end of peritremes; middle three pairs laterally between dorsal plate and peritremes; sixth pair just posterior to stigmata. Dorsal opisthosoma with four or five pairs of minute setae. Dorsal leg setae minute to large; most lateral and ventral leg setae small to medium sized, however, ventral setae of trochanters I-II, femora I-II, patella II, and one posteroventral seta of each tarsi I-II short, enlarged and peg-like.

MALE: Median length of idiosoma, 420 μ ; greatest width, 420 μ . Holoventral plate generally spade shaped (median length, 196 μ ; greatest width, 165 μ), covering almost entire venter between coxae I-III; five pairs of setae on holoventral plate slender, moderately long (length, 48-59 μ); first pair of sternal setae extend posteriorly beyond first pair of pores almost to level of second sternal setae. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair minute (length less than 13 μ); all others medium in length (21-37 μ); however, three pairs just behind first minute pair unusually expanded and enlarged. Dorsal plate oval (median length, 374 μ ; greatest width, 258 μ), with posterior end narrower; posterior quarter superficially divided from anterior portion by narrow transverse band of lightly sclerotized integument but joined by two median bridges. Six pairs of small (length 19-25 μ), robust podosomal setae present lateral to dorsal plate; first two pairs anterolateral to dorsal plate anterior to peritremes; middle three pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae medium sized, except smaller spinelike anterolateral seta of coxa III; posterolateral seta of coxa II not distinctly larger than other coxal setae. Ventral leg setae generally small to medium in length; however, most ventral setae of legs I-II considerably enlarged, spinelike, or peglike, and most ventral setae of legs III-IV slightly robust and spinelike. Antero- and posterolateral leg setae small to medium sized, some robust and spinelike. Dorsal leg setae either large or rather small; distal setae of trochanters II-IV, femora I-IV, patella I-IV, and proximal setae of tarsi III-IV large; large distal dorsal setae of legs III-IV distinctly serrated; all other dorsal leg setae smaller, with

proximal anterodorsal seta of femur II, and proximal posterodorsal seta of femur III and IV minute.

VENEZUELAN RECORDS (219 females, 152 males, 30 deutonymphs, and 42 protonymphs): of the 175 collections of *P. torrealbai*, 159 were from species of *Phyllostomus* (*P. hastatus*, 89; *P. discolor*, 64; and *P. elongatus*, 6). There were also 3 collections from *Artibeus jamaicensis* and one each from *Saccopteryx bilineata*, *Macrophyllum macrophyllum*, *Phylloderma stenops*, *Lep-tonycteris curasoae*, *Anoura caudifer*, *Carollia perspicillata*, *Ectophylla macconnelli*, *Artibeus cinereus*, *Artibeus fuliginosus*, *Desmodus rotundus*, and *Molossops planirostris*. Collections were made in the following states and territories: T. F. Amazonas (57), Zulia (28), Falcón (22), Monagas (19), Sucre (20), Carabobo (10), Trujillo (9), Apure (3), Miranda (2), Bolívar (2), Barinas (1), Guárico (1), and Lara (1). At least 1 collection was made during every month, but the majority of collections were made from March through July.

REMARKS: *P. torrealbai* and *P. paratorrealbai* n. sp. from a distinct subgroup of *Periglischrus* group I. These two species share the following characters which distinguish them from other species: at least two pairs of ventral setae posterior to the sternal plate of females grossly expanded basally, and certain ventral setae of legs I and II short and spinelike to peglike in both sexes. Females of *P. torrealbai* may be distinguished from those of *P. paratorrealbai* n. sp. in having five pairs of ventral body setae grossly enlarged, rather than only two pairs; by the form of the sternal plate; and by the posteroventral seta of femur IV and patella IV being inflated and bladlike rather than setaceous and recurved. The males of these two species show the large dorsal setae of tarsi III and IV coarsely barbed, as do the males of *P. acutisternus* and *P. paracutisternus*, but they differ in having certain ventral setae of legs I and II enlarged and fusiform, and the proximal anterodorsal seta of each femur I, patella I, tibia I, and patella IV smaller. The male of *P. torrealbai* may be distinguished from that of *P. paratorrealbai* n. sp. by having the several pairs of intercoxa IV setae enlarged basally, and the sternal setae longer (first pair extending well beyond level of first pair of pores).

P. torrealbai is recorded primarily from three species of *Phyllostomus*. Machado-Allison (1965a), who originally described this species, reported collections from *P. hastatus* and *P. discolor* in Venezuela; and Furman (1966), who

described this same species as *P. inflatseta*, recorded collections from *P. hastatus* in Panamá. As noted previously in this paper, and by Furman (1966), this species is frequently found in association with *P. acutisternus*.

Periglischus paratorrealbai n. sp.

Fig. 10, 42-49

DESCRIPTION

FEMALE: (Holotype) (Fig. 10, 42-43). *Venter*: Sternal plate broadly pear shaped; anterior end considerably narrower than posterior; three pairs of small, slender sternal setae set on lightly sclerotized margin; two pairs of circular pores set well in from lateral margins; metasternal setae small and more robust, posterolateral to third sternal setae. Genital plate elongate with posterior end more narrowly rounded than anterior end; genital setae short, robust, and spinelike. First pair of setae posterior to genital plate minute; next two pairs greatly inflated with abruptly acute tips; ventral opisthosoma with eight pairs of small to medium-sized setae plus one pair of medium-sized ad-

anal setae. Ventral opisthosoma with bilateral, curiously shaped sclerites or apodemes and poorly to well-sclerotized associated areas. *Dorsum*: Peritreme length and width normal for genus, lying over coxa II and III. Dorsal plate generally oval in shape with posterior end narrower; posterior quarter divided from anterior portion of plate by rather wide transverse band of lightly sclerotized integument but with two distinct bridges connecting two sections of plate; plate ornamented with narrow, median, distinct bridges connecting two sections of longitudinal, lightly sclerotized area, numerous subcircular darker areas of various sizes, and small pores or setal bases. Podosoma with six small to minute setae anterior and lateral to dorsal plate; first pair at anterior end of plate; second pair anterolaterally at end of peritremes; middle three pairs laterally between plate and peritremes; sixth pair adjacent to stigmata. Dorsal opisthosoma with about four pairs of minute setae. *Legs*: Coxa I with two small, slender setae, medioproximal and posterodistal in positions; coxa II with small anterolateral seta and

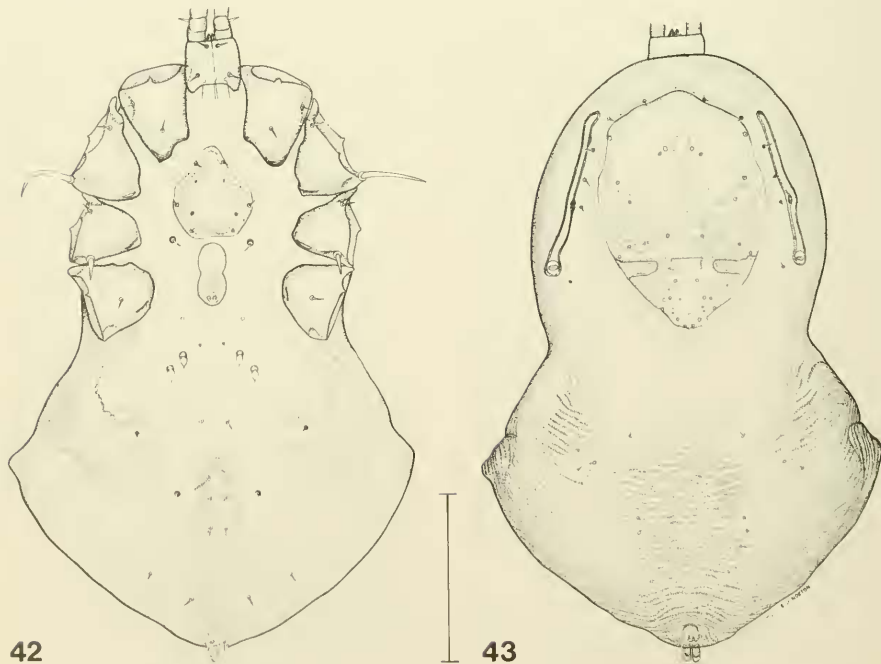


Fig. 42-43. *Periglischus paratorrealbai* n. sp., female. (42) venter; (43) dorsum, scale = 300 μ .

medium length, robust posterolateral seta; coxa IV with small to minute median seta. Anteroventral seta of trochanter I and femur I large, bluntly spinelike; some ventral leg setae short, robust and spinelike, others of moderate length and spinelike, and few small, setaceous. Some posterolateral setae of legs I-II, IV and anterolateral setae of legs III-IV rather long, usually recurved. Distal dorsal setae of trochanters II-IV, femora I-IV, patella I-IV, tibiae III-IV, and one to several proximal setae of tarsi I-IV rather long; proximal anterodorsal seta of each femur I-IV and posterodorsal seta of femur III minute; other dorsal leg setae small to medium sized. *Gnathosoma*: gnathosomal and median hypostomal setae small; lateral and distal hypostomal setae absent or inapparent. Most palpal setae small; mediadorsal seta of palpal femur and medioventral seta of tibia short, spinelike; two pairs of laterodistal setae of palpal tibia short, peglike. *Measurements*: Idiosoma length, 953 μ ; greatest width, 681 μ . Sternal plate length, 146 μ ; greatest width, 129 μ . Sternal setae length, 13-16 μ ; metasternal setae length, 16-18 μ ; genital setae length, 10-13 μ ; length first pair setae behind genital plate, 7 μ ; length two pairs inflated setae posterior to genital plate, 23-25 μ ; length posterior ventral opisthosomal setae, 9-21 μ . Peritreme length, 254 μ . Dorsal plate length, 379 μ ; greatest width, 281 μ .

Dorsal podosomal setae length, 6-18 μ ; dorsal opisthosomal setae length, 6-9 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 281 μ ; leg II, 294 μ ; leg III, 242 μ ; leg IV, 266 μ .

MALE: (Allotype) (Fig. 44-45), *Venter*: Holoventral plate broadly spade shaped; four pairs of sternal setae and genital setae on plate; all located marginally except third sternal setae which are medial and slightly anterior to fourth pair (metasternal); two pairs of circular pores on plate, first pair directly posterior to first sternal setae and second pair anterior to third pair of sternal setae. Interoxa IV area with seven pairs of usually slender setae, plus pair of subterminal adanal setae; first pair setae posterior to genital setae minute; others small to medium in length, and in horizontal rows of two, four, four, two. *Dorsum*: Peritreme width and length usual for genus; lying over coxae II and III. Dorsal plate oval, with posterior end narrower; posterior quarter divided from anterior section by narrow transverse band of lightly sclerotized integument but with two distinct connecting bridges medially; plate slightly ornamented with narrow, median, longitudinal, light area, variable size and shape darker areas, and small pores or setal bases. Six pairs of dorsal podosomal setae short, peglike to spinelike, located lateral to dorsal plate; first two pairs set against anterolateral margins of dorsal plate an-

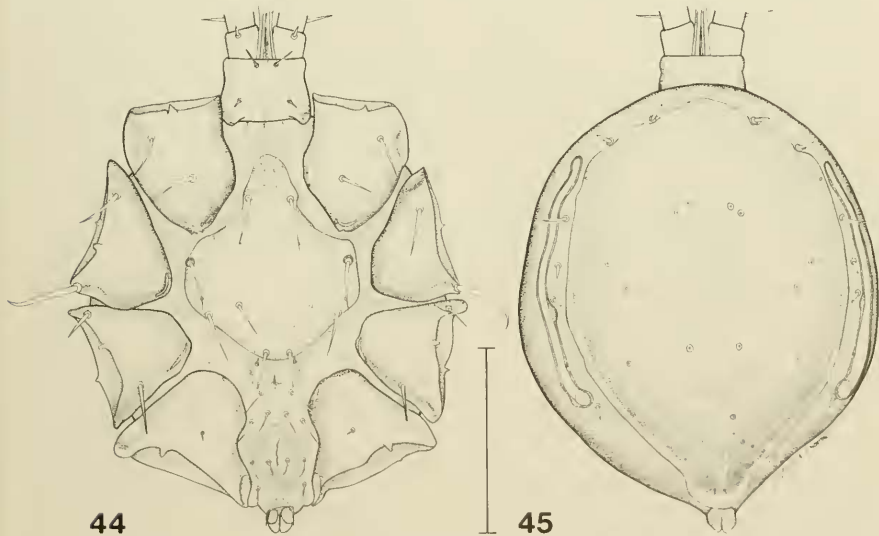


Fig. 44-45. *Periglischrus paratorrealbai* n. sp., male. (44) venter; (45) dorsum. scale = 200 μ .

terior to peritremes; middle three pairs located between dorsal plate and peritremes; sixth pair posterior to stigmata. *Legs*: Coxa I with two medium-sized setae, proximal and distal in position; coxa II with medium-sized anterolateral seta and large posterolateral seta; coxa III with small anterolateral seta and medium-sized posterolateral seta; coxa IV with minute medial seta. Anterior seta of femur I enlarged considerably peglike; some posterovenral setae of legs I-III, somewhat enlarged, spinelike or peglike; most other ventral leg setae small, setaceous. Most antero- and posterolateral setae of legs medium in length, somewhat enlarged and spine-like. Distal dorsal setae of trochanters III-IV and proximal dorsal setae of tarsi III-IV large, long, and serrated, especially those of legs III-IV; proximal anterodorsal seta of each femur I, femur II, patella II, femur III, and proximal posterovenral seta of femur III and IV minute; other dorsal leg setae small to medium in length. *Gnathosoma*: Gnathosomal and median hypostomal setae small to medium in length; lateral and distal hypostomal setae absent or inapparent. Ventral distal seta of palpal trochanter short, robust, and peglike; two pairs of laterodistal setae of palpal tibia enlarged and peglike; most other palpal setae small to medium sized. *Measurements*: Idiosoma length 411 μ ; greatest width, 351 μ . Holovenral plate length, 204 μ ; greatest width, 180 μ . Length of sternal and genital setae, 29-50 μ ; length of intercoxa IV area setae, 13-23 μ . Peritreme length, 242 μ . Dorsal plate length, 382 μ ; greatest width, 276 μ . Dorsal podosomal setae length, 13-23 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 393 μ ; leg II, 311 μ ; leg III, 302 μ ; leg IV, 346 μ .

FEMALE DEUTONYMPH: (Fig. 46-47). *Venter*: Sternal plate elongate oval, with both anterior and posterior ends narrowly rounded. 3 pairs of medium-sized sternal setae on lateral margins and 2 pairs of small circular pores set in from margins. Metasternal and genital setae medium sized, posterior to sternal plate. Interoxa IV area with 12 pairs of setae; 3 pairs medium sized, 3 pairs small, and 6 pairs minute; adanal setae small and subterminal. *Dorsum*: Peritreme length and width normal for genus, lying over coxae II and III. Dorsal plate oval, with posterior end narrower than anterior; posterior quarter superficially divided by narrow transverse band of lightly sclerotized integument, but with 2 medial connecting bridges. Six short, spinelike podosomal setae lateral to dorsal plate; first 2 pairs set close to anterolateral margins anterior to peritremes, middle 3 pairs located be-

tween dorsal plate and peritremes; sixth pair posterior to stigmata. *Legs*: Anterovenral setae of femur I, patella I, patella II, tibia II, and posterovenral setae of tarsus II short, enlarged, and peglike; most other ventral leg setae small to medium sized; some antero- and posterolateral setae of legs small to medium sized, some enlarged and spinelike, especially on leg IV. Distal dorsal setae of trochanters III-IV, femora I-IV, patella I-IV, and proximal dorsal setae of tarsi III-IV rather long and serrated, especially on leg IV; proximal anterodorsal seta of each femur I, femur II, femur III, and posterodorsal seta of femur III and femur IV minute; other dorsal setae small to medium in length. *Gnathosoma*: Gnathosomal and median hypostomal setae small yet prominent; lateral and distal hypostomal setae absent or inapparent. Distal ventral seta of palpal femur short, enlarged, and peglike; two pairs of laterodistal setae of palpal tibia not greatly enlarged but yet peglike; other palpal setae small, setaceous. *Measurements*: Idiosoma length, 553 μ ; greatest width, 391 μ . Sternal plate length, 183 μ ; greatest width, 134 μ . Sternal setae length, 30-41 μ ; genital setae length, 37-38 μ ; length of setae of intercoxa IV area, 5-29 μ . Peritreme length, 259 μ . Dorsal plate length, 307 μ ; greatest width, 292 μ . Podosomal setae length, 9-20 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 352 μ ; leg II, 306 μ ; leg III, 290 μ ; leg IV, 311 μ .

MALE DEUTONYMPH: UNKNOWN

PROTONYMPH: (Fig. 48-49). *Venter*: Sternal plate narrowly spade shaped; posterior end very narrowly rounded; anterior end rather broadly rounded; three pairs of sternal setae on lateral margins of plate and two pairs of small circular pores set in somewhat from margins. Interoxa IV area with four pairs of small, slender setae, plus pair of small adanal setae just anterior to terminal anal orifice. *Dorsum*: Peritreme of normal width, but short, lying over coxa III. Dorsal plate oval with posterior end narrower than anterior; posterior quarter appearing partially divided from anterior section by narrow transverse lightly sclerotized integument, with broad median bridge. Five pairs of small podosomal setae lateral to dorsal plate; first two pairs anterolateral in position at level of coxa I; middle two pairs lateral at level of coxa II; fifth pair posterior to stigmata. *Legs*: Coxa I with two medium-sized setae, proximal and distal in position; coxa II with medium-sized anterolateral seta and slightly larger posterolateral seta; coxa III with small, almost spinelike, anterolateral seta and medium-sized posterolateral seta; coxa IV with small to minute medioventral seta.

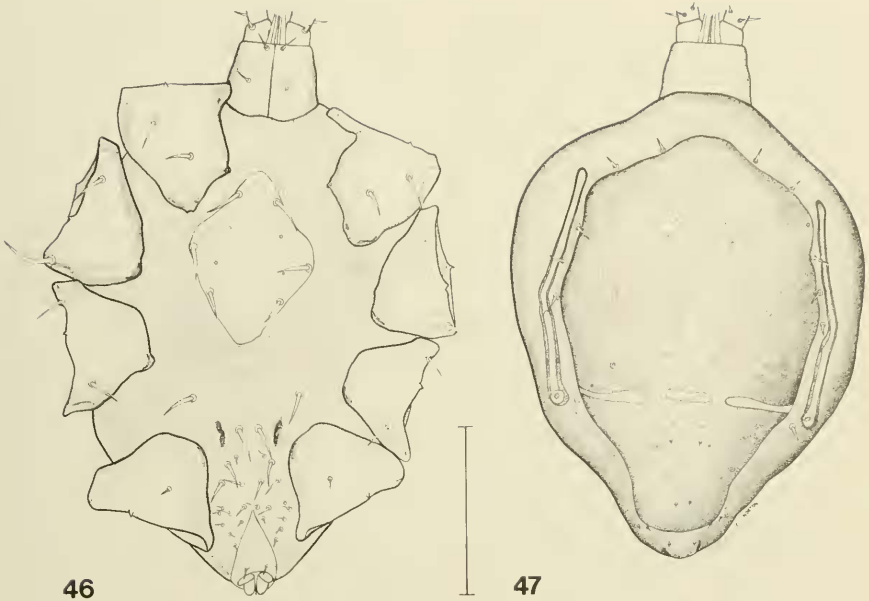


Fig. 46-47. *Periglischrus paratorrealbai* n. sp., female deutonymph. (46) venter; (47) dorsum, scale = 200 μ .

