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THE PTERODECTINE FEATHER MITES OF HUMMINGBIRDS:  
THE GENUS *TOXERODECTES* PARK AND ATYEO (THE  
*LECROYAE* AND *GLADIGER* GROUPS)<sup>1</sup>  
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ABSTRACT

The remaining species of the genus *Toxerodectes* are (re)described. These include *T. gladiger* (Trouessart) and the following new species: *T. attenuatus* from *Florisuga m. mellivora*, Mexico; *T. grandissimus* from *Campylopterus h. hemileucurus*, Mexico, Nicaragua; *T. heliomasteris* from *Heliomaster longirostris pallidiceps*, Mexico, *H. c. constantii*, Nicaragua, *H. c. leocadiae*, Mexico; *T. lecrovae* from *Lampornis clemenciae bessophilus*, Mexico, *L. c. clemenciae*, Texas, *L. a. amethystinus*, Mexico, *L. viridipallens ovandensis*, Mexico, *Lamprolaima r. rhami*, Mexico; *T. parallelus* from *Eupetomena m. macroura*, Brazil; *T. subulatus* from *Colibri serrirostris*, Brazil; *T. zusii* from *Urosticte b. benjamini*, Ecuador, *U. ruficrissa*, Colombia.

The genus *Toxerodectes* is divided into three species groups as defined in Park and Atyeo (1973). The cited paper, in addition to defining the groups, included a key to the species and (re)described the seven species of the *hastifolia* group. The present paper includes the three species of the *gladiger* group and the five species of the *lecrovae* group.

THE *GLADIGER* GROUP

*Toxerodectes attenuatus*, new species

MALE (holotype). Length, 352 $\mu$ ; width, 110 $\mu$ . Propodosomal shield 108 $\mu$  in length, 90 $\mu$  in width; external scapular setae separated by 43 $\mu$ , internal scapular setae by 32 $\mu$ . Scapular shields absent. Hysterosomal shield 214 $\mu$  in length, 87 $\mu$  in width; terminal cleft 27 $\mu$  in length. Ventral idiosoma with coxal fields I-IV open; genital organ 56 $\mu$  in length, extended to level of midway between *c* 2 and adanal discs; adanal discs 18 $\mu$  in diameter, separated center-to-center by 45 $\mu$ ; anal shields present. Setae: *sh*, 16 $\mu$  x 3 $\mu$ , bladelike; *d* 5, 40 $\mu$  in length, lanceolate; *d* 2 and *d* 4 in trapezoidal arrangement; *d* 4 at level of *l* 3. Tarsi IV not extended to level of *pae*; solenidion  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  1 shorter than  $\Phi$  on leg III.

FEMALE (paratype). Length, excluding hysterosomal appendages, 596 $\mu$ ; width, 160 $\mu$ . Propodosomal shield 148 $\mu$  in length, 120 $\mu$  in width; external scapular setae separated by 61 $\mu$ , internal scapular setae by 44 $\mu$ . Scapular shields absent. Hysterosomal shield 392 $\mu$  in length, 105 $\mu$  in width; terminal cleft narrowly U-shaped, 120 $\mu$  in length; hysterosomal appendages arising lateral to apices of lobes. Setae: *sh*, 24 $\mu$  x 4 $\mu$ , bladelike; *d* 5, 5 $\mu$  in length; *l* 5, 135 $\mu$  in length, basally dilated; *d* 2 and *d* 4 in trapezoidal arrangement; *pai* inserted anterior to the level of *l* 5;  $\Phi$  on tibia IV shorter than  $\Phi$  on leg III;  $\sigma$  1 shorter than  $\Phi$  on leg III.

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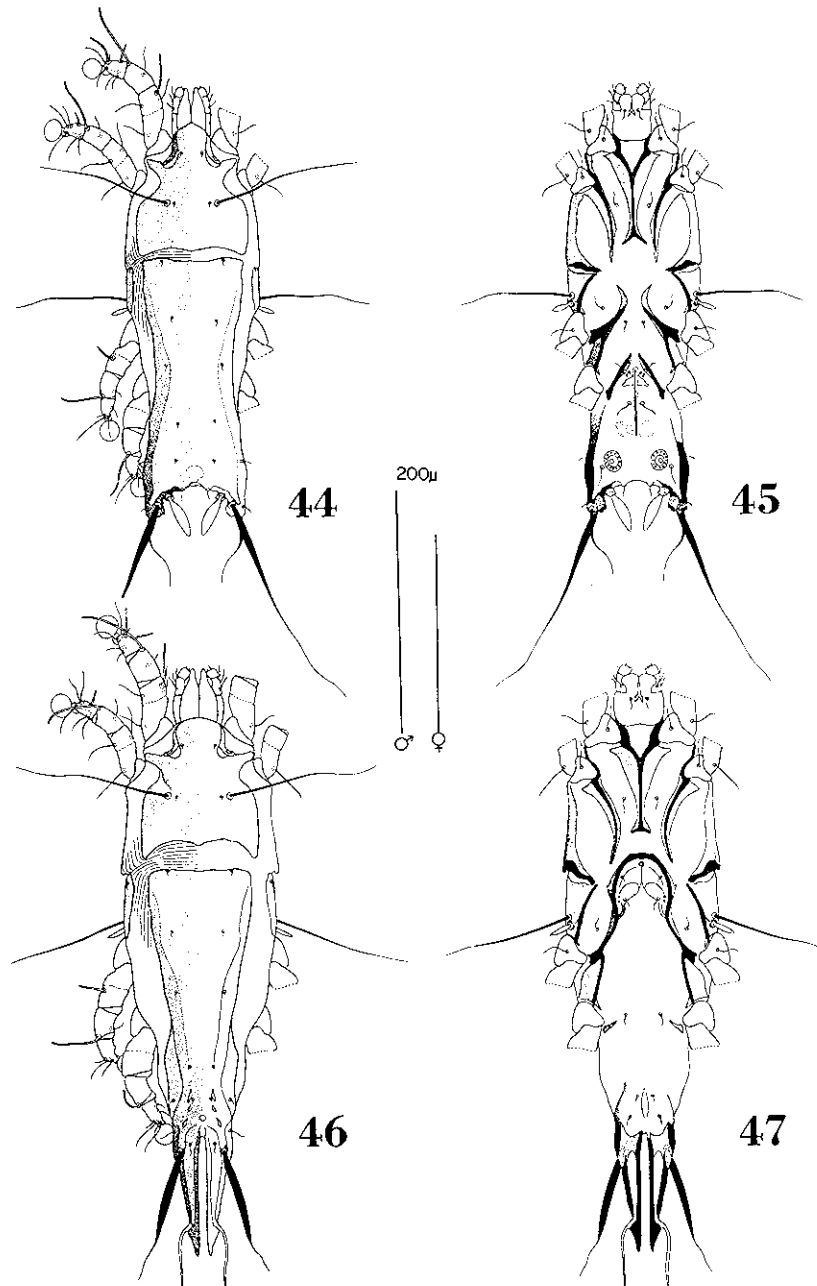
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Figs. 44-47. *Toxerodectes attenuatus*, n. sp.: dorsal and ventral aspects of male (44, 45) and female (46, 47).

