

## The Goblin Spider Genus *Costarina* (Araneae, Oonopidae), Part 2: the Costa Rican fauna

NORMAN I. PLATNICK,<sup>1</sup> LILY BERNIKER,<sup>1</sup> AND CARLOS VÍQUEZ<sup>2</sup>

### ABSTRACT

The type species of *Costarina*, *C. plena* (O. P.-Cambridge), is widely distributed, occurring from southern Mexico to southern Costa Rica, but Costa Rica also houses an extraordinarily large fauna of endemic, less widely distributed *Costarina* species. In addition to the two previously described species, *C. meridina* (Chickering, the female of which is newly described) and *C. watina* (Chickering), 49 new endemic species are described: *C. paraplana*, *superplana*, *maritza*, *cima*, *elena*, *monte*, *murphyorum*, *chiles*, *upala*, *poas*, *selva*, *viejo*, *rafael*, *azul*, *carara*, *nara*, *aguirre*, *quepos*, *carrillo*, *ramon*, *isidro*, *san*, *cuerici*, *leones*, *junio*, *reventazon*, *macho*, *cruz*, *chonta*, *barbilla*, *espavel*, *veragua*, *pity*, *penshurst*, *hitoy*, *mooreorum*, *cerere*, *frantzius*, *gemelo*, *pittier*, *alturas*, *cruces*, *ubicki*, *palmar*, *parabio*, *semibio*, *jimenez*, *parapalmar*, and *osa*. Two other species also occur in Costa Rica. *Costarina concinna* (Chickering) is placed as the male (and hence a senior synonym) of *C. potena* (Chickering), both of which were described from Volcán, Panama; the species appears to be a relatively widespread, southern vicariant of *C. plena*. The Panamanian species *C. obtina* (Chickering) is also newly recorded from Costa Rica, and its female is described for the first time.

### INTRODUCTION

*Costarina* Platnick and Dupérré (2011) is one of the most commonly collected members of the *Dysderina* complex of genera, occurring abundantly from Mexico south to southern Colombia. A total of 28 species are known from the northern part of the generic range, from Mexico south

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<sup>1</sup> Division of Invertebrate Zoology, American Museum of Natural History.

<sup>2</sup> Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica.

to Nicaragua (Platnick and Dupérré, 2012), but that fauna is dwarfed by the diversity found within Costa Rica alone. The present paper, the eighth in a series on the *Dysderina* complex, documents the remarkable radiation of microdistributed *Costarina* species found in Costa Rica.

In the species from Nicaragua and further north, the epigastric and postepigastric scuta of females are separate and distinct, but in some of the Costa Rican females, the two scuta have fused into a single unit (i.e., there is no epigastric furrow that extends laterally to the soft portions of the abdomen). The fused condition is found in several species (*C. maritza*, *chiles*, *upala*, *selva*, *viejo*, *azul*, *carrillo*, *watina*, *isidro*, *junio*, *cruz*, *espavel*, *hitoy*, *mooreorum*, *cerere*, *alturas*, and *osa*), but it is unlikely that those species constitute a monophyletic group, as the distinction is not always straightforward. Some females have the two scuta fused just at the edge (sometimes on one side only!), but still retain a conspicuous epigastric furrow; in the species with fully fused scuta, the epigastric furrow is obsolete, and the genital atrium is entirely surrounded by sclerotized cuticle (figs. 42, 97). In *C. plena*, for example, the sclerites are typically separate, but a few females from Heredia have the scuta fused at one edge or the other, and in most females from Limón, the epigastric furrow extends laterally only about halfway between the spiracles and the edge of the scutum. In *C. watina*, three of the four known females have the scuta fully fused, but the fourth still retains an epigastric furrow that extends almost, but not fully, to the soft portions of the abdomen. The interrelationships among the many species of *Costarina* will be considered in detail only in a subsequent publication, along with our treatment of the species found in Panama and Colombia.

