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## Three new genera of soft-bodied goblin spiders (Araneae, Oonopidae) from Mexico, Belize, and Guatemala

ANGELO BOLZERN,<sup>1</sup> NORMAN I. PLATNICK,<sup>1</sup> AND LILY BERNIKER<sup>1</sup>

### ABSTRACT

Three new genera of soft-bodied, oonopine goblin spiders are established. Two specific names (*Oonops tolucanus* Gertsch and Davis, *Oonops chickeringi* Brignoli) are transferred to the new genus *Toloonops*, characterized by retaining a separate palpal bulb and cymbium, having the cymbial cone near the cymbial margin, and having posteriorly directed projections on the male endites that originate far from the anterior endite margins; five new species are described: *T. chiapa*, *T. jacala*, *T. veracruz*, *T. belmo*, and *T. verapaz*. Six similar new species, united by having a stepped male endite profile and a subapical sclerite on the anterior genitalic process of females, are assigned to the new genus *Guatemoonops*: *G. purulha*, *G. rhino*, *G. jaba*, *G. chilasco*, *G. augustin*, and *G. zacapa*. *Oonops mckenziei* Gertsch is transferred to the new genus *Emboonops*, characterized by having a fused palpal bulb and cymbium, a hypertrophied embolus, and often a V-shaped female anterior genitalic process; nine new species are described: *E. tuxtlas*, *E. tamaz*, *E. catrin*, *E. nejapa*, *E. calco*, *E. palenque*, *E. bonampak*, *E. arriaga*, and *E. hermosa*.

### INTRODUCTION

Based on the 3-3-2-2 tarsal organ receptor pattern (figs. 25–28, 185–187, 311–314), the lack of a heavily sclerotized sperm duct in the male palp (figs. 64, 223, 351), and the clumped eye arrangement (figs. 1, 63, 190, 221, 277, 316), the spiders treated in the present paper all

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belong to the subfamily Oonopinae (Platnick and Dupérré, 2010; Platnick et al., 2012). Within this large subfamily, generic relationships remain poorly resolved. One large group of genera, the gamasomorphines, are united by the putatively synapomorphic presence of a sperm pore on the heavily sclerotized epigastric scutum, far in advance of the epigastric furrow (Platnick et al., 2012), but the species treated here are soft bodied and lack that character. In addition, they show a character that most gamasomorphines lack: an oblique, unsclerotized strip on the ventral surface of the basal segment of the anterior lateral spinnerets (figs. 56, 188, 215, 251, 298, 332). The presence of that strip may be a synapomorphy of the entire superfamily Dysderoidea, in which case the character has been lost in all gamasomorphines except *Niarchos* Platnick and Dupérré (see Grismado et al., 2014).

Numerous fully soft-bodied New World oonopine species were originally misplaced in the genus *Oonops* Templeton, resulting in a polyphyletic group comprising a conglomeration of obviously unrelated taxa (Brignoli, 1974). In recent years, catalyzed by the Goblin Spider Planetary Biodiversity Inventory (PBI) project, some of those groups have been delineated (Platnick and Dupérré, 2009b; Grismado and Ramírez, 2013; Platnick and Berniker, 2013a, 2013b). With the establishment here of three new genera (*Toloonops*, *Guatemoonops*, and *Emboonops*), we take another step in the same direction, removing an additional three misplaced species from *Oonops*.

The plesiomorphic character state of having a separate palpal bulb and cymbium on the male palp, as found in *Toloonops* and *Guatemoonops*, is present in a subset of soft-bodied Oonopinae (*Oonops*, *Oonopinus* Simon, *Heteroonops* Dalmas, *Birabenella* Grismado, *Guaraguaonops* Brescovit et al., *Predatoroonops* Brescovit et al., and *Neotrops* Grismado and Ramírez). Within this group, the only taxa with posteriorly directed projections on the male endites belong to *Heteroonops*. During their revision of that genus, Platnick and Dupérré (2009b) encountered a species that was seemingly not congeneric with *Heteroonops*, but did show a similar endite confirmation (fig. 106): *Oonops tolucanus* Gertsch and Davis (1942). Brignoli (1974) described another such species, *Oonops chickeringi*, which he regarded as closely related to *O. tolucanus*. We agree with his hypothesis, and establish the new genus *Toloonops*, comprising *T. tolucanus*, *T. chickeringi*, and five newly described species: *T. belmo*, *T. chiapa*, *T. jacala*, *T. veracruz*, and *T. verapaz*. We also recognize an additional group of “*Heteroonops*-like” species, known almost exclusively from Guatemala. This group is described here as *Guatemoonops*, comprising the new species *G. augustin*, *G. chilasco*, *G. jaba*, *G. purulha*, *G. rhino*, and *G. zacapa*.

*Toloonops* members have thick, anteriorly directed setae with pronounced bases on the chelicerae, near the clypeus (figs. 2, 89, 101), a character shared at least with *Oonopoides* Bryant (see Platnick and Berniker, 2013b: fig. 14). Surprisingly, even though all *Oonopoides* species have a fused cymbium and bulb, the male palp resembles those of *Toloonops* species. However, the new genus is based on three putative synapomorphies: males show symmetrical elevations at the anterior sternum rim (probably reduced in *T. jacala* and *T. tolucanus*, figs. 4, 5, 94, 117, 124, 132, 139), the cymbial cone (see Bolzern and Platnick, 2013) is present and situated right next to or (in *T. belmo* and *T. verapaz*) only slightly removed from the tarsal organ (figs. 9, 87, 123), and the very narrow lateral extensions in the female genitalia (figs. 71, 99, 114, 128).

Based on the shape and position of the male endite projections, the bulb, and embolus shape, three distinct species group can be recognized. Males of the *chiapa* group (*T. chiapa*, *T. jacala*, and *T. veracruz*) show posteriorly truncated and flattened projections anteromedially on the endites (figs. 7, 62, 67, 74, 75, 81, 89, 90), and have an embolus opening set back from the tip (figs. 13, 84, 85, 96). *T. chickeringi* and *T. tolucanus* form the *tolucanus* group, united by the medially positioned and horn-shaped endite projections (figs. 101, 102, 106, 116, 117, 121), and the embolus opening situated close to the embolus tip (figs. 108, 122). The third group, the *belmo* group (*T. belmo* and *T. verapaz*) can be recognized by the posteromedially located endite projections (figs. 131, 132, 138–140), the palpal femur subbasally attaching to the patella, the enlarged tibia (figs. 133, 135, 142, 144), and the subspherical bulb shape (figs. 133, 142). In females, characters supporting these groupings have not been detected.

To our knowledge, no species of the herein established genus *Guatemoonops* have previously been described. Due to the lack of specimens, four of the six newly described species are known from one sex only (female only in *G. augustin*, *G. chilasco*, and *G. jaba*, male only in *G. rhino*). However, this group is well defined by two putative synapomorphies: the endites of males show a distinctly stepped anterolateral rim (in lateral view) without a serrula (figs. 162, 167, 220, 233, 263), and the female genitalia have a distinct anterior genitalic process with a T-shaped apex, subapically with a rounded sclerite (figs. 202–204, 228–231, 245, 260, 275). In addition, the internal genitalia of all these species are medially and posteriorly very complex and distinct. In one species, *T. purulha*, there is an extraordinary plate situated on the abdominal venter just posterior of the pedicel (figs. 205, 206, 227–229). This plate was not detected in other congeneric species and is apparently an autapomorphy of that species. The function of this structure is completely unknown.

Unlike the taxa discussed above, the species here assigned to the new genus *Emboonops* have the male palpal cymbium and bulb fully fused; although such fusion is common in gamasomorphines, it is much less commonly found in soft-bodied genera. Among the fully soft-bodied New World genera, this feature is shared only with *Wanops* Chamberlin and Ivie, *Oonopoides*, and *Noonops* Platnick and Berniker. The 10 species assigned here to *Emboonops* are known only from southern Mexico (Veracruz, Oaxaca, Chiapas, and Tabasco). They are readily separated from members of *Wanops* by their hypertrophied, rather than terminal and whiplike, embolus, and from those of *Oonopoides* by the lack of a hyaline conductor accompanying the embolus. The hypertrophied embolus also separates them from most members of *Noonops*, but there are a few species of that genus, including its type species, *Noonops floridanus* (Chamberlin and Ivie), in which the male embolus is almost as enlarged. Females of those species, however, do not share the typically V-shaped anterior genitalic process found in most species of *Emboonops*. Although Platnick and Berniker (2013b) suggested that *Oonopoides* and *Noonops* might be sister taxa, it now seems likely that *Noonops* is more closely related to *Emboonops* than to *Oonopoides*. *Emboonops* may well represent the southern sister group of *Noonops*, which occurs widely in the southern United States and Mexico but has not been found in the four southern Mexican states inhabited by *Emboonops* species.

Our methods generally follow those of Platnick and Dupérré (2009a); only differences from the males (beyond the obvious lack of male endite modifications) are mentioned in the descrip-

tions of females. Some females were digested with enzymatic contact lens cleaner rather than pancreatin, with similar results. Scans were taken from coated or uncoated right male palps, and the images were flipped for consistency. All measurements are in mm; high-resolution versions of the images, a sortable version of the geocoded locality data, and a distribution map for each species will be available on the PBI website (<http://research.amnh.org/oonopidae>). Users should note that the relatively small published images are merely avatars for the actual image files on the website, which can each be enlarged several times before pixelating. The species descriptions are arranged by the informal species groups (where recognized) and then geographically, from Mexico south to Guatemala.

#### COLLECTIONS EXAMINED

AMNH	American Museum of Natural History, New York, NY
FMNH	Field Museum of Natural History, Chicago, IL
MCVR	Museo Civico di Storia Naturale, Verona, Italy

#### *Toloonops*, new genus

TYPE SPECIES: *Toloonops chiapa*, new species.

ETYMOLOGY: The generic name refers to the first described species of the group, *Oonops tolucanus* Gertsch and Davis (1942), which is now transferred to this new genus, and is masculine in gender.

DIAGNOSIS: Male members of this genus differ from many other soft-bodied oonopines in having the bulb and cymbium separated (figs. 10, 64, 76, 91, 103, 118, 133, 142). From those with a separated bulb and cymbium, they differ in having the cymbial cone situated immediately beside or only slightly removed from the tarsal organ (figs. 9, 87, 123), from members of *Neotrops* in having posteriorly directed endite projections (figs. 7, 8, 67, 75, 81, 90, 106, 121, 132, 140), from members of *Heteroonops* in the position of these endite projections, the suboval to subrectangular cymbium shape (in dorsal view; rather than ovoid, figs. 12, 65, 77, 92, 104, 119, 134, 143), and from members of *Guatemoonops* in having the anterolateral rim of the endites straight, in lateral view, and with a serrula (rather than distinctly stepped and without serrula, figs. 8, 62, 74, 89, 101, 116, 131, 138), and in the shape of the bulb and distal sclerites (figs. 10, 64, 76, 91, 103, 118, 133, 142; cf. figs. 170, 223, 235, 268). Females differ in having internal genitalia with filiform lateral extensions, distinct anterior genitalic process and median sclerite (figs. 43, 71, 72, 99, 113, 114, 127–129, 149, 150), and the absence of elongated, highly spinose pedipalps with laterally dilated or elongated patellae (figs. 41, 146, 147; pedipalp of *T. chickeringi* moderately elongated and spinose, but without lateral dilation, fig. 124).

DESCRIPTION: Total length of males 1.3–2.1, of females 1.4–2.3. Carapace, sternum, mouthparts typically yellow to pale orange, legs typically yellow, without any pattern, abdomen soft portions typically white to yellow-brown, without any pattern. **Cephalothorax:** Carapace broadly oval in dorsal view, anteriorly narrowed to approximately 0.5 times its maximum width, pars cephalica slightly elevated in lateral view, anterolateral corners without extension or projections, with rounded posterolateral corners, without depressions or radiating rows of pits, posterolateral edge without pits, posterior margin not bulging below poste-

rior rim, posterolateral surface without spikes, platelets present on pars cephalica; fovea absent, lateral margin straight (*T. chickeringi*, *T. jacala*) or moderately undulate, rebordered, without denticles; plumose setae near posterior margin of pars thoracica absent; marginal, nonmarginal pars cephalica, pars thoracica setae needlelike, scattered. Clypeus margin unmodified, curved downward in front view, vertical in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent; setae needlelike. Chillum absent. Six eyes, well developed (female *T. verapaz* with moderately smaller eyes), ALE largest, oval, PME almost squared, PLE oval; posterior eye row recurved from above, moderately procurved or straight from front; ALE separated by their radius to diameter, ALE-PLE almost touching or separated by less than ALE radius, PME touching throughout most of their length, PLE-PME separated by less or slightly more than PME radius. Sternum slightly longer than wide, not fused to carapace, surface without transverse ridges or pits, median concavity, hair tufts both absent, with radial furrows between coxae I–II, II–III, III–IV, furrows and surface smooth, without microsculpture, radial furrow opposite coxae III absent, sickle-shaped structures absent, anterior margin unmodified, males typically with symmetrical elevations at anterior sternum rim (present in *T. belmo*, *T. chiapa*, *T. chickeringi*, *T. veracruz*, and *T. verapaz*, absent in *T. jacala*, *T. tolucanus*, all females), posterior margin not extending posteriorly of coxae IV, without posterior hump, anterior corner unmodified, lateral margin without infracoxal grooves, distance between coxae approximately equal, extension of precoxal triangles present, lateral margins unmodified; setae sparse, needlelike, evenly scattered or more dense laterally, originating from surface. Chelicerae straight, anterior face unmodified, without teeth on both promargin and retromargin (scanned only in *T. chiapa* and male of *T. jacala*); fangs without toothlike projections, directed medially, shape normal, without prominent basal process, tip unmodified; setae needlelike, evenly scattered, near clypeus with thick, distinctly antierect directed setae with pronounced bases; paturon inner margin with scattered setae on distal region, posterior surface unmodified, promargin with row of flattened setae (scanned only in both sexes of *T. chiapa* and males except *T. belmo* and *T. veracruz*), inner margin unmodified, laminate groove absent. Labium rectangular or almost triangular, fused to sternum, indented at middle, same as sternum in sclerotization; with six or more setae on anterior margin, subdistal portion with unmodified setae. Endites same as sternum in sclerotization, distally not excavated, in males anterolateral rim distinctly stepped (in ventral view), most anterior part hyaline, anteromedially, medially or posteromedially with distinct, ventroposteriorly pointed projection (unmodified in females), serrula present in single row (scanned only in *T. chiapa*). Female palp without claw, sometimes with indistinct spines on tibia and tarsus (except *T. chickeringi* with distinct spines and moderately elongated palp segments; spines absent in *T. tolucanus*); patella without prolateral row of ridges, tarsus unmodified. **Abdomen:** Ovoid, without long posterior extension, rounded posteriorly, interscutal membrane without rows of small sclerotized platelets. Booklung covers large, ovoid, without setae, anterolateral edge unmodified, with posterior slit sensillae; posterior spiracles connected by groove. Pedicel tube short, unmodified, scutopedicel region unmodified, plumose hairs, matted setae on anterior ventral abdomen in pedicel area, cuticular outgrowths near pedicel all absent. Dorsal scutum absent. Epigastric scutum absent in



males, weakly sclerotized in females, not surrounding pedicel, sometimes protruding, small lateral sclerites absent, without lateral joints. Postepigastric scutum absent in males, weakly sclerotized in females, where short, almost rectangular, anterior margin unmodified, without posteriorly directed lateral apodemes, only around epigastric furrow, not fused to epigastric scutum. Spinneret scutum, fringe of setae, supraanal scutum all absent. Abdominal setae needlelike, epigastric area setae not basally thickened; dense patch of setae anterior to spinnerets absent, interscutal membrane with setae. Colulus represented only by setae. Anterior lateral spinnerets bisegmented, basal segment with oblique membranous strip, posterior median unisegmented, posterior laterals bisegmented; spigots scanned in *T. chiapa* and females of *T. chickeringi* and *T. veracruz*; in male and females anterior laterals with one major ampullate gland spigot and two or three piriform gland spigots, posterior medians with one spigot (four in female *T. veracruz*), posterior laterals with two spigots (five in female *T. veracruz*). **Legs:** Femur IV not thickened, same size as femora I–III, patella plus tibia I nearly as long as carapace or moderately shorter, tibia I unmodified, tibia IV specialized hairs on ventral apex, ventral scopula both absent, metatarsi I, II mesoapical comb absent, metatarsi III, IV weak ventral scopula absent. Leg spines sometimes present on femora (*T. chickeringi* and *T. belmo* on anterior and posterior femora, *T. jacala* and *T. verapaz* on posterior only), tibiae (*T. chickeringi* on all legs, *T. tolucanus* without spines), and metatarsi (*T. belmo* and *T. chickeringi* at all legs, *T. tolucanus* without spines); femoral spines, spines on posterior legs not as strong as tibial, metatarsal spines on anterior legs. Tarsi without inferior claw. Superior claws (scanned only in *T. chiapa*) with inner face smooth, with denticulated row in female (absent in male), tarsi I, II with six teeth on outer row, no teeth on inner row, tarsi III, IV with five teeth on outer row, no teeth on inner row. Trichobothrial base longitudinally narrowed, aperture not gratelike, hood covered by numerous low, closely spaced ridges. Tarsal organs with three receptors on legs I, II, two on legs III, IV, palps (scanned only in male and partly in female *T. chiapa*). **Genitalia:** Male epigastric area with sperm pore not visible; furrow without  $\Omega$ -shaped insertions, without special setae. Male palp of normal size, not strongly sclerotized, right and left palps mirror images, proximal segments, cymbium pale orange to yellow, embolus dark, prolateral excavation absent; trochanter of normal size, unmodified; femur of normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, typically attaching to patella basally (subbasally in *T. belmo* and *T. verapaz*); patella typically shorter than femur, not enlarged (as long as femur in *T. belmo*, enlarged in *T. belmo* and *T. verapaz*), without prolateral row of ridges, setae unmodified; tibia sometimes moderately dorsoventrally enlarged (in *T. belmo* and *T. verapaz*), with three trichobothria; cymbium shape suboval to subrectangular in dorsal view, not fused to bulb, not extending beyond distal tip of bulb, plumose setae, stout setae, distal patch of setae all absent, cymbial cone present immediately next to or only moderately removed (in *T. belmo* and *T. verapaz*) from tarsal organ, close to distal cymbial rim; bulb more than twice as long as cymbium, stout, usually tapering apically (except in *T. belmo* and *T. verapaz*). Embolus tube shaped, strongly prolaterally curved, second distal sclerite originating prolaterally of embolus. Female genitalia externally inconspicuous but distinct due to visibility of internal genitalic process through epigastric scutum; internally with distinct, laterally narrow

lateral extensions, sometimes medially connected with dorsally protruding plate with numerous glands (absent in *T. tolucanus*), anterior genitalic process probably expandable, protruding anteriorly, usually with T-shaped apex, median sclerite usually more strongly sclerotized, diversely shaped, posterior typically with pocketlike membranous appendage.

DISTRIBUTION: Specimens are known only from Mexico, Belize, and Guatemala.

### Key to Species of *Toloonops*

1. Male ..... 2
  - Female (unknown in *T. belmo* and *T. jacala*)..... 8
2. Endites with posteriorly truncated, flattened, anteromedian projections (figs. 7, 62, 67, 74, 75, 81, 89, 90).....*chiapa* group, 3
  - Endites with pointed median or posteromedian projections (figs. 101, 102, 106, 116, 117, 121, 131, 132, 138–140) ..... 5
3. Endite projection long, reaching anterior sternum rim (figs. 89, 90) .....*veracruz*
  - Endite projection short (figs. 7, 62, 67, 74, 75, 81) ..... 4
4. Embolus relatively short and strong (figs. 12–14, 65), symmetrical elevations at anterior sternum rim present (figs. 4, 5).....*chiapa*
  - Embolus relatively long and slender (figs. 77, 82–84), symmetrical elevations at anterior sternum rim absent (figs. 75, 81) .....*jacala*
5. Endite projections medially located (figs. 101, 102, 106, 116, 117, 121), palpal femur basally attaching to patella, tibia not enlarged (figs. 103, 105, 118, 120)..... *tolucanus* group, 6
  - Endite projections posteromedially located (figs. 131, 132, 138–140), palpal femur subbasally attaching to patella, tibia enlarged (figs. 133, 135, 142, 144) ..... *belmo* group, 7
6. Leg spines absent ..... *tolucanus*
  - Distinct leg spines present.....*chickeringi*
7. Endite projections pointing posterolaterad (fig. 132), embolus longer than second distal sclerite (figs. 134, 136)..... *belmo*
  - Endite projections pointing posteriad (figs. 139, 140), embolus as long as second distal sclerite (figs. 141, 143) ..... *verapaz*
8. Three clearly separate genitalic processes detectable, anterior genitalic process pickaxe or mushroom shaped (figs. 113, 114, 149, 150)..... 9
  - Genitalic process only partly separated, anterior genitalic process differently shaped (figs. 71, 72, 99, 127, 128)..... 10
9. Median genitalic process suboval (figs. 113, 114) ..... *tolucanus*
  - Median genitalic process tube shaped, convoluted (figs. 149, 150) .....*verapaz*
10. Distinct spines present on tibiae I and II ..... *chickeringi*
  - No spines on tibiae I and II..... 11
11. Suboval part of median genitalic process posterior of epigastric furrow, all structures strongly sclerotized (figs. 43, 69–72) .....*chiapa*
  - Median parts of median genitalic process indistinct, at level of epigastric furrow, only moderately sclerotized (figs. 98, 99) .....*veracruz*



The *chiapa* Group  
*Toloonops chiapa*, new species  
Figures 1–72

**TYPES:** Male holotype, 10 male paratypes, and nine female paratypes from a hillside, 5 miles northeast of Chiapa de Corzo, 16.75°N, 92.96667°W, Chiapas, Mexico (Aug. 22, 1966; J. W. Ivie), deposited in AMNH (PBI\_OON 1607).

**ETYMOLOGY:** The specific name is a noun in apposition taken from the type locality.

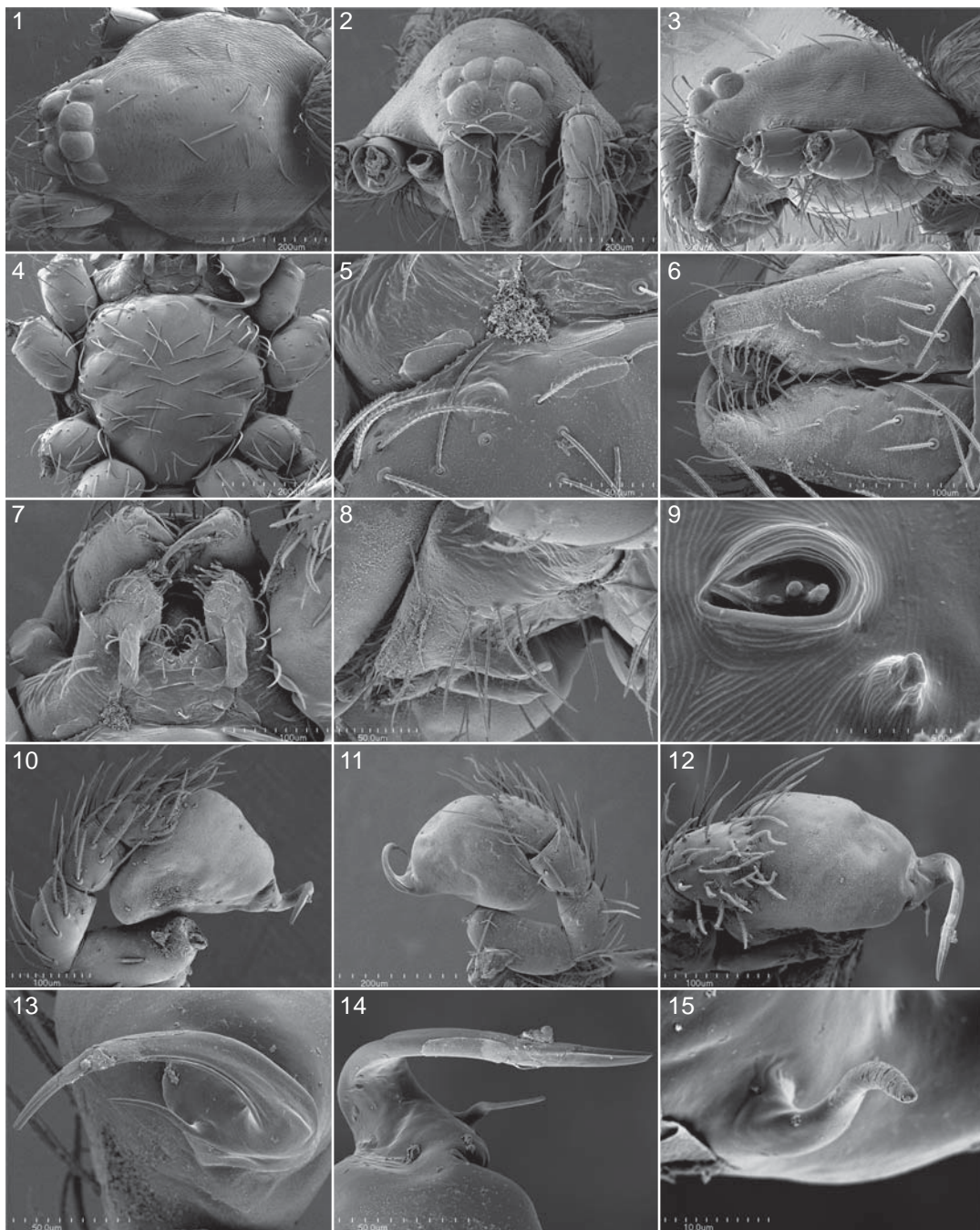
**DIAGNOSIS:** Males resemble those of *T. jacala* (figs. 77, 81–85) and *T. veracruz* (figs. 90, 92, 95, 96) in having posteriorly truncated and flattened projections anteromedially on the endites (figs. 7, 8, 62), and the embolus opening set back from the tip of the embolus (figs. 13). They differ from males of both species in having a relatively short and strong embolus (rather than a relatively long and slender one, figs. 12–14, 65), from *T. jacala* in having symmetrical elevations at the anterior sternum rim (figs. 4, 5, 67), and from *T. veracruz* by the short endite projections (rather than long, reaching sternum rim, figs. 7, 8, 67) and the more rectangular embolus tip (rather than flattened with pronounced anterior rim, figs. 13, 14, 65). Females differ from those of all other species by the shape of the translucent genital sclerites (fig. 69, 70), and internally in having a strongly sclerotized, suboval median genitalic process, posterior of epigastric furrow, dorsally covered by a large pocketlike structure (figs. 43, 71, 72).

