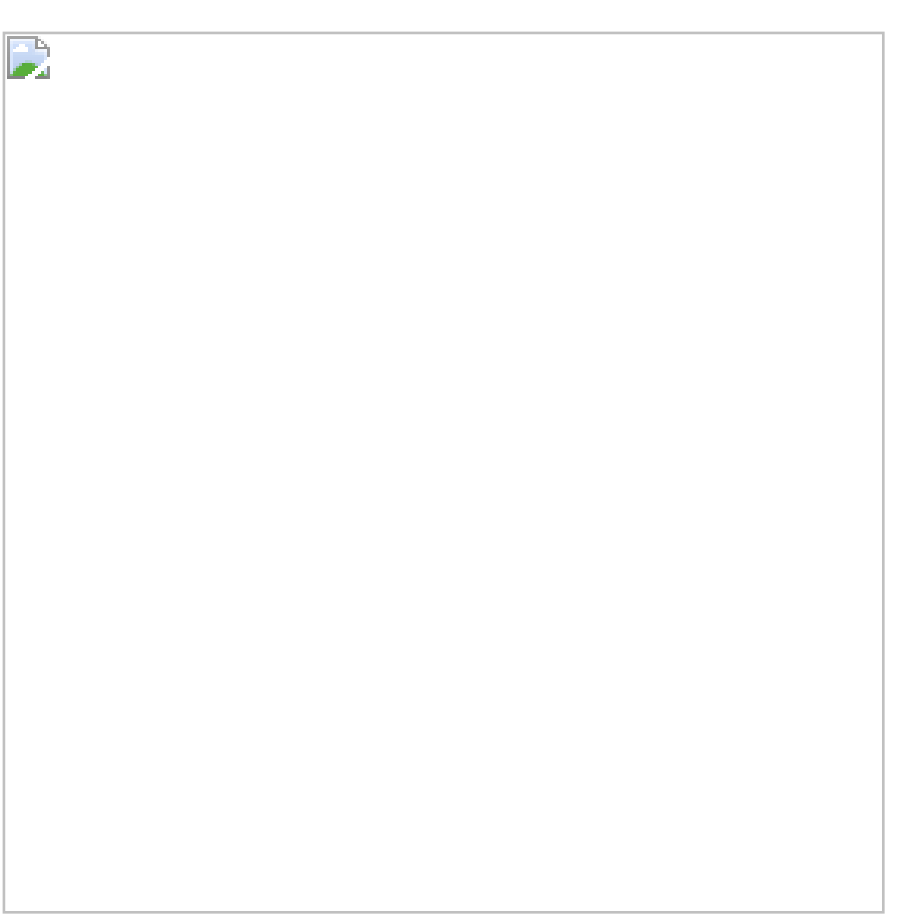

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The Goblin Spider Genus *Costarina* (Araneae, Oonopidae), Part 1

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ABSTRACT

The type species of *Costarina*, *C. plena* (O. P.-Cambridge), is redescribed, has an unusually broad distribution (extending from southern Mexico to northern Costa Rica), and is sometimes sympatric with a relatively widespread new sibling species, *C. subplena*. The same region also houses 26 additional new species with much smaller distribution ranges: *C. iviei*, *C. llama*, *C. oaxaca*, *C. mixtepec*, *C. naja*, *C. sepultura*, and *C. bochil* from southern Mexico, *C. belmopan*, *C. peten*, *C. macha*, *C. cahui*, *C. morales*, and *C. izabal* from Belize and Guatemala, *C. cortes*, *C. cofradia*, *C. cusuco*, *C. tela*, *C. ceiba*, *C. branstetteri*, *C. olancho*, *C. muralla*, *C. coma*, and *C. gracias* from Honduras, and *C. waspuk*, *C. musun*, and *C. blanco* from Nicaragua. At least 11 of these highly localized, microdistributed species have been taken in sympatry with *C. plena*. Because *C. plena* and *C. subplena* are the only members of the genus that have been collected in western and southern Guatemala, we suspect that this area represents the original range of one or both of the widespread species. However, five pairs of the microdistributed species have also been taken in sympatry with each other (and in one case together with *C. plena* as well).

INTRODUCTION

The present paper, the fourth in a series on the complex of Neotropical genera including *Dysderina* Simon (1891), begins our coverage of the speciose genus *Costarina* Platnick and Dupérré (2011a), which occurs from southern Mexico south into Colombia. Because *Costarina* includes such a large assemblage of species, almost all of which are microdistributed (i.e., have tiny distribution ranges), our coverage of the group will be divided geographically. In this

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paper, we detail those species of the genus that occur in the northern part of the genus range, from southern Mexico south through Nicaragua.

Most of the species treated below are microdistributed, but the type species of the genus, *C. plena* (O. P.-Cambridge), is an obvious exception. Although that species was originally described from southern Mexico, it occurs abundantly from Veracruz and Oaxaca, Mexico, south into at least the northern provinces of Costa Rica. Such widespread distributions are uncommon in the members of the *Dysderina* complex, except for the genus *Neoxyphinus* Birabén, which includes at least four similarly widespread species (Abrahim et al., in press).

In part of its range, from Chiapas, Mexico, to southern Guatemala, *C. plena* is sometimes sympatric with a closely related new species, described below as *C. subplena*. The two species are similar in most respects; although members of *C. subplena* have relatively small eyes, the eye size varies within *C. plena* and we have found no somatic characters that consistently differentiate these sibling species. The genitalic details that separate them are consistent, but unfortunately are detectable only by scanning electron microscopy of the male embolus or digestion and compound microscopy of the female genitalia. It is therefore possible that some specimens of *C. subplena* are misidentified as *C. plena* below; the available collections of *C. plena* are so large that we have had to use a sampling strategy to detect specimens of *C. subplena*. We have scanned the palp of at least one male, or digested the genitalia of at least one female, from each locality at which relatively small-eyed specimens have been detected.

The wide distribution of *C. plena*, and the relatively wide distribution of *C. subplena*, seem anomalous, as does the fact that *C. subplena* has been taken only at sites where *C. plena* has also been found. Interestingly, *C. plena* and *C. subplena* are the only members of the genus that have been collected, to date, in the western and southern parts of Guatemala; endemic Guatemalan species are known only from the three most northeastern departments of that country (Petén, Alta Verapaz, and Izabal). We therefore suspect that the widespread species were originally native only to southwestern Guatemala, and that some ecological or behavioral shift has allowed members of these anomalous species to colonize other areas and live sympatrically with each other and, in the case of *C. plena*, with many of their congeners as well. There are 11 cases in which *C. plena* has been taken together with one of the microdistributed species: *C. llama* in Oaxaca, Mexico; *C. naja*, *C. sepultura,* and *C. bochil* in Chiapas, Mexico; *C. morales* and *C. izabal* in Izabal, Guatemala; *C. cortes* and *C. cofradia* in Cortés, Honduras; *C. ceiba* in Atlántica, Honduras; *C. olancho* in Olancho, Honduras; and *C. blanco* in Matagalpa, Nicaragua.

However, those are not the only cases where the species treated below have been collected together. Even the microdistributed species have sometimes been taken in the same litter samples: *C. belmopan* and *C. cahui* occur together in the Parque Nacional Tikal in Petén, Guatemala; *C. peten* and *C. macha* occur together near Machaquilá in Petén, Guatemala; *C. morales* and *C. izabal* occur together at two sites in Izabal, Guatemala (although both those species are sometimes sympatric with *C. plena*, the three species have not all been found in the same sample); *C. olancho* and *C. muralla* occur together in the Parque Nacional La Muralla in Olancho, Honduras; and *C. cortes* and *C. cofradia* occur together in the Parque Nacional Cusuco in Cortés, Honduras (and in this case, both of those species and *C. plena* have been found in the same litter sample).

Males of some of the species treated below show remarkable modifications of the endites (see, for example, figs. 259–261), and there may be a correlation between those modifications and the structure of the sternum. Most males have a continuous, transverse groove that occupies the anterior edge of the sternum (fig. 6), as do all the females, but in those males with pronounced endite modifications, the sternal groove is typically interrupted at the midline (figs. 208, 261), rather than continuous.

Our methods follow those of Platnick and Dupérré (2009a, 2009b); only differences from the males (beyond the obvious lack of male endite modifications) are mentioned in the descriptions of females. The species are treated geographically, beginning in Mexico and proceeding southward; separate keys are provided to the species of Mexico, Belize plus Guatemala, Honduras, and Nicaragua. Scans were taken from uncoated right male palps, and the images were flipped for consistency. All measurements are in mm. High-resolution versions of the images, many additional images of the two widespread species, the geocoded locality data, and a distribution map for each species will be available on the goblin spider Planetary Biodiversity Inventory (PBI) project's website (http://research.amnh.org/oonopidae).

COLLECTIONS EXAMINED

AMNH	American Museum of Natural History, New York, NY
BMNH	Natural History Museum, London, England
CAS	California Academy of Sciences, San Francisco, CA
CNC	Canadian National Collection, Ottawa, Ontario, Canada
FMNH	Field Museum of Natural History, Chicago, IL
INBIO	Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, MA
REL	Robin Leech collection, Edmonton, Alberta, Canada
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC

Costarina Platnick and Dupérré

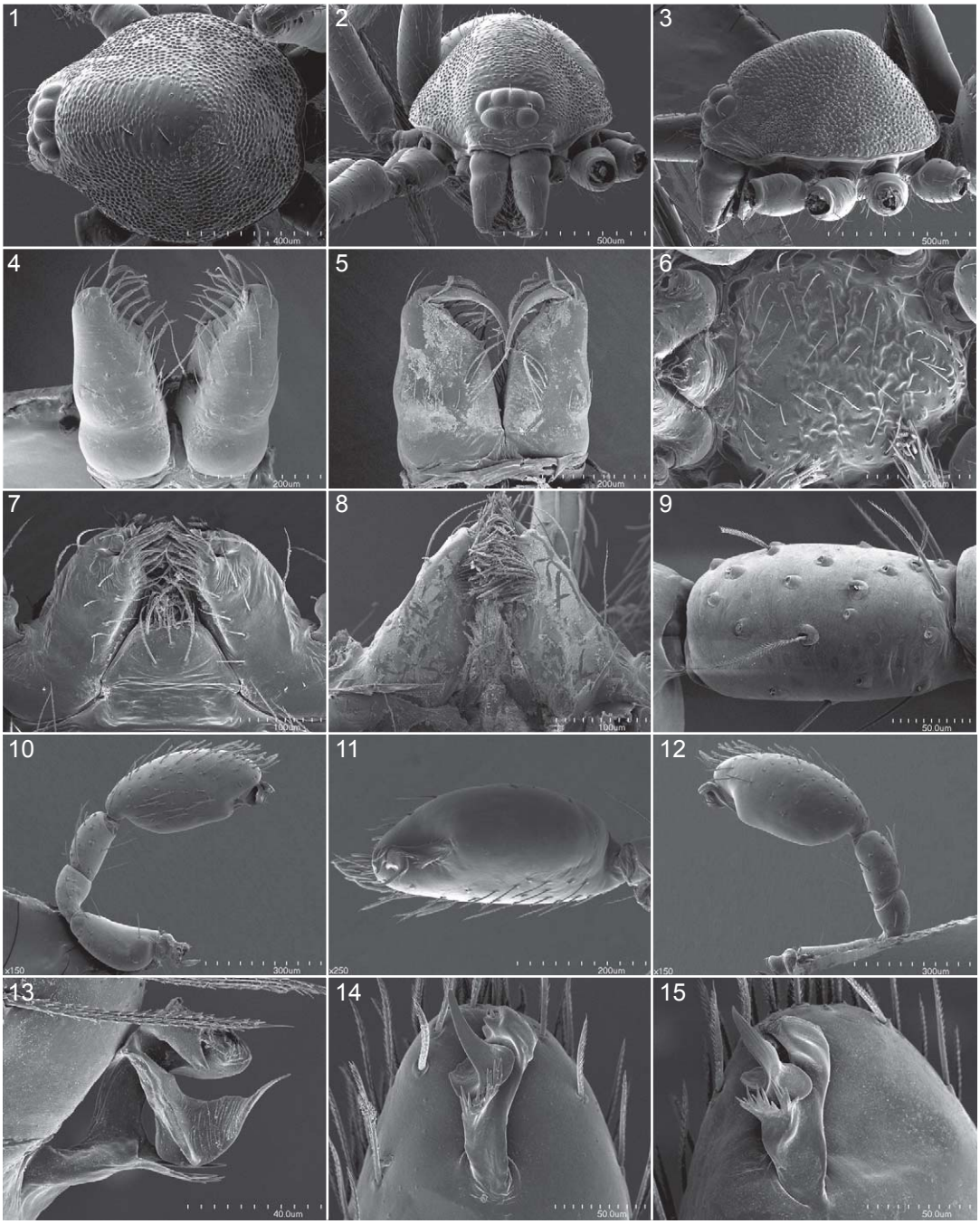
Costarina Platnick and Dupérré, 2011a: 50 (type species by original designation *Dysderina plena* O. P.-Cambridge, 1894).

Diagnosis: Members of this genus resemble those of *Dysderina* and *Simonoonops* Harvey (2002) in having three transverse ridges on the sternum (figs. 163, 193), but differ in lacking grooves connecting either the anterior or posterior pairs of spiracles (fig. 44; cf. Platnick and Dupérré, 2011a: fig. 5, for *Dysderina*, and Platnick and Dupérré, 2011b: figs. 13, 41, for *Simonoonops*).

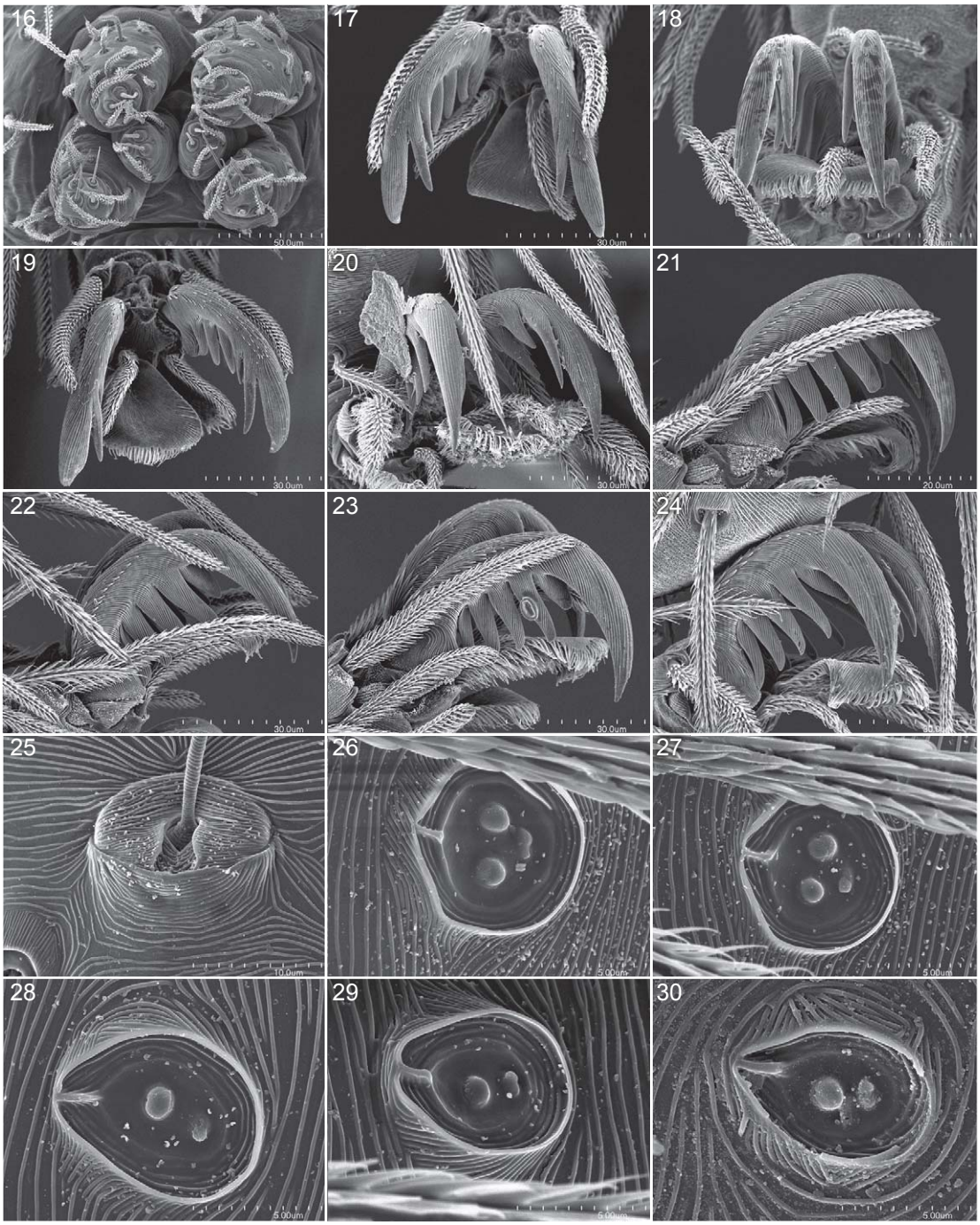
Description: Total length of males 1.6–2.2, of females 1.7–2.8. Carapace, sternum, mouthparts, abdominal scuta typically orange-brown, without pattern; abdomen soft portions white, without pattern; legs pale orange, without pattern. **Cephalothorax:** Carapace ovoid in dorsal view, anteriorly narrowed to 0.49 times its maximum width or less, pars cephalica strongly elevated in

lateral view (figs. 3, 33), anterolateral corners with slightly sclerotized triangular projections, pars thoracica 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 with low tubercles, producing strongly reticulate appearance under light microscopy, except on posterior U-shaped smooth area (fig. 1, except in *C. blanco*), females usually with much smaller smooth areas (fig. 31, exceptions noted in species descriptions), sides granulate; fovea absent, lateral margin straight, rebordered, without denticles; plumose setae near posterior margin of pars thoracica absent; marginal, nonmarginal pars cephalica, pars thoracica setae light, needlelike, scattered. Clypeus margin strongly rebordered, sinuous in front view (figs. 2, 32), vertical in lateral view, high, ALE separated from edge of carapace by their radius or more, median projection absent (except for fused chilum); setae light, needlelike. Chilum undivided, small, triangular, fused to clypeus, seam present. Eyes six, well developed, ALE largest, oval, PME squared, PLE oval; posterior eye row recurved from above, procurved from front; ALE separated by slightly less to slightly more than their radius, ALE-PLE separated by less than ALE radius, PME touching throughout most of their length, PLE-PME separated by less than PME radius. Sternum wider than long, not fused to carapace, surface smooth except for three transverse ridges connected by anastomosing longitudinal ridges, median concavity and hair tufts absent, with radial furrows between coxae I–II, II–III, III–IV, furrow smooth, radial furrow opposite coxae III absent, surface without pits, sickle-shaped structures absent, anterior margin with deep transverse groove (figs. 6, 43), sometime interrupted at middle (especially in species with greatly extended processes on male endites), posterior margin extending posteriorly beyond anterior edges of coxae IV as single extension, but without posterior hump, anterior corner unmodified, lateral margin with infracoxal grooves bearing anterior, posterior openings, distance between coxae approximately equal, extensions of precoxal triangles absent, lateral margins with bridges to coxae; setae sparse, dark, needlelike, densest laterally, originating from surface. Chelicerae slightly divergent, anterior face with swelling (fig. 4); promargin usually with one tooth (fig. 35), retromargin usually without teeth in males, with one tooth in females; fangs without toothlike projections, directed medially, shape normal, without prominent basal process, tip unmodified (figs. 5, 36); setae light, needlelike, densest medially; paturon inner margin with pairs of enlarged setae, distal region, posterior surface unmodified, promargin with row of flattened setae (fig. 34), inner margin unmodified, laminate groove absent. Labium triangular, not fused to sternum, anterior portion set at sharp angle to flattened posterior portion, anterior margin not indented at middle, same as sternum in sclerotization; with six or more setae on anterior margin, subdistal portion with unmodified setae (figs. 7, 37). Endites same as sternum in sclerotization, those of males distally excavated between ventral, dorsal anterior processes, posterior part unmodified, serrula apparently reduced to single tooth situated near base of medially directed setae (figs. 8, 38), females with ridged lobe near tip of endite (figs. 38, 39). Female palp without claw or spines (figs. 40, 41), tibia with three trichobothria (fig. 42), patella without prolateral row of ridges, tarsus elongate. **Abdomen:** ovoid, without long posterior extension, rounded posteriorly, interscutal membrane without rows of small sclerotized platelets. Booklung covers large, ovoid, with-

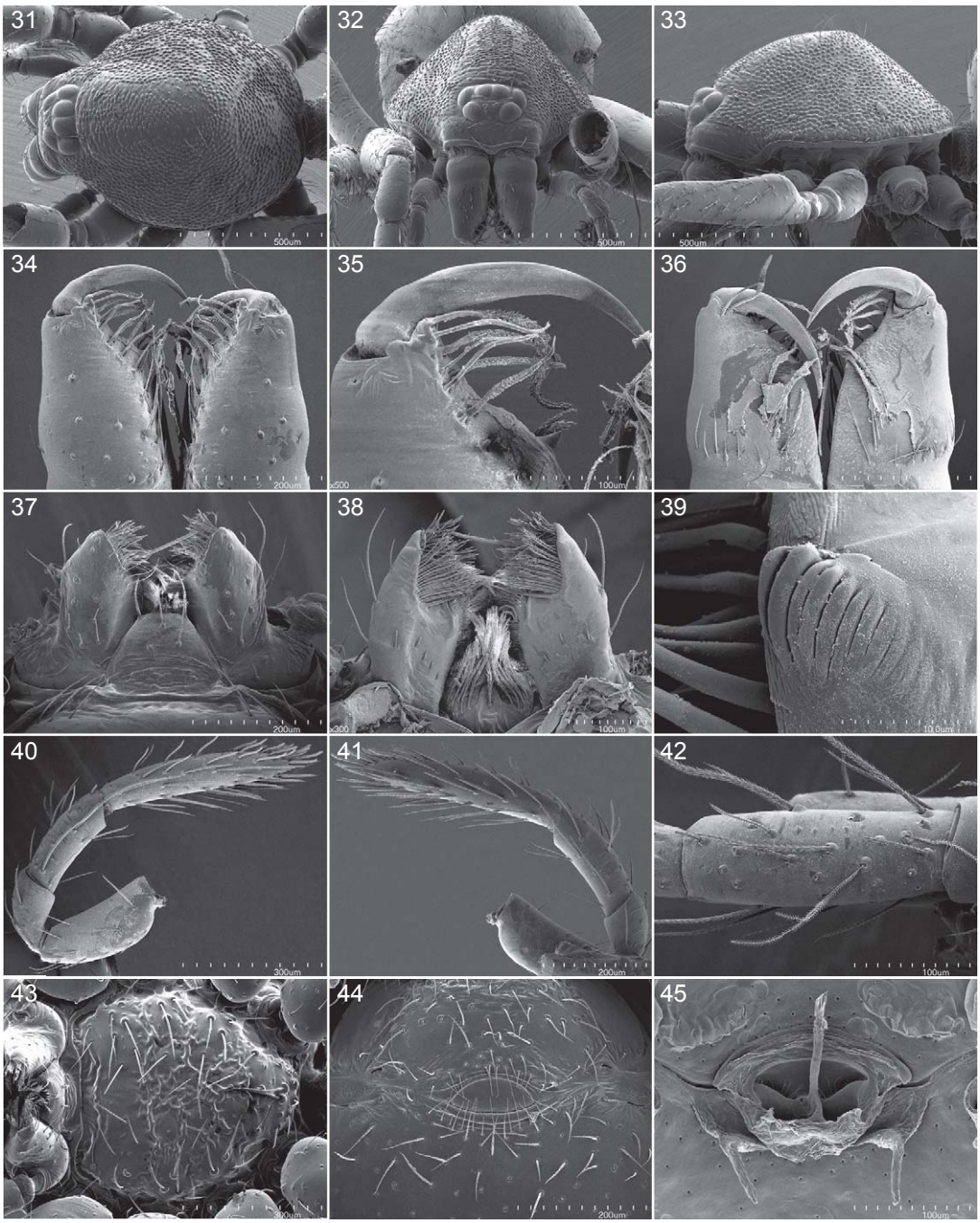
out setae, anterolateral edge unmodified; anterior, posterior spiracles not connected by groove (fig. 44). Pedicel tube medium, ribbed, scutopedicel region unmodified, scutum extending far dorsal of pedicel, plumose hairs, matted setae on anterior ventral abdomen in pedicel area, cuticular outgrowths near pedicel absent. Dorsal scutum strongly sclerotized, usually covering full length of abdomen in males, shorter in females, from above, no soft tissue visible at sides in males, some in females, not fused to epigastric scutum, middle surface, sides smooth, anterior half without projecting denticles. Epigastric scutum strongly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent, without lateral joints in females. Postepigastric scutum strongly sclerotized, in males long, semicircular, fused to epigastric scutum, in females shorter, not fused to epigastric scutum, anterior margin unmodified, with short posteriorly directed lateral apodemes. Spinneret scutum present, incomplete ring, with fringe of long setae; supraanal scutum absent. Abdominal setae light, needlelike, epigastric area setae not basally thickened; dense patch of setae anterior to spinnerets absent, interscutal membrane with setae. Colulus present, tiny, with pair of setae (fig. 46). Anterior lateral spinnerets bisegmented, posterior median unisegmented, posterior laterals bisegmented; spigots scanned only in *C. plena*, anterior laterals with singe major ampullate gland spigot and three piriform gland spigots in males (fig. 16), four in females (fig. 47), posterior medians with four spigots in males (two with convex bases, presumably minor ampullate gland spigots, one with concave base, presumably aciniform gland spigot, fig. 16), with seven spigots in females (two with convex bases, five with concave bases, fig. 48), posterior laterals with four spigots in males (two with convex bases, two with concave bases, fig. 16), eight spigots in females (two with convex bases, six with concave bases, fig. 49). **Legs:** Femur IV not thickened, same size as femora I–III, patella plus tibia I shorter than carapace, tibia I unmodified, tibia IV specialized hairs on ventral apex, ventral scopula absent, metatarsi I, II mesoapical comb absent, metatarsi III, IV weak ventral scopula absent. Leg spines present on anterior femora, tibiae, metatarsi, femoral spines strong, tibial and metatarsal spines long (fig. 50), absent on posterior legs (fig. 51). Tarsi without inferior claw. Superior claws (scanned only in *C. plena*) with two rows of teeth, most distal tooth of internal row much longer than others, most distal tooth of outer row much shorter than others (figs. 17–24, 52–55). Trichobothrial base with numerous parallel ridges (fig. 25). Tarsal organ with three receptors on legs I, II (figs. 26, 27, 56, 57), two on legs III, IV, palp (figs. 28–30, 58–60). **Genitalia:** Male epigastric region with sperm pore small, oval, situated between anterior, posterior spiracles, rebordered; furrow without Ω-shaped insertions, without specialized setae. Male palp of normal size, not strongly sclerotized, right, left palps symmetrical, proximal segments pale orange, cymbium, bulb yellow, embolus dark, without prolateral excavation; 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 (fig. 9); cymbium ovoid in dorsal view, completely fused with bulb (figs. 10–12), no seam visible, not extending beyond distal tip of bulb, plumose, stout setae absent, without distal patch of setae; bulb 1–1.5 times as long as cymbium, stout, elongated. Embolus distinctly divided into proximal and distal prongs (figs. 13–15), usually accompanied by tiny basal spur bearing sharp projec-



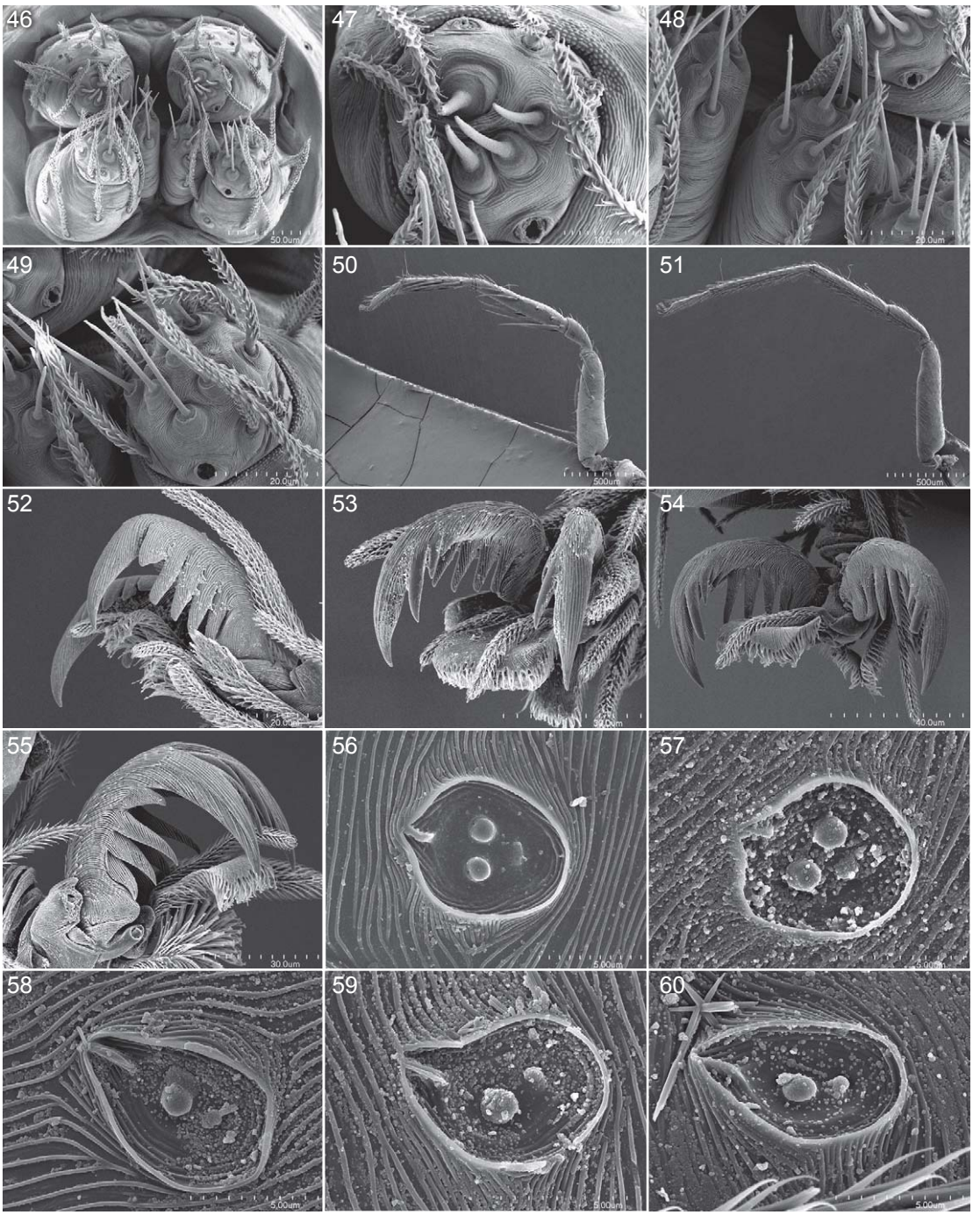
FIGS. 1–15. *Costarina plena* (O. P.-Cambridge), male. **1.** Carapace, dorsal view. **2.** Same, anterior view. **3.** Same, lateral view. **4.** Chelicerae, anterior view. **5.** Same, posterior view. **6.** Sternum, ventral view. **7.** Labium and endites, ventral view. **8.** Labrum and endites, dorsal view. **9.** Palpal tibia, dorsal view. **10.** Left palp, prolateral view. **11.** Same, ventral view. **12.** Same, retrolateral view. **13.** Left embolus, prolateral view. **14.** Same, ventral view, PBI_OON 716 from Chiapas, Mexico. **15.** Same, PBI_OON 746 from Zacapa, Guatemala.