Aside from minor variation in coloration and microsculpture, the species treated here differ mainly in embolus and female genitalic structure; identifications therefore require careful comparison of those structures with the images presented below. The embolus is highly three-dimensional but is attached to the palpal bulb by soft cuticle and thus varies greatly in position; palps must therefore be rotated in both horizontal and vertical planes for comparison with the images. The species descriptions are presented in geographic order, proceeding from west to east across the northern portion of the country (Guanacaste, northern Puntarenas, Alajuela, and Heredia), then from west to east across the middle portion (central Puntarenas, San José, Cartago, and northern Limón), followed by southern Limón and southern Puntarenas. A key to species would do little to speed identification, merely ordering the figures to be compared; faster results can be obtained by simply starting with the images of those species recorded from the relevant province.

We have attempted to minimize repetition in the individual species descriptions, and have therefore adopted the following conventions. For purposes of nomenclature, all the new species are authored by Platnick and Berniker only. Unless otherwise stated, the new specific names are nouns in apposition taken or shortened from the type locality. The generic description includes the leg spination of a typical male and a typical female, and only differences from the typical pattern are included in the individual species descriptions. Otherwise, our methods follow those of Platnick and Dupérré (2009). High-resolution versions of the images, a sortable version of the geocoded locality data, and a distribution map for each species (with dots linked to the specimen data) are available on the oonopid Planetary Biodiversity Inventory (PBI) project's website (<http://research.amnh.org/oonopidae>). Detailed locality data are presented only on the website, but the number of specimens examined (including the types) is noted at

the end of each description, in the format “( $N = x$ ).” Users should note that the relatively small published images are merely avatars for the actual image files on the website, which can each be enlarged several times before pixelating.

### COLLECTIONS EXAMINED

AMNH	American Museum of Natural History, New York, NY
CAS	California Academy of Sciences, San Francisco, CA
CDU	Darrell Ubick Collection, San Francisco, CA
CNC	Canadian National Collection, Ottawa, 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
USNM	National Museum of Natural History, Smithsonian Institution, Washington, DC

### *Costarina* Platnick and Dupérré

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

**DIAGNOSIS:** Members of *Costarina* can be recognized by the presence of three transverse sternal ridges together with the absence of grooves connecting either the anterior or posterior pairs of spiracles (see Platnick and Dupérré, 2012: 3).

**DESCRIPTION:** For all characters not mentioned here, see Platnick and Dupérré, 2012: 3. Total length of males 1.6–2.5, of females 1.8–2.8. Carapace, sternum, mouthparts, abdominal scuta usually orange-brown, legs usually pale orange, but sclerotized parts notably darkened in *C. superplena*, *isidro*, *quepos*, *obtina*, *pittier*. Posterior portion of pars cephalica usually with large, U-shaped smooth area, but smooth area reduced in females of *C. cima*, *viejo*, *aguirre*, *meridina*, *ramon*, *chonta*, absent in females of *C. plena*, *carrillo*, *pity*, *cerere*, *frantzius*, *gemelo*, absent in both sexes of *C. maritza*, *concinna*. ALE separated by roughly their radius. Anterior margin of sternum usually with continuous transverse groove but groove interrupted medially in at least *C. carara*, *watina*, *isidro*, *parabio*; surface of sternum with three transverse ridges connected by median longitudinal ridge, longitudinal ridge usually with anastomosing branches but sometimes simple or weak, rarely reduced to connecting only two anteriormost transverse ridges. Cheliceral retro-margin usually without tooth. Serrula apparently absent (scanned only in *C. plena*). Dorsal scutum of males usually covering full length, width of abdomen, of females covering from 3/4 to full length, width of abdomen. Postepigastric scutum of males usually extending to nearly full length of abdomen; postepigastric scutum of females almost semicircular, usually free, but partially or entirely fused to epigastric scutum in some species (see Introduction for details), extending to at least 2/3 of abdomen length. Spinneret scutum present as incomplete ring with fringe of long setae in females, but often reduced to narrow rim or detectable only by setal positions in males. Typical leg-spination pattern of males (only surfaces bearing spines listed): femur I p0-0-2, r1-1-1;

tibiae I, II v4-4-1p; metatarsi: I v2-2-1p; II v3-0-2, of females: femora I, II p0-0-2, r1-1-1; tibiae: I v4-4-2; II v4-4-1p; metatarsi: I v2-2-2; II v3-0-2.