**MALE** (PBI\_OON 1607, figs. 1–30, 61–67): Total length 1.33. Carapace surface everywhere finely reticulate. Endites anteromedially with long, broad, posteriorly truncated, flattened projection. Abdomen extending anteriad of pedicel. Leg spination: tibia IV p0-0-1, v0-0-1p, r0-0-1; metatarsus IV p0-0-1, v0-1-2, r0-0-1. Bulb with basal part protruding ventrally; embolus relatively short, strong, evenly curved prolaterad, distally moderately tapering, ventrally with indistinct longitudinal groove, otherwise smooth, tip flattened, embolus opening located ventrally at 2/3 of embolus length, triangular; second distal sclerite distinctly reduced, narrow, finger shaped, originating ventroprolaterally at embolus base.

**FEMALE** (PBI\_OON 1607, figs. 31–60, 68–72): Total length 1.54. Female palp spines: tibia p1-0-1; tarsus p2-2-2. Epigastric scutum slightly protruding. Leg spination: tibiae: III p0-0-1, v0-1-1p; IV p0-1-1, v0-1-2, r0-1-1. Narrow lateral extensions relatively wide, U-shaped; anterior genitalic process probably expandable, tubelike, with distinct enlarged apex, subapically with short, protruding glands; medially with strongly sclerotized structure, suboval, posterior of epigastric furrow, dorsally covered by large pocketlike structure.

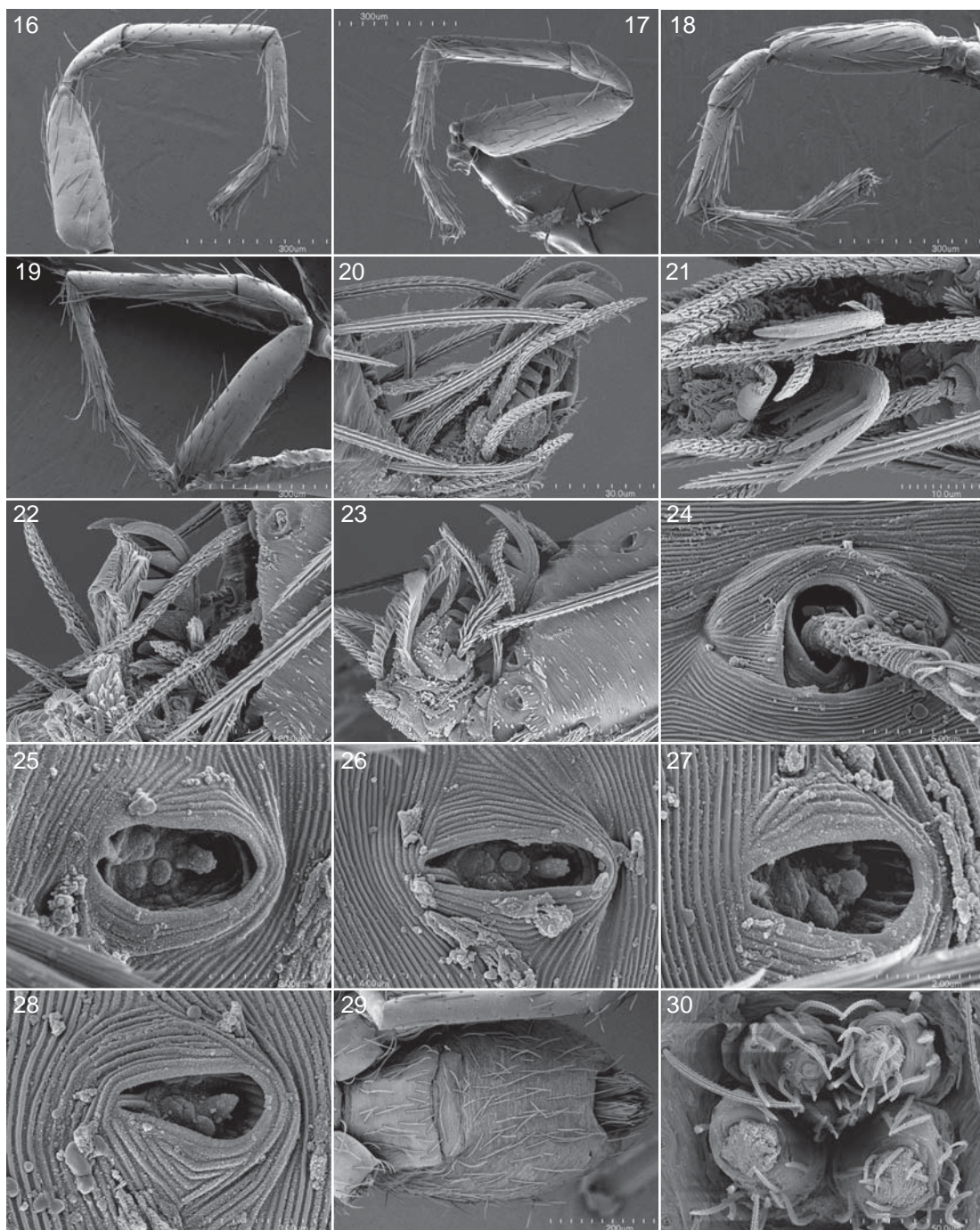
**OTHER MATERIAL EXAMINED:** MEXICO: **Chiapas:** hillside, 5 mi NE Chiapa de Corzo, 16.75°N, 92.96667°W, Aug. 22, 1966 (J. W. Ivie, AMNH PBI\_OON 1607), 11 juveniles; plateau 6 mi S Tuxtla Gutiérrez, 16.7°N, 93.11667°W, Aug. 21, 1966 (J. W. Ivie, AMNH PBI\_OON 1377, 1713), 3 ♀, 5 ♂. **San Luis Potosí:** Tamazunchale, 21.15°N, 98.47°W, Aug. 17, 1964 (J. W. Ivie, AMNH PBI\_OON 31138), 1 ♀, 2 ♂; 1 mi SW Tamazunchale, 21.15°N, 98.49°W, July 25, 1966 (J. W. Ivie, AMNH PBI\_OON 31141), 1 ♂. **Tamaulipas:** Cueva de Florida, Sierra de El Abra, Feb. 16, 1970, under stones, limestone rocks in scrub outside cave (J.A.L. Cooke, AMNH PBI\_OON 31142), 1 ♂. **Veracruz:** 4 mi NE Acayucan, 17.58°N, 94.5°W, Apr. 27, 1963 (W.J. Gertsch, W. Ivie, AMNH PBI\_OON 1714), 1 ♂.

**DISTRIBUTION:** Mexico (Tamaulipas to Chiapas).



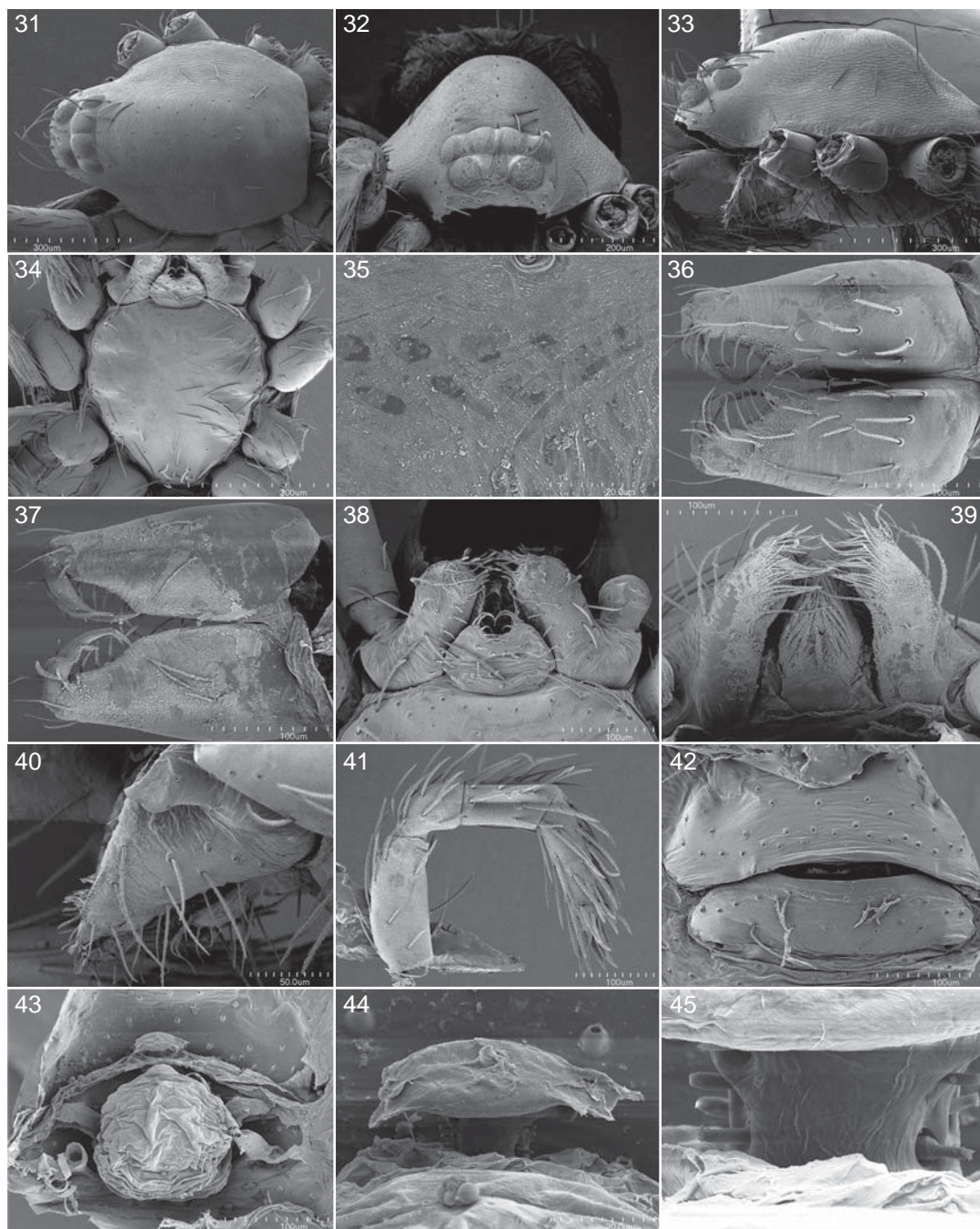
FIGURES 1–15. *Toloopsis chiapa*, new species, male. 1. Carapace, dorsal view. 2. Same, anterior view. 3. Same, lateral view. 4. Sternum, ventral view. 5. Same, anterolateral margin, ventral view. 6. Chelicerae, anterior view. 7. Mouthparts, ventral view. 8. Same, lateral view. 9. Tarsal organ and cymbial cone, dorsal view. 10. Palp, prolateral view. 11. Same, retrolateral view. 12. Same dorsal view. 13. Embolus and second distal sclerite, anteroventral view. 14. Same, dorsal view. 15. Second distal sclerite, prolateral view.





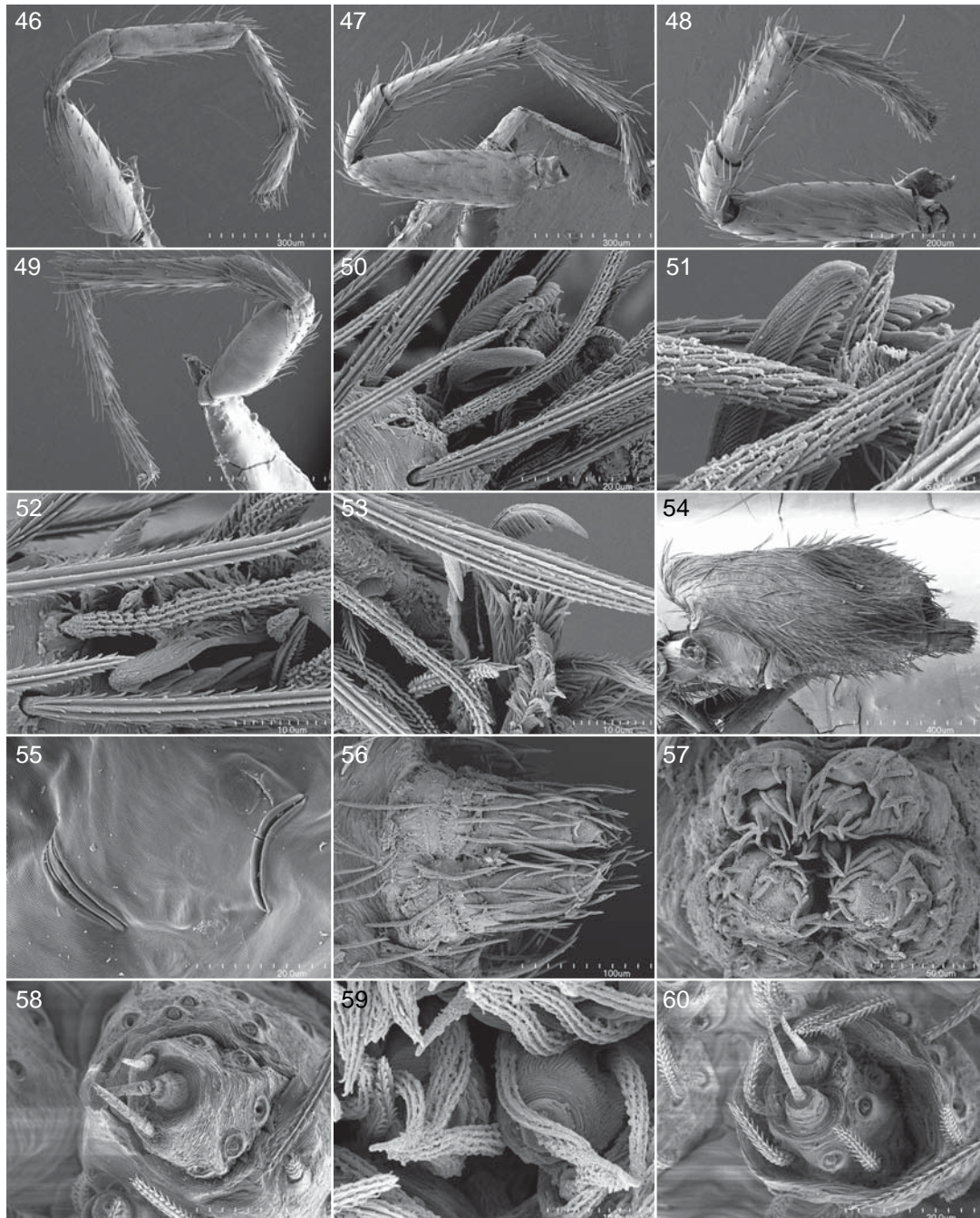
FIGURES 16–30. *Toloanops chiapa*, new species, male. 16. Leg I, retrolateral view. 17. Leg II, prolateral view. 18. Leg III, same. 19. Leg IV, same. 20. Claw, leg I, retrolateral view. 21. Claw, leg II, dorsal view. 22. Claw, leg III, prolateral view. 23. Same, leg IV. 24. Trichobothrial base, metatarsus IV, dorsal view. 25. Tarsal organ, leg I, dorsal view. 26. Same, leg II. 27. Same, leg III. 28. Same, leg IV. 29. Abdomen, ventral view. 30. Spinnerets, posterior view.



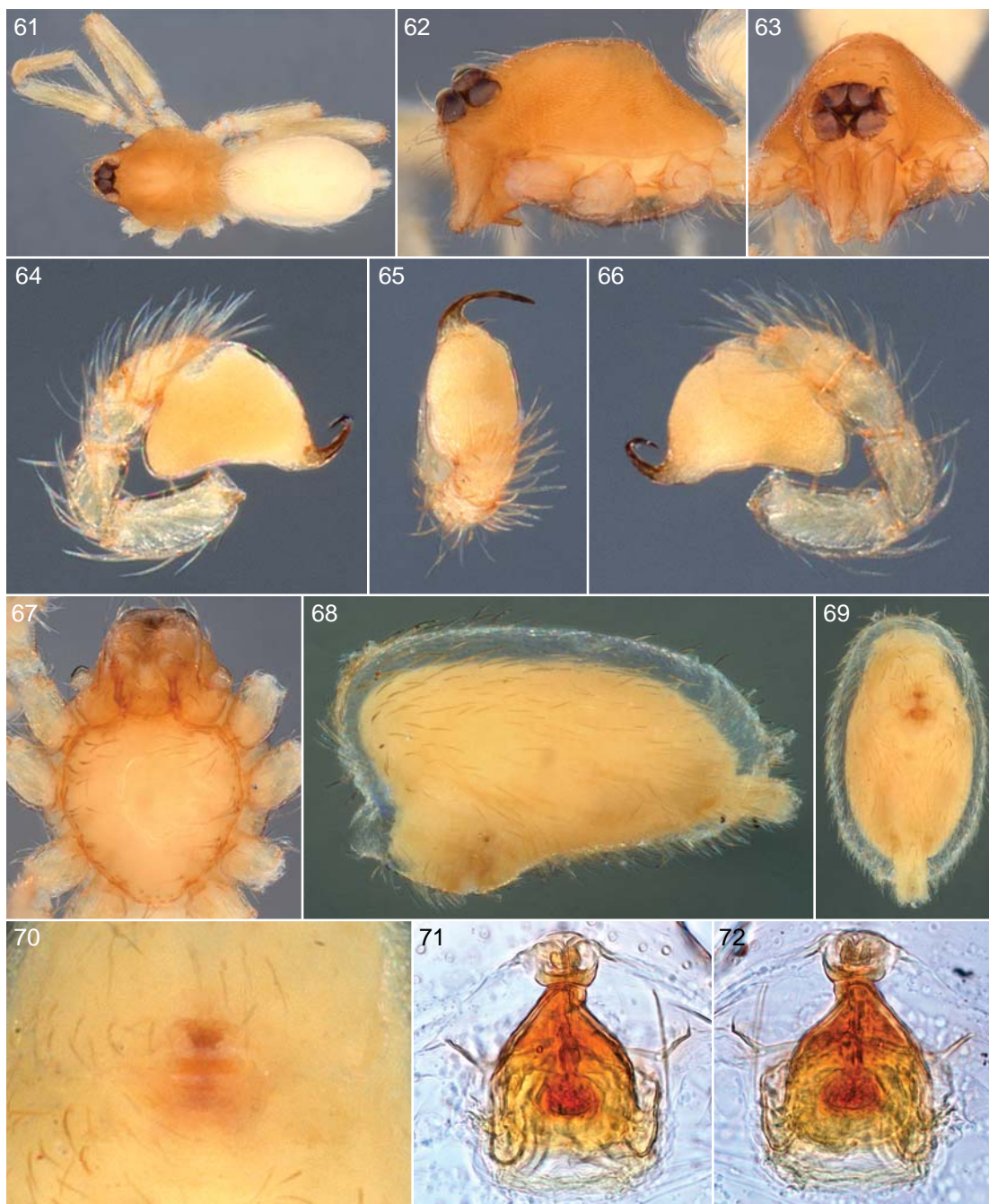


FIGURES 31–45. *Tolooneops chiapa*, new species, female. 31. Carapace, dorsal view. 32. Same, anterior view (with detached chelicerae). 33. Same, lateral view. 34. Sternum, ventral view. 35. Carapace platelets, dorsal view. 36. Chelicerae, anterior view. 37. Same, posterior view. 38. Mouthparts, ventral view. 39. Same, dorsal view. 40. Same, lateral view. 41. Palp, lateral view. 42. Epigastric area, ventral view. 43. Internal genitalia, dorsal view. 44. Anterior genitalic process, same. 45. Same, lateral glands.





FIGURES 46–60. *Toloopsis chiapa*, new species, female. 46. Leg I, prolateral view. 47. Leg II, same. 48. Leg III, same. 49. Leg IV, retrolateral view. 50. Claws, leg I, dorsolateral view. 51. Same, prolateral view. 52. Same, leg III, dorsolateral view. 53. Same, leg IV, anterolateral view. 54. Abdomen (moderately deformed), lateral view. 55. Booklung cover, ventral view. 56. Spinnerets, ventral view. 57. Same, posterior view. 58. Anterior lateral spinneret, same. 59. Posterior median spinnerets, same. 60. Posterior lateral spinneret, same.



FIGURES 61–72. *Toloopsis chiapa*, new species, male (61–67) and female (68–72). **61.** Habitus, dorsal view. **62.** Carapace, lateral view. **63.** Same, anterior view. **64.** Palp, prolateral view. **65.** Same, dorsal view. **66.** Same, retrolateral view. **67.** Sternum, ventral view. **68.** Abdomen, lateral view. **69.** Same, ventral view. **70.** Epigastric area, ventral view. **71.** Genitalia, ventral view. **72.** Same, dorsal view.



*Toloonops jacala*, new species

Figures 73–87

TYPE: Male holotype taken at a site 10–20 miles south of Jacala, Hidalgo, Mexico (July 20, 1956; V. Roth, W. Gertsch), deposited in AMNH (PBI\_OON 21063).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males resemble those of *T. chiapa* (figs. 7, 13, 14, 65, 67) and *T. veracruz* (figs. 90, 92, 95, 96) in having posteriorly truncated and flattened projections anteromedially on the endites (figs. 74, 75, 81), and the embolus opening set back from the tip of the embolus (figs. 84, 85). They differ from males of both species in the absence of symmetrical elevations at the anterior sternum rim (fig. 81), from *T. chiapa* in having a relatively long and slender embolus (rather than a relatively short and strong one, figs. 76–78, 82–84), and from *T. veracruz* by the short endite projections (rather than long, reaching sternum rim, figs. 74, 75, 81), and the simply flattened embolus tip (rather than with pronounced anterior rim, figs. 83–86).

MALE (PBI\_OON 31140, figs. 73–87): Total length 1.71. Carapace surface smooth. Endites anteromedially with long, broad, posteriorly truncated, flattened projection. Leg spination: femora III, IV d1-0-1; tibiae III, IV p1-0-1, v0-1-2, r1-0-1; metatarsi: III v0-1-2, r1-0-1; IV d0-0-1, p1-0-1, v0-0-2, r1-0-1. Bulb with basal part protruding ventrally, narrow; embolus relatively long, slender, abruptly curved prolaterad, distally tapering, ventrally with moderate longitudinal folding, tip flattened, embolus opening located ventrally at 2/3 of embolus length, triangular; second distal sclerite distinctly reduced, short, finger shaped, originating ventroprolaterally at embolus base.

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: MEXICO: **Puebla**: Tlacotepec (K. 224), July 25, 1956 (V. Roth, W. Gertsch, AMNH PBI\_OON 1605), 1 ♂. **Tamaulipas**: Gómez Farías, Mar. 13, 1972, road cut (J.A.L. Cooke, AMNH PBI\_OON 31140), 1 ♂.

DISTRIBUTION: Mexico (Tamaulipas to Puebla).