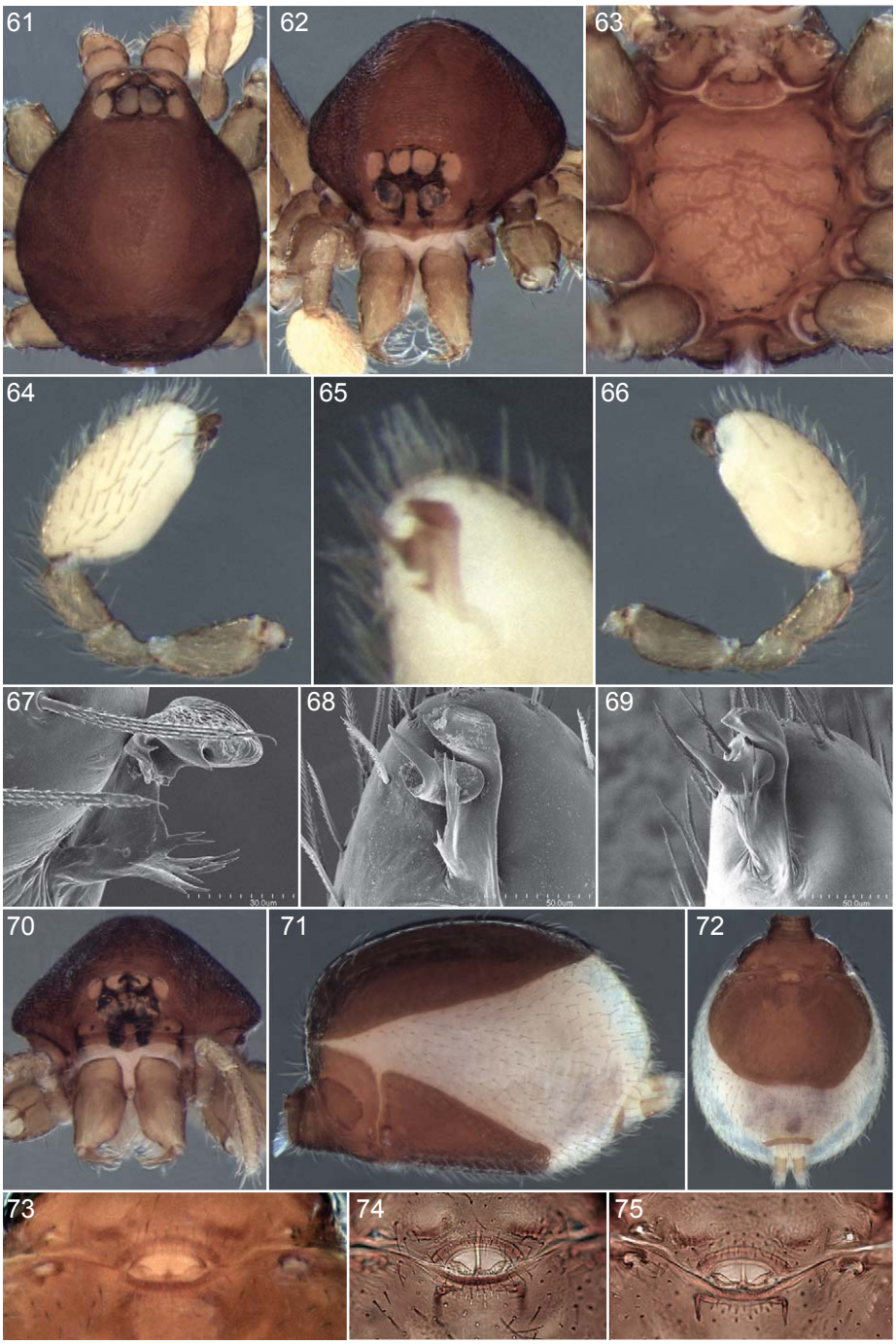
FIGS. 16–30. *Costarina plena* (O. P.-Cambridge), male. **16.** Spinnerets, apical view. **17.** Claws of leg I, apical view. **18.** Same, leg II. **19.** Same, leg III. **20.** Same, leg IV. **21.** Claws of leg I, lateral view. **22.** Same, leg II. **23.** Same, leg III. **24.** Same, leg IV. **25.** Trichobothrial base from metatarsus I, dorsal view. **26.** Tarsal organ from leg I, dorsal view. **27.** Same, leg II. **28.** Same, leg III. **29.** Same, leg IV. **30.** Same, palp.



FIGS. 31–45. *Costarina plena* (O. P.-Cambridge), female. **31.** Carapace, dorsal view. **32.** Same, anterior view. **33.** Same, lateral view. **34.** Chelicerae, anterior view. **35.** Fang, anterior view. **36.** Chelicerae, posterior view. **37.** Labium and endites, ventral view. **38.** Labrum and endites, dorsal view. **39.** Same, detail of ridges near tip. **40.** Palp, prolateral view. **41.** Same, retrolateral view. **42.** Palpal tibia, dorsal view. **43.** Sternum, ventral view. **44.** Epigastric area, ventral view. **45.** Genitalia, dorsal view.



FIGS. 46–60. *Costarina plena* (O. P.-Cambridge), female. **46.** Spinnerets, apical view. **47.** Anterior lateral spinneret, same. **48.** Posterior median spinnerets, same. **49.** Posterior lateral spinneret, same. **50.** Leg I, lateral view. **51.** Leg IV, same. **52.** Claws of leg I, lateral view. **53.** Claws of leg II, apical view. **54.** Leg III, same. **55.** Claws of leg IV, lateral view. **56.** Tarsal organ from leg I, dorsal view. **57.** Same, leg II. **58.** Same, leg III. **59.** Same, leg IV. **60.** Same, palp.



FIGS. 61–75. *Costarina plena* (O. P.-Cambridge), male (61–69) and female (70–75). **61.** Carapace, dorsal view. **62, 70.** Same, anterior view. **63.** Sternum, ventral view. **64.** Left palp, prolateral view. **65.** Same, ventral view. **66.** Same, retrolateral view. **67.** Damaged left embolus, prolateral view, proximal prong missing. **68, 69.** Left embolus, ventral view. **71.** Abdomen, lateral view. **72.** Same, ventral view. **73, 74.** Genitalia, ventral view. **75.** Same, dorsal view.

tions (usually visible only under scanning electron microscopy), but spur apparently absent in *C. belmopan*, *C. coma*, and *C. musun*. Female genitalia with conspicuous genital atrium (fig. 44); anterior genitalic process long (fig. 45); posterior apodemes usually conspicuous, directed posteriorly, but apparently directed anteriorly in *C. cahui*. *C. izabal*, and *C. coma*.

Distribution: Southern Mexico south into Colombia.

Key to Species from Mexico

1. Males.....2
– Females (those of *C. iviei* unknown).....10
2. Proximal and distal prongs of embolus relatively long, narrow (figs. 81, 90, 105, 150).....3
– Embolus otherwise.....6
3. Both prongs of embolus sinuous (figs. 81, 83).....*iviei*
– Proximal prong of embolus straight.....4
4. Proximal and distal prongs of embolus approximate at base (fig. 92).....*llama*
– Proximal and distal prongs of embolus widely separated at base (figs. 107, 152).....5
5. Distal prong of embolus wide at base (figs. 150, 152).....*naja*
– Distal prong of embolus narrow at base (figs. 105, 107).....*oaxaca*
6. Distal prong of embolus relatively short (figs. 15, 135).....7
– Distal prong of embolus relatively long (figs. 120, 165, 180).....8
7. Proximal prong of embolus convex at base (figs. 14, 15, 68, 69).....*plena*
– Proximal prong of embolus concave at base (figs. 135, 137).....*subplena*
8. Proximal prong of embolus relatively narrow (fig. 180).....*bochil*
– Proximal prong of embolus relatively wide (figs. 120, 165).....9
9. Proximal prong of embolus abruptly narrowed distally (fig. 120).....*mixtepec*
– Proximal prong of embolus gradually narrowed distally (fig. 165).....*sepultura*
10. Anterior genitalic process greatly widened anteriorly (figs. 128, 129).....*mixtepec*
– Anterior genitalic process not greatly widened at tip.....11
11. Genitalic apodemes relatively long (figs. 75, 99, 174).....12
– Genitalic apodemes relatively short (figs. 114, 144, 159, 189).....14
12. Posterior margin of genital atrium W-shaped, anterior genitalic process sinuous (figs. 98, 99).....*llama*
– Posterior margin of genital atrium otherwise, anterior genitalic process straight.....13
13. Lateral sclerotizations of genital atrium relatively small (figs. 74, 75).....*plena*
– Lateral sclerotizations of genital atrium relatively large (figs. 173, 174).....*sepultura*
14. Genital atrium relatively long, narrow (figs. 114, 144).....15
– Genital atrium relatively short, wide (figs. 159, 189).....16
15. Lateral sclerotizations of genital atrium relatively small (figs. 143, 144).....*subplena*
– Lateral sclerotizations of genital atrium relatively large (figs. 113, 114).....*oaxaca*
16. Lateral sclerotizations of genital atrium larger medially than laterally (figs. 188, 189)..*bochil*
– Lateral sclerotizations of genital atrium larger laterally than medially (figs. 158, 159)..*naja*

Costarina plena (O. P.-Cambridge)
Figures 1–75

Dysderina plena O. P.-Cambridge, 1894: 143, pl. 17, figs. 7, 7a–d (female holotype from Teapa, Tabasco, Mexico, in BMNH; examined), 1896: 192, pl. 24, figs. 4, 4a–e (male). – F.O. P.-Cambridge, 1899: 44, pl. 3, fig. 5, 5a (female). – Chickering, 1968: 23, figs. 46–49 (male, female).
Costarina plena: Platnick and Dupérré, 2011a: 50.

Note: In the original description, which included only the female, the type locality was cited only as Mexico, but it was specified as Teapa when O. P.-Cambridge (1896) described the male as well.

Diagnosis: This species closely resembles *C. subplena,* but males have the anterior margin of the proximal prong of the embolus convex rather than concave (figs. 14, 15, 68, 69) and females have the anterior genitalic process set on a much longer, transverse, posteriorly W-shaped base, as well as a thicker anterior margin on the genital atrium (figs. 73–75).

Male (PBI_OON 1419, figs. 1–30, 61–69): Total length 1.78. ALE separated by less than their radius. Sternum anterior margin with continuous transverse groove. Endites with ventral process narrow, sharply pointed, dorsal process wider. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-1-0; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with distal prong short, tip directed ventrally, proximal prong with convexly curved base and long projection.

Female (PBI_OON 1419, figs. 31–60, 70–75): Total length 2.11. Dorsal scutum covering more than 3/4 of abdomen length, more than 1/2 to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora: I p0-1-1, r1-1-1; II p0-0-1, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium oval, with rounded lateral margins, posterior margin with short median sclerotization extending forward less than one-fourth of atrium length.

Variation: As would be expected of such an anomalously widespread and abundant species, there is some variation in genitalic details (see figs. 14, 15, 68, 69). Most obviously, some males have emboli that at first glance look notably simpler. However, scanning electron microscopy suggests that these palps have simply lost the proximal embolar prong, possibly during copulation (fig. 67), and other males have been found which have a normal palp on one side and a damaged one on the other side.

Material Examined: **Mexico:** *Campeche:* Chicanna, 10 km W Xpujil, July 13, 1983, Berlese, mixed tropical forest litter, elev. 300 m (S., J. Peck, AMNH PBI_OON 27510), 1♂. *Chiapas:* Bazóm, 16°44′19″N, 92°29′18.3″W, July 9, 2003, oak forest litter, elev. 2450 m (R. Anderson, AMNH PBI_OON 695, 46508), 1♂, 3♀, 16.7443°N, 92.49279°W, May 31, 2008, wet oak-magnolia forest litter, elev. 2460 m (R. Anderson, MCZ 80157, PBI_OON 38085), 1♀; Benito Juárez, 15°22′01″N, 92°19′07″W, July 28, 2005, oak-pine forest litter, elev. 2050 m (R. Anderson, AMNH PBI_OON 691), 3♂; 5.9 km E Bochil, Sept. 19, 1991, riparian mesophyllic forest litter, elev. 1500 m (R. Anderson, AMNH PBI_OON 711), 1♂, 1♀, Sept. 15, 1992, riparian mesophyllic forest litter, elev. 1300 m (R. Anderson, AMNH PBI_OON 710), 1♂; 15.1 km NW Bochil, Sept. 24, 1992, pine/oak/liquidambar litter, elev. 1930 m (R. Anderson, AMNH PBI_OON 712), 3♂, 1♀; 17.3 km NW Bochil, Sept. 24, 1992, rotten treehouse litter, elev. 1800 m (R. Anderson,

AMNH PBI_OON 713), 21♂, 4♀; Cerro de Tapalapa, 17.18786°N, 93.12308°W, May 28, 2008, cloud forest litter, elev. 2260 m (R. Anderson, MCZ 80145, PBI_OON 38105), 1♂, 17.19159°N, 93.11772°W, May 27, 2008, oak-pine forest litter, elev. 2240 m (R. Anderson, MCZ 80274, PBI_OON 38104), 3♂; Cerro El Calvario, near Tapalapa, 17°10′28.5″N, 93°07′52.2″W, July 25, 2003, oak-pine forest litter, elev. 2000 m (R. Anderson, AMNH PBI_OON 692), 1♀; Cerro El Calvario, near Tapalapa, 17°11′11.9″N, 93°07′21″W, July 23, 2003, wet cloud forest litter, elev. 2200 m (R. Anderson, AMNH PBI_OON 694), 8♂, 8♀; Cerro Huitepec, ca. 5 km W San Cristóbal, Sept. 14, 1992, wet oak forest litter, elev. 2700 m (R. Anderson, AMNH PBI_OON 680), 2♂, 3♀; Cerro Huitepec (Pico), ca. 5 km W San Cristóbal, Sept. 18, 1991, cloud forest litter, elev. 2750 m (R. Anderson, AMNH PBI_OON 715), 6♂, 4♀; Cerros de Chalchihuitán, 16°59′20.8″N, 92°37′13.0″W, July 24, 2003, wet cloud forest litter, elev. 2050 m (R. Anderson, AMNH PBI_OON 688), 1♂, 1♀; 5 km NE Coapilla, 17.17565°N, 93.13221°W, May 25, 2008, leaf litter, secondary mesophyll forest, elev. 1990 m (MCZ PBI_OON 38097), 2♂, 4♀; 5 km NNW Coapilla, 17.18273°N, 93.15168°W, May 25, 2008, leaf litter, secondary mesophyll forest, elev. 1915 m (MCZ 79902, PBI_OON 38123), 2♂, 5♀; Cruz Quemada, near Amatenango, July 24, 1950 (C., M. Goodnight, AMNH PBI_OON 1090), 1♂ (teneral); Cueva del Tempisque, 8 mi W Ocozocoautla, Aug. 17, 1967 (J. Reddell, T. Evans, AMNH PBI_OON 37908), 1♂; 2 km SE Custepec, 15.72077°N, 92.95081°W, May 17, 2008, mesophyll forest litter, elev. 1520 m (MCZ PBI_OON 38099, 46499), 8♂, 10♀; 3 km SE Custepec, 15.71566°N, 92.93817°W, May 17, 2008, secondary mesophyll forest litter, elev. 1700 m (MCZ 79793, PBI_OON 38087), 2♂, 2♀; 4 km SE Custepec, 15.70673°N, 92.93127°W, May 20, 2008, cloud forest litter, elev. 2125 m (MCZ 80392, PBI_OON 38084), 1♂, 5♀; 15.71018°N, 92.92887°W, May 20, 2008, cloud forest litter, elev. 2140 m (MCZ 79893, PBI_OON 38086), 2♂, 1♀; 6.6 mi W El Bosque, Aug. 29, 1973, Berlese, litter, cloud forest with pines, elev. 4800 ft (A. Newton, FMNH 44466, PBI_OON 10700, 46498), 2♂; 10 km W El Bosque, Sept. 15, 1992, pine cloud forest litter, elev. 1475 m (R. Anderson, AMNH PBI_OON 716, 719), 13♂, 4♀; El Real, July 1, 1950 (C., M. Goodnight, AMNH PBI_OON 37883), 1♀, July 3, 1950 (C., M. Goodnight, AMNH PBI_OON 37888), 1♀, July 3, 1950, on hill (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37890), 1♂, July 6–7, 1950 (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37889, 37891), 3♀; Finca Cuauhtemoc, near Cacahoatán, Aug. 12, 1950 (C., M. Goodnight, AMNH PBI_OON 37886), 1♂ (teneral, possibly misidentified); Huitepec, San Cristóbal, 16.75070°N, 92.68270°W, cloud forest leaf litter, elev. 2480 m (MCZ 79766, PBI_OON 38122), 5♂; Lago Metzabok, 17.12659°N, 91.63035°W, 2007, lowland wet forest litter, elev. 570 m (MCZ 80393, PBI_OON 38082), 1♂, 1♀; Lagos de Montebello, Cinco Lagos, Sept. 22, 1992, oak pine forest litter, elev. 1500 m (R. Anderson, AMNH PBI_OON 686), 4♂; Laguna Montebello, Aug. 14–17, 1969, carrion trap, tropical montane forest, elev. 4500 ft (S., J. Peck, AMNH PBI_OON 721), 1♀; 2.8 km NW Las Piedracitas, Sept. 20, 1991, oak-pine forest litter, elev. 2400 m (R. Anderson, AMNH PBI_OON 722), 1♂; 13.7 km NW Metzabok, 17.19051667°N, 91.73748333°W, 2007, Winkler, leaf litter, wet forest fragment, elev. 540 m (J. Longino, MCZ 81373, PBI_OON 36967), 2♂; Monte Libano, 20 km E El Real, July 4–5, 1950 (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37884), 1♀; 7.4 km SSW Motozintla, Sept. 21, 1992, cut over cloud forest litter, elev. 2000 m (R. Anderson, AMNH PBI_OON 37907), 1♀; Municipio Coapilla, 1.8 km NE junction roads Tapalapa/Ocotepec, 17.17314°N, 93.14607°W, May 26, 2008, oak forest litter, elev. 1810 m (R. Anderson, MCZ 80297, PBI_OON 38120), 1♀, 2.0 km NE junction roads Tapalapa/Ocotepec, 17.17536°N, 93.14939°W, May 26, 2008, oak-pine forest litter, elev. 1775 m (R. Anderson, MCZ 80179, PBI_OON 26340), 1♂, 2♀, 2.5 km NW junction roads Tapalapa/Ocotepec, 17.17602°N, 93.13293°W, May 26, 2008, dry oak forest litter, elev. 1960 m (MCZ PBI_OON 38098), 1♀, 4.5 km NW junction roads Tapalapa/Ocotepec, 17.18263°N, 93.11807°W, May 27, 2008, shrubby cloud forest litter, elev. 2180 m (MCZ 80275, PBI_OON 38093), 1♂; Naja, 16.96291°N, 91.59335°W, June 10, 2008, mesophyll forest litter, elev. 950 m (MCZ 80132, PBI_OON 38118), 2♂, 1♀,16.96385°N, 91.59313°W, June 8, 2008, mesophyll forest litter, elev. 985 m (MCZ 79634, PBI_OON 38088), 2♂, 16.97416667°N, 91.58991667°W, July 14, 2007, montane wet forest litter, elev. 950 m (MCZ 79060, PBI_OON 38100), 1♂; 6 km SW Ocosingo, Sept. 16, 1992, wet

oak-pine forest litter, elev. 1400 m (R. Anderson, AMNH PBI_OON 717, 718), 5♂, 1♀; 6.3 km SW Ocosingo, July 29, 1983, oak-pine forest litter, elev. 1070 m (S., J. Peck, R. Anderson, AMNH PBI_OON 176), 1♀; 12.5 km NW Ocosingo, Sept. 16, 1992, oak-pine forest litter (R. Anderson, AMNH PBI_OON 720), 1♂; Palenque ruins, July 18, 1949 (C. Goodnight, AMNH PBI_OON 37911), 1♀, Mar. 28, 1974, litter (C. Alteri, AMNH PBI_OON 37905), 2♂ (1 with damaged right palp), Jan. 1984, dense jungle (B., V. Roth, CAS 26314, PBI_OON 2746), 1♂; Parque Laguna Belgica, 16 km NW Ocozocoautla, June 14, 1990, flight intercept trap (H. Howden, AMNH PBI_OON 27511), 1♂; Parque Nacional Lagunas de Montebello, Grutas de San Rafael, 16°07.993′N, 91°43.752′W, July 24, 2005, valley bottom forest litter, elev. 1500 m (R. Anderson, AMNH PBI_OON 689), 2♂, 2♀; Pichucalco, July 18, 1947 (C., M. Goodnight, AMNH PBI_OON 175), 1♀; Pico El Triunfo, Reserva El Triunfo, 15°40.16′N, 92°48.70′W, Nov. 16–21, 2001, cloud forest litter, elev. 2300 m (R. Anderson, AMNH PBI_OON 696), 10♂, 1♀; Playón de La Gloria, 16.14774°N, 90.89548°W, June 24, 2008, secondary wet forest litter, elev. 170 m (MCZ 79889, PBI_OON 38090), 3♂; 8.9 km E Rayón, Sept. 19, 1991, cloud forest litter, elev. 1500 m (R. Anderson, AMNH PBI_OON 723, 46501), 7♂, 2♀; Reserva El Triunfo, 15°39.428′N, 92°48.537′W, Nov. 16–21, 2001, oak forest litter, elev. 2050 m (R. Anderson, AMNH PBI_OON 697), 3♂, 2♀, 15.72141°N, 92.93936°W, May 17, 2008, oak-pine forest litter, elev. 1860 m (R. Anderson, MCZ 80277, PBI_OON 38110, 46482), 1♂, 1♀, May 18, 2008, mixed oak forest litter, elev. 1849 m (R. Anderson, MCZ 80271, PBI_OON 38112), 1♀, 15.72170°N, 92.94044°W, May 17, 2008, shrubby hardwood forest litter, elev. 1860 m (MCZ 80272, PBI_OON 38091), 1♀, 15.72173°N, 92.94059°W, May 20, 2008, mixed oak forest litter, elev. 1850 m (MCZ 80276, PBI_OON 38113), 3♀, 15.72188°N, 92.93677°W, May 19, 2008, oak-pine forest litter, elev. 1600 m (R. Anderson, MCZ 80105, PBI_OON 40134), 1♂, 1♀; 15.72193°N, 92.94122°W, May 20, 2008, oak forest litter, elev. 1850 m (MCZ 80315, PBI_OON 38114, 46496), 1♂, 1♀, 15.72216°N, 92.94298°W, 2008, oak forest litter, elev. 1820 m (R. Anderson, MCZ 80053, PBI_OON 38111), 1♀; Reserva Huitepec, San Cristóbal de las Casas, July 11, 2003, cloud forest litter, elev. 2450 m (R. Anderson, AMNH PBI_OON 46510), 1♂, 16°45′N, 92°41′W, July 9, 2007, elev. 2600 m (M. Branstetter, MCZ 79197, PBI_OON 38095), 2♂, 16°45.09′N, 92°40.96′W, Nov. 13, 2001, lower cloud forest litter, elev. 250 m (R. Anderson, AMNH PBI_OON 682, 46509), 4♂, 8♀, Nov. 22, 2001, cloud forest floor, elev. 2800 m (R. Anderson, AMNH PBI_OON 679), 2♂, 2♀, 16°45.84′N, 92°40.70′W, Nov. 13, 2001, oak forest litter, elev. 2220 m (R. Anderson, AMNH PBI_OON 684), 1♀, July 7, 2003, oak forest litter, elev. 2200 m (R. Anderson, AMNH PBI_OON 690), 2♂, July 11, 2003, cloud forest litter, elev. 2450 m (R. Anderson, AMNH PBI_OON 687), 4♂, 7♀, July 15, 2005, mixed oak forest litter, elev. 2300 m (R. Anderson, AMNH PBI_OON 693), 1♀, 16.74476667°N, 92.68853333°W, July 11, 2007, Winkler, leaf litter under pines, cloud forest edge, elev. 2600 m (J. Longino, MCZ 79055, 79058, PBI_OON 38096, 38121, 1♂, 1♀; 8 km SE Salto de Agua, 17.51592°N, 92.30231°W, June 14, 2008, leaf litter, secondary wet forest, elev. 100 m (MCZ 82070, PBI_OON 36964), 1♂; San Cristóbal, July 11, 1950 (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37885), 1♂, July 12, 1950 (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37881), 1♀, July 14, 1950 (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37882, 37887), 2♂, July 21, 1950 (C., M. Goodnight, L. Stannard, AMNH PBI_OON 37910), 1♀; 4 mi SE San Cristóbal, 16°42′N, 92°36′W, Aug. 23, 1966 (J., W. Ivie, AMNH PBI_OON 1362, 37906, 46507), 3♂, 5♀, same, Aug. 25, 1966 (PBI_OON 37903), 2♂, 2♀; 5 km W San Cristóbal, Aug. 13–16, 1969, carrion traps, pine-oak forest, elev. 8000 ft (S., J. Peck, AMNH PBI_OON 37898), 2♀; 5 mi W San Cristóbal, 16°45′N, 92°41′W, Aug. 24, 1966, pine-oak forest (J., W. Ivie, AMNH PBI_OON 37897), 1♀; 7 km WSW San Cristóbal, 16°43′N, 92°42′W, July 9, 2007, elev. 2550 m (M. Branstetter, MCZ 79196, PBI_OON 38094), 2♂, 1♀; 15 km E San Cristóbal, 16.74683°N, 92.49008°W, May 29, 2008 (MCZ 79690, PBI_OON 38115, 1♀, 16.74689°N, 92.48985°W, May 29, 2008 (MCZ 80050, PBI_OON 38116), 1♀; San Cristóbal de las Casas, July 22, 1947 (C., M. Goodnight, AMNH PBI_OON 37900), 1♂; Sierra Morena, 16.15342°N, 93.60078°W, May 12, 2008, secondary mesophyll forest litter, elev. 1330 m (MCZ 80376, PBI_OON 38092), 1♂, 2♀; Tenejapa, July 22, 1950 (C. Goodnight, AMNH PBI_OON 37878), 1♂, 1♀; Volcán Tacaná, lower slopes, ca. 4 km N

