

Three new species of the giant vinegaroon genus *Mastigoproctus* (Thelyphonida: Thelyphonidae) from Mexico

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Abstract. The giant vinegaroons of the genus *Mastigoproctus* Pocock, 1894 have been the subject of recent investigations aimed at elucidating relationships between their species and their validity. In particular, new data have revealed the presence of new species as well as revalidated species that were previously considered as synonyms of *Mastigoproctus giganteus* (Lucas, 1835). The genus occurs in southern USA, Mexico and South America. In this paper, we describe three additional new species from Mexico: *M. franckei* Barrales-Alcalá, sp. nov. from Xilitla, San Luis Potosí, *M. xetame* Barrales-Alcalá & Francke, sp. nov. from the highlands of Jalisco and *M. yalchanchak* Barrales-Alcalá & Francke, sp. nov. from La Esperanza, Chiapas. The present contribution raises the diversity of the order Thelyphonida in Mexico to 10 species.

Resumen. Los vinagrillos del género *Mastigoproctus* Pocock, 1894 han sido objeto de investigaciones recientes encaminadas a dilucidar las relaciones entre sus especies y la validez de las mismas. En particular, nuevos datos han revelado la presencia de nuevas especies, así como la validez de otras que antes se consideraban como sinónimos de *Mastigoproctus giganteus* (Lucas, 1835). El género se encuentra en el sur de Estados Unidos, México y Sudamérica. En este artículo, describimos tres nuevas especies adicionales de México: *M. franckei* Barrales-Alcalá, sp. nov. de Xilitla, San Luis Potosí, *M. xetame* Barrales-Alcalá & Francke, sp. nov. del altiplano de Jalisco y *M. yalchanchak* Barrales-Alcalá & Francke, sp. nov. de La Esperanza, Chiapas. La presente contribución eleva la diversidad del orden Thelyphonida en México a 10 especies.

Keywords: Whip-scorpion, biodiversity, new taxa

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ZooBank Registration: <https://zoobank.org/References/1CE05AC3-6D8B-4A7A-A980-2F1D2464C16A>

The genus *Mastigoproctus* Pocock, 1894 (Thelyphonidae Lucas, 1835, Mastigoproctinae Speijer, 1933), known as giant vinegaroons or whip scorpions, comprises 21 species, all endemic to the New World. The genus ranges from southern USA to South America, and includes seven species from Mexico: *M. lacandonensis* Ballesteros & Francke, 2006 from the southeastern state of Chiapas, *M. giganteus* (Lucas, 1835) from the state of Morelos, *M. scabrosus* Pocock, 1902 from Veracruz and Oaxaca, *M. mexicanus* (Butler, 1872) from Aguascalientes and Jalisco, *M. cinteotl* Barrales-Alcalá et al., 2018 from Tamaulipas, San Luis Potosí and Queretaro, *M. vandevenderi* Barrales-Alcalá et al., 2018 from the Sierra Madre Occidental in Sonora, and *M. tohono* Barrales-Alcalá et al., 2018 from the lowlands of Sonora and southern Arizona (Barrales-Alcalá et al. 2018). The habitats occupied by these species are diverse and can vary from pasturelands to pine/oak forest at altitudes from 10 to 2440 meters above sea level (Barrales-Alcalá et al. 2018).

The taxonomic history of the genus *Mastigoproctus* in Mexico involves a series of descriptions and synonymies over time. The first species described for Mexico was *Thelyphonus giganteus* Lucas, 1835 with a type locality given simply as “Mexico” (Lucas 1835). Likewise, *T. mexicanus* Butler, 1872 was also described from “Mexico” (Butler 1872). Pocock (1894) transferred *T. giganteus* to his new genus *Mastigoproctus* Pocock, 1894. *Mastigoproctus giganteus floridanus* Lönnberg, 1897 from “Florida” was subsequently described, and synonymized soon after with the nominotypical form (Kraepelin 1899). Pocock (1902) later lowered *T. mexicanus* to a subspecies of *M. giganteus*, forming the combination *M. giganteus mexicanus* (Butler, 1872) and added another subspecies, *Mastigoproctus giganteus scabrosus* Pocock, 1902, from Playa Vicente, Oaxaca.

An exhaustive revision of numerous populations of vinegaroons in Mexico and the United States using morphological characters led to the discovery of clear differences between the subspecies of *M. giganteus* that had been recognized by Lönnberg (1897) and Pocock (1902), and as a result *M. scabrosus*, *M. mexicanus* and *M. floridanus* were recognized as valid species (Barrales-Alcalá et al. 2018). The discovery of new morphological characters has helped to achieve a better understanding of the diversity of this genus. Barrales-Alcalá et al. (2018) also referred to the presence of several species in Mexico, some of them previously named and others awaiting description.

Three new Mexican species are described in the present contribution: *M. franckei* Barrales-Alcalá, sp. nov. from the state of San Luis Potosí; *M. xetame* Barrales-Alcalá & Francke, sp. nov. from the state of Jalisco and *M. yalchanchak* Barrales-Alcalá & Francke, sp. nov. from the state of Chiapas.

The present contribution raises the diversity of the order Thelyphonida in Mexico from seven species to ten, widely distributed in the Mexican territory (Fig. 1).

METHODS

Material examined is deposited in the following collections: Colección Nacional de Arácnidos (CNAN), Instituto de Biología, Universidad Nacional Autónoma de México (IBUNAM), Ciudad de México; Invertebrate Collection at the American Museum of Natural History (AMNH), New York and the Smithsonian National Museum of Natural History (NMNH), Washington, D. C.

The species diagnoses and descriptions presented herein are based primarily on adult male specimens, which provide most of the diagnostic characters. Chelicerae were dissected using needles and forceps, and prepared for scanning electron microscopy (SEM) as described by Cruz-López & Francke (2016).

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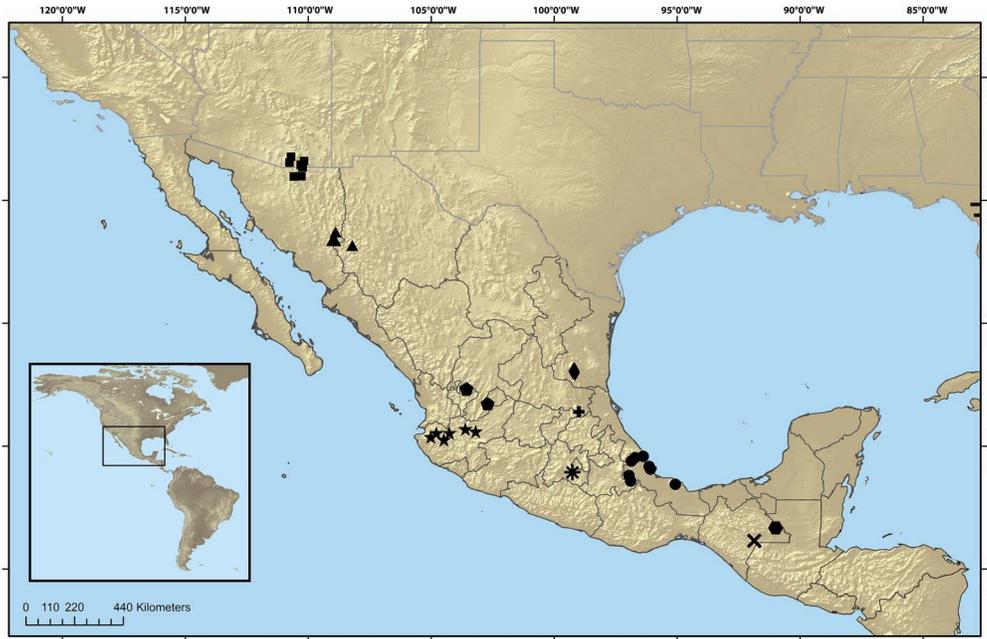


Figure 1.—Map of Mexico and the southern United States, plotting known localities of *Mastigoproctus* spp: *M. giganteus* (Lucas, 1835) (asterisk); *M. lacandonensis* Ballesteros & Francke, 2006 (hexagon); *M. mexicanus* (Butler, 1872) (pentagon); *M. scabrosus* (Pocock, 1902) (circles); *M. cinteotl* Barrales-Alcalá, Francke & Prendini, 2018, (diamond); *M. tohono* Barrales-Alcalá, Francke & Prendini, 2018 (squares); *M. vandevenderi* Barrales-Alcalá, Francke & Prendini, 2018 (triangles), *Mastigoproctus franckei* Barrales-Alcalá, sp. nov., (cross), *Mastigoproctus xetame* Barrales-Alcalá & Francke, sp. nov., (star), *Mastigoproctus yalchanchak* Barrales-Alcalá & Francke, sp. nov., (x).

Morphological terminology and measurements follow Huff et al. (2008), Huff & Prendini (2009) and Barrales-Alcalá et al. (2018). Measurements (millimeters) were taken with ULTRA-TECH digital Vernier calipers, and an ocular micrometer attached to a Nikon SMZ660 stereomicroscope. Spines along the prodorsal margin of the pedipalp trochanter were numbered consecutively from proximal to distal following Barrales-Alcalá, et al. (2018).

Habitus, carapace, chelicerae, pedipalp and pedipalpal trochanters images were taken using a Nikon D7500 DSLR camera attached to a Firenze Mini Repro copy stand and prepared using Adobe Photoshop 2021. Scanning electron micrographs of

chelicerae and pedipalp coxae were taken by accelerating voltages of 10–20 kV under high vacuum with a Hitachi SU1510 SEM at IBUNAM.

SYSTEMATICS

Family Thelyphonidae Lucas, 1835
 Subfamily Mastigoproctinae Speijer, 1933
 Genus *Mastigoproctus* Pocock, 1894: 129, 130

Type species.—*Thelyphonus giganteus* Lucas, 1835, by original designation.