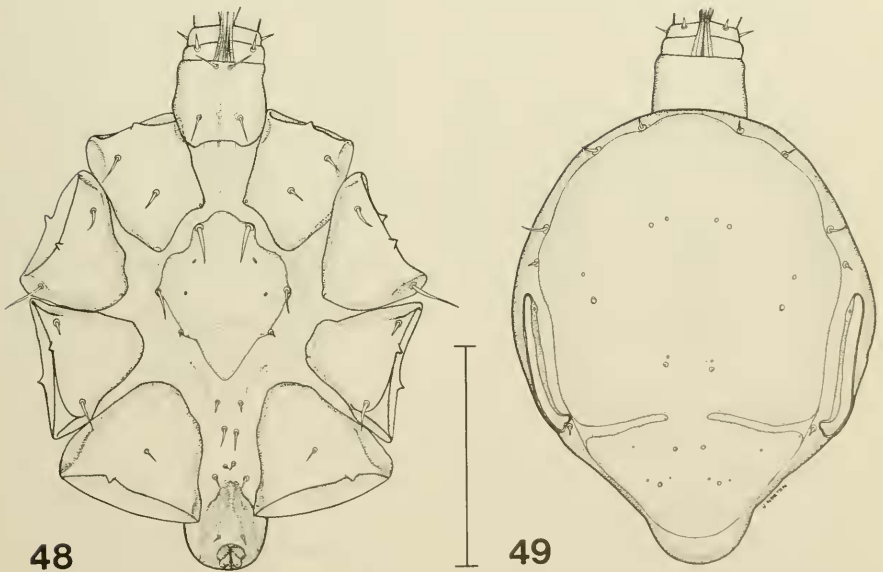


Fig. 48-49. *Periglischrus paratorrealbai* n. sp., protonymph. (48) venter; (49) dorsum, scale = 200 μ .

Most ventral setae of femora I-II, patella I-II, tibia I-II, and one seta on each tarsi I-II short, enlarged, and spinelike to peglike; other ventral leg setae small, setaceous. Antero- and posterolateral setae of legs small to medium sized and setaceous, except setae of leg IV enlarged and spinelike. Distal dorsal setae of trochanters III-IV, femora I-IV, patella I-IV, and two proximal dorsal setae of tarsi III-IV large and rather long, those of leg IV coarsely serrated; proximal anterodorsal seta of each femur I, III, and IV minute; other dorsal leg setae small to medium sized. *Gnathosoma*: Gnathosomal and median hypostomal setae small, slender; distal ventral seta of palpal trochanter short, robust, and spinelike; two laterodistal seta of palpal tibia of normal size but peglike; other palpal setae small, setaceous. *Measurements*: Idiosoma length, 368 μ ; greatest width, 304 μ . Sternal plate length, 166 μ ; greatest width, 124 μ . Sternal setae length, 8-34 μ ; intercoxa IV setae length, 7-22 μ . Peritreme length, 235 μ . Dorsal plate length, 360 μ ; greatest width, 263 μ . Podosomal setae length, 8-24 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 261 μ ; leg II, 256 μ ; leg III, 249 μ ; leg IV, 271 μ .

TYPE MATERIAL: holotype female, allotype male, 3 paratype females, 10 paratype males, 3 paratype deutonymphs, and 6 paratype protonymphs (SVP-17345) from *Phylloderma stenops*, Boca Mavaca, 84 km SSE Esmeralda (138 m), T. F. Amazonas, Venezuela, 23 March 1967.

VENEZUELAN RECORDS (16 females, 15 males, 3 deutonymphs, and 6 protonymphs): 4 collections from *Phylloderma stenops* in T. F. Amazonas during the months of January, March, April, and July. One collection of 6 females was from *Tonatia bidens* in Zulia during February.

REMARKS: The differentiating characters as well as the differences and similarities between *P. paratorrealbai* and *P. torrealbai* have already been discussed in the Remarks section of *P. torrealbai*. It is sufficient here to note that this species is easily distinguished by the two pairs of grossly enlarged ventral body setae of females, the shape of the sternal plate, and the slender distinctive arrangement of the intercoxa IV setae of the males.

P. paratorrealbai is found primarily on *Phylloderma stenops* and in association with *P. grandisoma*. In all four collections of this species, *P. grandisoma* was found also.

Group II

This major group of *Periglischrus* is composed of six species assigned to two subgroups.

The main distinguishing characteristic of this group is the possession of six large, long, robust, dorsal podosomal setae. In addition to phenetic similarities, five of the six species of the group parasitize bats of the subfamily *Glossophaginae* (family *Phyllostomidae*); *P. hopkinsi* is parasitic primarily on *Desmodus rotundus* (subfamily *Desmodontinae*).

Subgroup A

The four species of this subgroup (*P. caligus*, *P. paracaligus* n. sp., *P. paravargasi* n. sp., and *P. vargasi*) are rather closely related phenetically as well as in host-parasite associations. There is something of a phenetic similarity gradient from *P. caligus* to *P. vargasi*, in the order listed above. The species of this subgroup may be distinguished by the large, long, dorsal podosomal setae, with the distance between the first and second pairs distinctly greater than the distance between the second and third pairs, and by the small to minute proximal anterodorsal seta of each femur I, patella I, tibia I, and tibia II. The species of this subgroup parasitize bats of the closely related genera *Glossophaga*, *Anoura*, and *Leptonycteris*.

Periglischrus caligus Kolenati, 1857

Fig. 11

Periglischrus caligus Kolenati, 1857: 60

Periglischrus setosus Machado-Allison 1964: 199-200

DESCRIPTION

FEMALE: Idiosoma length, 952 μ ; greatest width, 782 μ . All ventral setae small to minute (length less than 10-15 μ). Sternal plate angularly jug shaped (median length, 115 μ ; greatest width, 91 μ); five sides (margins) of plate almost straight with anterior projection narrowly rounded (Fig. 11). Dorsal plate oblong-oval (median length, 355 μ ; greatest width, 255 μ); posterior quarter divided from anterior portion only by faint superficial suture; plate ornamented with irregularly round, medium to large, darker areas and small pores or setal bases. Six pairs of large (length 62-76 μ) setae present lateral to dorsal plate; first five pairs mostly equidistant from each other; sixth pair located posterior to stigmata. Dorsal opisthosoma with four pairs of minute setae. Dorsal leg setae mostly large to medium sized, except proximal anterodorsal seta of each femur I-II, patella II, tibia II, and proximal posterodorsal seta of each femur II-IV, patella I and tibia II small to minute; posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV rather

large, recurved; posterolateral setae of femur, patella, and tibia of legs IV greatly inflated, recurved. Most ventral leg setae small; however, some anteroventral setae of legs I-IV and posteroventral setae of legs II somewhat enlarged and serrate.

MALE: Median length of idiosoma, 366 μ ; greatest width, 284 μ . Holoventral plate somewhat pear-shaped (median length, 182 μ ; greatest width, 155 μ), covering almost entire venter between coxae; five pairs of seta on holoventral plate small (length 15-27 μ); first sternal setae extend posteriorly about two-thirds distance to first pair of pores. Intercoxa IV area bears seven pairs of setae plus pair of subterminal adanal setae; first pair very minute; other setae small (length 14-19 μ). Dorsal plate oblong-oval (median length, 342 μ ; greatest width, 223 μ); posterior end narrower; posterior quarter superficially divided from anterior portion by narrow transverse band of lightly sclerotized integument. Six pairs of medium-sized (length 24-45 μ) podosomal setae present lateral to dorsal plate; first two pairs located anterolateral to dorsal plate and anterior to peritremes; middle three pairs laterally between dorsal plate and peritremes; sixth pair located posterior to stigmata. Coxal setae small to medium in length; proximal seta of coxa I distinctly smaller than distal seta; anterolateral seta of coxa III and seta of coxa IV small; two setae of coxae II and posterolateral seta of coxa III considerably longer. Ventral leg setae small, some slightly robust. Antero- and posterolateral setae of legs small to medium sized, some slightly recurved. Dorsal leg setae range in size from minute to large, robust; distal dorsal setae of trochanters II-IV, femora I-IV, patella I-IV, tibia III-IV, and basal dorsal setae of tarsi III-IV decidedly larger than all others; proximal anterodorsal seta of each femur I, femur II, femur III, and posterodorsal seta of femur III and femur IV minute.

VENEZUELAN RECORDS (448 females, 91 males, 24 deutonymphs, 25 protonymphs, and 3 specimens in alcohol): Of the 225 collections, 129 were from *Glossophaga longirostris*, 87 from *G. soricina*, 4 from *Desmodus rotundus*, 2 from *Artibeus jamaicensis*, and 1 each from *Pteronotus parnellii*, *Phyllostomus hastatus*, and *Sturmia lilium*. Collections were made in the following states and territories: Apure (51), Falcón (43), T. F. Amazonas (38), Nueva Esparta (17), Barinas (17), Bolívar (14), Guajira (10), Sucre (9), Zulia (9), Miranda (8), Yaracuy (2), Guárico (2), Trujillo (1), Monagas (1), and Carabobo (1). They varied in elevation from

sea level to 851 m, with a majority (92) from elevations below 100 m. Collections were made in all months of the year as follows: January (20), February (9), March (3), April (11), May (4), June (47), July (34), August (4), September (5), October (11), November (10), and December (65).

REMARKS: *P. caligus* is easily distinguished from *P. vargasi* in the female by the broadly inflated posterolateral seta of each femur IV, patella IV, and tibia IV; the distinctive ornamentation of the dorsal plate; and the sclerotization and apparent form of the sternal plates (Fig. 11, 14). The other two species of the subgroup (*P. paracaligus* n. sp. and *P. paravargasi* n. sp.) are intermediate in phenetic characters between *P. caligus* and *P. vargasi*. The *P. caligus* female may be distinguished from females of these two closely related species by the presence of five pairs of small to minute dorsal opisthosomal setae, rather than six pairs (the anteriormost three to four pairs of which are long to medium in length), and by the form of the anterior projection of the sternal plates. In the male of *P. caligus*, the posterolateral seta of coxa II is much shorter than the width of coxa II, and the intercoxa IV area bears eight pairs of setae.

P. caligus is found primarily on species of the genus *Glossophaga*. This species was originally described from *G. soricina* in Brazil and Surinam (Kolenati, 1857). Machado-Allison (1964, 1965a) erroneously described specimens of this species from *G. longirostris* and *G. soricina* in Venezuela as *Periglischnus setosus*. In his addendum, Furman (1966) considered *P. setosus* to be a synonym of *P. caligus*, an opinion which was subsequently considered valid by Machado-Allison and Antequera (1971). Furman (1966) recorded *P. caligus* from *G. soricina* in Panamá. In the present study, 216 of the 225 collections were from *G. longirostris* (129) and *G. soricina* (87).

Periglischnus paracaligus n. sp.

Fig. 12, 50-58

DESCRIPTION

FEMALE (Holotype): (Fig. 12, 50-52). Venter: Sternal plate broadly jug shaped; greatest width anterior to second sternal setae; posterior margin almost straight, anterior end narrowing abruptly to form narrow, blunt anterior projection. Three pairs of small sternal setae located on lateral margins of plate, two pairs of circular pores on plate; metasternal setae minute, located posterior to sternal plate. Genital plate

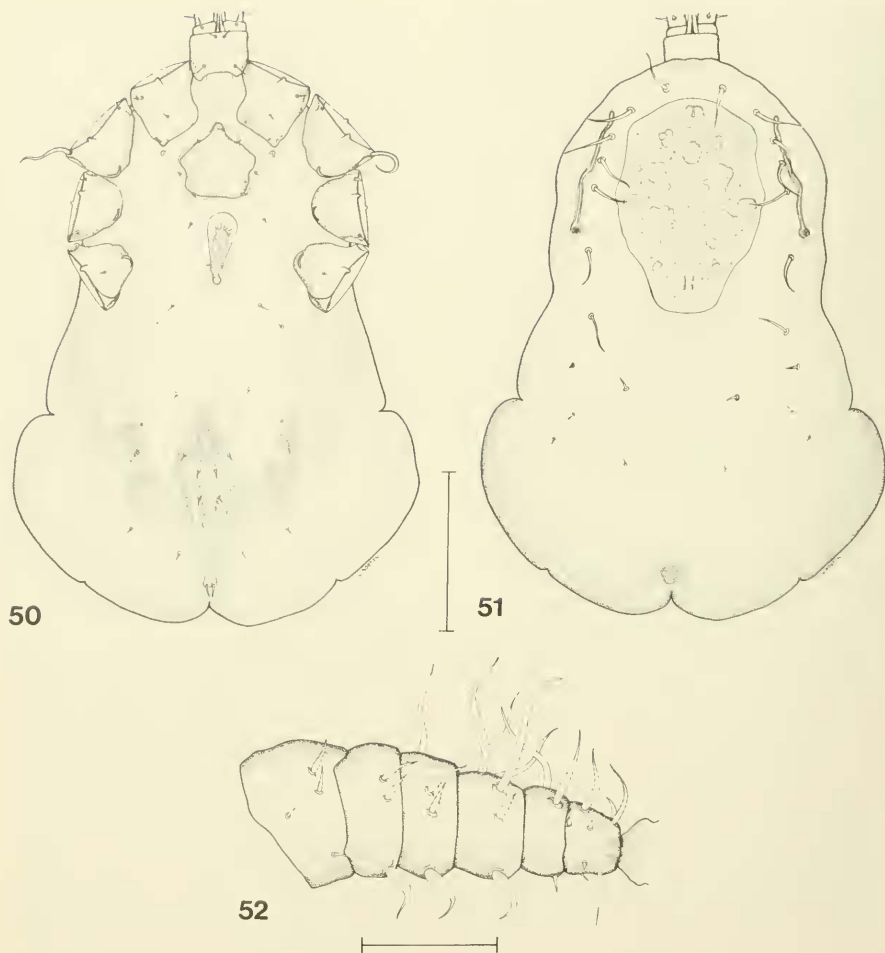


Fig. 50-52. *Periglischrus paracaligus* n. sp., female. (50) venter; (51) dorsum, scale = 300 μ ; (52) ventral view of leg IV, scale = 100 μ .

elongate; anterior end rather broadly rounded; posterior end narrowly rounded; genital setae minute, set on lateral margins of plate. First two pairs of setae posterior to genital plate vestigial, represented only by setal bases; ventral opisthosoma with eight pairs of minute to small setae, plus one pair of small adanal setae. Ventral opisthosoma with curiously shaped, heavily sclerotized bilateral areas. *Dorsum*: Peritreme dorsal; lying over coxae II and III;

of normal length and width for genus. Dorsal plate oblong-oval; posterior end narrower and broadly rounded; posterior quarter not divided, with only faint indication of suture line medially; plate distinctly ornamented with numerous small, subcircular darker areas and several larger irregular-shaped lighter areas, plus small circular pores or setal bases. Dorsal podosoma with six pairs of large setae lateral to dorsal plate; first pair located at anterior end of plate;

middle four pairs equidistant from each other laterally between dorsal plate and peritremes; sixth pair located posterior to stigmata. Dorsal opisthosoma with six pairs of setae; first pair just posterior to level of coxa IV and dorsal plate slender, rather long; next three pairs small to medium sized; posterior two pairs small to minute. *Legs*: Coxa I with two small setae, proximal and distal in position; coxa II with small anterolateral seta and large, long posterolateral seta; both antero- and posterolateral setae of coxa III small; median seta of coxa IV minute. Posteroventral setae of most segments of legs I-III and anteroventral setae of legs III-IV of medium length, robust and spinelike, some serrated; other ventral leg setae rather small, setaceous. Most antero- and posterolateral setae of legs small to medium sized, except posterolateral seta of each femur IV, patella IV, and tibia IV greatly inflated basally with more slender recurved end. Distal dorsal setae of trochanters II-IV, femora I-IV, patella I-IV, and tibia I-IV rather large, long; other dorsal leg setae small to medium in length. *Gnathosoma*: Gnathosomal setae minute, median hypostomal setae of medium length. Palpal setae small to minute; dorsal seta of palpal femur spinelike; two pairs of laterodistal setae of palpal tibia small, peglike. Mediodistal lobe of palpal tibia small to inapparent. *Measurements*: Idiosoma length, 1004 μ ; greatest width, 727 μ . Sternal plate length, 135 μ ; greatest width, 136 μ . Sternal setae length, 12-16 μ ; genital setae length, 6-8 μ ; ventral opisthosomal setae length, 8-19 μ . Peritreme length, 177 μ . Dorsal plate length, 355 μ ; greatest width, 270 μ . Podosomal setae length, 68-98 μ ; first dorsal opisthosomal setae length, 56 μ ; second three pairs of dorsal opisthosomal setae length, 12-30 μ ; last two pairs of dorsal opisthosomal setae length, less than 12 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 311 μ ; leg II, 241 μ ; leg III, 253 μ ; leg IV, 276 μ .

MALE: (Allotype): (Fig. 53-54). *Venter*: Holoventral plate covers most of venter between coxae I-III; anterior end narrows moderately between coxae I; point of greatest width just posterior to second sternal setae; lightly sclerotized border present posterior to first sternal setae. Sternal setae 1 and 2, metasternal setae and genital setae on or very near margins of plate, whereas third sternal setae set in slightly anterior and mediad to metasternal setae; genital setae close together on posterior margin; setae of holoventral plate small to medium sized; first sternal setae do not extend posteriorly to level of first pair of pores. Intercoxa IV

area with six pairs of setae, plus one pair of subterminal adanal setae; first pair posterior to holoventral plate minute; all others small to medium sized. *Dorsum*: Peritreme dorsal; lying over coxae II and III, of normal length and width for genus. Dorsal plate oblong-oval, but narrower posteriorly; posterior quarter superficially divided from anterior portion by faint suture line laterally and medially; plate ornamented by lighter and darker areas of variable shape and size, with small pores or setal bases. Dorsal podosoma with six pairs of medium length, robust, almost spinelike setae lateral to dorsal plate; first two pairs anterolateral to dorsal plate and anterior to peritremes; middle three pairs located between dorsal plate and peritremes; sixth pair posterior to stigmata. *Legs*: Coxa I with two slender, small to medium-sized setae, proximal and distal in position; coxa II with medium-sized anterolateral seta and somewhat larger posterolateral seta; anterolateral seta of coxa III small and enlarged somewhat basally, posterolateral seta medium sized; medial seta of coxa IV small. Most ventral leg setae small, some antero- and posteroventral setae spinelike. Most antero- and posterolateral setae of legs smaller, some robust. One or both distal dorsal setae of trochanter II-IV, femur I-IV, and patella I-IV rather large, long; other dorsal leg setae small to medium in length. *Gnathosoma*: Gnathosomal and median hypostomal setae medium in length; lateral and distal hypostomal setae absent or inapparent. Distal ventral setae of palpal trochanter, distal dorsal seta of palpal femur, and lateral seta of palpal femur short, robust, and spinelike; most other palpal setae small, some spinelike; two pairs of laterodistal setae of palpal tibia small, peglike. No mediodistal lobe present on palpal tibia. Spermatophore process of moderate length and recurved. *Measurements*: Idiosoma length, 409 μ ; greatest width, 331 μ . Holoventral plate length, 203 μ ; greatest width 174 μ . Sternal and genital setae length, 24-33 μ ; intercoxa IV setae length (excluding first pair of minute setae), 14-22 μ . Peritreme length, 239 μ . Dorsal plate length, 319 μ ; greatest width, 262 μ . Podosomal setae length, 30-54 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 334 μ ; leg II, 266 μ ; leg III, 290 μ ; leg IV, 358 μ .