Unión Juárez, Sept. 18, 1992, cloud forest litter, elev. 1800 m (R. Anderson, AMNH PBI_OON 724), 1♂, same, elev. 1950 m (R. Anderson, AMNH PBI_OON 683), 2♂, Sept. 20, 1992, cloud forest litter, elev. 2000 m (R. Anderson, AMNH PBI_OON 681, 725), 8♂; Yerbabuena Reserve, 2.1 km NW Pueblo Nuevo Solistahuacan, Sept. 19, 1991, oak-pine forest litter, elev. 1750 m (R. Anderson, AMNH PBI_OON 726), 1♂, 2♀, Sept. 23, 1992, cloud forest litter, elev. 2100 m (R. Anderson, AMNH PBI_OON 685, 46506), 3♂, 3♀, same, liquidambar forest litter, elev. 2070 m (R. Anderson, AMNH PBI_OON 727), 1♂. *Oaxaca:* Mirador Grande, 17.89844°N, 96.36253°W, Aug. 14, 2009, Winkler, leaf litter, montane tropical rainforest, elev. 990 m (M. Branstetter, MCZ PBI_OON 704), 1♂, 2♀; 6 mi S Valle Nacional, May 19, 1971, Berlese, leaf litter, elev. 2000 ft (S. Peck, AMNH PBI_OON 37909), 6♂; 10.8 SW Valle Nacional, 17.68102°N, 96.33026°W, Aug. 13, 2009, Winkler, leaf litter, disturbed mesophyll forest, elev. 1120 m (M. Branstetter, MCZ 95150, PBI_OON 701), 4♂, 3♀, same, nest under rock (L. Sáenz, MCZ 94020, PBI_OON 702), 2♂; 13.2 km SW Valle Nacional, 17.65934°N, 96.33426°W, Aug. 11, 2009, Winkler, leaf litter, tropical wet forest, elev. 1360 m (M. Branstetter, MCZ 95180, PBI_OON 700), 1♂; 14.8 km SSW Valle Nacional, 17.64483°N, 96.33637°W, Aug. 13, 2009, leaf litter, disturbed mesophyll forest, elev. 1370 m (M. Branstetter, MCZ 94652, PBI_OON 703), 2♂; 15 m S Valle Nacional, May 21, 1971, Berlese, leaf litter, elev. 4000 ft (S. Peck, AMNH PBI_OON 37899), 1♀; 32 m S Valle Nacional, May 22, 1971, Berlese, leaf litter, elev. 7000 ft (S. Peck, AMNH PBI_OON 37912), 1♂. *Tabasco:* Teapa (H. Smith, BMNH) PBI_OON 698), 1♂, 2♀ (including holotype), July 16, 1947 (C., M. Goodnight, AMNH PBI_OON 1419), 2♂, 1♀; Villa Hermosa, Aug. 14, 1945 (F. Bonet, AMNH PBI_OON 37902), 2♀. *Veracruz:* 3.6 mi E Catemaco, Aug. 23, 1967, elev. 1000 ft (R. Leech, REL PBI_OON 699), 1♂; 1.2 mi S Huatusco, July 2, 1969, Berlese, cloud forest soil, litter, elev. 1344 m (S., J. Peck, AMNH PBI_OON 37913), 1♂; Los Tuxtlas Biological Station, 33 km NE Catemaco, Aug. 1, 1993, Berlese, ravine litter, fungi, elev. 160 m (S., J. Peck, AMNH PBI_OON 1390, 5♂, 4♀, same, tree base litter (AMNH PBI_OON 37901), 5♂, 2♀; Volcán San Martín, July 14, 1953 (C. Goodnight, AMNH PBI_OON 37879), 2♂. **Guatemala:** *Alta Verapaz:* Cacao, Mar. 26, 1906 (USNM PBI_OON 27884), 1♀; Gruta de Lanquín, Feb. 5, 1980 (B., V. Roth, AMNH PBI_OON 38052), 1♀. *Baja Verapaz:* Biotopo Quetzal, 15.21241135°N, 90.214580799°W, May 7, 2009, Winkler, oak/tree fern cloud forest litter, elev. 1750 m (MCZ 89571, PBI_OON 37490), 2♂, 2♀; 8.6 km W Chilascó, May 24, 1991, oak/pine/liquidambar litter, elev. 1560 m (R. Anderson, AMNH PBI_OON 38057), 1♀; 4.5 km S Purulhá, May 21, 1991, cloud forest litter, elev. 1630 m (R. Anderson, AMNH PBI_OON 765), 3♂, May 24, 1991, same (AMNH PBI_OON 766), 3♂; 7 km E Purulhá, May 23, 1991, cloud forest litter, elev. 1660 m (R. Anderson, AMNH PBI_OON 760, 46497), 1♂, 6♀, May 25, 1981, cloud forest litter, elev. 1600 m (R. Anderson, AMNH PBI_OON 767), 3♂, 1♀, pine/cloud forest litter, elev. 1600 m (R. Anderson, AMNH PBI_OON 768), 2♂; 7.3 km E Purulhá, May 19, 1991, cloud forest litter, elev. 1700 m (R. Anderson, AMNH PBI_OON 758), 2♂, 1♀; 7.5 km S Purulhá, May 26, 1991, cloud forest litter, elev. 1630 m (R. Anderson, AMNH PBI_OON 38058, 46502), 5♂, 1♀; 8 km S Purulhá, May 19, 1991, pine/cloud forest litter, elev. 1600 m (R. Anderson, AMNH PBI_OON 759), 1♀, May 23–25, 1991, flight intercept, wet montane forest (H. Howden, AMNH PBI_OON 38054), 3♂, May 27–29, 1991, same (AMNH PBI_OON 38051, 38053), 2♂; 14.5 km S Purulhá, May 26, 1991, riparian bottomland oak forest litter, elev. 1600 m (R. Anderson, AMNH PBI_OON 27507), 1♂; Ranchitos del Quetzal, 15.21443°N, 90.22123°W, Sept. 20, 2008, cloud forest litter, elev. 1750 m (R. Anderson, MCZ 83303, PBI_OON 37471), 2♂, same (INBIO PBI-OON 761), 2♂, 15.21508°N, 90.22003°W, Sept. 20, 2008, cloud forest litter, elev. 1700 m (R. Anderson, INBIO PBI_OON 762), 3♂, 1♀. *El Progresso:* Cerro Pinalón, 15.0849726°N, 89.94547974°W, Apr. 30, 2009, oak/pine/tree fern litter, elev. 2560 m (MCZ 89518, PBI_OON 26351), 5♂, 6♀, 15.0873113°N, 89.94404961°W, Apr. 30, 2009, oak/pine/tree fern litter, elev. 2550 m (MCZ 89490, PBI_OON 319), 8♂, 3♀; Cerro Pinalón, peak, 15.08122°N, 89.92080°W, May 1–5, 2009, mixed hardwood litter, elev. 2900 m (R. Anderson, MCZ 99249, PBI_OON 751), 1♂, 1♀, May 2, 2009, litter under shrubs, elev. 2900 (R. Anderson, MCZ 99290, PBI_OON 755), 3♂, near peak, 15.08217°N, 89.92184°W, May 1–5, 2009, mixed cloud/pine litter, elev. 2850 m (R. Anderson, MCZ 99240, PBI_OON 752), 1♂, near

peak, 15.08280°N, 89.92320°W, May 1–5, 2009, cloud/oak litter, elev. 2820 m (R. Anderson, MCZ 99270, PBI_OON 753), 1♂, 2♀, trail to peak, 15.08467°N, 89.93492°W, May 1–5, 2009, cloud forest litter, elev. 2680 m (R. Anderson, MCZ 99478, PBI_OON 754), 1♂; Cerro Pinalón, Finca Las Nubes, 15.08385°N, 89.94258°W, Sept. 20, 2008, oak cloud forest litter, elev. 2500 m (R. Anderson, INBIO PBI_OON 750), 2♂, 2♀, Sept. 21, 2008, same (MCZ 83169, PBI_OON 36965), 1♂; Cerro Pinalón, trail to Peña del Ángel, 15.08405°N, 89.94991°W, May 3, 2009, mixed oak litter, elev. 2520 m (R. Anderson, MCZ 99231, PBI_OON 756), 1♂, 1♀; 2 km N Estancia de la Virgen, June 8, 1991, cloud forest litter, elev. 1800–1900 m (R. Anderson, AMNH PBI_OON 757), 1♀. *Guatemala:* near Las Nubes, 14.53975°N, 90.44983°W, Sept. 18, 2008, cloud forest, elev. 2950 m (R. Anderson, INBIO PBI_OON 741), 2♀; Univ. del Valle, June 10, 1991, oak/pine/mimosa forest litter, elev. 1400 m (R. Anderson, AMNH PBI_OON 742), 1♂, 3♀. *Huehuetenango:* Huehuetenango, 15.50673°N, 91.64473°W, Sept. 14, 2008, oak cloud forest, elev. 2750 m (R. Anderson, INBIO PBI_OON 730), 5♂, 2♀; San Miguel Chicharro, 15.57988°N, 91.96905°W, Sept. 16, 2008, oak cloud forest, elev. 2100 m (R. Anderson, INBIO PBI_OON 731), 5♂, 1♀. *Izabal:* Firmeza, 15.40708°N, 88.69612°W, Sept. 19, 2008, montane rainforest litter, elev. 590 m (R. Anderson, MCZ 83291, PBI_OON 37469), 2♂, 1♀, same (INBIO PBI_OON 763), 1♀; Izabal, Dec. 14, 1986, malaise trap, elev. 350 m (M. Sharkey, CNC PBI_OON 38124), 1♀. *Jalapa:* 4 km E Mataquescuintla, 14.52986618°N, 90.14908234°W, June 1, 2009, oak cloud forest, elev. 2600 m (MCZ 89382, PBI_OON 40800), 2♂, 1♀, 14.53256659°N, 90.15252622°W, June 1, 2009, oak cloud forest, elev. 2400 m (MCZ 89467, PBI_OON 37491), 6♂, 3♀; Miramundo, Pino Dulce, 14.53388°N, 90.15236°W, Sept. 18, 2008, cloud forest, elev. 2300 m (INBIO PBI_OON 743), 1♂, 1♀. *Quetzaltenango:* 12 km SW Zunil, NE face, Cerro Zunil, May 28, 1991, hardwood forest litter, elev. 2700–2760 m (R. Anderson, AMNH PBI_OON 38056), 1♂, 1♀, same, Fuentes Georginas, May 27, 1991, cloud forest litter, elev. 2460 m (R. Anderson, AMNH PBI_OON 732), 2♂; Volcán Chicabal, Las Nubes, 14°48.1′N, 91°40.1′W, Sept. 12, 2008, oak forest litter, elev. 2280 m (L. Sáenz, MCZ 82921, PBI_OON 37473), 1♂. *Quiché:* 1.5 km S Chichicastenango, 14.91852°N, 91.10458°W, Sept. 17, 2008, oak/ostrya/pine forest litter, elev. 2000 m (R. Anderson, MCZ 83277, PBI_OON 37470), 1♀; 3 km S Joya Larga, 15.40538°N, 90.83805°W, Sept. 15, 2008, oak cloud forest litter, elev. 2350 m (R. Anderson, INBIO PBI_OON 734), 3♂. *Sacatepéquez:* 5 km SE Antigua, 14.52779181°N, 90.68970603°W, June 10, 2009, old secondary oak forest litter, elev. 2350 m (MCZ 89455, PBI_OON 40803), 6♂, 4♀, 14.5357724°N, 90.69427782°W, June 6, 2009, old secondary hardwood forest, litter from clearing near road with occasional pine, cypress, elev. 2150 m (R. Anderson, MCZ 89414, PBI_OON 40802), 3♂, 6♀, 14.53862°N, 90.70488°W, June 9, 2009, hardwood forest litter, elev. 1875 m (MCZ 99191, PBI_OON 735), 1♀; Cerro Alux, June 9, 1991, wet oak forest litter, elev. 2260 m (R. Anderson, AMNH PBI_OON 38055), 1♂, 1♀, 14.61033°N, 90.64191°W, Sept. 9, 2008, oak forest, elev. 2170 m (R. Anderson, INBIO PBI_OON 737), 1♂, 1♀; Cerro Carmona, 6 km SE Antigua, 14°32.1′N, 90°41.7′W, Sept. 9, 2008, mesic oak forest litter, elev. 2180 m (L. Sáenz, MCZ 82951, PBI_OON 36966), 1♂; Cerro Carmona, Finca El Pilar, 14.53452°N, 90.69446°W, Sept. 9, 2008, oak/ostrya forest litter, elev. 2160 m (MCZ 83159, PBI_OON 26343), 5♂, same (INBIO PBI_OON 739), 2♂, 1♀, 14.54115°N, 90.70483°W, Sept. 9, 2008, oak forest, elev. 1980 m (INBIO PBI_OON 738), 4♂, 2♀; Parque Senderos de Alux, 15–20 km W Guatemala City, 14°36′39.2″N, 90°38′21.1″W, June 30, 2006, Berlese, pine forest litter, elev. 2256 m (J. Huff, C. Víquez, E. Agrada, D. Ortiz, AMNH PBI_OON 740), 1♂; 4.5 km SW San Miguel Dueñas, June 12, 1991, mesic hardwood forest litter, elev. 1760 m (R. Anderson, AMNH PBI_OON 27508), 1♂. *San Marcos:* road Bojonal-Fraternidad, 14.94533°N, 91.88038°W, Sept. 11, 2008, cloud forest litter, elev. 1580 m (R. Anderson, MCZ 83221, PBI_OON 37468), 1♂; 9.8 km WSW San Marcos, 14°56.7′N, 91°52.8′W, Sept. 11, 2008, cloud forest litter, elev. 1600 m (L. Sáenz, MCZ 82928, PBI_OON 37467), 1♀. *Suchitepéquez:* Volcán Atitlán, 9.5 km SE Santiago Atitlán, 14°33.5′N, 91°11.4′W, Sept. 10, 2008, cloud forest litter, elev. 2060 m (M. Branstetter, MCZ 83242, PBI_OON 37472), 1♂; 4 km S Volcán Atitlán, 14.5491476°N, 91.19054782°W, June 15, 2009, Winkler, cloud forest litter, elev. 1625 m (MCZ 89429, PBI_OON 733), 3♂, 2♀. *Zacapa:* 2 km SE La Unión, 14.9470362°N, 89.27627275°W, June 12, 2009, Winkler, oak cloud forest litter, elev. 1550 m (MCZ 89348, PBI_OON 745, 46504), 3♂, 2♀, same, 14.95389983°N, 89.27638319°W, June 12, 2009, Winkler, oak

cloud forest litter, elev. 1430 m (MCZ 89502, PBI_OON 744), 2♀; 3.5 km SE La Unión, June 4, 1991, cloud forest litter, elev. 1500 m (R. Anderson, AMNH PBI_OON 748, 749), 13♂, 8♀, June 6, 1991, same (AMNH PBI_OON 746, 747), 24♂, 3♀, Sierra de Los Minas, 10 km N San Lorenzo, Nov. 7–9, 1986, wet moss by creek in cloud forest, elev. 2200 m (E. Lindquist, CNC PBI_OON 38131), 1♂; 5 mi N San Lorenzo, July 13, 1986, cloud forest litter (J. Campbell, CNC PBI_OON 38126), 1♀. **Honduras:** *Atlántida:* La Ceiba, Pico Bonito Lodge, 15.69040°N, 86.90272°W, Oct. 2, 2008, litter from property with cacao, elev. 150 m (C. Víquez. M. Branstetter, AMNH PBI_OON 38438), 1♂. *Cortés:* Parque Nacional Cusuco, July–Sept. 2007, elev. 1535 m (J. Nunez-Mino, MRAC PBI_OON 40136), 1♂, same, elev. 1600 m (MRAC PBI_OON 40135), 1♂, 15.48683°N, 88.23425°W, May 30, 2010, mesophyll forest litter, elev. 1330 m (MCZ 99071, PBI_OON 774), 2♂, 3♀; 15.48940°N, 88.23681°W, May 30, 2010, mesophyll forest litter, elev. 1290 m (MCZ 99120, PBI_OON 773), 5♂, 3♀. *Francisco Morazán:* Tegucigalpa, Parque Nacional La Tigre, trail to view point, 14.20721°N, 87.09428°W, Sept. 25, 2008, Winkler, cloud forest litter, elev. 1830 m (M. Branstetter, AMNH PBI_OON 38440), 1♂, 14.21778°N, 87.09101°W, Sept. 25, 2008, Winkler, secondary mesophyll forest litter, elev. 1870 m (M. Branstetter, AMNH PBI_OON 38349), 1♂. *Gracias a Dios:* Las Marías, 15.70861°N, 84.86211°W, June 8, 2010, tropical rainforest litter, elev. 80 m (MCZ 98870, PBI_OON 769), 1♀. *Lempira:* Gracias, Parque Nacional Montaña de Celaque. Trail to Quebrada, 14.55619°N, 88.65799°W, Sept. 30, 2008, Winkler, litter, elev. 1925 m (M. Branstetter, AMNH PBI_OON 38442), 1♂. *Ocotepeque:* 13 km E Nuevo Ocotepeque, 14.45748°N, 89.06819°W, May 25, 2010, cloud forest litter, elev. 150 m (MCZ 98076, PBI_OON 764), 3♀. *Olancho:* 11 km N Catacamas, 14.95003°N, 85.91609°W, May 8, 2010, cloud forest litter, elev. 2080 m (MCZ 98092, PBI_OON 772), 2♂; 14 km N La Unión, Parque Nacional La Muralla, Sept. 1, 1994, montane forest litter (S., J. Peck, FMNH 56880, PBI_OON 10823), 1♂, 1♀. *Santa Bárbara:* 15 km SE Santa Bárbara, Aug. 24, 1994, montane wet forest litter (S., J. Peck, FMNH 56882, PBI_OON 10825), 3♂. **Nicaragua:** *Matagalpa:* Aranjunes, Cerro Arenas, road to Jinotega, 13.03361°N, 85.897°W, Winkler, elev. 1310 m (C. Víquez. J. Mata, AMNH PBI_OON 29346), 1♂; Reserva Natural El Musún, 3 km NNW Río Blanco, 12°57.5′N, 85°13.8′W, Oct. 12, 2008, mesic forest litter, elev. 600 m (M. Branstetter, MCZ 83253, PBI_OON 37476), 1♂; Reserva Natural El Musún, 3.2 km NNW Río Blanco, 12°57.6′N, 85°13.9′W, Oct. 12, 2008, mesic forest litter, elev. 700 m (M. Branstetter, MCZ 83269, PBI_OON 775), 2♂.

Distribution: Southern Mexico (Veracruz, Tabasco, Campeche, Oaxaca, and Chiapas) south to northern Costa Rica.

Costarina iviei, new species

Figures 76–84

Type: Male holotype taken 10 mi SE of Coatzacoalcos, Veracruz, Mexico (Aug. 14, 1966; J., W. Ivie), deposited in AMNH (PBI_OON 37904).

Etymology: The specific name is a patronym in honor of one of the collectors, the late Wilton Ivie.

Diagnosis: Males can easily be recognized by the shape of the embolus; both the proximal and distal prongs are sinuous (figs. 80–84).

Male (PBI_OON 37904, figs. 76–84): Total length 1.61. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, dorsal process longer. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with sinuous proximal and distal prongs.

Female: Unknown.

Other Material Examined: None.

Distribution: Mexico (Veracruz).

Costarina llama, new species

Figures 85–99

Type: Male holotype from Winkler sample of leaf litter taken in a montane tropical rainforest at an elevation of 990 m at Mirador Grande, 17.89844°N, 96.36253°W, Oaxaca, Mexico (Aug. 14, 2009, M. Branstetter), deposited in MCZ (93984, PBI_OON 705).

Etymology: The specific name is a noun in apposition taken from the LLAMA (Leaf Litter Arthropods of Middle America) project that produced numerous specimens for this study.

Diagnosis: Males can be recognized by the shape of the embolus, which has a long, narrow proximal prong and a shorter, wider, sinuous distal prong (figs. 89–93). The single female here tentatively matched with the male has a W-shaped posterior atrial margin and a sinuous anterior genitalic process (figs. 97–99); like the male, it was taken together with specimens of *C. plena*.

Male (PBI_OON 705, figs. 85–93): Total length 1.69. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, tip almost reaching tip of dorsal process. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2, r0-1-0; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-1p-2. Embolus with proximal prong long, narrow, distal prong shorter, wider, sinuous.

Female (PBI_OON 1103, figs. 94–99): Total length 1.87. Dorsal scutum covering more than 3/4 of abdomen, more than 1/2 to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2, II v4-4-1p; metatarsi I, II v2-2-1p. Posterior margin of genital atrium W-shaped, anterior genitalic process distinctly bent at about one-third its length.

Other Material Examined: **Mexico:** *Oaxaca:* 6 mi S Valle Nacional, May 19, 1971, Berlese, leaf litter, elev. 2000 ft (S. Peck, AMNH PBI_OON 1103), 1♀.

Distribution: Mexico (Oaxaca).

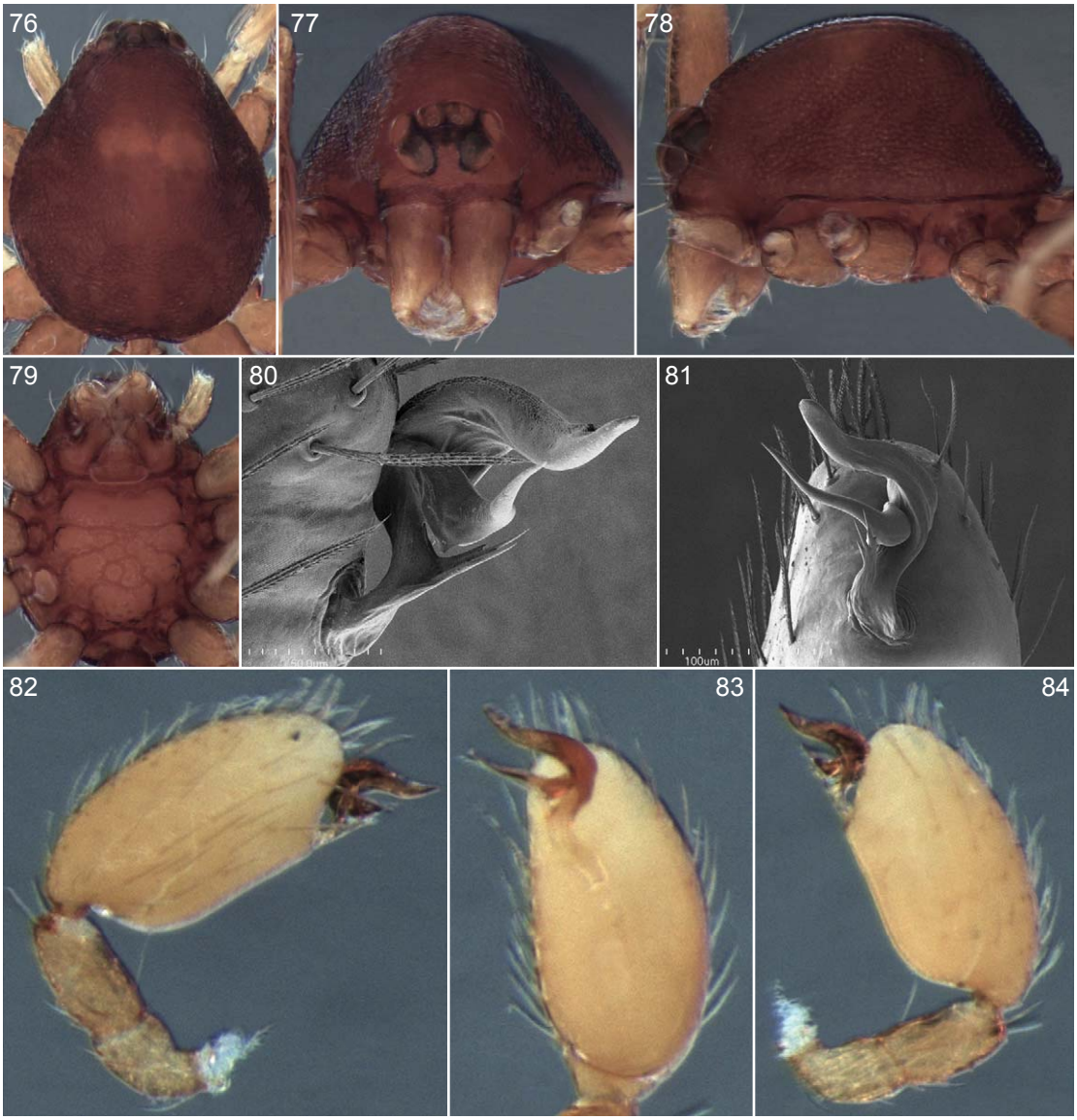
Costarina oaxaca, new species

Figures 100–114

Types: Male holotype, female allotype, and male paratype from Winkler sample of leaf litter taken in a tropical wet forest at an elevation of 680 m at a site 7.5 km S of Valle Nacional, 17.70752°N, 96.30516°W, Oaxaca, Mexico (Aug. 12, 2009, M. Branstetter), deposited in MCZ (94631, PBI_OON 706).

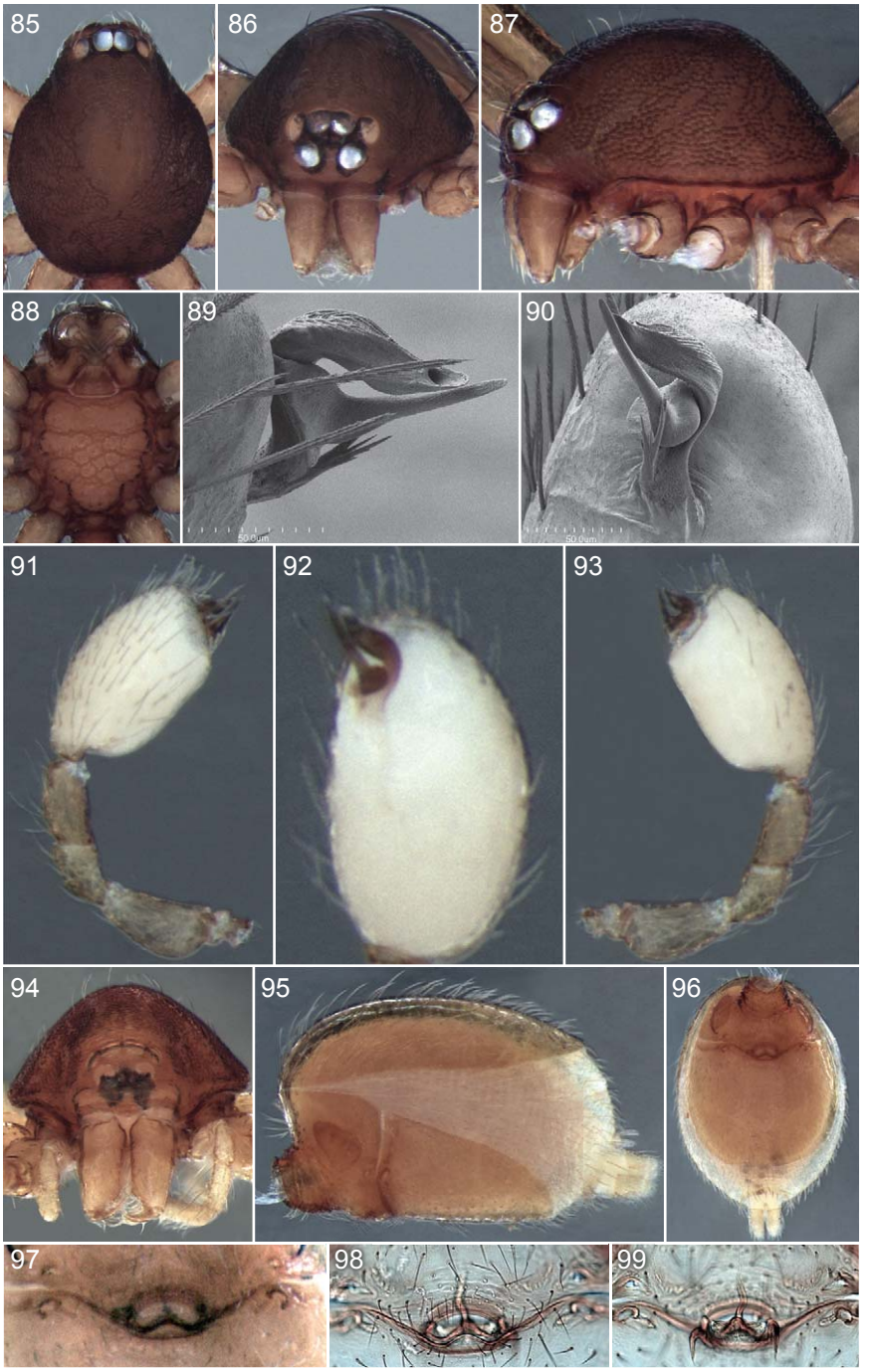
Etymology: The specific name is a noun in apposition taken from the type locality.

Diagnosis: Males resemble those of *C. llama* but both the proximal and distal prongs of the embolus are narrower (figs. 104–108); females have the median three-fifths of the posterior atrial border thickened (figs. 112–114).

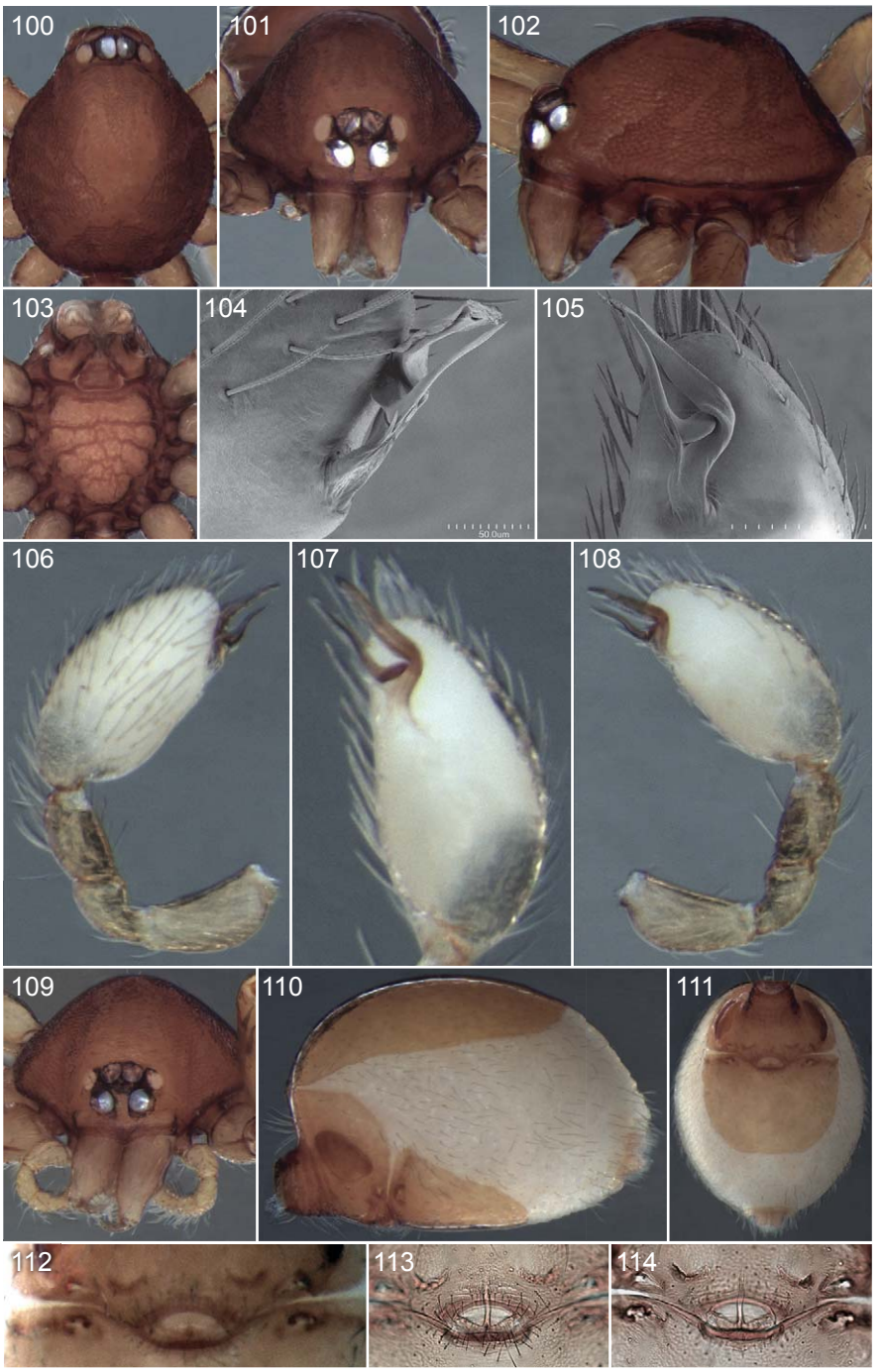


FIGS. 76–84. *Costarina iviei,* new species, male. **76.** Carapace, dorsal view. **77.** Same, anterior view. **78.** Same, lateral view. **79.** Sternum, ventral view. **80.** Left embolus, prolateral view. **81.** Same, ventral view. **82.** Left palp, prolateral view. **83.** Same, ventral view. **84.** Same, retrolateral view.