TYPE DATA. From *Florisuga m. mellivora*: ♂ holotype, 3 ♂♂, 9 ♀♀ paratypes, Vallee Nacional, Oaxaca, Mexico, March 9, 1961, L. L. Wolf; 3 ♀♀ paratypes, Escuilapa, Oaxaca, Mexico, April 9, 1939, M. del Toro Aviles; 2 ♀♀ paratypes, Futla, Oaxaca, Mexico, June 22, 1939, M. del Toro Aviles; 1 ♀ paratype, Escuilapa, Oaxaca, Mexico, April 17, 1939, M. del Toro Aviles. The holotype and paratypes and deposited in the University of Georgia; paratypes deposited: GAUD, NMNH.

REMARKS. This is one of two cases in which the type series of two *Toxerodectes* species were collected from the same study skin: *T. attenuatus* and *T. florisugae* from *Florisuga mellivora* and *T. grandissimus* and *T. kangi* from *Campylopterus hemileucurus*. Each double infestation occurred in Oaxaca and it is probable that contamination has resulted in questionable host associations for one of each pair of *Toxerodectes* species.

*Toxerodectes gladiger* (Trouessart)

*Proctophyllodes* (*Pterodectes*) *gladiger* Trouessart, 1885: 82-83.

*Pterodectes gladiger*: Poppe, 1888: 224.—Canestrini and Kramer, 1899: 127.—Radford, 1953: 214; 1958: 142, 143.

*Toxerodectes gladiger*: Park and Atyeo, 1971a: 78.

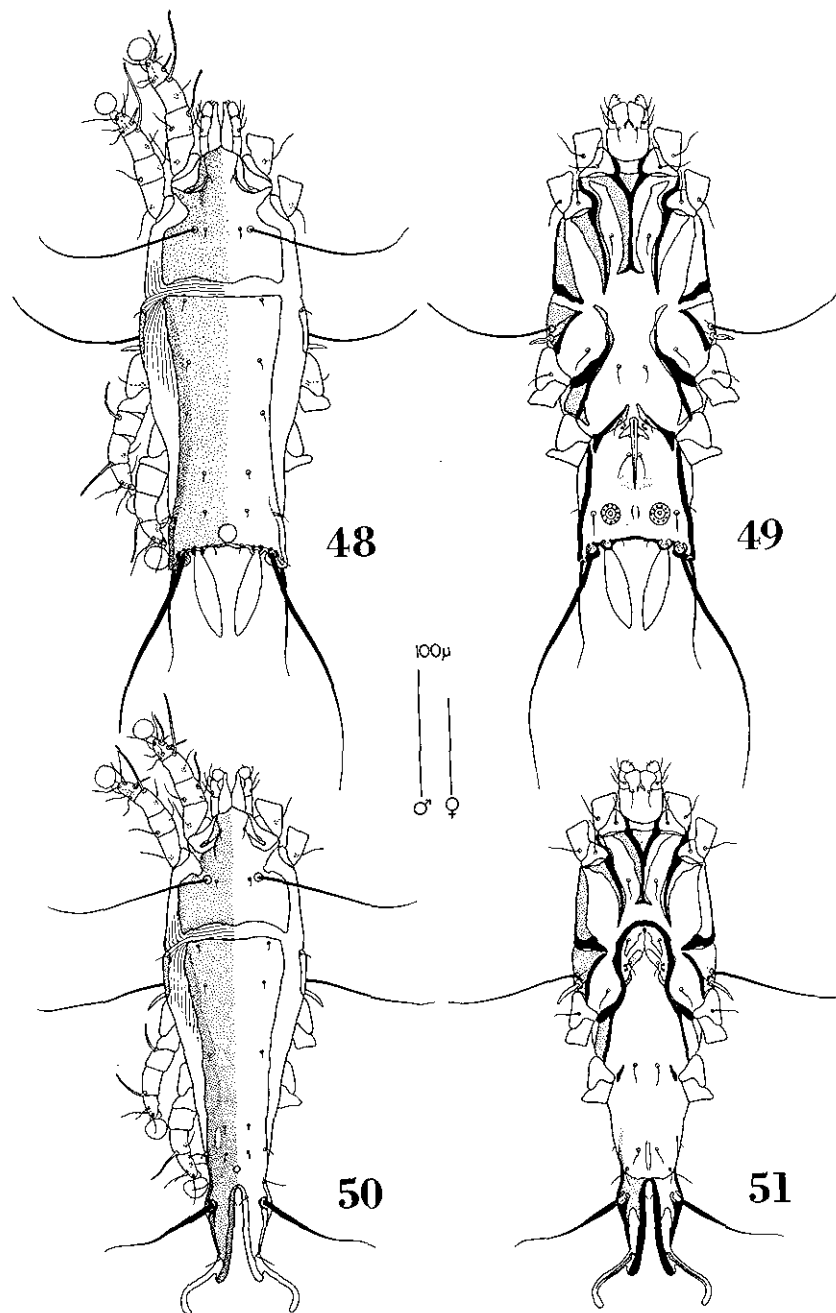
MALE (lectotype). Length, 389 $\mu$ ; width, 148 $\mu$ . Propodosomal shield 114 $\mu$  in length, 106 $\mu$  in width; external scapular setae separated by 48 $\mu$ , internal scapular setae by 31 $\mu$ . Scapular shields absent. Hysterosomal shield 226 $\mu$  in length, 103 $\mu$  in width; terminal cleft indistinct. Ventral idiosoma with coxal fields I-IV open; genital organ 57 $\mu$  in length, extended midway between *c* 2 and adanal discs; adanal discs 18 $\mu$  in diameter, separated center-to-center by 42 $\mu$ ; anal shields present. Setae: *sh*, 18 $\mu$  x 3 $\mu$ , bladelike; *d* 5, 75 $\mu$  in length, lanceolate; *d* 2 and *d* 4 in trapezoidal arrangement; *d* 4 at level of *l* 3. Tarsi IV not extended to level of setae *pae*; solenidion  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  1 subequal to  $\Phi$  on leg III.

FEMALE (paralectotype). Length, excluding hysterosomal appendages, 526 $\mu$ ; width, 156 $\mu$ . Propodosomal shield 127 $\mu$  in length, 122 $\mu$  in width; external scapular setae separated by 56 $\mu$ , internal scapular setae by 36 $\mu$ . Scapular shields absent. Hysterosomal shield 358 $\mu$  in length, 112 $\mu$  in width; terminal cleft narrow, V-shaped, 104 $\mu$  in length; hysterosomal appendages arising lateral to apices of the lobes. Setae: *sh*, 28 $\mu$  x 5 $\mu$ , bladelike; *d* 5, 8 $\mu$  in length; *l* 5, 107 $\mu$  in length, basally dilated; *d* 2 and *d* 4 in trapezoidal arrangement; *pai* inserted at level posterior to *l* 5;  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  1 subequal to  $\Phi$  on leg III.

TYPE DATA. From *Chrysolampis mosquitus*: ♂ lectotype, 2 ♂♂, 12 ♀♀ paralectotypes, "Guyanes, Equateur", other data unknown; 7 ♂♂, 17 ♀♀ paralectotypes, "Guyanes", other data unknown. The types are in the Trouessart Collections.