FEMALE DEUTONYMPI: (Fig. 55-56). *Venter*: Sternal plate oval; anterior and posterior ends broadly rounded; 3 pairs of small sternal setae on lateral margins of plate; 2 pairs of pores set in somewhat from margins of plate; metasternal setae small, posterolateral to third

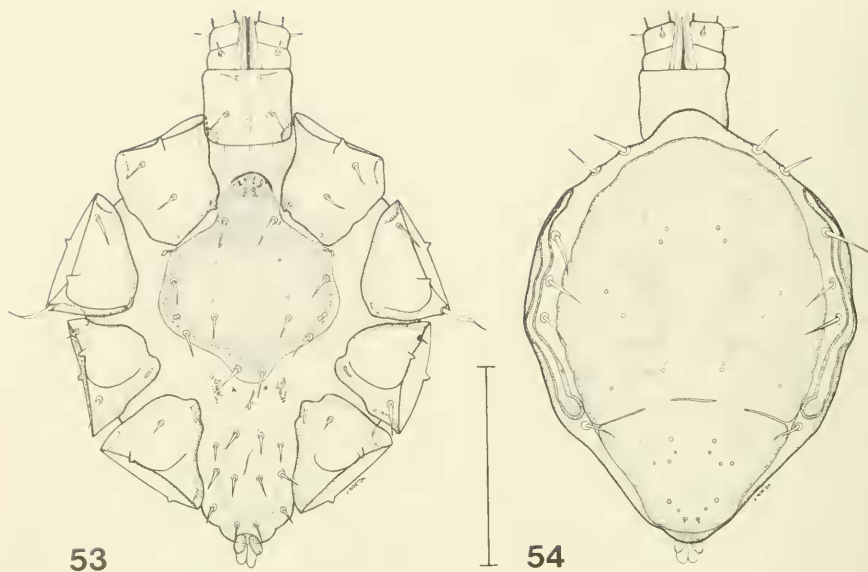


Fig. 53-54. *Periglischrus paracaligus* n. sp., male. (53) venter; (54) dorsum, scale = 200 μ .

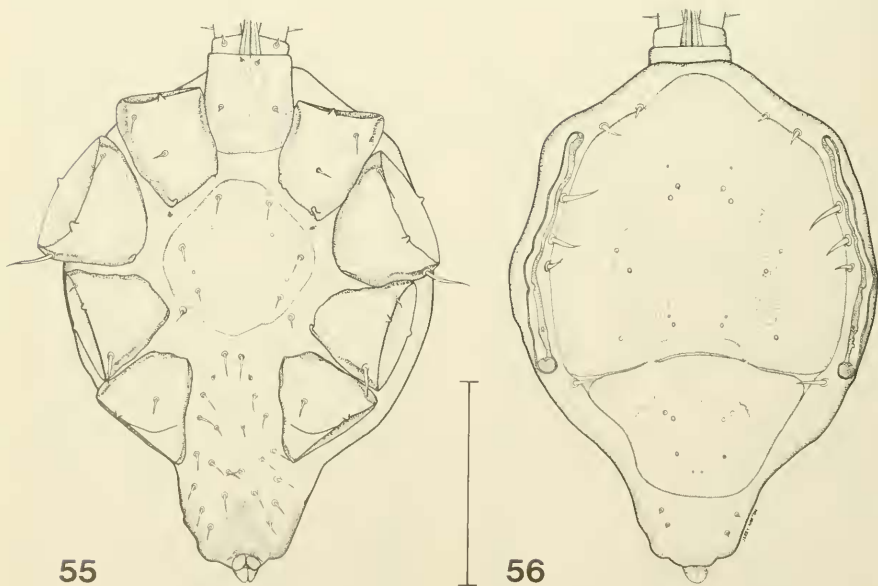


Fig. 55-56. *Periglischrus paracaligus* n. sp., female deutonymph. (55) venter; (56) dorsum, scale = 200 μ .

sternal setae. Genital setae of medium length; close together, posterior to sternal plate. First pair of setae posterior to genital setae very minute; intercoxa IV area with 10 pairs of small setae in addition to first minute pair, plus 1 pair of small, subterminal, adanal setae. *Dorsum*: Peritreme dorsal, lying over coxae II and III; length and width normal for genus. Dorsal plate generally oval; posterior quarter superficially divided from anterior portion by only narrow suture line; plate ornamented with lighter and darker areas of irregular size and shape and small pores or setal bases. Dorsal podosoma with six pairs of medium-sized, robust, spinelike setae; first 2 pairs anterolateral to dorsal plate and anterior to peritremes; middle 2 pairs located between dorsal plate and peritremes; sixth pair located posterior to stigmata. Dorsal opisthosoma posterior to dorsal plate with 3 to 4 pairs of small setae. *Legs*: Coxa I with 2 slender, small to medium-length setae, proximal and distal in position; coxa II with anterolateral setae slender, of medium length, and posterolateral seta of medium length but quite robust; anterolateral seta of coxa III small, posterolateral seta medium sized; single median seta of coxa IV small. Most ventral leg

setae small, some rather robust, spinelike. Antero- and posterolateral setae small, some especially on leg IV, more robust, spinelike. One or both distal dorsal setae of trochanters II-IV, femora I-IV, and patella I-IV rather large, long; most other leg setae small. *Gnathosoma*: Gnathosomal and 1 pair of hypostomal setae small; other hypostomal setae absent or inapparent. Palpal setae small, some short, robust, spinelike; 2 pairs of laterodistal setae of palpal tibia small, peglike. *Measurements*: Idiosoma length, 483 μ ; greatest width, 363 μ ; sternal plate length, 151 μ ; greatest width 149. Sternal setae length, 12-33 μ ; genital setae length, 24-26 μ ; intercoxa IV setae length, 15-22 μ . Peritreme length, 233 μ . Dorsal plate length, 349 μ ; greatest width, 311 μ . Dorsal podosomal setae length, 17-44 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 268 μ ; leg II, 261 μ ; leg III, 245 μ ; leg IV, 266 μ .

MALE DEUTONYMPH: UNKNOWN

PROTONYMPH: (Fig. 57-58). *Venter*: Sternal plate oval; broadly rounded anterior and posterior ends; three pairs of small setae on lateral margins. Metasternal and genital setae absent; intercoxa IV area with four pairs of setae plus one pair of adanal setae; first pair posterior to

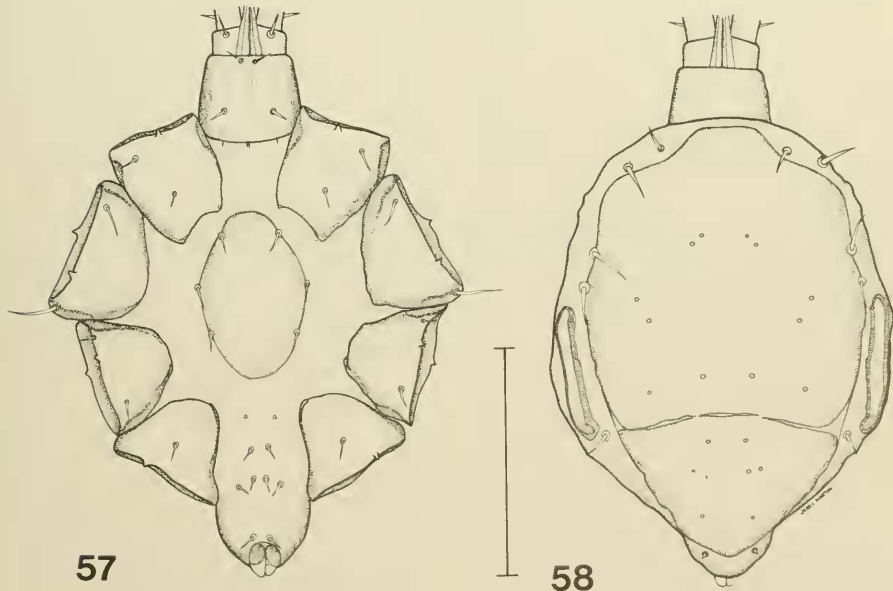


Fig. 57-58. *Periglischrus paracaligus* n. sp., protonymph. (57) venter; (58) dorsum, scale = 200 μ .

sternal plate minute, all others small. *Dorsum*: Peritreme dorsal, short, lying over coxa III. Dorsal plate oval with posterior end narrower; posterior quarter superficially divided from anterior portion by narrow transverse suture. Dorsal podosoma with five pairs of medium length, robust, somewhat spinelike setae; first two pairs anterolateral to dorsal plate at level over coxa I; middle two pairs anterior to peritremes and lateral to dorsal plate at level over coxa II; fifth pair posterior to stigmata. *Legs*: coxa I with two small setae, proximal and distal in position; coxa II with medium-length, slender, anterolateral seta and moderately large posterolateral seta; coxa III with small anterolateral seta and medium-sized posterolateral seta; coxa IV with one small median seta. Ventral leg setae small, some spinelike. Antero- and posterolateral setae small to medium sized, some recurved slightly or nearly spinelike. One or two distal dorsal setae of trochanters II-IV, femora I-IV, and patella I-IV relatively large; most other dorsal leg setae minute to small in size. *Gnathosoma*: Gnathosomal and one hypostomal setae small, slender; other hypostomal setae absent or inapparent. Palpal setae small, some short, spinelike; two pairs of laterodistal setae of palpal tibia short, peglike. *Measurements*: Idiosoma length, 405 μ ; greatest width, 300 μ . Sternal plate length, 135 μ ; greatest width, 129 μ . Sternal setae length, 17-22 μ ; intercoxa IV seta (excluding first minute pair) length, 11-20 μ . Peritreme length, 116 μ . Dorsal plate length, 369 μ ; greatest width 242 μ . Dorsal podosomal setae length, 78-137 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 263 μ ; leg II, 250 μ ; leg III, 205 μ ; leg IV, 227 μ .

TYPE MATERIAL: holotype female, allotype male, 3 paratype females and 1 paratype male (SVP-23598) from *Leptonyciteris curasoa*, nr. Cojoro, 36 km NNE Paragaitaipoa (15 m), Zulia, Venezuela, 30 June 1968; 3 paratype females and 1 paratype deutonymph (SVP-44553) from *Leptonyciteris curasoa*, Caserio Boro (528 m), 10 km N El Tocuyo, Lara, Venezuela, 14 July; and 1 paratype deutonymph (SVP-44553) from *Leptonyciteris curasoa*, same locality as SVP-44428, 16 July 1968; 39 additional collections (131 females, 8 males, and 1 deutonymph) were made from the same host species and locality as SVP-44428 and SVP-44553, 14-16 July 1968.

VENEZUELAN RECORDS (169 females, 16 males, 3 deutonymphs, and 2 protonymphs): all 55 collections of *P. paracaligus* were from *Leptonyciteris curasoa*. Collections were made in the following states: Lara (41), Falcón (9), Nueva

Esparta (4), and Zulia (1). Of the 55 specimens of *Leptonyciteris curasoa* from which *P. paracaligus* were recovered, 41 were from the same location in Lara, on 14 and 16 July 1967. Other collections were made in January, February, and June.

REMARKS: *P. paracaligus* is most closely related phenetically to *P. paravargasi* n. sp., differing primarily in the form of the female sternal plate (Fig. 12-13). Both resemble *P. caligus* in the broadly inflated posteroventral seta of each femur, patella, and tibia IV, and in the ornamentation of the dorsal plate. However, in the female they differ from *P. caligus* in the form of the sternal plate and in the size of the anteriormost dorsal opisthosomal setae (long to medium in length). In the male, the sternal plate is small and the first pair of sternal seta does not extend posteriorly to the level of the first pair of pores. *P. paracaligus* is known only from *Leptonyciteris curasoa* collected in Venezuela.

Periglischrus paravargasi n. sp.

Fig. 13, 59-69

DESCRIPTION

FEMALE (Holotype): (Fig. 13, 59-61). *Venter*: Sternal plate irregularly jug shaped, greatest width anterior to second sternal setae; posterior margin broadly rounded; anterior end narrowing abruptly in front of first sternal setae forming narrow, blunt, anterior projection. Three pairs of small to minute sternal setae set on lightly sclerotized lateral margins of plate; two pairs of small circular pores set in somewhat from margins of plate; metasternal setae minute, located posterior to sternal plate. Genital plate elongate; anterior end rather broadly rounded; posterior end rather narrow; genital setae minute, set on lateral margins of plate. First two pairs of setae posterior to genital plate vestigial, represented only by setal bases; ventral opisthosoma with eight pairs of minute to small setae, plus one pair of small adanal setae. Ventral opisthosoma with curiously shaped, heavily sclerotized, bilateral areas. *Dorsum*: Peritreme dorsal, lying over coxae II and III; of normal length and width for genus. Dorsal plate oblong-oval, posterior end narrower and broadly rounded with slight indication of division of posterior quarter; plate distinctly ornamented with numerous small darker circular areas and some larger irregularly shaped lighter areas, plus very small circular pores or setal bases. Dorsal podosoma with six pairs of large setae lateral to dorsal plate, first two pairs anterolateral to plate and anterior to peritremes;

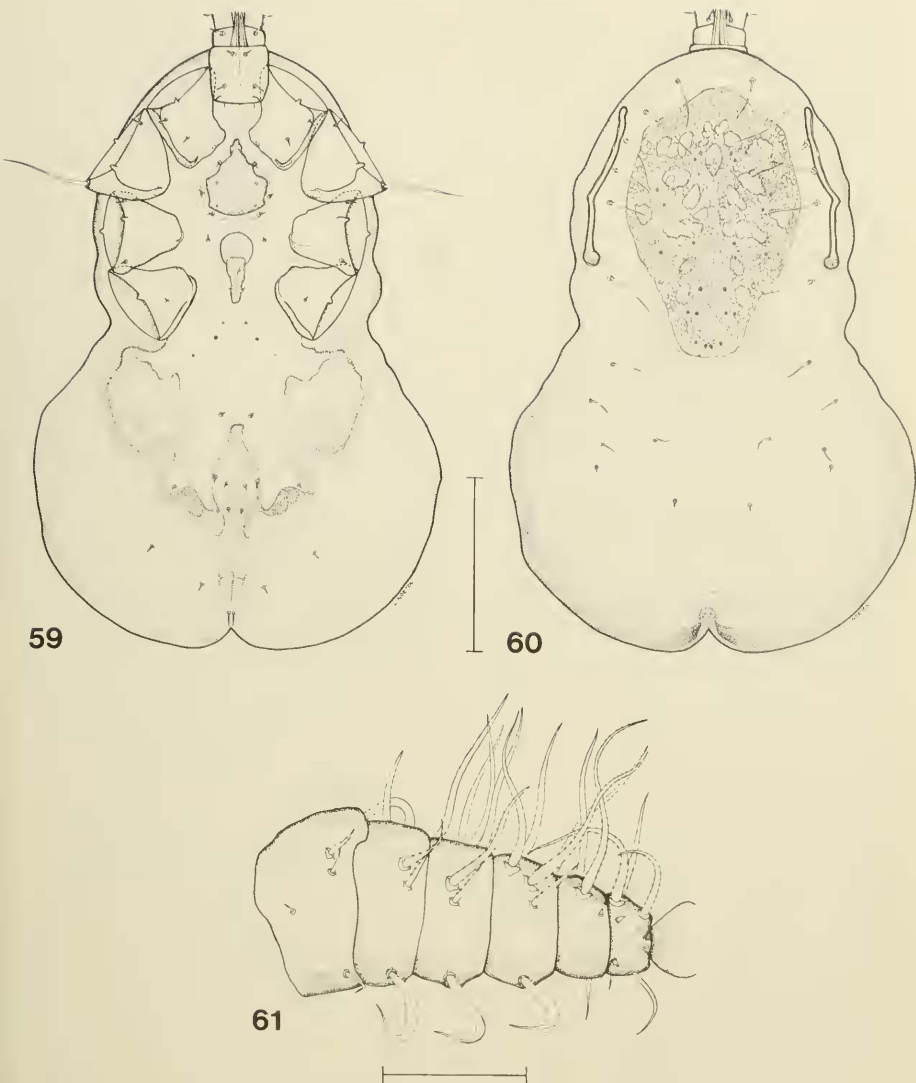


Fig. 59-61. *Periglischrus paravargasi* n. sp., female. (59) venter; (60) dorsum, scale = 300 μ ; (61) ventral view of leg IV, scale = 100 μ .

middle three pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Dorsal opisthosoma with six pairs of setae; first pair behind level of coxa IV rather large; next three pairs medium sized; last two

pairs (posteriormost) small to minute. *Legs*: Coxa I with two small setae, proximal and distal in position; coxa II with small, inapparent anterolateral seta and large, long posterolateral seta; both antero- and posterolateral setae of

coxa III small and inapparent; coxa IV with minute median seta. Posteroventral setae of most segments of legs I-III and anteroventral setae of legs III-IV medium sized, robust, and spinelike, some serrated; other ventral leg setae small, setaceous. Posterolateral setae of legs I-II and anterolateral setae of legs III-IV medium to large, some recurved; posterolateral seta of each femur, patella, and tibia of leg IV greatly inflated basally with more slender recurved end. Distal dorsal setae of trochanters II-IV, femora, I-IV, patella I-IV, and tibiae I-IV rather large, long; proximal dorsal setae of femora II-III and patella II minute; other dorsal leg setae small to medium sized. *Gnathosoma*: Gnathosomal setae and one pair of hypostomal setae small; other hypostomal setae absent or inapparent. Palpal setae small to medium sized, with some more robust and spinelike; two pairs of laterodistal setae of palpal tibia small, peglike. Mediodistal lobe of palpal tibia small. *Measurements*: Idiosoma length, 1016 μ ; greatest width, 564 μ . Sternal plate length, 135 μ ; greatest width, 122 μ . Sternal and genital setae length, 9-15 μ ; ventral opisthosomal setae length, 6-24 μ . Peritreme length, 275 μ . Dorsal plate length, 456 μ ; greatest width, 302 μ . Podosomal setae length, 75-116 μ ; first dorsal opisthosomal setae length, 51 μ ; second three pairs of dorsal opisthosomal setae length, 27-37 μ ; last two pairs of dorsal opisthosomal setae length too minute to accurately measure. Length of legs (base of

trochanter to end of tarsus): Leg I, 336 μ ; leg II, 243 μ ; leg III, 248 μ ; leg IV, 278 μ .