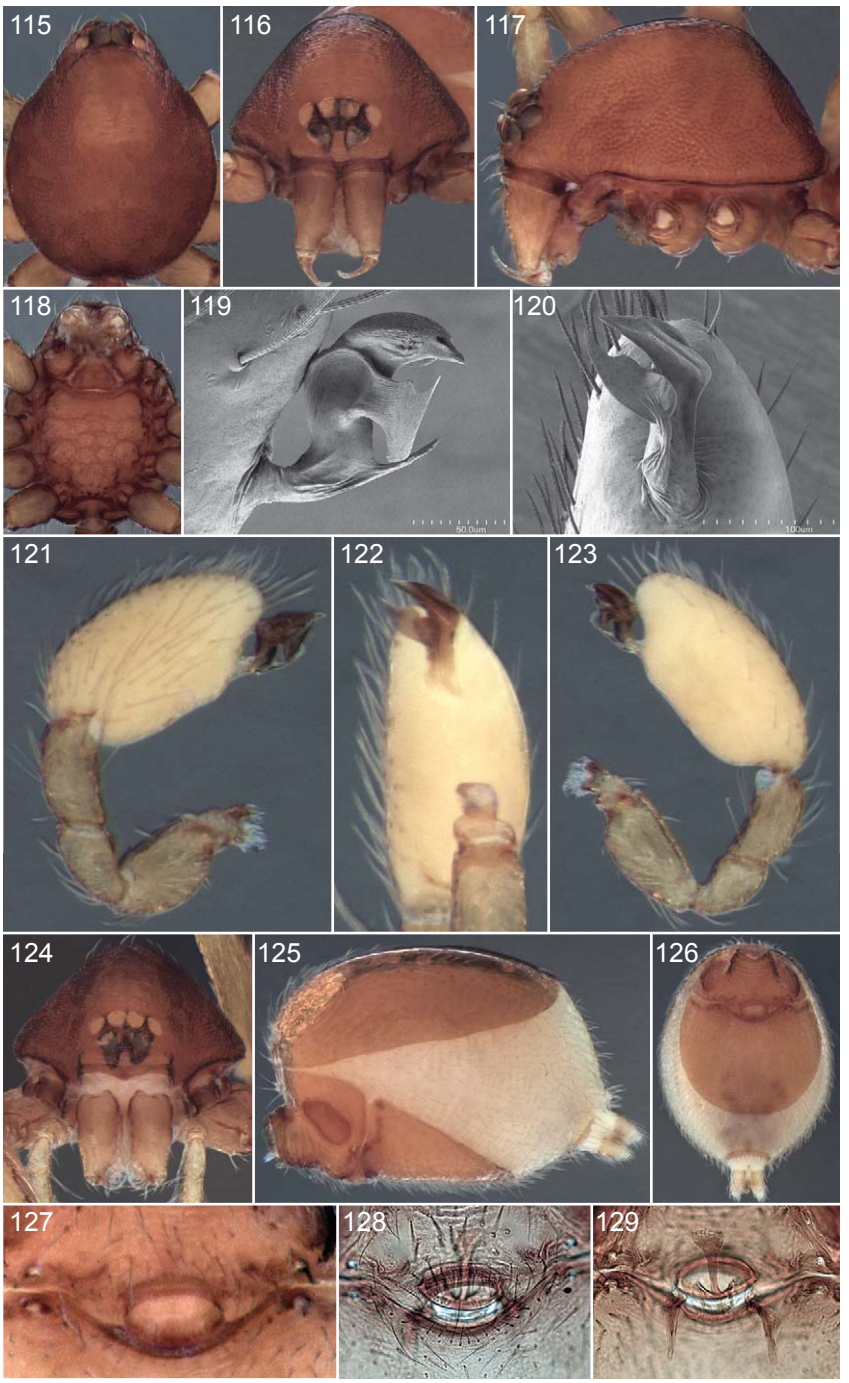
Male (PBI_OON 706, figs. 100–108): Total length 1.78. ALE separated by less than their radius. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, not reaching to tip of dorsal process. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femora: I p0-0-2, r0-1-1; II p0-0-2; tibiae: I v4-4-2; II v4-4-0; metatarsi I, II v2-1p-2. Embolus



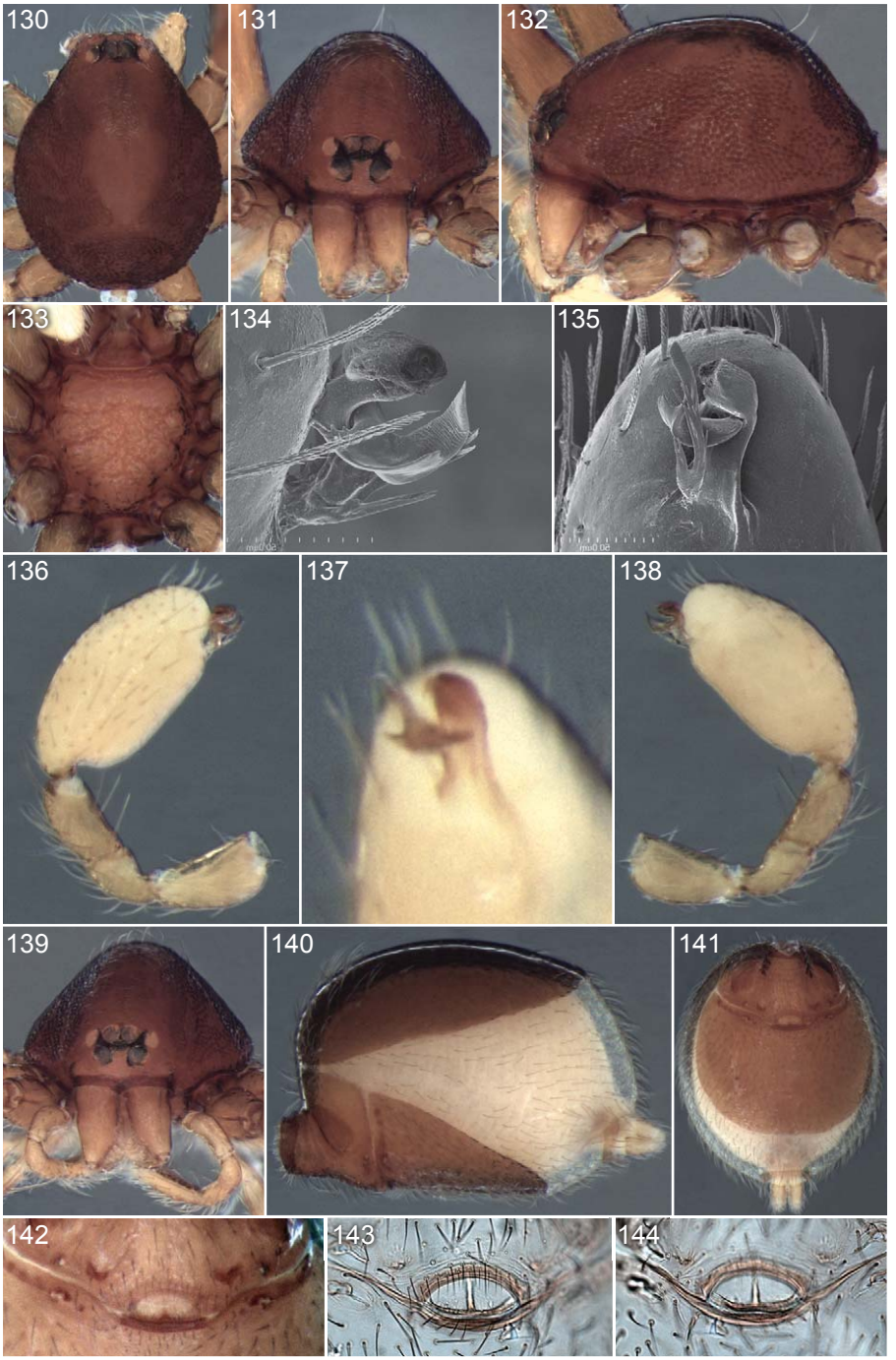
FIGS. 85–99. *Costarina llama,* new species, male (85–93) and female (94–99). **85.** Carapace, dorsal view. **86, 94.** Same, anterior view. **87.** Same, lateral view. **88.** Sternum, ventral view. **89.** Left embolus, prolateral view. **90.** Same, ventral view. **91.** Left palp, prolateral view. **92.** Same, ventral view. **93.** Same, retrolateral view. **95.** Abdomen, lateral view. **96.** Same, ventral view. **97, 98.** Genitalia, ventral view. **99.** Same, dorsal view.



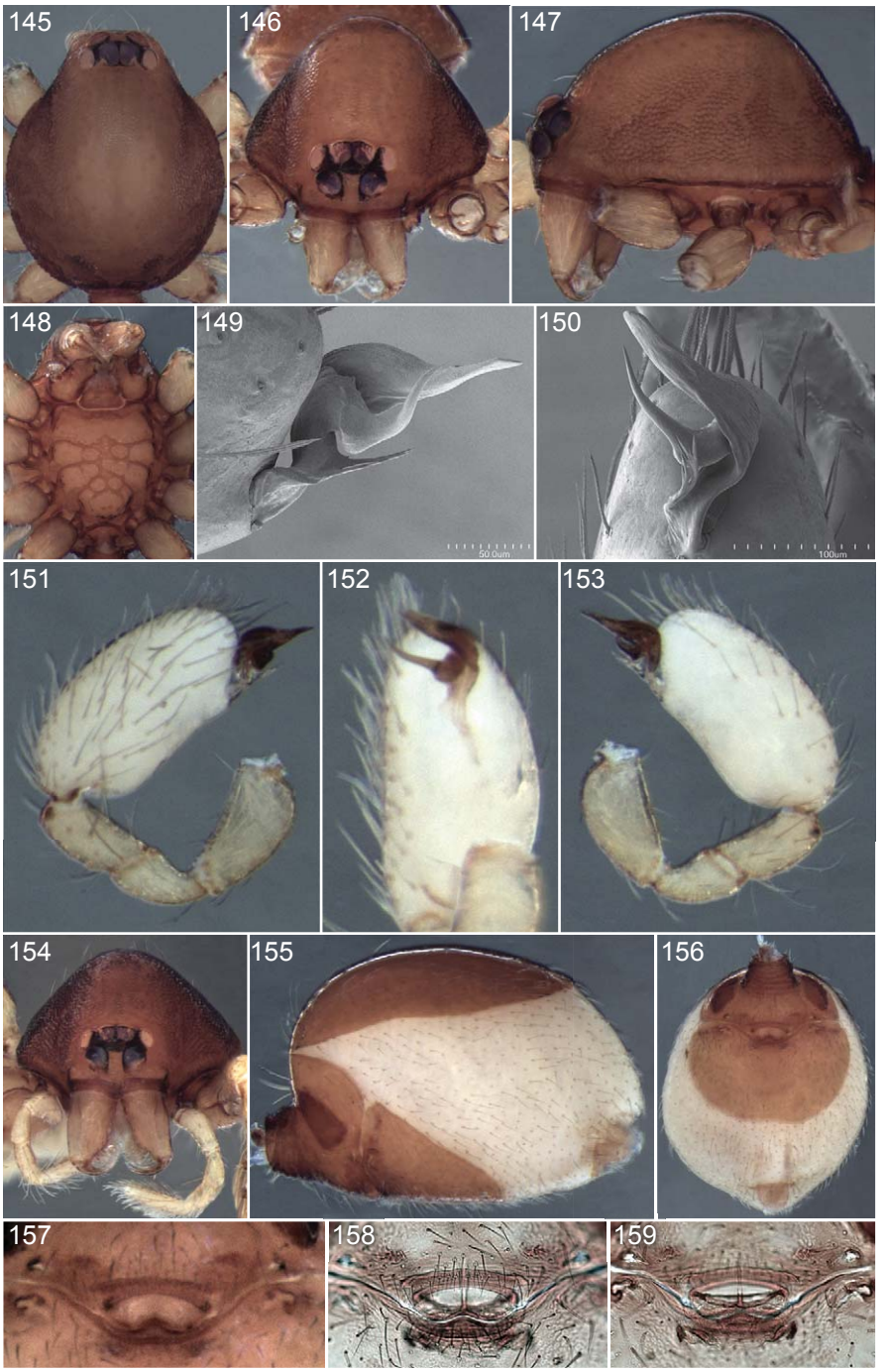
FIGS. 100–114. *Costarina oaxaca,* new species, male (100–108) and female (109–114). **100.** Carapace, dorsal view. **101, 109.** Same, anterior view. **102.** Same, lateral view. **103.** Sternum, ventral view. **104.** Left embolus, prolateral view. **105.** Same, ventral view. **106.** Left palp, prolateral view. **107.** Same, ventral view. **108.** Same, retrolateral view. **110.** Abdomen, lateral view. **111.** Same, ventral view. **112, 113.** Genitalia, ventral view. **114.** Same, dorsal view.



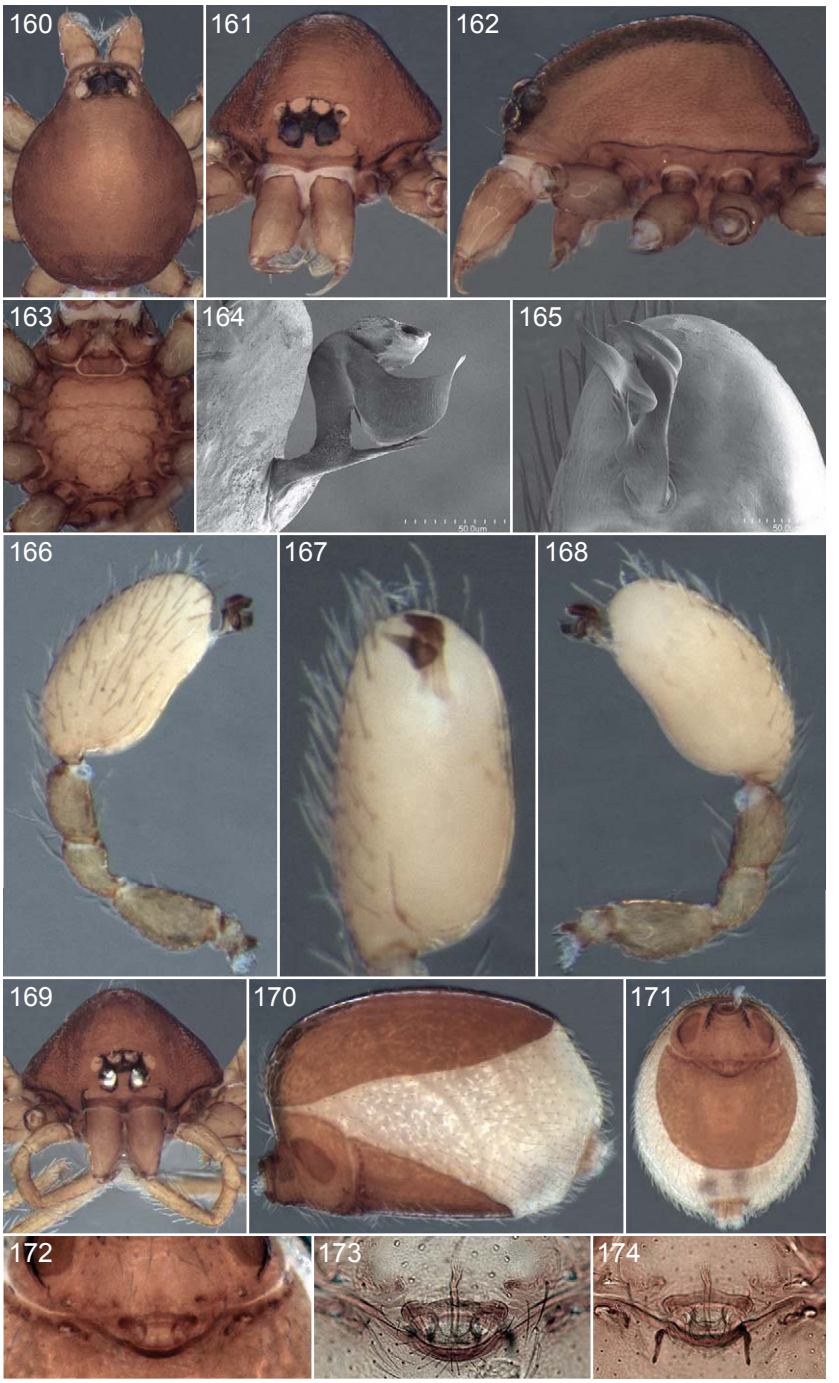
FIGS. 115–129. *Costarina mixtepec,* new species, male (115–123) and female (124–129). **115.** Carapace, dorsal view. **116, 124.** Same, anterior view. **117.** Same, lateral view. **118.** Sternum, ventral view. **119.** Left embolus, prolateral view. **120.** Same, ventral view. **121.** Left palp, prolateral view. **122.** Same, ventral view. **123.** Same, retrolateral view. **125.** Abdomen, lateral view. **126.** Same, ventral view. **127, 128.** Genitalia, ventral view. **129.** Same, dorsal view.



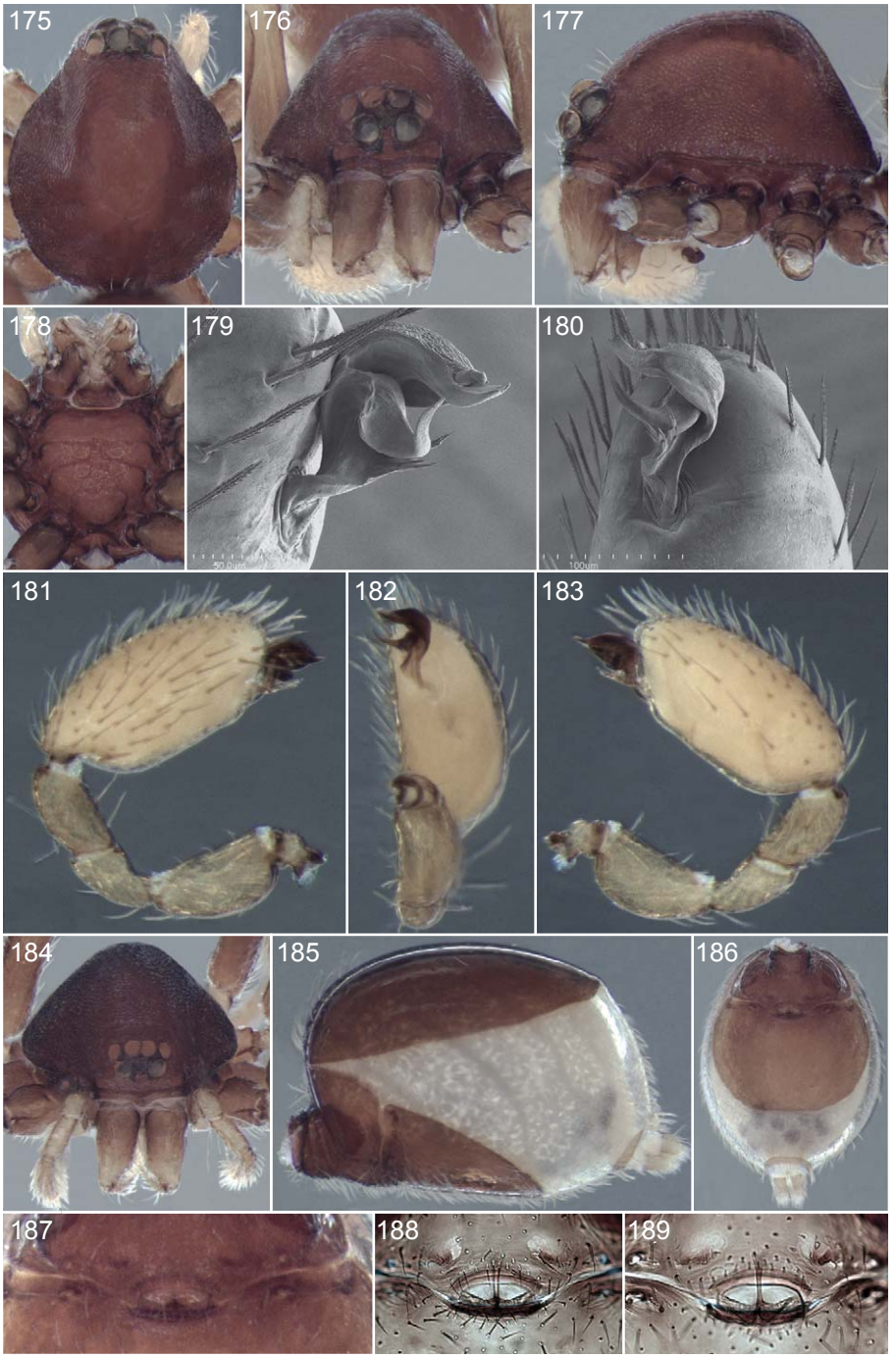
FIGS. 130–144. *Costarina subplena,* new species, male (130–138) and female (139–144). **130.** Carapace, dorsal view. **131, 139.** Same, anterior view. **132.** Same, lateral view. **133.** Sternum, ventral view. **134.** Left embolus, prolateral view. **135.** Same, ventral view. **136.** Left palp, prolateral view. **137.** Same, ventral view. **138.** Same, retrolateral view. **140.** Abdomen, lateral view. **141.** Same, ventral view. **142, 143.** Genitalia, ventral view. **144.** Same, dorsal view.



FIGS. 145–159. *Costarina naja,* new species, male (145–153) and female (154–159). **145.** Carapace, dorsal view. **146, 154.** Same, anterior view. **147.** Same, lateral view. **148.** Sternum, ventral view. **149.** Left embolus, prolateral view. **150.** Same, ventral view. **151.** Left palp, prolateral view. **152.** Same, ventral view. **153.** Same, retrolateral view. **155.** Abdomen, lateral view. **156.** Same, ventral view. **157, 158.** Genitalia, ventral view. **159.** Same, dorsal view.



FIGS. 160–174. *Costarina sepultura,* new species, male (160–168) and female (169–174). **160.** Carapace, dorsal view. **161, 169.** Same, anterior view. **162.** Same, lateral view. **163.** Sternum, ventral view. **164.** Left embolus, prolateral view. **165.** Same, ventral view. **166.** Left palp, prolateral view. **167.** Same, ventral view. **168.** Same, retrolateral view. **170.** Abdomen, lateral view. **171.** Same, ventral view. **172, 173.** Genitalia, ventral view. **174.** Same, dorsal view.



FIGS. 175–189. *Costarina bochil,* new species, male (175–183) and female (184–189). **175.** Carapace, dorsal view. **176, 184.** Same, anterior view. **177.** Same, lateral view. **178.** Sternum, ventral view. **179.** Left embolus, prolateral view. **180.** Same, ventral view. **181.** Left palp, prolateral view. **182.** Same, ventral view. **183.** Same, retrolateral view. **185.** Abdomen, lateral view. **186.** Same, ventral view. **187, 188.** Genitalia, ventral view. **189.** Same, dorsal view.

with proximal prong very long, narrow, separated from slightly longer, slightly wider, sinuous distal prong by U-shaped space.

Female (PBI_OON 706, figs. 109–114): Total length 2.20. ALE separated by their radius to diameter. Dorsal scutum covering more than 3/4 of abdomen, more than 1/2 to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium relatively wide, broadly triangular, median three-fifths of posterior margin thickened.

Other Material Examined: None.

Distribution: Mexico (Oaxaca).

Costarina mixtepec, new species

Figures 115–129

Types: Male holotype, female allotype, and two female paratypes from Berlese sample taken in cloud forest 23.4 km N of San Gabriel Mixtepec, Oaxaca, Mexico (July 11, 1987, R. Anderson), deposited in FMNH (61605, PBI_OON 10891).

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

Diagnosis: Males resemble those of *C. plena* but have a much narrower, sharply bent proximal prong on the embolus (figs. 119–123); females have a short, wide genital atrium, with a wide transverse bar visible through the cuticle anterior of the anterior atrial margin (figs. 127–129).

Male (PBI_OON 10891, figs. 115–123): Total length 2.05. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral prong short, wide, dorsal prong greatly elongated, narrow, protruding anteriorly. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2, r0-1-0; tibiae: I v4-4-0; II v4-4-1p; metatarsi: I v2-2-1p; II v2-2-0. Embolus with proximal prong relatively narrow, abruptly bent at about half its length, distal prong with two parallel ledges (in ventral view).

Female (PBI_OON 10891, figs. 124–129): Total length 2.35. Dorsal scutum with no soft tissue visible from above, postepigastric scutum reaching to about 2/3 of abdominal length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium short, wide, wide transverse bar visible through cuticle anterior of anterior atrial margin.

Other Material Examined: **Mexico:** *Oaxaca:* 30.6 km S Suchixtepec, July 12, 1987. Berlese, wet oak-pine forest, elev. 3400 ft (R. Anderson, FMNH 61609, PBI_OON 10895), 3♂; 40.5 km S Suchixtepec, July 25, 1992. Berlese, cloud forest leaf litter, elev. 1300 m (R. Anderson, AMNH PBI_OON 708), 3♂, 2♀.

Distribution: Mexico (Oaxaca).

Costarina subplena, new species

Figures 130–144

Types: Female holotype taken in oak-pine forest litter at an elevation of 1600 m in the Reserva El Triunfo, 15.72188°N, 92.93677°W, Chiapas, Mexico (May 19, 2008; R. Anderson), deposited in MCZ (80105, PBI_OON 38109).

Etymology: The specific name refers to the similarities to *C. plena*.

Diagnosis: This species closely resembles *C. plena* but males have the anterior margin of the proximal prong of the embolus concave rather than convex (figs. 134–138), and females have the anterior genitalic process set on a much shorter, evenly curved transverse base, along with a thinner anterior margin on the genital atrium (figs. 142–144).

Male (PBI_OON 46495, figs. 130–138): Total length 1.81. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral prong long, narrow, spiniform, dorsal prong with short extension. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2, r0-1-0; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus proximal prong with concave anterior margin, distal prong relatively short, with rounded tip.

Female (PBI_OON 46481, figs. 139–144): Total length 1.92. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae I, II v4-4-1p; metatarsi I, II v2-2-1p. Anterior genitalic process relatively short, transverse bar at base short, evenly curved, genital atrium with thin anterior margins.

Other Material Examined: **Mexico:** *Chiapas:* 3 km SE Custepec, 15.71566°N, 92.93817°W, May 17, 2008, secondary mesophyll forest litter, elev. 1700 m (MCZ PBI_OON 46505), 1♀; 10 km W El Bosque, Sept. 15, 1992, pine cloud forest litter, elev. 1475 m (R. Anderson, AMNH PBI_OON 46483), 1♀. **Guatemala:** *Baja Verapaz:* 4.5 km S Purulhá, May 24, 1991, same (AMNH PBI_OON 46481), 1♀; 7 km E Purulhá, May 25, 1981, cloud forest litter, elev. 1600 m (R. Anderson, AMNH PBI_OON 46484), 2♂; Biotopo Quetzal, 15.21241135°N, 90.214580799°W, May 7, 2009, Winkler, oak/tree fern cloud forest litter, elev. 1750 m (ex MCZ 89571, PBI_OON 46495), 1♂.

Distribution: Chiapas, Mexico, to Baja Verapaz, Guatemala.

Costarina naja, new species

Figures 145–159

Types: Male holotype and female allotype taken at an elevation of 950 m at Naja, 16°58′N, 91°35′W, Chiapas, Mexico (July 14, 2007, M. Branstetter), deposited in MCZ (79063, PBI_OON 38117).

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

Diagnosis: Males resemble those of *C. oaxaca* but have a much more protuberant base on the proximal prong of the embolus as well as an extremely narrow projection originating from the base of the embolus (figs. 149–153); females have a distinct, anteriorly directed, broadly triangular extension of the posterior atrial margin (figs. 157–159).

Male (PBI_OON 38117, figs. 145–153): Total length 2.02. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral, dorsal processes long, narrow. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus proximal prong with protuberant

base accompanied by long, extremely narrow projection from embolar base, distal prong long, tapering gradually to tip.