KEY TO SPECIES OF THE *MASTIGOPROCTUS* OF NORTH AMERICA

1. Presence of a well-developed carina that extends from the lateral ocelli approximately two-thirds the length of the carapace toward the median ocular tubercle; pedipalps elongate, punctate, and tuberculate; presence of a spine on ventral part of the tibia of the legs II–IV; anterior tergites (I–III) divided medially, rest (IV–IX) undivided; tergite XII with a pair of ommatoids 2
- Two pairs of soft dorsal keels on carapace running from anterior margin, over lateral ocelli and median ocular tubercle extending toward center of carapace; pedipalps smooth, without granulations and with a polished appearance; ventral spine of tibia present only in legs IV; opisthosomal tergites II–IX divided longitudinally by a thin sutural line; tergite XII without ommatoids. *Mastigoproctus lacandonensis*
2. Chelicerae and pedipalp coxae, opposing surfaces with stridulatory organ (*pars stridens* and *plectrum*, respectively) (Figs. 2a–d) 4
- Chelicerae and pedipalp coxae, opposing surfaces without stridulatory organ (Figs. 2e, f) 3
3. Terminal spiniform tubercle on the retroventral surfaces of the femora of legs II–IV conical; average size of 70 mm in adult males; general dark reddish brown color *Mastigoproctus scabrosus*
- Terminal spiniform tubercle on the retroventral surfaces of the femora of legs II–IV tubular (digitiform); average size of 53 mm in adult males; general reddish color; spermathecal neck narrow, seminal receptacles anteriorly directed (Figs. 3e, f) *Mastigoproctus yalchanchak* sp. nov.
4. Sternite V, medial surface with patch of fine macrosetae (♂); pedipalp trochanter, prodorsal margin with spines S3 and S4 sub-equal or variable in size, unequal, distance between them equal to or less than length of longest spine (Figs. 4c, d); pedipalp

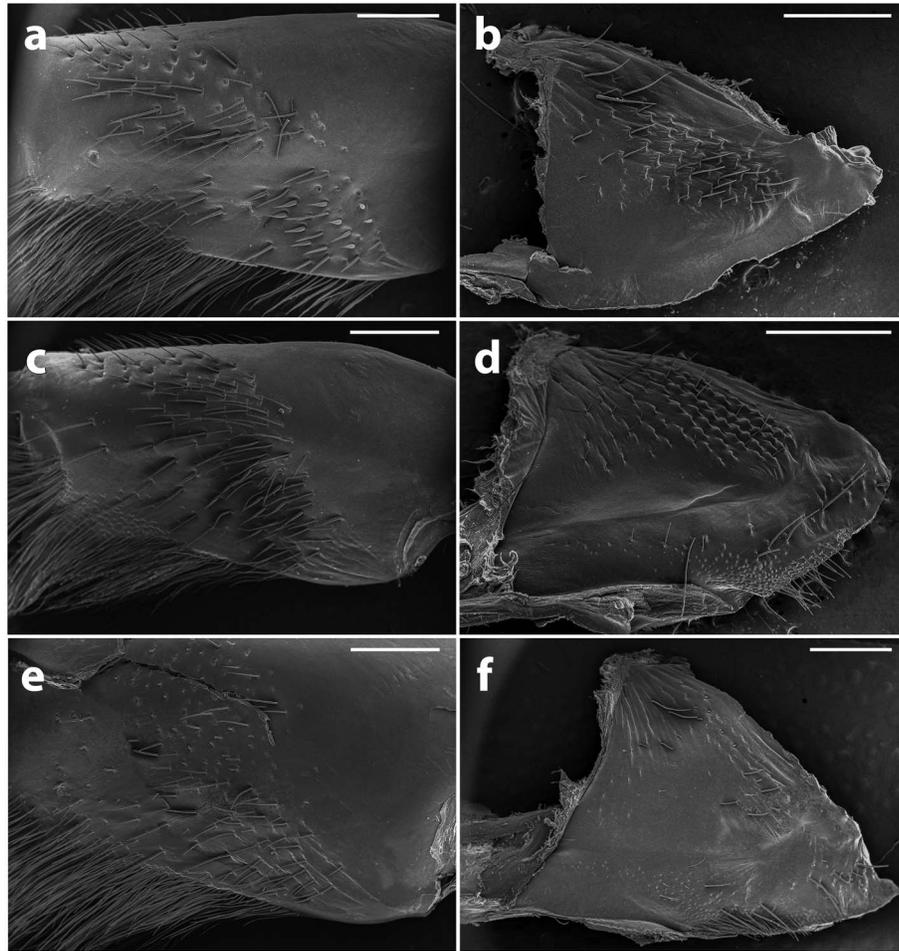


Figure 2.—*Mastigoproctus* left chelicerae, retrolateral aspect, illustrating absence (e) and presence (a, c) of stridulatory organ (*pars stridens*); and right pedipalp coxae, dorsomedial aspect, illustrating absence (f) and presence (b, d) of stridulatory organ (*stridulitrum*) with scanning electron microscopy. a, b. *Mastigoproctus franckei*, sp. nov., ♂ holotype (CNAN [Th1508]). c, d. *Mastigoproctus xetame*, sp. nov., ♂ holotype (AMNH HUFF231). e, f. *Mastigoproctus yalchanchak*, sp. nov., ♂ paratype (NMNH A10122). Scale bars = 1 mm.

- femur and tibia, retrolateral surfaces tuberculate or punctate, femur retrolateral margin smooth or punctate, smooth cristulated (Figs. 5c, d) 5
- Sternite V, medial surface asetose (♂); pedipalp trochanter, prodorsal margin with spines S3 and S4 similar in size, both longer than distance between them; pedipalp tibia and femur, retrolateral surfaces markedly punctate, femur retrolateral margin distinctly cristulate *Mastigoproctus cinteotl*
- 5. Carapace epistoma visible in dorsal aspect (Figs. 6a–f); pedipalp tibia, retrolateral surface tuberculate or punctate (Figs. 5a–d) 6
- Carapace, epistoma not visible in dorsal aspect; pedipalp tibia, retrolateral surface markedly punctate *Mastigoproctus tohono*
- 6. Pedipalp trochanter, prodorsal margin with five sharp spines (♂); pedipalp femur, retrolateral surface tuberculate or punctate 7
- Pedipalp trochanter, prodorsal margin with five spines, spine S4 short and blunt (♂); pedipalp femur, retrolateral surface punctate *Mastigoproctus floridanus*
- 7. Pedipalp femur, retrolateral surface with long digitiform tubercles, retrolateral margin not cristulated (♂) 8
- Pedipalp femur retrolateral surface markedly punctate or cristulated, retrolateral margin cristulated (♂) (Figs. 5a–d) 9
- 8. Pedipalps densely setose; trochanter, prodorsal margin with spine S3 longer than others (♂), distance between S3 and S4 approximately equal to length of S3; femur, retrolateral surface with one macroseta at base of each tubercle; carapace, anterior margin serrate, carinae present between anterior margin and median ocular tubercle; spermatheca neck wide, seminal receptacles anteriorly directed *Mastigoproctus mexicanus*
- Pedipalps sparsely setose; trochanter, prodorsal margin with spine S3 equal to or longer than S4, both longer than others (♂), distance between them equal to or greater than length of longest spine; femur, retrolateral surface without macroseta at base of each tubercle; carapace, anterior margin almost smooth, carinae between anterior margin and median ocular tubercle absent; spermatheca neck narrow, seminal receptacles posteriorly directed *Mastigoproctus vandevenderi*

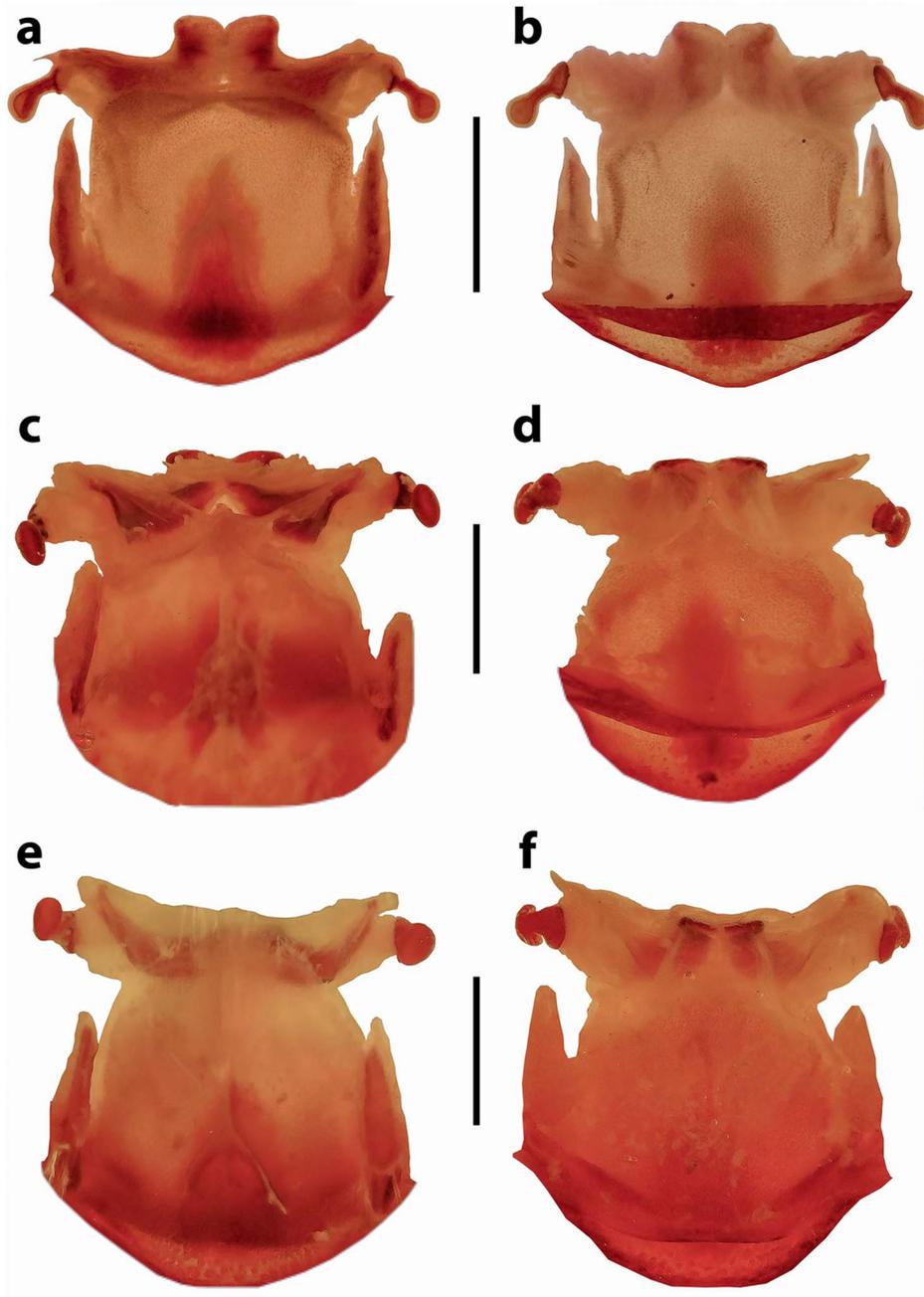


Figure 3.—*Mastigoproctus* spermathecae, dorsal (a, c, e) and ventral aspect (b, d, f). a, b. *Mastigoproctus franckei*, sp. nov., ♀ paratype (CNAN [T1509]). c, d. *Mastigoproctus xetame*, sp. nov., ♀ paratype (CNAN [T1504]). e, f. *Mastigoproctus yalchanchak*, sp. nov., ♀ paratype (CNAN [T1501]). Scale bars = 2 mm.