MALE (Allotype): (Fig. 62-63). *Venter*: Holoventral plate covers large part of venter between coxae I-III; anterior end narrows between coxae I; point of greatest width at or just anterior to second pair of setae. Sternal setae 1 and 2, metasternal setae and genital setae on margins of plate; third pair of sternal setae set in from margins anterior and medial to metasternal setae; genital setae close together on posterior margin; setae of holoventral plate medium sized, first sternal setae extend posteriorly to level of first pair of pores. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair posterior to holoventral plate minute; all others small to medium sized. *Dorsum*: Peritreme dorsal; lying over coxae II and III; of normal length and width, except undulating laterally around and between middle four pairs of podosomal setae. Soft integument of dorsum surrounding dorsal plate with undulating striations, particularly anterolaterally. Dorsal plate oblong-oval; narrower posteriorly than anteriorly; posterior quarter superficially divided from anterior portion by faint, incomplete suture line laterally and medially; plate faintly ornamented with lighter and darker areas of variable size and shape, small circular pores or setal bases, and very minute light punctae. Dorsal podosoma with six pairs of large setae lateral to dorsal

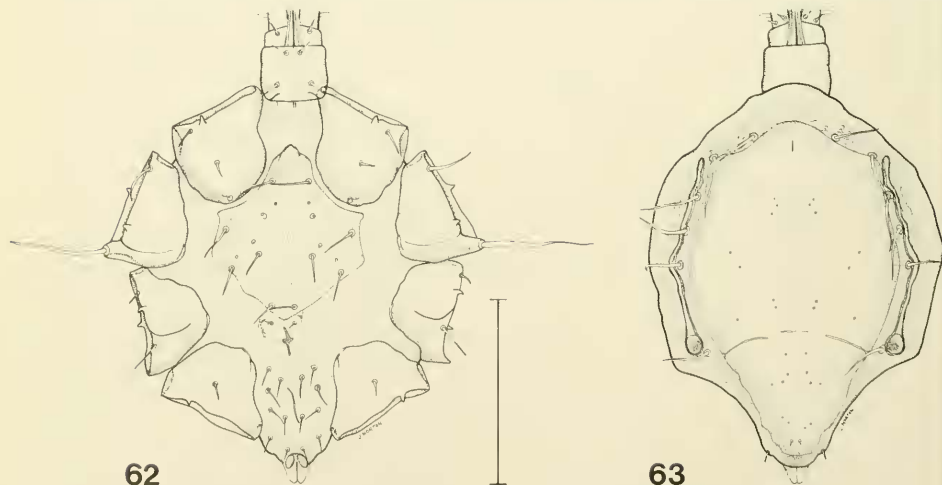


Fig. 62-63. *Periglischrus paravargasi* n. sp., male. (62) venter; (63) dorsum, scale = 300 μ .

plate; first two pairs anterolateral to dorsal plate anterior to peritremes; middle three pairs between dorsal plate and peritremes; sixth pair posterior to stigmata. *Legs*: Coxa I with small proximal seta and medium-sized distal seta; coxa II with medium-sized anterolateral seta and rather large, long posterolateral seta; coxa III with small, somewhat spinelike anterolateral seta and medium-sized posterolateral seta; median seta of coxa IV small. Most ventral leg setae small to medium sized, some antero- and posteroventral setae enlarged, spinelike; most antero- and posterolateral setae small to medium sized, some, especially on legs IV, rather long, robust. One or both distal setae of trochanters II-IV, femora I-IV, patella I-IV, and tibiae I-IV rather large, long; proximal posterodorsal seta of each femur II and III minute; other dorsal leg setae small to medium sized. *Gnathosoma*: Gnathosomal and one pair of hypostomal setae medium sized, other two pairs of hypostomal setae absent or inapparent. Palpal setae mostly small, some robust and spinelike or peglike, especially anterolateral seta of palpal femur and two pairs of laterodistal setae of palpal tibia. No mediolateral lobe present on palpal tibia. Spermatophore process of moderate length and recurved. *Measurements*: Idiosoma length, 603 μ ; greatest width, 477 μ . Holventral plate length, 281 μ ;

greatest width, 252 μ . Sternal and genital setae length, 46-71 μ ; intercoxa IV setae length (excluding first pair of minute setae), 20-35 μ . Peritreme length, 315 μ . Dorsal plate length, 515 μ ; greatest width, 355 μ . Podosomal setae length, 74-106 μ . Length of legs (base of trochanter to end of tarsus): Could not be measured because legs were curled up too much.

FEMALE DEUTONYMPH: (Fig. 64-65). *Venter*: Sternal plate oval; anterior end more broadly rounded than posterior; 3 pairs of small to medium-sized sternal setae on lateral margins of plate; 2 pairs of small pores set in somewhat from margins; metasternal setae larger than and posterolateral to third sternal setae; genital setae medium sized, close together posterior to sternal plate. First pair setae posterior to genital setae minute; intercoxa IV area with additional 10 pairs of mostly small setae plus 1 pair of subterminal adanal setae. *Dorsum*: Peritreme dorsal; lying over coxae II and III; length and width normal for genus, except slightly undulating laterally around and between middle 3 pairs of podosomal setae. Dorsal plate generally oval; posterior quarter superficially divided from anterior portion by narrow suture line; plate slightly ornamented with lighter and darker areas of variable size and shape. Dorsal podosoma with 6 pairs of large setae lateral

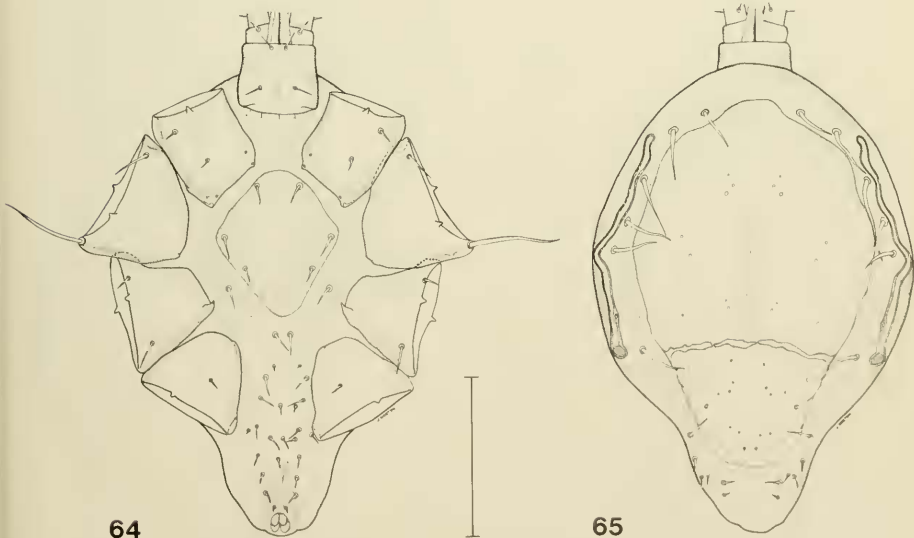


Fig. 64-65. *Periglischrus paravargasi* n. sp., female deutonymph. (64) venter; (65) dorsum, scale = 200 μ .

to dorsal plate; first 2 pairs anterolateral to dorsal plate anterior to peritremes; middle 3 pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Dorsal opisthosoma posterior to dorsal plate with 5 pairs of small setae. *Legs*: Coxa I with small proximal seta and medium-sized distal seta; coxa II with medium-sized anterolateral seta and rather large, long posterolateral seta; coxa II with small, somewhat spinelike anterolateral seta and medium-sized posterolateral seta; coxa IV with small median seta. Most ventral leg setae small, some robust, spinelike. Antero- and posterolateral setae of legs small to medium sized, some more robust, spinelike. One or both distal dorsal setae of trochanters II-IV, femora, patella, and tarsi I-IV rather large, long; most other leg setae small. *Gnathosoma*: Gnathosomal and one hypostomal setae small, slender; other 2 pairs of hypostomal setae absent or inapparent. Palpal setae small, some robust, spinelike; 2 pairs of laterodistal setae of palpal tibia peglike. *Measurements*: Idiosoma length, 537 μ ; greatest width, 395 μ . Sternal plate length, 168 μ ; greatest width, 144 μ . Sternal setae length, 17-29 μ ; genital setae length, 27-28 μ ; intercoxa IV setae length (excluding first pair of minute setae), 8-23 μ . Peritreme length, 266 μ . Dorsal plate length, 431 μ ; greatest width, 294 μ . Length of legs (base of trochanter to end of tarsus): Leg III, 263 μ ; leg IV, 316 μ ; length of legs I and II could not be measured because legs were twisted too much.

MALE DEUTONYMPH: (Fig. 66-67). *Venter*: Similar in most characters to female deutonymph with following exceptions: sternal setae, especially first and second, distinctly larger and longer, first pair extending posteriorly almost to level of first pair of pores; intercoxa IV area posterior to genital setae with eight pairs of mostly small setae, including first pair of minute setae and one pair of subterminal adanal setae. *Dorsum*: Similar in most characters to female deutonymph with following exceptions: Dorsal podosomal setae somewhat more robust and dorsal opisthosomal setae absent or inapparent. *Legs*: Similar in most characters to female deutonymph. *Gnathosoma*: Similar in most characters to female deutonymph. *Measurements*: Idiosoma length, 465 μ ; greatest width, 336 μ . Sternal plate length, 164 μ ; greatest width, 135 μ . Sternal setae length, 22-41 μ ; genital setae length, 28-30 μ ; intercoxa IV setae length (excluding first pair of minute setae), 9-26 μ . Peritreme length, 271 μ . Dorsal plate length, 433 μ ; greatest width, 330 μ . Length of legs (base of trochanter to end of tarsus): Leg III, 304 μ ; leg IV, 381 μ ; length of legs I and II could not be measured because legs were twisted.

PROTONYMPH: (Fig. 68-69). *Venter*: Sternal plate oval to diamond shaped; three pairs of small setae on lateral margins; two pairs of small circular pores set in from lateral margins; metasternal and genital setae absent. Intercoxa IV area with four pairs of setae plus one pair

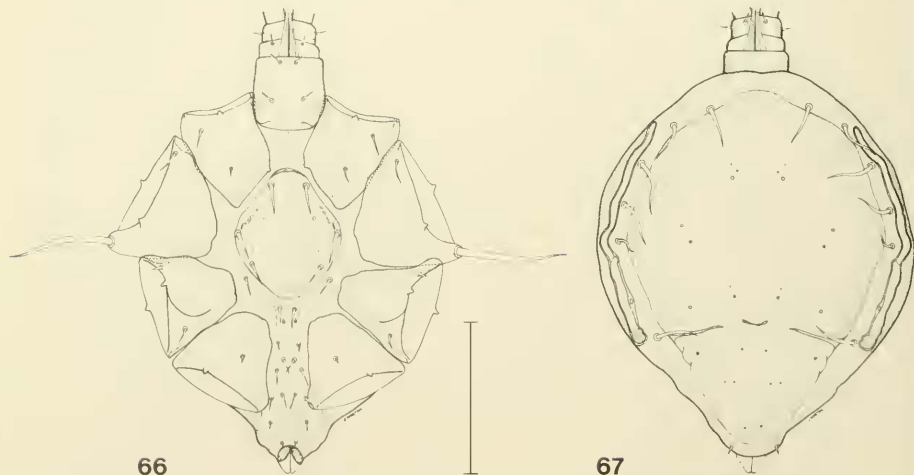


Fig. 66-67. *Periglyschrus paravargasi* n. sp., male deutonymph. (66) venter; (67) dorsum, scale = 200 μ .

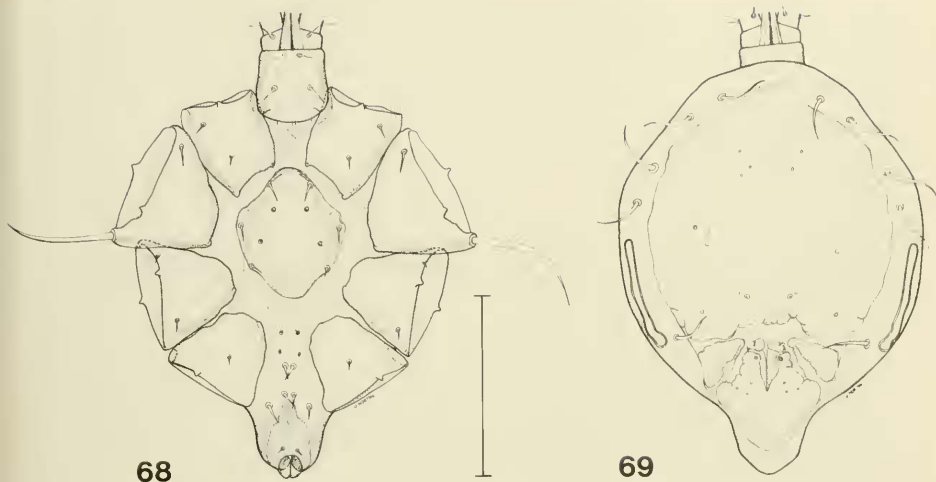


Fig. 68-69. *Periglischrus paravargasi* n. sp., protonymph. (68) venter; (69) dorsum, scale = 200 μ .

of subterminal adanal setae; first pair posterior to sternal plate minute, all others small. *Dorsum*: Peritreme dorsal, short, lying over coxa III. Posterior quarter of dorsal plate superficially divided from anterior portion by narrow transverse band of lightly sclerotized integument; dorsal plate slightly ornamented with small light and dark areas of irregular shapes and small circular pores or setal bases. Dorsal podosoma with five pairs of rather large setae lateral to dorsal plate; first two pairs anterolateral to dorsal plate at level over coxa I; middle two pairs anterior to peritremes and lateral to dorsal plate at level over coxa II; fifth pair posterior to stigmata. *Legs*: Coxa I with both proximal and distal setae small; coxa II with anterolateral seta medium sized, but posterolateral seta rather large; anterolateral seta of coxa III small, spinelike, and posterolateral seta more slender and somewhat longer; median seta of coxa IV small. Ventral leg setae small, some spinelike. Antero- and posterolateral setae of legs small to medium sized, larger setae often slightly recurved. One or two distal dorsal setae of trochanters II-IV; femora, patella, and tibiae I-IV relatively large; most other leg setae small to medium sized, except certain proximal setae of some femora, patella and tibiae minute. *Gnathosoma*: Gnathosomal and one pair of hypostomal setae small, slender; other hypostomal setae absent or inapparent. Palpal setae small, some spinelike; two pairs of laterodistal setae of palpal tibia short, peglike. Mediodistal lobe

of palpal tibia absent. *Measurements*: Idiosoma length, 422 μ ; greatest width, 329 μ . Sternal plate length, 147 μ ; greatest width, 121 μ . Sternal setae length, 14-23 μ ; intercoxa IV setae (excluding first minute pair) length, 10-19 μ . Peritreme length, 135 μ . Dorsal plate length, 391 μ ; greatest width, 263 μ . Dorsal podosomal setae length, 47-67 μ . Length of legs (base of trochanter to end of tarsus): Leg I, 275 μ ; leg II, 231 μ ; leg III, 235 μ ; leg IV, 258 μ .

TYPE MATERIAL: holotype female, allotype male, and one paratype female (SVP-33740) from *Anoura caudifer*, 2 km SW Altamira (620 m), Barinas, Venezuela, 26 December 1967; one paratype male and one paratype deutonymph (SVP-33163), one paratype deutonymph (SVP-33166), four paratype females, one paratype deutonymph and one paratype protonymph (SVP-33361) from *Anoura caudifer*, Altamira (794 m), Barinas, Venezuela, 13 December 1967; the following paratypes from the same host species and locality as SVP-33740 (holotype), 16-18 December 1967: two females and one protonymph (SVP-33694), one deutonymph (SVP-33695), one female and one male (SVP-33696), one male (SVP-33699), two females (SVP-33734), one male (SVP-33735), one male and two protonymphs (SVP-33736), three females (SVP-33746), and five males and one protonymph (SVP-33785); and the following paratypes from the same host species and locality, 1-4 January 1968: one female and one

male (SVP-33915), two females and one protonymph (SVP-34008), one female (SVP-34107), two females (SVP-34185), and two females (SVP-34187).

VENEZUELAN RECORDS (83 females, 47 males, 14 deutonymphs, and 15 protonymphs): of the 57 collections of *P. paravargasi*, 55 were from species of *Anoura* (*A. caudifer*, 47; *Anoura* sp. A, 5; and *A. geoffroyi*, 3). Two were from *Phyllostomus discolor*, and 1 was from *Chironectes minimus*. Collections were made in the following states: Barinas (20), Bolívar (15), Miranda (6), T. F. Amazonas (5), Carabobo (4), Monagas (3), Dto. Federal (2), Falcón (1), and Yaracuy (1). Collections were made during every month except August.

REMARKS: As noted in the Remarks section of *P. paracaligus*, these two species are rather closely related phenetically, differing primarily in the form of the female sternal plate. In the male the sternal setae are long, the first pair extending posterior to or slightly beyond the level of the first pair of pores, and the posterolateral setae of coxa II are long (length at least equal to the width of coxa II). *P. paravargasi* is recorded from species of *Anoura*, mostly *A. caudifer*. In host-parasite associations, this species is most similar to *P. vargasi*, which parasitizes species of *Anoura*, primarily *Anoura geoffroyi*.

Periglischrus vargasi Hoffman, 1944

Fig. 14

Periglischrus vargasi Hoffman, 1944a: 91

Periglischrus squamosus Machado-Allison, 1965
a: 279-281.

DESCRIPTION

FEMALE: Idiosomal length, 784 μ ; greatest width, 442 μ . Ventral idiosomal setae small to minute (length 5-17 μ), with posterior two pairs longer. Sternal plate irregularly jug shaped (median length, 124 μ ; greatest width, 98 μ); widest point at level between first and second sternal setae; posterior margin broadly rounded; anterior projection rather broad, moderately rounded. Dorsal plate oblong-oval (median length, 352 μ ; greatest width, 266 μ); posterior quarter not divided or separated from anterior portion of plate; plate ornamented with numerous small irregularly round dark areas, and small pores or setal bases. Six pairs of large (length 41-79 μ) podosomal setae present lateral to dorsal plate. Dorsal opithosoma with six pairs of medium sized to minute setae; first pair just behind level of coxa IV medium in length (69-

77 μ), but others small to minute (length 37-57 μ). Dorsal leg setae large to medium in length, except proximal antero- and posterodorsal setae of femur II, patella II, and tibia II small to minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV mostly large, recurved. Most ventral leg setae small; however, some antero- and posterolateral setae may be enlarged and serrated.

MALE: Median length of idiosoma, 464 μ ; greatest width, 303 μ . Holovenital plate broadly pear shaped (median length, 202 μ ; greatest width, 175 μ); covering almost entire dorsum between coxae; five pairs of setae of holovenital plate small to medium sized (length 21-38 μ); third pair of sternal setae smallest; first pair of sternal setae largest, extending posteriorly almost to level of first pair of pores. Intercoxa IV area with 8 pairs of setae plus one pair of subterminal adanal setae; first pair minute, all others small (length 11-23 μ). Dorsal plate oval (median length, 415 μ ; greatest width, 290 μ); posterior end narrower; posterior quarter superficially divided from anterior portion by narrow transverse band of lightly sclerotized integument. Six pairs of rather large (length, 31-59 μ) podosomal setae present lateral to dorsal plate; first pair anterolateral to dorsal plate anterior to peritremes; middle four pairs equidistant from each other laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Peritreme undulated laterally around and between middle four pairs of podosomal setae; integument of dorsum surrounding dorsal plate with undulating striations, particularly anterolaterally. Coxal setae varying in size from small to quite large; proximal seta of coxa I much smaller than distal seta; anterolateral seta of coxa III and seta of coxa IV small; anterolateral seta of coxa II and posterolateral seta of coxa III medium sized; posterolateral seta of coxa II large, length almost as great as width of coxa II. Ventral leg setae all rather small, some spinelike. Antero- and posterolateral setae of legs small to medium sized, some slightly recurved. Most distal dorsal setae of leg segments medium to large in size, whereas proximal dorsal setae smaller; proximal setae of femur II, patella II, tibia II, and proximal posterodorsal seta of femur III minute.

VENEZUELAN RECORDS (114 females, 48 males, 19 deutonymphs, and 13 protonymphs): of the 69 collections from Venezuela, 49 were from *Anoura geoffroyi*, 18 from *Anoura* sp. A, and one each from *Sturnira bideus* and *Vampyrops helleri*. Collections were made in the follow-

ing states, etc.: Bolívar (19), T. F. Amazonas (13), Sucre (12), Monagas (8), Falcón (7), Mérida (3), Dto. Federal (3), Barinas, (2), Miranda (1), and Carabobo (1). Collections were made in every month except January, March, and September, with the majority in May (9), June (13), and July (16).

REMARKS: Of the four species assigned to this subgroup, *P. vargasi* is the most dissimilar in relation to the other three. In addition to the large, long, dorsal podosomal setae; this species may be distinguished from the female of other species by the slender, setaceous, recurved posteroventral setae of the femur, patella, and tibia of leg IV; by the ornamentation of the dorsal plate; and by the irregular shape of the sclerotized part of the sternal plate. In the male of *P. vargasi*, the intercoxa IV area bears nine pairs of setae (rather than seven or eight pairs as in the other three species). This species is recorded primarily from species of *Anoura* in Venezuela.