Female (PBI_OON 38117, figs. 154–159): Total length 2.12. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora: I p0-1-2, r1-1-1; II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium short, wide, posterior margin W-shaped, transverse bar visible through cuticle anterior of anterior atrial margin.

Other Material Examined: **Mexico:** *Chiapas:* Naja, 16.96291°N, 91.59335°W, June 10, 2008, mesophyll forest litter, elev. 950 m (MCZ PBI_OON 707), 2♂, 2♀, 16.96385°N, 91.59313°W, June 8, 2008, mesophyll forest litter, elev. 985 m (MCZ PBI_OON 728), 1♀.

Distribution: Mexico (Chiapas).

Costarina sepultura, new species

Figures 160–174

Types: Male holotype and female allotype from secondary mesophyll forest litter taken at an elevation of 1330 m at Sierra Morena, 16.15342°N, 93.60078°W, Chiapas, Mexico (May 12, 2008), deposited in MCZ (PBI_OON 729).

Etymology: The specific name is a noun in apposition taken from one of the localities at which the species occurs.

Diagnosis: Males resemble those of *C. plena* but have the distal prong of the embolus broadly folded at its base (figs. 164–168); females have distinctive anterolateral darkenings in the genital atrium (figs. 172–174).

Male (PBI_OON 729, figs. 160–168): Total length 1.80. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, dorsal process with heavily sclerotized distal extension. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with proximal prong long, gradually narrowing toward tip, distal prong broadly folded near base.

Female (PBI_OON 729, figs. 169–174): Total length 2.07. Dorsal scutum with no soft tissue visible from above, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium ovoid, anterolateral corners darkened, transverse bar visible through cuticle just anterior of anterior atrial margin.

Other Material Examined: **Mexico:** *Chiapas:* Municipio Villa Corso: Ejido Sierra Moreno, Reserva Biosfera La Sepultura, 16°09.61′N, 93°36.343′W, May 12, 2008, liquidambar forest litter, elev. 1322 m (R. Anderson, MCZ 80234, PBI_OON 38107), 2♀, 16°09.773′N, 93°36.211′W, May 13, 2008, oak forest litter, elev. 1487 m (MCZ 80221, PBI_OON 38083), 1♂, 16°09.856′N, 93°36.291′W, May 13, 2008, mixed oak/hardwood forest litter, elev. 1497 m (MCZ 80259, PBI_OON 38108), 1♂, 16.16121°N, 93.60024°W, May 15, 2008, liquidambar forest litter, elev. 1367 m (R. Anderson, MCZ 80019, PBI)OON 38106), 1♂; Sierra Morena, 16.16001°N,

93.60519°W, May 12, 2008, secondary mesophyll forest litter, elev. 1360 m (MCZ 79704, PBI_OON 38089), 1♂, 1♀.

Distribution: Mexico (Chiapas).

Costarina bochil, new species

Figures 175–189

Types: Male holotype, female allotype, six male paratypes, and five female paratypes from rotten treehouse litter taken at an elevation of 1800 m at a site 17.3 km NW of Bochil, Chiapas, Mexico (Sept. 24, 1992, R. Anderson), deposited in AMNH (PBI_OON 714).

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

Diagnosis: Males have both the proximal and distal embolar prongs long and sinuous, with the distal prong abruptly narrowed near its tip (figs. 179–183); females have an extremely short genital atrium (figs. 187–189).

Male (PBI_OON 714, figs. 175–183): Total length 2.05. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process long, narrow, dorsal process with long distal extension. Dorsal scutum covering more than 3/4 of abdomen length, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v3-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with both proximal and distal embolar prongs long, sinuous, distal prong abruptly narrowed near its tip.

Female (PBI_OON 714, figs. 184–189): Total length 2.73. Dorsal scutum more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Genital atrium extremely short, recurved ridge visible through cuticle just anterior of anterior atrial margin.

Other Material Examined: None.

Distribution: Mexico (Chiapas).

Key to Species from Belize and Guatemala

1. Males (those of *C. cahui* unknown).....2
– Females.....8
2. Distal prong of embolus wider than bulb (figs. 195, 197).....*belmopan*
– Distal prong of embolus narrower.....3
3. Spur at embolar base very long, narrow (as in figs. 250, 265).....4
– Spur at embolar base shorter.....6
4. Proximal prong of embolus relatively wide (fig. 265).....*izabal*
– Proximal prong of embolus relatively narrow (figs. 137, 250).....5
5. Distal prong of embolus relatively long (fig. 250).....*morales*
– Distal prong of embolus relatively short (fig. 137).....*subplena*
6. Proximal prong of embolus angular at base (figs. 225, 227).....*macha*

– Proximal prong of embolus rounded at base (figs. 15, 210).....7
7. Distal prong of embolus relatively narrow (figs. 210, 212).....*peten*
– Distal prong of embolus relatively wide (figs. 15, 65).....*plena*
8. Genitalic apodemes extending posterior of epigastric furrow (figs. 75, 204, 219, 257).....9
– Genitalic apodemes not extending posterior of epigastric furrow (figs. 144, 234, 242, 272).....12
9. Posterior margin of genital atrium heavily sclerotized, W-shaped (figs. 202, 203).....*belmopan*
– Posterior margin of genital atrium otherwise.....10
10. Genital atrium relatively narrow (figs. 217, 218).....*peten*
– Genital atrium relatively wide (figs. 74, 256).....11
11. Genital atrium relatively short (figs. 255, 256).....*morales*
– Genital atrium relatively long (figs. 73, 74).....*plena*
12. Genital atrium with posterior extensions (figs. 270, 271).....*izabal*
– Genital atrium without posterior extensions.....13
13. Anterior genitalic process expanded anteriorly (figs. 241, 242).....*cahui*
– Anterior genitalic process not expanded anteriorly.....14
14. Genital atrium oval (figs. 142, 143).....*subplena*
– Genital atrium triangular (figs. 232, 233).....*macha*

Costarina belmopan, new species
Figures 190–204

Type: Male holotype from a Berlese sample of secondary forest litter taken at Belmopan, Cayo, Belize (Aug. 7, 1972; S., J. Peck), deposited in FMNH (33615, PBI_OON 10122).

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

Diagnosis: Males can easily be recognized by the enormously enlarged distal embolar prong, which extends more than half the length of the palpal bulb (figs. 194–198), females by the strongly sclerotized, W-shaped posterior margin of the genital atrium (figs. 202–204).

Male (PBI_OON 10122, figs. 190–198): Total length 1.81. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral prong elongated, tip directed dorsally, dorsal prong elongated, tip directed medially. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2, r0-1-0; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus proximal prong with strong basal projection, distal prong enormously enlarged, sail shaped.

Female (PBI_OON 177, figs. 199–204): Total length 1.86. Posterior portion of pars cephalica with small U-shaped smooth area. Dorsal scutum covering more than 3/4 of abdomen, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-1p; II v2-2-0. Genital atrium football shaped, posterior margin strongly sclerotized, W-shaped.

Other Material Examined: **Belize:** *Cayo:* Augustine, Aug. 20, 1972, Berlese, evergreen forest litter (S., J. Peck, CNC PBI_OON 38129), 1♂; Blancaneau Lodge, June 29, 1971 (C. Goodnight, AMNH PBI_OON 177), 2♀; Caves Branch, Aug. 4–14, 1972, Berlese, high canopy forest (S., J. Peck, FMNH 33610, PBI_OON 10117), 1♂. *Stann Creek:* 27 mi NW Stann Creek, Aug. 19, 1972, forest litter (S., J. Peck, CNC PBI_OON 38063), 1♂. **Guatemala:** *Petén:* Parque Nacional Tikal, 17.24033736°N, 89.62094017°W, May 22, 2009, Winkler, tropical moist forest litter, elev. 270 m (MCZ 89313, PBI_OON 776), 1♂.

Distribution: Belize and northern Guatemala.

Costarina peten, new species

Figures 205–219

Types: Male holotype, female allotype, and two female paratypes from a Winkler sample of tropical moist forest litter taken at an elevation of 390 m at a site 13 km NW of Machaquilá, 16.44147064°N, 89.53447°W, Petén, Guatemala (May 28, 2009), deposited in MCZ (PBI_OON 777).

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

Diagnosis: Males resemble those of *C. plena* but have a basally longer proximal embolar prong (figs. 209–213); females have a distinctive pair of triangular sclerotizations projecting forward from the posterior margin of the genital atrium (figs. 217–219).

Male (PBI_OON 777, figs. 205–213): Total length 1.77. ALE separated by their radius to diameter. Sternum anterior margin with interrupted transverse groove. Endites with ventral process short, wide, dorsal process with dark, anteriorly directed tip. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with proximal embolar prong basally long, tapering smoothly toward tip.

Female (PBI_OON 777, figs. 214–219): Total length 2.08. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdominal length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Genital atrium ovoid, most of atrial area occupied by two anteriorly directed projections that originate internally from anterior margin of postepigastric scutum.

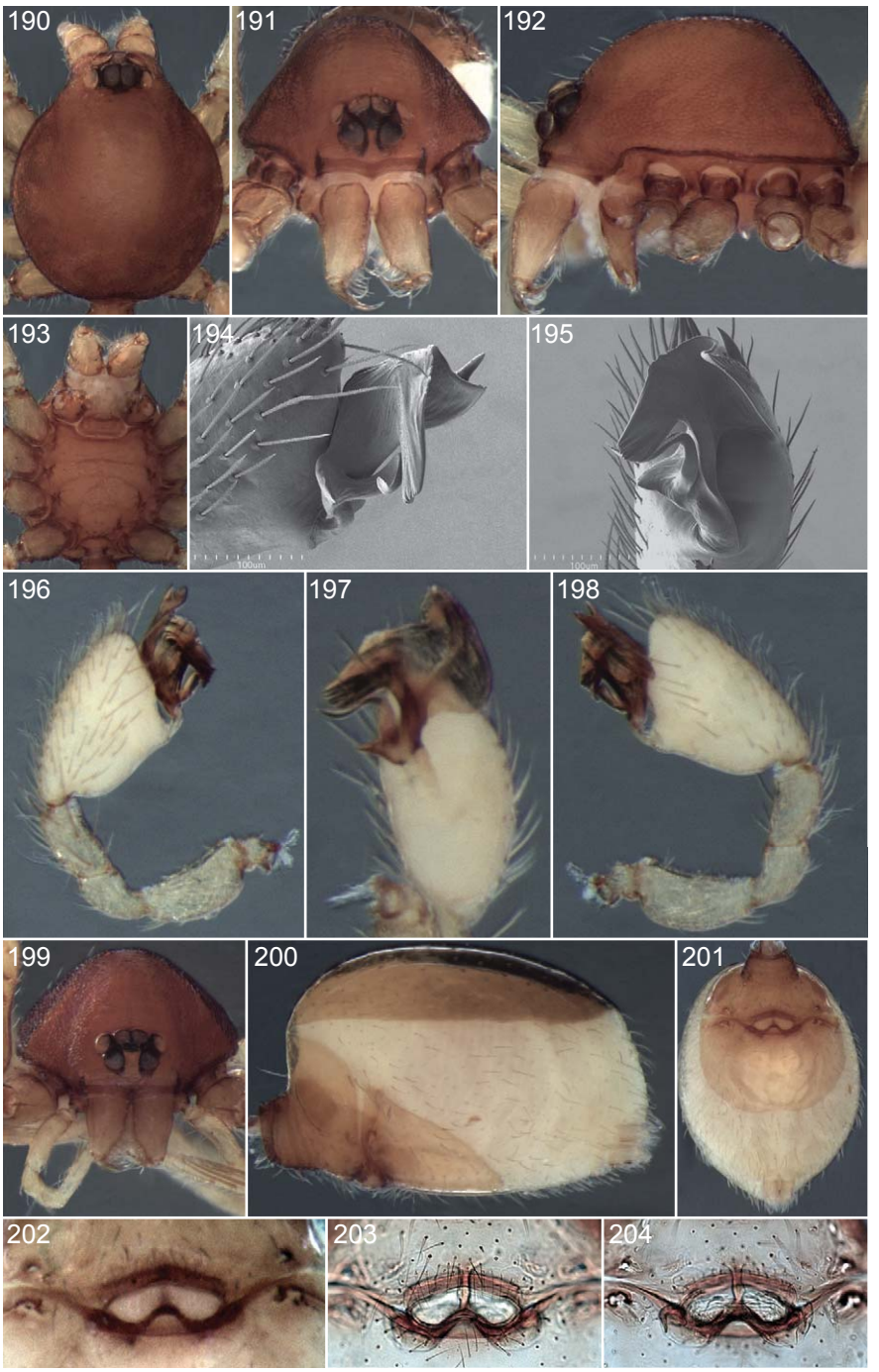
Other Material Examined: **Guatemala:** *Alta Verapaz:* Sierra de Chinajá, 15.99443°N, 90.23710°W, Nov. 9, 2009, tropical moist forest litter, elev. 720 m (L. Sáenz, MCZ PBI_OON 781), 1♂; Tzuul Taq'a, 15.84800°N, 90.50394°W, Nov. 11, 2009, tropical moist forest litter, elev. 450 m (L. Sáenz, MCZ PBI_OON 782), 1♂.

Distribution: Northern Guatemala (Petén and Alta Verapaz).

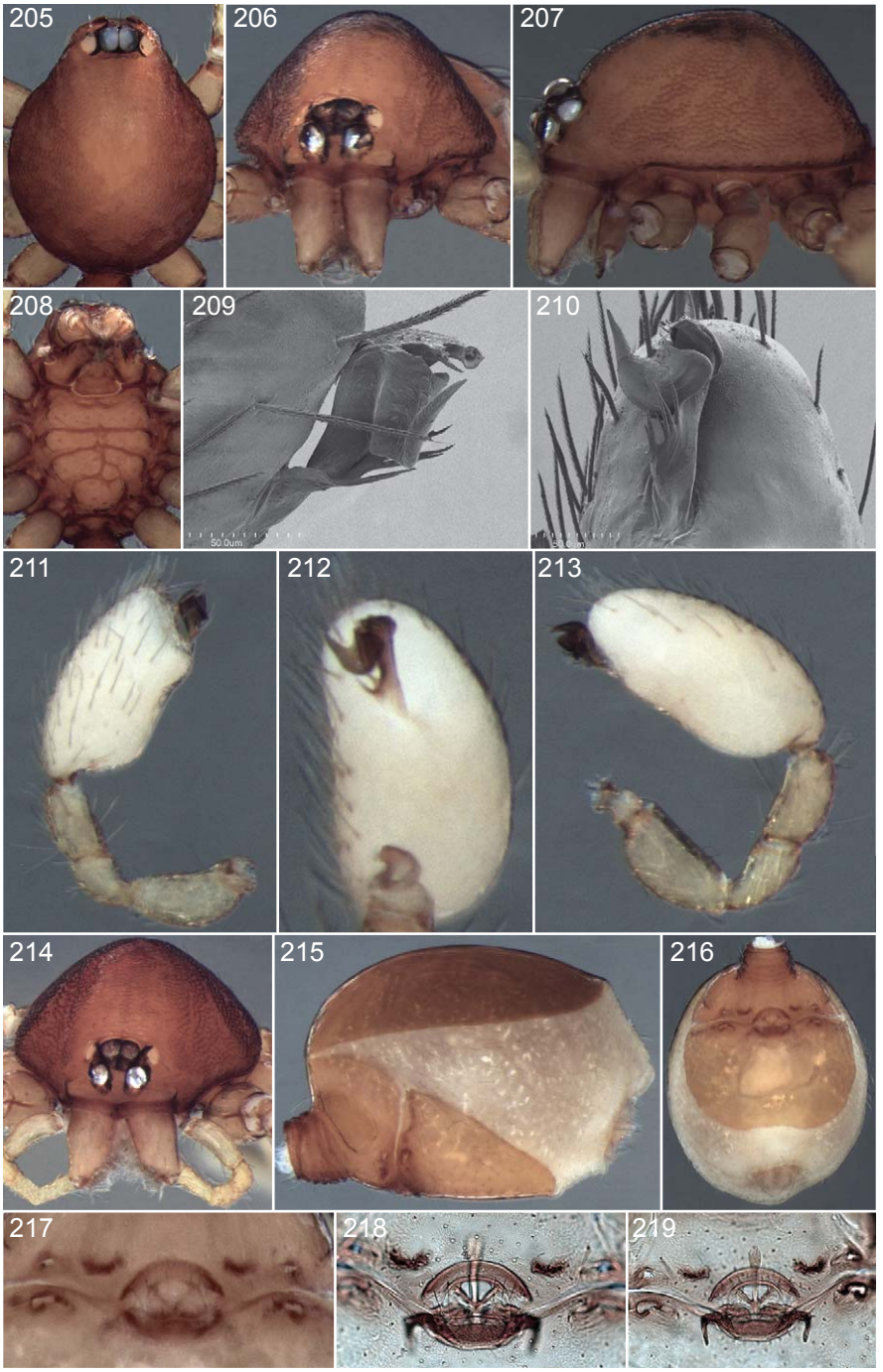
Costarina macha, new species

Figures 220–234

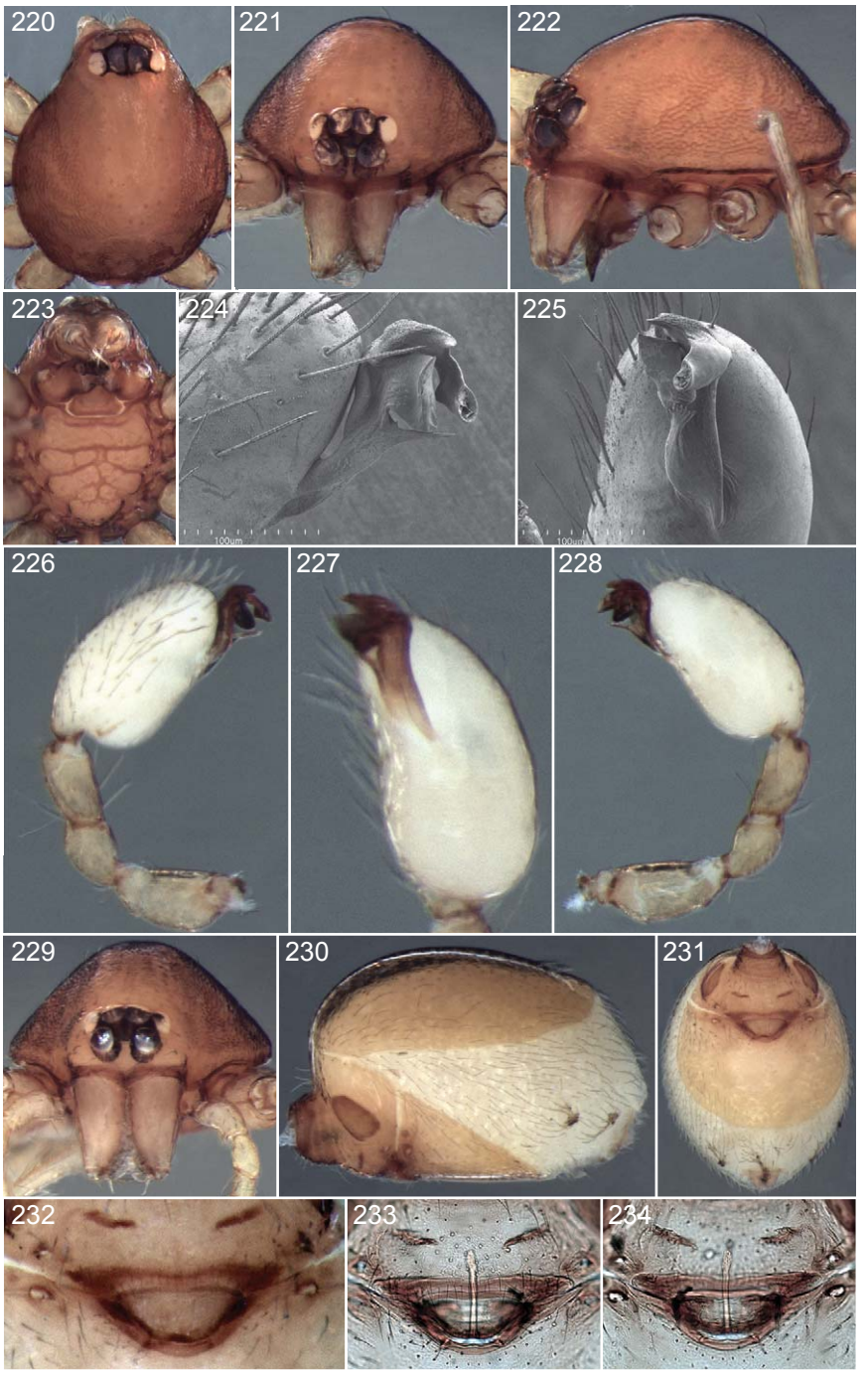
Types: Male holotype, female allotype, two male paratypes, and three female paratypes from a Winkler sample of tropical moist forest litter taken at an elevation of 390 m at a site 13 km NW of Machaquilá, 16.44147064°N, 89.53447°W, Petén, Guatemala (May 28, 2009), depos-



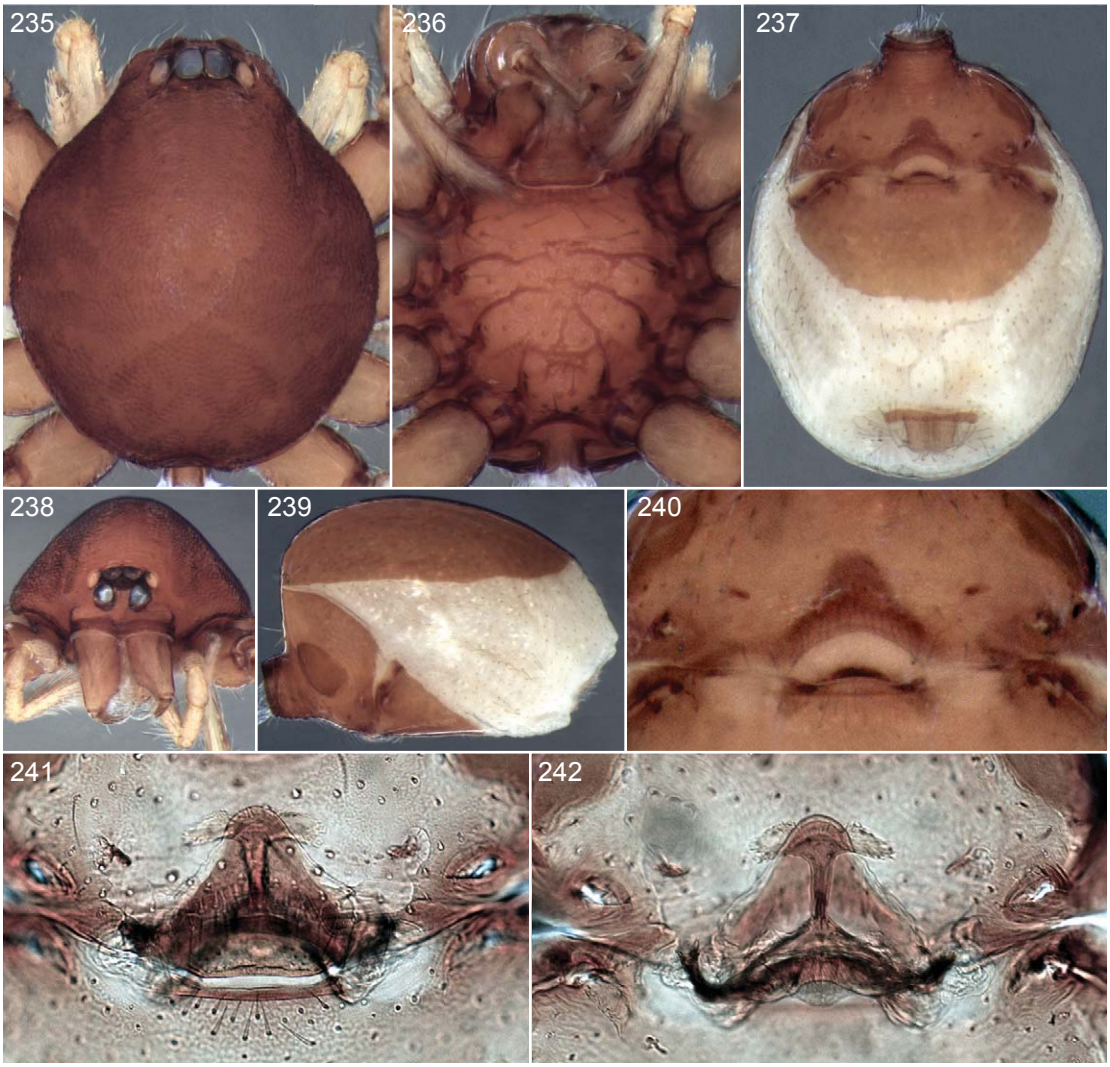
FIGS. 190–204. *Costarina belmopan,* new species, male (190–198) and female (199–204). **190.** Carapace, dorsal view. **191, 199.** Same, anterior view. **192.** Same, lateral view. **193.** Sternum, ventral view. **194.** Left embolus, prolateral view. **195.** Same, ventral view. **196.** Left palp, prolateral view. **197.** Same, ventral view. **198.** Same, retrolateral view. **200.** Abdomen, lateral view. **201.** Same, ventral view. **202, 203.** Genitalia, ventral view. **204.** Same, dorsal view.



FIGS. 205–219. *Costarina peten,* new species, male (205–213) and female (214–219). **205.** Carapace, dorsal view. **206, 214.** Same, anterior view. **207.** Same, lateral view. **208.** Sternum, ventral view. **209.** Left embolus, prolateral view. **210.** Same, ventral view. **211.** Left palp, prolateral view. **212.** Same, ventral view. **213.** Same, retrolateral view. **215.** Abdomen, lateral view. **216.** Same, ventral view. **217, 218.** Genitalia, ventral view. **219.** Same, dorsal view.



FIGS. 220–234. *Costarina macha,* new species, male (220–228) and female (229–234). **220.** Carapace, dorsal view. **221, 229.** Same, anterior view. **222.** Same, lateral view. **223.** Sternum, ventral view. **224.** Left embolus, prolateral view. **225.** Same, ventral view. **226.** Left palp, prolateral view. **227.** Same, ventral view. **228.** Same, retrolateral view. **230.** Abdomen, lateral view. **231.** Same, ventral view. **232, 233.** Genitalia, ventral view. **234.** Same, dorsal view.



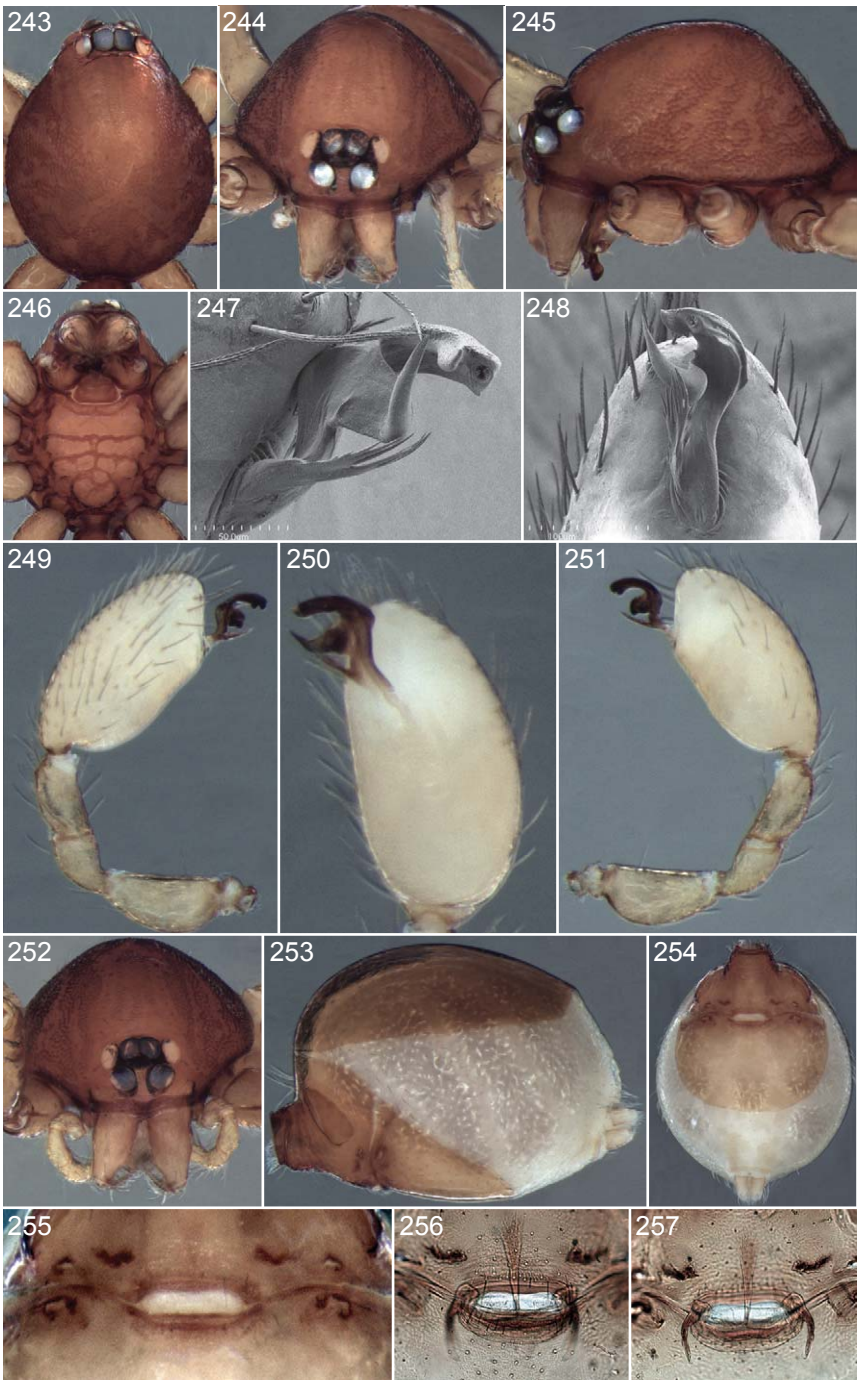
FIGS 235–242. *Costarina cahui,* new species, female. **235.** Carapace, dorsal view. **236.** Sternum, ventral view. **237.** Abdomen, same. **238.** Carapace, anterior view. **239.** Abdomen, lateral view. **240, 241.** Genitalia, ventral view. **242.** Same, dorsal view.

ited in MCZ (89583, PBI_OON 29655).