- 9. Pedipalp femur, retrolateral surface markedly punctate; presence of a subterminal accessory spine (AS) in the prodorsal margin of the trochanter (♂) (Figs. 4a–b) 10
- Pedipalp femur retrolateral surface cristulated (Figs. 5c, d); spine S4 is longer than the other spines on the prodorsal margin of the pedipalp trochanter (♂), subterminal accessory spine (AS) absent (♂) (Fig. 4c); spermathecal neck wide, seminal receptacles posteriorly directed (Figs. 3c, d) *Mastigoproctus xetame* sp. nov.
- 10. Retrolateral surface of the pedipalp femur markedly cristulated with punctures; spine S3 longer or equal than S4, and longer than the other spines of the prodorsal margin of the pedipalp trochanter (♂), subterminal accessory spine (AS) present (♂); sternites V–VII with (♂) patch of fine macrosetae medially *Mastigoproctus giganteus*
- Femur retrolateral surface punctate, with smooth cristulae (Figs. 5a, b); on the prodorsal margin of the pedipalp trochanter spine S4 longer than S5 and S3 (♂), subterminal accessory spine (AS) present (♂, ♀) (Figs. 4a, b); sternite V with patch of fine macrosetae medially (♂); spermathecal neck narrow, seminal receptacles posteriorly directed (Figs. 3a, b) *Mastigoproctus franckei* sp. nov.

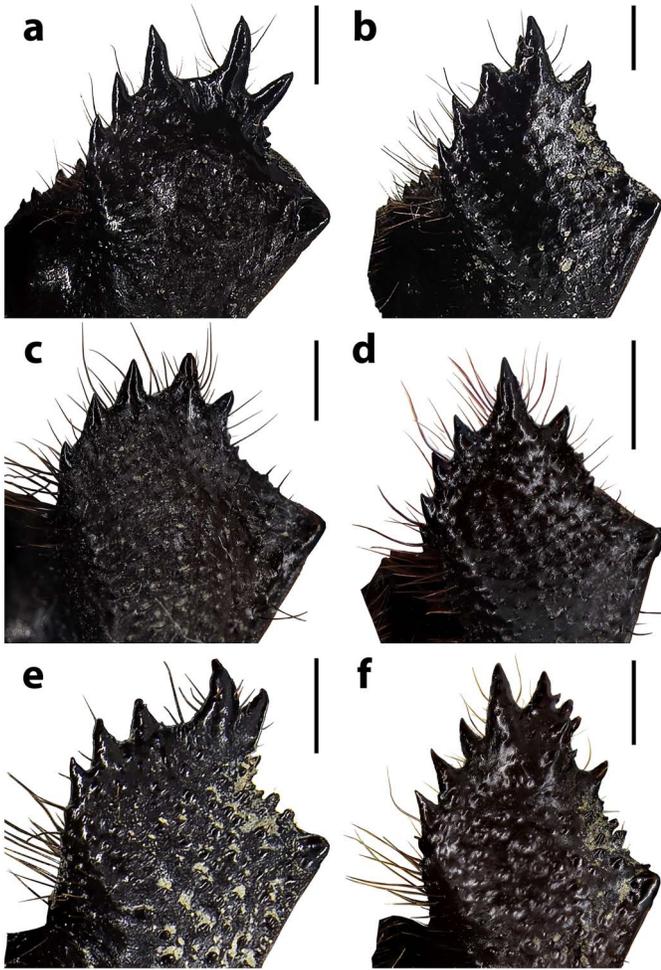


Figure 4.—*Mastigoproctus* right pedipalp trochanter, dorsal aspect, illustrating prodorsal spines in males (a, c, e) and females (b, d, f). a, b. *Mastigoproctus franckei*, sp. nov., ♂ holotype (CNAN [T1506]), ♀ paratype (CNAN [T1509]). c, d. *Mastigoproctus xetame*, sp. nov., ♂ holotype (CNAN [T1502]), ♀ paratype (CNAN [T1504]). e, f. *Mastigoproctus yalchanchak*, sp. nov., ♂ paratype (NMNH [A10122]), ♀ paratype (CNAN [T1501]). Scale bars = 2 mm.

Mastigoproctus franckei Barrales-Alcalá, sp. nov.

Figs. 7a–d, Table 1

ZooBank Registration: <https://zoobank.org/NomenclaturalActs/6F2AF51D-E482-4528-9B9B-F8AD41B80E20>

Type material.—*Holotype male*. MEXICO: *San Luis Potosí*: Municipio Xilitla: Xilitla, 21°23′08.70″N, 99°01′01.98″W, 1140 m. 26 May 2016, S. Mata (CNAN T1506).

Paratypes. MEXICO: *San Luis Potosí*: 1 ♂, collected with holotype (CNAN T1507); 1 ♂, Xilitla, 21°23′08.70″N, 99°01′01.98″W, 1140 m. 26 May 2016, L. Guevara (CNAN T1508); 1 adult ♀, Jardín Surrealista de Edward James, 21°23′45.168″N, 98°59′49.488″W, 585 m. 09 May 2012, G. Contreras, J. Cruz, R. Monjaraz, J. Mendoza (CNAN T1509, Ur53); 1 ♀, Jardín Surrealista de Edward James, 21°23′45.168″N, 98°59′49.488″W, 584 m, 9 March 2012, J. Cruz, O. Francke, A. Guzman, C. Santibañez, (CNAN T1510, Ur126); Municipio Aquismon: 1 ♀, Mantetzulel, outside the cave “Espíritu Santo”,

21°37′36.012″N, 99°03′42.948″W, 461 m, J. Contreras, J. Cruz, O. Francke, C. Santibañez, A. Valdez, (CNAN T1511, Ur96).

Other material examined.—MEXICO: *San Luis Potosí*: 1 juvenile, Municipio Xilitla: Outside the cave “La Barracuda”, 21°19′55.956″N, 99°02′52.116″W, 722 m, 3 September 2015, G. Contreras, G. Montiel (CNAN Ur200); 2 juveniles, Sotano de Huixmotitla, 21°25′09.912″N, 99°00′11.016″W, 777 m, 10 May 2012, J. Cruz, G. Contreras, J. Mendoza, R. Monjaraz (CNAN Ur121); 1 subadult ♂, 1 juveniles, Jardín Surrealista de Edward James, 21°23′30.876″N, 99°00′0.972″W, 582 m, 25 October 2013, J. Cruz, G. Contreras, J. Mendoza, R. Monjaraz (CNAN Ur53); 1 ♀, 5 juveniles, Jardín Surrealista de Edward James, 21°23′45.168″N, 98°59′49.488″W, 584 m, 9 March 2012, J. Cruz, O. Francke, A. Guzman, C. Santibañez (CNAN Ur126); 1 subadult ♂, 1 ♀, Xilitla, 21°23′24″N, 99°00′48″W, 900 m. 25 May 2016, (pitfall), L. Guevara (CNAN Ur168); 1 ♂, Xilitla, 21°23′30.876″N, 99°00′0.972″W, 8 June 2013, L. Lacleste (CNAN Ur142); 1 juvenile, outside the cave “El Sol”, 21°37′48″N, 99°03′38.736″W, J. Cruz, O. Francke, A. Guzman, C. Santibañez (CNAN Ur124).

Etymology.—This species name is a patronym in honor to Oscar F. Francke Ballve, who has devoted his life to arachnology in Mexico and other parts of America. His tireless work has become a benchmark for a new generation of enthusiastic arachnologists.

Diagnosis.—*Mastigoproctus franckei* sp. nov. resembles *M. cinteotl* from which it differs as follows: spine S4 on the prodorsal margin of the pedipalp trochanter is bigger than S3 whereas S3 and S4 are subequal in *M. cinteotl*. Tergite V possesses a patch of fine setae in *M. franckei* ♂, whereas in *M. cinteotl*, tergite V is asetose (♂, ♀).

Description.—The following description is based on two males and one female.

Total length: The maximum length from anterior margin of carapace to posterior margin of opisthosomal segment XII (pygidium) in adult specimens was 63.9 mm (♂) and 53.3 mm (♀) (Table 1).

Color: Carapace dark reddish-brown, anterior margin dark brown. Tergites I–III dark reddish-brown, IV–IX dark brown, posterior and lateral margins blackish. Sternites I–II dark reddish-brown, III–IX dark brown, lateral margins dark reddish-brown. Pygidium, dorsal and ventral surfaces dark brown. Flagellum dark brown, segments with reddish macrosetae. Pedipalp trochanter dorsal and ventral surfaces dark brown, prolateral surface with reddish macrosetae. Pedipalp femur and patella dark brown, patellar apophysis almost black; tibia, dorsal and ventral surfaces dark brown, mesal surfaces with reddish macrosetae; fixed finger and basitarsus dark brown, almost black. Leg I femur dark reddish-brown, rest reddish brown; II–IV, coxae, ventral surfaces reddish brown, trochanters, femora, patellae, tibiae, basitarsi and tarsi, dorsal and ventral surfaces dark reddish-brown, lateral surfaces reddish-brown.

Carapace: Epistoma visible in dorsal aspect. Pair of strongly developed carinae anterolaterally, extending from lateral ocelli to two-thirds the distance to median ocular tubercle (Figs. 5a, b). Three pairs of lateral ocelli without accessory translucent eye spot; anterior ocellus larger than median and posterior ocelli; anterior ocelli slightly separated from posterior ocellus by a tubercle, distance between median and posterior ocelli 6.2 times distance between anterior and median ocelli. Perimeter serrated.

Median ocular tubercle smooth, situated in the anterior 10% of carapace (Table 1); distance between ocelli twice ocular diameter.