*Costarina plena* (O. P.-Cambridge) (Figures 1–11)

*Dysderina plena* O. P.-Cambridge, 1894: 143, pl. 17, figs. 7, 7a–d.

*Costarina plena*: Platnick and Dupérré, 2011: 50; 2012: 12, figs. 1–75.

DIAGNOSIS: This widespread species has two close relatives in northern Costa Rica; members of *C. plena* differ from those of *C. paraplana* (cf. figs. 12–22) in having shorter, weaker, more widely separated longitudinal extensions of the lateral arms of the posterior sternal ridge (fig. 7) and from those of *C. superplena* (cf. figs. 23–33) in color, being orange-brown and without darkened leg segments. Males of *C. plena* typically retain a slight spinneret scutum, and have a shorter, stubbier proximal embolar prong (figs. 1–6). Females of *C. plena* can easily be separated from those of the other two species by their much longer genital atrium (figs. 10, 11).

MALE (figs. 1–6): See Platnick and Dupérré, 2012: 12 (*N* = 41).

FEMALE (figs. 7–11): See Platnick and Dupérré, 2012: 12 (*N* = 41).

DISTRIBUTION: Widespread and abundant in Costa Rica (and also further north, to southern Mexico).

*Costarina paraplana*, new species (Figures 12–22)

TYPE: Male holotype from Upala, Aeropuerto 1.1, 10°53'21"N, 85°01'04"W, Alajuela, Costa Rica (Mar. 19, 2010; C. Viquez), deposited in INBIO (PBI\_OON 49943).

ETYMOLOGY: The specific name refers to the similarities between this species and *C. plena*.

DIAGNOSIS: Specimens of this species resemble those of *C. plena* (cf. figs. 1–11) but can easily be distinguished by the much more pronounced, longitudinally arranged extensions of the lateral arms of the posterior sternal ridge (fig. 18). Males have lost the spinneret scutum and have a longer, more arched proximal embolar prong (figs. 12–17); females can easily be distinguished from those of *C. plena* by their much shorter genital atrium (figs. 21, 22); and from those of *C. superplena* (cf. figs. 23–33) by the longer apodemes (figs. 21, 22).

MALE (PBI\_OON 49941, figs. 12–17): Total length 1.76. Endite ventral process narrow, with sinuous tip; dorsal process short. Femur I r0-1-1; metatarsus II v2-2-1p. Embolus distal prong with ventrally directed tip; proximal prong long, arched (*N* = 14).

FEMALE (PBI\_OON 49944, figs. 18–22): Total length 2.31. Metatarsus II v2-1r-1p. Genital atrium short, much wider than long (*N* = 22).

DISTRIBUTION: Widespread in Costa Rica (Guanacaste, Alajuela, Heredia, Limón, and northern Puntarenas).

*Costarina superplena*, new species (Figures 23–33)

TYPE: Male holotype taken in humus at an elevation of 450–550 m at a site 10 km southeast of La Virgen, 10°20'N, 84°05'W, Heredia, Costa Rica (Mar. 17, 2003; R. Anderson), deposited in INBIO (PBI\_OON 29750).

ETYMOLOGY: The specific name refers to the similarities between this species and *C. plena*.

DIAGNOSIS: Specimens of this species can easily be distinguished from those of the similar species *C. plena* (cf. figs. 1–11) and *C. paraplana* (cf. figs. 12–22) by their relatively dark color-



ation; the carapace and abdomen are dark brown rather than orange-brown and the leg femora are distinctly darker than the coxae; the abdomen is narrower than in most other species. Males lack a spinneret scutum and have a thicker, straighter proximal embolar prong (figs. 23–28); females have a wide, short genital atrium, and short, strong apodemes (figs. 32, 33).