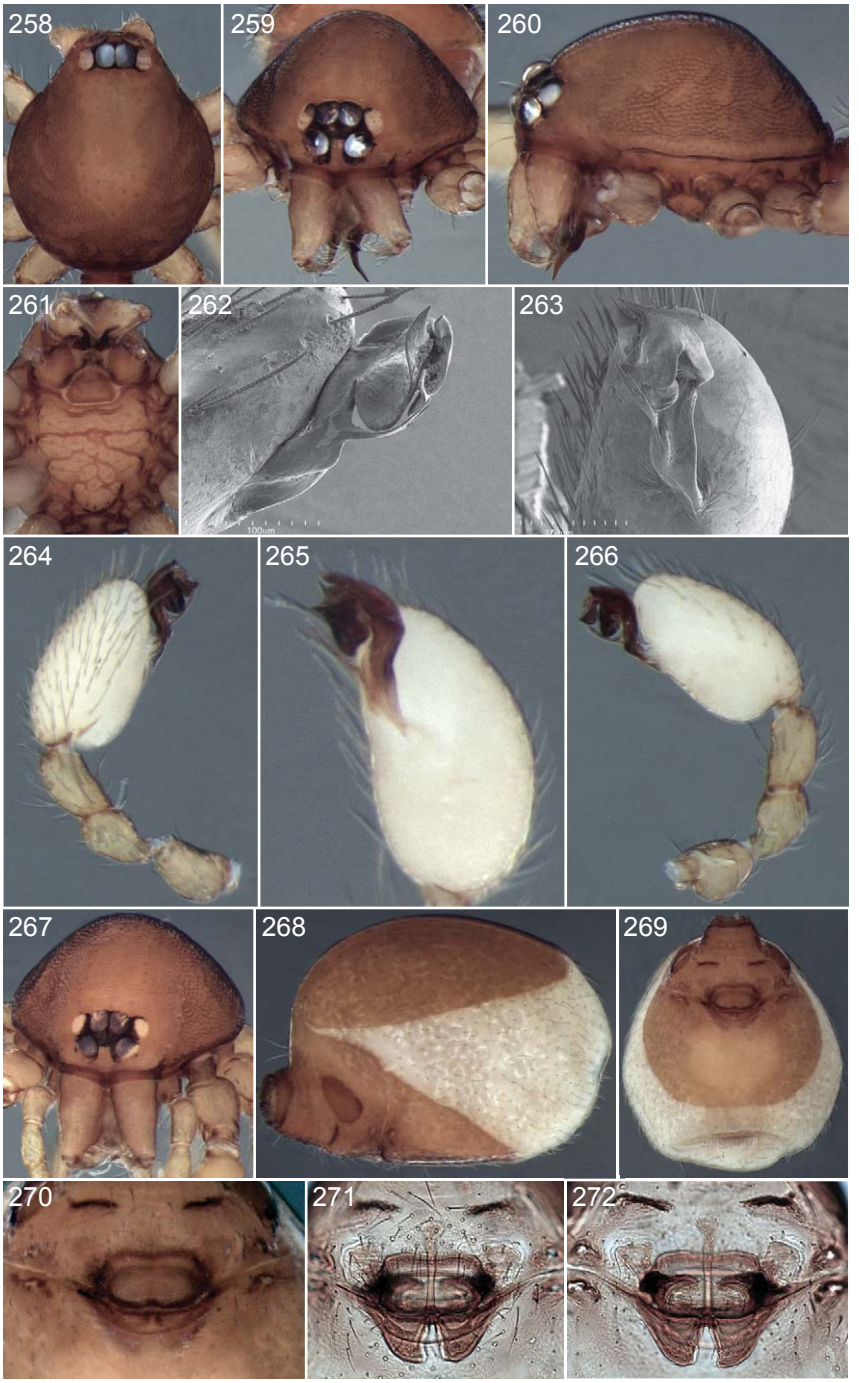
Etymology: The specific name is a noun in apposition shortened from the type locality.

Diagnosis: Although sympatric with *C. peten*, males can easily be distinguished by the massive distal projections on the endites (figs. 222, 223) and the much more complex embolus, which bears a thin, basal spur and a distally recurved proximal embolar prong (figs. 224–228); females have an enlarged, triangular genital atrium (figs. 232–234).

Male (PBI_OON 29655, figs. 220–228): Total length 1.79. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral prong short, wide, dorsal prong hypertrophied, heavily sclerotized, with two laterally directed



FIGS. 243–257. *Costarina morales,* new species, male (243–251) and female (252–257). **243.** Carapace, dorsal view. **244, 252.** Same, anterior view. **245.** Same, lateral view. **246.** Sternum, ventral view. **247.** Left embolus, prolateral view. **248.** Same, ventral view. **249.** Left palp, prolateral view. **250.** Same, ventral view. **251.** Same, retrolateral view. **253.** Abdomen, lateral view. **254.** Same, ventral view. **255, 256.** Genitalia, ventral view. **257.** Same, dorsal view.



FIGS. 258–272. *Costarina izabal,* new species, male (258–266) and female (267–272). **258.** Carapace, dorsal view. **259, 267.** Same, anterior view. **260.** Same, lateral view. **261.** Sternum, ventral view. **262.** Left embolus, prolateral view. **263.** Same, ventral view. **264.** Left palp, prolateral view. **265.** Same, ventral view. **266.** Same, retrolateral view. **268.** Abdomen, lateral view. **269.** Same, ventral view. **270, 271.** Genitalia, ventral view. **272.** Same, dorsal view.

prongs. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with long, thin basal spur; proximal embolar prong distally recurved, distal prong long, smoothly arched.

Female (PBI_OON 29655, figs. 229–234): Total length 1.83. Dorsal scutum covering more than 3/4 of abdomen, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-1, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium triangular, entire atrium rebordered, posterior margin slightly invaginated at midline.

Other Material Examined: **Guatemala:** *Petén:* 13 km NW Machaquilá, 16.44568931°N, 89.54981728°W, May 27, 2009, Winkler, tropical moist forest litter, elev. 400 m (MCZ 89327, PBI_OON 37492), 1♀.

Distribution: Northern Guatemala (Petén).

Costarina cahui, new species

Figures 235–242

Type: Female holotype and two female paratypes from Winkler sample of tropical moist forest litter taken at an elevation of 250 m at Cerro Cahuí, 17.00225704°N, 89.71661333°W, Petén, Guatemala (May 22, 2009), deposited in MCZ (89327, PBI_OON 778).

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

Diagnosis: Although sympatric with *C. belmopan*, females can easily be distinguished by the small, triangular genital atrium and the large, triangular sclerite visible through the cuticle just anterior of the atrium (figs. 240–242).

Male: Unknown.

Female (PBI_OON 778, figs. 235–242): Total length 2.16. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v2-2-0. Genital atrium triangular, large triangular sclerite situated anterior of atrium, clearly visible through cuticle.

Other Material Examined: **Guatemala:** *Petén:* Parque Nacional Tikal, 17.24033736°N, 89.62094017°W, May 22, 2009, Winkler, tropical moist forest litter, elev. 270 m (MCZ PBI_OON 43541), 1♀.

Distribution: Northern Guatemala (Petén).

Costarina morales, new species

Figures 243–257

Types: Male holotype, female allotype, and female paratype from Winkler sample of secondary lowland tropical rainforest litter taken at an elevation of 195 m at a site 5 km NW of Morales, 15.51070069°N, 88.86093539°W, Izabal, Guatemala (May 17, 2009), deposited in MCZ (89540, PBI_OON 40798).

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

Diagnosis: Although sympatric with *C. izabal*, males can be distinguished by the hypertrophied dorsal projection on the endites (figs. 245, 246) and the long, narrow proximal embolar prong, which is widely separated from the long, arched distal embolar prong (figs. 247–251); females can be distinguished by the very short, rectangular genital atrium (figs. 255–257).

Male (PBI_OON 37466, figs. 243–251): Total length 1.94. ALE separated by their radius to diameter. Sternum anterior margin with interrupted transverse groove. Endites with ventral process long, narrow, dorsal process with hypertrophied, heavily sclerotized distal projection, tip of projection directed laterally. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femora: I p0-0-2, r0-1-0; II p0-0-2; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Embolus with proximal prong long, narrow, widely separated from long, arched distal prong.

Female (PBI_OON 40798, figs. 252–257): Total length 2.40. ALE separated by less than their radius. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Genital atrium very short, wide, posterior margin thickened.

Other Material Examined: **Guatemala:** *Izabal:* Finca La Firmeza, 10.7 km SE Morales, 15°24.4′N, 88°41.8″W, Sept. 19, 2008, montane rainforest litter, elev. 500 m (L. Sáenz, MCZ PBI_OON 779), 1♀; Firmeza, 15.40708°N, 88.69612°W, Sept. 19, 2008, Winkler, montane rainforest litter, elev. 590 m (R. Anderson, MCZ 83476, PBI_OON 37466), 2♂.

Distribution: Northern Guatemala (Izabal).

Costarina izabal, new species

Figures 258–272

Types: Male holotype and male paratype from Winkler sample of secondary lowland rainforest litter taken at an elevation of 245 m at a site 5 km NW of Morales, 15.51070069°N, 88.86093539°W, Izabal, Guatemala (May 17, 2009), deposited in MCZ (89371, PBI_OON 40797).

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

Diagnosis: Although sympatric with *C. morales*, this species is probably closer to *C. macha*; males can easily be distinguished by the long, sharply pointed anterior projections on the endites (figs. 259–261) and the widened, complexly shaped proximal embolar prong (figs. 262–266), female by the protuberance occupying most of the genital atrium (figs. 270–272).

Male (PBI_OON 40797, figs. 258–266): Total length 1.72. ALE separated by less than their radius. Sternum anterior margin with interrupted transverse groove. Endites with ventral prong narrow, sharply pointed, dorsal prong hypertrophied, with fanglike anterolateral projections. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with proximal prong widened, complexly shaped, distal prong long, strongly arched.

Female (PBI_OON 780, figs. 267–272): Total length 1.90. ALE separated by their radius to diameter. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Genital atrium large, rectangular, almost completely filled with rectangular protuberance.

Other Material Examined: **Guatemala:** *Izabal:* Finca La Firmeza, 10.7 km SE Morales, 15°24.4′N, 88°41.8″W, Sept. 19, 2008, montane rainforest litter, elev. 500 m (L. Sáenz, MCZ 82946, PBI_OON 37465), 1♀; 5 km NW Morales, 15.51070069°N, 88.86093539°W, May 17, 2009, Winkler, secondary lowland tropical rainforest litter, elev. 195 m (MCZ PBI_OON 780), 1♀.

Distribution: Northern Guatemala (Izabal).

Key to Species from Honduras

1. Males.....2
– Females (those of *C. branstetteri* unknown).....12
2. Proximal prong of embolus extending further distally than distal prong (as in figs. 14, 323, 407).....3
– Proximal prong of embolus otherwise.....5
3. Proximal prong of embolus greatly widened at base (figs. 14, 15).....*plena*
– Proximal prong of embolus not widened at base (figs. 323, 407).....4
4. Distal prong of embolus relatively short (figs. 407, 409).....*gracias*
– Distal prong of embolus relatively long (figs. 323, 325).....*tela*
5. Proximal prong of embolus with tip long, narrow (figs. 338, 362, 392).....6
– Proximal prong of embolus with broad tip.....8
6. Proximal prong of embolus narrow throughout, sinuous (fig. 392).....*coma*
– Proximal prong of embolus with wide base.....7
7. Proximal prong of embolus with tip much longer than base (fig. 338).....*ceiba*
– Proximal prong of embolus with tip shorter (fig. 362).....*olancho*
8. Proximal prong of embolus relatively narrow (figs. 352, 353).....*branstetteri*
– Proximal prong of embolus wide, squared (figs. 277, 292, 307, 376).....9
9. Proximal prong of embolus relatively short, wide (figs. 278, 280).....*cortes*
– Proximal prong of embolus longer.....10
10. Distal prong of embolus bifid (figs. 376, 377).....*muralla*
– Distal prong of embolus entire (figs. 293, 308).....11
11. Proximal prong of embolus angular (figs. 292, 293).....*cofradia*
– Proximal prong of embolus rounded (figs. 307, 308).....*cusuco*
12. Genitalic apodemes short, wide (fig. 401).....*coma*
– Genitalic apodemes narrow (as in fig. 75).....13
13. Genitalic apodemes longer than genital atrium (figs. 302, 317).....14
– Genitalic apodemes shorter than genital atrium.....15

14. Anterior margin of genital atrium thick (figs. 301, 302).....*cofradia*
– Anterior margin of genital atrium thin (figs. 316, 317).....*cusuco*
15. Genitalic apodemes extending about as far posteriorly as posterior margin of genital atrium (figs. 347, 371, 386).....16
– Genitalic apodemes extending far posteriorly of posterior margin of genital atrium (as in figs. 287, 332).....18
16. Anterior genitalic process not expanded at tip (fig. 347).....*ceiba*
– Anterior genitalic process expanded at tip (figs. 371, 386).....17
17. Anterior margin of genital atrium widest anteriorly (fig. 371).....*olancho*
– Anterior margin of genital atrium widest posteriorly (fig. 386).....*muralla*
18. Anterior genitalic process not expanded at tip (figs. 75, 287).....19
– Anterior genitalic process expanded at tip (figs. 332, 416).....20
19. Genital atrium oval (fig. 73).....*plena*
– Genital atrium triangular (fig. 285).....*cortes*
20. Anterior genitalic process with triangular tip (fig. 416).....*gracias*
– Anterior genitalic process with square tip (fig. 332).....*tela*

Costarina cortes, new species

Figures 273–287

Type: Male holotype taken from mesophyll forest litter at an elevation of 1330 m in the Parque Nacional Cusuco, 15.48683°N, 88.23425°W, Cortés, Honduras (May 30, 2010), deposited in MCZ (PBI_OON 784).

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

Diagnosis: Although sympatric with *C. cofradia*, males can be recognized by the sharp projections on the endites (figs. 274–276) and the rectangular tips of both the proximal and distal embolar prongs (figs. 277–281), females by the rounded projection filling the genital atrium (figs. 285–287).

Male (PBI_OON 783, figs. 273–281): Total length 1.75. ALE separated by their radius to diameter. Sternum anterior margin with interrupted transverse groove. Endites with ventral process long, narrow, dorsal process triangular, tip with laterally directed hook. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with proximal and distal embolar prongs rectangular in ventral view.

Female (PBI_OON 783, figs. 282–287): Total length 1.96. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v2-2-1p. Genital atrium large, ovoid, mostly filled by triangular protuberance.

Other Material Examined: **Honduras:** *Cortés:* Parque Nacional Cusuco, 15.48940°N, 88.23681°W, May 30, 2010, mesophyll forest litter, elev. 1290 m (MCZ PBI_OON 783), 4♂, 6♀.

Distribution: Honduras (Cortés).

Costarina cofradia, new species

Figures 288–302

Types: Male holotype, female allotype, six male paratypes, and two female paratypes taken from cloud forest litter at a site 25 km N of Cofradía, Parque Nacional Cusuco, Cortés, Honduras (July 26, 1994; S., J. Peck), deposited in FMNH (56881, PBI_OON 10824).

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

Diagnosis: Although sympatric with *C. cortes*, males can be recognized by the much narrower anterior projections on the endites (figs. 290, 291) and large retrolateral lobe on the proximal embolar prong (figs. 292–296), females by the much shorter genital atrium, the posterior margin of which has a slight invagination at the midline, where the very long anterior genitalic process arises (figs. 300–302).

Male (PBI_OON 10824, figs. 288–296): Total length 1.76. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral prong short, wide, dorsal prong with narrow, anterolaterally directed extension. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-2; II v4-4-0; metatarsi I, II v2-2-1p. Embolus proximal prong with rounded retrolateral lobe, distal prong angular.

Female (PBI_OON 10798, figs. 297–302): Total length 2.28. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium short, wide, posterior margin slightly invaginated at midline; anterior genitalic process long, extending far anterior of anterior margin of genitalic atrium.

Other Material Examined: **Honduras:** *Cortés:* Lago de Yajoa, Aug. 23–28, 1994, flight intercept trap, tropical evergreen forest, elev. 650 m (S., J. Peck, FMNH 56583, PBI_OON 10798), 1♀; Parque Nacional Cusuco, 15.48683°N, 88.23425°W, May 30, 2010, mesophyll forest litter, elev. 1330 m (MCZ 99766, PBI_OON 785), 1♀.

Distribution: Honduras (Cortés).

Costarina cusuco, new species

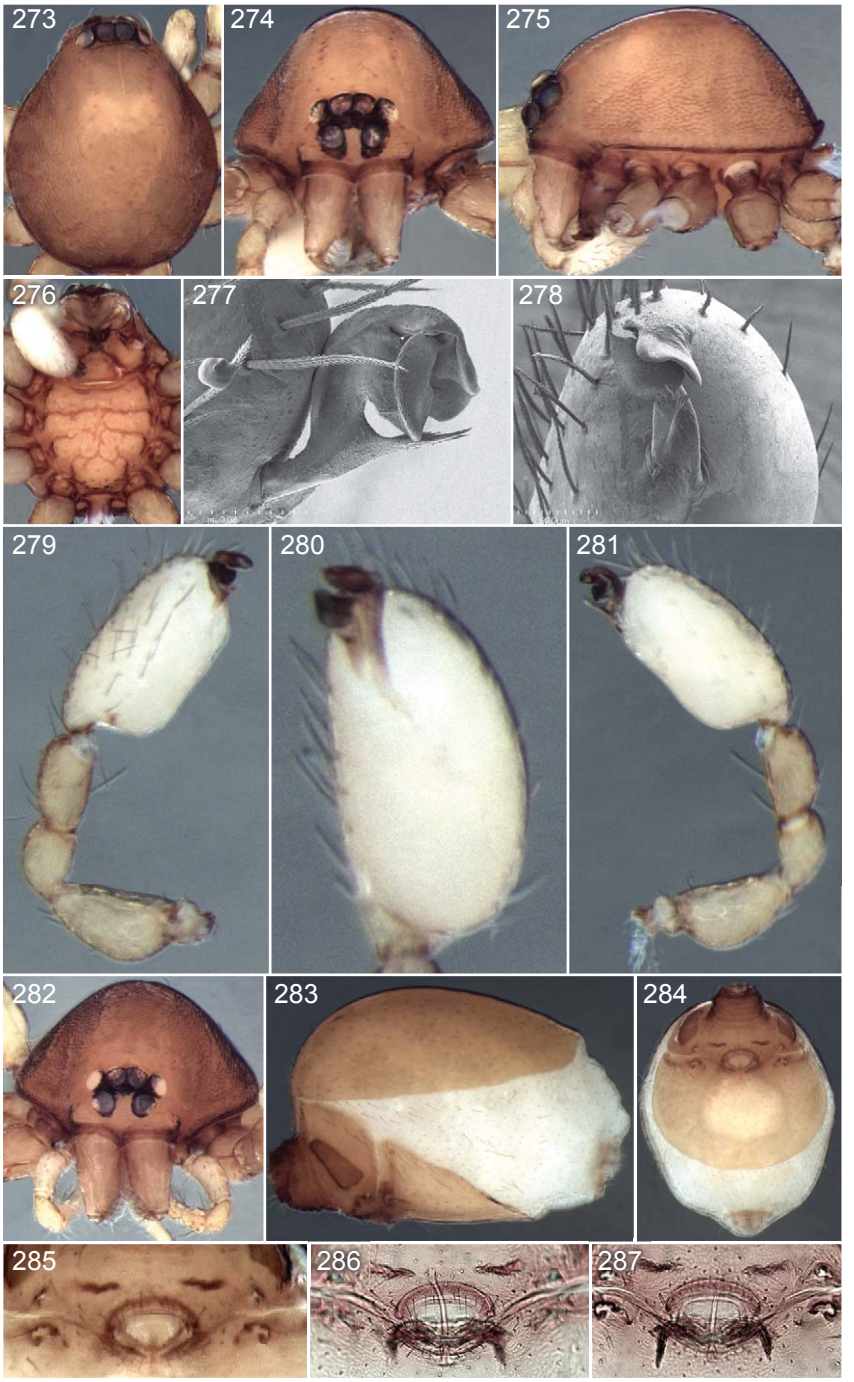
Figures 303–317

Types: Male holotype and female allotype taken in a montane forest at an elevation of 2075 m in the Parque Nacional Cusuco, Cortés, Honduras (July–Sept. 2007; J. Nunez-Mino), deposited in AMNH (PBI_OON 40133).

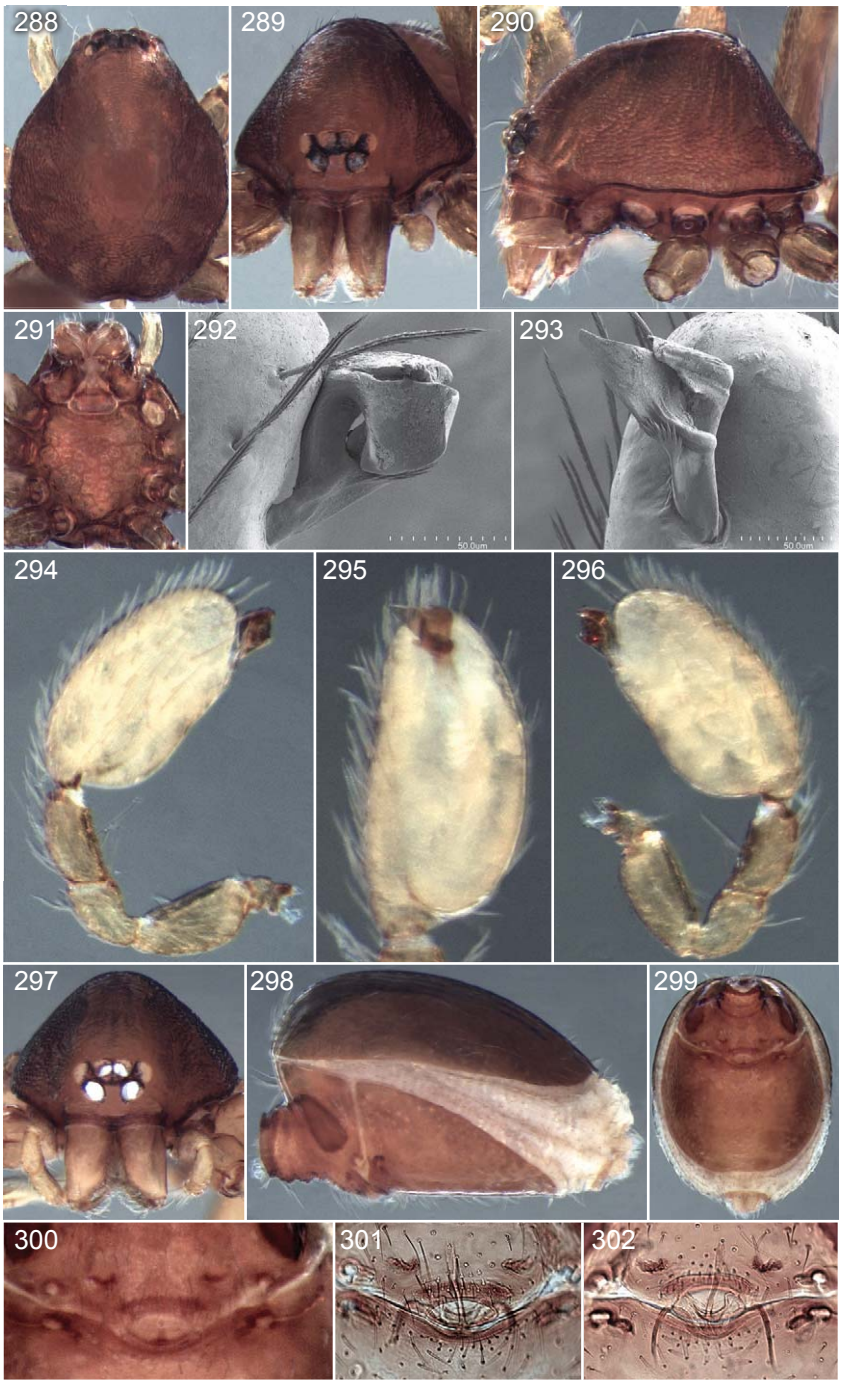
Etymology: The specific name is a noun in apposition taken from the type locality.

Diagnosis: Males can be recognized by the flag-shaped proximal embolar prong (figs. 307–311), females by the rectangular posterior sclerotization at the base of the semicircular genital atrium (figs. 315–317).

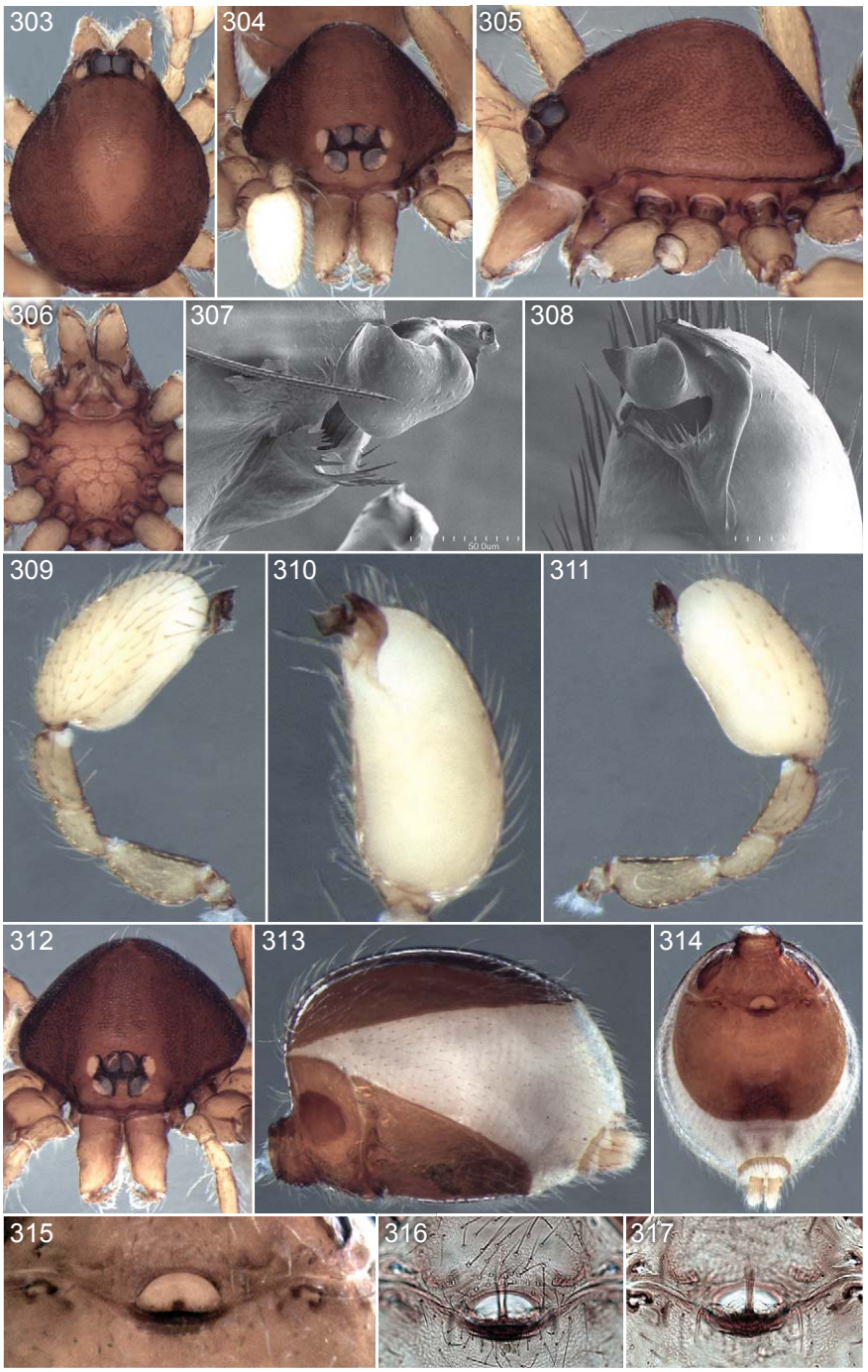
Male (PBI_OON 40133, figs. 303–311): Total length 2.20. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, dorsal process long, with very long, ventrally directed extension.