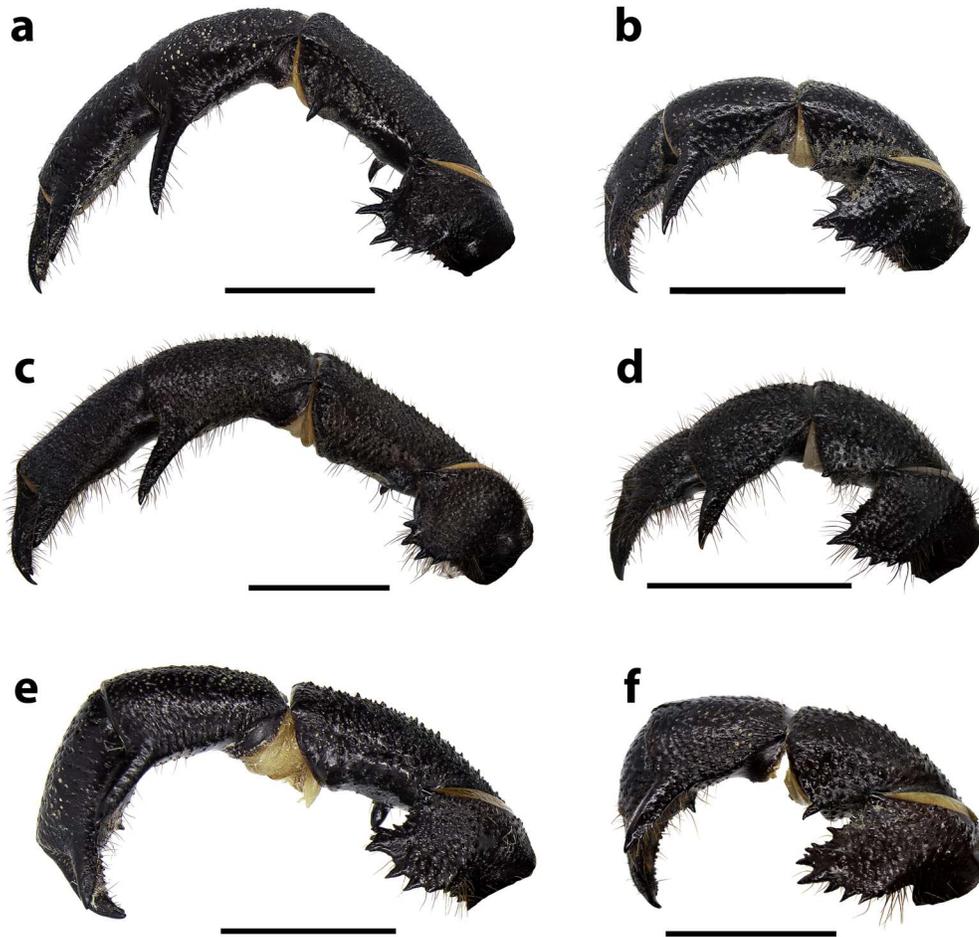


Figure 5.—*Mastigoproctus* right pedipalp, dorsal aspect. a, b. *Mastigoproctus franckei*, sp. nov., ♂ holotype (CNAN [T1506]) (a), ♀ paratype (CNAN [T1509]) (b). c, d. *Mastigoproctus xetame*, sp. nov., ♂ holotype (CNAN [T1502]) (c), ♀ paratype (CNAN [T1504]) (d). e, f. *Mastigoproctus yalchanchak*, sp. nov., ♂ holotype (CNAN [T1500]) (e), ♀ paratype (CNAN [T1501]) (f). Scale bars = 10 mm.

Carapace anterior and medial surfaces rugose, mediolateral surfaces granular. Posterior fovea present, distinct.

Chelicerae: Retrolateral surface with stridulatory organ (*plectrum*), comprising approximately twenty-four short, thick (ca. eight times longer than wide), anteroventrally-directed spiniform macrosetae (Fig. 2a); mesal surface with few short, thick, anteroventrally-directed spiniform macrosetae.

Pedipalps: Cuticle punctate with cristulae (Figs. 5a, b). Coxa, retrolateral surface rugose; ventral surface smooth and slightly punctate; coxal apophysis with one terminal spine; prodorsal surface with long, proventrally-directed setae inserted in cristulae, forming stridulatory surface (*stridulitrum*) (Fig. 2b). Trochanter longer than wide (♂, ♀); retrodorsal surface with cristulae (♂), punctate; prodorsal margin with five terminal spines (S1–S5) and one subterminal accessory spine (AS), all sharply pointed, varying in size such that $S4 > S5 \geq S3 > S2 > S1 > AS$ (♂; Fig. 4a) or $S4 > S3 \geq S5 \geq S2 > S1 \geq AS$ (♀; Fig. 4b); space between S3 and S4 two thirds the length of longest spine (♂) or equal to space between S4 and S5 (♀); prolateral surface with several (18) spiniform tubercles and reddish setae (♂); proventral margin with two spines (♂). Femur laterally compressed (♂) or terete (♀), 2.5 (♀) to three (♂) times longer than wide (Table 1); prolateral surface with two spines, one prodorsal, short, sharply pointed, the other

proventral, curved, sharply pointed, length one-third femur width (♂) or short, sharply pointed, and situated apically (♀); retrolateral surface punctate, with smooth cristulae (♂). Patella shorter than tibia (♂, ♀) (Table 1); prolateral surface with reddish macrosetae, one vestigial (♂) or distinct (♀) spine situated distally on proventral margin; two short, pointed spines (♂) or two sharply pointed spines (♀) at base of patellar apophysis; retrolateral surface shallowly punctate. Patellar apophysis elongated, almost one-quarter carapace length, smooth and slender (♂) or shorter and robust (♀); prolateral margin with row of blunt (♂) or sharply pointed (♀) denticles; retrolateral margin smooth (♂) or sparsely denticulate (♀), with subterminal macrosetae. Tibia laterally compressed (♂) or terete (♀); prodorsal surface with sparse row of denticles; retrolateral surface with reddish macrosetae; proventral margin with two spines distally; fixed finger, dorsal and ventral margins each with row of denticles. Basitarsus (movable finger), dorsal and ventral margins each with serrate row of denticles; prolateral surface with several reddish macrosetae; apex bifid (♂).

Legs: Leg I, basitarsal and telotarsal tarsomeres I–VII gradually decreasing in length, with tarsomere I longest, tarsomere VIII two-thirds length of tarsomere I. Legs I–III coxae, lateral surfaces and IV, dorsal surface each with setose spiniform tubercles. Legs II–IV trochanters, dorsal and lateral surfaces with setose spiniform

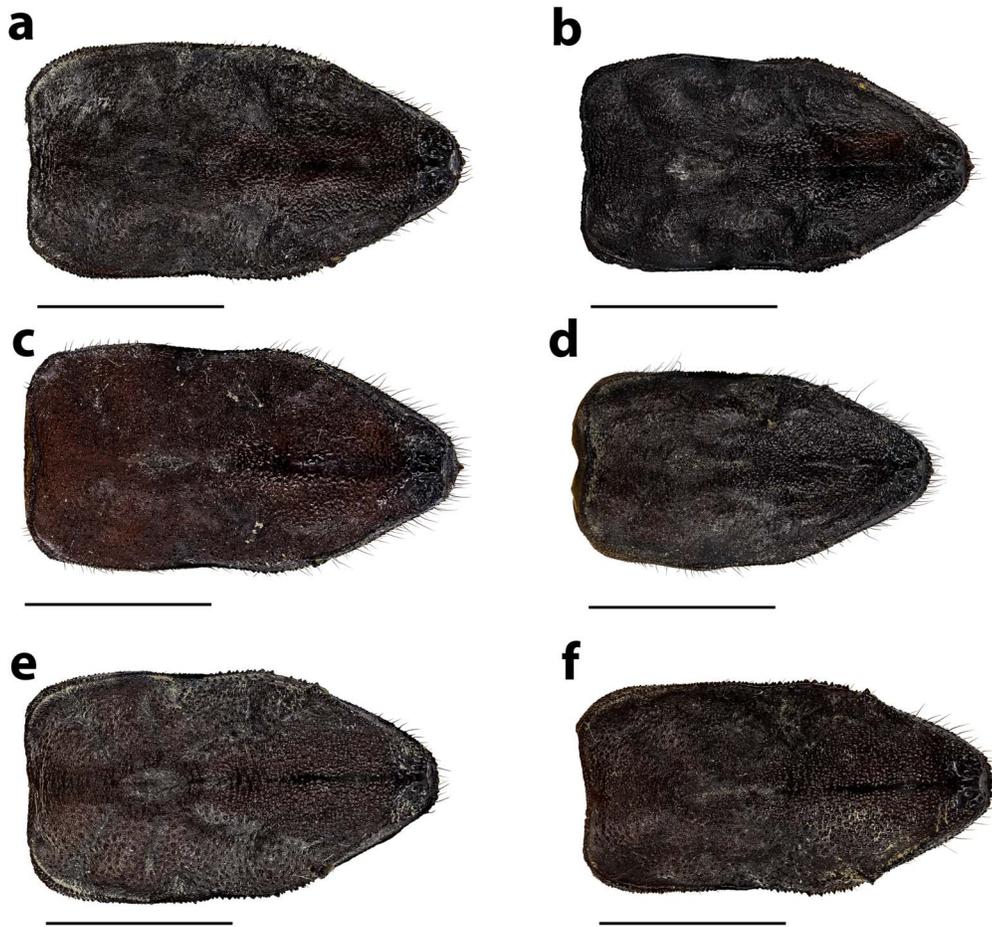


Figure 6.—*Mastigoproctus* carapaces, dorsal aspect. a, b. *Mastigoproctus franckei*, sp nov., ♂ holotype (CNAN [T1506]) (a), ♀ paratype (CNAN [T1510]) (b). c, d. *Mastigoproctus xetame*, sp nov., ♂ holotype (CNAN [T1502]) (c), ♀ paratype (CNAN [T1504]) (d). e, f. *Mastigoproctus yalchanchak*, sp nov., ♂ holotype (CNAN [T1500]) (e), ♀ paratype (CNAN [T1501]) (f). Scale bars = 10 mm.

tubercles. Legs I–IV femora with setose spiniform tubercles, situated proximally on I, on dorsal surfaces of II–IV, retroventral surfaces of II–IV each with setose spiniform tubercle terminally, with macroseta inserted terminally; lateral surfaces smooth; tibiae each with one ventrodistal spur; basitarsi each with two ventrodistal spurs. Leg I tibia with two trichobothria distally; legs II–IV tibiae each with one trichobothrium distally.

Opisthosoma: Tergites finely granular, more coarsely along posterior margins; I with median longitudinal suture extending from mid-segment to posterior margin; II with median longitudinal suture; III with median longitudinal suture extending from anterior margin to anterior third of segment; other tergites undivided; X (first segment of pygidium) with distinct lateral longitudinal sutures (pleuron); XII with pair of obovate ommatoids posterolaterally. Sternite II (genital) with pair of V-shaped (♂) or lanceolate (♀) depressions submedially, posterolateral surfaces inflated (♂) or flat (♀), and posteriomedian margin protruding markedly (♂) or slightly (♀) posteriorly into median lobe, emarginate medially and overlapping sclerotized area in space between sternites II and III (♀); III divided longitudinally (♂) or undivided (♀), linear (♂) or with pronounced emargination (♀) anteriorly, posterior margin with (♂) or without (♀) patch of reddish macrosetae on median bulge; IV undivided longitudinally (♂, ♀); V with (♂) or without (♀) patch of

fine macrosetae medially; VI–IX surfaces smooth. Spermathecae seminal receptacles rounded, posteriorly directed; spermathecal neck tall, narrow; aperture of uterus curved, with medial notch; atrium quadrate in dorsal aspect (Figs. 3a, b).