ADDITIONAL MATERIAL. From *Chrysolampis mosquitus*: 10 ♂♂, 23 ♀♀, South America, no other data; 1 ♂, Vega de Oropouche, Trinidad, British West Indies, February 2, 1960, T. H. G. Aitkin; 1 ♂, 2 ♀♀, Colombia, no other data.

REMARKS. *Chrysolampis mosquitus* appears to be the only host of *Toxerodectes gladiger*. However, there are numerous forms similar to *T. gladiger* from birds mentioned by Trouessart (1885) and in our collections.



Figs. 48-51. *Toxerodectes gladiger* (Trouessart): dorsal and ventral aspects of male (48, 49) and female (50, 51).

These are: *Anthracothonax viridis* (= *Lampornis viridis*), Puerto Rico; *Aphantochroa cirrochloris*, Brazil; *Chrysuronia oenone*, Ecuador; *Eulampis jugularis*, West Indies; *Lepidopyga coeruleogularis*, Panama; *Leucippus fallax*, Venezuela; and *Phaeochroa cuvieri*, Costa Rica.

*Toxerodectes parallelus*, new species

MALE (holotype). Length, 403 $\mu$ ; width, 162 $\mu$ . Propodosomal shield 114 $\mu$  in length, 133 $\mu$  in width; without lacunae; external scapular setae separated by 56 $\mu$ , internal scapular setae by 39 $\mu$ . Scapular shields absent. Hysterosomal shield 230 $\mu$  in length, 130 $\mu$  in width; without lacunae; terminal cleft 30 $\mu$  in length. Ventral idiosoma with coxal fields I-IV open; genital organ 63 $\mu$  in length, extended to level of anal shields; adanal discs 20 $\mu$  in diameter, separated center-to-center by 40 $\mu$ ; anal shields present. Setae: *sh*, 22 $\mu$  x 3 $\mu$ , bladelike; *d* 5, 45 $\mu$  in length, leaflike; *d* 2 and *d* 4 in rectangular arrangement; *d* 4 anterior to level of *l* 3. Tarsi IV not extended to level of setae *pae*; solenidion  $\Phi$  on tibia IV slightly longer than  $\Phi$  on tibia III;  $\sigma$  1 slightly shorter than  $\Phi$  on leg III.

FEMALE (paratype.) Length, excluding hysterosomal appendages, 584 $\mu$ ; width, 182 $\mu$ . Propodosomal shield 137 $\mu$  in length, 150 $\mu$  in width; without lacunae; external scapular setae separated by 65 $\mu$ , internal scapular setae by 43 $\mu$ . Scapular shields absent. Hysterosomal shield 370 $\mu$  in length, 142 $\mu$  in width; without lacunae; terminal cleft U-shaped, 103 $\mu$  in length; hysterosomal appendages arising lateral to apices of lobes. Setae: *sh*, 30 $\mu$  x 4 $\mu$ , bladelike; *d* 5, 15 $\mu$  in length, *l* 5, 120 $\mu$  in length, basally not dilated; *d* 2 and *d* 4 in a rectangular arrangement; *pai* inserted at the level of *l* 5;  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  1 slightly shorter than  $\Phi$  on leg III.

TYPE DATA. From *Eupetomena m. macroura*:  $\delta$  holotype, 2  $\delta$   $\delta$ , 2  $\varnothing$   $\varnothing$  paratypes, Mato Grosso, Brazil, September, 1882, collector unknown; 1  $\delta$ , 2  $\varnothing$   $\varnothing$  paratypes, Mato Grosso, Brazil, [circa 1885], H. H. Smith; 2  $\delta$   $\delta$ , 1  $\varnothing$   $\varnothing$  paratypes, Mato Grosso, Brazil, August 13, 1885, H. H. Smith; 2  $\varnothing$   $\varnothing$  paratypes, Rio Maderia, Brazil, 1906, W. Hoffmanns. The holotype and paratypes are deposited in the American Museum of Natural History; paratypes deposited in the University of Georgia.

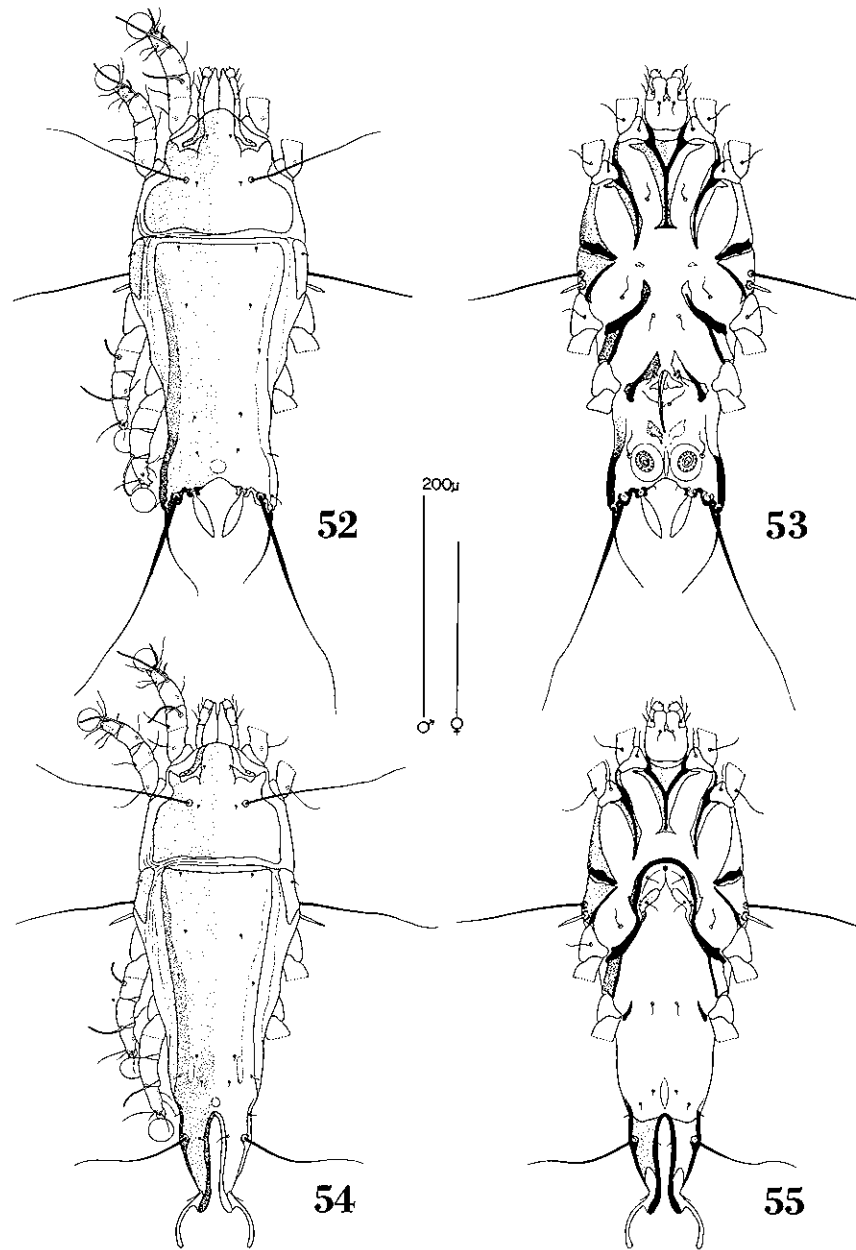
REMARKS. This species, apparently restricted to birds of the genus *Eupetomena*, is closely related to *T. gladiger* and *T. attenuatus*, but is separated by the male being larger and having setae *d* 5 more or less lanceolate rather than spatula-shaped, and by the female having the terminal cleft parallel-sided with setae *pai* positioned at the level of *l* 5. The name *parallelus* refers to the condition of the terminal cleft in the female.