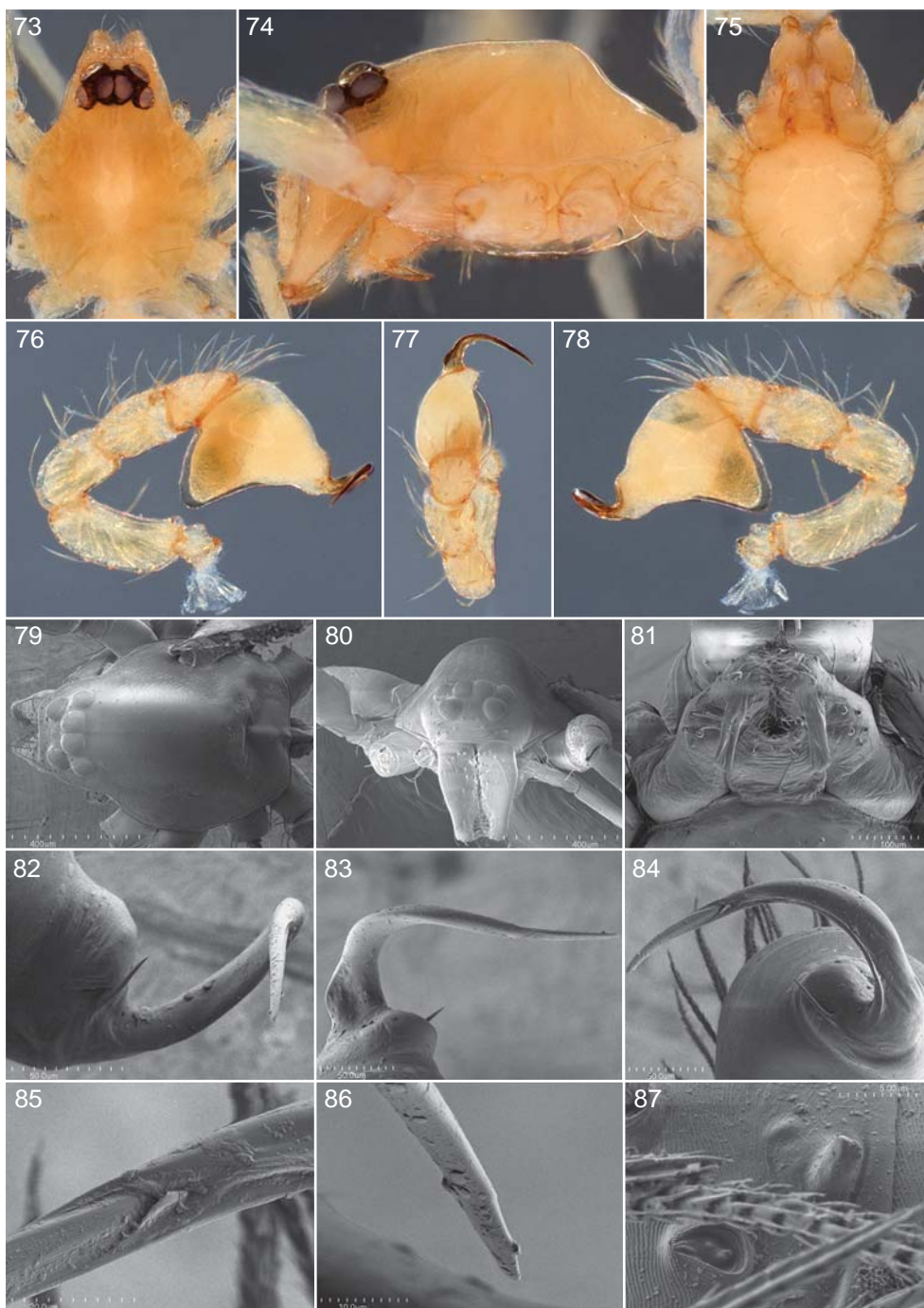
*Toloonops veracruz*, new species

Figures 88–99

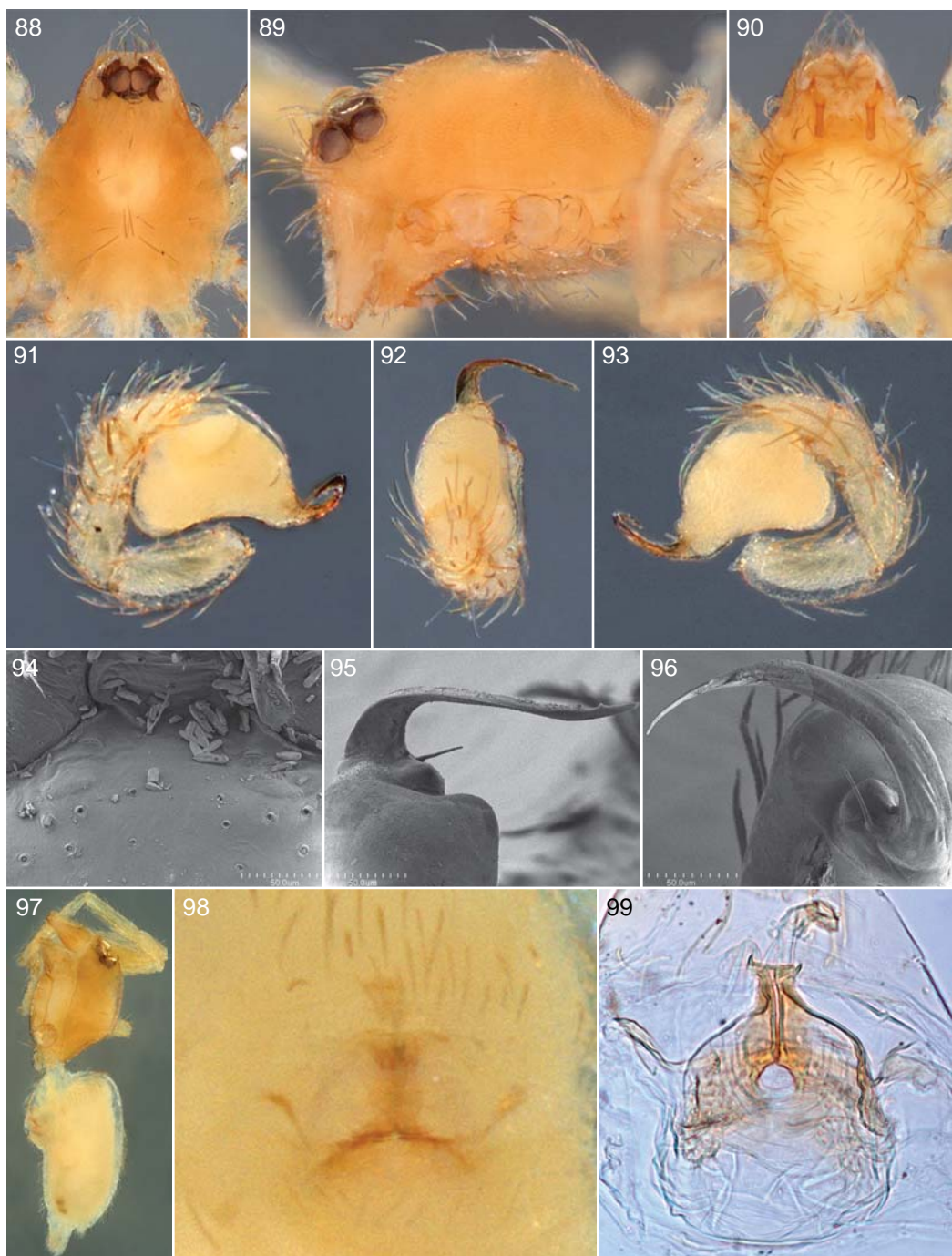
TYPE: Male holotype taken at a site 9 miles south-southwest of Veracruz, Veracruz, Mexico (Aug. 7, 1966; J., W. Ivie), deposited in AMNH (PBI\_OON 49252).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males resemble those of *T. chiapa* (figs. 7, 13, 14, 65, 67) and *T. jacala* (figs. 77, 81–85) in having posteriorly truncated and flattened projections anteromedially on the endites (figs. 89, 90), and the embolus opening set back from the tip of the embolus (figs. 96). They differ from males of both species in having long endite projections, reaching the sternum rim (rather than short ones, figs. 90), and the flattened embolus tip with a pronounced anterior rim (rather than more rectangular, figs. 95, 96), from *T. chiapa* in having a relatively long and slender embolus (rather than a relatively short and strong one, figs. 92, 95, 96), and from *T. jacala* in having symmetrical elevations at the anterior sternum rim (figs. 90, 94). Females differ from those of all other species by the wide, W-shaped translucent lateral extensions (fig. 98), and internally in having an indistinct, moderately sclerotized, anteriorly goblet-shaped median genital process, dorsally covered by a large pocketlike structure (fig. 99).



FIGURES 73–87. *Toloopsis jacala*, new species, male. 73. Carapace, dorsal view. 74. Same, lateral view. 75. Sternum, ventral view. 76. Palp, prolateral view. 77. Same, dorsal view. 78. Same, retrolateral view. 79. Carapace, dorsal view. 80. Same, anterior view. 81. Mouthparts, ventral view. 82. Embolus, prolateral view. 83. Same, dorsal view. 84. Same, anteroventral view. 85. Embolus opening, same. 86. Embolus tip, retrolateral view. 87. Tarsal organ and cymbial cone, dorsal view.



FIGURES 88–99. *Toloosops veracruz*, new species, male (88–96) and female (97–99). 88. Carapace, dorsal view. 89. Same, lateral view. 90. Sternum, ventral view. 91. Palp, prolateral view. 92. Same, dorsal view. 93. Same, retrolateral view. 94. Sternum, anterior part, ventral view. 95. Embolus, dorsal view. 96. Same, antero-ventral view. 97. Habitus, lateral view. 98. Epigastric area, ventral view. 99. Genitalia, dorsal view.



MALE (PBI\_OON 49252, figs. 88–96): Total length 1.48 (PBI\_OON 1953 measured, abdomen of PBI\_OON 49252 missing). Surface of elevated portion of pars cephalica smooth, sides finely reticulate. Endites anteromedially with long, broad, distally truncated, flattened projection. Leg spination: tibia IV p1-0-1, v0-1-2, r1-0-1; metatarsi III, IV v0-1-0. Bulb with basal part protruding ventrally; embolus relatively long, slender, moderately flattened, abruptly curved prolaterad, distally tapering, tip distinctly flattened, with pronounced anterior rim, embolus opening located ventrally at 3/4 of embolus length, triangular; second distal sclerite reduced, short, finger shaped, straight, originating ventroprolaterally at embolus base.

FEMALE (PBI\_OON 1633, figs. 97–99): Total length 1.39. Female palp spines: tibia p1-0-1; tarsus p2-2-2, v0-0-1. Epigastric scutum strongly protruding. Leg spination: as in male (but leg IV missing). Narrow lateral extensions relatively wide, W-shaped, connected by wing-shaped but medially separated, porous plate; anterior genitalic process tubelike, protruding anteriorly (probably expandable), enlarged apex; median genitalic process anteriorly goblet shaped; posterior genitalic process membranous, pocketlike, broadly oval, dorsally covered by porous, symmetrically wing-shaped, moderately sclerotized lamella.

OTHER MATERIAL EXAMINED: MEXICO: **Veracruz**: 3 mi S Veracruz, 19.12722°N, 96.13352°W, Apr. 26, 1963 (W.J. Gertsch, W. Ivie, AMNH PBI\_OON 1953), 1 ♂; Veracruz, July 10, 1953 (C.J. Goodnight, AMNH PBI\_OON 1633), 1 ♀.

DISTRIBUTION: Mexico (Veracruz).

#### The *tolucanus* Group

#### *Toloonops tolucanus* (Gertsch and Davis), **new combination**

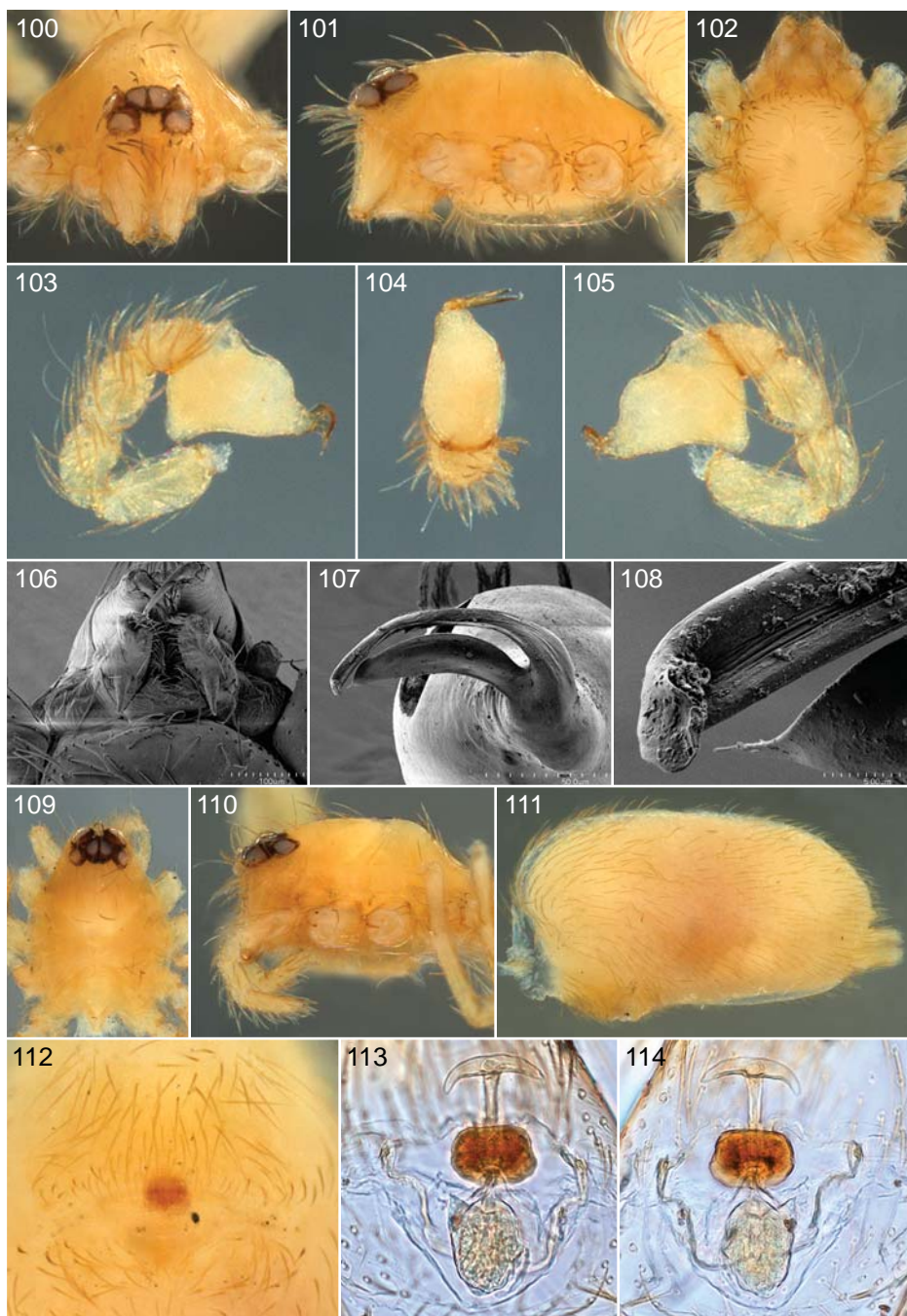
Figures 100–114

*Oonops tolucanus* Gertsch and Davis, 1942: 4, figs. 11–13 (male holotype from Mt. Toluca, México, Mexico, in AMNH; examined).

DIAGNOSIS: Male resembles those of *T. chickeringi* (figs. 116, 117, 119, 121, 122) in having endites medially with horn-shaped, pointed projections (figs. 101, 102, 106), but differ from this and all other species in having no leg spines, and a broad, flat, sickle-shaped second distal sclerite, as long as the embolus (rather than reduced, finger shaped in males of the *chiapa* group and *T. chickeringi*, or differently shaped in the *belmo* group, figs. 104, 107). Females differ from those of all other species in having no spines on the palps and legs, a distinctly tripartite internal genital structure with the anterior genitalic process pickaxe shaped, the median process suboval, strongly sclerotized, and the posterior process long, oval, and pocketlike (figs. 113, 114).

MALE (PBI\_OON 49255, figs. 100–108): Total length 1.74. Carapace surface smooth. Endites medially with horn-shaped, pointed projections. Abdomen moderately extending anteriorly of pedicel. Leg spines absent. Bulb with basal part protruding ventrally; embolus abruptly curved prolaterad, ventrally longitudinally ribbed, distally moderately tapering, embolus tip with opening abruptly bent ventrad; second distal sclerite broad, flat, sickle shaped, distally sharply pointed (three spikes), originating ventroprolaterally at embolus base, as long as embolus.

FEMALE (PBI\_OON 49255, figs. 109–114): Total length 2.00. Female palp spines absent. Epigastric scutum slightly protruding. Median genitalic process visible through epigastric scu-



FIGURES 100–114. *Toloconops tolucanus* (Gertsch and Davis), new combination, male (100–108) and female (109–114). **100.** Carapace, anterior view. **101, 110.** Same, lateral view. **102.** Sternum, ventral view. **103.** Palp, prolateral view. **104.** Same, dorsal view. **105.** Same, retrolateral view. **106.** Mouthparts, ventral view. **107.** Embolus, anteroventral view. **108.** Embolus tip, same. **109.** Carapace, dorsal view. **111.** Abdomen, lateral view. **112.** Epigastric area, ventral view. **113.** Genitalia, same. **114.** Same, dorsal view.

tum, reddish brown, suboval. Very narrow lateral extensions weakly sclerotized, U-shaped; anterior genitalic process pickaxe shaped, protruding anteriorly; median genitalic process suboval, strongly sclerotized; posterior genitalic process pocketlike, long, oval, dorsally covered by porous, membranous lamella.

**MATERIAL EXAMINED:** MEXICO: **México:** Mt. Toluca, June 28, 1936 (A., L. Davis, AMNH PBI\_OON 49255), 1 ♂ (holotype), 1 ♀ (allotype), same (AMNH PBI\_OON 1734), 1 ♀ (paratype).

**DISTRIBUTION:** Mexico (state of México).

*Toloonops chickeringi* (Brignoli), **new combination**

Figures 115–129, 156–159

*Oonops chickeringi* Brignoli, 1974: 200, figs. 2A–I (male holotype from Cueva del Panteon, Teopisca, Chiapas, Mexico, in MCVR; examined).

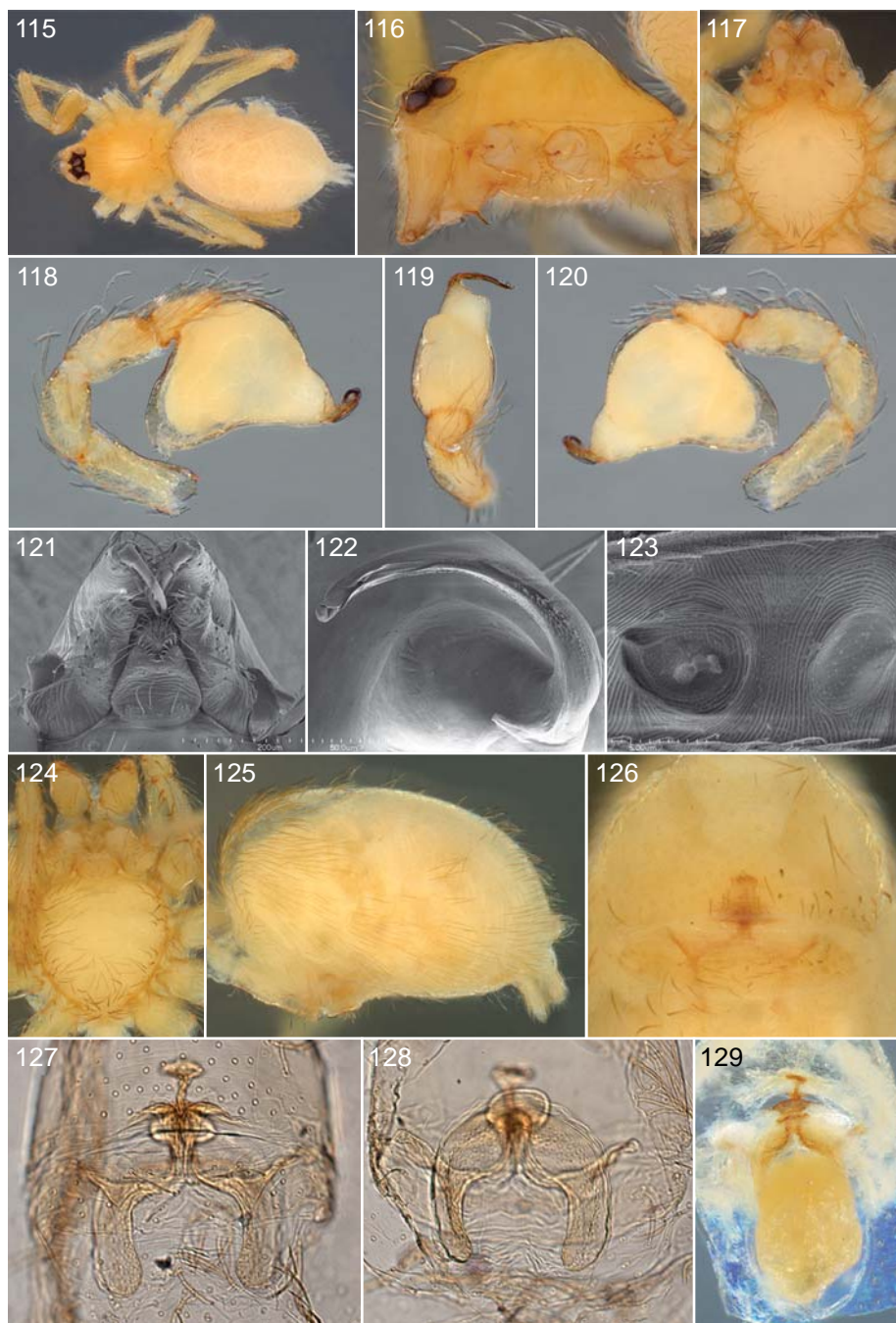
**DIAGNOSIS:** Male resembles those of *T. tolucanus* (figs. 101, 102, 104, 106–108) in having endites medially with horn-shaped, pointed projections (figs. 116, 117, 121), but differ in having the endite projections pointing more laterally (rather than posteriorly, figs. 117, 121), a reduced, finger-shaped second distal sclerite (fig. 122, partly broken off on SEM image), and from this and all other species in having strong spines on tibiae I and II. Females differ from those of all other species in having strong spines on the palp and anterior tibiae, by the horse-shoe-shaped but medially separated, porous plate and the suboval, moderately sclerotized median genitalic process (figs. 127, 128).

**MALE** (PBI\_OON 49586, figs. 115–123): Total length 2.07. Carapace surface smooth. Endites medially with horn-shaped, pointed projections. Abdomen moderately extending anteriorly of pedicel. Leg spination (spines on leg II less distinct): femora: I d1-0-0; III, IV d1-0-1; tibiae: I v2-1-1; II p0-1-0, v1-0-1; III, IV p0-1-1, v1-0-2, r0-1-1; metatarsi: I p0-1-1, v2-2-0, r0-0-1; II p1-0-0, v1-0-1, III v1-0-2, r0-0-1; IV p0-1-1, v1-0-2, r0-1-1. Bulb with basal part protruding ventrally; embolus abruptly curved prolaterad, distally moderately tapering, ventrally longitudinally ribbed with longitudinal folding, bearing field of tiny spikes, tip with distinct folding, embolus opening shifted proximally, ventroanteriorly from tip; second distal sclerite reduced, finger shaped (broken off in SEM), originating ventroprolaterally at embolus base.

**FEMALE** (PBI\_OON 49586, 49219, figs. 124–129, 156–159): Total length 2.22. Female palp spines: femur v2-1-1; patella p0-1-1; tibia d0-0-1, p2-2-1; tarsus d2-2-2, p1-2-2, v2-2-2. Palp segments moderately elongated. Epigastric scutum moderately protruding. Leg spination: femur II d1-0-0; tibiae: I p0-1-1, v2-1-1; II v2-2-2; III p0-1-1, v2-0-2, r0-1-1; metatarsi: II p1-0-0, v2-2-0; III v2-0-2, r0-1-1. Anterior, median genitalic processes, lateral extensions visible through epigastric scutum, reddish brown. Narrow lateral extensions connected by horseshoe-shaped but medially separated, porous plate; anterior genitalic process narrow, tubelike, protruding anteriorly, apex enlarged; median genitalic process suboval, moderately sclerotized; posterior genitalic process large, pocketlike, long, oval (better seen in undigested specimen).

**OTHER MATERIAL EXAMINED:** MEXICO: **Chiapas:** Cueva del Panteon, Teopisca, May 19, 1971 (R. Argano, V. Sbordoni, MCVR PBI\_OON 49220), 1 ♂ (holotype), same (MCVR PBI\_OON 49216, 49219),





FIGURES 115–129. *Toloosops chickeringi* (Brignoli), new combination, male (115–123) and female (124–129). 115. Habitus, dorsal view. 116. Carapace, lateral view. 117, 124. Sternum, ventral view. 118. Palp, prolateral view. 119. Same, dorsal view. 120. Same, retrolateral view. 121. Mouthparts, ventral view. 122. Embolus, anteroventral view. 123. Tarsal organ and cymbial cone, dorsal view. 125. Abdomen, lateral view. 126. Epigastric area, ventral view. 127. Genitalia, ventral view. 128. Same, dorsal view. 129. Same, not digested or cleared, paratype.

2 ♀ (paratypes); 5 mi W San Cristobal, 16.75°N, 92.68333°W, Aug. 24, 1966, pine-oak forest (J., W. Ivie, AMNH PBI\_OON 49586), 1 ♂, 3 ♀.

DISTRIBUTION: Mexico (Chiapas).

#### The *belmo* Group

#### *Toloonops belmo*, new species

Figures 130–136

TYPE: Male holotype from a Berlese sample of forest litter on limestone taken at a site 2.5 miles south of Belmopan, Cayo, Belize (Aug. 04, 1972; S., J. Peck), deposited in FMNH (72196, PBI\_OON 49257).

ETYMOLOGY: The specific name is a noun in apposition shortened from the type locality.

DIAGNOSIS: Males resemble those of *T. verapaz* (figs. 139–144) in having short horn-shaped projections posteromedially on the endites (fig. 132), the palpal femur attaching to the patella subbasally, the patella and tibia enlarged, and a spherical bulb (figs. 133–135). They differ in having the embolus distinctly longer than the bulb (rather than nearly as long, fig. 134), and a second distal sclerite much shorter than the embolus (rather than reaching 3/4 of embolus length, figs. 141, 143).

Male (PBI\_OON 49257, figs. 130–136): Carapace length 0.74 (abdomen missing), surface smooth. Endites posteromedially with short horn-shaped projection, pointing posterolaterad. Leg spination: femora: I d1-0-1, p0-0-1; II, III d1-0-1; tibiae: III d1-0-0, p1-0-1, v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1; metatarsi: I, II v0-1-0; III d1-0-0, v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. Palpal femur attaching to patella subbasally, patella, tibia both enlarged. Bulb spherical, not tapering apically; embolus moderately flattened, slender, abruptly curved prolaterad, distinctly longer than bulb, embolus opening large, shifted anteriad, with distinctly protruding tip; second distal sclerite basally broad, flat, long, triangular, distally strongly narrowed, leaf shaped, originating prolaterally of embolus base, much shorter than embolus.

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Belize (Cayo).

#### *Toloonops verapaz*, new species

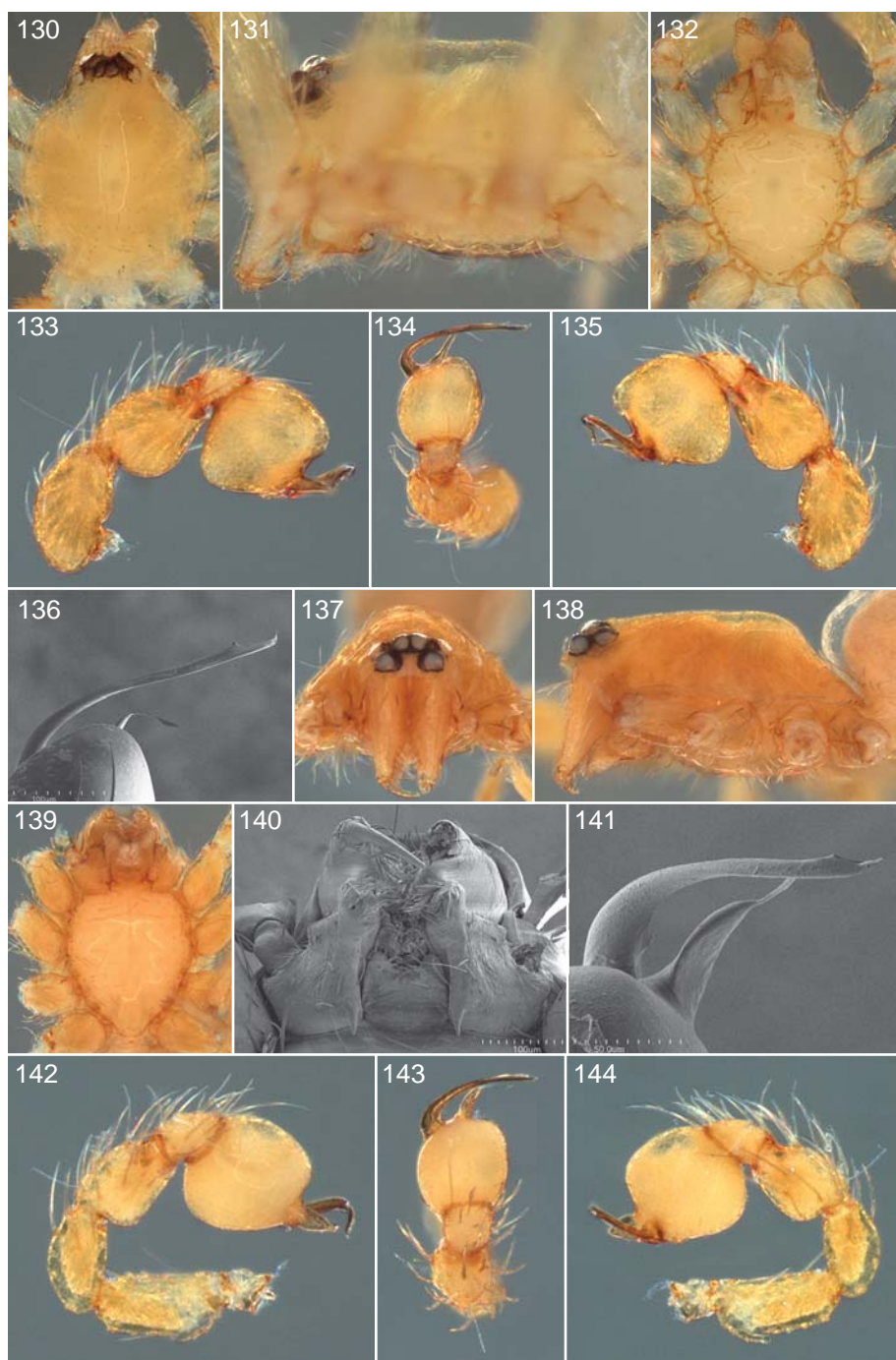
Figures 137–155

NOTE: Males and females have not been collected together, show some somatic differences (e.g., eye size, carapace shape, size), and may be mismatched.