Sexual dimorphism: Adult males present several characters that differ from the females and immature stages. The pedipalps of the male are elongated (Fig. 5a), unlike the pedipalps of the female, which are shorter and robust. A wide gap is present between spines S3 and S4 than between the other spines on the prodorsal margin of the pedipalp trochanter in the male (Fig. 4a), whereas all spines along the prodorsal margin are evenly spaced in the female (Fig. 4b). The retrolateral surface of the pedipalp femur is punctate, with smooth cristulae in the male (Fig. 5a) but punctate and smooth, without cristulae, in the female (Fig. 5b). The patellar apophysis of the male is more slender and more elongated than that of the female. The posterolateral surfaces of sternite II are inflated in the male, but flat in the female. Sternite III is not emarginate anteriorly in the male and exhibits a posteromedian bulge with a patch of macrosetae in the male, whereas it is emarginate anteriorly, its posteromedian margin does not protrude, and a patch of macrosetae is absent in the female (Fig. 7d).

Distribution—This species is known from the municipality of Xilitla and Aquismon, San Luis Potosi, Mexico (Fig. 1).

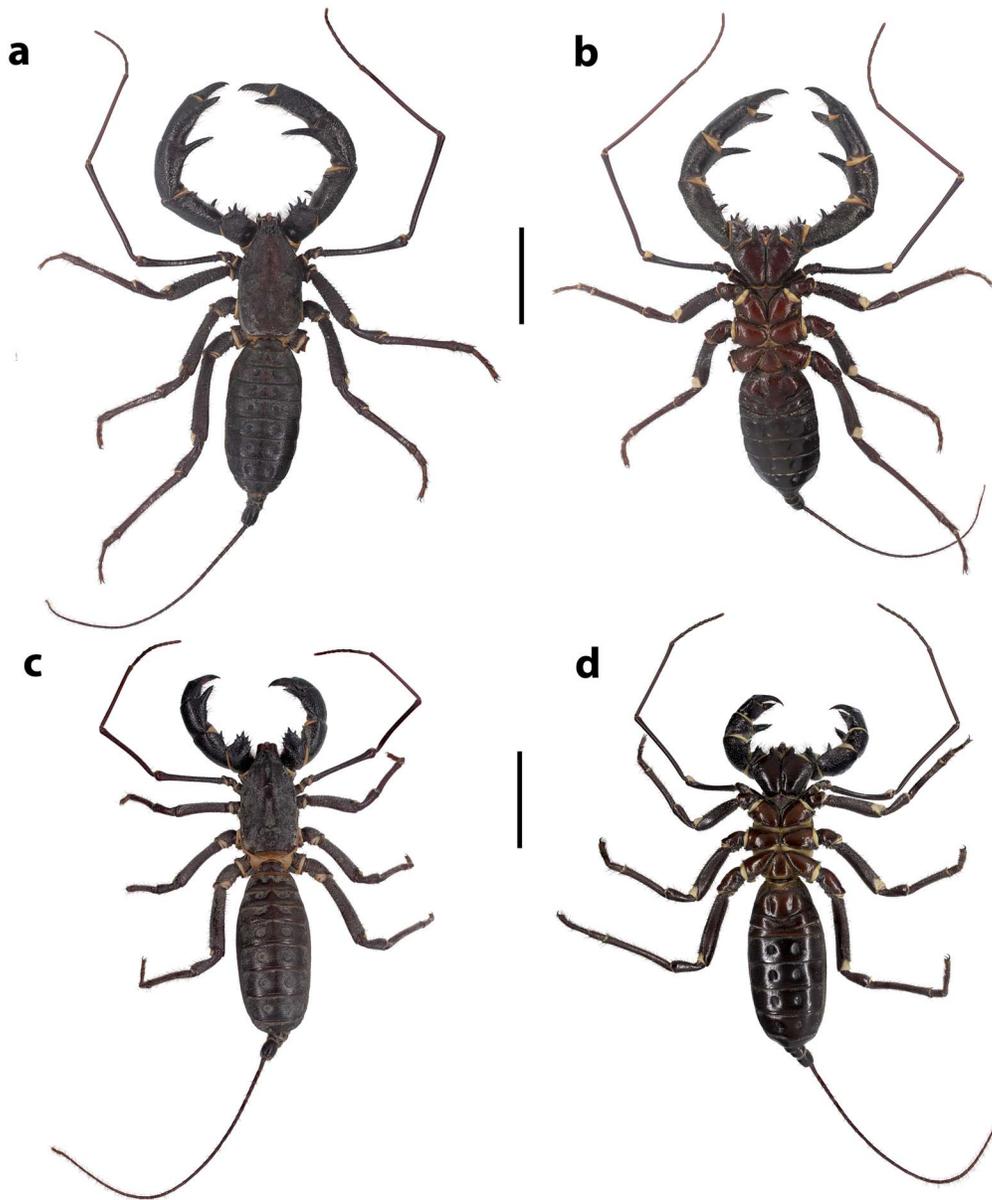


Figure 7.—*Mastigoproctus franckei*, sp. nov., habitus, dorsal (a, c) and ventral (b, d) aspect. a, b. Holotype ♂ (CNAN T1506). c, d. Paratype ♀ (CNAN T1509). Scale bars = 25 mm.

Natural history.—*Mastigoproctus franckei* sp. nov. inhabits the tropical rain forest, at elevations of 500–1200 m, with temperatures of 7–38°C and mean annual precipitation of 2760 mm.

Mastigoproctus xetame Barrales-Alcalá & Francke, sp. nov.

Figs. 8a–d; Table 2

ZooBank Registration: <https://zoobank.org/NomenclaturalActs/751D9AA6-B3F9-497B-9F58-C3BE208AA0E8>

Type material.—*Holotype male*. MEXICO: Jalisco: Municipio Zapopan: Bosque de la Primavera, 20°41′19.8168″N, 103°36′32.6304″W, 1649 m, 18 September 2020, D. Barrales, G. Contreras, mixed pine/oak forest (CNAN T1502).

Paratypes. MEXICO: Jalisco: 1 ♀, collected with holotype (CNAN T1504); 1 ♂, faldas del Bosque de la Primavera [no date]

(CNAN T1503); Municipio Guadalajara: 1 ♂, 5000 ft, 13/15 July 1959, H.E. Evans (AMNH HUFF-231); [Municipio Guachinango]: 1 ♀, 30 km al O de Ameca, puente Los Otates, 20°31′52.74″N, 104°15′33.846″W, 1497 m, 8 July 2005, O. Francke, J. Ponce, M. Cordova, A. Jaimes, V. Capovilla, G. Francke (CNAN T1505) (CNAN Ur29).

Other material examined.—MEXICO: Jalisco: [Municipio Mascota]: 1 ♂ subadult, Km 111 carretera Ameca Mascota, 20°28′49.2″N, 104°45′30.492″W, 1500 m, 9 July 2005, O. Francke, J. Ponce, M. Cordova, A. Jaimes, V. Capovilla, G. Francke (CNAN Ur56), 1 ♂, terraceria Las Palmas–Mascota, 20 June 2003, R. Paredes (CNAN Ur3); Municipio Talpa de Allende: 1 ♀, 9 km al sur del Cerro de la Tetilla, 20°22′02.424″N, 105°01′14.304″W, 2441 m, 21 July 2012, D. Barrales, G. Contreras, O. Francke, A. Valdez, pine/oak forest (AMNH); [Municipio Cautla]: 2 ♂, 1 ♀, 5

Table 1.—Measurements (mm) of *Mastigoproctus franckei* Barrales-Alcala, sp. nov from Xilitla, San Luis Potosi, Mexico, deposited in the National Collection of Arachnids (CNAN), Institute of Biology, National Autonomous University of Mexico, Mexico City, Mexico.

Type	Holotype	Paratype	Paratype	Paratype	Paratype	Paratype
Sex	♂			♀		
Collection	CNAN	CNAN	CNAN	CNAN	CNAN	CNAN
Code	T1506	T1507	T1508 [Ur167]	T1509 [Ur53]	T1510 [Ur126]	T1511 [Ur96]
Total length	63.9	63.0	63.9	62.7	55.3	53.3
Pedipalp						
Trochanter length	8.2	7.5	7.8	5.9	6.5	5.7
Trochanter width	5.5	5.1	5.0	4.0	3.7	3.5
Length S3 trochanter	1.4	1.3	1.0	-	-	-
Length S4 trochanter	1.7	1.5	1.1	-	-	-
Space length between S3 and S4	1.0	1.0	1.0	-	-	-
Femur length	17.4	15.8	16.8	9.9	9.9	8.9
Femur width	5.5	4.9	5.5	4.7	4.5	4.6
Ventromesal spine length	2.2	1.9	2.2	1.4	1.3	1.1
Ventromesal spine width	0.9	0.9	0.7	0.6	0.5	0.6
Patella length	11.7	10.9	11.6	6.3	6.4	5.7
Patella width	5.6	5.1	5.5	4.2	4.2	4.0
Patellar apophysis length	6.4	6.5	5.4	4.5	4.0	4.1
Patellar apophysis width	1.4	1.2	2.0	1.9	1.3	1.5
Tibia length	11.5	10.8	10.9	5.3	5.7	5.0
Tibia width	5.0	4.7	4.7	3.5	3.1	3.0
Carapace						
Total length	23.2	22.9	23.4	20.7	19.2	19.2
Total width at lateral ocelli	10.9	10.3	10.4	9.2	9.0	8.7
Total width at fovea	13.0	13.5	13.4	11.0	11.3	10.3
Median ocular tubercle distance	1.8	1.8	1.6	1.3	1.4	1.3
Ocular width	0.5	0.5	0.5	0.6	0.5	0.4
Distance between median ocelli	1.0	1.0	0.9	0.9	0.8	0.8
Leg I						
Coxa length	4.4	4.2	4.2	3.2	3.5	3.5
Trochanter length	4.0	4.2	3.9	3.4	3.5	3.0
Femur length	16.7	16.8	18.2	13.3	14.7	12.9
Patella length	22.8	22.0	22.2	18.4	18.4	18.1
Tibia length	21.5	20.7	20.4	16.9	17.7	16.9
Basitarsus–tarsus length	17.2	16.9	17.6	12.9	12.8	13.6
Leg IV						
Coxa length	6.7	6.7	7.0	6.1	6.0	5.5
Trochanter length	7.2	6.7	7.4	6.0	5.5	5.9
Femur length	18.7	17.6	19.0	14.6	15.8	14.1
Patella length	8.1	7.7	8.2	6.3	6.8	6.4
Tibia length	19.0	17.1	18.6	14.9	14.4	14.5
Basitarsus length	3.5	3.3	3.5	2.9	3.0	2.2
Tarsus length	7.4	7.4	7.2	6.4	6.4	5.9

juveniles, km 37 carretera los Volcanes—Ayutla, 20°15'14.4612''N, 104°28'50.0412''W, 1886 m, 9 July 2005, O. Francke, J. Ponce, M. Cordova, A. Jaimes, V. Capovilla, G. Francke (CNAN Ur56); Municipio Zapopan: 1 juvenile, Bosque de la Primavera, 20°36'55.3788''N, 103°29'36.7944''W, 1836 m, 19 August 2017, J. Mendoza, R. Ramirez, oak forest [Municipio Tecalitlán]: 1 ♀, 23 km E Tecalitlán, 19°25'51.96''N, 103°10'01.5''W, 1175 m, 10 July 2005, O. Francke, J. Ponce, M. Cordova, A. Jaimes, V. Capovilla, G. Francke (CNAN Ur30); [Municipio] Ocotlán: 1 juvenile, a 15 km de Guadalajara, 13 October 1962, C. Bolivar, J. Hendrichs (CNAN Ur47).