MALE (PBI\_OON 29750, figs. 23–28): Total length 1.85. Endite ventral and dorsal processes both small, triangular, widely separated. Femur I r0-0-0; tibiae I, II v4-4-0; metatarsus II v2-2-0. Embolus distal prong distally arched, thickened; proximal prong basally enlarged, with straight distal margin ( $N = 3$ ).

FEMALE (PBI\_OON 51223, figs. 29–33): Total length 2.02. Femur II r1-1-0; tibia I v4-4-1p; metatarsus I v2-2-1p. Genital atrium very wide, short, with gently arched anterior margin ( $N = 1$ ).

DISTRIBUTION: Alajuela and Heredia.

***Costarina maritza*, new species (Figures 34–44)**

TYPE: Male holotype from wet montane forest litter taken at an elevation of 875 m in the Estación Biológica Maritza, Guanacaste, Costa Rica (Feb. 13, 1996; R. Anderson), deposited in AMNH (PBI\_OON 21119).

DIAGNOSIS: Males have the proximal embolar prong distinctively bifid, with a long prolaterally directed portion and a shorter apically directed portion (figs. 34–39); females have fully fused ventral scuta and a slightly angular anterior margin on the genital atrium (figs. 41–44). The palp resembles that of *C. blanco* Platnick and Dupérré from Nicaragua, but the proximal and distal embolar prongs are more widely separated than in that species (cf. Platnick and Dupérré, 2012: figs. 451–455). Members of this species have been found in Berlese samples together with representatives of both *C. plena* (cf. figs. 1–11) and *C. upala* (cf. figs. 100–110), but can easily be differentiated by having the surfaces of the sternum between the transverse ridges roughened (fig. 40) rather than smooth.

MALE (PBI\_OON 49949, figs. 34–39): Total length 2.02. Endite ventral process long, distally narrow; dorsal process shorter. Femur II r0-1-0; tibia II v4-4-0; metatarsi: I v2-2-2; II v2-2-0. Embolus distal prong very narrow; proximal prong bifid, with long prolaterally directed portion and shorter apically directed portion ( $N = 53$ ).

FEMALE (PBI\_OON 49949, figs. 40–44): Total length 2.34. Spination typical. Genital atrium large, ovoid, completely surrounded by sclerotized cuticle ( $N = 42$ ).

DISTRIBUTION: Widespread and abundant in the northern half of Costa Rica (Guanacaste, Alajuela, Heredia, Cartago, Limón, and northern Puntarenas).

***Costarina cima*, new species (Figures 45–55)**

TYPE: Male holotype from the summit (cima) of Volcán Cacao, Guanacaste, Costa Rica (July 27, 2010; C. Viquez), deposited in INBIO (PBI\_OON 21114).

DIAGNOSIS: Males resemble those of *C. poas* (cf. figs. 111–121) in having a broad, flat embolus, which has the proximal and distal prongs fused for much of their length, but have a more rectangular proximal prong (figs. 45–50); females have very thick, heavily sclerotized anterior margin of the genital atrium (figs. 54, 55).

MALE (PBI\_OON 21114, figs. 45–50): Total length 2.02. Endite ventral process basally widened; distal process narrow. Femora: I r0-1-1; II p0-0-2; metatarsus II v2-1p-1r. Embolus

distal and proximal prongs fused for most of their length, producing wide structure with translucent prolateral portion ( $N = 36$ ).

FEMALE (PBI\_OON 88, figs. 51–55): Total length 2.24. Femur II r0-0-0. Genital atrium very short, with broad, heavily sclerotized anterior margin ( $N = 18$ ).

DISTRIBUTION: Abundant in northern Costa Rica (Guanacaste, Alajuela, and northern Puntarenas).