Subgroup B

The two species of this subgroup (*P. hopkinsi* and *P. herrerae*) may be distinguished by the larger size of the proximal anterodorsal seta of each femur I, patella I, tibia I, and the anterodorsal seta of tibia II and by the distance between the first and second dorsal podosomal

setae being equal to or less than the distance between the second and third setae. However, in many phenetic characters, these two species are rather dissimilar. This is in agreement with host-parasite associations: *P. hopkinsi* is recorded primarily from *Lionycteris spurrelli* (family Phyllostomidae, subfamily Glossophaginae) and *P. herrerae* parasitizes *Desmodus rotundus* (subfamily Desmodontinae).

Periglischrus hopkinsi Machado-Allison, 1965a
Fig. 15, 70-73

Periglischrus hopkinsi Machado-Allison, 1965a:
275-276.

DESCRIPTION

FEMALE: (Fig. 15, 70-71). Idiosomal length, 946 μ ; greatest width, 805 μ . Ventral idiosomal setae small to minute (length 7-21 μ). Sternal plate roughly rounded (median length, 93 μ ; greatest width, 100 μ); anterolateral margins almost straight; apex of anterior projection narrowly truncate (Fig. 15). Dorsal plate oblong-oval (median length, 377 μ ; greatest width, 240 μ); posterior quarter superficially divided laterally from anterior portion; plate slightly ornamented with darker areas of irregular shapes and variable sizes, and small pores or setal bases. Six pairs of large (length 59-74 μ) podosomal setae present lateral to dorsal plate; first five

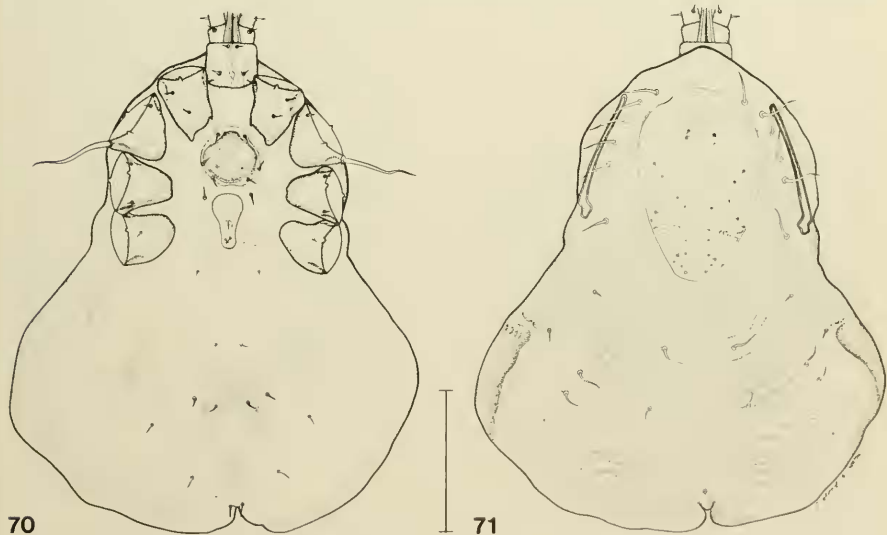


Fig. 70-71. *Periglischrus hopkinsi* Machado-Allison, female. (70) venter; (71) dorsum, scale = 300 μ .

pairs approximately equidistant from each other, lateral and anterolateral to dorsal plate; sixth pair located posterior to level of stigmata. Dorsal opisthosoma with six small to large setae (length 18-57 μ); first two pairs behind level of coxa IV rather small; next three pairs large; sixth pair (located medially) small. Dorsal leg setae large to medium sized, except proximal anterodorsal seta of femur II and proximal posterodorsal seta of femur III minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV large, recurved. Most ventral leg setae small; however, some antero- and posteroventral setae enlarged, finely serrate.

MALE: (Fig. 72-73). Median length of idiosoma, 426 μ ; greatest width, 348 μ . Holovenal plate rather broadly spade shaped (median length, 201 μ ; greatest width, 169 μ); covering almost entire venter between coxae; five pairs of setae of holovenal plate slender, medium sized (length 22-40 μ); first pair of sternal setae extends posteriorly to level of first pair of pores. Intercoxa IV area with six pairs of setae plus one pair of subterminal adanal setae; first pair minute (length less than 11 μ); all others slender, small to medium sized (length 18-27 μ). Dorsal plate oval (median length, 395 μ ; greatest width, 233 μ); posterior end narrower; posterior quarter divided from anterior portion by narrow transverse band of lightly sclerotized integument. Six pairs of rather large (length

43-56 μ) podosomal setae lateral to dorsal plate; first five pairs approximately equidistant from each other; first pair anterior to peritremes; middle four pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Proximal and distal setae of coxa I, anterolateral seta of coxa II, and posterolateral seta of coxa III slender, medium in length; anterolateral seta of coxa III and seta of coxa IV small; posterolateral seta of coxa II large, much larger than any other coxal setae. Ventral leg setae small to medium sized, some slightly more robust than others. Antero- and posterolateral setae of legs small to medium sized, some slightly recurved. Dorsal leg setae vary from small to large; proximal dorsal setae of trochanters, femora, patella, and tibia larger, whereas distal dorsal setae of all leg segments smaller; proximal anterodorsal seta of femur II and proximal posterodorsal seta of femur III minute.

VENEZUELAN RECORDS (12 females, 8 males, and 3 deutonymphs): 8 collections of *P. hopkinsi* were made from *Lionycteris spurrelli* and 1 from *Lonchophylla robusta*. Three collections were made in T. F. Amazonas during May, 4 in Bolívar during May and June, and 1 in Barinas during December.

REMARKS: Females of *P. hopkinsi* may be distinguished from the other species of the subgroup, *P. herrerae*, by the small irregularly round sternal plate and by the smaller size of

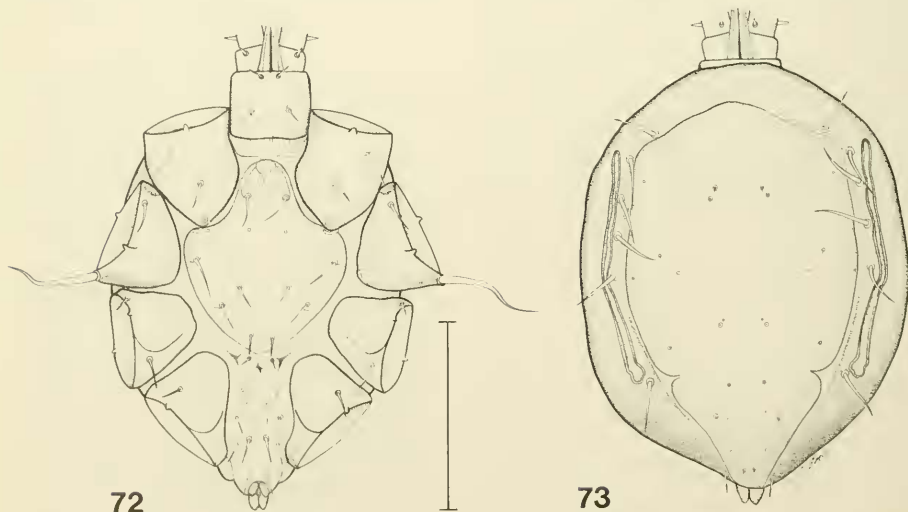


Fig. 72-73. *Periglischrus hopkinsi* Machado-Allison, male. (72) venter; (73) dorsum, scale = 200 μ .

the first dorsal opisthosomal setae just posterior to the level of coxa IV. The male of *P. hopkinsi* is distinctly smaller in size, the ventral setae are noticeably more slender and shorter, and the intercoxa IV area bears seven pairs of setae, the first of which is minute in size. The original description (Machado-Allison, 1965a) of this species was based on a single collection from *Liouycteris spurrelli* in Venezuela. In the present study, eight of the nine collections were from this same host.

Periglischrus herrerae Machado-Allison, 1965
Fig. 16

Periglischrus herrerae Machado-Allison, 1965a:
282-284.

Periglischrus desmodi Furman, 1966: 139-141.

DESCRIPTION

FEMALE: Idiosomal length, 1013 μ ; greatest width, 753 μ . Ventral idiosomal setae minute to medium sized; sternal setae and two pairs of posterior opisthosomal setae slender, medium in length (about 23 μ); all other setae small to minute (length about 9 μ). Sternal plate narrowly jug shaped (median length, 155 μ ; greatest width, 110 μ); posterior end broadly rounded; anterior projection narrow, elongate, and blunt (Fig. 16). Dorsal plate oblong-oval (median length, 446 μ ; greatest width, 292 μ); posterior quarter only superficially divided from anterior portion by slight, rather inapparent suture line; plate ornamented with dark areas of variable size, and small pores or setal bases. Six pairs of large (length 67-99 μ) podosomal setae present lateral to dorsal plate in groups of two, three, and one; (first two pairs close together anterior to peritremes; next three pairs close together laterally between dorsal plate and peritremes; sixth pair located adjacent to stigmata). Dorsal opisthosoma with six pairs of small to medium-sized (length 8-12 μ) setae; first pair just posterior to level of coxa IV medium sized (length about 12 μ); remaining five pairs rather small (length about 8 μ). Dorsal leg setae large to medium in length, except proximal antero-dorsal seta of femur II and proximal postero-dorsal seta of femur III quite small to minute. Posterolateral setae of legs I-II, IV, and anterolateral seta of legs III-IV rather long, recurved. Most ventral leg setae rather small; however, some posteroventral setae of legs I-II and anteroventral setae of legs III-IV enlarged, finely serrate.

MALE: Median length of idiosoma, 479 μ ; greatest width, 412 μ . Holoventral plate broadly spade shaped (median length, 227 μ ; greatest

width 202 μ), covering most of venter between coxae. Plate between first and second sternal setae lightly sclerotized, appearing to be incised anteromedially to second sternal setae; five pairs of setae of holoventral plate slender, long (47-69 μ); first sternal setae extend posteriorly well beyond level of first pair of pores to or beyond level of second sternal setae. Intercoxa IV area with eight to nine pairs of setae plus one pair of subterminal adanal setae; all setae of intercoxa IV area slender, small to medium in length (17-38 μ); first pair subequal in length to others, not minute as in most other species. Dorsal plate oblong-oval (median length, 442 μ ; greatest width, 287 μ); posterior end narrower; posterior quarter divided from anterior portion by narrow transverse band of lightly sclerotized integument. Six pairs of rather large (length 55-76 μ) podosomal setae lateral to dorsal plate; first two pairs close together anterolateral to dorsal plate anterior to peritremes; middle three pairs close together in group between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae generally slender, medium length; posterolateral seta of coxa II rather large, long; anterolateral seta of coxa III and seta of coxa IV smaller than other coxal setae. Most ventral leg setae slender, short to medium in length. Antero- and posterolateral leg setae mostly slender, short to medium in length, with longer setae usually recurved slightly. Proximal anterodorsal seta of femur II and proximal posterodorsal seta of femur III minute; distal setae of trochanters II-IV, femora I-IV, and patella I-IV large, long; all other dorsal leg setae slender, short to medium in length.

VENEZUELAN RECORDS (42 females, 50 males, 23 deutonymphs, and 4 protonymphs): among the 66 collections of *P. herrerae*, 62 were from *Desmodus rotundus*, 2 were from *Sturnira lilium*, 1 was from *Sturnira ludovici*, and 1 was from *Anoura* sp. A. Collections were made in the following states and territories: Trujillo (13), T. F. Amazonas (11), Guárico (8), Falcón (5), Barinas (4), Carabobo (4), Nueva Esparta (4), Sucre (4), Apure (4), Zulia (3), Miranda (2), Guajira (2), Bolívar (1), and Monagas (1). Collections were made in each month except February and May, but the majority were made during the latter half of the year.

REMARKS: Even though *P. herrerae* is recorded primarily from *Desmodus rotundus* (subfamily Desmodontinae), it is phenetically similar to *P. hopkinsi* and the other 4 species of group II in the specific characters noted previously. Its main differentiating character is the posses-

sion of large dorsal podosomal setae. The female of this species is easily separated from that of *P. hopkinsi* by the narrow anterior projection of the sternal plate and the larger size of the first pair of dorsal opisthosomal setae just posterior to the level of coxa IV; and in the males by the 9 or 10 pairs of setae of the intercoxa IV area, the first of which is distinctly longer than that in any other species. Machado-Allison (1965a) reported *P. herrerae* only from *Desmodus rotundus*, and in the present study 62 of the 66 collections were from this host. The other 4 collections may represent accidental hosts or contamination of collections.

Group III

The three species comprising this major group (*P. ojustii*, *P. ramirezi*, and *P. iheringi*) are parasitic primarily on three different phyllostomid bat subfamilies: Sturnirinae, Carolliinae, and Stenodermatinae, respectively. However, *P. ojustii* and, particularly, *P. iheringi* are much less host specific than most other species of *Periglischrus* and thus are recorded from a great number of different hosts of several families and subfamilies of bats. This group may be distinguished from group II by the smaller size of the dorsal podosomal setae and from group I by the combination of a number of characters previously noted. There is considerable overall phenetic similarity among these three species: *e. g.*, the form of the female sternal plates, especially between *P. ojustii* and *P. iheringi*; and the dorsal plate and setation, except for the first pair of podosomal setae, which are small to minute and on the anterolateral margins of the dorsal plate in females of *P. ramirezi* and *P. iheringi*.

Periglischrus ojustii Machado-Allison, 1964

Fig. 17

Periglischrus ojustii Machado-Allison, 1964: 197-199.

Periglischrus aitkeni Furman, 1966: 137-139.

DESCRIPTION

FEMALE: Idiosomal length, 1177 μ ; greatest width, 780 μ . Ventral podosomal setae small to medium sized (length 13-23 μ); opisthosomal setae small to minute. Sternal plate broadly pear shaped (median length, 153 μ ; greatest width, 149 μ); posterior and lateral margins broadly rounded; anterior projection narrowly rounded (Fig. 17). Dorsal plate oblong-oval (median length, 491 μ ; greatest width, 321 μ); lateral margins moderately invaginated, forming rather

prominent anterolateral shoulders; posterior quarter superficially divided from anterior portion by narrow band of lightly sclerotized integument, plate ornamented with darker areas of variable size and shape, and small pores or setal bases. Six pairs of medium-sized (length 21-49 μ) dorsal podosomal setae present lateral to dorsal plate; first two pairs distinctly closer together than others, sixth pair posterior to stigmata. Dorsal opisthosoma with four pairs of small to minute setae; no seta present just posterior to level of coxa IV. Dorsal leg setae large, except proximal anterodorsal seta of femur II and posterodorsal seta of femur III minute. Posterolateral setae of legs I-II and anterolateral setae of legs III-IV mostly large; posterolateral setae of legs III-IV blade-like, short, expanded, and flattened. Ventral leg setae small to medium sized; however, some anteroventral and posteroventral leg setae may be somewhat enlarged, spinelike.

MALE: Median length of idiosoma, 561 μ ; greatest width, 399 μ . Holovenal plate spade shaped (median length, 258 μ ; greatest width, 212 μ), covering almost entire venter between coxae; five pairs of setae of holovenal plate rather large, robust (length 55-80 μ); first sternal setae extend posteriorly beyond level of second sternal setae. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair minute, but all others medium length (30-45 μ) and rather robust. Dorsal plate oblong-oval (median length, 518 μ ; greatest width, 307 μ); posterior end distinctly narrowing to form narrow, blunt posterior end; posterior quarter superficially divided from anterior portion by narrow band of lightly sclerotized integument. Six pairs of rather large (length 47-56 μ) podosomal setae present lateral to dorsal plate; first two pairs close together anterior to peritremes; middle three pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae medium sized to very large, robust; anterolateral seta of coxa III smallest, with posterolateral seta of coxa II largest (length as great as or greater than width of coxa II). Ventral leg setae small to medium sized, most rather robust and spinelike. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV of medium length and slightly recurved; other antero- and posterolateral setae mostly short, straight. Most distal dorsal setae of trochanters, femora, patella, and tibiae rather large; most other dorsal leg setae small to medium sized, except proximal anterodorsal seta of femur II minute. Spermatophore process of chelicerae short,

shaped like shepherd's crook, not long and recurved as in most other species.

VENEZUELAN RECORDS (1,128 females, 567 males, 65 deutonymphs, 66 protonymphs, and 141 undetermined nymphs): *P. ojustii* is parasitic primarily on bats of the genus *Sturnira*. Of 695 total collections, 488 were from *Sturnira lilium*, 97 from *S. ludovici*, 36 from *S. erythromos*, 22 from *S. tildae*, 12 from *S. bidens*, and 4 from *S. bogotensis*. There were 6 collections from *Artibeus jamaicensis*, 4 from *Desmodus rotundus*; 3 from *Phyllostomus discolor*: 2 each from *Glossophaga soricina*, *Carollia perspicillata*, *Uroderma bilobatum*; *Vampyrops helleri*, *Artibeus hartii*, and *A. lituratus*; and 1 each from *Noctilio leporinus*, *N. labialis*, *Phyllostomus hastatus*, *Phylloderma stenops*, *Trachops cirrhosus*, *Glossophaga longirostris*, *Anoura geoffroyi*, *Leptonycteris curasoae*, *Vampyrops umbratus*, *Vampyressa bidens*, *Artibeus cinereus*, and *Artibeus* sp. Collections were made in the following states, etc.: Dto. Federal (95), Trujillo (80), T. F. Amazonas (76), Barinas (74), Miranda (70), Bolívar (65), Sucre (58), Guárico (40), Zulia (29), Mérida (27), Falcón (27), Carabobo (20), Monagas (17), Apure (12), Aragua (11), Monagas (6), Yaracuy (2), Táchira (2), and Nueva Esparta (1). At least 8 collections were made during every month of the year.

REMARKS: The female and male *P. ojustii* resemble *P. iheringi* in many ventral idiosomal characters, particularly the form of sternal and holoventral plates and relative length of setae. However, the two differ significantly in dorsal characters. The first pair of dorsal podosomal setae of females of *P. ojustii* are subequal in length to the other podosomal setae and are on the integument anterolateral to the dorsal plate, whereas in *P. iheringi* and also in *P. ramirezi*, the first pair are small to minute and are on the anterolateral margins of the dorsal plate. In both sexes of *P. ojustii* the distance between the first and second pairs of podosomal setae is distinctly less than the distance between the second and third pairs, whereas in the other two species the distance between the first and second pairs is distinctly greater than that between the second and third. The posteroventral setae of femur IV, patella IV, and tibia IV are straight and bladeliike in females of both *P. ojustii* and *P. iheringi*, whereas in those of *P. ramirezi* these setae are slender and recurved.

P. ojustii has been previously reported almost exclusively from species of *Sturnira*. Machado-Allison (1964, 1965a) recorded collections

from *S. lilium* and *S. ludovici* in Venezuela, and Furman (1966), who described this species as *P. aitkeni*, reported collections from *S. lilium*, *S. ludovici*, an unidentified species of *Sturnira*, and *Noctilio leporinus* in Panamá. In the present study 659 of the 695 collections were from species of *Sturnira*; the remaining 36 collections were from various other species of bats (some of which may have been accidental associations or work table contaminations).

Periglischrus ramirezi Machado-Allison and Antequera, 1971

Fig. 18

Periglischrus ramirezi Machado-Allison and Antequera, 1971: 3-6.