Etymology.—This new species name refers to the Huichol word *xetáme* that means reddish (Grimes & McIntosh 1954), which is the color of the adult specimens. The name is a noun in apposition.

Diagnosis.—*Mastigoproctus xetame*, sp. nov. resembles *M. mexicanus*, from which it differs as follows: tubercles on the retrolateral surface of the pedipalp femur of males of *M. mexicanus* are long, straight and digitiform; whereas in *M. xetame* are short and conical. In *M. mexicanus*, spine S3 is longer than the other spines on the prodorsal margin of the pedipalp trochanter of the adult male; whereas in *M. xetame*, spine S4 is longer than the others. In *M. mexicanus*, the subterminal accessory spine (AS) is present, whereas in *M. xetame* is absent in males.

Description.—The following description is based on three males and two females.

Total length: Maximum length from anterior margin of carapace to posterior margin of opisthosomal segment XII (pygidium) in adult specimens 56.2 mm (♂) and 52.1 mm (♀) (Table 2).

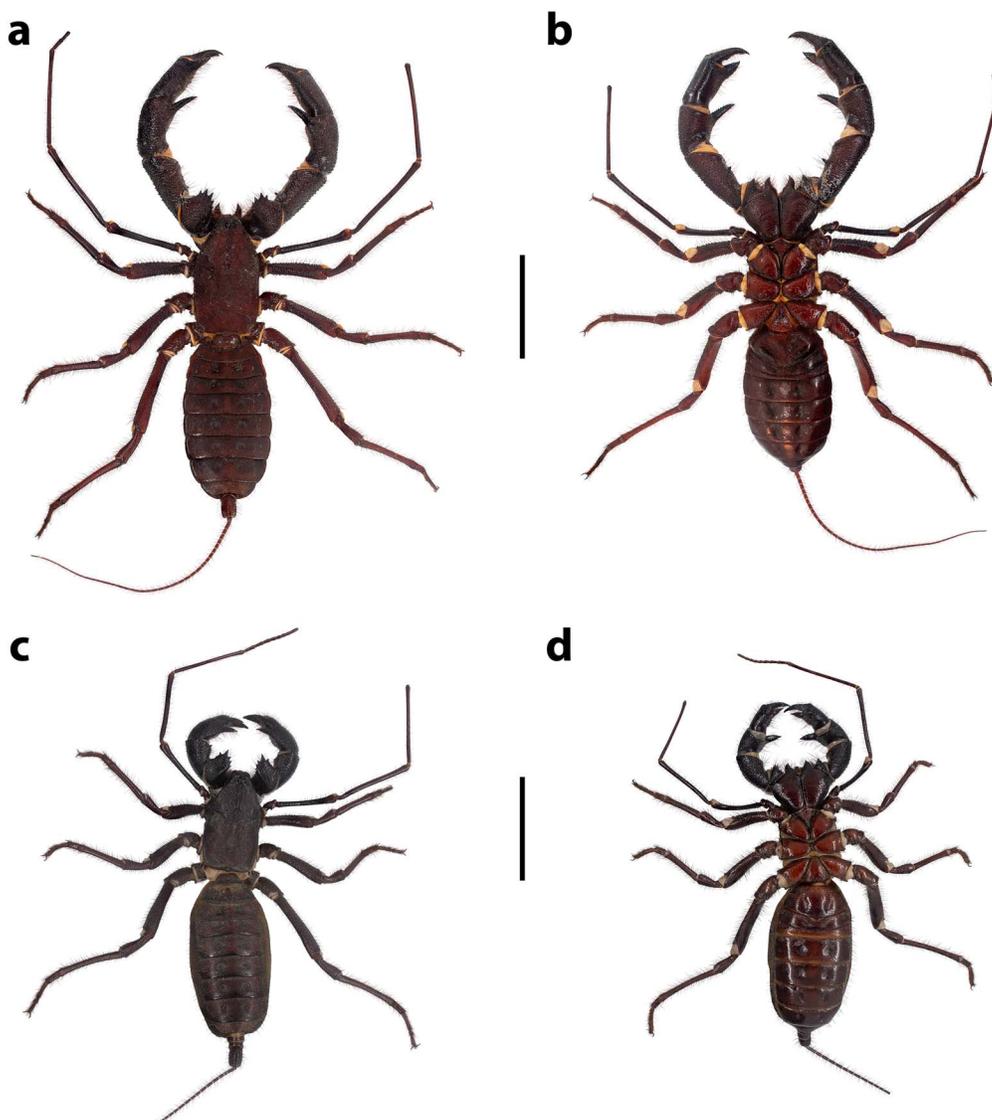


Figure 8.—*Mastigoproctus xetame*, sp. nov., habitus, dorsal (a, c) and ventral (b, d) aspect. a, b. ♂ holotype (CNAN [T1502]). c, d. ♀ paratype (CNAN [T1504]). Scale bars = 20 mm.

Color: Carapace reddish, anterior margin dark reddish brown, lateral margins reddish brown, median ocular tubercle dark reddish brown. Tergites I–IX reddish, anterior and lateral margins reddish brown, posterior margins reddish. Sternite I reddish, sternites II–IV reddish brown; V–VIII, and pygidium reddish brown, IX dark reddish brown. Pedipalp trochanter, femur, patella and tibia, dark reddish brown, mesal surfaces with several dark reddish macrosetae; patellar apophysis, fixed finger and basitarsus blackish, with reddish macrosetae. Legs I and II dark reddish brown; III and IV reddish brown, with ventral and dorsal margins dark reddish brown; II–IV coxae, ventral surfaces reddish brown.

Carapace: Epistoma visible in dorsal aspect. Pair of strongly developed carinae anterolaterally, extending from lateral ocelli to two-thirds the distance to median ocular tubercle (Figs. 6c, d). Three pairs of lateral ocelli; anterior ocelli almost equal to median, posterior ocelli larger; anterior two pairs slightly separated from posterior pair by tubercle, distance between median and posterior ocelli 5× distance between anterior and median ocelli. Median

ocular tubercle smooth, situated in anterior 10% of carapace (Table 2); distance between ocelli subequal to ocular diameter. Carapace surfaces granular, tuberculate mediolaterally, and with sclerotized crests between median ocular tubercle and anterior margin. Posterior fovea present, distinct.

Chelicerae: Retrolateral surface with stridulatory surface (*plectrum*), comprising approximately 25 long, stout (ca. 8× or 9× longer than wide), anteroventrally directed spiniform macrosetae (Fig. 2c); mesal surface with few short, stout, anteroventrally directed spiniform macrosetae.

Pedipalps: Cuticle punctate and tuberculate, with conical cristulae (Figs. 5c, d). Coxa, retrolateral surface with cristulae; ventral surface rugose; coxal apophysis with one terminal spine; prodorsal surface with long, retroventrally directed macrosetae inserted in cristulae, forming stridulatory surface (*pars stridens*) (Fig. 2d). Trochanter longer than wide (♂), or subequal (♀); retrodorsal surface with short, conical cristulae (♂) or punctate (♀); prodorsal margin with five terminal spines (S1–S5) and one

Table 2.—Measurements (mm) of *Mastigoproctus xetame* Barrales-Alcala & Francke sp nov., from Jalisco, Mexico, deposited in the National Collection of Arachnids (CNAN), Institute of Biology, National Autonomous University of Mexico, Mexico City, Mexico; and the Invertebrate Collection at the American Museum of Natural History (AMNH), New York.

Type	Holotype	Paratype	Paratype	Paratype	Paratype
Sex	♂				♀
Collection Code	CNAN T1502	AMNH HUFF-231	CNAN T1503	CNAN T1504	CNAN T1505 Ur29
Total length	56.2	43.6	49.3	52.1	49.2
Pedipalp					
Trochanter length	8.0	5.7	5.8	5.9	5.7
Trochanter width	4.8	3.1	3.9	3.0	3.2
Length S3 trochanter	9.0	0.3	0.4	-	-
Length S4 trochanter	1.1	0.6	0.5	-	-
Space length between S3 & S4	0.6	0.6	0.7	-	-
Femur length	17.1	10.2	12.2	8.9	9.2
Femur width	5.4	3.6	4.3	4.3	3.9
Ventromesal spine length	1.3	0.4	0.6	0.6	0.9
Ventromesal spine width	0.5	0.3	0.5	0.4	0.5
Patella length	11.4	7.2	8.5	5.7	6.1
Patella width	5.6	3.7	4.4	3.9	3.7
Patellar apophysis length	5.3	3.4	3.5	3.4	3.9
Patellar apophysis width	2.0	1.0	1.2	1.7	1.2
Tibia length	10.8	7.1	8.0	5.1	4.3
Tibia width	5.0	3.5	3.8	2.8	2.8
Carapace					
Total length	22.7	17.4	19.1	18.9	18.3
Total width at lateral ocelli	10.9	7.8	8.5	8.5	8.4
Total width at fovea	12.8	9.2	10.2	10.1	10.5
Median ocular tubercle distance	2.0	1.6	1.4	1.7	1.3
Ocular width	0.5	0.5	0.5	0.6	0.5
Distance between median ocelli	0.8	0.6	0.6	0.7	0.7
Leg I					
Coxa length	4.0	2.7	3.3	3.2	3.1
Trochanter length	3.7	2.5	3.3	3.0	3.1
Femur length	13.2	12.2	11.2	11.3	10.8
Patella length	19.5	14.8	14.5	14.7	14.3
Tibia length	18.5	14.1	16.0	14.6	14.7
Basitarsus–tarsus length	-	12.6	-	11.7	11.4
Leg IV					
Coxa length	6.4	5.1	5.5	5.5	5.3
Trochanter length	7.0	5.1	5.5	5.0	5.3
Femur length	16.5	12.6	13.8	13.7	12.9
Patella length	6.9	6.8	6.3	6.0	5.9
Tibia length	15.9	11.2	11.2	12.3	12.0
Basitarsus length	2.9	2.6	2.5	2.5	2.9
Tarsus length	7.5	5.6	6.2	6.8	6.0