THE LECROYAE GROUP

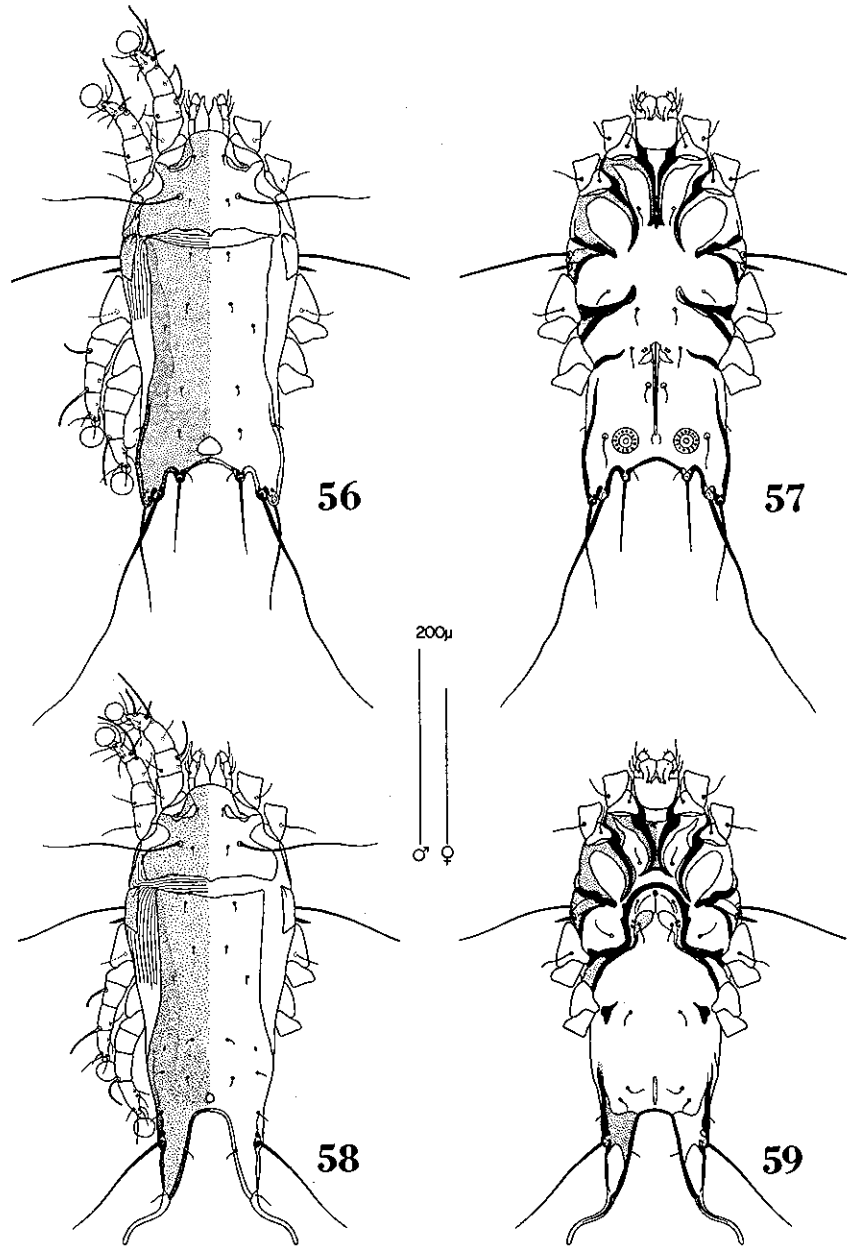
*Toxerodectes grandissimus*, new species

MALE (holotype). Length, 448 $\mu$ ; width, 195 $\mu$ . Propodosomal shield 109 $\mu$  in length, 150 $\mu$  in width; external scapular setae separated by 62 $\mu$ , internal scapular setae by 42 $\mu$ . Scapular shields present. Hysterosomal shield 284 $\mu$  in length, 156 $\mu$  in width; terminal cleft 52 $\mu$  in length. Ventral idiosoma with coxal fields I-IV open; genital organ 96 $\mu$  in length, extended to level of adanal discs; adanal discs 26 $\mu$  in diameter, separated center-to-center by 65 $\mu$ ; anal shields absent. Setae: *sh*, 23 $\mu$  x 2 $\mu$ , spiculiform;