DESCRIPTION

FEMALE: Idiosomal length, 1231 μ ; greatest width, 762 μ . Ventral idiosomal setae all rather small to medium sized (length 9-30 μ). Sternal plate oval (median length, 160 μ ; greatest width, 127 μ); faint, broadly rounded anterior projection present (Fig. 18). Dorsal plate oblong-oval in general shape (median length, 449 μ ; greatest width, 310 μ); lateral margins slightly invaginated; posterior quarter superficially divided from anterior portion; ornamented only slightly by shaded areas of irregular shapes and various sizes and small pores or setal bases. First dorsal podosomal seta medium sized (length 25 μ), on anterolateral margin of dorsal plate; next four pairs of podosomal setae larger (length 31-46 μ) laterally between dorsal plate and peritremes; sixth pair adjacent to stigmata. Dorsal opisthosoma with four pairs of small to minute (length 9-17 μ) setae, no seta just posterior to level of coxa IV. Dorsal leg setae large to medium sized, except posterodorsal seta of femur III minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV mostly long, recurved. Ventral leg setae small to medium in length.

MALE: Median length of idiosoma, 495 μ ; greatest width, 392 μ . Holoventral plate somewhat spade shaped (median length, 243 μ ; greatest width, 192 μ), covering almost entire venter between coxae; five pairs of setae of holoventral plate medium sized (length, 45-60 μ); first sternal setae extend posteriorly just beyond first pair of pores. Intercoxa IV area with six pairs of setae plus one pair of subterminal adanal setae; first pair of setae minute (length less than 15 μ), all others medium sized (length 27-38 μ). Dorsal plate oblong-oval (median length, 438 μ ; greatest width, 316

μ); posterior end narrower; posterior quarter very superficially divided from anterior portion by faint narrow transverse band of lightly sclerotized integument. Six pairs of moderately large (length, 55-62 μ) podosomal setae present lateral to dorsal plate; first pair anterior to peritremes, set on anterolateral margins of dorsal plate; middle four pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Coxal setae all medium sized, except posterolateral seta of coxa II rather large, long (length approximately equal to width of coxa II). Ventral leg setae small to medium in length, most robust, spinelike; ventral setae of legs III-IV rather robust and apically recurved. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV moderately large, recurved; other antero- and posterolateral setae smaller, straight. Most distal dorsal setae of trochanters, femora, patella, and tibiae large, long, whereas most other leg setae small to medium sized, except proximal posterodorsal seta of femur III minute.

VENEZUELAN RECORDS (44 females, 11 males, and 4 protonymphs): the 12 collections were from *Rhinophylla pumilio* in T. F. Amazonas (10) and Bolívar (2), during February, April, May, June, September, and October. In addition, Machado-Allison and Antequera (1971) reported 9 collections (12 females, 2 males, and 2 protonymphs) from the Smithsonian Venezuelan Project collection of *Rhinophylla pumilio*. These collections were from Bolívar (7) and Apure (2). They also reported a collection of 3 females from *R. pumilio* at Belém, Pará, Brazil in August 1965.

REMARK: *P. ramirezi* is most similar to *P. iheringi*, yet differs in several important characters: The first pair of dorsal podosomal setae of the female are small but not minute as in *P. iheringi*, and the posteroventral setae of femur IV, patella IV, and tibia IV of the female are setaceous and recurved rather than straight and bladlike. The female sternal plate is oval in shape rather than pear shaped, and in the male the sternal setae are shorter and the intercoxa IV area bears seven pairs of setae rather than eight pairs. *P. ramirezi* has been reported only from *Rhinophylla pumilio*, all from Venezuela except the one report from Brazil.

Periglischrus iheringi Oudemans, 1902

Fig. 19

Periglischrus iheringi Oudemans, 1902: 38.

Periglischrus iheringi (sic) Oudemans, 1903: 135.

Periglischrus meridensis Hirst, 1927: 335.

Spiturnix ewingia Wharton, 1938: 139.

Spiturnix artibiensis Radford, 1951: 97.

DESCRIPTION

FEMALE: Idiosomal length, 1,262 μ ; greatest width, 854 μ . Ventral podosomal setae small to medium sized (length 13-24 μ); ventral opisthosomal setae small to minute (length 9-23 μ), with posteriormost two pairs longer than others. Sternal plate broadly pear shaped (median length, 153 μ ; greatest width, 143 μ ; anterior projection short, broad, moderately rounded (Fig. 19). Dorsal plate oblong-oval (median length, 507 μ ; greatest width, 323 μ); lateral margins invaginated with prominent anterolateral shoulders and distinct, rounded, anterior projection; posterior quarter of plate superficially divided from anterior portion; plate ornamented with mostly large, darker areas of variable shape and small pores or setal bases. First dorsal podosomal seta quite small (length 12-13 μ), located on anterolateral margins of dorsal plate; next four dorsal podosomal setae moderately large (length 36-57 μ), located laterally between dorsal plate and peritremes; sixth pair posterior and adjacent to stigmata. Dorsal opisthosoma with four pairs of rather small setae (length 18-24 μ); no seta located just posterior to level of coxa IV. Dorsal leg setae large, except anterolateral seta of femur II and posterolateral seta of femur III minute. Most posterolateral setae of legs I-II and anterolateral setae of legs III-IV rather long, recurved; posterolateral setae of leg IV bladlike, straight, flattened, somewhat expanded, and shorter. Ventral leg setae small to medium sized.

MALE: Median length of idiosoma, 659 μ ; greatest width, 447 μ . Holoventral plate spade shaped (median length, 288 μ ; greatest width, 204 μ); covering most of venter between coxae; five pairs of setae of holoventral plate quite large (length 59-89 μ); first sternal setae extend posteriorly to or beyond level of second sternal setae. Intercoxa IV area with seven pairs of setae plus one pair of subterminal adanal setae; first pair minute (length less than 12 μ); all others medium in length (27-50 μ) and rather robust. Dorsal plate oblong-oval (median length, 503 μ ; greatest width, 338 μ); posterior end narrowing considerably, forming narrow, blunt posterior end; posterior quarter superficially divided from anterior portion by narrow band of lightly sclerotized integument. Six pairs of rather large (length 55-68 μ) podosomal setae present lateral to dorsal plate; first pair anterior to peritremes on anterolateral margins of dorsal

plate; second pair on anterolateral margins of dorsal plate at level of anterior end of peritremes, and set relatively close to first pair; middle three pairs laterally between dorsal plate and peritremes; sixth pair posterior to stigmata. Most coxal setae moderately large, rather robust; anterolateral seta of coxa III smallest, with posterolateral seta of coxa II largest. Most ventral leg setae small to medium sized, some rather robust, spinelike. Posterolateral setae of legs I-II, IV, and anterolateral setae of legs III-IV medium sized, slightly recurved; other antero- and posterolateral leg seta smaller, straight. Most distal dorsal setae of trochanters, femora, patella, and tibia quite large, long; all other leg setae small to medium sized.

VENEZUELAN RECORDS: Collections of this species from throughout Venezuela numbered 1,682. Of these, about 525 were mounted and their identification was confirmed. Eighty-one percent of these were on species of *Artibeus*, *Vampyrops*, and *Uroderma*. The remaining 1,150+ collections were examined in alcohol and tentatively determined to be *P. iheringi* on the basis of their association with the above bats.

The 525 verified collections of *P. iheringi* represent 607 females, 459 males, 92 deutonymphs, and 91 protonymphs. There were 340 collections from bats of the genus *Artibeus* (*A. jamaicensis*, 234; *A. lituratus*, 90; *A. harti*, 8; *A. cinereus*, 6; and *A. fuliginosus*, 2), 45 collections from the genus *Vampyrops* (*V. helleri*, 41; *V. aurarius*, 2; and *V. umbratus*, 2), and 40 collections from the genus *Uroderma* (*U. bilobatum*, 39; and *U. magnirostrum*, 1). Other host records were as follows: *Sturnira lilium* (9), *Carollia perspicillata* (8), *Vampyressa pusilla* (8), *Ectophylla macconnelli* (6), *Desmodus rotundus* (5), *Carollia brevicauda* (4), *Sturnira ludovici* (4), *Pteronotus davyi* (3), *Pteronotus parnellii* (3), *Phyllostomus hastatus* (3), *Glossophaga longirostris* (3), *Anoura geoffroyi* (3), *Phyllostomus discolor* (2), *Glossophaga soricina* (2), *Ametrida centurio* (2), *Miconycteris megalotis* (1), *Mimon crenulatum* (1), *Anoura caudifer* (1), *Anoura* sp. (1), *Carollia* sp. (1), *Eumops glaucinus* (1), *Sphaeronycteris toxophyllum* (1), *Chiroderma villosum* (1), *Myotis albescens* (1), *Myotis nigricans* (1), *Sturnira* sp. (1), and *Molossus ater* (1). Verified collections were made from the following states, etc.: Zulia (70), Trujillo (67), Apure (65), T. F. Amazonas (61), Barinas (47), Dto. Federal (38), Falcón (34), Yaracuy (26), Carabobo (25), Miranda (24), Sucre (22), Monagas

(20), Guárico (20), Aragua (2), Bolívar (2), Lara (1), and Nueva Esparta (1). Twelve to 85 collections were made during each month of the year.

The 1,150+ tentatively identified collections of *P. iheringi* represent about 3,487 specimens (approximately 1,750 females, 869 males, and 868 deutonymphs and protonymphs together). There were 553 collections from bats of the genus *Artibeus* (*A. lituratus*, 315; *A. jamaicensis*, 147; *A. cinereus*, 88; *A. concolor*, 2; and *A. harti*, 1), 384 collections from species of *Vampyrops* (*V. helleri*, 279; *V. umbratus*, 73; *V. aurarius*, 32; *V. vittatus*, 5; and *V. saccharus*, 1), and 178 collections from species of *Uroderma* (*U. bilobatum*, 172; and *U. magnirostrum*, 7). Other host records of tentatively identified *P. iheringi* are as follows: *Vampyressa pusilla* (14), *Vampyressa bidens* (11), *Chiroderma trinitatum* (4), *Vampyrodes caraccioli* (3), *C. salvini* (2), *Noctilio labialis* (2), *Rhynconycteris naso* (1), *Vampyrum spectrum* (1), *Carollia perspicillata* (1), *Sturnira ludovici* (1), and *Ametrida centurio* (1). These 1,150+ collections were from: T.F. Amazonas (182), Apure (177), Yaracuy (127), Zulia (120), Bolívar (108), Barinas (97), Falcón (76), Miranda (71), Sucre (54), Carabobo (51), Dto. Federal (43), Trujillo 14, Monagas (14), Nueva Esparta (11), Guárico (10), Lara (5), and Aragua (4). Twenty-five to 219 collections were made during each month of the year.

REMARKS: *P. iheringi* is the best known and most frequently collected of all species of *Periglischrus*. This frequency of occurrence is no doubt correlated with the low degree of host specificity demonstrated by this species. It is easily recognized and may be distinguished from all other species by the following characters in females: the first pair of dorsal podosomal setae are minute and on the anterolateral margin of the dorsal plate; the posteroventral setae of femur IV, patella IV, and tibia IV are straight and bladelike; and the sternal plate is broadly pear shaped. In the male, the sternal setae are rather large and long and the first pair extends to or beyond the level of the second pair of setae.

P. iheringi is recorded from the families Emballonuridae, Noctilionidae, Mormoopidae, almost all subfamilies of Phyllostomidae, and Vespertilionidae. However, most collections are from Phyllostomid bats, particularly the subfamily Stenodermatinae; i.e., of the 1,682 collections in the present study, 1,578 were from bats of the subfamily Stenodermatinae. By far, the majority of collections are from species of

the genera *Artibeus*, *Uroderma*, and *Vampyrops*. These data are in agreement with the host-parasite relationships reported by previous workers dealing with this species throughout the Neotropical region.

Group IV

Periglischrus natali Furman, 1966

Fig. 20

Periglischrus natali Furman, 1966: 128-130.

Mesoperiglischrus nyctiellinus Dusbabek, 1968: 12-15.

DESCRIPTION

FEMALE: Idiosomal length, 666 μ ; greatest width, 453 μ . All ventral idiosomal setae small to minute (length 10-13 μ). Sternal plate broadly pear shaped (median length, 120 μ ; greatest width, 108 μ); greatest width just anterior to second sternal setae; narrowing toward narrowly rounded anterior end (Fig. 20). Peritremes laterodorsal in position, between coxa IV and coxa I; of normal width posteriorly near stigmata and at anterior end, but narrow and threadlike between. Dorsal plate oblong-oval (median length, 328 μ ; greatest width, 243 μ); posterior quarter superficially divided from anterior portion. Six pairs of medium-sized (length 14-25 μ) podosomal setae lateral to dorsal plate; first two pairs flattened, bladelike; first pair located near anterior end of plate, with distance between first and second pairs much greater than that between second and third; middle four pairs laterally between dorsal plate and peritremes; distance between third and fourth much greater than that between fourth and fifth; sixth pair located posterior to stigmata. Dorsal opisthosoma with six pairs of small to minute setae (length 8 μ or less). Most leg setae small to medium in length, except distal posterodorsal seta of each femur I-II and patella I-II distinctly longer than other leg setae, and proximal anterodorsal seta of each femur II, patella II, and proximal posterodorsal seta of each femora III-IV minute. Posterolateral setae of legs I-II, IV, and anterolateral setae of leg III of medium length, recurved. Most ventral leg setae small to minute.

MALE: Idiosomal length, 314 μ ; greatest width, 237 μ . Holoventral plate covers entire venter between coxae (median length, 159 μ ; greatest width, 123 μ); five pairs of setae of holoventral plate of medium length (length 24-38 μ); setae distinctly shorter than distance to adjacent posterior setal bases; first sternal setae extend posteriorly to or just beyond first pair of pores. Interoxae IV area posterior to

holoventral plate with seven slender, small to medium length setae (length 20+ μ). Laterodorsal peritremes of normal width over coxa III but becoming narrow and threadlike (appearing to be absent) anterior to level of coxa III. Dorsal plate oblong-oval (median length, 250 μ ; greatest width, 221 μ), similar to that of female. Six pairs of podosomal setae rather small, in approximately same relative positions as in females. Leg setae similar to those of females.

VENEZUELAN RECORDS (3 females, 1 male, and 1 deutonymph): the four collections of *P. natali* were from *Natalus tumidirostris*. One collection was made in Bolivar during April and the other three in Falcón during July.

REMARKS: *P. natali* is relegated to a separate, monotypic group because of its dissimilarity to all other species of *Periglischrus*. However, it is sufficiently similar to other species of *Periglischrus* to be included in the genus. Dusbabek (1968) described this species as *Mesoperiglischrus nyctiellinus*, but we have determined it to be synonymous with *P. natali* Furman, 1966, and have further determined that it should not be placed in a separate genus. Both sexes of this species can be easily distinguished by the narrow, threadlike section of the peritreme from coxa III to near coxa I. Also, the dorsal podosomal setae are rather small and the first two pairs are flattened and bladelike in the female and minute in the male.

P. natali is known only from bats of the genus *Natalus* (family Natalidae). Furman (1966) reported collections of this species from *Natalus stramineus* and *N. tumidirostris*, and Dusbabek (1968) reported collections from *N. lepidus*. Our four collections were from *N. tumidirostris*.

Inserti Sedis

The following three collections containing one adult female and/or male specimen each represent two or three different forms which could not be placed with the other species of *Periglischrus* treated herein. These may represent two or three new taxa. However, in the absence of additional specimens of each, we felt it inadvisable to describe them as new species.

One female, 1 male, and 1 protonymph (SVP-17517) from *Macrophyllum macrophyllum*, 108 km SSE Esmeralda (140 m), Rio Mavaca, T.F. Amazonas, Venezuela, April 5, 1967. One female (SVP-41655) and 1 male (SVP-41660) from *Macrophyllum macrophyllum*, 56 km WNW Econtrados (76 m), El Rosario, Zulia, Venezuela, March 10, 1968.

An additional deutonymph and 10 protonymphs (10 collections) could not be correctly identified either on morphological characters or by association with identifiable adults. These 10 collections were from the following hosts: *Saccopteryx bilineata* (1), *Lonchophylla robusta* (1), *Anoura geoffroyi* (1), *Anoura* sp. (1), *Carollia perspicillata* (1), *Sturnira lilium* (4), and *Molossus ater* (1).

Genus *Spinturnix* von Heyden

Spinturnix von Heyden, 1826, Isis (Oken), 18(6): 612.

TYPE SPECIES: *Pteroptus myotis* Kolenati, 1856, designated by Opinion 128 of the International Commission on Zoological Nomenclature (1936).

DESCRIPTION

Dorsal plate single, with several pairs of pores on surface. Three to five pairs of propodosomal setae present lateral to dorsal plate. Peritremes short, lying dorsal to coxae III; anterior ends bending ventrad, usually reaching ventral surface between coxae II and III. One pair of metapodosomal setae present near stigmata. Opisthosoma with few to many setae. Tritosternum usually small, but sometimes moderately large or totally reduced. Sternal plate of female with three pairs of setae and two pairs of pores. Holoventral plate of male with three to five pairs of setae and two pairs of pores. Endopodal and metasternal plates usually represented by small remnants. One pair of short metasternal setae usually present. Genital plate of female small, usually delicately sclerotized with one pair of small setae on or near posterior apex. Integument between genital and anal plates with few to many short setae. Anal plate small, ventroterminal, with one pair of adanal setae and one postanal seta. Legs stout, with mostly short ventral setae, except for lateroventral setae which may be mostly long; dorsal

setae mostly long to very long; claws and caruncles large and strong but not unusually enlarged.

REMARKS: Rudnick (1960) divided the species of the genus *Spinturnix* into three groups on the basis of leg setation. The first group, composed of *S. americanus* and *S. banksi*, can be distinguished by the following characters: most ventral leg setae short, proximal pair of dorsal setae of femora I and II (anterodorsal and posterodorsal) minute, and proximal posterodorsal seta of each femora III and IV minute. The second group, consisting of *S. bakeri*, *S. mexicanus*, *S. orri*, and *S. surinamensis*, is characterized as follows: posteroventral setae of leg II and anteroventral setae of leg III mostly long; proximal anterodorsal seta of each femur I and II long, but proximal posterodorsal seta of each femur I and II minute; and proximal posterodorsal seta of each femur III and IV long. The last group, which includes only *S. subacuminatus* from the New World, may be distinguished as follows: most lateroventral leg setae long; proximal anterodorsal seta of each femur I and II long, with proximal posterodorsal seta of each femur I and II long or short but never minute; and proximal posterodorsal seta of each femur III and IV long.

The genus *Spinturnix* is cosmopolitan in distribution, with the majority of known species occurring on Old World bats of the superfamily Vespertilionoidea. There are currently seven species described from the New World, primarily from tropical and subtropical areas. Of these seven species, four are recorded from Venezuela: *S. americanus*, *S. bakeri*, *S. surinamensis*, and *S. subacuminatus*. In Venezuela, these four species are restricted to bats of the family Vespertilionidae, subfamily Vespertilioninae. *S. americanus* is recorded from species of *Myotis*; *S. bakeri* and *S. surinamensis* occur on species of the genus *Eptesicus*; and *S. subacuminatus* is found only on bats of the genus *Rhogeessa*.