TYPE: Male holotype from an oak forest litter sample taken at an elevation of 1660 m at a junction 3.5 km south of Pantín, Baja Verapaz, Guatemala (May 23, 1991; R. Anderson), deposited in AMNH (PBI\_OON 49256).

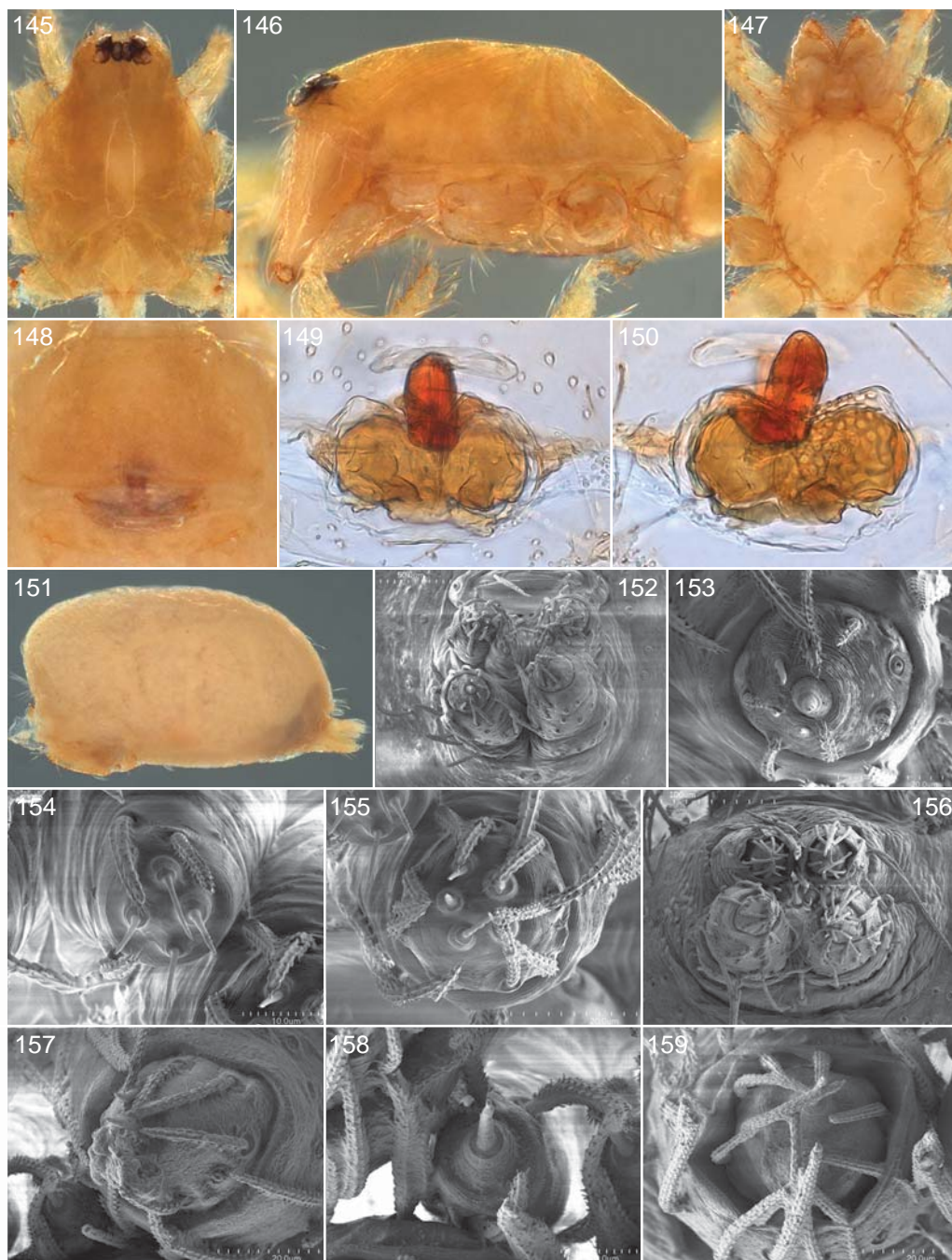
ETYMOLOGY: The specific name is a noun in apposition shortened from the type locality.

DIAGNOSIS: Males resemble those of *T. belmo* (figs. 131–136) in having short horn-shaped projections posteromedially on the endites (fig. 138–140), the palpal femur attaching to the patella subbasally, the patella and tibia enlarged, and a spherical bulb (figs. 142–144). They



FIGURES 130–144. *Toloosops belmo*, new species, male (130–136), and *T. verapaz*, new species, male (137–144). 130. Carapace, dorsal view. 131, 138. Same, lateral view. 132, 139. Sternum, ventral view. 133, 142. Palp, prolateral view. 134, 143. Same, dorsal view. 135, 144. Same, retrolateral view. 136. Embolus, dorsal view. 137. Carapace, anterior view. 140. Mouthparts, ventral view. 141. Embolus, dorsal view.





FIGURES 145–159. *Toloopsis verapaz*, new species, female (145–155), and *T. chickeringi* (Brignoli), new combination, female (156–159). 145. Carapace, dorsal view. 146. Same, lateral view. 147. Sternum, ventral view. 148. Epigastric area, ventral view. 149. Genitalia, same. 150. Same, dorsal view. 151. Abdomen, lateral view. 152, 156. Spinnerets, posterior view. 153, 157. Anterior lateral spinnerets, same. 154, 158. Posterior median spinnerets, same. 155, 159. Posterior lateral spinnerets, same.

differ in having an embolus nearly as long as the bulb (rather than distinctly longer, fig. 143), and a second distal sclerite reaching  $3/4$  of embolus length (rather than much shorter than the embolus, figs. 141–143). Females differ from those of all other species in the distinct shape of the translucent genitalic process (fig. 148), the mushroom-shaped anterior genitalic process, the tube-shaped, convoluted, and strongly sclerotized median genitalic process, and the peanut-shaped posterior genitalic process (figs. 149, 150).

**MALE** (PBI\_OON 49256, figs. 137–144): Total length 1.42. Carapace surface smooth. Endites posteromedially with distinct short horn-shaped projection, pointing posteriad. Abdomen extending anteriorly of pedicel. Leg spination: femora III, IV d1-0-1; tibiae III, IV d0-1-0, p1-0-1, v0-1-2, r1-0-1; metatarsi: III v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. Palpal femur attaching to patella subbasally, patella, tibia each moderately enlarged. Cymbial cone not detected. Bulb spherical, not tapering apically; embolus moderately flattened, abruptly curved prolaterad, ventrally with longitudinal rim, nearly as long as bulb, embolus opening large, shifted anteriorly, with distinctly protruding tip; second distal sclerite basally broad, flat, triangular, distally strongly narrowed, leaf shaped, protruding, originating prolaterally of embolus base, reaching  $3/4$  of embolus length.

**FEMALE** (PBI\_OON 49260, figs. 145–155): Total length 1.84. Eyes moderately reduced. Female palp spines: tibia d0-1-1, p2-0-2; tarsus d1-1-0, p2-2-2. Epigastric scutum slightly protruding. Leg spination: tibia III p1-0-1, v0-1-2, r1-0-1; metatarsi: III v0-1-2, r0-0-1; IV d1-0-0, p1-0-1, v0-1-2, r1-0-1. Median genitalic process, lateral extensions each visible through epigastric scutum, reddish brown. Narrow lateral extensions indistinct, anterior genitalic process mushroom shaped, protruding anteriorly; median genitalic process convoluted, tube shaped, strongly sclerotized; posterior genitalic process pocketlike, broad, peanut shaped, dorsally covered by porous, membranous lamella.

**OTHER MATERIAL EXAMINED:** GUATEMALA: **Baja Verapaz:** 8.6 km W Chilascó, May 24, 1991, oak-pine-*Liquidambar* forest litter, elev. 1560 m (R. Anderson, AMNH PBI\_OON 49265), 1 ♂; 7 km E Purulha, May 25, 1991, cloud forest litter, elev. 1600 m (R. Anderson, AMNH PBI\_OON 49260), 2 ♀.

**DISTRIBUTION:** Guatemala (Baja Verapaz).

### *Guatemoonops*, new genus

**TYPE SPECIES:** *Guatemoonops purulha*, new species.

**ETYMOLOGY:** The generic name refers to the fact that this oonopinae group is almost exclusively known from Guatemala and is masculine in gender.

**DIAGNOSIS:** Male members of this genus differ from most other soft-bodied oonopines in having the bulb and cymbium separated (figs. 170, 223, 235, 268). From those groups with bulb and cymbium separated, they differ in having the endites with a distinctly stepped anterolateral rim (in lateral view, figs. 162, 167, 220, 233, 263) without a serrula (fig. 167), from members of *Neotrops* in having posteriorly directed endite projections (figs. 165, 166, 222, 234, 238, 265, 266), from members of *Toloonops* in having the cymbial cone well separated from the tarsal organ (fig. 168), and from members of *Heteroonops* in the position of the endite projection (figs. 165, 222, 234, 238, 265, 266) as well as the shape of the bulb and distal sclerites (figs. 170–174, 223–225, 235–237, 239, 240, 267–270). Females differ in having strongly sclerotized

internal genitalia with the anterior genitalic process protruding anteriorly, with a T-shaped apex, subapically with a rounded sclerite, the median and posterior processes very complex and diversely shaped (figs. 202, 203, 228–231, 245, 246, 253, 254, 260, 261, 275, 276), and by the absence of elongated, highly spinose pedipalps with laterally dilated or elongated patellae (figs. 199, 272).

**DESCRIPTION:** Total length of males 1.65–1.77, of females 1.99–2.25. Carapace, sternum, mouthparts, legs typically pale orange to orange brown, without any pattern, abdomen soft portions typically white to yellow-brown, without any pattern. **Cephalothorax:** Carapace broadly oval in dorsal view, anteriorly narrowed to approximately half its maximum width, pars cephalica slightly elevated in lateral view, anterolateral corners without extension or projections, with rounded posterolateral corners, without depressions or radiating rows of pits, posterolateral edge without pits, posterior margin not bulging below posterior rim, posterolateral surface without spikes, surface of elevated portion of pars cephalica, sides all smooth, platelets present everywhere; fovea absent, lateral margin undulate, rebordered, without denticles; plumose setae near posterior margin of pars thoracica absent; marginal, nonmarginal pars cephalica, pars thoracica setae needlelike, scattered. Clypeus margin unmodified, curved downward in front view, vertical in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent; setae needlelike. Chilum absent. Six eyes, well developed, all eyes subequal or ALE moderately larger, ALE oval, PME almost squared, PLE oval; posterior eye row recurved from above, straight from front; ALE separated by their radius to diameter, ALE-PLE separated by less than ALE radius, PME touching throughout most of their length, PLE-PME separated by moderately less or more than PME radius. Sternum as long as wide or slightly longer than wide, not fused to carapace, surface without transverse ridges or pits, median concavity, hair tufts both absent, with radial furrows between coxae I–II, II–III, III–IV, furrows, surface all smooth without microsculpture, radial furrow opposite coxae III absent, sickle-shaped structures absent, anterior margin unmodified, posterior margin not extending posteriorly of coxae IV, without posterior hump, anterior corner unmodified, lateral margin without infracoxal grooves, distance between coxae approximately equal, extension of precoxal triangles present, lateral margins unmodified; setae abundant, needlelike, densest laterally, originating from surface. Chelicerae straight, anterior face unmodified, without teeth on promargin or retromargin (scanned only in *G. purulha* and male *G. rhino* and *G. zacapa*); fangs without toothlike projections, directed medially, shape normal, without prominent basal process, tip unmodified; setae needlelike, evenly scattered; paturon inner margin with scattered setae, distal region, posterior surface both unmodified, promargin with row of flattened setae (scanned only in *G. purulha*), inner margin unmodified, laminate groove absent. Labium rectangular or trapezoidal, fused to sternum, indented at middle, same as sternum in sclerotization; typically with six or more setae on anterior margin (3–5 in *G. jaba*), subdistal portion with unmodified setae. Endites same as sternum in sclerotization, distally not excavated, in males anterolateral rim distinctly stepped (in lateral view), most anterior part hyaline, anteromedially and/or medially with distinct projections (unmodified in females), in females serrula present in single row (scanned only in *G. purulha*), absent in males (scanned in *G. purulha*, *G. rhino*, and *G. zacapa*). Female palp without claw, typically with spines on tibia and tarsus (tarsus with chaotic pattern of several spines, except *G. zacapa* with only indistinct spines);



patella without prolateral row of ridges, tarsus unmodified. **Abdomen:** Ovoid, without long posterior extension, rounded posteriorly, interscutal membrane without rows of small sclerotized platelets. Booklung covers large, ovoid, without setae, anterolateral edge unmodified; posterior spiracles connected by groove. Pedicel tube short, unmodified, scutopedicel region unmodified, plumose hairs, matted setae on anterior ventral abdomen in pedicel area, cuticular outgrowths near pedicel all absent. Dorsal scutum absent. Epigastric scutum present but indistinct in males, weakly sclerotized in females (strongly sclerotized in *G. chilasco*), not surrounding pedicel, sometimes protruding, in females small lateral sclerites typically present but indistinct (absent in *G. chilasco*), without lateral joints. Postepigastric scutum present but indistinct in males, weakly sclerotized in females (strongly sclerotized in *G. chilasco*), anterior margin unmodified, without posteriorly directed lateral apodemes, short, almost rectangular, only around epigastric furrow, not fused to epigastric scutum. Spinneret scutum, fringe of setae, supraanal scutum all absent. Abdominal setae needlelike, epigastric area setae not basally thickened; dense patch of setae anterior to spinnerets absent, interscutal membrane with setae. Colulus represented only by setae (sometime indistinct plate detectable). Anterior lateral spinnerets bisegmented, basal segment with oblique membranous strip, posterior medians unisegmented, posterior laterals bisegmented; spigots scanned only in *G. purulha*, in male anterior laterals with one major ampullate gland spigot and two piriform gland spigots (three in female), posterior medians with two spigots (four in female), posterior laterals with three spigots (five in female). **Legs:** Femur IV not thickened, same size as femora I–III, patella plus tibia I nearly as long as carapace, tibia I unmodified, Emerit's glands present, tibia IV specialized hairs on ventral apex, ventral scopula both absent, metatarsi I, II mesoapical comb, metatarsi III, IV weak ventral scopula all absent. Leg spines present on all femora, tibiae, and metatarsi, sometimes also on patella I (*G. augustin* and *G. chilasco*). Tarsi without inferior claw. Superior claws (scanned only in *G. purulha*) with inner face smooth, with denticulated row in female (absent in male), tarsi I, II with five teeth on outer row, none on inner row, tarsi III, IV with three teeth on outer row, none on inner row. Trichobothrial base longitudinally narrowed, aperture not gratelike, hood covered by numerous low, closely spaced ridges. Tarsal organs with three receptors on legs I, II, two on legs III, IV, palps (scanned only in male and partly in female *G. purulha*). **Genitalia:** Male epigastric area with sperm pore not visible; furrow without  $\Omega$ -shaped insertions, without special setae. Male palp of normal size, not strongly sclerotized, right and left palps mirror images, proximal segments, cymbium pale orange, embolus dark, prolateral excavation absent; trochanter of normal size, unmodified; femur of normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, attaching to patella basally; patella shorter than femur, not enlarged, without prolateral row of ridges, setae unmodified; tibia with three trichobothria; cymbium moderately narrow in dorsal view, not fused to bulb, not extending beyond distal tip of bulb, plumose setae, stout setae, distal patch of setae all absent, cymbial cone present, distant from tarsal organ, close to distal cymbial rim; bulb 1.5–2 times as long as cymbium, stout, tapering apically. Embolus massive, ventrally with longitudinal folding, basally broad with distinct massive dorsal rim, embolus opening large, suboval; second distal sclerite strongly sclerotized, protruding. Female genitalia externally conspicuous, genitalic process distinctly visible through epigastric scutum; internally with all sclerites strongly sclerotized, distinct lateral extensions, anterior genitalic process protruding anteriorly,

with T-shaped apex, subapically with rounded sclerite, medially, posteriorly complex, diversely shaped, typically dorsally covered by platelike structure.

DISTRIBUTION: Specimens are known only from southern Mexico and Guatemala.

#### Key to Species of *Guatemoonops*

1. Male (unknown in *G. augustin*, *G. chilasco*, and *G. jaba*) ..... 2
  - Female (unknown in *G. rhino*) ..... 4
2. Endites posteromedially with spinelike protuberance (figs. 263, 265, 266), embolus on same base as second distal sclerite, basally fused (figs. 267, 269) ..... *zacapa*
  - Endites without posteromedian spinelike protuberance (figs. 165, 222, 233, 238), embolus distant from second distal sclerite (figs. 172, 224, 236) ..... 3
3. Endites with anterolateral projection (figs. 165, 222), embolus orthogonally protruding, second distal sclerite originating on bulb (figs. 170, 172, 224) ..... *purulha*
  - Endites with median projection (figs. 234, 238), embolus diagonally protruding, second distal sclerite originating on separate bulb protuberance (fig. 236, 239) ..... *rhino*
4. Anterior genitalic process with large subapical sclerite (figs. 203, 230, 245), T-shaped apex bold (figs. 203, 230) or slender and relatively narrow (fig. 245) ..... 5
  - Anterior genitalic process with small subapical sclerite, T-shaped apex slender but relatively wide (figs. 253, 260, 275) ..... 6
5. T-shaped apex bold (figs. 203, 230), subrectangular sclerite present ventrally at pedicel (figs. 205, 227–229) ..... *purulha*
  - T-shaped apex slender and relatively narrow (fig. 245), ventral sclerite at pedicel absent ..... *jaba*
6. Distinct symmetrical pockets on posterior genitalic process absent, median genitalic process spindle shaped (figs. 260, 261) ..... *augustin*
  - Distinct symmetrical pockets on posterior genitalic process present (figs. 253, 254, 275, 276), median genitalic process subtriangular (fig. 275, 276) or more complex (figs. 253, 254) . 7
7. Lateral extensions distally pointed anterolaterally, median genitalic process complex (figs. 253, 254) ..... *chilasco*
  - Lateral extensions distally enlarged, truncated, median genitalic process subtriangular (figs. 275, 276) ..... *zacapa*

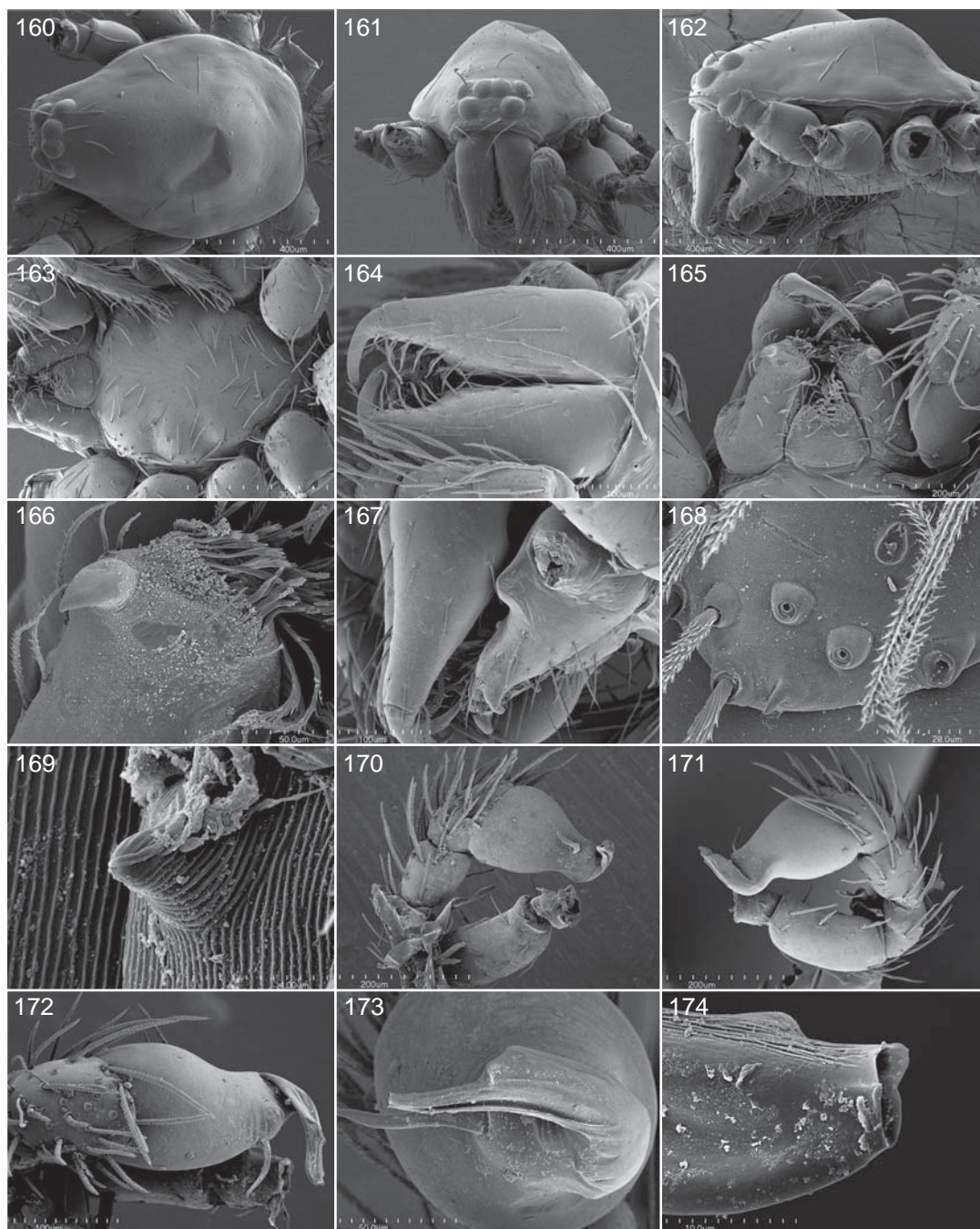
#### *Guatemoonops purulha*, new species

Figures 160–231

TYPES: Female holotype plus two female and two male paratypes from a cloud forest litter sample taken at an elevation of 1660 m 8 km south of Purulha, Baja Verapaz, Guatemala (June 01, 1991; R. Anderson), deposited in AMNH (PBI\_OON 49258).