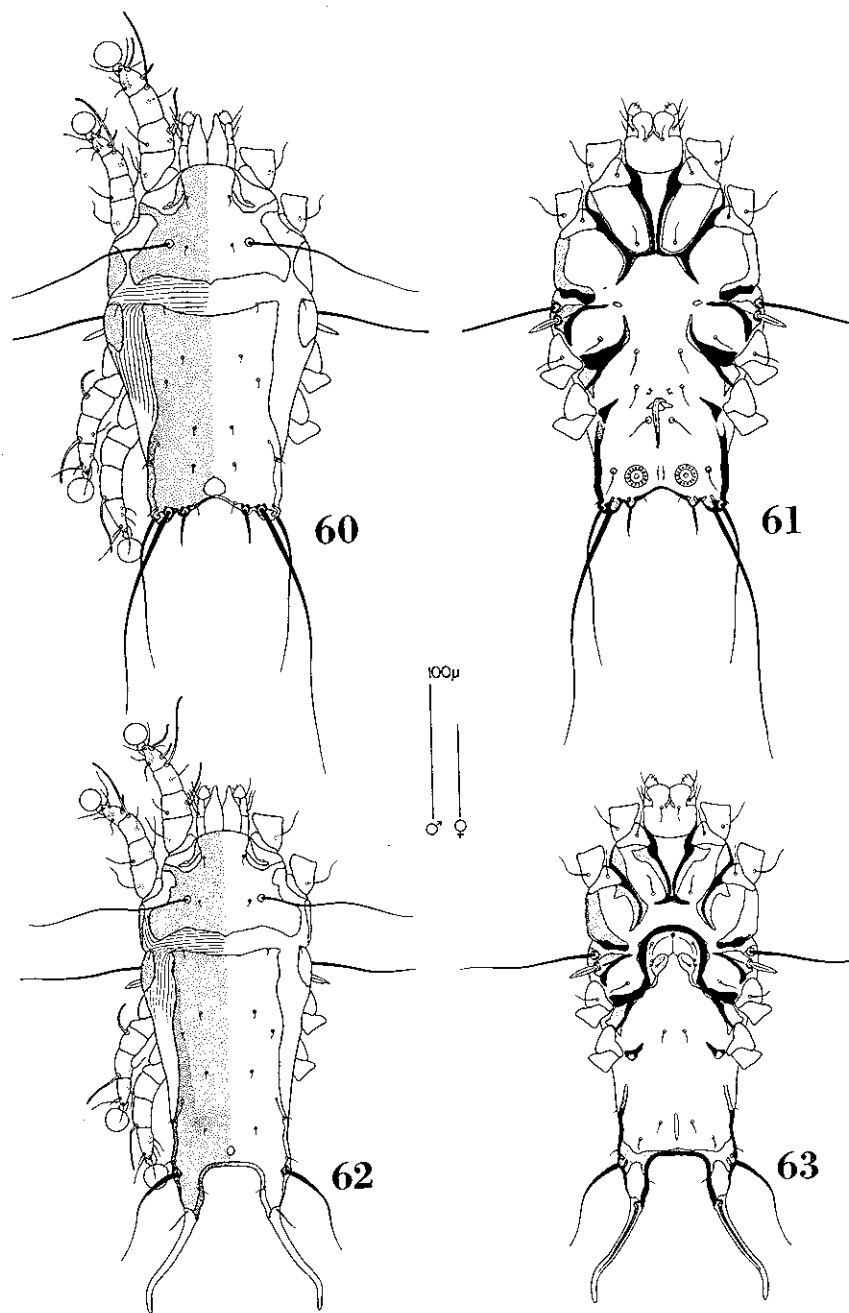




Figs. 52-55. *Toxerodectes parallelus*, n. sp.: dorsal and ventral aspects of male (52, 53) and female (54, 55).



Figs. 56-59. *Toxerodectes grandissimus*, n. sp.: dorsal and ventral aspects of male (56, 57) and female (58, 59).



Figs. 60-63. *Toxerodectes heliomasteris*, n. sp.: dorsal and ventral aspects of male (60, 61) and female (62, 63).

*d* 5, 70 $\mu$  in length, spiculiform; *d* 2 and *d* 4 in trapezoidal arrangement; *d* 4 at level of *l* 3. Tarsi IV not extended to level of setae *pae*; solenidion  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  *l* shorter than  $\Phi$  on leg III.

FEMALE (paratype). Length, excluding hysterosomal appendages, 616 $\mu$ ; width, 233 $\mu$ . Propodosomal shield 130 $\mu$  in length, 173 $\mu$  in width; external scapular setae separated by 78 $\mu$ , internal scapular setae by 48 $\mu$ . Scapular shields present. Hysterosomal shield 430 $\mu$  in length, 161 $\mu$  in width; terminal cleft broad, U-shaped, 122 $\mu$  in length; hysterosomal appendages arising from apices of lobes. Setae: *sh*, 23 $\mu$  x 2 $\mu$ , spiculiform; *d* 5, 8 $\mu$  in length; *l* 5, 156 $\mu$  in length, setiform; *d* 2 and *d* 4 in trapezoidal arrangement; *pai* inserted midlength of cleft;  $\Phi$  on tibia IV subequal to  $\Phi$  on leg III;  $\sigma$  *l* shorter than  $\Phi$  on leg III.

TYPE DATA. From *Campylopterus h. hemileucurus*:  $\delta$  holotype, 1  $\delta$ , 4  $\varphi$   $\varphi$  paratypes, Escuilapa, Oaxaca, Mexico, April 12, 1939, M. del Toro Aviles; 1  $\delta$ , 1  $\varphi$  paratypes, Vallee Nacional, Oaxaca, Mexico, April 22, 1961, L. L. Wolf; 1  $\varphi$  paratype, Soyaltepec, Oaxaca, Mexico, November 10, 1943, M. del Toro Aviles; 3  $\varphi$   $\varphi$  paratypes, San Rafael del Norte, Jinotega, Nicaragua, March 29, 1917, collector unknown. The holotype and paratypes are deposited in the University of Georgia; paratypes deposited: AMNH, NMNH.

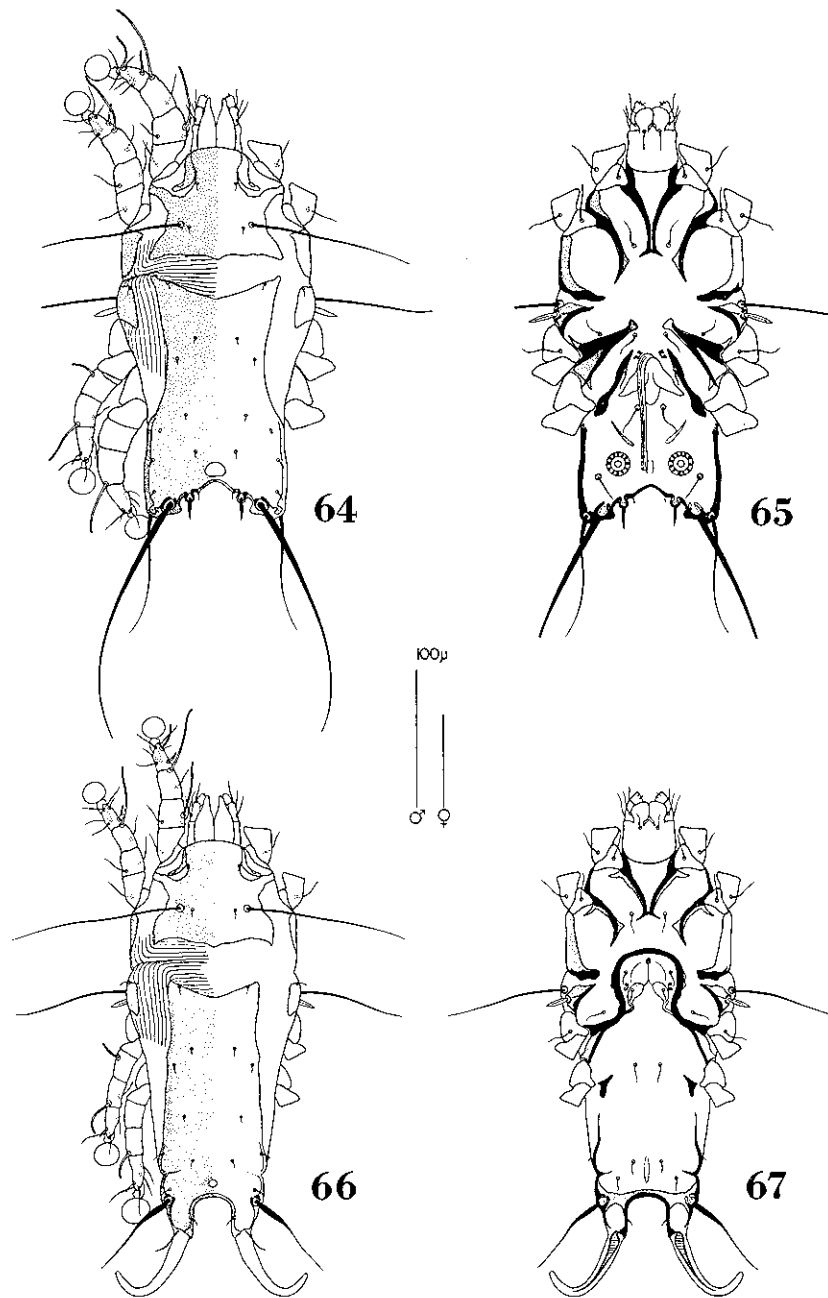
REMARKS. This taxon is readily separated from all the other species of *Toxerodectes* by its body size, and by the male having long, needle-like *d* 5. The name *grandissimus* refers to the large body size of both sexes.