***Costarina elena*, new species (Figures 56–66)**

TYPE: Male holotype from cloud-forest litter taken at an elevation of 1650 m in the Santa Elena Cloud Forest Reserve, 10°20'42"N, 84°47'53"W, Santa Elena, Guanacaste, Costa Rica (June 11, 2001; R. Anderson), deposited in AMNH (PBI\_OON 29360).

DIAGNOSIS: Males resemble those of *C. carrillo* (cf. figs. 210–220) in having an enlarged, distally flared distal embolar prong with a long, narrow basal extension and a basally widened proximal embolar prong, but have a sharper tip on the distal prong (figs. 56–61); females have a short, wide genital atrium with a rebordered anterior margin (figs. 65, 66).

MALE (PBI\_OON 29360, figs. 56–61): Total length 2.40. Endite ventral process short, wide; dorsal process longer, narrow. Femur I r1-1-0; metatarsus II v2-2-0. Embolus distal prong enlarged, with invaginated anterior margin; proximal prong long, sinuous, gradually tapered ( $N = 18$ ).

FEMALE (PBI\_OON 29359, figs. 62–66): Total length 2.31. Femur II r1-1-0; metatarsus I v2-2-1p. Genital atrium very short, wide, with sinuous posterior margin ( $N = 6$ ).

DISTRIBUTION: Guanacaste and northern Puntarenas.

***Costarina monte*, new species (Figures 67–77)**

TYPES: Male holotype and female allotype from litter taken at an elevation of 1500 m at Monteverde, Puntarenas, Costa Rica (Aug. 28, 1983; J., F. Murphy), deposited in AMNH (PBI\_OON 36793).

DIAGNOSIS: Males have a distinctive embolus, with a broad, ridged distal prong and a narrow proximal prong that is widened at about one-fourth of its length (figs. 67–72); females have a short, wide genital atrium with a posteromedian enlargement of the posterior margin (figs. 76, 77).

MALE (PBI\_OON 36793, figs. 67–72): Total length 2.11. Endite ventral process basally wide, distally narrow, tip heavily sclerotized; dorsal process with elongate tip. Femur I r0-1-0; tibia II v4-4-0. Embolus proximal prong long, narrow, abruptly bent at about half its length; distal prong enlarged, dorsally ridged ( $N = 10$ ).

FEMALE (PBI\_OON 36793, figs. 73–77): Total length 2.20. Spination typical. Genital atrium short, wide, posterior margin with wide posteromedian enlargement ( $N = 3$ ).

DISTRIBUTION: Northern Puntarenas.

***Costarina murphyorum*, new species (Figures 78–88)**

TYPES: Male holotype, female allotype, and female paratype taken from roadside scrub at an elevation of 1500 m at Monteverde, Puntarenas, Costa Rica (Aug. 24, 1983; J., F. Murphy), deposited in AMNH (PBI\_OON 36787).

ETYMOLOGY: The specific name is a patronym in honor of John and Frances Murphy, who collected the only known specimens of this species.

**DIAGNOSIS:** This appears to be a northern vicariant of *C. meridina* (cf. figs. 221–231); males differ in having all parts of the embolus wider (figs. 78–83), females in having more recurved posterolateral corners of the genital atrium and wider paramedian lobes on the posterior genitalic elements (figs. 86–88).

**MALE** (PBI\_OON 36787, figs. 78–83): Total length 1.97. Endite ventral process basally wide, distally heavily sclerotized; dorsal process long, arched. Femur II p0-0-2, r0-1-0. Embolus proximal prong arched; distal prong deeply bifid ( $N = 6$ ).

**FEMALE** (PBI\_OON 36787, figs. 84–88): Total length 2.12. Spination typical. Genital atrium wide, posterior margin transverse, with recurved corners ( $N = 3$ ).

**DISTRIBUTION:** Northern Puntarenas.

***Costarina chiles*, new species (Figures 89–99)**

**TYPES:** Male holotype and female allotype from mini-Winkler sample taken at an elevation of 100 m at Finca San Luis, Los Chiles, Alajuela, Costa Rica (Feb. 8, 2009; M. Solis, B. Hernández), deposited in INBIO (96607, PBI\_OON 1680).