Key to New World Species of *Spinturnix*

- 1. Lateroventral setae of legs mostly short; pair of proximal dorsal setae of femora I-II minute; proximal posterodorsal seta of each femur III-IV minute. (Group 1) 2
- Lateroventral setae of legs mostly long or, at least, posteroventral setae of leg II and anteroventral setae of leg III mostly long; pair of proximal dorsal setae of femora I-II long, or only one of each pair minute; proximal posterodorsal seta of each femur III-IV long 3
- 2(1). About 32-36 (16-18 pairs) dorsal opisthosomal setae in female; about 8-10 (4-5 pairs) dorsal opisthosomal setae in male: from *Myotis grisescens*
 *S. banksi* Rudnick, 1960

- With 25 or fewer (13 or fewer pairs) dorsal opisthosomal setae in female; 4 (2 pairs) long dorsal opisthosomal setae in male; with or without long posterolateral setae on tibiae III-IV; from *Myotis* spp. and *Natalus* spp.
S. americanus (Banks, 1902) (p. 62)
- 3(1). Pair of proximal dorsal setae of femora I-II long, or anterior seta of pair long and posterior seta long to short, but not minute; from *Rhogeessa* spp. (Group III)
S. subacuminatus Furman, 1966 (p. 65)
- Pair of proximal dorsal setae of femora I-II with 1 seta long and 1 minute. (Group II) 4
- 4(3). Four (2 pairs) dorsal opisthosomal setae in male and female; from *Eptesicus fuscus* and *E. montosus* *S. bakeri* Rudnick, 1960 (p. 63)
- More than 4 (2 pairs) dorsal opisthosomal setae in female; more or less than 4 (2 pairs) dorsal opisthosomal setae in male 5
- 5(4). About 8 or 9 (4+ pairs) dorsal opisthosomal setae in female; dorsal propodosomal setae rather small; sternal plate with anterior end acute, and posterior margin convex or straight; genital plate small, rather short; one pair of dorsal opisthosomal setae in male; from *Antrozous* spp. *S. orri* Rudnick, 1960
- About 14-18 (7-9 pairs) dorsal opisthosomal setae in female; dorsal propodosomal setae larger; sternal plate with anterior end broadly rounded, and posterior margin invaginated; genital plate long with parallel sides; 2 or 8 (1 or 4 pairs) dorsal opisthosomal setae in male 6
- 6(5). Dorsal plate of female with anterior, narrowly rounded apex, and distinct lateral invaginations just behind apex; genital setae on unsclerotized integument posterolateral to margins of broad, inverted-arrow-shaped genital plate; male with 2 (1 pair) dorsal opisthosomal setae; intercoxa IV area of male with 4 pairs of small setae; from several species of *Eptesicus*
S. surinamensis Dusbabek and Lukoschus, 1971 (p. 64)
- Dorsal plate of female with anterior end broadly rounded and lacking lateral invaginations; genital setae on posterolateral margins of narrow, parallel sided genital plate; male with 8 (4 pairs) dorsal opisthosomal setae; intercoxa IV area of male with 8 pairs of small setae; from *Pizonyx vivisi* *S. mexicanus* Rudnick, 1960

Spinturnix americanus (Banks, 1902)

Pteroptus americanus Banks, 1902: 173.

Spinturnix americanus Banks, 1915: 72.

Spinturnix carloshoffmanni Hoffmann, 1944b: 185.

DESCRIPTION

FEMALE: Idiosomal length, 931 μ ; greatest width, 732 μ . Ventral idiosomal setae small to medium sized (length 15-33 μ); first three sternal setae on lateral margins of plate; fourth pair posterior and slightly lateral to third pair; genital setae just off posterolateral margins of small genital plate; ventral idiosoma between and posterior to coxae IV with eight pairs of setae; anal plate with pair of adanal setae and single post-anal seta. Sternal plate arrow shaped (median length, 198 μ ; greatest width, 173 μ); anterior end bluntly pointed; posterior end slightly invaginated between third sternal setae. Dorsal plate broadly oval to somewhat diamond shaped (median length, 680 μ ; greatest width, 534 μ); anterior end much more broadly rounded than

posterior end; greatest width at level between coxae II and III. Six pairs of moderately large (length 66-122 μ) dorsal podosomal setae surround dorsal plate laterally and anteriorly; first pair close together anterior to plate; second, third, and fourth pairs anterolateral to plate; fifth pair lateral at level of greatest width of plate; sixth pair posterior to stigmata. Dorsal and terminal opisthosoma with nine plus pairs of moderately long (length 68-147 μ), rather robust setae (more terminally located setae larger). All coxal setae small to medium sized; posterolateral seta of coxa II not unusually larger than other coxal setae. Proximal anterodorsal and posterodorsal setae of femora I-II, and proximal posterodorsal seta of each femur III-IV minute; all other dorsal, anterolateral, and posterolateral setae of legs I-IV rather large or at least of medium length; all ventral leg setae small to medium sized.

MALE: Median length of idiosoma, 799 μ ; greatest width, 676 μ . Holventral plate broadly spade shaped (median length, 337 μ ; greatest

width, 258 μ); moderately narrow and elongate anterior projection bears genital orifice apically; posterior end abruptly narrowing to blunt point. Ventral idiosomal setae mostly small (length 22-32 μ); holovenral plate with first three pairs of sternal setae on or near lateral margins; fourth pair of sternal setae near posterolateral margins of plate, directly posterior to third pair of setae; genital setae close together at posterior end of holovenral plate. Intercoxa IV area with six pairs of setae; anal plate bears pair of adanal setae and single postanal seta. Dorsal plate oval to diamond shaped as in female (median length, 659 μ ; greatest width, 530 μ). Six pairs of rather large (length 96-136 μ) podosomal setae; first four pairs equidistant from each other, anterolateral to dorsal plate; first pair at anterior end of plate; fifth pair lateral to plate at point of greatest width; sixth pair posterior to stigmata. Dorsal opisthosoma posterior to dorsal plate with two pairs of moderately large (length 108 μ) setae. Proximal anterodorsal and posterodorsal seta of each femur I-II, and proximal posterodorsal seta of each femur I-II minute; all other dorsal, anterolateral, and posterolateral setae of legs I-IV rather large or at least of medium length; all ventral leg setae small to medium sized.

VENEZUELAN RECORDS (145 females, 182 males, 11 deutonymphs, 1 protonymph, and 42 undetermined nymphs): Of the 137 collections of *S. americanus*, 135 were from bats of the genus *Myotis* (*M. nigricans*, 77; *M. albescens*, 33; and *M. keaysi*, 25). A single female was collected from *Eumops glaucinus*, and 1 collection (1 female and 1 male) was recorded from *Saccopteryx canescens*. Collections were made in Carabobo (71), Aragua (24), T.F. Amazonas (23), Apure (7), Miranda (5), Monagas (3), Yaracuy (2), Bolívar (1), and Guárico (1). From 1 to 74 collections were made in each of nine months; no collections were recorded during May, October, and December.

REMARKS: *S. americanus* is the only representative of Rudnick's (1960) first group collected in Venezuela. This species may be recognized by the short lateroventral setae of the legs (both proximal anterodorsal and posterodorsal setae of femora I and II are minute and the proximal posterodorsal seta of each femur III and IV is minute) and the dorsal opisthosoma bearing 10-25 setae in the female but only 4 (2 pairs) in the male. Furman (1966) considered *S. carlos-hoffmanni* Hoffman, 1944 to be a synonym of *S. americanus*. He found considerable variation in characters previously used to differentiate

the two species (i.e., the presence or absence of a long, posterolateral seta on tibia III and IV and the number of dorsal, subterminal opisthosomal setae). In Panamá, Furman (1966) observed populations of two variants occurring on the same host species, and in one collection both were found on the same host specimen. In the present study, we have found considerable variation and, thus, have chosen to recognize this synonym as valid. *S. americanus* is known from various species of *Myotis* throughout the Nearctic and Neotropical regions.

Spinturnix bakeri Rudnick, 1960

Spinturnix bakeri Rudnick, 1960: 226-228.

DESCRIPTION

FEMALE: Idiosomal length, 981 μ ; greatest width, 709 μ . Ventral idiosomal setae small to medium sized (length 10-28 μ); first three sternal setae on lateral margins of sternal plate; fourth pair of sternal setae directly posterior to third pair; genital setae on posterolateral margins of small genital plate; ventral idiosoma between and posterior to coxae IV with six pairs of setae; anal plate with pair of adanal setae and single postanal seta. Sternal plate somewhat arrow shaped (median length, 155 μ ; greatest width, 187 μ); posterior end straight to slightly invaginated between third sternal setae; greatest width at level of second sternal setae. Dorsal plate undivided, generally diamond shaped (median length, 705 μ ; greatest width, 511 μ); greatest width at level between coxae II and III; both anterior and posterior ends narrowing considerably. Six pairs of medium sized (length 59-27 μ) dorsal podosomal setae anterior and lateral to dorsal plate; first pair close together anterior to dorsal plate; second, third, and fourth pair lateral at level of greatest width of plate; sixth pair posterior to stigmata. Dorsal opisthosoma with two pairs of medium sized setae (length 46-32 μ). All coxal setae, except posterolateral seta of coxa II, rather small, posterolateral seta of coxa II quite large. Proximal posterodorsal seta of each femur I and femur II minute; all other dorsal seta, anterolateral setae, posterolateral setae, posteroventral setae of legs I-II, and anteroventral setae of leg II-IV rather large or at least of medium length; other ventral leg setae small and rather slender.

MALE: Median length of idiosoma, 905 μ ; greatest width, 705 μ . Holovenral plate narrowly spade shaped (median length, 327 μ ; greatest width, 537 μ); narrow elongate anterior projection bearing genital orifice apically; pos-

terior end narrowing to blunt point. Ventral idiosomal setae mostly small (length 16-33 μ); holoverital plate with first three pairs of sternal setae on or near lateral margins; fourth pair of sternal setae posterior to third pair at level of posterior end of plate; genital setae close together at posterior end of plate directly between fourth sternal setae. Intercoxa IV area with five pairs of setae; anal plate bearing pair of adanal setae and single postanal seta. Dorsal plate diamond shaped as in female (median length, 736 μ ; greatest width, 537 μ). Six pairs of rather large (length 83-117 μ) dorsal podosomal setae located anterior and lateral to dorsal plate margins; first pair close together anterior to dorsal plate; second, third, and fourth pairs form group anterolateral to plate; fifth pair lateral to place of greatest width of plate; sixth pair posterior to stigmata. Dorsal opisthosoma posterior to dorsal plate with two pairs of rather large setae (length 104-119 μ). Proximal posterodorsal seta of each femur I and femur II minute; all other dorsal setae, anterolateral setae, posterolateral setae, posteroventral setae of legs I-II, and anteroventral setae of legs III-IV rather large or at least of medium length; other ventral leg setae slender, small to medium in length.

VENEZUELAN RECORDS (25 females, 23 males, and 1 nymph): Twenty collections of this spinturnicid mite were made in Venezuela. Eighteen of them were from *Eptesicus montosus*, in Dto. Federal (16) and Carabobo (2); a single collection (1 female) was from *Myotis keaysi* in Miranda; and 1 collection of 2 females and 1 male was from *Eptesicus fuscus* in Dto. Federal. Collections were made in the months of July (10), August (7), November (2), and December (1).

REMARKS: *S. bakeri* belongs to Rudnick's (1960) second group of *Spinturnix* mites. It may be differentiated from other species of the genus in Venezuela by the following characters: most lateroventral leg setae are long, particularly the posteroventral setae of leg II and the anteroventral setae of leg III; the proximal anteroventral seta of each femur I and II is long, but the posterodorsal seta is minute; the proximal posterodorsal seta of femur II and IV is long; and the dorsal opisthosoma, posterior to the dorsal plate in both females and males, bears two pairs of setae (those of the female are smaller than those of the male). The latter of these characters differentiates *S. bakeri* from *S. orri*, *S. mexicanus*, and *S. surinamensis*.

S. bakeri has been recorded primarily from *Eptesicus fuscus* throughout North America

(Rudnick, 1960). The above Venezuelan records, most of them from *Eptesicus montosus*, are the first reported from the Neotropical region.

Spinturnix surinamensis Dusbabek and Lukoschus, 1971

Spinturnix surinamensis Dusbabek and Lukoschus, 1971: 150-154.

DESCRIPTION

FEMALE: Median length of idiosoma, 1,375 μ ; greatest width, 916 μ . Anterior end of sternal plate oval in shape, anterior end broadly rounded, but posterior end truncate (straight) between third sternal setae (median length, 169 μ ; greatest width, 161 μ). All ventral idiosomal setae rather small (length 11-32 μ); first three pairs of sternal setae on lateral margins of sternal plate; fourth pair of sternal setae posterolateral to third pair; genital setae on integument lateral to posterior end of genital plate; ventral idiosoma posterior to genital plate bearing from seven to nine pairs of setae plus pair of adanal setae and single postanal seta on anal plate. Dorsal plate generally oval to diamond shaped (median length, 738 μ ; greatest width, 508 μ); anterior end narrowly rounded with invaginations anterolaterally; greatest width at level between coxae II and III. Six pairs of medium-sized to large (length 62-119 μ) dorsal podosomal setae laterally adjacent to dorsal plate; first pair close together at anterior end of plate; second, third, and fourth pairs form group anterolateral to plate; fifth pair lateral to widest point of dorsal plate; sixth pair posterior to stigmata. Dorsal opisthosoma with seven to nine pairs of medium to rather large setae (length 28-117 μ). Coxal setae, except posterolateral seta of coxa II, small to medium sized; posterolateral seta of coxa II quite large, long; proximal posterodorsal seta of each femur I-II minute; all other dorsal setae, antero- and posterolateral setae, posteroventral setae of legs I-II, and anteroventral setae of legs III-IV quite large; other ventral leg setae small to medium sized.

MALE: Median length of idiosoma, 978 μ ; greatest width, 757 μ . Holoverital plate narrowly elongate, spade shaped (median length, 383 μ ; greatest width, 217 μ). Ventral idiosomal setae slender and small (length 20-38 μ); first three sternal setae on or near lateral margins of holoverital plate; fourth sternal setae lateral to posterior end of plate; genital setae close together at posterior end of holoverital plate. Intercoxa IV area with four pairs of setae; anal plate with pair of adanal setae and single post-

anal seta. Dorsal plate oval to diamond shaped (median length, 799 μ ; greatest width, 543 μ); posterior end narrower with greatest width at level between coxae II and III. Six pairs of rather large (length 86-128 μ) podosomal setae lateral and anterior to dorsal plate; first pair close together anterior to plate; second, third, and fourth pairs anterolateral to plate; sixth pair posterior to stigmata. Dorsal opisthosoma with one pair of rather large (length 120-124 μ) setae. Coxal setae, except posterolateral seta of coxa II, small to medium sized; posterolateral seta of coxa II quite large. Leg setation identical to that of female; proximal posterodorsal seta of each femur I and II minute.

VENEZUELAN RECORDS (7 females, 8 males, and 2 deutonymphs): This species is restricted to bats of the genus *Eptesicus*. The nine Venezuelan collections were from *E. brasiliensis* (7) and *E. andinus* (2). Collections were made in T.F. Amazonas (5), Barinas (2), and Monagas (2) during the months of April, June, July, and December.

REMARKS: *S. surinamensis* is the only other Venezuelan species of the second group of *Spinturnix*. The species is quite similar in general phenetic characters to *S. bakeri*. However, it can be easily distinguished from *S. bakeri* by the number of dorsal opisthosomal setae: i.e., females of *S. surinamensis* have seven to nine pairs of dorsal opisthosomal setae and the males four pairs, whereas both males and females of *S. bakeri* bear two pairs. Phenetically, *S. surinamensis* is intermediate between *S. orri* and *S. mexicanus*, neither of which have been reported from Venezuela. *S. surinamensis* differs from *S. orri* in the greater number of dorsal opisthosomal setae (seven to nine pairs rather than four plus pairs) in the females; in the larger size of the dorsal podosomal setae, especially the anteriormost pairs in both sexes; and in the shape of the female sternal plate (wider and more broadly rounded anterior end). *S. surinamensis* is more similar to *S. mexicanus* than to any other species of this group. However, it may be differentiated from the latter by the following characters: the dorsal plate of the female has an anterior, narrowly rounded apex with distinct anterolateral invaginations; the genital setae are off the plate near the posterolateral margins; and in the male the dorsal opisthosoma bears one pair of setae and the intercoxa IV area bears four pairs of setae.

This species, originally described from Surinam (Dusbabek and Lukoschus, 1971), has been recorded from three species of *Eptesicus*

(*E. melanopterus*, *E. brasiliensis*, and *E. andinus*).

Spinturnix subacuminatus Furman, 1966

Spinturnix subacuminatus Furman, 1966: 151-152.

DESCRIPTION

FEMALE: Median length of idiosoma, 1,108 μ ; greatest width, 810 μ . Sternal plate generally arrow shaped (median length, 182 μ ; greatest width, 140 μ); anterior end narrow, acute; posterior end truncate (straight) between third sternal setae. Ventral idiosomal setae small (length 15-38 μ); first 3 sternal setae on or off margins of sternal plate; however, setae bases always joined to plate; fourth sternal setae posterolateral to third setae; genital setae on or off posterolateral margins of small, short, genital plate. Ventral idiosoma posterior to genital plate with 5-7 pairs of setae; anal plate bears pair of adanal setae and single postanal seta. Dorsal plate oval to elongate, diamond shaped (median length, 726 μ ; greatest width, 434 μ); both anterior and posterior ends moderately rounded; greatest width at level between coxae II and III. Six pairs of medium-sized (length 46-64 μ) podosomal setae lateral to dorsal plate; first 4 pairs equidistant from each other anterolateral to plate; fifth pair lateral to point of greatest width of plate; sixth pair posterior to stigmata. Dorsal and terminal opisthosoma posterior to sixth podosomal seta with 15-18 pairs of medium sized to large (length 42-123 μ) setae. Coxal setae, except posterolateral seta of coxa II, small to medium sized; posterolateral seta of coxa II rather large. No minute dorsal setae on femora I-IV; however, proximal posterodorsal seta of each femur I and II smaller than most other leg setae; most dorsal leg setae, antero- and posterolateral leg setae, posteroventral setae of legs I-II and anteroventral setae of legs III-IV moderately to quite large; other ventral leg setae small to medium sized.

MALE: Median length of idiosoma, 768 μ ; greatest width, 656 μ . Holoventral plate somewhat spade shaped (median length, 271 μ ; greatest width, 240 μ). Ventral idiosomal setae generally slender, small (length 16-37 μ); first three pairs of sternal setae on or near lateral margins of holoventral plate; fourth sternal setae posterolateral to end of holoventral plate; genital setae close together between fourth sternal setae and just posterior to holoventral plate. Intercoxa IV area with four pairs of setae; anal plate with pair of adanal setae and single postanal seta. Dorsal plate oval to elongate, dia-

mond shaped (median length, 658 μ ; greatest width, 463 μ); anterior and posterior ends moderately rounded; greatest width at level between coxae II and III. Six medium-sized (length 48-73 μ) podosomal setae anterior and lateral to dorsal plate; first four pairs equidistant from each other anterolateral to plate; fifth pair lateral to point of greatest width of dorsal plate; sixth setae posterior to stigmata. Dorsal opisthosoma with only one pair of moderately large (length 74-79 μ) setae. Coxal and leg setae as in female; no minute dorsal setae proximally on femora I-IV; however, proximal posterodorsal seta of each femur I-II smaller than most other dorsal leg setae.

VENEZUELAN RECORDS (97 females, 100 males, 67 deutonymphs, and 19 protonymphs): All 93 collections of *S. subacuminatus* were from bats of the genus *Rhogeessa*. There were 80 collections from *R. minutilla*, 7 from *R. tumida*, and 6 from *Rhogeessa* sp. Most (75) of the Venezuelan collections were made in Lara during the period of July 14-18, 1968. Collections were also made in Zulia (8), Miranda (2), Falcón

(3), Guajira (1), Monagas (1), Nueva Esparta (1), Apure (1), and Yaracuy (1). In addition to the numerous collections made during July, others were made during January, March, June, October, November, and December.