*Toxerodectes heliomasteris*, new species

MALE (holotype). Length, 316 $\mu$ ; width, 169 $\mu$ . Propodosomal shield 96 $\mu$  in length, 125 $\mu$  in width; external scapular setae separated by 65 $\mu$ , internal scapular setae by 39 $\mu$ . Scapular shields present. Hysterosomal shield 166 $\mu$  in length, 104 $\mu$  in width; terminal cleft 18 $\mu$  in length. Ventral idiosoma with coxal fields I closed, II-IV open; genital organ 36 $\mu$  in length, extended to midway between *c* 2 and adanal discs; adanal discs 17 $\mu$  in diameter, separated center-to-center by 39 $\mu$ ; anal shields absent. Setae: *sh*, 29 $\mu$  x 5 $\mu$ , bladelike; *d* 5, 25 $\mu$  in length, spiculiform; *d* 2 and *d* 4 in trapezoidal arrangement; *d* 4 near level of *l* 3. Tarsi IV extended to level of setae *pae*; solenidion  $\Phi$  on tibia IV longer than  $\Phi$  on tibia III;  $\sigma$  *l* shorter than  $\Phi$  on leg III.

FEMALE (paratype). Length, excluding hysterosomal appendages, 492 $\mu$ ; width, 197 $\mu$ . Propodosomal shield 117 $\mu$  in length, 169 $\mu$  in width; external scapular setae separated by 80 $\mu$ , internal scapular setae by 49 $\mu$ . Scapular shields present. Hysterosomal shield 295 $\mu$  in length, 132 $\mu$  in width; terminal cleft broad, U-shaped, 62 $\mu$  in length; hysterosomal appendages arising from apices of lobes. Setae: *sh*, 32 $\mu$  x 6 $\mu$ , bladelike; *d* 5, 21 $\mu$  in length; *l* 5, 86 $\mu$  in length, basally dilated; *d* 2 and *d* 4 in rectangular arrangements; *pai* inserted midlength of cleft;  $\Phi$  on tibia IV subequal to  $\Phi$  on leg III;  $\sigma$  *l* shorter than  $\Phi$  on leg III.

TYPE DATA. From *Heliomaster longirostris pallidiceps*:  $\delta$  holotype, 4  $\delta$   $\delta$ , 5  $\varphi$   $\varphi$  paratypes, Presidio, Veracruz, Mexico, January 23, 1943, A. Ramirez; 4  $\delta$   $\delta$ , 5  $\varphi$   $\varphi$  paratypes, Rancho Cacahuatl, Chiapas,



Figs. 64-67. *Toxerodectes lecrovae*, n. sp.: dorsal and ventral aspects of male (64, 65) and female (66, 67).

Mexico, March 18, 1954, C. C. Lamb; 3 ♂♂, 4 ♀♀ paratypes, Puerta Vallarta, Jalisco, Mexico, June 26, 1950, C. C. Lamb; 3 ♂♂, 4 ♀♀ paratypes, 15 miles northeast Tapanatepec, Oaxaca, Mexico, January 8, 1947, C. C. Lamb. The holotype and paratypes are deposited in the University of Georgia; paratypes deposited: AMNH, BMNH, CAS, GAUD, LAS, NMNH, ZSZM.

ADDITIONAL MATERIAL. From *Heliomaster c. constantii*: 32 ♂♂, 21 ♀♀, Mataglapa, Nicaragua (3 collections). From *H. c. leocadiae*: 8 ♂♂, 7 ♀♀, Sinaloa, Mexico (2 collections).

*Toxerodectes lecrovae*, new species

MALE (holotype). Length, 318 $\mu$ ; width, 156 $\mu$ . Propodosomal shield 83 $\mu$  in length, 104 $\mu$  in width; external scapular setae separated by 53 $\mu$ , internal scapular setae by 40 $\mu$ . Scapular shields present. Hysterosomal shield 182 $\mu$  in length, 109 $\mu$  in width; terminal cleft 28 $\mu$  in length. Ventral idiosoma with coxal fields I-IV open; genital organ 89 $\mu$  in length, extended to level of adanal discs; adanal discs 18 $\mu$  in diameter, separated center-to-center by 48 $\mu$ ; anal shields present. Setae: *sh*, 21 $\mu$  x 4 $\mu$ , blade-like; *d* 5, 16 $\mu$  in length, spiculiform; *d* 2 and *d* 4 in rectangular arrangement; *d* 4 at level of *l* 3. Tarsi IV extended to level of setae *pa*; solenidion  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  1 shorter than  $\Phi$  on leg III.