subterminal accessory spine (AS) present in females and absent in males, varying in size such that $S4 > S3 \geq S2 \geq S5 > S1$ (♂; Fig. 4c) or $S4 > S5 \geq S3 > S2 > S1 > AS$ (♀; Fig. 4d); space between S4 and S3 subequal to length of S4 (♂) or subequal to space between S4 and S5 (♀); prolateral surface with conical tubercles and reddish macrosetae (♂); proventral margin with two spines (♂). Femur laterally compressed (♂) or terete (♀), $2 \times$ (♀) to $2.5 \times$ (♂) longer than wide (Table 2); prolateral surface with two spines, one prodorsal, short, sharply pointed, the other proventral, blunt, length almost one-fifth femur width (♂) or short, sharply pointed, and apical (♀); retrolateral surface with conical tubercles (♂) or short tubercles proximally (♀). Patella slightly longer (♂) or shorter (♀) than tibia (Table 2); prolateral surface with several reddish macrosetae,

one spine (♂) or one to two spines (♀) situated distally on proventral margin; one or two vestigial (♂) or distinct (♀) spine at base of patellar apophysis; retrolateral surface tuberculate proximally. Patellar apophysis elongated, almost one-quarter carapace length, granulated and slender (♂) or shorter and robust (♀); prolateral margin with row of blunt, pointed denticles; retrolateral margin smooth (♂) or denticulate (♀), with subterminal macrosetae. Tibia laterally compressed; prodorsal surface with sparse row of denticles; retrolateral surface sparsely punctate, with reddish macrosetae; proventral margin with two spines distally; fixed finger, dorsal and ventral margins each with row of denticles. Basitarsus (movable finger), dorsal and ventral margins each with serrate row of denticles; prolateral surface with several reddish macrosetae; apex bifid (♂).

Legs: Leg I, basitarsal and telotarsal tarsomeres I–VII gradually decreasing in length, with tarsomere I longest, tarsomere VIII four-fifths length of tarsomere I. Legs I–III coxae, lateral surfaces and IV, dorsal surface each with setose tubercles. Legs I–IV trochanters, dorsal and lateral surfaces with setose conical tubercles; femora dorsal and ventral surfaces with setose conical tubercles, situated proximally on I, II–IV, retroventral surfaces each with setose spiniform tubercle terminally, with macroseta inserted subterminally; tibiae each with one ventrodorsal spur; basitarsi each with two ventrodorsal spurs. Leg I tibia with two trichobothria distally; legs II–IV tibiae each with one trichobothrium distally.

Opisthosoma: Tergites slightly granular with dark setae; I without median longitudinal suture; II with smooth median longitudinal suture, extending from anterior margin to midsegment; tergites III–IX undivided; X (first segment of pygidium) with distinct lateral longitudinal sutures (pleuron); XII with pair of lateral, obovate ommatoids posterolaterally. Sternite II (genital) with pair of V-shaped (♂) or lanceolate (♀) depressions submedially, posterolateral surfaces inflated (♂) or flat (♀), and posterior margin protruding markedly (♂) or slightly (♀) posteriorly into median lobe, emarginate medially and overlapping sclerotized area in space between sternites II and III (♀); III divided longitudinally (♂) or undivided (♀), linear (♂) or with pronounced emargination (♀) anteriorly, posterior margin with (♂) or without (♀) median bulge with patch of reddish macrosetae; IV undivided longitudinally; V with (♂) or without (♀) patch of fine macrosetae medially; VI–IX surfaces smooth, with few dark macrosetae (♂). Spermathecae seminal receptacles rounded, posteriorly directed, spermathecal neck short, wide; aperture of uterus curved, with medial notch; atrium pentagonal in dorsal aspect (Figs. 3c, d).

Sexual Dimorphism: Adult males present characters that differ from the females and immature stages. The pedipalps of the male are elongated (Fig. 5c), unlike the pedipalps of the female, which are shorter and more robust. In females, all spines along the prodorsal margin of the pedipalp trochanter are evenly spaced whereas a wider gap is present between spines S3 and S4 than between other spines in the male (Figs. 4c, d). Conical distinct tubercles are present on the retrolateral surface of the femur in the male, whereas cristulae are present on the retrolateral surface of the female. The retroventral spine on the pedipalp femur is short and situated proximally in the male, whereas it is longer and situated distally in the female. The patellar apophysis is slender and elongated in the male, whereas it is short and stout in the female. The posterolateral surfaces of sternite II are slightly inflated in the male, but flat in the female. Sternite III is not emarginate anteriorly and its posterior margin exhibits a posteromedian bulge with a patch of macrosetae in the male, whereas sternite III is conspicuously emarginate anteriorly, its posteromedian margin does not protrude, and a patch of macrosetae is absent in the female (Fig. 8d).

Distribution.—This species is known from the state of Jalisco, Mexico (Fig. 1).

Natural history.—*Mastigoproctus xetame* inhabits mixed pine/oak forests, at elevations of 1400–2000 m, with a temperature range of 9°–30° C and mean annual precipitation of 902 mm. Specimens were collected under large rocks and rotten logs. No aggressive behavior was observed.

Mastigoproctus yalchanchak Barrales-Alcalá & Francke,
sp. nov.

Figs. 9a–d; Table 3

ZooBank Registration: <https://zoobank.org/NomenclaturalActs/C07BC0A4-3ABA-4FA2-86FF-8FEEEE742804D>

Type material.—*Holotype male.* MEXICO: Chiapas: [Municipio La Trinitaria], [La Trinitaria] La Esperanza [16°09'15"N, 91°52'05"W, 1548 m], 6 June 1940, H. M. Smith (CNAN T1500).

Paratypes: MEXICO: Chiapas: 1 ♂, 1 ♀, collected with holotype (NMNH A10122, A10123); 1 ♀, collected with holotype (CNAN T1501).

Etymology.—This new species name is a composition of the Tojolabal words *yal chan* (small animal) and *chak* (red color) (Lenkersdorf 2010) and refers to the size and color of the adult specimens. The name is a noun in apposition.

Diagnosis.—*Mastigoproctus yalchanchak*, sp. nov. is a conspicuous species of *Mastigoproctus* that resembles *M. scabrosus* in lacking a stridulatory apparatus and the shape of the trochanter spines. It may be distinguished from *M. scabrosus* as follows: the terminal spiniform tubercle on the retroventral surfaces of the femora of legs II–IV is conical in *M. scabrosus* whereas it is more tubular (digitiform) in *M. yalchanchak*. *Mastigoproctus scabrosus* is a large animal, the average total size is over 70 mm in adult males whereas *M. yalchanchak* is a smaller species, with an average size of 57 mm in adult males. The color of *M. scabrosus* is dark reddish brown, whereas *M. yalchanchak* is reddish.

Description.—The following description is based on three males and one female.

Total length: The maximum length from anterior margin of carapace to posterior margin of opisthosomal segment XII (pygidium) in adult specimens was 57.5 mm (♂) and 56.1 mm (♀) (Table 3).

Color: Carapace reddish, anterior margin reddish, lateral margins reddish-brown. Tergites I–IX reddish-brown, posterior and lateral margins dark reddish-brown. Sternites I and II reddish; III–IX and pygidium reddish-brown. Flagellum reddish-brown, segments with reddish macrosetae. Pedipalp trochanter, femur, patella and tibia, dark reddish-brown, mesal surfaces with few reddish macrosetae; patellar apophysis, fixed finger and basitarsus, blackish, with reddish macrosetae. Legs I–IV dark reddish; II–IV coxae, ventral surfaces reddish.

Carapace: Epistoma visible in dorsal aspect. Pair of strongly developed carinae anterolaterally, extending from lateral ocelli to two-thirds the distance to median ocular tubercle (Figs. 6e, f). Three pairs of lateral ocelli; anterior ocellus larger than median and posterior ocelli; anterior two pairs slightly separated from posterior pair by tubercle, distance between median and posterior ocelli ten times distance between anterior and median ocelli. Median ocular tubercle rugose, situated in anterior 10% of carapace (Table 3); distance between ocelli almost twice ocular diameter. Carapace surfaces densely granular, tuberculate mediolaterally. Posterior fovea present, distinct.

Chelicerae: Retrolateral surface without stridulatory surface; mesal surface with reddish macrosetae (Fig. 2e).