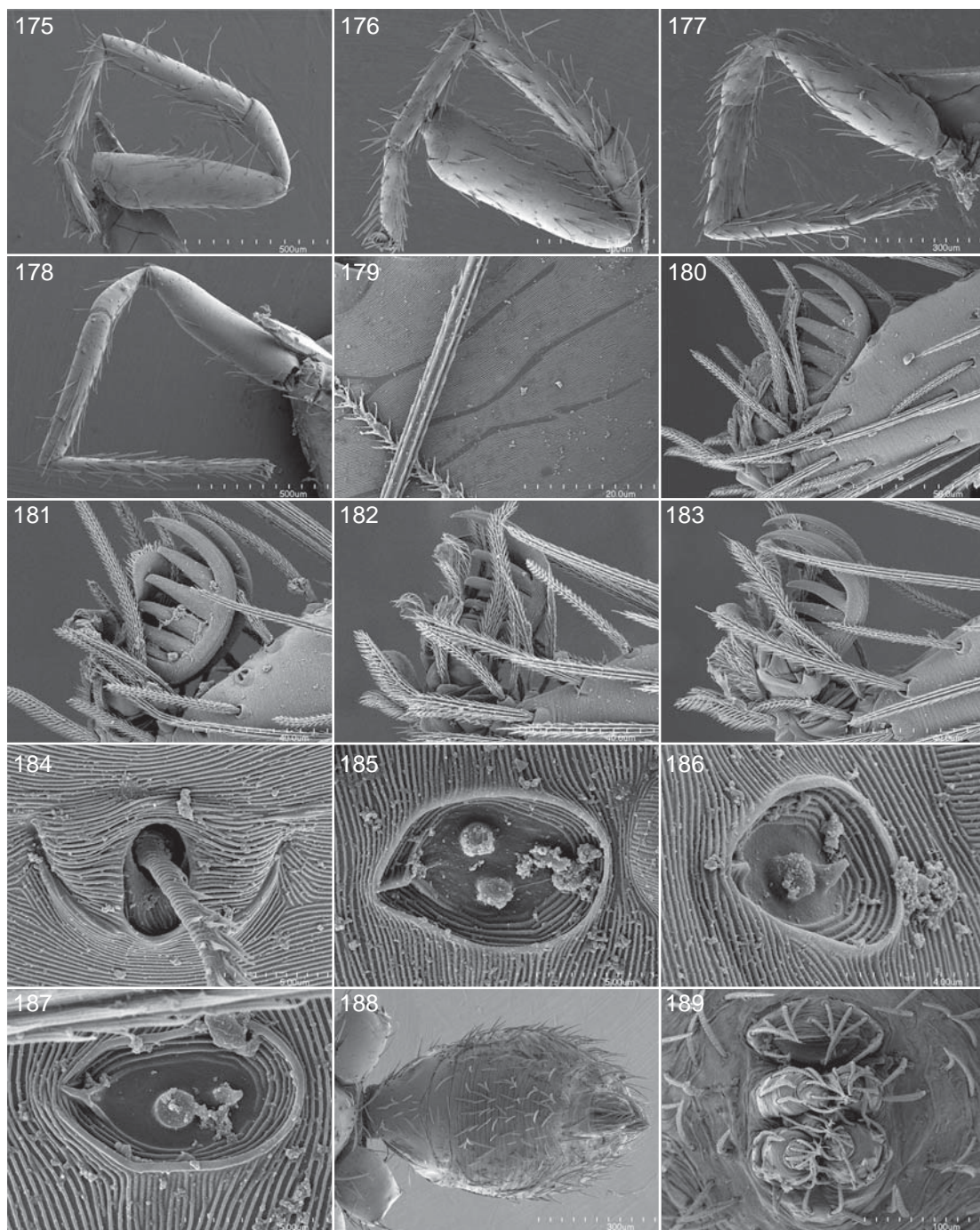
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males differ from those of the other species in having a toothlike anterolateral projection on the endites (rather than a strong median projection in *G. rhino*, or an additional spinelike posteromedian projection in *G. zacapa*, figs. 165–167, 220, 222), an embolus protruding orthogonally from the embolus base in prolateral direction (rather than diagonal in anteropro-



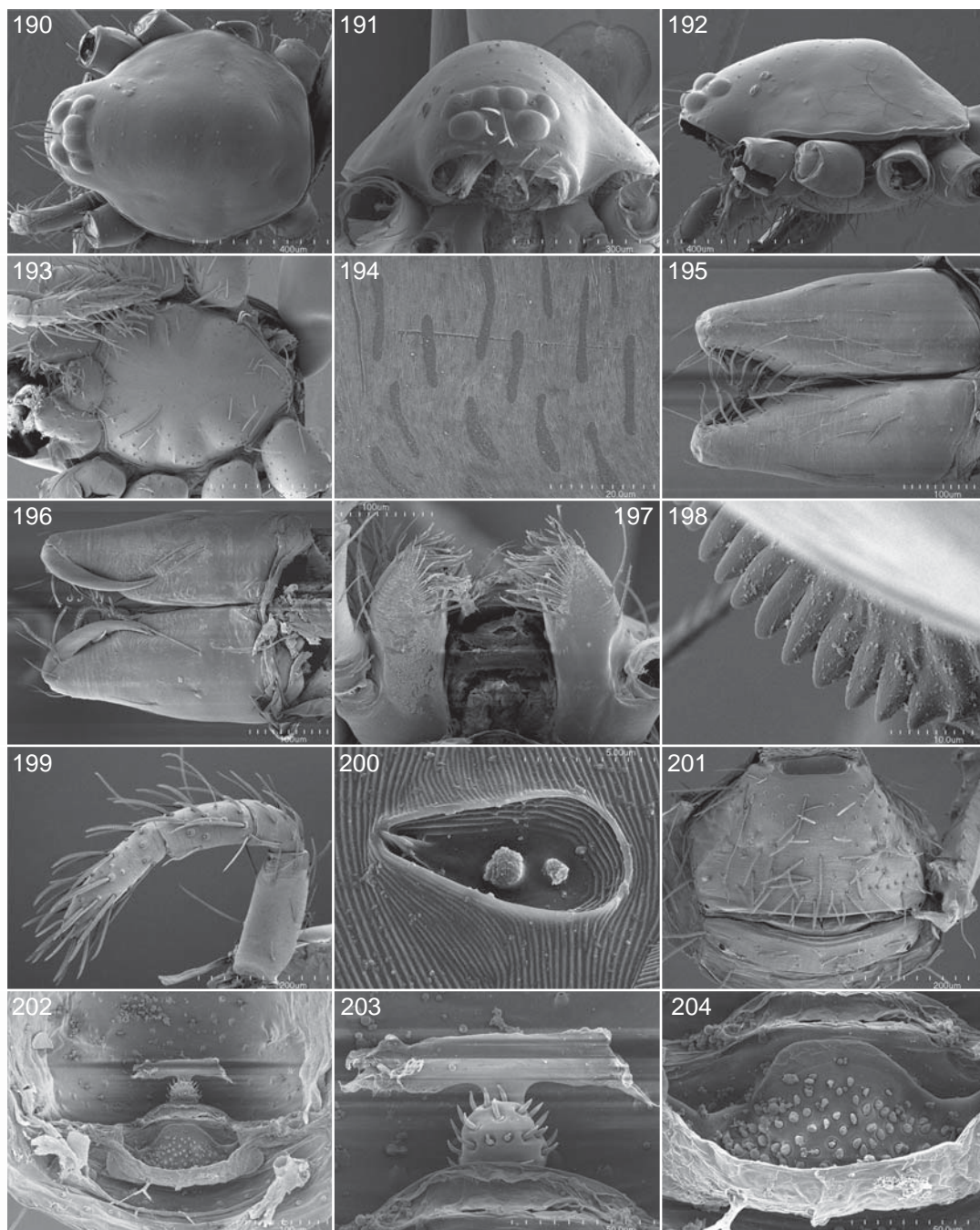
FIGURES 160–174. *Guatemoonops purulha*, new species, male. **160.** Carapace, dorsal view. **161.** Same, anterior view. **162.** Same, lateral view. **163.** Sternum, ventral view. **164.** Chelicerae, anterior view. **165.** Mouthparts, ventral view. **166.** Endite, distal margin, ventral view. **167.** Endite, lateral view. **168.** Tarsal organ and cymbial cone, dorsal view. **169.** Cymbial cone, dorsolateral view. **170.** Palp, prolateral view. **171.** Same, retrolateral view. **172.** Same, dorsal view. **173.** Embolus and second distal sclerite, anteroventral view. **174.** Embolus tip, dorsal view.



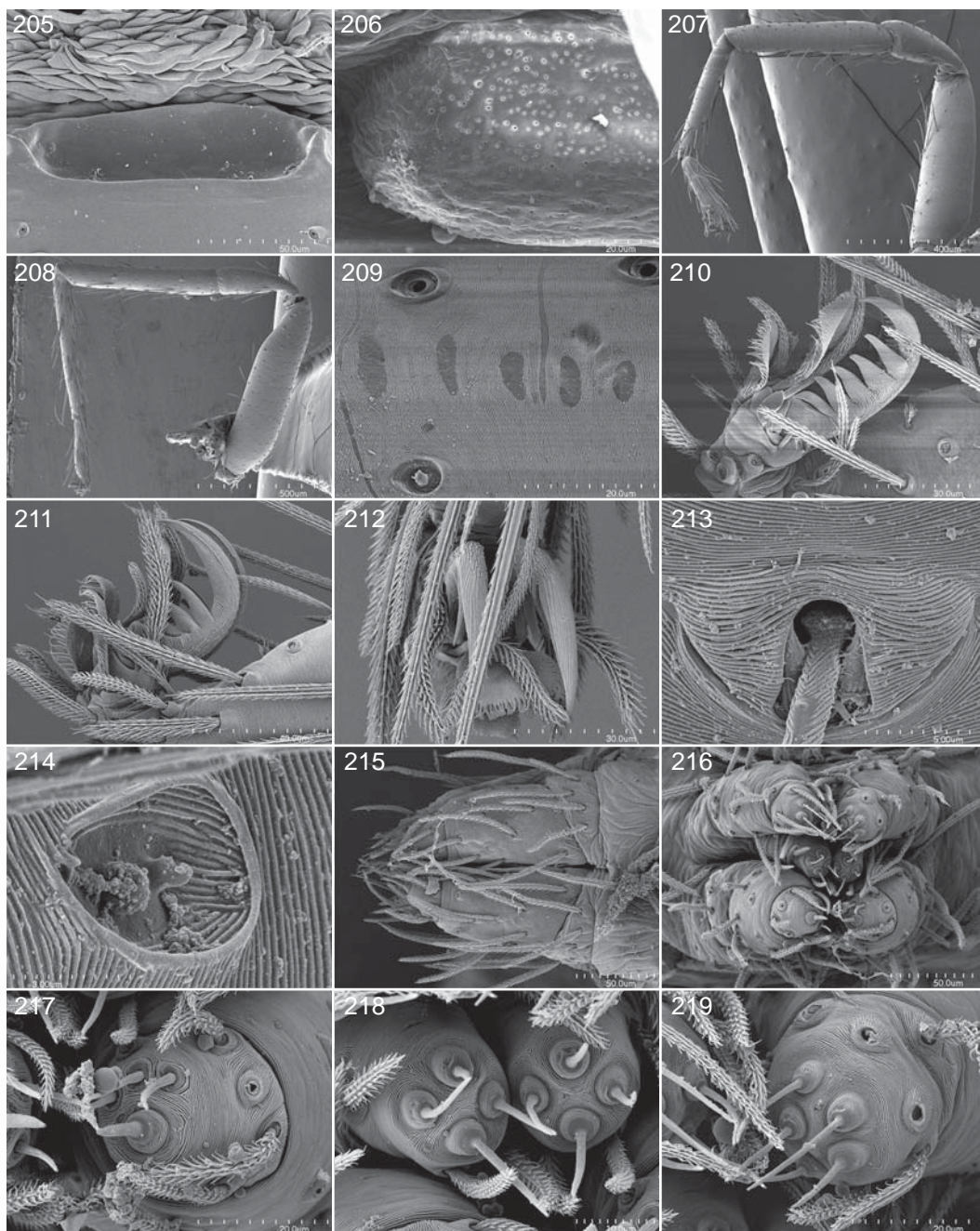


FIGURES 175–189. *Guatmoonops purulha*, new species, male. 175. Leg I, prolateral view. 176. Leg II, same. 177. Leg III, same. 178. Leg IV, retrolateral view. 179. Platelets on tibia IV, prolateral view. 180. Claw, leg I, prolateral view. 181. Same, leg II. 182. Same, leg III. 183. Same, leg IV. 184. Trichobothrial base, metatarsus III, dorsal view. 185. Tarsal organ, leg I, dorsal view. 186. Same, leg III. 187. Same, leg IV. 188. Abdomen, ventral view. 189. Spinnerets, posterior view.



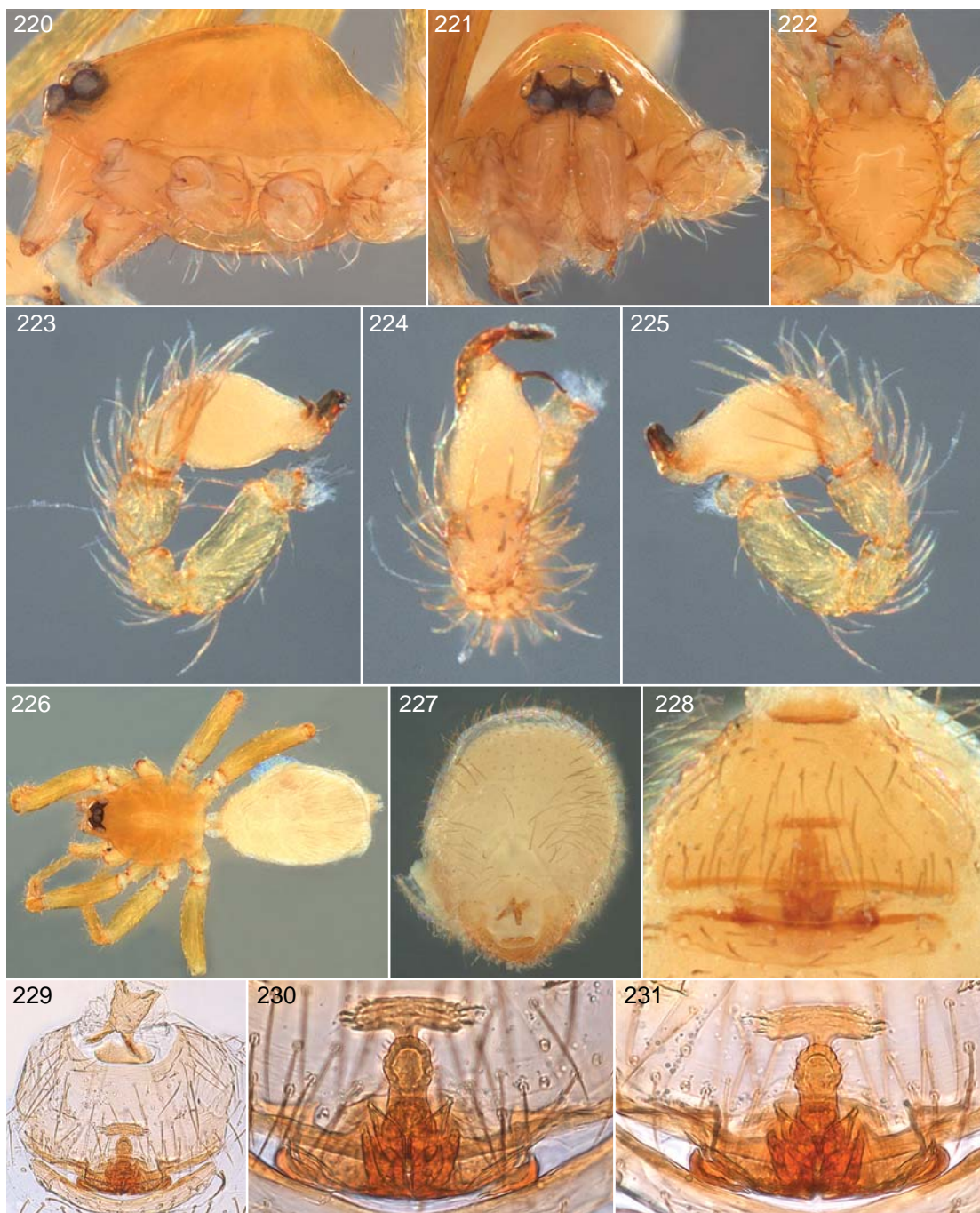


FIGURES 190–204. *Guatmoonops purulha*, new species, female. **190.** Carapace, dorsal view. **191.** Same, anterior view (with detached chelicerae). **192.** Same, lateral view. **193.** Sternum, ventral view. **194.** Platelets on carapace, dorsal view. **195.** Chelicerae, anterior view. **196.** Same, posterior view. **197.** Mouthparts, dorsal view. **198.** Serrula, dorsal view. **199.** Palp, prolateral view. **200.** Tarsal organ, palp, dorsal view. **201.** Epigastric area, ventral view. **202.** Genitalia, dorsal view. **203.** Anterior genitalic process, same. **204.** Posterior genitalic plate, same.



FIGURES 205–219. *Guatemoonops purulha*, new species, female. **205.** Rectangular pit/plate at anterior margin of epigastric area, ventral view. **206.** Same, dorsal view. **207.** Leg I, retrolateral view. **208.** Leg IV, prolateral view. **209.** Platelets, tibia I, retrolateral view. **210.** Claw, leg I, retrolateral view. **211.** Claw, leg IV, prolateral view. **212.** Same, anterior view. **213.** Trichobothrial base, metatarsus IV, dorsal view. **214.** Tarsal organ, leg IV, dorsal view. **215.** Spinnerets, ventral view. **216.** Same, posterior view. **217.** Anterior lateral spinnerets, same. **218.** Posterior median spinnerets, same. **219.** Posterior lateral spinnerets, same.





FIGURES 220–231. *Guatemoonops purulha*, new species, male (220–225) and female (226–231). 220. Carapace, lateral view. 221. Same, anterior view. 222. Sternum, ventral view. 223. Palp, prolateral view. 224. Same, dorsal view. 225. Same, retrolateral view. 226. Habitus, dorsal view. 227. Abdomen, anterior view. 228. Epigastric area, ventral view. 229. Same, dorsal view. 230. Genitalia, ventral view. 231. Same, dorsal view.

lateral direction, figs. 172, 173, 224), and in the unpronounced base of the second distal sclerite, distant from the embolus base (distinct protuberance in *G. rhino*, fused to embolus base in *G. zacapa*, figs. 170, 172, 224). Females differ from those of all other species in having a subrectangular sclerite posteroventrally at the pedicel (figs. 205, 206, 227–229), the posterior margin of epigastric scutum and anterior margin of postepigastric scutum continuous and pronounced (fig. 228), and a bold T-shaped apex of the anterior genitalic process (figs. 202, 203, 228–231).

**MALE** (PBI\_OON 49258, figs. 160–189, 220–225): Total length 1.77. Endites with anterolateral projection broad, toothlike. Leg spination: femora: I, II d1-0-1; III, IV d1-0-2; tibiae: I v4-2-2; II v2-2-2; III, IV d0-1-0, p1-0-1, v0-1-2, r1-0-1; metatarsi: I, II v2-0-2; III d0-1-0, v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. Embolus orthogonally protruding prolaterad, midway abruptly tapering, tip dorsoventrally flattened, tube shaped; second distal sclerite flat, hornlike, moderately posteriad curved, distally pointed, originating prolateral of and distant from embolus base.

**FEMALE** (PBI\_OON 49258, figs. 190–219, 226–231): Total length 1.99. Female palp spines: tibia d0-1-1, p2-3-2. Leg spination: femora: I d1-1-0; II as in male or d1-1-1; III, IV d1-0-1; tibiae I, II v4-4-2; metatarsi: I, II v4-0-2; IV r2-0-1. Pedicel posteroventrally with extraordinary subrectangular sclerite. In ventral view (not dissected), posterior margin of epigastric scutum and anterior margin of postepigastric scutum pronounced, more strongly sclerotized; translucent genitalic process moderately bell shaped, anterior T-shaped apex straight. Lateral extensions wide, shallow U-shaped, laterally protruding; anterior genitalic process distally bold, T-shaped, subapical sclerite large, spherical, covered with short protruding glands, posterior with two leaf-shaped structures; median part with additional two leaf-shaped structures, dorsally covered by trapezoidal plate with glands; no posterior genitalic process detectable.

**OTHER MATERIAL EXAMINED:** GUATEMALA: no specific locality, 1991 (R. Anderson, AMNH PBI\_OON 49262), 2♂. **Baja Verapaz:** 7 km E Purulha, May 25, 1991, pine, cloud forest litter, elev. 1600 m (R. Anderson, AMNH PBI\_OON 49259), 1♀; 14.5 km S Purulha, May 26, 1991, riparian bottomland oak forest litter, elev. 1600 m (R. Anderson, AMNH PBI\_OON 21005), 2♀, 1 juv.

**DISTRIBUTION:** Guatemala (Baja Verapaz).

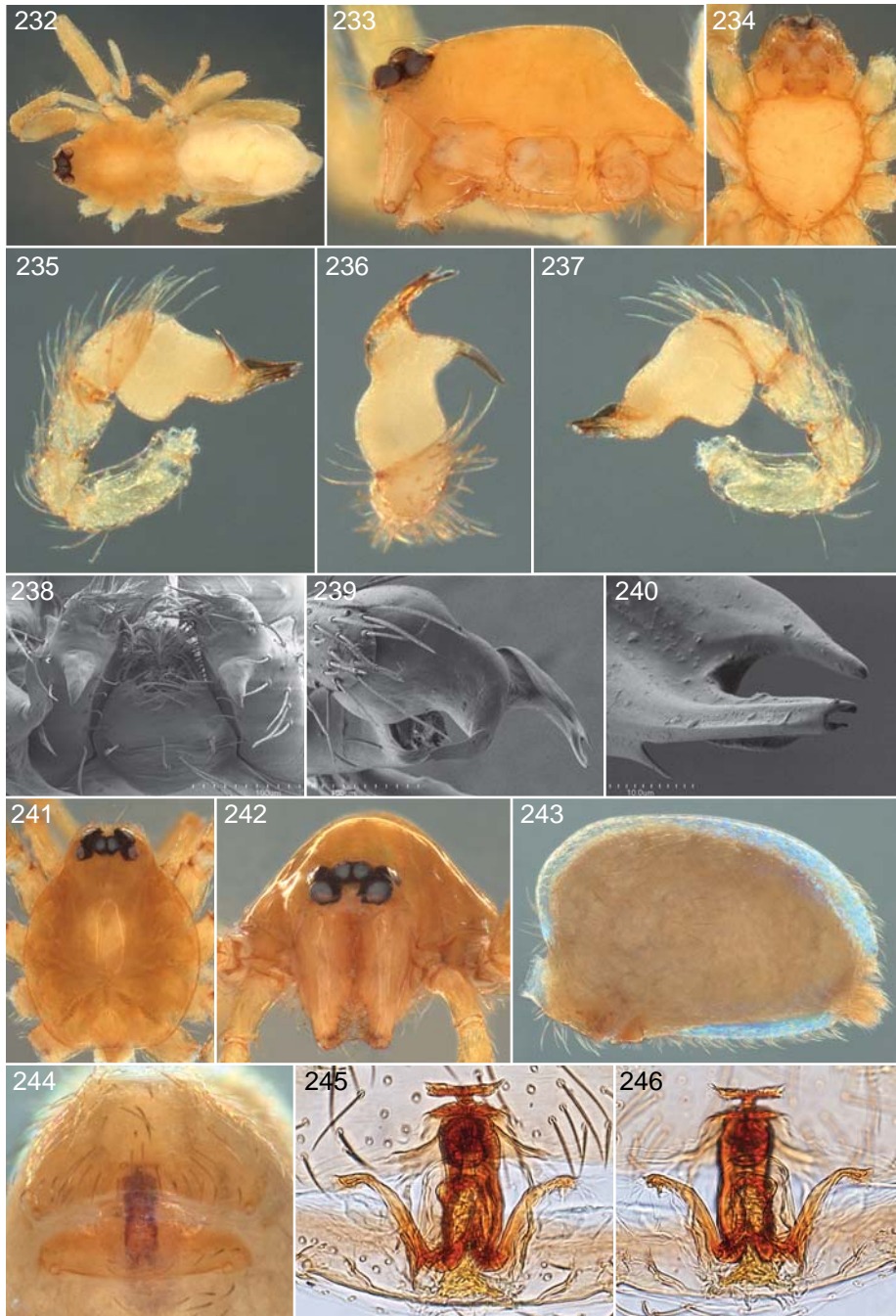
### *Guatemoonops rhino*, new species

Figures 232–240

**TYPES:** Male holotype and one male paratype from a site 4 miles southeast of San Cristóbal de Las Casas, 16.42°N, 92.36°W, Chiapas, Mexico (Aug. 23, 1966; J., W. Ivie), deposited in AMNH (holotype, PBI\_OON 1603; paratype, PBI\_OON 1609).

**ETYMOLOGY:** The specific name is a noun in apposition, referring to the prolateral view of the bulb, which resembles the shape of the head of a rhinoceros (fig. 235).

**DIAGNOSIS:** Males differ from those of the other species in having a strong median projection on the endites (rather than a toothlike anterolateral projection in *G. purulha*, or an additional spine-like posteromedian projection in *G. zacapa*, figs. 234, 238), an embolus protruding diagonally from the embolus base in anteroprolateral direction (rather than orthogonal in prolateral direction, figs. 236, 239), a distinct protuberance at the base of the second distal sclerite, distant from the embolus base (unpronounced base in *G. purulha*, fused to embolus base in *G. zacapa*, figs. 236, 239).



FIGURES 232–246. *Guatemoonops rhino*, new species, male (232–240), and *G. jaba*, new species, female (241–246). 232. Habitus, dorsal view. 233. Carapace, lateral view. 234. Sternum, ventral view. 235. Palp, pro-lateral view. 236. Same, dorsal view. 237. Same, retrolateral view. 238. Mouthparts, ventral view. 239. Bulb, dorsal view. 240. Embolus, anterodorsal view. 241. Carapace, dorsal view. 242. Same, anterior view. 243. Abdomen, lateral view. 244. Epigastric area, ventral view. 245. Genitalia, same. 246. Same, dorsal view.



MALE (PBI\_OON 1603, figs. 232–240): Total length 1.65. Endites medially with strong, tooth-like, ventroposteriorly pointed projection. Leg spination: femora: I d1-1-1; II, III d1-0-1; IV d1-0-2; tibiae: I v4-3-2; II v3-3-0; III, IV d0-1-0, p1-0-1, v0-1-2, r1-0-1; metatarsi: I, II v2-0-2; III v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. Embolus protruding prolaterad, distally with dorsal pointed projection, ventrally tube shaped with back-set spur, embolus opening suboval; second distal sclerite broad, flat, hornlike, curved prolateroposteriad, distally with truncated, pointed parts, originating prolateral of and distant from embolus on separate bulb protuberance.

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Mexico (Chiapas).

***Guatemoonops jaba*, new species**

Figures 241–246

TYPE: Female holotype from a cloud forest litter sample taken at an elevation of 1630 m at a site 4.5 km south of Purulha, Baja Verapaz, Guatemala (May 23, 1991; R. Anderson), deposited in AMNH (PBI\_OON 49261).

ETYMOLOGY: The specific name is a noun in apposition, a shortened anagram taken from the type locality.

DIAGNOSIS: Female differs from those of all other species in having a long rectangular genitalic sclerite visible through the epigastric and postepigastric scuta (fig. 244), a slender T-shaped apex of the anterior genitalic process (rather than bold in *G. purulha*, slender and wide in all other described species, figs. 245, 246), and the lateral extensions W-shaped (figs. 245, 246).

MALE: Unknown.

FEMALE (PBI\_OON 49261, figs. 241–246): Total length 2.05. ALE largest. Female palp spines: tibia d1-0-1, p2-2-2. Epigastric scutum moderately protruding. Leg spination: femora: I, II d1-0-0; III, IV d1-0-1; tibiae: I v1-1-0; II v0-1-0; III p1-0-1, v0-1-2, r0-0-1; IV d0-1-0, p1-0-1, v1-0-2, r1-0-1; metatarsi: II v0-1-0; III v0-1-2, r0-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. In ventral view (not dissected), translucent genitalic process long, rectangular, anterior T-shaped apex slender. Lateral extensions W-shaped; anterior genitalic process apically slender, T-shaped, subapically with large circular sclerite; median part long, subrectangular, anteriorly with short lateral extensions; posterior genitalic process pocketlike, less sclerotized, long oval.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Guatemala (Baja Verapaz).