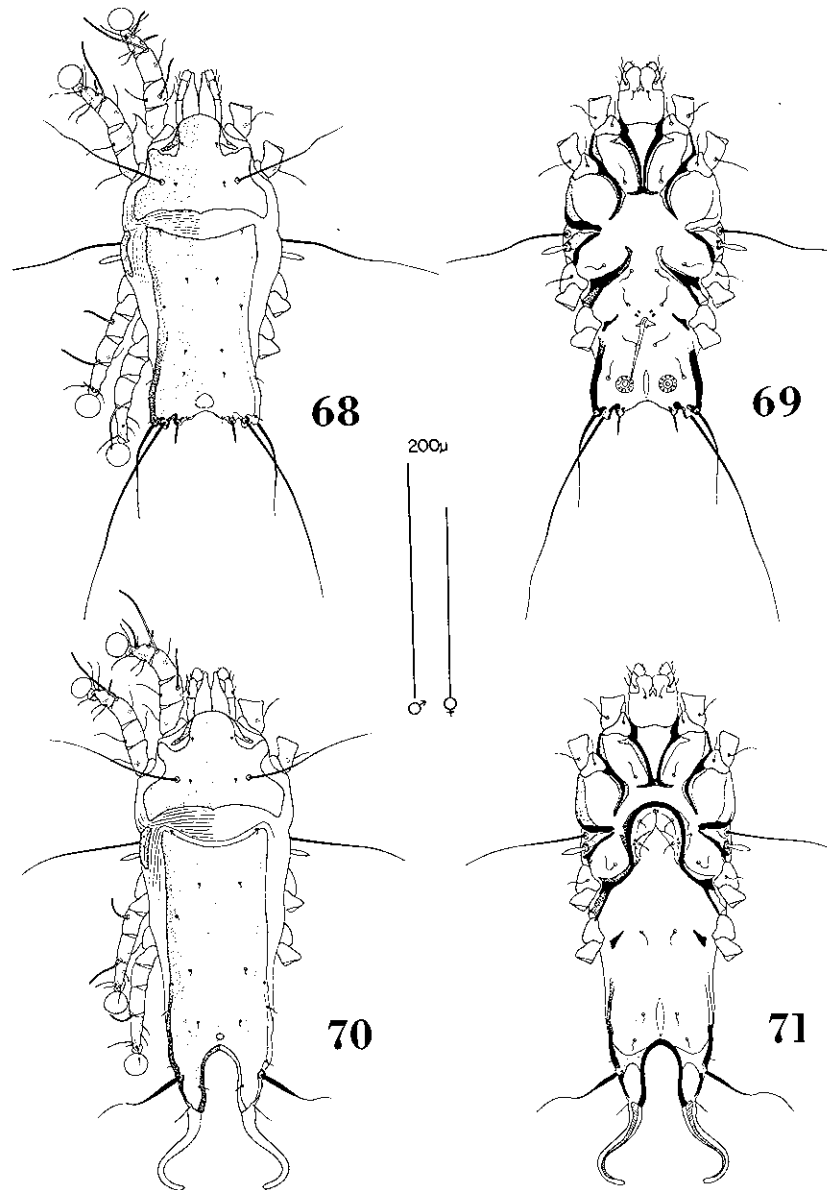
FEMALE (paratype). Length, excluding hysterosomal appendages, 482 $\mu$ ; width, 192 $\mu$ . Propodosomal shield 112 $\mu$  in length, 143 $\mu$  in width; external scapular setae separated by 76 $\mu$ , internal scapular setae by 53 $\mu$ . Scapular shields present. Hysterosomal shield 282 $\mu$  in length, 130 $\mu$  in width; terminal cleft U-shaped, 47 $\mu$  in length; hysterosomal appendages arising from apices of lobes. Setae: *sh*, 27 $\mu$  x 5 $\mu$ , blade-like; *d* 5, 34 $\mu$  in length; *l* 5, 104 $\mu$  in length, basally dilated; *d* 2 and *d* 4 in rectangular arrangement; *pa* inserted midlength of cleft;  $\Phi$  on tibia IV shorter than  $\Phi$  on leg III;  $\sigma$  1 shorter than  $\Phi$  on leg III.

TYPE DATA. From *Lampornis clemenciae bessophilus*: ♂ holotype, 1 ♂, 1 ♀ paratypes, Santa Lucia, Sinaloa, Mexico, October 26, 1934, C. C. Lamb; 1 ♂, 2 ♀♀ paratypes, same data as holotype except November 1, 1934; 4 ♂♂ paratypes, May 19, 1937 and 3 ♂♂ paratypes, May 16, 1937, Mt. Mahinora, Chihuahua, Mexico, R. T. Moore. The holotype and paratypes are deposited in the University of Georgia; paratypes deposited: GAUD, NMNH.

ADDITIONAL MATERIAL. From *Lampornis a. amethystinus*: 2 ♂♂, 3 ♀♀, Oaxaca, Puebla, Mexico (2 collections). From *L. c. clemenciae*: 5 ♂♂, 3 ♀♀, Texas. From *L. viridipallens*: 8 ♂♂, 5 ♀♀, Chiapas, Mexico (4 collections). From *Lamprolaima rhami*: 19 ♂♂, 14 ♀♀, Guerrero, Mexico (4 collections).

REMARKS. There is a smaller version of *Toxerodectes lecrovae* from *Amazilia beryllina*, Sinaloa, Mexico which we prefer to retain in a *T. lecrovae* complex rather than establish a new species for a form that may display geographical variation.

This new species is named for Mary LeCroy of the American Museum of Natural History. Mrs. LeCroy has given us invaluable assistance in establishing host synonymies and determining accurate collecting data, especially of localities in New Guinea.



Figs. 68-71. *Toxerodectes subulatus*, n. sp.: dorsal and ventral aspects of male (68, 69) and female (70, 71).

*Toxerodectes subulatus*, new species

MALE (holotype). Length, 302 $\mu$ ; width, 145 $\mu$ . Propodosomal shield 90 $\mu$  in length, 112 $\mu$  in width; without lacunae; external scapular setae separated by 60 $\mu$ , internal scapular setae by 40 $\mu$ . Scapular shields absent. Hysterosomal shield 170 $\mu$  in length, 100 $\mu$  in width; without lacunae; terminal cleft 16 $\mu$  in length. Ventral idiosoma with coxal fields I nearly closed; genital organ 50 $\mu$  in length, extended beyond the level of midway between *c* 2 and adanal discs; adanal discs 15 $\mu$  in diameter, separated center-to-center by 35 $\mu$ ; anal shields absent. Setae: *sh*, 22 $\mu$  x 5 $\mu$ , blade-like; *d* 5, 20 $\mu$  in length, spikelike; *d* 2 and *d* 4 in rectangular arrangement; *d* 4 anterior to level of *l* 3. Tarsi IV extended beyond level of setae *pa*e; solenidion  $\Phi$  on tibia IV slightly longer than  $\Phi$  on tibia III;  $\sigma$  1 slightly shorter than  $\Phi$  on leg III.

FEMALE (paratype). Length, excluding hysterosomal appendages, 46 $\mu$ ; width, 171 $\mu$ . Propodosomal shield 113 $\mu$  in length, 145 $\mu$  in width; without lacunae; external scapular setae separated by 75 $\mu$ , internal scapular setae by 47 $\mu$ . Scapular shields absent. Hysterosomal shield 290 $\mu$  in length, 120 $\mu$  in width; without lacunae; terminal cleft U-shaped, 62 $\mu$  in length; hysterosomal appendages arising from the apices of lobes. Setae: *sh*, 25 $\mu$  x 6 $\mu$ , bladeliike; *d* 5, 36 $\mu$  in length; *l* 5, 135 $\mu$  in length, basally dilated; *d* 2 and *d* 4 in rectangular arrangement; *pa*i inserted at the level posterior to *l* 5;  $\Phi$  on tibia IV slightly shorter than  $\Phi$  on tibia III;  $\sigma$  1 slightly shorter than  $\Phi$  on leg III.