REMARKS: *S. subacuminatus* is the only species of Rudnick's (1960) third group found in Venezuela. This species may be distinguished from all other species of *Spinturnix* by the larger size of all dorsal leg setae (the proximal posterodorsal seta of each femur I and II, shorter than other dorsal leg setae but never minute as in other species) and the dorsal and terminal opisthosoma posterior to the stigma bearing 14-17 pairs of setae in females but only I pair in males. *S. subacuminatus* has been recorded from several species of the genus *Rhogeessa* in Panama (Furman, 1966) as well as in Venezuela.

Inserti Sedis

Two males (SVP-00331) from *Carollia brevicauda*, 4 km NNW Caracas (1,550 m), Los Venados, Dto. Federal, Venezuela, July 19, 1965.

Appendix 1. Frequency of occurrence of spinturnicid mites on species of bats in Venezuela. (Asterisk denotes the species of mite most often collected from the host species.)

	Host Data		Parasite Data	
	Total Collected	Number Parasitized	Percent Parasitized	Percent of Total on Host
FAMILY NOCTILIONIDAE				
<i>Noctilia labialis</i>	535	2	0.4	
<i>Periglischrus iheringi</i>				3
<i>Noctilio leporinus</i>	87	1	1.1	
<i>Periglischrus ojasii</i>				2
FAMILY EMBALLONURIDAE				
<i>Rhynchonycteris naso</i>	160	1	0.6	
<i>Periglischrus iheringi</i>				4
<i>Saccopteryx bilineata</i>	420	2	0.5	
<i>Periglischrus</i> sp.				1
<i>Periglischrus torrealbai</i>				1
<i>Saccopteryx canescens</i>	23	1	4.3	
<i>Spinturnix americanus</i>				2
SUPERFAMILY PHYLLOSTOMOIDEA				
FAMILY MORMOOPIDAE				
<i>Mormoops megalophylla</i>	88	9	10.2	
* <i>Cameronieta strandmanni</i>				51
<i>Pteronotus davyi</i>	222	31	14.0	
* <i>Cameronieta elongatus</i>				84
<i>Periglischrus iheringi</i>				3
<i>Pteronotus parnellii</i>	505	46	9.1	
* <i>Cameronieta elongatus</i>				216
<i>Cameronieta thomasi</i>				3
<i>Periglischrus acutisternus</i>				1
<i>Periglischrus gameroi</i>				1
<i>Periglischrus caligus</i>				2
<i>Periglischrus iheringi</i>				3

Appendix I (continued)

<i>Pteronotus suapurensis</i>	51	11	21.6		
* <i>Cameronieta elongatus</i>				37	97.4
<i>Periglischrus acutisternus</i>				1	2.6
FAMILY PHYLLOSTOMIDAE					
SUBFAMILY PHYLLOSTOMINAE					
<i>Lonchorhina aurita</i>	131	21	16.0		
* <i>Periglischrus gameroi</i>				39	100
<i>Lonchorhina orinocensis</i>	252	13	5.1		
* <i>Periglischrus gameroi</i>				23	100
<i>Macrophyllum macrophyllum</i>	50	5	10.0		
<i>Cameronieta elongatus</i>				1	14.3
<i>Periglischrus</i> sp.				5	71.4
<i>Periglischrus torrealbai</i>				1	14.3
<i>Micronycteris megalotis</i>	101	10	9.9		
<i>Periglischrus iheringi</i>				1	3.4
* <i>Periglischrus micronycteridis</i>				35	96.6
<i>Micronycteris microtis</i>	45	1	2.2		
* <i>Periglischrus micronycteridis</i>				3	100
<i>Micronycteris minuta</i>	66	3	4.5		
* <i>Periglischrus micronycteridis</i>				4	100
<i>Micronycteris nicefori</i>	192	7	3.6		
* <i>Periglischrus parvus</i>				18	100
<i>Mimon crenulatum</i>	72	23	31.9		
* <i>Periglischrus dusbabcki</i>				68	98.6
<i>Periglischrus iheringi</i>				1	1.4
<i>Phylloderma stenops</i>	28	12	42.9		
<i>Cameronieta elongatus</i>				4	5.7
* <i>Periglischrus grandisoma</i>				24	34.3
<i>Periglischrus ojasii</i>				1	1.4
* <i>Periglischrus paratorrealbai</i>				40	57.1
<i>Periglischrus torrealbai</i>				1	1.4
<i>Phyllostomus discolor</i>	327	147	44.9		
* <i>Periglischrus acutisternus</i>				174	53.2
<i>Periglischrus iheringi</i>				2	0.6
<i>Periglischrus ojasii</i>				3	0.9
<i>Periglischrus paravargasi</i>				5	1.5
* <i>Periglischrus torrealbai</i>				143	43.7
<i>Phyllostomus elongatus</i>	117	30	25.6		
* <i>Periglischrus acutisternus</i>				57	59.4
* <i>Periglischrus torrealbai</i>				39	40.6
<i>Phyllostomus hastatus</i>	504	200	39.7		
* <i>Periglischrus acutisternus</i>				334	55.9
<i>Periglischrus caligus</i>				1	0.2
<i>Periglischrus iheringi</i>				3	0.5
<i>Periglischrus ojasii</i>				1	0.2
* <i>Periglischrus torrealbai</i>				258	43.2
<i>Tonatia bidens</i>	19	1	5.3		
<i>Periglischrus paratorrealbai</i>				6	85.7
<i>Periglischrus tonatii</i>				1	14.3
<i>Tonatia brasiliensis</i>	51	2	3.9		
* <i>Periglischrus tonatii</i>				3	100
<i>Tonatia carrikeri</i>	2	2	100		
* <i>Periglischrus tonatii</i>				12	100
<i>Tonatia silvicola</i>	42	5	11.9		
* <i>Periglischrus tonatii</i>				38	100
<i>Trachops cirrhosus</i>	362	36	9.9		
<i>Periglischrus ojasii</i>				1	1.0
* <i>Periglischrus paracutisternus</i>				103	99.0
<i>Vampyrum spectrum</i>	5	1	20		
<i>Periglischrus iheringi</i>				3	100
SUBFAMILY GLOSSOPHACINAE					
<i>Anoura caudifer</i>	120	49	40.8		
<i>Periglischrus iheringi</i>				2	1.4
* <i>Periglischrus paravargasi</i>				143	97.9
<i>Periglischrus torrealbai</i>				1	0.7
<i>Anoura geoffroyi</i>	190	64	34.2		
<i>Cameronieta elongatus</i>				1	0.6

Appendix I (continued)

<i>Periglischrus</i> sp.				1	0.6
<i>Periglischrus iheringi</i>				6	3.4
<i>Periglischrus ojasii</i>				4	2.2
<i>Periglischrus paravargasi</i>				13	7.3
<i>Periglischrus paracutisternus</i>				11	6.2
* <i>Periglischrus vargasi</i>				142	79.8
<i>Anoura</i> sp. A.	91	26	28.6		
<i>Periglischrus</i> sp.				1	1.5
<i>Periglischrus herrerae</i>				1	1.5
<i>Periglischrus iheringi</i>				1	1.5
<i>Periglischrus paravargasi</i>				13	20.0
* <i>Periglischrus vargasi</i>				49	75.4
<i>Glossophaga longirostris</i>	837	133	15.8		
* <i>Periglischrus caligus</i>				325	99.7
<i>Periglischrus iheringi</i>				4	2.2
<i>Periglischrus ojasii</i>				1	0.3
<i>Glossophaga soricina</i>	866	92	10.6		
* <i>Periglischrus caligus</i>				255	98.5
<i>Periglischrus iheringi</i>				2	0.8
<i>Periglischrus ojasii</i>				2	0.8
<i>Leptonycteris curasoae</i>	765	56	7.3		
<i>Periglischrus ojasii</i>				3	1.5
* <i>Periglischrus paracaligus</i>				190	97.9
<i>Periglischrus torrealbai</i>				1	0.5
<i>Lionycteris spurrelli</i>	175	8	4.6		
* <i>Periglischrus hopkinsi</i>				15	100
<i>Lonchophylla robusta</i>	26	2	7.7		
<i>Periglischrus</i> sp.				1	33.3
<i>Periglischrus hopkinsi</i>				2	66.7
SUBFAMILY CAROLLINIINAE					
<i>Carollia brevicauda</i>	563	5	0.8		
* <i>Periglischrus iheringi</i>				24	92.3
<i>Spinturnix</i> sp.				2	7.7
<i>Carollia perspicillata</i>	4305	16	0.3		
<i>Cameronieta elongatus</i>				1	3.0
<i>Periglischrus</i> sp.				1	3.0
<i>Periglischrus acutisternus</i>				1	3.0
* <i>Periglischrus iheringi</i>				13	39.4
<i>Periglischrus ojasii</i>				7	21.2
<i>Periglischrus torrealbai</i>				10	30.3
<i>Carollia</i> sp.	1797	3	0.1		
<i>Periglischrus acutisternus</i>				3	50.0
<i>Periglischrus iheringi</i>				2	33.3
<i>Periglischrus micronycteridis</i>				1	16.7
<i>Rhinophylla pumilio</i>	61	22	36.1		
* <i>Periglischrus ramirezi</i>				78	100
SUBFAMILY STURNIRINAE					
<i>Sturnira bidens</i>	16	1	6.2		
* <i>Periglischrus ojasii</i>				50	98.0
<i>Periglischrus vargasi</i>				1	2.0
<i>Sturnira bogotensis</i>	4	4	100		
* <i>Periglischrus ojasii</i>				4	100
<i>Sturnira erythromos</i>	108	36	33.3		
* <i>Periglischrus ojasii</i>				64	100
<i>Sturnira lilium</i>	2291	508	22.1		
<i>Cameronieta elongatus</i>				3	0.2
<i>Periglischrus</i> sp.				4	0.3
<i>Periglischrus acutisternus</i>				1	0.1
<i>Periglischrus caligus</i>				1	0.1
<i>Periglischrus herrerae</i>				2	0.1
<i>Periglischrus iheringi</i>				13	0.9
* <i>Periglischrus ojasii</i>				1423	98.3
<i>Sturnira ludovici</i>	363	103	28.3		
<i>Periglischrus herrerae</i>				1	0.5
<i>Periglischrus iheringi</i>				21	9.5
* <i>Periglischrus ojasii</i>				198	90.0

Appendix 1 (continued)

<i>Sturnira tildae</i>	218	23	10.5		
<i>Cameronieta elongatus</i>				1	2.5
* <i>Periglischrus ojasii</i>				39	97.5
<i>Sturnira</i> sp.	30	1	3.3		
<i>Periglischrus iheringi</i>				3	100
SUBFAMILY STENODERMATINAE					
<i>Ametrida centurio</i>	151	3	2.0		
* <i>Periglischrus iheringi</i>				10	100
<i>Artibeus cinereus</i>	438	98	22.3		
<i>Periglischrus acutisternus</i>				2	0.9
* <i>Periglischrus iheringi</i>				217	96.9
<i>Periglischrus ojasii</i>				4	1.8
<i>Periglischrus torrealbai</i>				1	0.4
<i>Artibeus concolor</i>	320	2	1.6		
<i>Periglischrus iheringi</i>				3	100
<i>Artibeus fuliginosus</i>	321	4	1.2		
<i>Periglischrus acutisternus</i>				2	33.3
<i>Periglischrus iheringi</i>				2	33.3
<i>Periglischrus torrealbai</i>				2	33.3
<i>Artibeus hartii</i>	126	11	8.7		
* <i>Periglischrus iheringi</i>				29	93.5
<i>Periglischrus ojasii</i>				2	6.5
<i>Artibeus jamaicensis</i>	2302	363	15.8		
<i>Periglischrus acutisternus</i>				6	0.5
<i>Periglischrus caligus</i>				3	0.3
<i>Periglischrus gameroi</i>				1	0.1
* <i>Periglischrus iheringi</i>				1125	98.1
<i>Periglischrus ojasii</i>				8	0.7
<i>Periglischrus torrealbai</i>				3	0.3
<i>Artibeus lituratus</i>	1620	408	25.2		
* <i>Periglischrus iheringi</i>				1091	99.8
<i>Periglischrus ojasii</i>				2	0.2
<i>Chiroderma salvini</i>	29	9	31.0		
* <i>Periglischrus iheringi</i>				24	100
<i>Chiroderma trinitatum</i>	67	12	17.9		
* <i>Periglischrus iheringi</i>				41	100
<i>Chiroderma villosum</i>	724	2	0.3		
<i>Periglischrus acutisternus</i>				1	50
<i>Periglischrus iheringi</i>				1	50
<i>Ectophylla macconnelli</i>	71	7	9.9		
* <i>Periglischrus iheringi</i>				8	88.9
<i>Periglischrus torrealbai</i>				1	11.1
<i>Sphaeronycteris toxophyllum</i>	157	1	0.6		
<i>Periglischrus iheringi</i>				2	100
<i>Uroderma bilobatum</i>	677	213	31.5		
* <i>Periglischrus iheringi</i>				641	99.4
<i>Periglischrus ojasii</i>				4	0.6
<i>Uroderma magnirostrum</i>	367	10	2.7		
<i>Periglischrus acutisternus</i>				2	5.1
* <i>Periglischrus iheringi</i>				37	94.9
<i>Vampyressa bidens</i>	117	12	10.3		
* <i>Periglischrus iheringi</i>				16	88.9
<i>Periglischrus ojasii</i>				2	11.1
<i>Vampyressa pusilla</i>	115	22	19.1		
* <i>Periglischrus iheringi</i>				40	100
<i>Vampyrodes caraccioli</i>	23	3	13.0		
<i>Periglischrus iheringi</i>				3	100
<i>Vampyrops aurarius</i>	62	28	45.2		
* <i>Periglischrus iheringi</i>				129	100
<i>Vampyrops helleri</i>	821	324	39.5		
* <i>Periglischrus iheringi</i>				1020	99.4
<i>Periglischrus ojasii</i>				5	0.5
<i>Periglischrus vorgasi</i>				1	0.1
<i>Vampyrops saccharus</i>	3	1	33.3		
<i>Periglischrus iheringi</i>				2	100
<i>Vampyrops umbratus</i>	221	76	34.3		
* <i>Periglischrus iheringi</i>				245	97.6

Appendix 1 (continued)

<i>Periglischrus ojasii</i>				6	2.4
<i>Vampyrops vittatus</i>	10	5	10.0		
° <i>Periglischrus iheringi</i>				20	100
SUBFAMILY DESMODONTINAE					
<i>Desmodus rotundus</i>	964	80	8.2		
<i>Periglischrus acutisternus</i>				14	8.8
<i>Periglischrus caligus</i>				4	2.5
<i>Periglischrus gameroi</i>				2	1.3
° <i>Periglischrus herrerae</i>				115	72.3
<i>Periglischrus iheringi</i>				6	3.8
<i>Periglischrus ojasii</i>				11	6.9
<i>Periglischrus tonatii</i>				1	0.6
<i>Periglischrus torrealbai</i>				6	3.8
SUPERFAMILY VESPERTILIONOIDEA					
FAMILY NATALIDAE					
<i>Natalus tumidirostris</i>	175	4	2.3		
° <i>Periglischrus natali</i>				5	100
FAMILY VESPERTILIONIDAE					
<i>Eptesicus andinus</i>	13	2	15.4		
° <i>Spinturnix surinamensis</i>				4	100
<i>Eptesicus brasiliensis</i>	64	7	10.9		
° <i>Spinturnix surinamensis</i>				13	100
<i>Eptesicus furinalis</i>	16	1	6.3		
<i>Periglischrus gameroi</i>				1	100
<i>Eptesicus fuscus</i>	4	1	25.0		
° <i>Spinturnix bakeri</i>				3	100
<i>Eptesicus montosus</i>	36	18	50.0		
° <i>Spinturnix bakeri</i>				46	100
<i>Myotis albescens</i>	86	34	39.5		
<i>Periglischrus iheringi</i>				1	1.6
° <i>Spinturnix americanus</i>				62	98.4
<i>Myotis keaysi</i>	55	26	47.2		
° <i>Spinturnix americanus</i>				59	98.3
<i>Spinturnix bakeri</i>				1	1.7
<i>Myotis nigricans</i>	153	78	50.8		
<i>Periglischrus iheringi</i>				1	0.4
° <i>Spinturnix americanus</i>				251	99.6
<i>Rhogeessa minutilla</i>	225	80	35.5		
° <i>Spinturnix subacuminatus</i>				264	100
<i>Rhogeessa tumida</i>	25	8	32.0		
<i>Periglischrus paracutisternus</i>				1	7.7
° <i>Spinturnix subacuminatus</i>				12	92.3
<i>Rhogeessa</i> sp.	3	3	100		
° <i>Spinturnix subacuminatus</i>				13	100
FAMILY MOLOSSIDAE					
<i>Eumops glaucinus</i>	81	2	2.5		
<i>Periglischrus iheringi</i>				1	50
<i>Spinturnix americanus</i>				1	50
<i>Molossops planirostris</i>	241	2	0.2		
<i>Periglischrus acutisternus</i>				1	50
<i>Periglischrus torrealbai</i>				1	50
<i>Molossus ater</i>	410	1	0.2		
<i>Periglischrus iheringi</i>				1	50
<i>Periglischrus</i> sp.				1	50

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ADDENDUM

A major shipment of spinturnicid mites (334 collections, 905 specimens) identified by Machado-Alliston arrived from Venezuela while we were correcting the second galley of this paper. Although the percentages of specimens collected from principal hosts varied somewhat from those given for each species, the additional data confirm the host-parasite relationships reported herein. It is likely that some specimens contained in the delayed shipment were collected in states other than those reported and thus some species probably have a greater geographical distribution than indicated.

Host data for the 334 collections are as follows:

Genus *Cameronieta*

- C. thomasi*: 3 collections (5 males, 2 nymphs) from *Pteronotus parnellii* (2) and *Carollia castanea* (1).

Genus *Periglischrus*

- P. microulycteridis*: 6 collections (18 females) from *Microulycteris megalotis*.
- P. torrealbai*: 7 collections (11 females, 13 males, 4 protonymphs) from *Phyllostomus hastatus*.
- P. paratorrealbai*: 1 collection (3 females) from *Phylloderma stenops*.
- P. caligus*: 32 collections (131 females, 6 males, 1 deutonymph, 1 protonymph) from *Glossophaga soricina* (28), *Sturnira lilium* (3), and *Phyllistomus hastatus* (1).
- P. vargasi*: 4 collections (4 females, 1 male) from *Anoura geoffroyi* (3) and *Vanpyrops helleri* (1).
- P. hopkinsi*: 2 collections (2 females) from *Lionycteris spurrelli*.
- P. herrerae*: 1 collection (1 male) from *Sturnira lilium*.

P. ojasii: 10 collections (17 females, 4 males, 1 deutonymph) from *Sturnira lilium* (3), *Glossophaga soricina* (3), *Tadarida europs* (1), *Carollia perspicillata* (1), and *Vampyrops helleri* (1).

P. ramirezi: 5 collections (4 females, 2 males, 1 deutonymph) from *Rhinophylla pumilio* (3), *Carollia perspicillata* (1), and *Chiroderma villosum* (1).

P. iheringi: 260 collections (669 specimens) from *Artibeus jamaicensis* (116),

A. lituratus (60), *A. hartii* (62), *A. cinereus* (1), *Vampyrops umbratus* (10), *V. helleri* (1), *Uroderma bilobatum* (3), *Glossophaga soricina* (3), *Chiroderma salvini* (1), *Anoura caudifera* (1), and *Phyllostomus hastatus* (1).

Genus *Spinturnix*

S. americanus: 2 collections (1 female, 2 males) from *Myotis nigricans*.

S. bakeri: 1 collection (1 protonymph) from *Eptesicus brasiliensis*.