***Guatemoonops chilasco*, new species**

Figures 247–254

TYPE: Female holotype from an oak-pine-*Liquidambar* forest litter sample taken at an elevation of 1560 m at a site 8.6 km west of Chilascó, Baja Verapaz, Guatemala (May 24, 1991; R. Anderson), deposited in AMNH (PBI\_OON 21006).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

**DIAGNOSIS:** Female differs from those of all other species in having strongly sclerotized epigastric and postepigastric scuta (rather than moderately sclerotized, fig. 252), the lateral extensions pointed anterolaterad (figs. 253, 254), a small-sized circular sclerite subapically on the anterior genitalic process (rather than large in *G. purulha* and *G. jaba*, or small sized but suboval in *G. augustin* and *G. zacapa*, figs. 253, 254), and the posteriorly complex flower-shaped anterior genitalic process (fig. 254).

**MALE:** Unknown.

**FEMALE** (PBI\_OON 21006, figs. 247–254): Total length 2.01. ALE largest. Female palp spines: tibia d1-0-1, p2-2-2. Epigastric, postepigastric scuta both strongly sclerotized, small lateral sclerites absent. Leg spination: femora: I, II d1-1-1; III, IV d1-0-2; patella I v0-1p-0; tibiae: I v4-4-4; II v4-4-2; III, IV d0-1-0, p1-0-1, v0-1-2, r1-0-1; metatarsi: I, II v4-0-2; III d1-0-0, v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. In ventral view (not dissected), posterior rim of epigastric scutum medially less sclerotized, more or less straight, translucent genitalic process subtriangular. Lateral extensions distally pointed anterolaterad; anterior genitalic process distally slender, wide T-shaped, subapically with small-sized circular sclerite, posteriorly complex, flower shaped; median complex with different rounded structures; posterior genitalic process ventrally sclerotized, laterally with large symmetrical pocketlike extensions, medially with triangular structure, dorsally covered with porous plate, less sclerotized.

**OTHER MATERIAL EXAMINED:** None.

**DISTRIBUTION:** Guatemala (Baja Verapaz).

***Guatemoonops augustin*, new species**

Figures 255–261

**TYPE:** Female holotype and female paratype from a pine/oak forest litter sample taken at an elevation of 1200 m at a site 1.2 km north of San Agustín Acasaguastlán, El Progreso, Guatemala (June 3, 1991; R. Anderson), deposited in AMNH (PBI\_OON 21004).

**ETYMOLOGY:** The specific name is a noun in apposition taken from the type locality.

**DIAGNOSIS:** Female differs from those of all other species in having distinctly sclerotized lateral extensions shining through the epigastric and postepigastric scuta (fig. 259), basally broad lateral extensions (fig. 261), and a spindle-shaped and laterally protruding median genitalic process (figs. 260, 261).

**MALE:** Unknown.

**FEMALE** (PBI\_OON 21004, figs. 255–261): Total length 2.25. ALE largest. Female palp spines: patella p1-0-1; tibia p2-2-2. Epigastric scutum slightly protruding. Leg spination: femora: I, II d1-1-1; III, IV d1-0-2; patella I v0-1p-0; tibiae: I, II v4-4-2; III d0-1-0, p1-1-0, v0-1-2, r1-1-0; IV d0-1-0, p1-1-0, v0-1-2, r2-1-0; metatarsi: I, II v4-2-0; III d1-0-0, v1-0-2, r1-1-0; IV d1-0-1, p1-1-0, v0-1-2, r1-1-0. Parts of genitalia protruding posteroventrad (expected to be inside abdomen in normal state, fig. 258). In ventral view (not dissected), translucent genitalic process subtriangular, laterally with distinctly sclerotized extensions; ventroposteriorly protruding part (outside of abdomen) distally with indented sclerite. Lateral extensions basally broad, distally strongly sclerotized; anterior genitalic process slender, wide T-shaped, subapi-



FIGURES 247–261. *Guatmoonops chilasco*, new species, female (247–254), and *G. augustin*, new species, female (255–261). 247. Habitus, dorsal view. 248, 257. Sternum, ventral view. 249. Abdomen, anterior view. 250, 258. Same, lateral view. 251. Spinnerets, ventral view. 252, 259. Epigastric area, ventral view. 253, 260. Genitalia, same. 254, 261. Same, dorsal view. 255. Carapace, dorsal view. 256. Same, anterior view.



cally small-sized suboval sclerite; median genitalic process spindle shaped, protruding laterally; posterior genitalic process pocketlike, less sclerotized, broadly protruding posteriad, dorsally covered with porous plate.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Guatemala (El Progreso).

*Guatemoonops zacapa*, new species

Figures 262–276

TYPES: Female holotype plus one female and three male paratypes from a cloud forest litter sample taken at an elevation of 1500 m at a site 3.5 km southeast of La Unión, Zacapa, Guatemala (June 4, 1991; R. Anderson), deposited in AMNH (PBI\_OON 49263).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

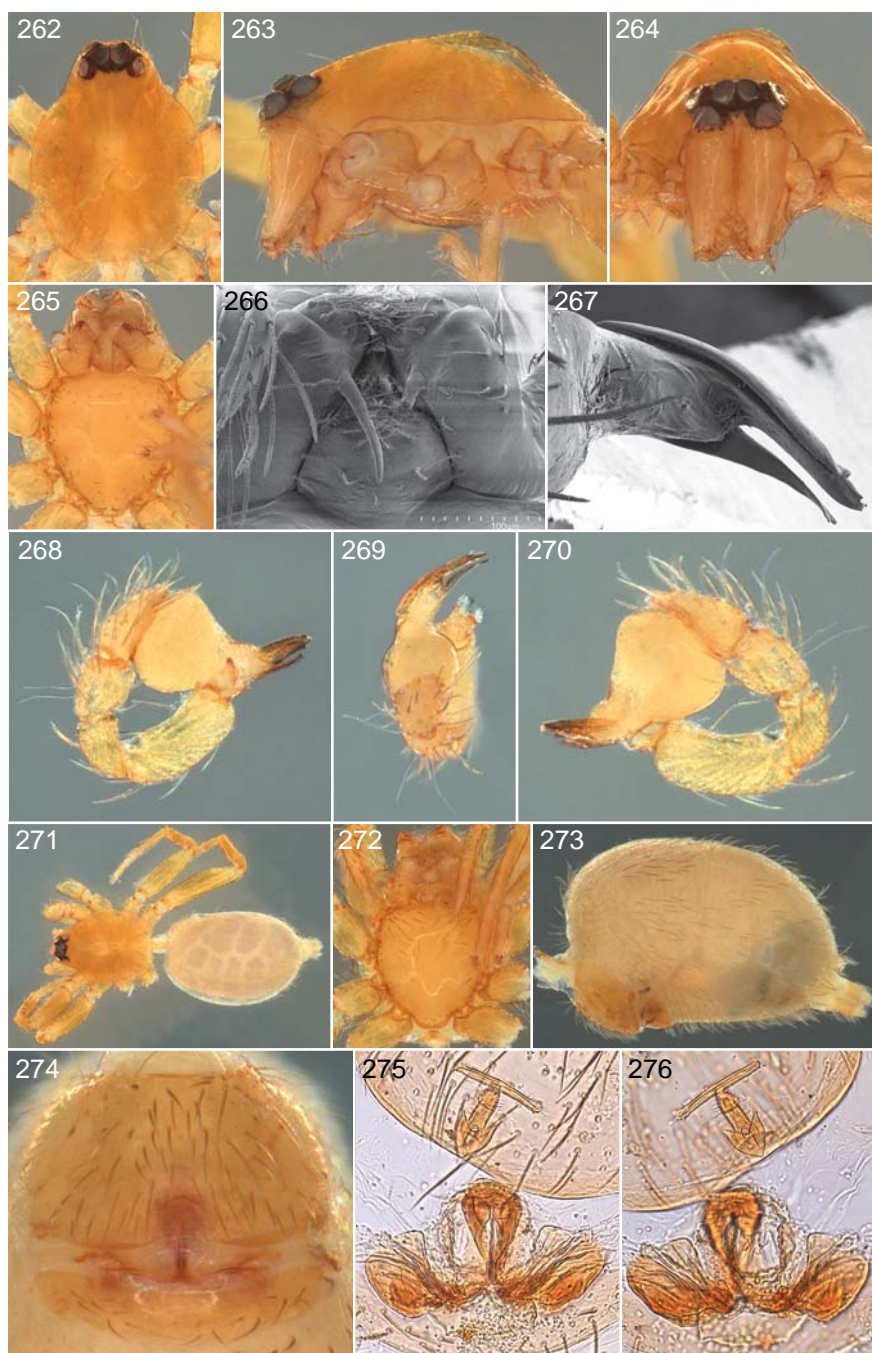
DIAGNOSIS: Males differ from those of the other species in having a toothlike anteromedian projection and an additional spinelike posteromedian projection on the endites (rather than a toothlike projection only in *G. purulha*, or a strong median projection in *G. rhino*, figs. 263, 265, 266), and the second distal sclerite parallel to the embolus, basally fused to the embolus base (figs. 267–269). Females differ from those of all other species in having the posterior margin of epigastric scutum undulated (fig. 274), the translucent genitalic process anteriorly bulbous (fig. 274), the lateral extensions wide, U-shaped, distally enlarged, and truncated (figs. 275, 276), and by the posteriorly arrowhead-shaped anterior genitalic process (figs. 275, 276).

MALE (PBI\_OON 49263, figs. 262–270): Total length 1.70. Eyes ALE largest. Endites with anteromedian projection toothlike, posteromedian projection spinelike, with posteriorly directed extensions. Leg spination: femora: I, II d1-1-1; III, IV d1-0-2; tibiae: I v4-2-2; II v3-2-2; III, IV d0-1-0, p1-0-1, v0-1-2, r1-0-1; metatarsi: I, II v2-0-2; III d1-0-0, v0-1-2, r1-0-1; IV d1-0-1, p1-0-1, v0-1-2, r1-0-1. Cymbial cone not detected. Embolus basally fused with bulb protuberance and second distal sclerite, dorsally folded, distally tapering, tip dorsoventrally flattened; second distal sclerite flat, protruding parallel to embolus, distally tapering, blunt tip with three indistinct projections, originating ventrally of embolus on shared base.

FEMALE (PBI\_OON 49263, figs. 271–276): Total length 2.1. Female palp spines: numerous spines on palp tibia and tarsus (chaotic pattern, not distinct). Epigastric scutum slightly protruding. Leg spination: femora: I–IV d1-0-2; tibia II v4-3-2; metatarsi I, II v4-0-2. In ventral view (not dissected), posterior margin of epigastric scutum undulated, pronounced, translucent genitalic process anteriorly bulbous, lateral extensions visible, wide, U-shaped, distally enlarged, truncated; anterior genitalic process slender, wide T-shaped, subapically small-sized suboval sclerite covered with short protruding glands, basally with arrowhead-shaped sclerite (anterior part artificially separated in figs. 275–276); median part with anteriorly expanded sclerite; posterior genitalic process posterolaterally large, symmetrical, median with single pocketlike structure, dorsally covered with porous plate, less sclerotized.

OTHER MATERIAL EXAMINED: GUATEMALA: **Zacapa**: same as holotype, June 6, 1991 (AMNH PBI\_OON 49264), 2 ♀.

DISTRIBUTION: Guatemala (Zacapa).



FIGURES 262–276. *Guatemoonops zacapa*, new species, male (262–270) and female (271–276). **262.** Carapace, dorsal view. **263.** Same, lateral view. **264.** Same, anterior view. **265, 272.** Sternum, ventral view. **266.** Mouthparts, ventral view. **267.** Embolus, dorsal view. **268.** Palp, prolateral view. **269.** Same, dorsal view. **270.** Same, retrolateral view. **271.** Habitus, dorsal view. **273.** Abdomen, lateral view. **274.** Epigastric area, ventral view. **275.** Genitalia, same (epigastric and postepigastric parts separated). **276.** Same, dorsal view.

*Emboonops*, new genus

TYPE SPECIES: *Emboonops nejapa*, new species.

ETYMOLOGY: The generic name refers to the enlarged embolus and the similarities to *Oonops*, and is masculine in gender.

DIAGNOSIS: Males of these species resemble those of *Wanops*, *Oonopoides*, and *Noonops* in having the palpal bulb fused to the cymbium, but can easily be distinguished from those of *Oonopoides* by the lack of a hyaline palpal conductor, and from those of *Wanops* and most *Noonops* species by the hypertrophied embolus. A few species of *Noonops* have males with somewhat enlarged emboli, but the females of those species lack the V-shaped anterior genitalic process found in females of most *Emboonops* species.

DESCRIPTION: Total length of males 1.3–1.7, of females 1.4–2.2. Carapace, sternum, mouthparts, palps, legs yellow, without pattern; abdomen white, without pattern. **Cephalothorax:** Carapace elongated hexagonal in dorsal view (figs. 277, 316), pars cephalica slightly elevated in lateral view (figs. 278, 317), anteriorly narrowed to between 0.5 and 0.75 times its maximum width, anterolateral corners without extension or projections, pars thoracica with angular posterolateral corners, without depressions or radiating rows of pits, posterolateral edge without pits, posterior margin not bulging below posterior rim, posterolateral surface without spikes, surface of elevated portion of pars cephalica smooth, sides smooth, fovea absent, lateral margin undulate, rebordered, without denticles; plumose setae near posterior margin of pars thoracica absent; marginal, nonmarginal pars cephalica, pars thoracica setae dark, needlelike, scattered. Clypeus margin slightly rebordered, curved downward in front view (figs. 279, 318), sloping forward in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent; setae dark, needlelike. Chilum absent. Eyes six, well developed, ALE largest, oval, PME squared, PLE oval; posterior eye row recurved from both above and front; ALE separated by more than their diameter, ALE-PLE separated by less than ALE radius, PME touching throughout most of their length, PLE-PME separated by less than PME radius. Sternum longer than wide, not fused to carapace, median concavity absent, with radial furrows between coxae I–II, II–III, III–IV, furrows wrinkled, radial furrow opposite coxae III absent, surface smooth, without pits, microsculpture absent, sickle-shaped structures absent, anterior margin with continuous transverse groove, posterior margin not extending posteriorly of coxae IV, anterior corner unmodified, lateral margin without infracoxal grooves, distance between coxae approximately equal, extensions of precoxal triangles absent, lateral margins unmodified, without posterior hump; setae sparse, dark, needlelike, in group at base of coxae (figs. 280, 319), originating from surface, hair tufts absent. Chelicerae straight, relatively long, anterior face unmodified (figs. 281, 320); without teeth on promargin or retromargin; fangs without toothlike projections, directed medially, shape normal, without prominent basal process, tip unmodified (fig. 283); setae dark, needlelike, densest medially; paturon inner margin with pairs of enlarged setae, distal region unmodified, posterior surface unmodified (figs. 282, 321), promargin with row of flattened setae, inner margin unmodified, laminate groove absent. Labium rectangular, fused to sternum, anterior margin indented at middle (figs. 284, 322), same as sternum in sclerotization; with six or more setae on anterior margin, subdistal portion with unmodified setae. Endites distally not excavated, serrula absent in males (fig. 286), present in females (figs. 323, 325); in males anterome-



dian tip with one strong, toothlike projection (figs. 285, 404), three smaller projections (fig. 378), excavated ridge (fig. 392), or without obvious modifications (fig. 418), posteromedian part unmodified, same as sternum in sclerotization. Labrum with thick cluster of setae at tip (figs. 287, 324). Female palp without claws or spines; patella without prolateral row of ridges, tibia with three trichobothria (fig. 328), tarsus unmodified (figs. 326, 327). **Abdomen:** Cylindrical, without long posterior extension, rounded posteriorly, interscutal membrane without rows of small sclerotized platelets. Book lung covers large, ovoid, without setae, anterolateral edge unmodified. Posterior spiracles connected by groove (figs. 296, 329). Pedicel tube short, unmodified, scutopedicel region unmodified, scutum not extending far dorsal of pedicel, plumose hairs, matted setae on anterior ventral abdomen in pedicel area, cuticular outgrowths near pedicel all absent. Dorsal scutum absent. Epigastric scutum weakly sclerotized, not surrounding pedicel, not protruding, small lateral sclerites absent, females without lateral joints. Postepigastric scutum weakly sclerotized, yellow, short, only around epigastric furrow, not fused to epigastric scutum, anterior margin unmodified, with short posteriorly directed lateral apodemes. Spinneret scutum absent. Supraanal scutum absent. Abdominal setae dark, needlelike, epigastric area setae not basally thickened. Dense patch of setae anterior to spinnerets absent. Colulus present (figs. 331, 332). Six spinnerets, anterior laterals bisegmented (figs. 297, 331), with oblique membranous strip (figs. 298, 332), posterior medians unisegmented, posterior laterals bisegmented; spigots scanned only in *E. nejapa*, anterior laterals with one major ampullate gland and two piriform gland spigots (figs. 299, 333), posterior medians with single long spigot in males (fig. 300), five in females (fig. 334), posterior laterals with two long spigots in males (fig. 301), four in females (fig. 335). **Legs:** Femur IV not thickened, same size as femora I–III, patella plus tibia I longer than carapace, tibia I unmodified, tibia IV specialized hairs on ventral apex, ventral scopula both absent, metatarsi I, II mesoapical comb absent, metatarsi III, IV weak ventral scopula absent. Leg spines present on tibiae, metatarsi I, II. Tarsi without inferior claw, claws scanned only in *E. nejapa*, those of males with single row of four or five long teeth on outer margin (figs. 302–305, 307–310), females with additional row of tiny, closely packed teeth on distal half of inner margin (figs. 336–343). Tarsal organs scanned only in *E. nejapa*, with three receptors on legs I, II (figs. 311, 312, 344, 345), two on legs III, IV, palp (figs. 313–315, 346–348). Trichobothrial base with triangular aperture (fig. 306). **Genitalia:** Male epigastric region with sperm pore not visible; furrow without  $\Omega$ -shaped insertions, without setae. Palp normal size, not strongly sclerotized, right and left palps mirror images, prolateral excavation absent; trochanter normal size, unmodified; femur normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, attaching to patella basally; patella shorter than femur, not enlarged, without prolateral row of ridges, setae unmodified; tibia with three trichobothria (fig. 288); cymbium ovoid in dorsal view, completely fused with bulb, no seam visible (figs. 289–291), not extending beyond distal tip of bulb, plumose setae, stout setae, distal patch of setae all absent; bulb 1–1.5 times as long as cymbium, stout, spherical, embolus hypertrophied (figs. 292–295). Female genitalia typically with deeply bifid, V-shaped anterior process (fig. 330) but arms of process nearly fused in *E. mckenziei*, apparently fully fused in *E. tuxtla* and *E. arriaga*.

**DISTRIBUTION:** Known only from southern Mexico (Veracruz, Oaxaca, Chiapas, and Tabasco).

Key to Species of *Emboonops*

1. Males (unknown in *bonampak*, *hermosa*, *mckenziei*, and *tamaz*) ..... 2
  - Females (unknown in *calco*) ..... 7
2. Embolus longer than bulb (fig. 357) ..... *tuxtlas*
  - Embolus shorter than bulb ..... 3
3. Embolus with two prolaterally directed projections (figs. 394, 397) ..... *calco*
  - Embolus without prolaterally directed projections ..... 4
4. Embolus long, narrowed at about half its length (figs. 291, 294) ..... *nejapa*
  - Embolus shorter (figs. 381, 407, 421) ..... 5
5. Embolus with triangular terminal projection (figs. 383, 409) ..... 6
  - Embolus without terminal projection (fig. 423) ..... *arriaga*
6. Embolus narrowed at base (fig. 383) ..... *catrin*
  - Embolus not narrowed at base (fig. 409) ..... *palenque*
7. Anterior genitalic process V-shaped (as in figs. 375, 439) ..... 9
  - Anterior genitalic process not V-shaped (figs. 365, 429) ..... 8
8. Genitalia with posterior, heavily sclerotized apodemes (fig. 365) ..... *tuxtlas*
  - Genitalia without heavily sclerotized apodemes (fig. 429) ..... *arriaga*
9. Arms of V-shaped anterior genitalic process short (fig. 439) ..... *mckenziei*
  - Arms of V-shaped anterior genitalic process longer ..... 10
10. Arms of V-shaped anterior genitalic process relatively narrow (figs. 370, 375, 389) ..... 11
  - Arms of V-shaped anterior genitalic process relatively wide (figs. 401, 415, 434) ..... 13
11. Anterior genitalic process originating from wide, oval sclerotization (fig. 370) ..... *tamaz*
  - Anterior genitalic process otherwise ..... 12
12. Anterior genitalic process originating from wide sclerotization (fig. 375) ..... *nejapa*
  - Anterior genitalic process originating from narrow sclerotization (fig. 389) ..... *catrin*
13. Arms of V-shaped anterior genitalic process forming vase-shaped sclerite (fig. 401) .....
  - ..... *bonampak*
  - Arms of V-shaped anterior genitalic process otherwise ..... 14
14. Arms of V-shaped anterior genitalic process distally widened (fig. 434) ..... *hermosa*
  - Arms of V-shaped anterior genitalic process distally narrower (fig. 415) ..... *palenque*

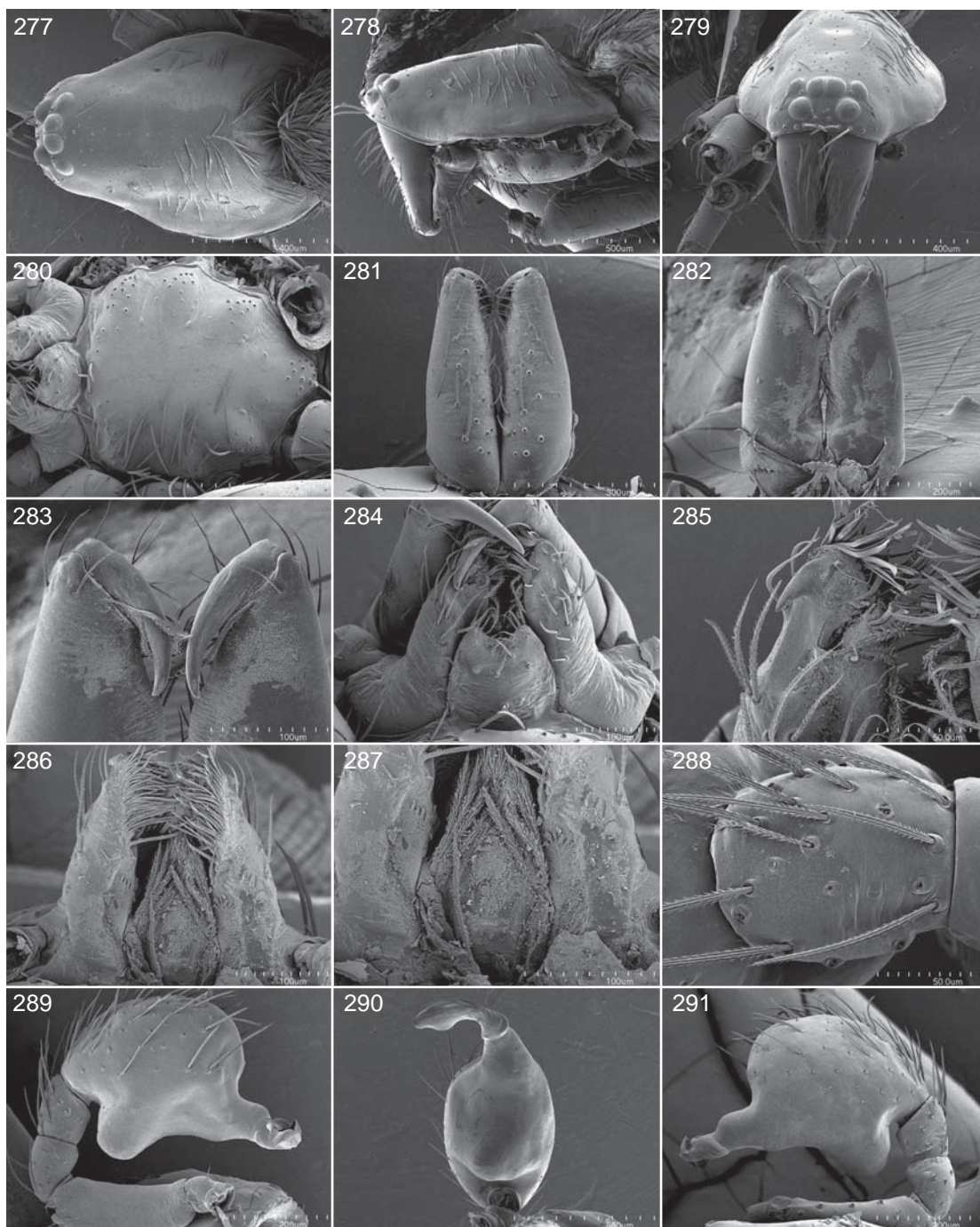
*Emboonops tuxtlas*, new species

Figures 352–365

TYPES: Male holotype, female allotype, and female paratype from a Berlese sample of ravine litter and fungi taken at an elevation of 160 m in the Estación de Biología Los Tuxtlas, 33 km northeast of Catemaco, Veracruz, Mexico (Aug. 1, 1983; S., J. Peck), deposited in AMNH (PBI\_OON 31154).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can easily be recognized by the two projections at the base of the elongated embolus (figs. 355–360), females by the widened and elongated base of the anterior genitalic process (figs. 363–365).