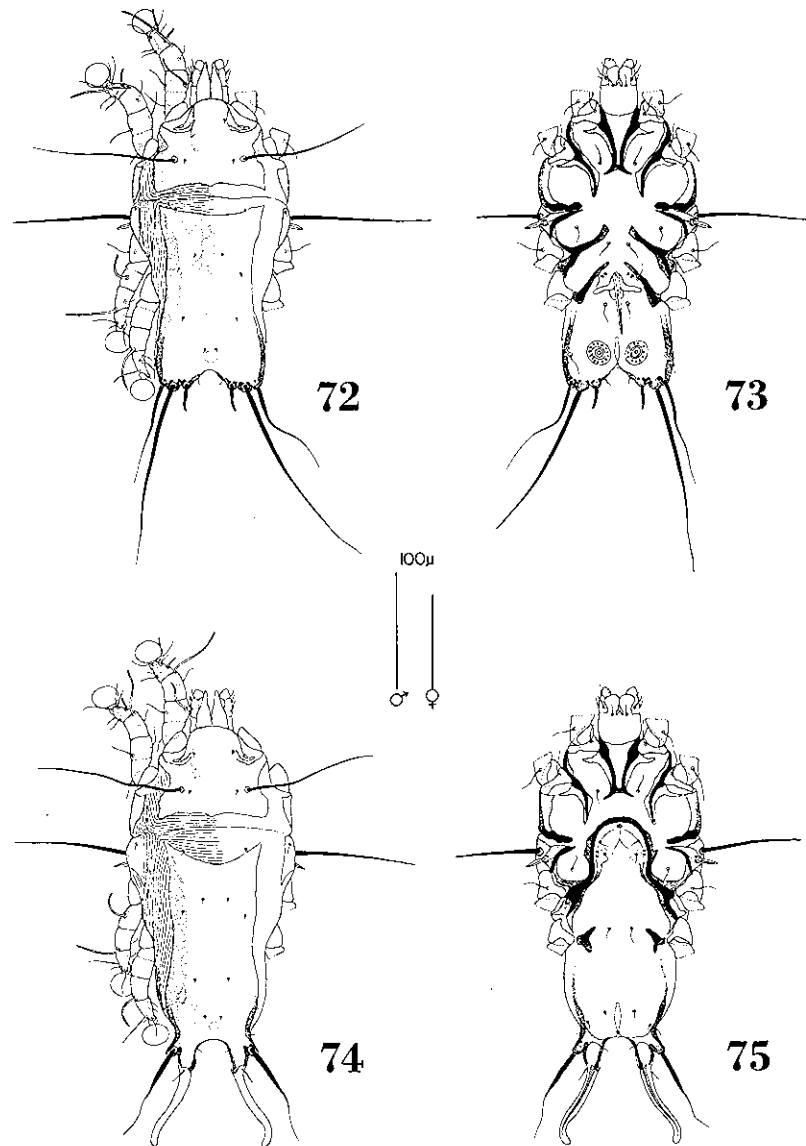
TYPE DATA. From *Colibri serrirostris*:  $\delta$  holotype, 7  $\varphi$   $\varphi$  paratypes, Mato Grosso, Brazil, July, 1883, collector unknown; 4  $\delta$   $\delta$ , 4  $\varphi$   $\varphi$  paratypes, São Paulo, Brazil, March 14, 1965, Weiner; 6  $\delta$   $\delta$ , 1  $\varphi$  paratypes, São Benedicto, Minas Gerais, Brazil, January 19, 1930, E. Kaempfer; 8  $\delta$   $\delta$ , 5  $\varphi$   $\varphi$  paratypes, Mato Grosso, Brazil, July 8, 1883, collector unknown. The holotype and paratypes are deposited in the American Museum of Natural History; paratypes deposited: GAUD, LAS, NMNH, NU, UGA.

REMARKS. This species is closely related to *T. heliomasteris*, but is readily separated by the male having a small genital arch and awl-shaped setae *d* 5, and by the female having the terminal cleft longer than wide. This taxon is restricted to birds of *Colibri* in Brazil; the name *subulatus* refers to the condition of setae *d* 5 in the male.

*Toxerodectes zusii*, new species

MALE (holotype). Length, 282 $\mu$ ; width, 135 $\mu$ . Propodosomal shield 78 $\mu$  in length, 95 $\mu$  in width; external scapular setae separated by 58 $\mu$ , internal scapular setae by 40 $\mu$ . Scapular shields present. Hysterosomal shield 150 $\mu$  in length, 90 $\mu$  in width; terminal cleft 18 $\mu$  in length. Ventral idiosoma with coxal fields I-IV open; genital organ 51 $\mu$  in length, extended to level of anterior end of anus; adanal discs 18 $\mu$  in diameter, separated center-to-center by 33 $\mu$ ; anal shields present. Setae: *sh*, 17 $\mu$  x 3 $\mu$ , bladeliike; *d* 5, 23 $\mu$  in length, spiculiform; *d* 2 and *d* 4 in trapezoidal arrangement; *d* 4 posterior to level of *l* 3. Tarsi IV not extended to level of setae *pa*e; solenidion  $\Phi$  on tibia IV subequal to  $\Phi$  on tibia III;  $\sigma$  1 shorter than  $\Phi$  on leg III.





Figs. 72-75. *Toxerodectes zusii*, n. sp.: dorsal and ventral aspects of male (72, 73) and female (74, 75).

FEMALE (paratype). Length, excluding hysterosomal appendages, 408 $\mu$ ; width, 108 $\mu$ . Propodosomal shield 94 $\mu$  in length, 120 $\mu$  in width; external scapular setae separated by 70 $\mu$ , internal scapular seta by 50 $\mu$ . Scapular shields present. Hysterosomal shield 238 $\mu$  in length, 100 $\mu$  in width; terminal cleft wide, U-shaped, 37 $\mu$  in length, 41 $\mu$  in width; hysterosomal appendages arising at apices of lobes. Setae: *sh*, 24 $\mu$  x 4 $\mu$ , bladeliike; *d* 5, 23 $\mu$  in length; *l* 5, 103 $\mu$  in length, basally dilated; *d* 2 and *d* 4 in trapezoidal arrangement; *pai* positioned anterior to level of terminal cleft midlength; solenidion  $\Phi$  on tibia IV shorter than  $\Phi$  on tibia III;  $\sigma$  1 shorter than  $\Phi$  on leg III.

TYPE DATA. From *Urosticte b. benjamini*:  $\delta$  holotype, 4  $\delta$   $\delta$ , 8  $\varnothing$   $\varnothing$  paratypes, August, 1898 and 2  $\delta$   $\delta$ , 4  $\varnothing$   $\varnothing$  paratypes, July, 1898, Qualea, Esmeraldas prov., Ecuador, Goodfellow and Hamilton. The holotype and paratypes are deposited in the National Museum of Natural History; paratypes deposited: AMNH, GAUD, UGA.

ADDITIONAL MATERIAL. From *Urosticte b. benjamini*: 4  $\delta$   $\delta$ , 13  $\varnothing$   $\varnothing$ , Pichincha and Esmeraldas provinces, Ecuador (3 collections with incomplete data). From *U. ruficrissa*: 1  $\delta$ , 1  $\varnothing$ , Huila dept., Colombia.

REMARKS. This species appears to be restricted to birds of the genus *Urosticte*; it can be easily distinguished from related species by the male having the genital organ extending to the anterior end of the anal slit, and by the female having the terminal cleft wider than long and the terminal lobes with lateral protuberances at the level of setae *l* 5. The taxon is named for Dr. Richard L. Zusi, Curator, Division of Birds, National Museum of Natural History — Smithsonian Institution, who has rendered invaluable cooperation during the course of the present study.

#### LITERATURE CITED

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#### SOIL-WASHING APPARATUS FOR RECOVERY OF TABANID LARVAE AND OTHER INVERTEBRATES<sup>1</sup>

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#### ABSTRACT

A description and illustrations are provided for construction of a portable rack for washing salt marsh soil and vegetation to recover invertebrates. A portable gasoline-powered pump is used to wash the samples through two sizes of wire mesh with the water being sprayed from above and below the sample.

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