Pedipalps: Cuticle punctate and tuberculate with cristulae (Figs. 5e, f). Coxa, retrolateral surface with cristulae; ventral surface rugose; coxal apophysis with one terminal spine; prodorsal surface smooth, with macrosetae. Trochanter longer than wide;

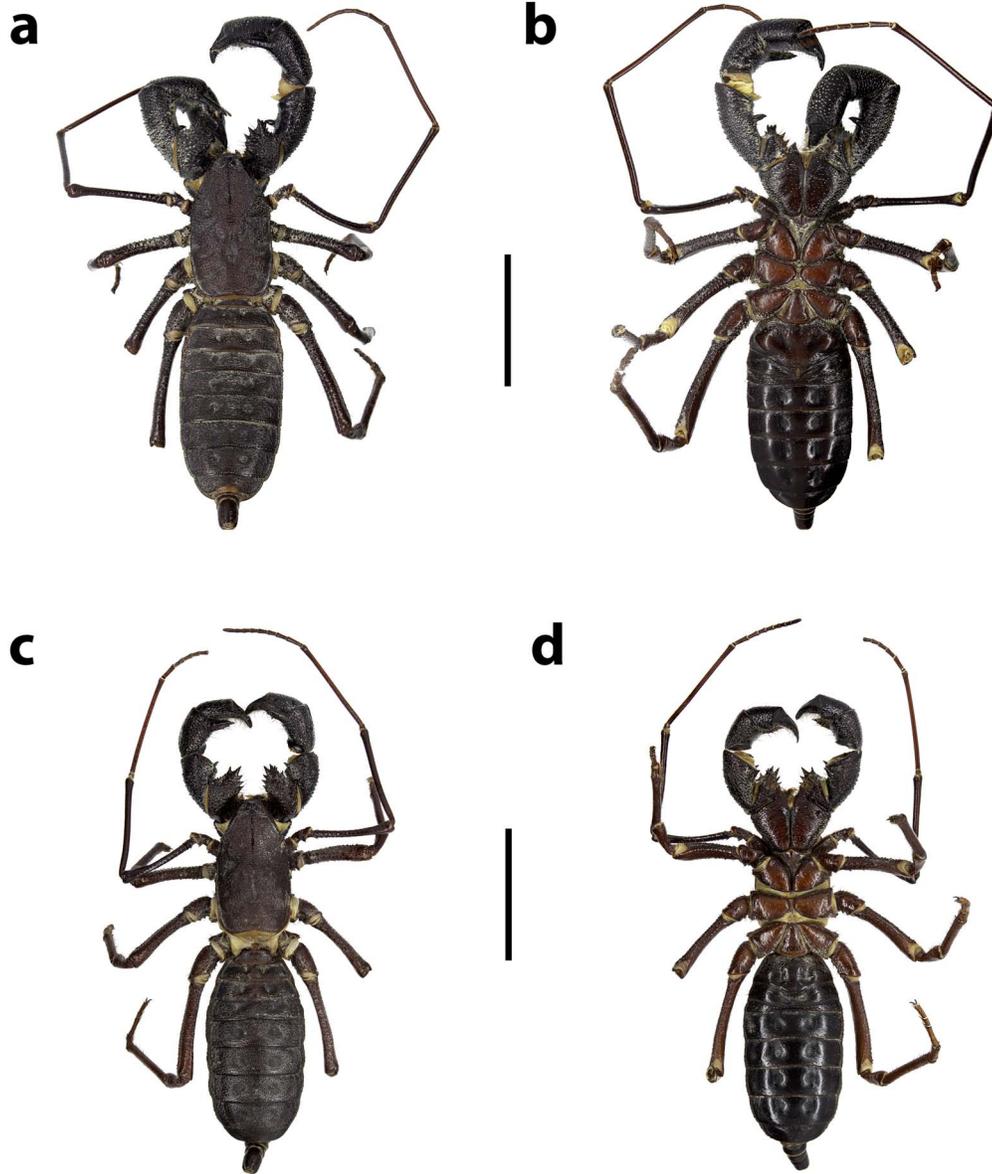


Figure 9.—*Mastigoproctus yalchanchak* sp. nov., habitus, dorsal (a, c) and ventral (b, d) aspect. a, b. ♂ holotype (CNAN [T1500]). c, d. ♀ paratype (CNAN [T1501]). Scale bars = 20 mm.

retrodorsal surface tuberculate; prodorsal margin with five terminal spines (S1–S5) and one subterminal accessory spine (AS), varying in size such that $S4 > S3 > S2 > S5 \geq S1 > AS$ (♂; Fig. 4e) or $S4 > S3 \geq S5 \geq S2 > S1 > AS$ (♀; Fig. 4f); spaces between S3 and S4 equal to or shorter than length of S3 (♂; Fig. 4e) or spines evenly spaced (♀); prolateral surface with several spiniform tubercles and reddish setae (♂); proventral margin with two spines (♂). Femur laterally compressed (♂) or terete (♀), two (♀) to almost three (♂) times longer than wide (Table 3); prolateral surface with two spines, one prodorsal, short, blunt (♂) or sharply pointed (♀), the other proventral, sharply pointed, length almost one-third femur width (♂) or short, sharply pointed, and situated apically (♀); retrolateral surface rugose, with short, blunt (♀) or sharply pointed (♂) tubercles. Patella almost equal (♂) or longer (♀) than tibia (Table 3); prolateral surface with reddish macrosetae, one vestigial (♂) or distinct (♀) spine situated

distally on proventral margin; one spine (♂, ♀) smooth (♂) or distinct (♀) at base of patellar apophysis; retrolateral surface with short tubercles (♂) or punctate (♀). Patellar apophysis elongated, almost one-fifth carapace length, smooth and slender (♂) or shorter and robust (♀); prolateral margin with row of blunt denticles; retrolateral margin smooth (♂) or denticulate (♀), with subterminal macrosetae. Tibia longer than wide, laterally compressed; prodorsal surface with sparse row of denticles; retrolateral surface punctate with smooth cristulae and reddish macrosetae; proventral margin with two spines distally; fixed finger, dorsal and ventral margins each with row of denticles. Basitarsus (movable finger), dorsal and ventral margins each with serrate row of denticles; prolateral surface with several reddish macrosetae; apex bifid (♂).

Legs: Leg I, femur with sclerotized crests proximally; basitarsal and telotarsal tarsomeres I–VII gradually decreasing in length,

Table 3.—Measurements (mm) of *Mastigoproctus yalchanchak* Barrales-Alcala & Francke, sp nov., from La Trinitaria, Chiapas, Mexico, deposited in the National Collection of Arachnids (CNAN), Institute of Biology, National Autonomous University of Mexico, Mexico City, Mexico; and the Smithsonian National Museum of Natural History (NMNH), Northwest Washington, Washington D. C.

Type	Holotype	Paratype	Paratype	Paratype
Sex	♂			♀
Collection Code	CNAN T1500	NMNH A-10122	NMNH A-10125	CNAN T1501
Total length	52.8	57.5	50.0	56.1
Pedipalp				
Trochanter length	7.3	7.8	6.7	7.0
Trochanter width	4.7	4.0	3.5	3.5
Length S3 trochanter	0.9	0.6	0.6	-
Length S4 trochanter	1.5	1.5	1.4	-
Space length between S3 and S4	0.9	1.0	0.7	-
Femur length	14.3	15.7	13.0	10.5
Femur width	5.3	5.5	4.9	5.4
Ventromesal spine length	1.8	1.6	1.6	1.9
Ventromesal spine width	0.9	1.0	0.8	1.0
Patella length	9.8	9.5	8.3	7.3
Patella width	4.7	5.1	4.1	4.9
Patellar apophysis length	4.6	4.5	4.7	4.4
Patellar apophysis width	1.3	1.5	1.5	1.6
Tibia length	9.0	9.6	8.5	6.0
Tibia width	4.5	4.7	4.2	3.7
Carapace				
Total length	22.0	23.2	20.3	22.0
Total width at lateral ocelli	9.7	10.3	9.1	9.5
Total width at fovea	12.8	12.9	11.3	12.2
Median ocular tubercle distance	1.8	1.7	1.6	1.8
Ocular width	0.5	0.6	0.6	0.5
Distance between median ocelli	0.7	0.8	0.8	0.9
Leg I				
Coxa length	4.0	3.2	4.0	3.9
Trochanter length	3.9	4.3	3.8	4.2
Femur length	14.9	16.2	15.2	14.2
Patella length	19.6	20.7	18.9	17.8
Tibia length	19.2	-	17.2	17.6
Basitarsus–tarsus length	17.0	-	14.5	-
Leg IV				
Coxa length	6.5	7.0	6.0	6.5
Trochanter length	6.5	7.1	6.2	7.0
Femur length	16.2	18.7	16.7	16.0
Patella length	7.6	7.2	7.1	6.9
Tibia length	15.2	18.5	15.8	16.2
Basitarsus length	2.2	3.2	3.6	2.1
Tarsus length	7.0	-	7.6	7.2

with tarsomere I longest, tarsomere VIII same length of tarsomere I. Legs I–III coxae, lateral surfaces and IV, dorsal surface each with setose spiniform tubercles. Legs I–IV trochanters, dorsal and lateral surfaces with setose spiniform tubercles. Legs II–IV femora dorsal surfaces with setose conical tubercles, retroventral surfaces each with setose spiniform tubercle terminally, with macroseta inserted terminally, prolateral surfaces granular, retrolateral surfaces smooth; tibiae each with one ventrodiscal spur; basitarsi each with two ventrodiscal spurs. Leg I tibia with two trichobothria distally; legs II–IV tibiae each with one trichobothrium distally.

Opisthosoma: Tergites granular; I with median longitudinal sulcus; II with median longitudinal suture extending from anterior margin to mid-segment; III with faint longitudinal suture; tergites IV–IX undivided; X (first segment of pygidium) with distinct lateral longitudinal sutures (pleuron); XII

with pair of obovate ommatoids posterolaterally. Sternite II (genital) with pair of V-shaped (♂) or lanceolate (♀) depressions submedially, posterolateral surfaces inflated (♂) or flat (♀), and posterior margin protruding markedly (♂) or slightly (♀) posteriorly into median lobe, emarginate medially and overlapping sclerotized area in space between sternites II and III (♀); III divided longitudinally (♂) or undivided (♀), linear (♂) or with pronounced emargination (♀) anteriorly, postero-medial margin with (♂) or without (♀) median bulge with patch of reddish macrosetae; IV undivided (♂, ♀); V with (♂) or without (♀) patch of fine macrosetae medially; VI–IX surfaces smooth, asetose. Spermathecae seminal receptacles round, anteriorly directed; spermathecal neck short, narrow, aperture of uterus rounded, with medial notch; atrium triangular in dorsal aspect (Figs. 3e, f).

Sexual dimorphism: Adult males present several characters that differ from the females and immature stages. The pedipalps of the male are elongated (Fig. 5e), unlike the pedipalps of the female, which are shorter and more robust. On the prodorsal margin of the pedipalp trochanter of the males, two gaps are present between spines S2 and S3 and between spines S3 and S4, and spines S4 and S5 are fused (Fig. 4e), whereas all spines along the prodorsal margin are evenly spaced, and spines S4 and S5 are separated in the female, being S4 the longest spine. Sharp tubercles are present on the retrolateral surface of the femur in the male, whereas short tubercles and sclerotized crests are present on the retrolateral surface of the female. The retroventral spine on the pedipalp femur is blunt in the male, whereas it is pointed in the female. The patellar apophysis of the male is more slender and more elongated than that of the female. The posterolateral surfaces of sternite II are slightly inflated in the male but flat in the female. Sternite III is not emarginate anteriorly in the male exhibiting a posteromedian bulge with a patch of macrosetae, whereas sternite III is emarginate anteriorly, its posteromedian margin does not protrude, and a patch of macrosetae is absent in the female (Fig. 9d).

Distribution.—This species is only known from the type locality (Fig. 1). Several efforts have been made to collect more material, but due the lack of reliable information of the exact locality, it has been unsuccessful.

Natural history.—Unknown.

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