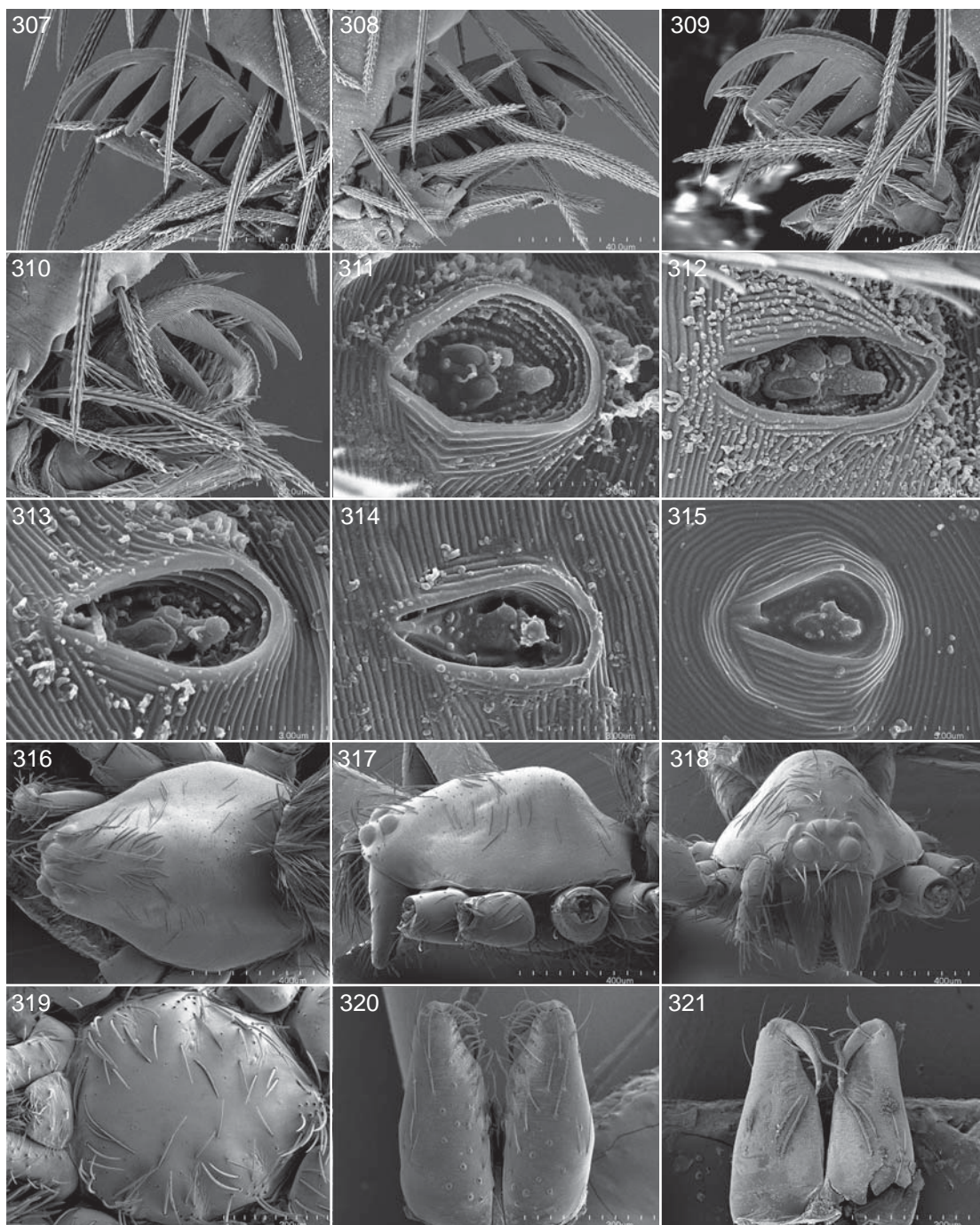
FIGURES 277–291. *Emboonops nejapa*, new species, male. 277. Carapace, dorsal view. 278. Same, lateral view. 279. Same, anterior view. 280. Sternum, ventral view. 281. Chelicerae, anterior view. 282. Same, posterior view. 283. Fangs, posterior view. 284. Endites, ventral view. 285. Tip of endite, same. 286. Endites, dorsal view. 287. Labrum, same. 288. Palpal tibia, dorsal view. 289. Left palp, prolateral view. 290. Same, ventral view. 291. Same, retrolateral view.





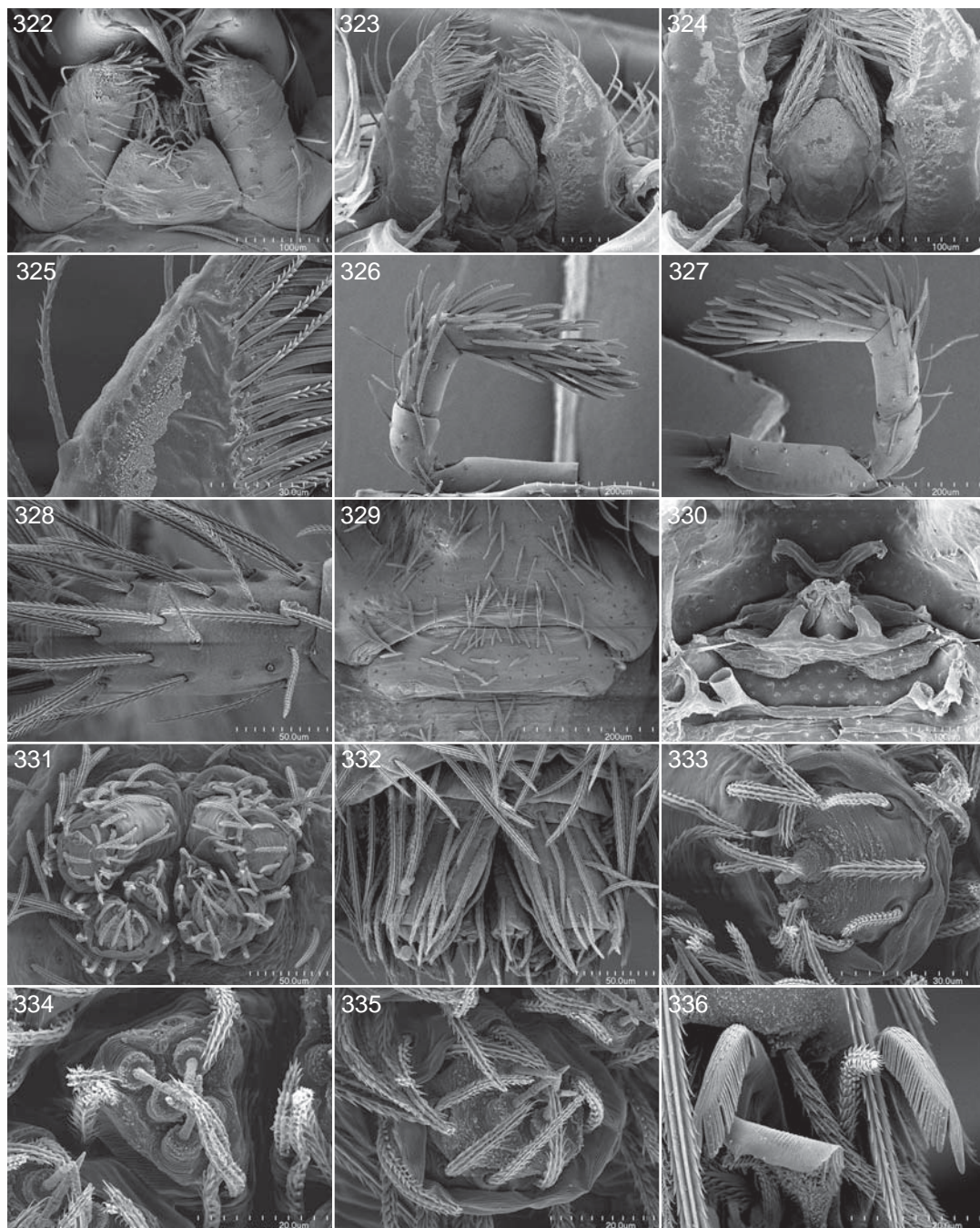
FIGURES 292–306. *Emboonops nejapa*, new species, male. 292. Left embolus, prolateral view. 293. Same, ventral view. 294. Same, retrolateral view. 295. Same, dorsal view. 296. Epigastric region, ventral view. 297. Spinnerets, distal view. 298. Anterior lateral spinnerets, ventral view. 299. Same, distal view. 300. Posterior median spinnerets, same. 301. Posterior lateral spinneret, same. 302. Claws of leg I, distal view. 303. Same, leg II. 304. Same, leg III. 305. Same, leg IV. 306. Trichobothrial base from metatarsus I, dorsal view.





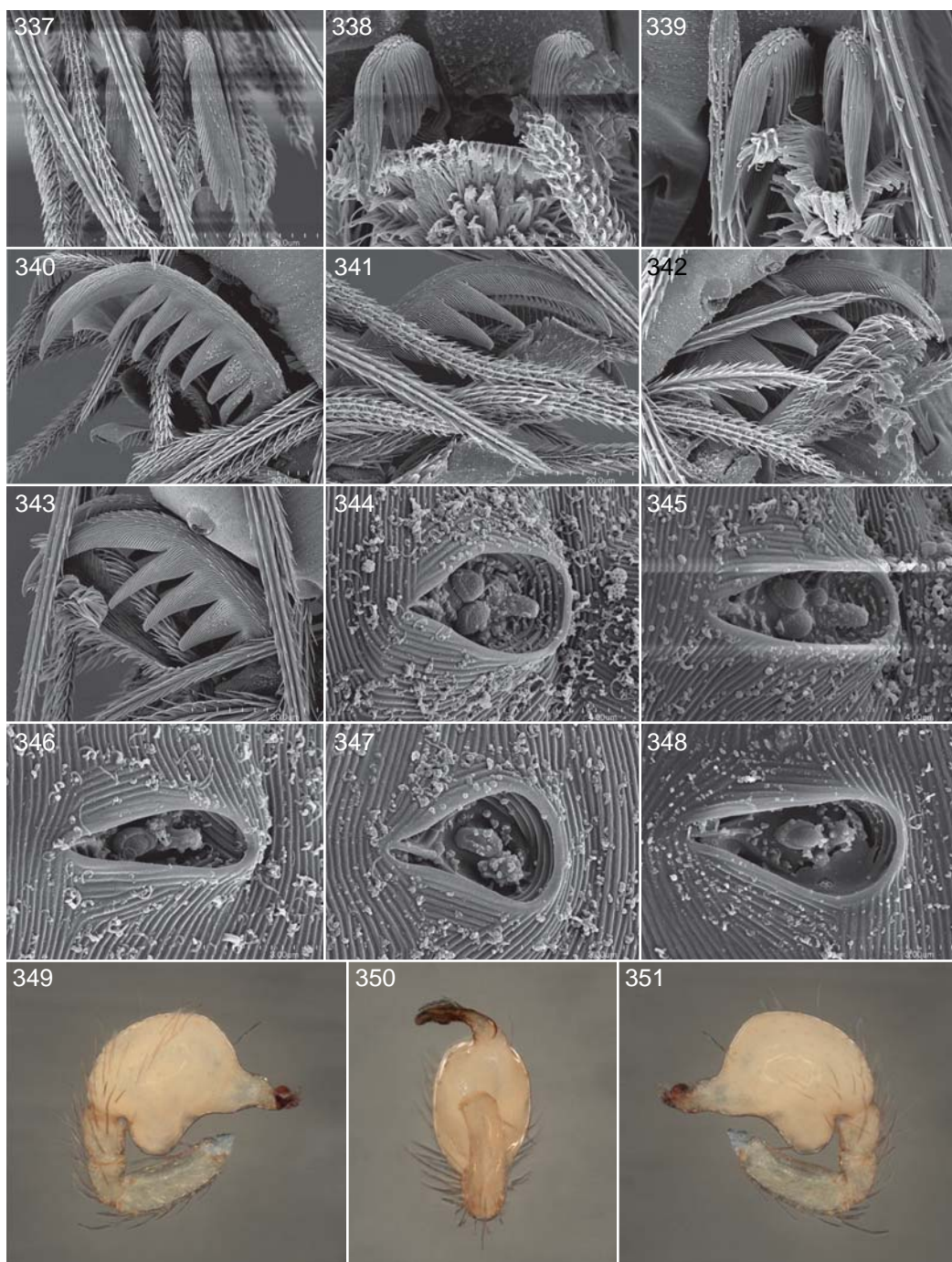
FIGURES 307–321. *Emboonops nejapa*, new species, male (307–315) and female (316–321). 307. Claws of leg I, lateral view. 308. Same, leg II. 309. Same, leg III. 310. Same, leg IV. 311. Tarsal organ of leg I, dorsal view. 312. Same, leg II. 313. Same, leg III. 314. Same, leg IV. 315. Same, palp. 316. Carapace, dorsal view. 317. Same, lateral view. 318. Same, anterior view. 319. Sternum, ventral view. 320. Chelicerae, anterior view. 321. Same, posterior view.



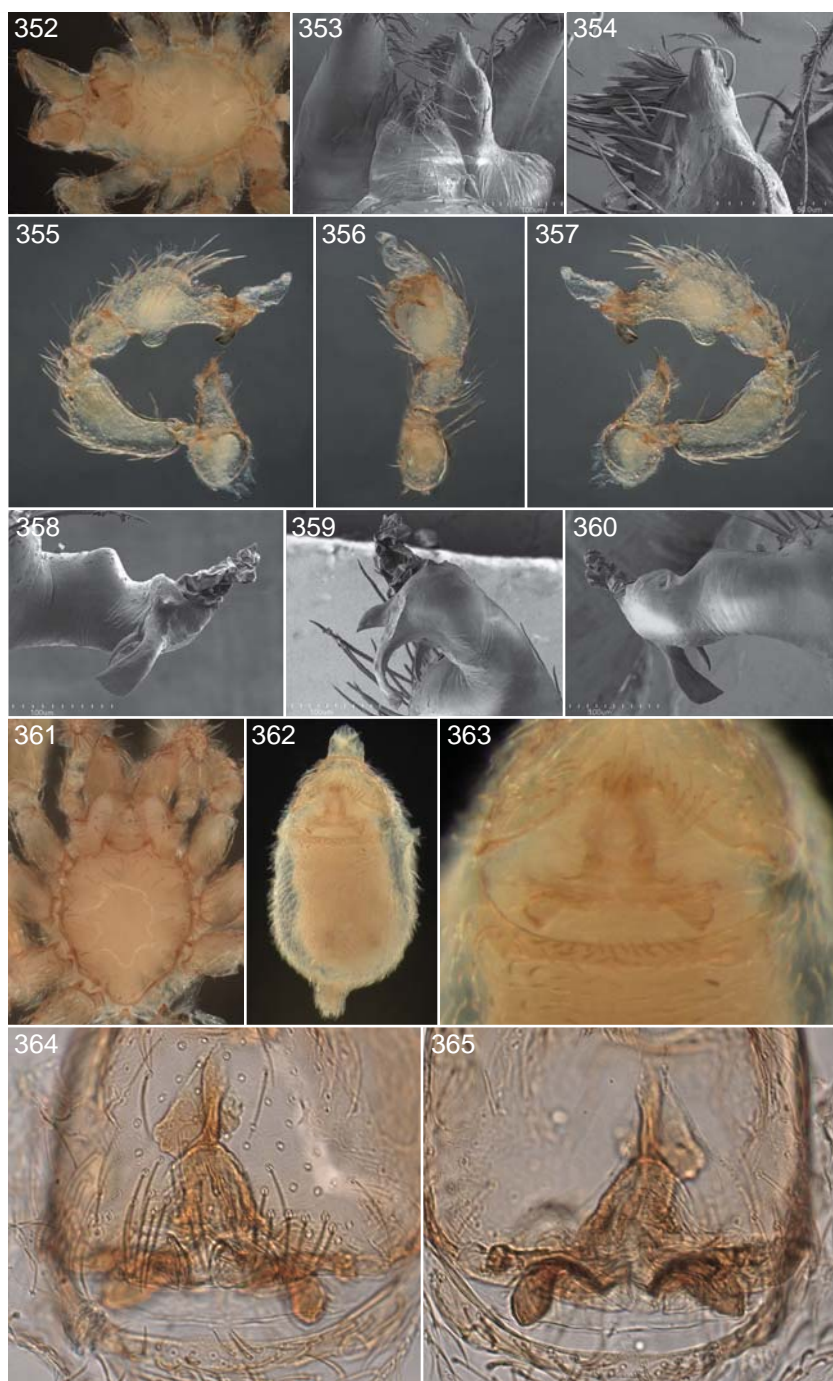


FIGURES 322–336. *Emboonops nejapa*, new species, female. 322. Endites, ventral view. 323. Same, dorsal view. 324. Labrum, same. 325. Serrula, dorsal view. 326. Palp, prolateral view. 327. Same, retrolateral view. 328. Palpal tibia, dorsal view. 329. Epigastric region, ventral view. 330. Internal genitalia, dorsal view. 331. Spinnerets, distal view. 332. Anterior lateral spinnerets, ventral view. 333. Same, distal view. 334. Posterior median spinnerets, same. 335. Posterior lateral spinneret, same. 336. Claws of leg I, distal view.





FIGURES 337–351. *Emboonops nejapa*, new species, female (337–348) and male (349–351). 337. Claws of leg II, distal view. 338. Same, leg III. 339. Same, leg IV. 340. Claws of leg I, lateral view. 341. Same, leg II. 342. Same, leg III. 343. Same, leg IV. 344. Tarsal organ of leg I, dorsal view. 345. Same, leg II. 346. Same, leg III. 347. Same, leg IV. 348. Same, palp. 349. Left palp, prolateral view. 350. Same, ventral view. 351. Same, retrolateral view.



FIGURES 352–365. *Emboonops tuxtlas*, new species, male (352–360) and female (361–365). 352, 361. Sternum, ventral view. 353. Endites, same. 354. Tip of endite, same. 355. Left palp, prolateral view. 356. Same, ventral view. 357. Same, retrolateral view. 358. Left embolus, prolateral view. 359. Same, ventral view. 360. Same, retrolateral view. 362. Abdomen, ventral view. 363, 364. Genitalia, same. 365. Same, dorsal view.

MALE (PBI\_OON 31154, figs. 352–360): Total length 1.32. Leg spination: tibiae: III v0-1p-2; IV p1-1-1, v1p-0-1p; metatarsi: III v0-0-2; IV p1-0-0, v1p-1p-1p. Embolus with two ventral projections, proximal one short, sharply pointed, distal one wider, wide at tip; dorsal projection membranous.

FEMALE (PBI\_OON 31154, figs. 361–365): Total length 1.41. Leg spination: tibiae: III p0-0-1, v0-0-1p; IV v1p-0-2; metatarsi: III v0-0-2; IV p0-1-0, v1p-0-2. Anterior genitalic process long, abruptly narrowed at about half its length.

OTHER MATERIAL EXAMINED: MEXICO: **Veracruz**: Estación de Biología Los Tuxtlas, 33 km NE Catemaco, Aug. 1, 1983, tree base litter, elev. 160 m (S., J. Peck, AMNH PBI\_OON 49594), 1 ♀.

DISTRIBUTION: Mexico (Veracruz).

***Emboonops tamaz*, new species**

Figures 366–370

TYPES: Female holotype and female paratype from 10 mi northwest of Tamazulapan del Progreso, 17°44'N, 97°42'W, Oaxaca, Mexico (May 1, 1963; W. Gertsch, W. Ivie), deposited in AMNH (PBI\_OON 37338).

ETYMOLOGY: The specific name is a noun in apposition shortened from the type locality.

DIAGNOSIS: Females can be recognized by the wide, oval base of the anterior genitalic process (figs. 368–370).

MALE: Unknown.

FEMALE (PBI\_OON 37338, figs. 366–370): Total length 1.83. Leg spination: tibiae III, IV v0-0-2; metatarsi: III v0-1p-0; IV p1-0-1, v0-0-2. Anterior genitalic process V-shaped, posterior portion of genitalia with wide, sclerotized oval.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Mexico (Oaxaca).

***Emboonops catrin*, new species**

Figures 376–389

TYPES: Male holotype and female allotype from El Catrín, 17°21'N, 96°57'W, Oaxaca, Mexico (Sept. 3, 1964; J., W. Ivie), deposited in AMNH (PBI\_OON 37340).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can easily be recognized by the arched tip of the embolus (figs. 379–384), females by the short, thumb-shaped base of the anterior genitalic process (figs. 387–389).

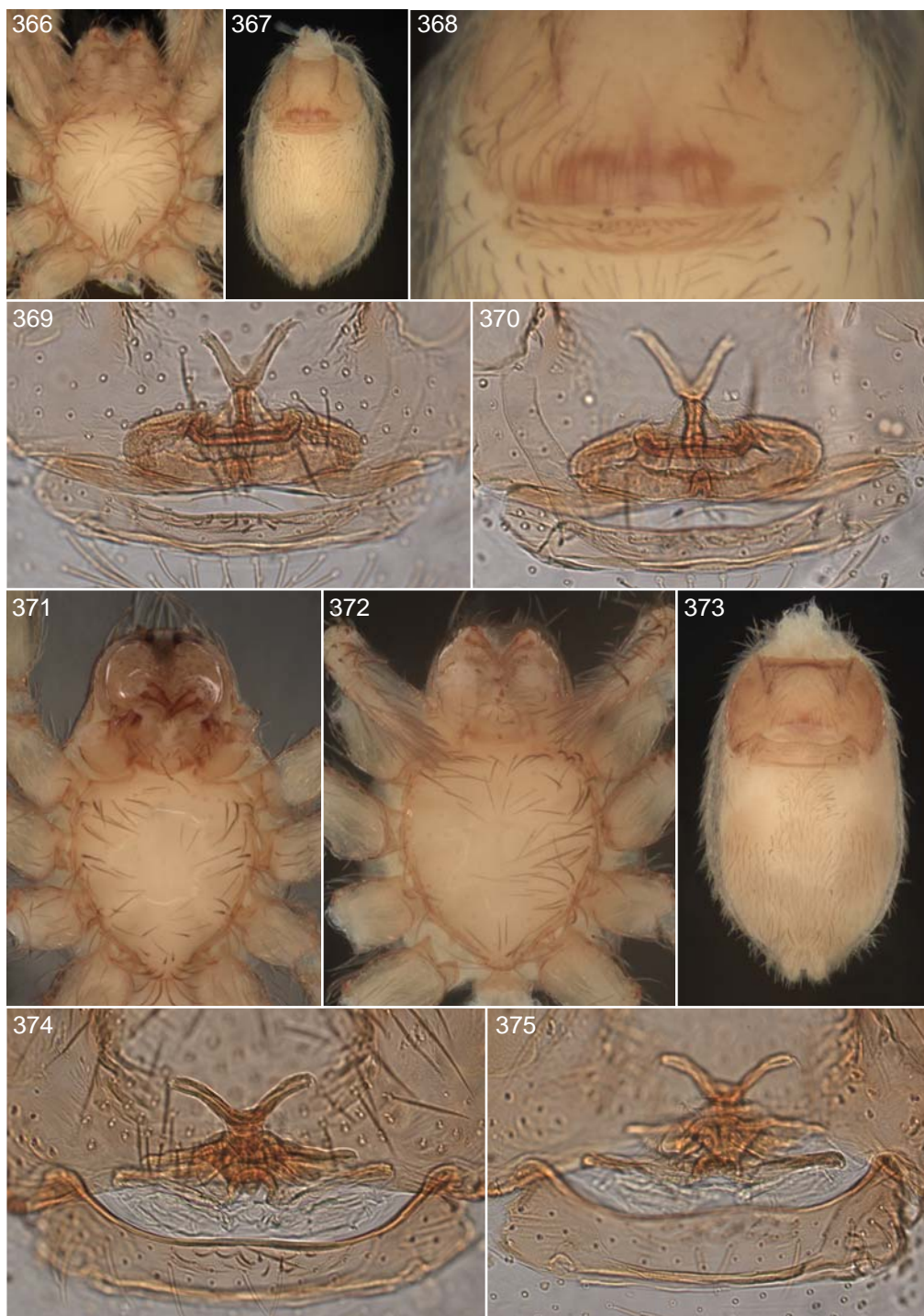
MALE (PBI\_OON 37340, figs. 376–384): Total length 1.41. Leg spination: tibiae: III v0-1p-0; IV p0-0-1, v1p-0-2; metatarsi: III v0-0-2; IV p1-0-0, v1p-0-2. Embolus with basal expansion on prolateral side, distally wide.

FEMALE (PBI\_OON 37340, figs. 385–389): Total length 2.15. Leg spination: tibiae: III v0-0-2; IV p0-0-1, v0-1p-2; metatarsi: III v1p-1p-2; IV p1-0-0, v1p-0-2. Anterior genitalic process V-shaped, arms short, originating from median, almost circular sclerotization.

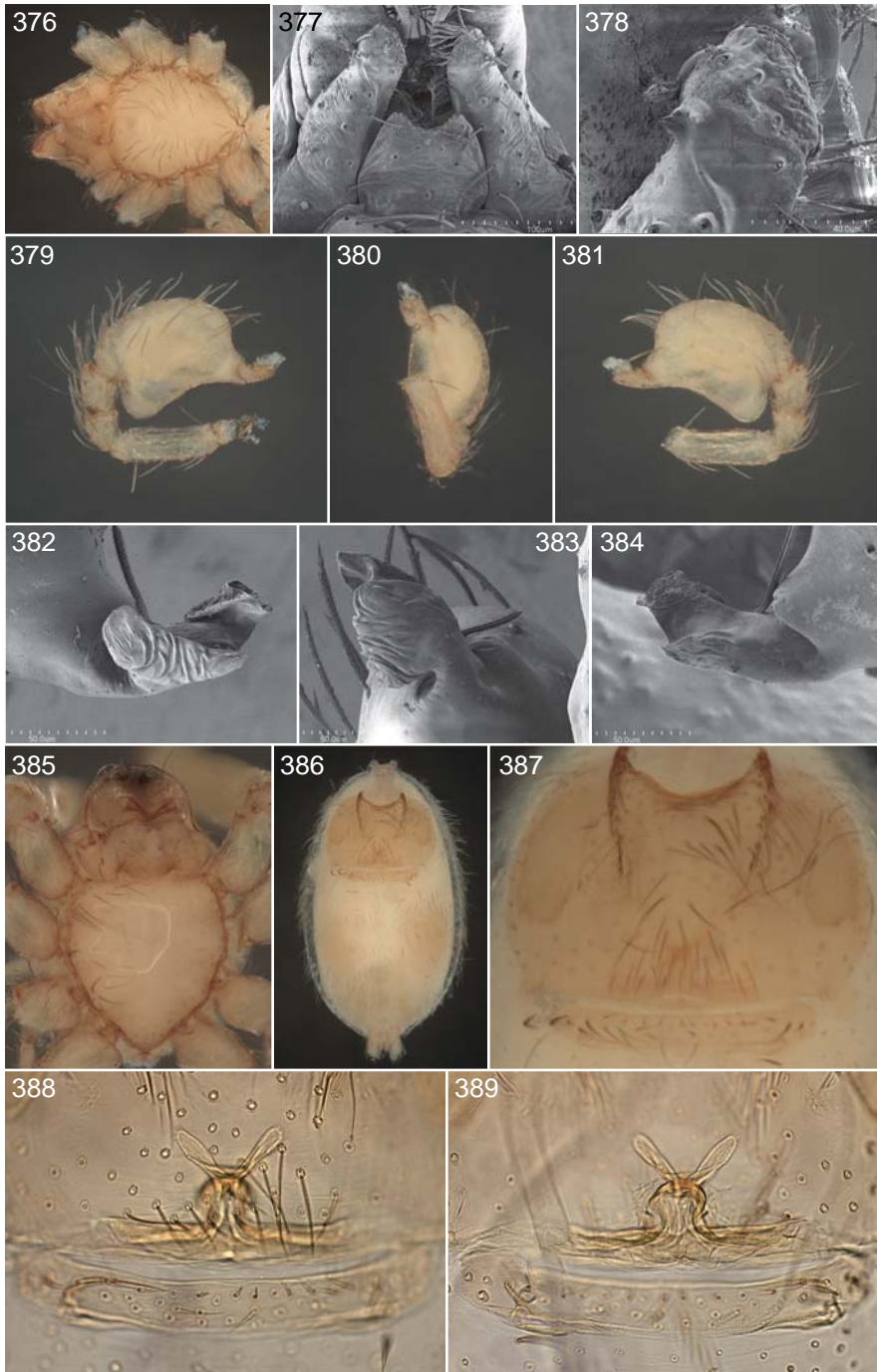
OTHER MATERIAL EXAMINED: MEXICO: **Oaxaca**: El Catrín, 17°21'N, 96°57'W, Sept. 3, 1964 (J., W. Ivie, AMNH PBI\_OON 37346), 1 ♂; 9 mi SE Nochixtlán, 17°20'N, 97°12'W, May 1, 1963 (W. Gertsch, W. Ivie, AMNH PBI\_OON 37337), 1 ♀.