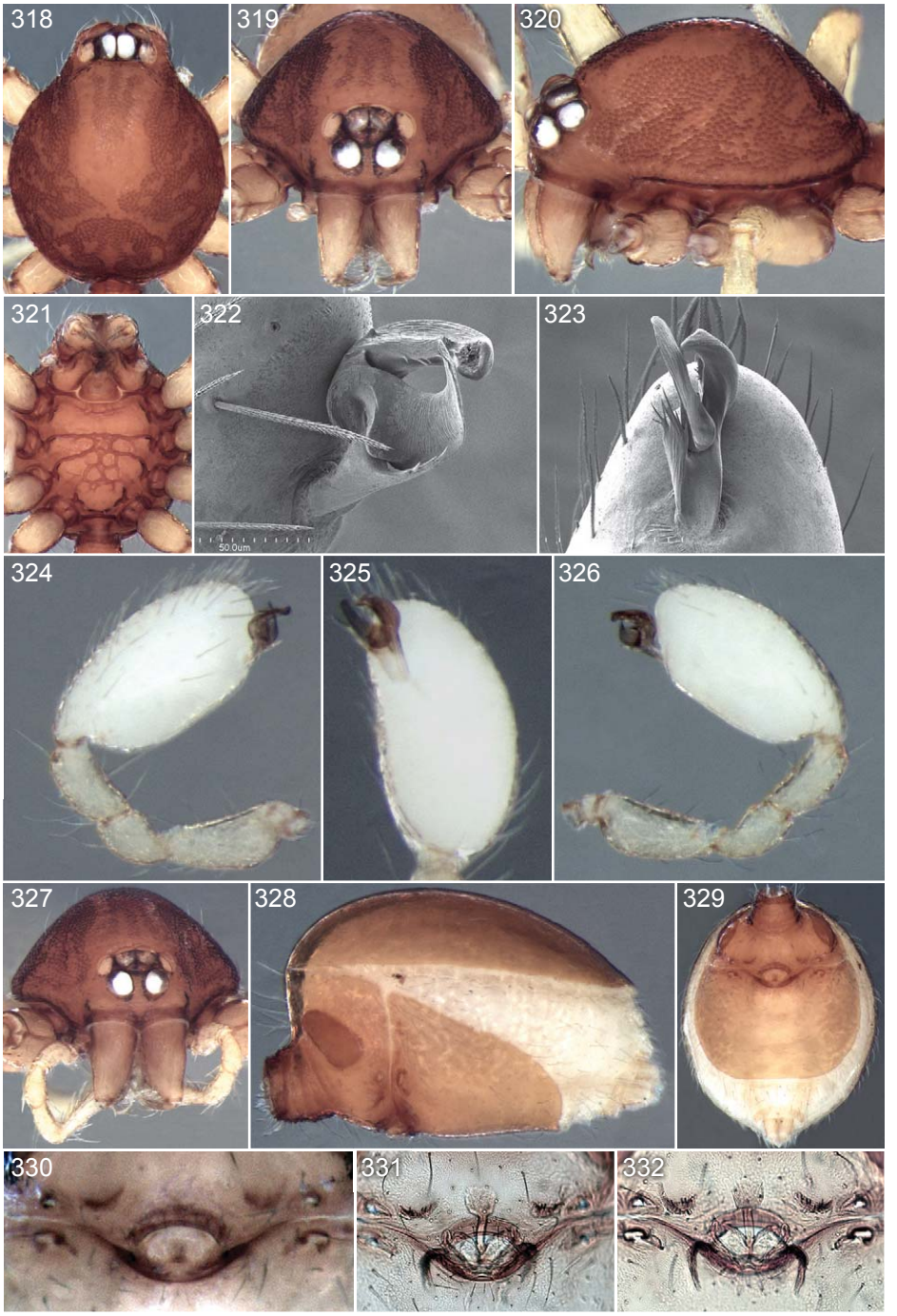
FIGS. 273–287. *Costarina cortes,* new species, male (273–281) and female (282–287). **273.** Carapace, dorsal view. **274, 282.** Same, anterior view. **275.** Same, lateral view. **276.** Sternum, ventral view. **277.** Left embolus, prolateral view. **278.** Same, ventral view. **279.** Left palp, prolateral view. **280.** Same, ventral view. **281.** Same, retrolateral view. **283.** Abdomen, lateral view. **284.** Same, ventral view. **285, 286.** Genitalia, ventral view. **287.** Same, dorsal view.



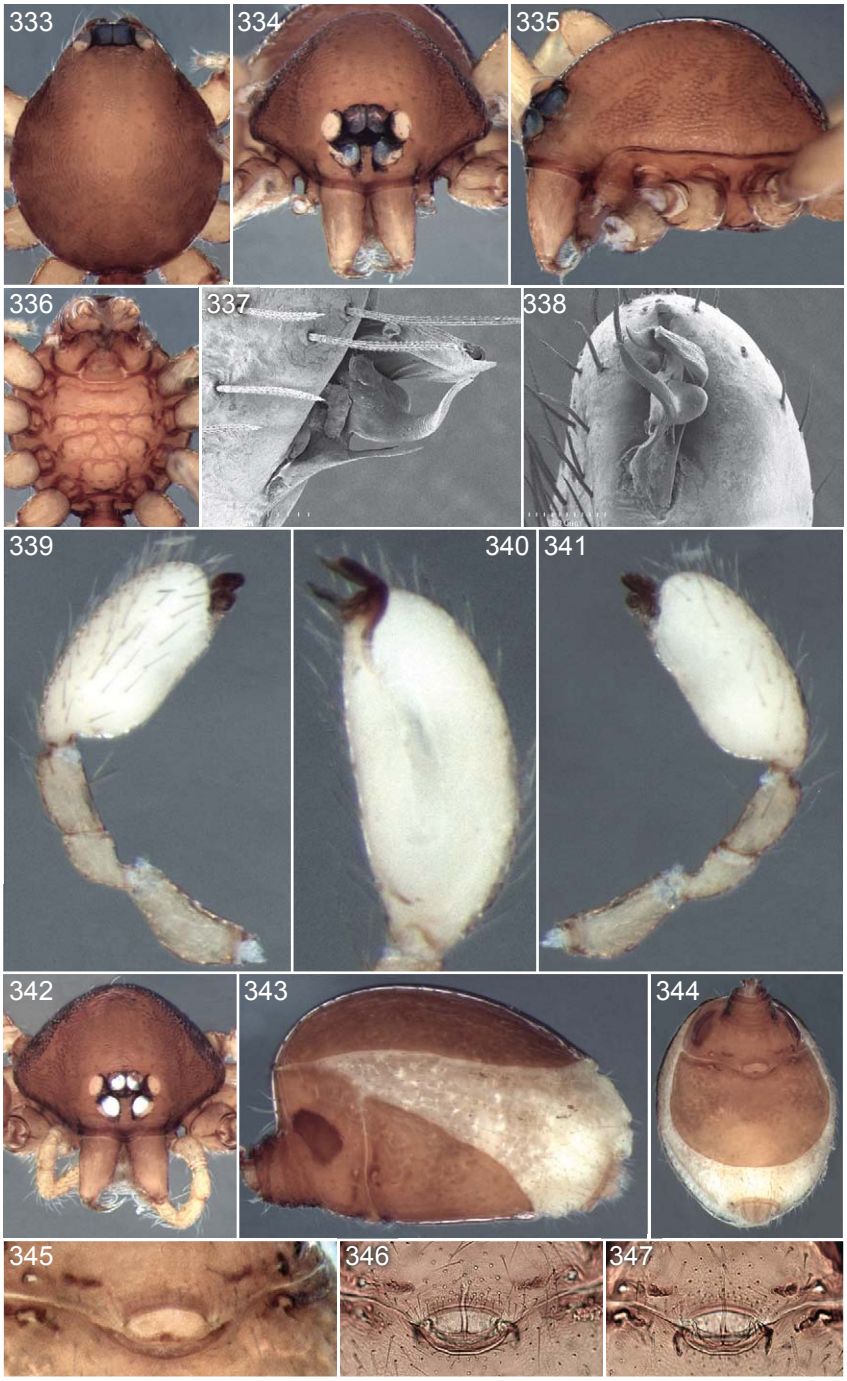
FIGS. 288–302. *Costarina cofradia,* new species, male (288–296) and female (297–302). **288.** Carapace, dorsal view. **289, 297.** Same, anterior view. **290.** Same, lateral view. **291.** Sternum, ventral view. **292.** Left embolus, prolateral view. **293.** Same, ventral view. **294.** Left palp, prolateral view. **295.** Same, ventral view. **296.** Same, retrolateral view. **298.** Abdomen, lateral view. **299.** Same, ventral view. **300, 301.** Genitalia, ventral view. **302.** Same, dorsal view.



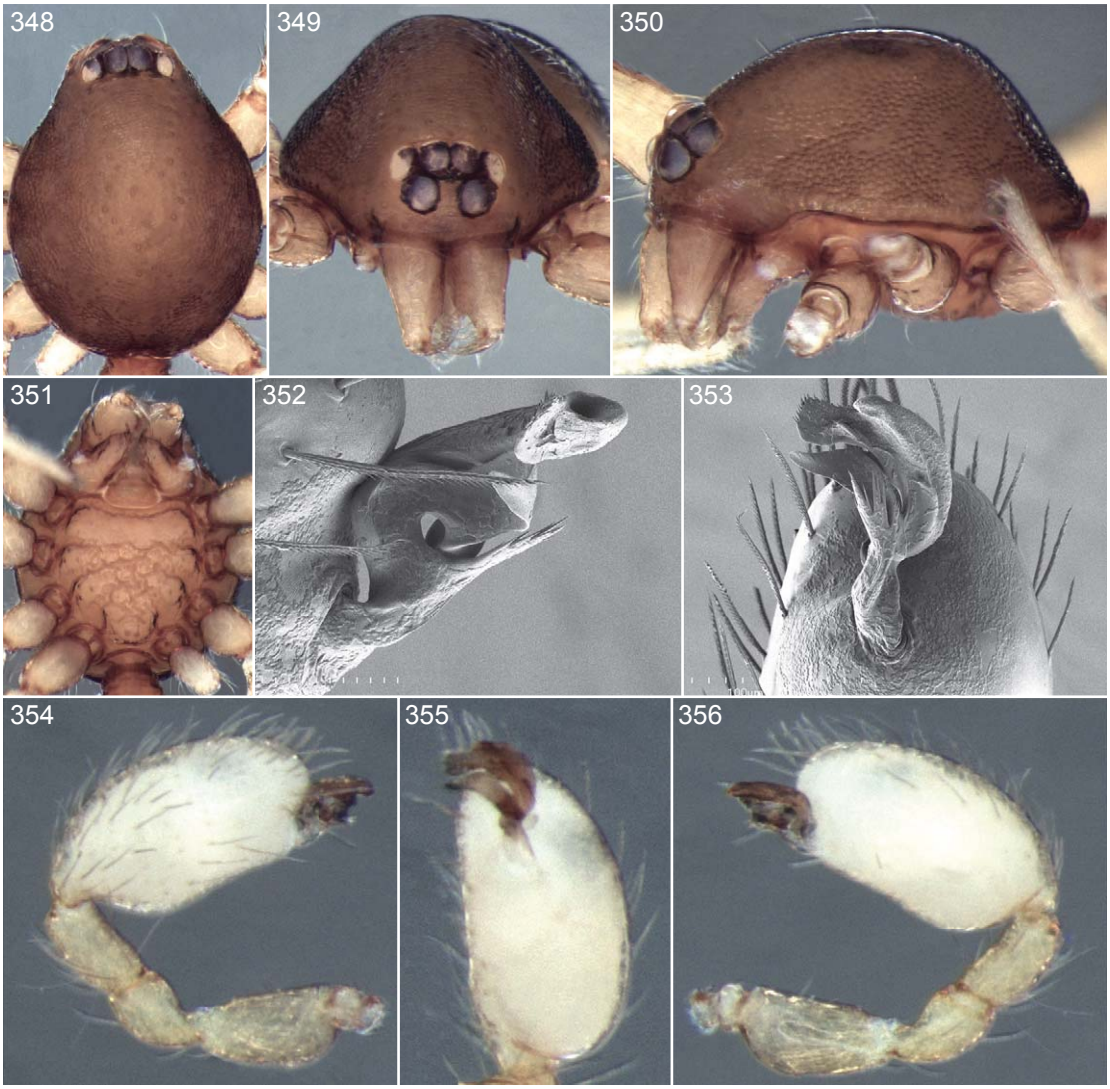
FIGS. 303–317. *Costarina cusuco,* new species, male (303–311) and female (312–317). **303.** Carapace, dorsal view. **304, 312.** Same, anterior view. **305.** Same, lateral view. **306.** Sternum, ventral view. **307.** Left embolus, prolateral view. **308.** Same, ventral view. **309.** Left palp, prolateral view. **310.** Same, ventral view. **311.** Same, retrolateral view. **313.** Abdomen, lateral view. **314.** Same, ventral view. **315, 316.** Genitalia, ventral view. **317.** Same, dorsal view.



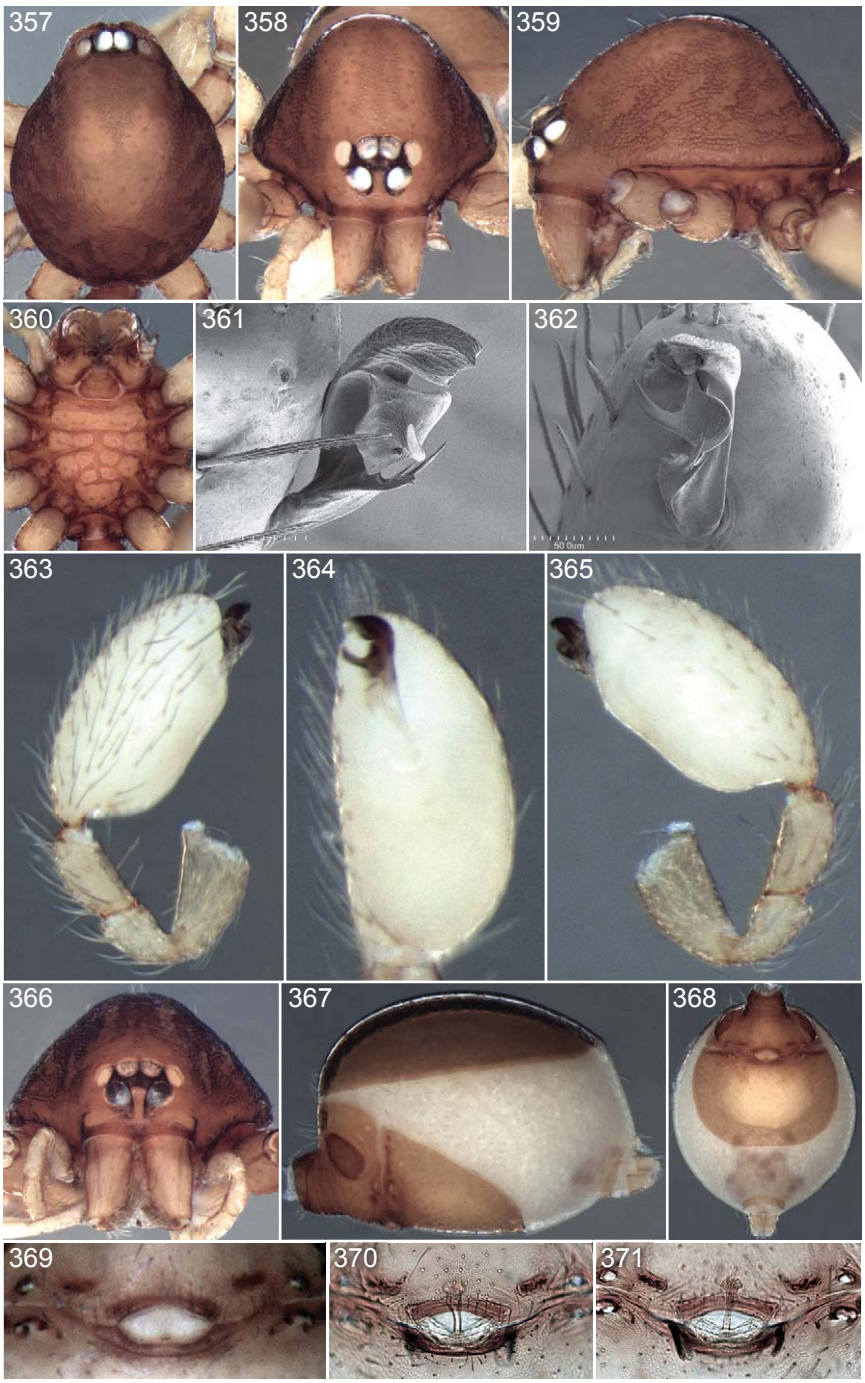
FIGS. 318–332. *Costarina tela,* new species, male (318–326) and female (327–332). **318.** Carapace, dorsal view. **319, 327.** Same, anterior view. **320.** Same, lateral view. **321.** Sternum, ventral view. **322.** Left embolus, prolateral view. **323.** Same, ventral view. **324.** Left palp, prolateral view. **325.** Same, ventral view. **326.** Same, retrolateral view. **328.** Abdomen, lateral view. **329.** Same, ventral view. **330, 331.** Genitalia, ventral view. **332.** Same, dorsal view.



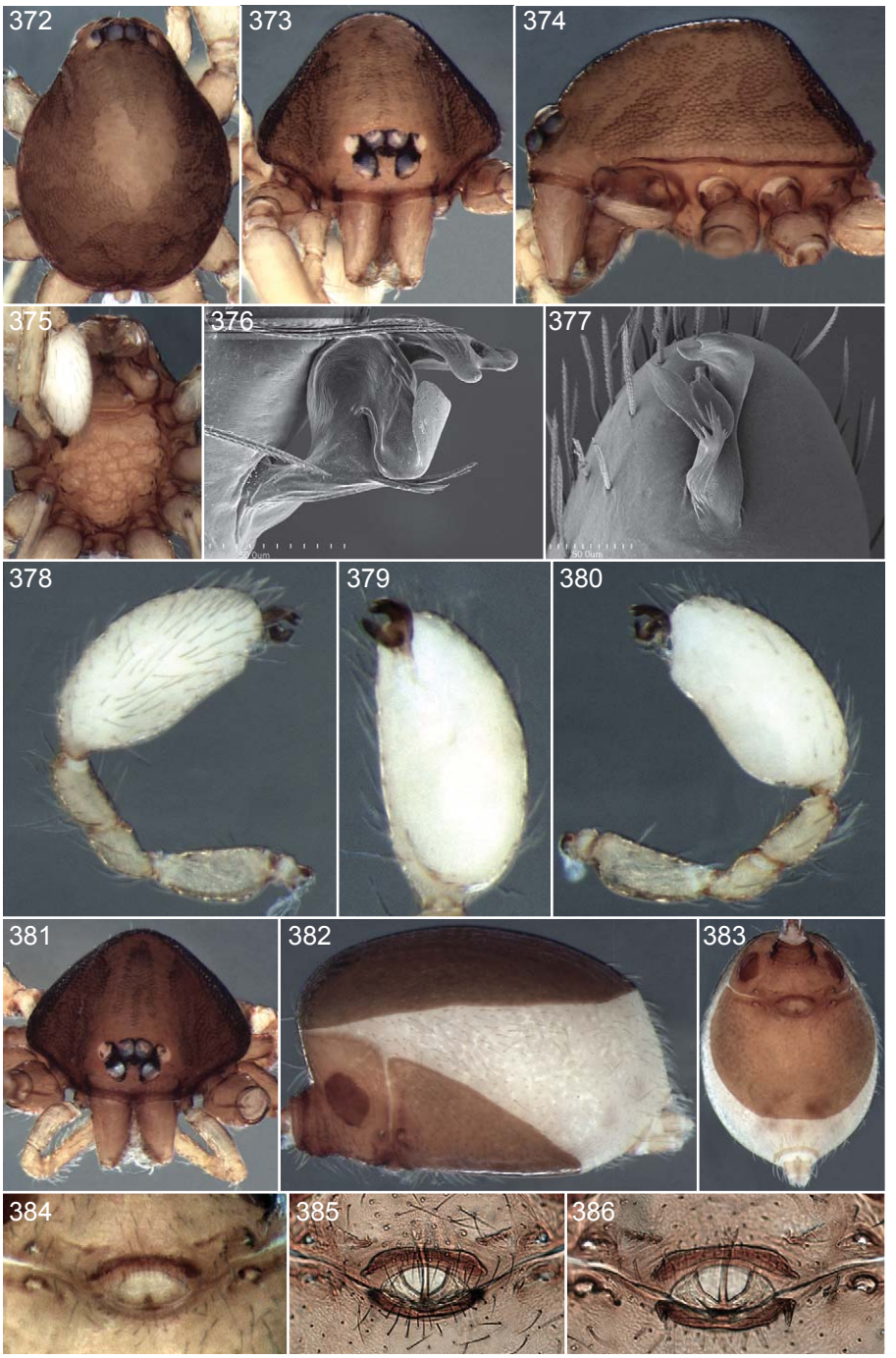
FIGS. 333–347. *Costarina ceiba,* new species, male (333–341) and female (342–347). **333.** Carapace, dorsal view. **334, 342.** Same, anterior view. **335.** Same, lateral view. **336.** Sternum, ventral view. **337.** Left embolus, prolateral view. **338.** Same, ventral view. **339.** Left palp, prolateral view. **340.** Same, ventral view. **341.** Same, retrolateral view. **343.** Abdomen, lateral view. **344.** Same, ventral view. **345, 346.** Genitalia, ventral view. **347.** Same, dorsal view.



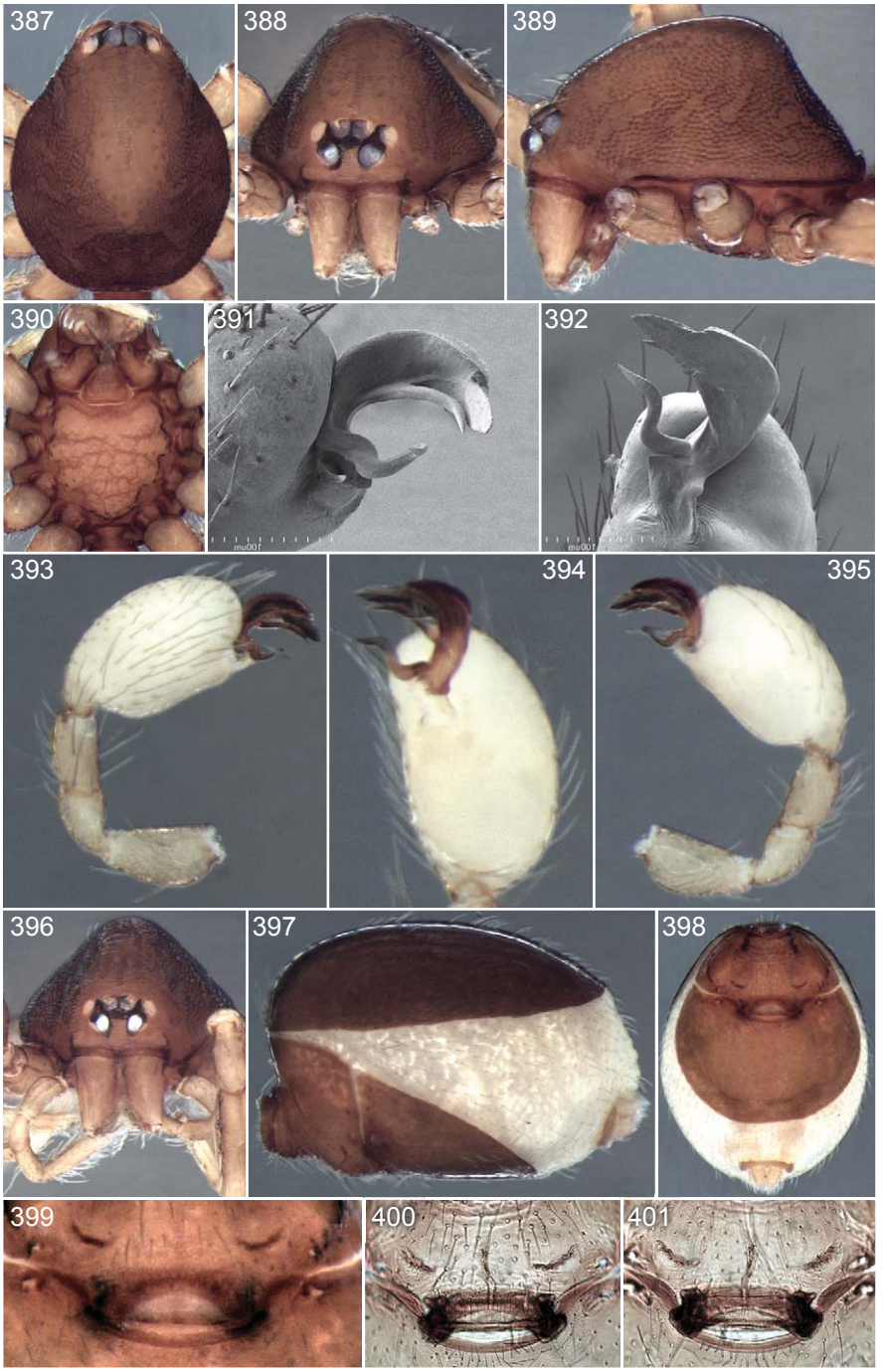
FIGS. 348–356. *Costarina branstetteri,* new species, male. **348.** Carapace, dorsal view. **349.** Same, anterior view. **350.** Same, lateral view. **351.** Sternum, ventral view. **352.** Left embolus, prolateral view. **353.** Same, ventral view. **354.** Left palp, prolateral view. **355.** Same, ventral view. **356.** Same, retrolateral view.



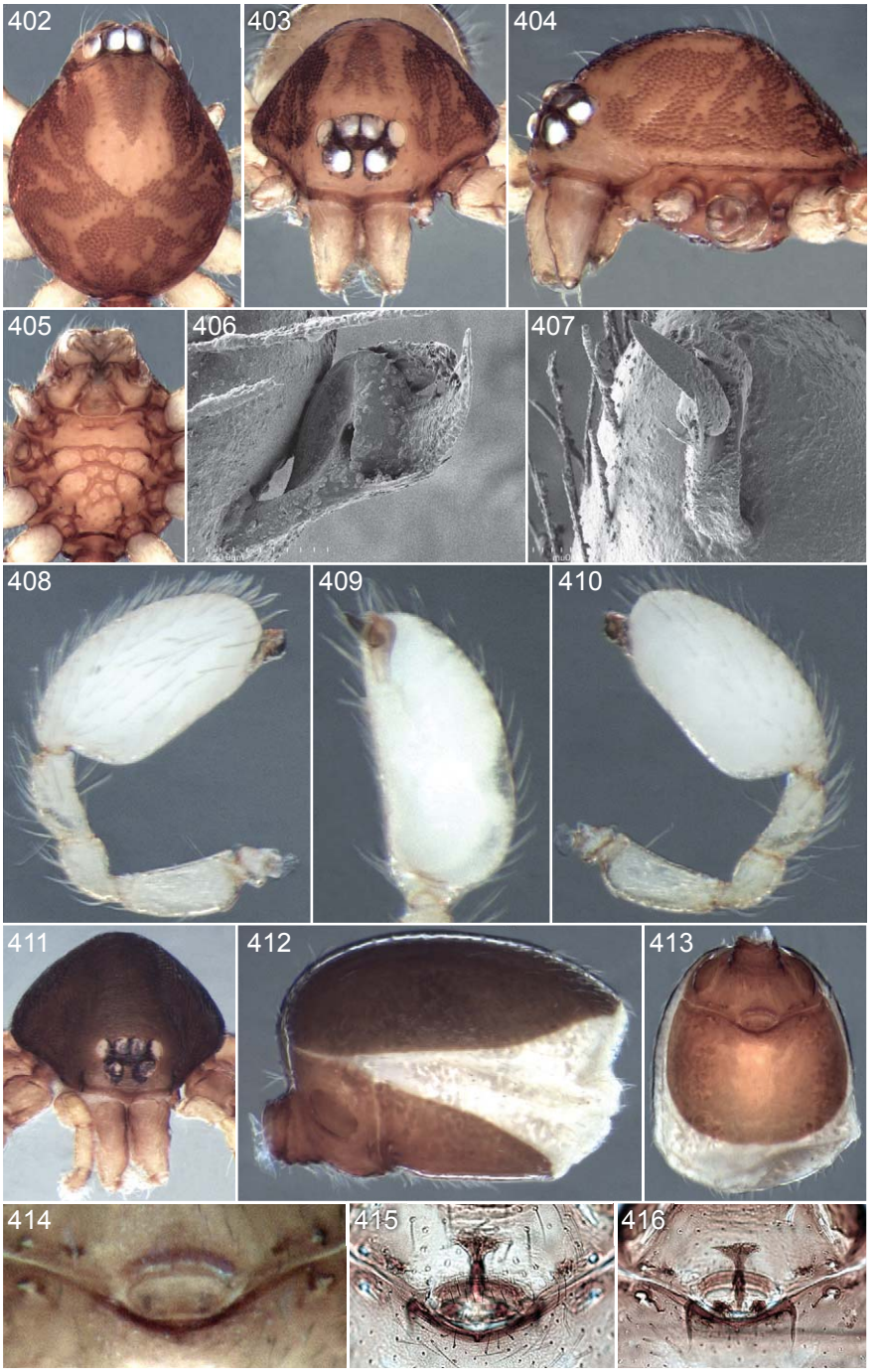
FIGS. 357–371. *Costarina olancho,* new species, male (357–365) and female (366–371). **357.** Carapace, dorsal view. **358, 366.** Same, anterior view. **359.** Same, lateral view. **360.** Sternum, ventral view. **361.** Left embolus, prolateral view. **362.** Same, ventral view. **363.** Left palp, prolateral view. **364.** Same, ventral view. **365.** Same, retrolateral view. **367.** Abdomen, lateral view. **368.** Same, ventral view. **369, 370.** Genitalia, ventral view. **371.** Same, dorsal view.



FIGS. 372–386. *Costarina muralla,* new species, male (372–380) and female (381–386). **372.** Carapace, dorsal view. **373, 381.** Same, anterior view. **374.** Same, lateral view. **375.** Sternum, ventral view. **376.** Left embolus, prolateral view. **377.** Same, ventral view. **378.** Left palp, prolateral view. **379.** Same, ventral view. **380.** Same, retrolateral view. **382.** Abdomen, lateral view. **383.** Same, ventral view. **384, 385.** Genitalia, ventral view. **386.** Same, dorsal view.



FIGS. 387–401. *Costarina coma,* new species, male (387–395) and female (396–401). **387.** Carapace, dorsal view. **388, 396.** Same, anterior view. **389.** Same, lateral view. **390.** Sternum, ventral view. **391.** Left embolus, prolateral view. **392.** Same, ventral view. **393.** Left palp, prolateral view. **394.** Same, ventral view. **395.** Same, retrolateral view. **397.** Abdomen, lateral view. **398.** Same, ventral view. **399, 400.** Genitalia, ventral view. **401.** Same, dorsal view.