DISTRIBUTION: Mexico (Oaxaca).





FIGURES 366–375. 366–370. *Emboonops tamaz*, new species, female. 371–375. *E. nejapa*, new species, male (371) and female (372–375). 366, 371, 372. Sternum, ventral view. 367, 373. Abdomen, ventral view. 368, 369, 374. Genitalia, ventral view. 370, 375. Same, dorsal view.



FIGURES 376–389. *Emboonops catrin*, new species, male (376–384) and female (385–389). **376, 385.** Sternum, ventral view. **377.** Endites, same. **378.** Tip of endite, same. **379.** Left palp, prolateral view. **380.** Same, ventral view. **381.** Same, retrolateral view. **382.** Left embolus, prolateral view. **383.** Same, ventral view. **384.** Same, retrolateral view. **386.** Abdomen, ventral view. **387, 388.** Genitalia, same. **389.** Same, dorsal view.

*Emboonops nejapa*, new species

Figures 277–351, 371–375

TYPES: Male holotype and female allotype from 5 mi southeast of Nejapa, 16°34'N, 95°56'W, Oaxaca, Mexico (Apr. 29, 1963; W. Gertsch, W. Ivie), deposited in AMNH (PBI\_OON 1046).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can easily be recognized by the ledge-shaped embolus (figs. 289–295, 349–351), females by the diamond-shaped base of the anterior genitalic process (figs. 330, 373–375).

MALE (PBI\_OON 1710, figs. 277–315, 349–351, 371): Total length 1.67. Leg spination: tibiae: III p0-1-0, v1p-1p-1p; IV v0-1p-1p; metatarsi: III v1p-1p-1p; IV p0-1-0, v1p-1p-1p. Embolus long, wide, with wide opening.

FEMALE (PBI\_OON 1710, figs. 316–348, 372–375): Total length 1.83. Leg spination: tibiae: III v0-0-1p; IV v1p-0-1p; metatarsi: III v0-1p-1p; IV p1-0-1, v1p-0-1p. Anterior genitalic process V-shaped, posterior projection almost circular.

OTHER MATERIAL EXAMINED: MEXICO: **Oaxaca**: 5 mi SE Nejapa, 16°34'N, 95°56'W, Apr. 29, 1963 (W. Gertsch, W. Ivie, AMNH PBI\_OON 1710), 6♂, 11♀.

DISTRIBUTION: Mexico (Oaxaca).

*Emboonops calco*, new species

Figures 390–398

TYPE: Male holotype from Pichucalco, Chiapas, Mexico (July 18, 1947; C., M. Goodnight), deposited in AMNH (PBI\_OON 31166).

ETYMOLOGY: The specific name is a noun in apposition shortened from the type locality.

DIAGNOSIS: Males can easily be recognized by the elongated projection on the base of the embolus (figs. 394, 397).

MALE (PBI\_OON 31166, figs. 390–398): Total length 1.54. Leg spination: tibiae III v0-0-2; metatarsi: III v0-1p-2 (leg IV missing). Embolus with two narrow, prolateral projections near base.

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Mexico (Chiapas).

*Emboonops palenque*, new species

Figures 402–415

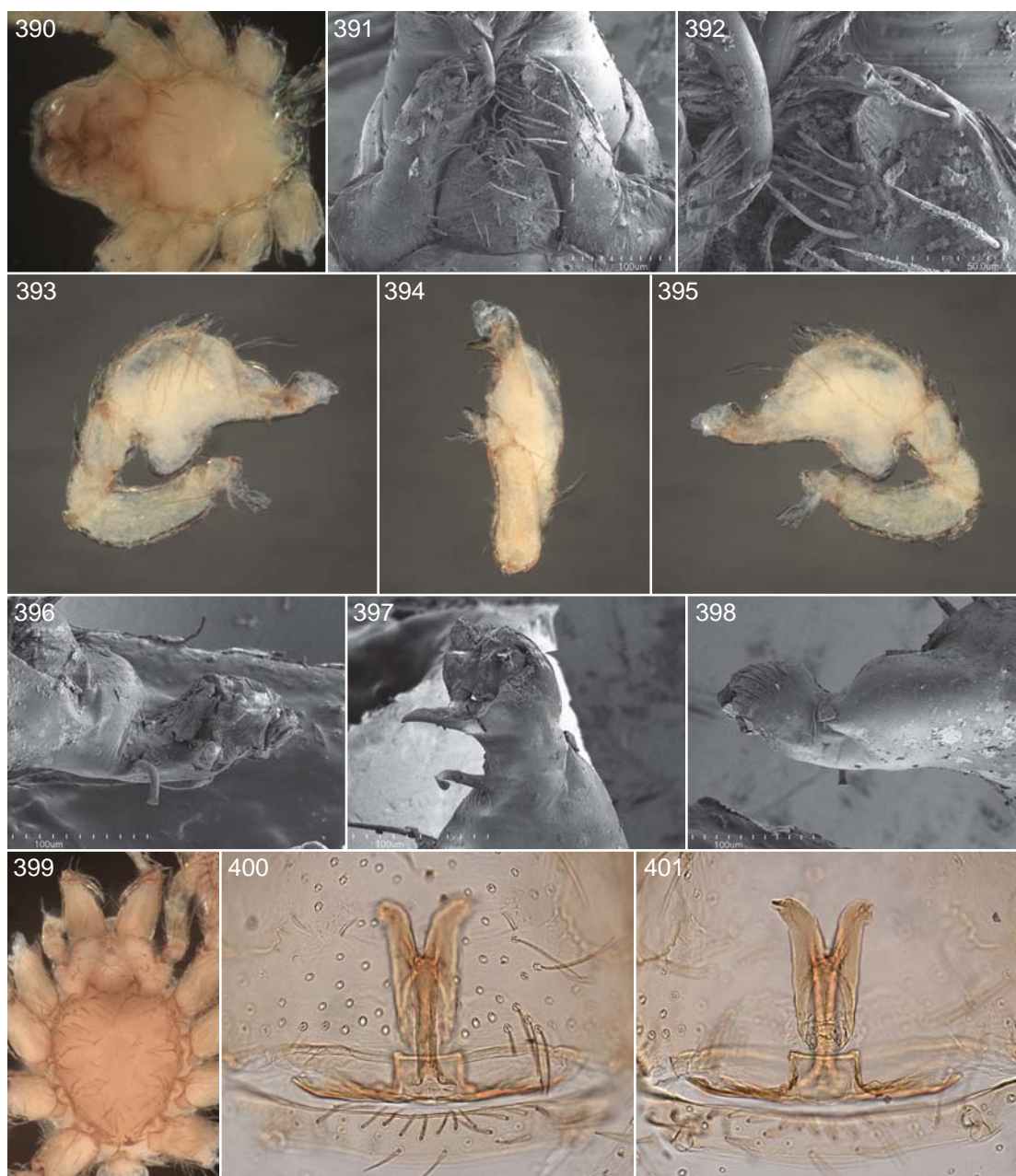
TYPES: Male holotype, female allotype, and female paratype taken from a broken termite nest in a rainforest at an elevation of 80 m at Palenque, Chiapas, Mexico (July 29, 1983; S., J. Peck), deposited in AMNH (PBI\_OON 31155).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

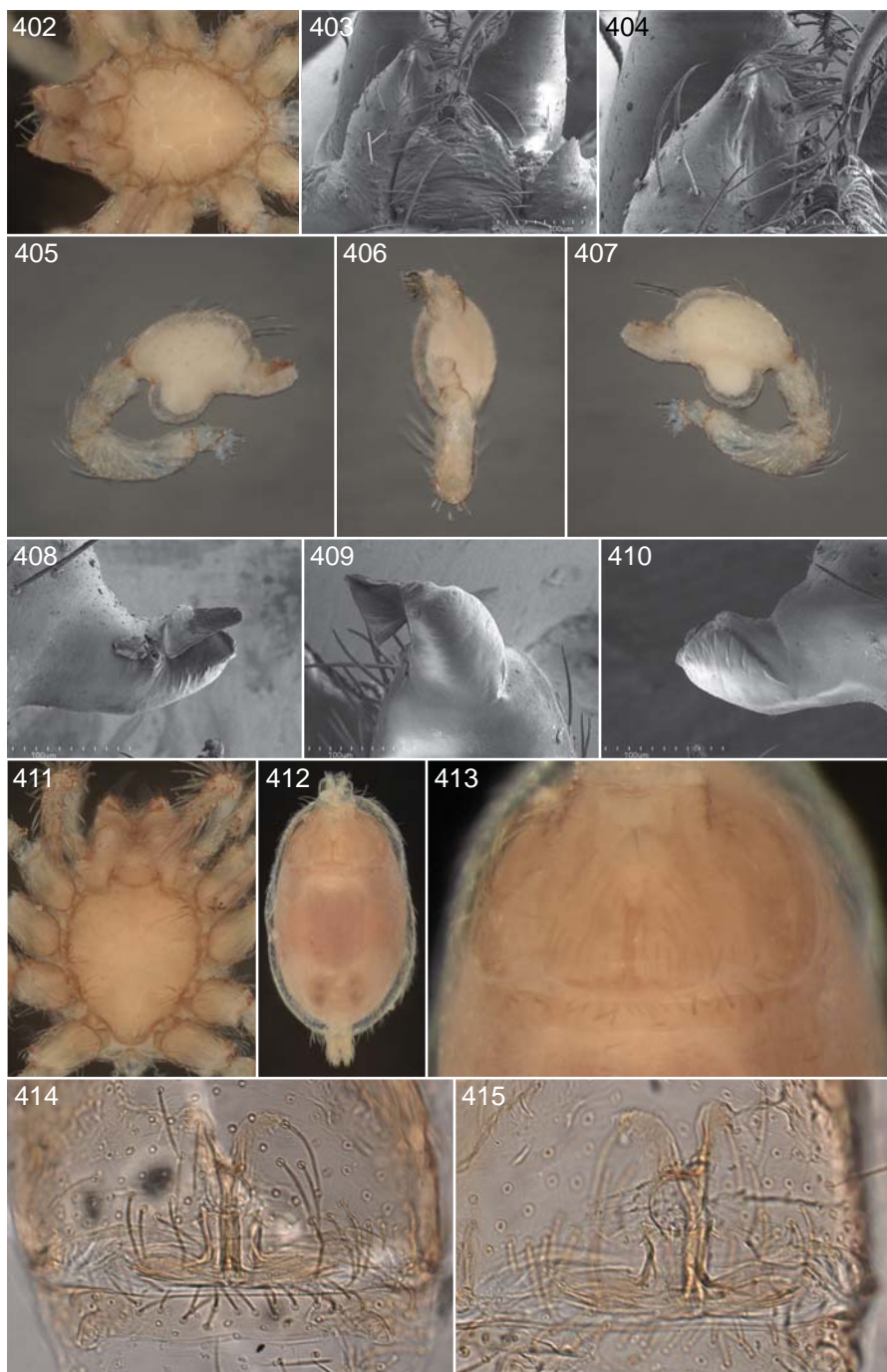
DIAGNOSIS: Males can easily be recognized by the wide ledge on the embolus (figs. 405–410), females by the long, deeply bifid anterior genitalic process (figs. 413–415).

MALE (PBI\_OON 31155, figs. 402–410): Total length 1.54. Leg spination: tibiae: III p0-0-1, v0-0-2; IV p1-0-1, v0-1p-2; metatarsi III, IV v0-1p-2. Embolus with thumb-shaped projection at base, tip triangular in ventral view.





FIGURES 390–401. 390–398. *Emboonops calco*, new species, male. 399–401. *E. bonampak*, new species, female. 390, 399. Sternum, ventral view. 391. Endites, same. 392. Tip of endite, same. 393. Left palp, prolateral view. 394. Same, ventral view. 395. Same, retrolateral view. 396. Left embolus, prolateral view. 397. Same, ventral view. 398. Same, retrolateral view. 400. Genitalia, ventral view. 401. Same, dorsal view.



FIGURES 402–415. *Emboonops palenque*, new species, male (402–410) and female (411–415). **402, 411.** Sternum, ventral view. **403.** Endites, same. **404.** Tip of endite, same. **405.** Left palp, prolateral view. **406.** Same, ventral view. **407.** Same, retrolateral view. **408.** Left embolus, prolateral view. **409.** Same, ventral view. **410.** Same, retrolateral view. **412.** Abdomen, ventral view. **413, 414.** Genitalia, same. **415.** Same, dorsal view.

FEMALE (PBI\_OON 31155, figs. 411–415): Total length 1.63. Leg spination: tibiae: III p0-1-0; IV p1-0-0, v0-1p-2; metatarsi: III v0-1p-2; IV p1-0-0, v0-1p-2. Anterior genitalic process elongated, bifid for about half its length.

OTHER MATERIAL EXAMINED: MEXICO: **Chiapas**: Palenque, Mar. 2–24, 1975, Berlese (C. Alteri, AMNH PBI\_OON 31169), 1 ♂.

DISTRIBUTION: Mexico (Chiapas).

***Emboonops bonampak*, new species**

Figures 399–401

TYPE: Female holotype from Berlese sample of *Aristolochia* flowers taken in a rain forest at an elevation of 230 m on Bonampak Road, 100 km southeast of Palenque, Chiapas, Mexico (June 8, 1983; S., J. Peck), deposited in AMNH (PBI\_OON 1670).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Females can be recognized by the long anterior genitalic process, which is bifid only for the distalmost one-third of its length (figs. 400, 401).

MALE: Unknown.

FEMALE (PBI\_OON 1670, figs. 399–401): Total length 1.89. Leg spination: tibiae: III v1p-1-1p; IV v0-1p-2, r0-1-0; metatarsi: III v0-1p-2, r0-0-1; IV p1-0-1, v1p-0-2, r1-0-1. Only anterior third of anterior genitalic process bifid.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Mexico (Chiapas).

***Emboonops arriaga*, new species**

Figures 416–429

TYPES: Male holotype and female allotype taken in a pine forest situated 15 mi northwest of Arriaga, 16°25'N, 94°01'W, Chiapas, Mexico (Aug. 27, 1966; J., W. Ivie), deposited in AMNH (PBI\_OON 1725).

ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can easily be recognized by the tube-shaped embolus (figs. 419–424), females by the long anterior genitalic process (figs. 427–429).

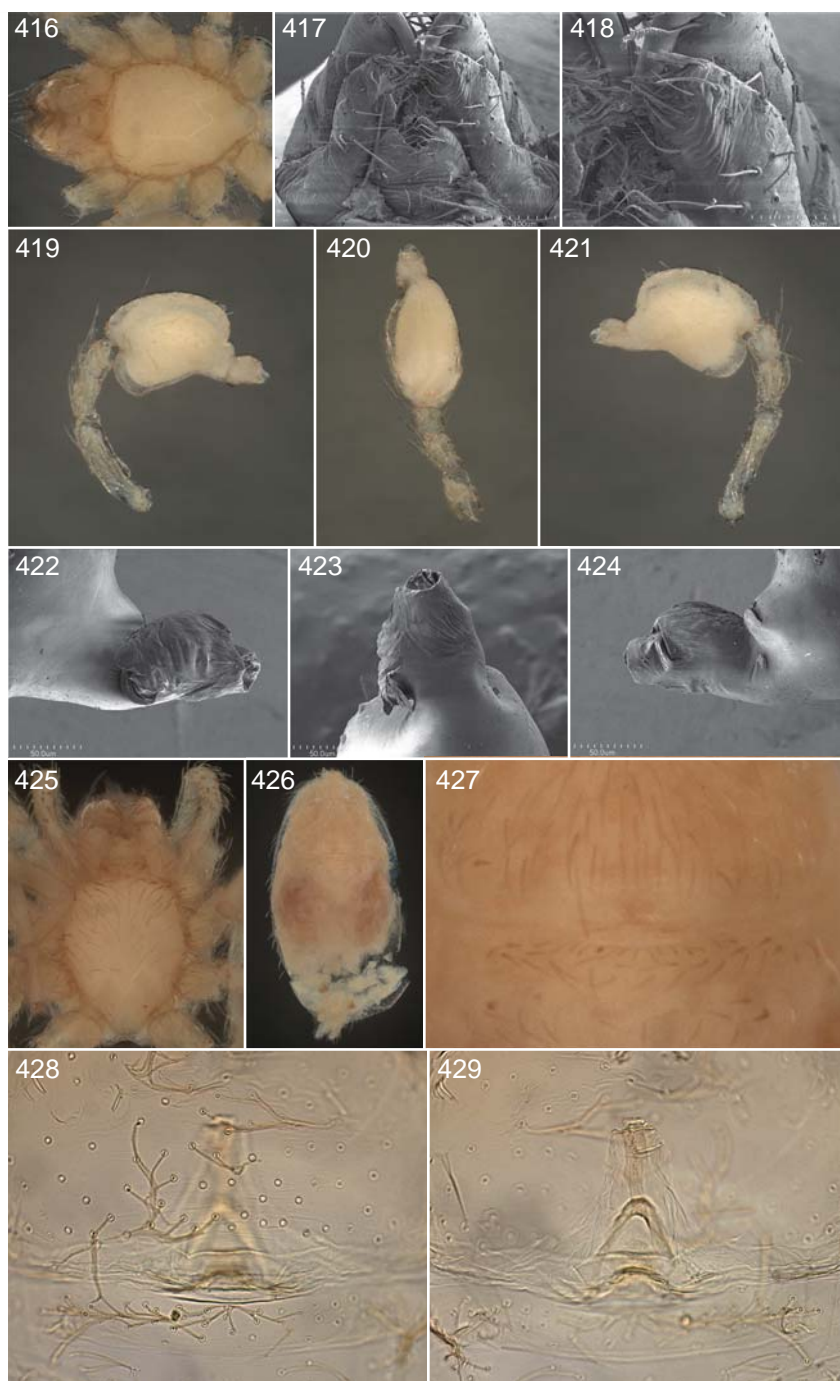
MALE (PBI\_OON 1725, figs. 416–424): Total length 1.32. Leg spination: tibiae: III p1-0-1, v0-1p-2, r0-0-1; IV p0-0-1, v0-1p-0, r0-0-1; metatarsi: III v0-1p-2; IV p0-0-1, v0-1p-2; r0-0-1. Embolus with basally directed, medially invaginated (in ventral view) prolateral protrusion.

FEMALE (PBI\_OON 1725, figs. 425–429): Total length 2.02. Leg spination: tibiae: III p0-1-1, v0-1p-2; IV p1-0-1, v0-1p-2, r1-0-0; metatarsi: III v0-0-2; IV p0-0-1, v0-1p-2, r1-0-0. Anterior genitalic process inverted Y-shaped.

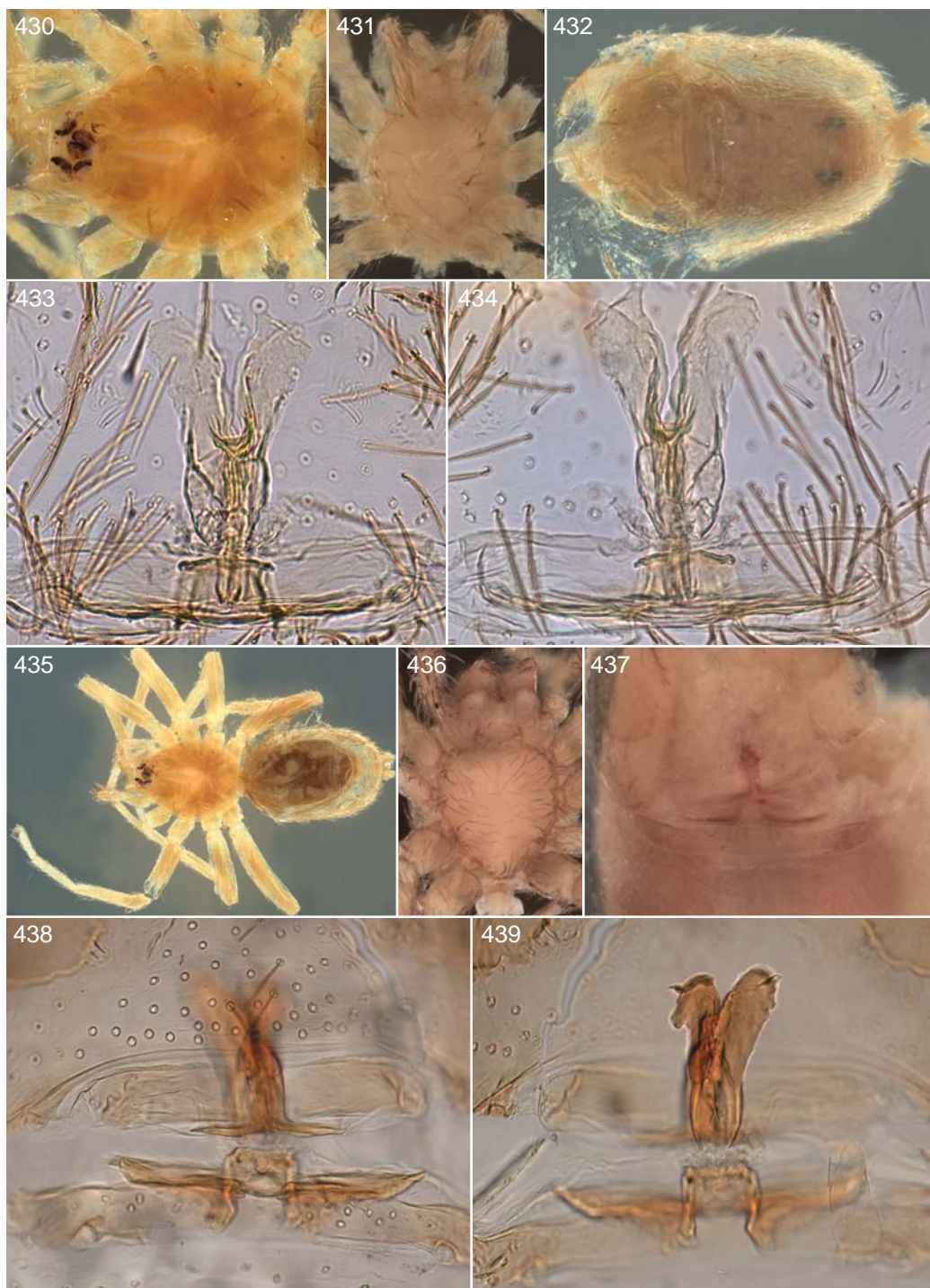
OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Mexico (Chiapas).





FIGURES 416–429. *Emboonops arriaga*, new species, male (416–424) and female (425–429). **416, 425.** Sternum, ventral view. **417.** Endites, same. **418.** Tip of endite, same. **419.** Left palp, prolateral view. **420.** Same, ventral view. **421.** Same, retrolateral view. **422.** Left embolus, prolateral view. **423.** Same, ventral view. **424.** Same, retrolateral view. **426.** Abdomen, ventral view. **427, 428.** Genitalia, same. **429.** Same, dorsal view.



FIGURES 430–439. 430–435. *Emboonops hermosa*, new species, female. 436–439. *E. mckenziei* (Gertsch), female. 430. Carapace, dorsal view. 431, 436. Sternum, ventral view. 432. Abdomen, ventral view. 433, 437, 438. Genitalia, same. 434, 439. Same, dorsal view. 435. Habitus, dorsal view.

*Emboonops hermosa*, new species

Figures 430–435

TYPE: Female holotype from Villahermosa, Tabasco, Mexico (Aug. 14, 1945; F. Bonet), deposited in AMNH (PBI\_OON 31162).

ETYMOLOGY: The specific name is a noun in apposition shortened from the type locality.

DIAGNOSIS: Females resemble those of *E. palenque*, but have the distal arms of the anterior genitalic process straighter and almost touching (figs. 432–434).

MALE: Unknown.

FEMALE (PBI\_OON 31162, figs. 430–435): Total length 1.77. Leg spination: tibiae: III p1-0-1, v1p-1p-2, r1-0-0; IV p1-0-0, v0-1p-2, r1-0-1; metatarsi: III v1p-1p-2, r1-0-0; IV p1-0-1, v0-1p-2, r1-0-1. Anterior genitalic process with winglike distal arms.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Mexico (Tabasco).

*Emboonops mckenziei* (Gertsch), new combination

Figures 436–439

*Oonops mckenziei* Gertsch, 1977: 123, figs. 67, 70 (female holotype from surface near Grutas de Coconá, Tabasco, Mexico, in AMNH; examined).

DIAGNOSIS: Females can easily be recognized by the relatively short, heavily sclerotized anterior genitalic process (figs. 437–439).

MALE: Unknown.

FEMALE (PBI\_OON 1594, figs. 436–439): Total length 2.01. Leg spination: tibiae: III p0-1-0, v1p-0-0; IV p1-0-0, v1p-1p-2, r1-0-1; metatarsi: III v1p-0-1p, r1-0-0; IV p1-0-1, v1p-0-2, r1-0-1. Anterior genitalic process relatively short, heavily sclerotized, distally bifid.

MATERIAL EXAMINED: Only the holotype, taken Aug. 25, 1972 by J. Cooke, R. Mitchell, and W. Russell (AMNH PBI\_OON 1594).

DISTRIBUTION: Mexico (Tabasco).

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