FIGS. 402–416. *Costarina gracias,* new species, male (402–410) and female (411–416). **402.** Carapace, dorsal view. **403, 411.** Same, anterior view. **404.** Same, lateral view. **405.** Sternum, ventral view. **406.** Left embolus, prolateral view. **407.** Same, ventral view. **408.** Left palp, prolateral view. **409.** Same, ventral view. **410.** Same, retrolateral view. **412.** Abdomen, lateral view. **413.** Same, ventral view. **414, 415.** Genitalia, ventral view. **416.** Same, dorsal view.

Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femora: I p0-0-2, r0-1-0; II p0-0-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Embolus with proximal prong flag shaped, on distinct base, dorsal prong narrow, distally bifid.

Female (PBI_OON 40133, figs. 312–317): Total length 2.47. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae I, II v4-4-2; metatarsi I, II v2-2-1p. Genital atrium semicircular, posterior margin almost straight, with rectangular sclerotization at midline occupying about one-fifth of atrial length.

Other Material Examined: **Honduras:** *Cortés:* Parque Nacional Cusuco, Aug. 2007, under bark (M. Jocqué, AMNH PBI_OON 786), 1♂.

Distribution: Honduras (Cortés).

Costarina tela, new species

Figures 318–332

Type: Male holotype taken from secondary tropical rainforest litter at an elevation of 30 m at a site 2 km SSW Tela, 15.76403°N, 87.45651°W, Atlántida, Honduras (June 15, 2010), deposited in MCZ (98061, PBI_OON 787).

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

Diagnosis: Males can be recognized by the long, sail-shaped extension on the proximal embolar prong (figs. 322–326), females by the relatively long genital atrium, which has a posterior sclerotization along the midline that reaches to almost half the atrial length (figs. 330–332).

Male (PBI_OON 787, figs. 318–326): Total length 1.91. ALE separated by less than their radius. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, dorsal process with long, ventrally directed, heavily sclerotized extension. Dorsal scutum covering full length of abdomen, postepigastric scutum reaching to nearly full length of abdomen. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r0-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Embolus proximal prong with sail-shaped extension, dorsal prong with truncate tip.

Female (PBI_OON 855, figs. 327–332): Total length 2.12. Posterior portion of pars cephalica with short, narrow, U-shaped smooth area. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae I, II v4-4-2; metatarsi: I v2-2-2; II v2-1p-2. Genital atrium relatively long, ovoid, with posterior sclerotization along midline, extending about half of atrial length.

Other Material Examined: **Honduras:** *Atlántida:* 7 km SSW Tela, 15.72417°N, 87.45187°W, June 15, 2010, tropical rainforest litter, elev. 190 m (MCZ PBI_OON 855), 1♀.

Distribution: Honduras (Atlántida).

Costarina ceiba, new species

Figures 333–347

Types: Male holotype and female allotype taken from litter on property with cacao at an elevation of 150 m at Pico Bonito Lodge, La Ceiba, 15.69040°N, 86.90272°W, Atlántida, Honduras (Oct. 2, 2008; C. Víquez. M. Branstetter), deposited in AMNH (PBI_OON 38443).

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

Diagnosis: Males can be recognized by the very narrow proximal embolar prong, which is separated from the distal prong by a rectangular space (figs. 337–341), females by the relatively short, almost rectangular genital atrium, which has a pair of small, posterior, paramedian sclerotizations (figs. 345–347).

Male (PBI_OON 38443, figs. 333–341): Total length 1.73. ALE separated by less than their radius. Sternum anterior margin with continuous transverse. Endites with ventral prong short, wide, dorsal prong with short, narrow, anteriorly directed extension. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Embolus with proximal prong very narrow, separated from distal prong by rectangular space.

Female (PBI_OON 38443, figs. 342–347): Total length 2.10. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v2-2-1p. Genital atrium relatively short, almost rectangular, posterior margin with pair of tiny sclerotizations.

Other Material Examined: None.

Distribution: Honduras (Atlántida).

Costarina branstetteri, new species

Figures 348–356

Type: Male holotype taken from secondary lowland rainforest litter at an elevation of 190 m at a site 5.2 SSE of Tela, 15°43.6′N, 87°27.1′W, Atlántida, Honduras (Oct. 1, 2010; M. Branstetter), deposited in MCZ (83158, PBI_OON 37477).

Etymology: The specific name is a patronym in honor of the collector, Michael Branstetter, one of the participants in the Leaf Litter Arthropods of Middle American project.

Diagnosis: Males can be recognized by the large, bipartite distal embolar prong, the distal portion of which is shorter than the proximal portion (figs. 352–356).

Male (PBI_OON 37477, figs. 348–356): Total length 1.69. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process small, triangular, dorsal process with anterolaterally directed extension abruptly narrowed at about half its length. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v2-2-0. Embolus with proximal prong long, translucent, distal prong arched, abruptly narrowed before tip.

Female: Unknown.

Other Material Examined: None.

Distribution: Honduras (Atlántida).

Costarina olancho, new species

Figures 357–371

Type: Male holotype taken from upland wet forest litter at an elevation of 1530 m at La Unión, Parque Nacional La Muralla, 15.09723°N, 86.73842°W, Olancho, Honduras (Oct. 4, 2008; C. Víquez, M. Branstetter), deposited in AMNH (PBI_OON 38439).

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

Diagnosis: Males resemble those of *C. plena* but have the proximal embolar prong boat shaped (figs. 361–365); females also resemble those of *C. plena* but have a shorter, wider genital atrium (figs. 369–371).

Male (PBI_OON 788, figs. 357–365): Total length 2.19. ALE separated by their radius to diameter. Sternum anterior margin with interrupted transverse groove. Endites with ventral process wide, very short, dorsal process with long, anteromedially directed extension. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femora: I p0-0-2; II p0-0-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Embolus with distal prong narrow, proximal prong boat shaped.

Female (PBI_OON 788, figs. 366–371): Total length 2.47. Posterior portion of pars cephalica with small, narrow U-shaped smooth area. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae I, II v4-4-2; metatarsi: I v2-2-2; II v2-2-1p. Genital atrium relatively short, wide, posterior margin slightly sinuous, with short transverse sclerotization at midline near posterior margin.

Other Material Examined: **Honduras:** *Olancho:* La Unión, Parque Nacional La Muralla, 15.09374°N, 86.73546°W, Oct. 4, 2008, Winkler, litter near visitor center, elev. 1455 m (C. Víquez, M. Branstetter, AMNH PBI_OON 38348), 2♂, 15.09862°N, 86.73526°W, Oct. 4, 2008, upland wet forest litter, elev. 1450 m (C. Víquez, M. Branstetter, AMNH PBI_OON 38441), 1♂, 15.10095°N, 86.74104°W, Oct. 4, 2008, upland wet forest litter, elev. 1540 m (C. Víquez, M. Branstetter, AMNH PBI_OON 38444), 2♂; Parque Nacional La Muralla, 15.09484°N, 86.73954°W, May 2, 2010, cloud forest litter, elev. 1420 m (MCZ PBI_OON 788), 2♂, 3♀, 15.09916°N, 86.74061°W, May 2, 2010, cloud forest litter, elev. 1530 m (MCZ PBI_OON 789), 6♂, 1♀.

Distribution: Honduras (Olancho).

Costarina muralla, new species

Figures 372–386

Types: Male holotype, female allotype, and male paratype taken from cloud forest litter at an elevation of 1530 m in the Parque Nacional La Muralla, 15.09916°N, 86.74061°W, Olancho, Honduras (May 2, 2010), deposited in MCZ (ex 98591, PBI_OON 46503).

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

Diagnosis: Males can be recognized by the scoop-shaped proximal prong of the embolus (figs. 376–380), females by the U-shaped genital atrium (figs. 384–386).

Male (PBI_OON 771, figs. 372–380): Total length 1.80. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process long, narrow, dorsal process with long, anteriorly directed extension. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femora: I p0-0-2; II p0-0-1; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v1p-2-2. Embolus with distal prong sharply bent, proximal prong scoop shaped.

Female (PBI_OON 771, figs. 381–386): Total length 2.07. Posterior portion of pars cephalica with small, narrow U-shaped smooth area. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-1p; II v2-1p-2. Genital atrium U-shaped, with thick anterior margin; genitalic apodemes relatively wide.

Other Material Examined: **Honduras:** *Olancho:* Parque Nacional La Muralla, 15.09484°N, 86.73954°W, May 2, 2010, cloud forest litter, elev. 1420 m (MCZ 98039, PBI_OON 771), 2♂, 1♀, 15.09916°N, 86.74061°W, May 2, 2010, cloud forest litter, elev. 1530 m (MCZ 98591, PBI_OON 770), 1♀.

Distribution: Honduras (Olancho).

Costarina coma, new species

Figures 387–401

Types: Male holotype, female allotype, and two male paratypes taken from cloud forest litter at an elevation of 2140 m at a site 12 km ENE Comayagua, 14.48139°N, 87.53225°W, Comayagua, Honduras (May 15, 2010), deposited in MCZ (99149, PBI_OON 790).

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

Diagnosis: Males can easily be recognized by the blade-shaped distal prong and the sinuous proximal prong of the embolus (figs. 391–395), females by the swollen posterior margin of the genital atrium (figs. 399–401).

Male (PBI_OON 790, figs. 387–395): Total length 1.97. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, sharply pointed, dorsal process long, sharply pointed. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v2-2-0. Embolus with distal prong blade-shaped, flattened, proximal prong narrow, sinuous.

Female (PBI_OON 790, figs. 396–401): Total length 2.18. Posterior portion of pars cephalica with small U-shaped smooth area. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Posterior margin of genital atrium swollen, recurved, anterior margin arched.

Other Material Examined: **Honduras:** *Comayagua:* 10 km E Comayagua, 14.46012°N, 87.54523°W, May 15, 2010, cloud forest litter, elev. 2000 m (MCZ 98829, 98830, PBI_OON 791, 792), 6♂, 2♀; Parque Nacional Cerro Azul Meambar, 14.87113°N, 87.89935°W, May 20, 2010, ridgetop cloud forest litter, elev. 1120 m (MCZ 98733, PBI_OON 793), 1♂.

Distribution: Honduras (Comayagua).

Costarina gracias, new species

Figures 402–416

Types: Male holotype and female allotype taken from tropical rainforest litter at an elevation of 150 m at Las Marías, 15.66442°N, 84.85764°W, Gracias a Dios, Honduras (June 8, 2010), deposited in MCZ (98709, PBI_OON 794).

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

Diagnosis: Males resemble those of *C. plena* but have a shorter, wider distal prong and a flattened, blade-shaped proximal prong on the embolus (figs. 406–410); females have the genital atrium mostly filled with three darkened genitalic elements visible through the cuticle (figs. 414–416). Differences in the carapace microsculpture suggest that the sexes might be mismatched, despite having been collected together.

Male (PBI_OON 794, figs. 402–410): Total length 1.96. ALE separated by less than their radius. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, sharply pointed, dorsal process short, distally narrowed, sharply pointed. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-0-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-1p; II v2-2-2. Embolus with distal prong short, wide, almost rectangular in retrolateral view, proximal prong laterally flattened, ventrally arched.

Female (PBI_OON 794, figs. 411–416): Total length 1.76. ALE separated by their radius to diameter. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdomen length. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-1-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi I, II v2-2-1p. Genital atrium almost completely occupied by three transversely arrayed sclerotizations visible through cuticle.

Other Material Examined: None.

Distribution: Honduras (Gracias a Dios).

Key to Species from Nicaragua

1. Males.....2
– Females.....5
2. Distal prong of embolus much shorter than proximal prong (figs. 14, 437).....3
– Distal prong of embolus longer (figs. 422, 452).....4
3. Proximal prong of embolus elbowed (figs. 437, 439).....*musun*

– Proximal prong of embolus not elbowed (figs. 14, 15).....*plena*
4. Proximal prong of embolus wide at tip (figs. 422, 424).....*waspuk*
– Proximal prong of embolus narrow at tip (figs. 452, 454).....*blanco*
5. Anterior genitalic process expanded at tip (figs. 445, 446).....*musun*
– Anterior genitalic process not expanded at tip (as in fig. 461).....6
6. Genitalic apodemes relatively long (figs. 430, 431).....*waspuk*
– Genitalic apodemes shorter (figs. 75, 461).....7
7. Genitalic apodemes extending far posterior of posterior margin of genital atrium (figs. 74, 75).....*plena*
– Genitalic apodemes not extending far posterior of posterior margin of genital atrium (figs. 460, 461).....*blanco*

Costarina waspuk, new species

Figures 417–431

Types: Male holotype and female allotype from Río Waspuk, Musawas, Atlántico Norte, Nicaragua (Oct. 10–31, 1955; B. Malkin), deposited in AMNH (PBI_OON 1368).

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

Diagnosis: Males can be recognized by the scissorslike arrangement of the proximal and distal embolar prongs (figs. 421–425), females by the almost circular genital atrium containing a median longitudinal sclerotization visible through the cuticle (figs. 429–431).

Male (PBI_OON 1368, figs. 417–425): Total length 1.96. ALE separated by less than their radius. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, dorsal process long, distally narrowed. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v2-2-0. Embolus chelate in appearance, proximal prong wider than distal prong.

Female (PBI_OON 1368, figs. 426–431): Total length 2.42. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae I, II v4-4-2; metatarsi: I v2-2-2; II v2-2-1p. Genital atrium posteriorly prolonged, almost circular, with median longitudinal sclerotization visible through cuticle.

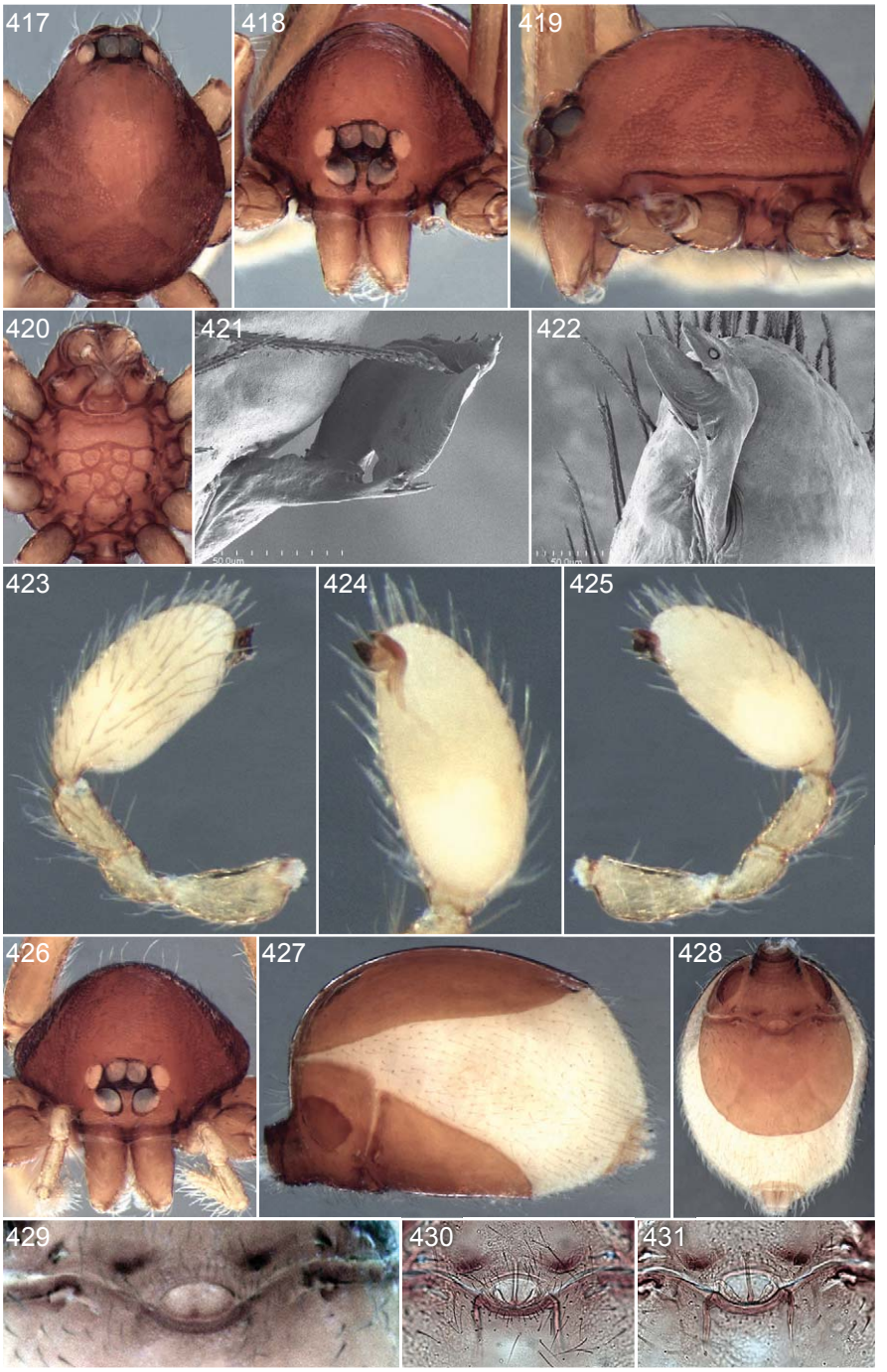
Other Material Examined: Two males and one female taken with the types (AMNH PBI_OON 37880).

Distribution: Nicaragua (Atlántico Norte).

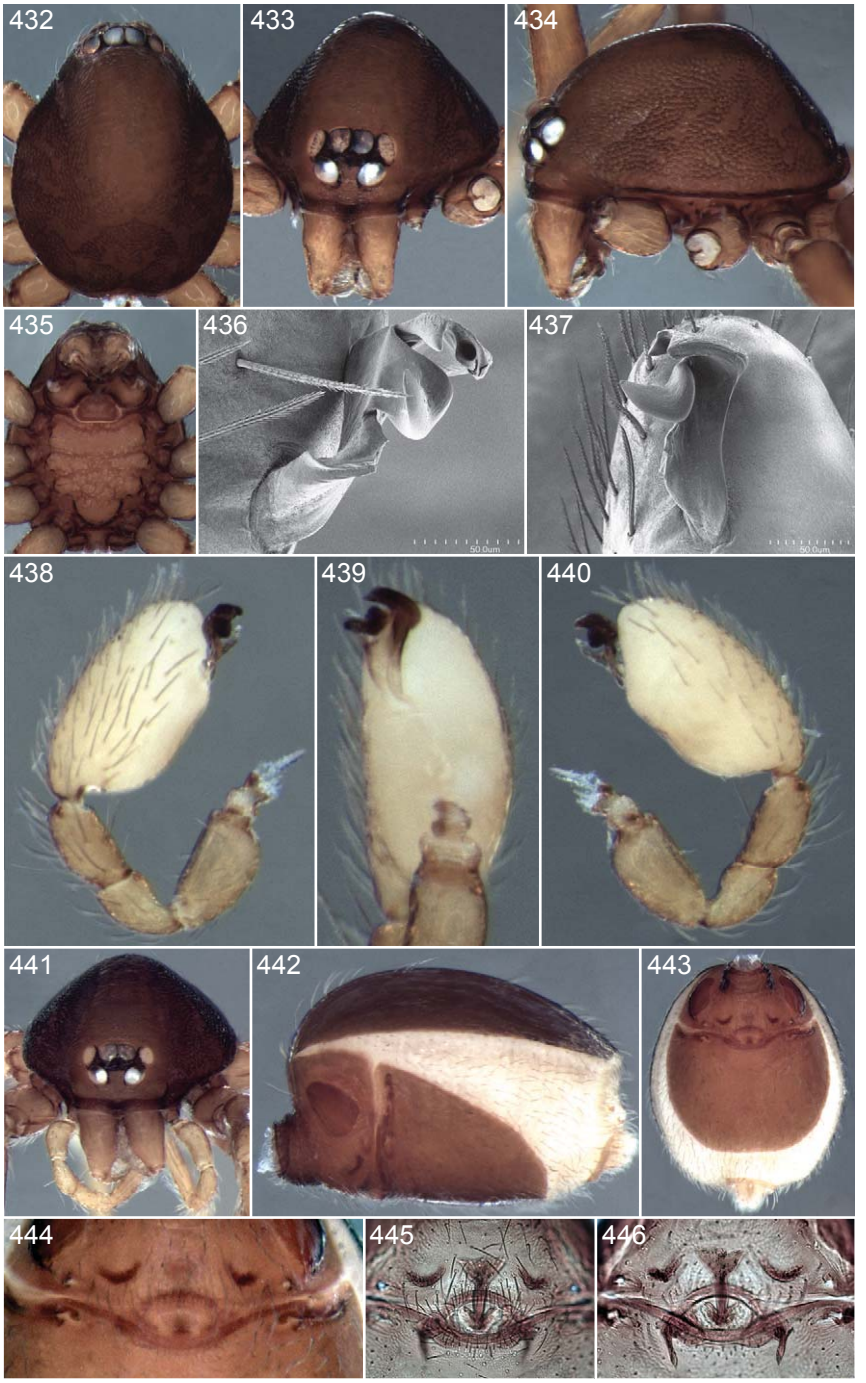
Costarina musun, new species

Figures 432–446

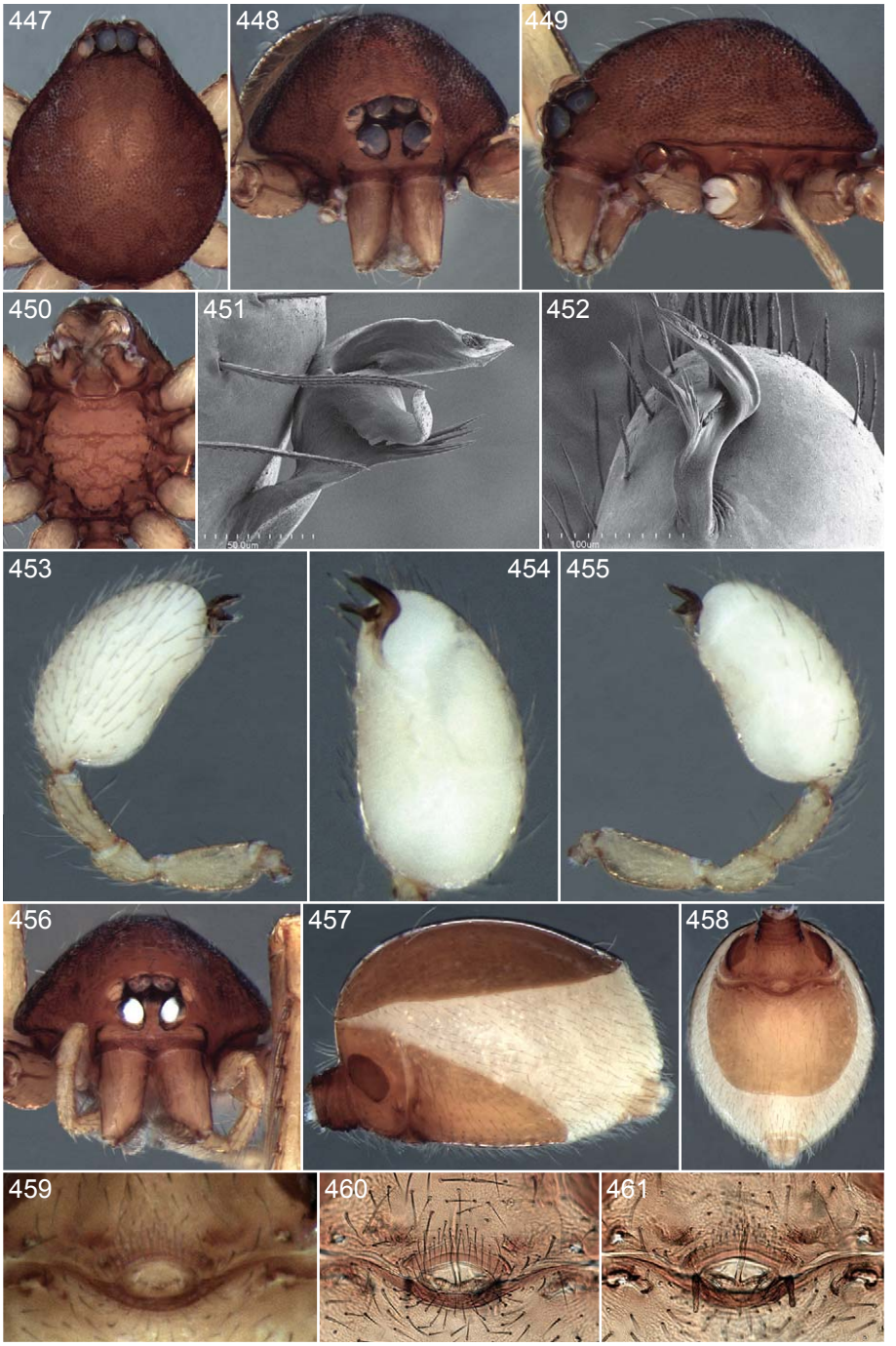
Types: Male holotype, female allotype, and two male paratypes taken from mesic forest litter at an elevation of 900 m in the Reserva Natural El Musún, 4.8 km NNW of Río Blanco, 12°58.4′N, 85°14′W, Matagalpa, Nicaragua (Oct. 11, 2008; M. Branstetter), deposited in MCZ (83142, PBI_OON 37474).



FIGS. 417–431. *Costarina waspuk,* new species, male (417–425) and female (426–431). **417.** Carapace, dorsal view. **418, 426.** Same, anterior view. **419.** Same, lateral view. **420.** Sternum, ventral view. **421.** Left embolus, prolateral view. **422.** Same, ventral view. **423.** Left palp, prolateral view. **424.** Same, ventral view. **425.** Same, retrolateral view. **427.** Abdomen, lateral view. **428.** Same, ventral view. **429, 430.** Genitalia, ventral view. **431.** Same, dorsal view.



FIGS. 432–446. *Costarina musun,* new species, male (432–440) and female (441–446). **432.** Carapace, dorsal view. **433, 441.** Same, anterior view. **434.** Same, lateral view. **435.** Sternum, ventral view. **436.** Left embolus, prolateral view. **437.** Same, ventral view. **438.** Left palp, prolateral view. **439.** Same, ventral view. **440.** Same, retrolateral view. **442.** Abdomen, lateral view. **443.** Same, ventral view. **444, 445.** Genitalia, ventral view. **446.** Same, dorsal view.



FIGS. 447–461. *Costarina blanco,* new species, male (447–455) and female (456–461). **447.** Carapace, dorsal view. **448, 456.** Same, anterior view. **449.** Same, lateral view. **450.** Sternum, ventral view. **451.** Left embolus, prolateral view. **452.** Same, ventral view. **453.** Left palp, prolateral view. **454.** Same, ventral view. **455.** Same, retrolateral view. **457.** Abdomen, lateral view. **458.** Same, ventral view. **459, 460.** Genitalia, ventral view. **461.** Same, dorsal view.

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

Diagnosis: Males can be recognized by the wide, sharply angled distal prong and the backward L-shaped proximal prong of the embolus (figs. 436–440), females by the oval, protuberant genital atrium, which contains a triangular posterior sclerotization (figs. 444–446).

Male (PBI_OON 37474, figs. 432–440): Total length 2.02. ALE separated by their radius to diameter. Sternum anterior margin with continuous transverse groove. Endites with ventral process short, wide, dorsal process with long, basally widened, anteriorly directed, heavily sclerotized extension. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femur I p0-0-2; tibiae: I v4-4-1p; II v4-4-0; metatarsi: I v2-2-1p; II v2-2-0. Embolus with dorsal prong wide, sharply bent, tip invaginated at middle; proximal prong bent at right angle.

Female (PBI_OON 37474, figs. 441–446): Total length 2.14. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 3/4 of abdominal length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v2-2-1p. Genital atrium oval, protuberant, posterior margin with large median sclerotization visible through cuticle.

Other Material Examined: None.

Distribution: Nicaragua (Matagalpa).

Costarina blanco, new species

Figures 447–461

Type: Male holotype taken from mesic forest litter at an elevation of 700 m at the Reserva Natural El Musún, 3.2 km NNW Río Blanco, 12°57.6′N, 85°13.9′W, Matagalpa, Nicaragua (Oct. 12, 2008; M. Branstetter), deposited in MCZ (PBI_OON 795).

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

Diagnosis: Males can be recognized by the L-shaped proximal prong of the embolus (figs. 451–455), females by the wide V-shaped sclerotization visible through the cuticle of the genital atrium (figs. 459–461).

Male (PBI_OON 795, figs. 447–455): Total length 2.12. ALE separated by less than their radius. Sternum anterior margin with continuous transverse groove. Endites with ventral process narrow, pointed, dorsal process long, tip directed medially. Dorsal scutum covering full length of abdomen, postepigastric scutum covering nearly full length of abdomen. Leg spination: femora: I p0-0-2, r1-1-1; II p0-0-2, r1-0-0; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v2-2-0. Embolus with distal prong narrow, sharply bent at about one-third its length, proximal prong L-shaped.

Female (PBI_OON 38437, figs. 456–461): Total length 2.27. Posterior portion of pars with small, narrow U-shaped smooth area. Dorsal scutum covering more than 3/4 of abdomen length, more than half to most of abdomen width, postepigastric scutum reaching to about 2/3 of abdomen length. Leg spination: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v2-2-1p. Genital atrium oval, with transverse V-shaped sclerotization visible through cuticle, occupying almost entire width of atrium.

Other Material Examined: **Nicaragua:** *Matagalpa:* Selva Negra, km 140, highway Matagalpa-Jinotega, 13.00711°N, 85.91004°W, Oct. 7, 2008, Winkler, elev. 1560 m (C. Víquez, M. Branstetter, AMNH PBI_OON 38437), 1♀.

Distribution: Nicaragua (Matagalpa).

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