**DIAGNOSIS:** Males have a greatly widened proximal embolar prong (figs. 89–94); females have fully fused ventral scuta and a short, distally widened anterior genitalic process (figs. 96–99).

**MALE** (PBI\_OON 1680, figs. 89–94): Total length 1.65. Endite ventral process long, narrow, heavily sclerotized, tip nearly touching tip of long, narrow dorsal process in clawlike formation. Femur I r0-1-1; tibiae I, II v4-4-0; metatarsus II v2-2-0. Embolus distal prong narrow, arched; proximal prong greatly widened ( $N = 2$ ).

**FEMALE** (PBI\_OON 1680, figs. 95–99): Total length 1.85. Metatarsus I v2-2-1p. Genital atrium moderately long, very wide, anterior and posterior margins rebordered ( $N = 3$ ).

**DISTRIBUTION:** Alajuela.

***Costarina upala*, new species (Figures 100–110)**

**TYPES:** Male holotype and female allotype from Upala, Dago 1.1, Alajuela, Costa Rica (C. Viquez), deposited in INBIO (PBI\_OON 49954).

**DIAGNOSIS:** Males can easily be recognized by the large, basally twisted distal embolar prong (figs. 100–105), females by the fully fused ventral scuta, the protuberant genital atrium, and the posterolaterally enlarged posterior genitalic elements (figs. 107–110).

**MALE** (PBI\_OON 49955, figs. 100–105): Total length 1.72. Both processes of endite basally widened, with arched tips. Femur I r0-1-1; tibia II v3-4-0. Embolus distal prong widened distally, ventral portions translucent; proximal prong short, narrow ( $N = 12$ ).

**FEMALE** (PBI\_OON 49955, figs. 106–110): Total length 2.00. Spination typical. Genital atrium oval, with surface convex, protuberant ( $N = 6$ ).

**DISTRIBUTION:** Alajuela.

***Costarina poas*, new species (Figures 111–121)**

**TYPES:** Male holotype, female allotype, and male paratype from Berlese sample taken at an elevation of 2520–2540 m on the lake trail at Volcán Poás, 10.17442305°N, 84.2375125°W, Alajuela, Costa Rica (Apr. 6, 2002; P. Thomas), deposited in INBIO (72382, PBI\_OON 31183).

DIAGNOSIS: Males resemble those of *C. cima* (cf. figs. 45–55) but have a much longer, distally narrower distal embolar prong (figs. 111–116); females also resemble those of *C. cima* but have a longer genital atrium and shorter, stronger apodemes (figs. 120, 121).

MALE (PBI\_OON 31183, figs. 111–116): Total length 2.35. Endite ventral process relatively wide; dorsal process relatively narrow. Femur I r1-1-0; tibia II v4-4-0; metatarsus II v2-2-0. Embolus distal prong arched, narrow; proximal prong enlarged, translucent, attached to distal prong basally ( $N = 16$ ).

FEMALE (PBI\_OON 31183, figs. 117–121): Total length 2.42. Spination typical. Genital atrium short, wide, with rebordered posterior margin, paramedian apodemal lobes visible through cuticle ( $N = 7$ ).

DISTRIBUTION: Alajuela and Heredia.

***Costarina selva*, new species (Figures 122–132)**

TYPES: Male holotype, female allotype, and male paratype taken at an elevation of 50–150 m in the Estación Biológica La Selva, 10°26'N, 84°01'W, Heredia, Costa Rica (June 18, 1999), deposited in INBIO (PBI\_OON 29785).

DIAGNOSIS: Males have a distinctive embolus, with a bifid-appearing proximal prong and a trifid distal prong (figs. 122–127); females have fully fused ventral scuta and a rectangular, medially situated, posterior extension of the posterior genitalic elements (figs. 129–132).

MALE (PBI\_OON 29785, figs. 122–127): Total length 1.81. Both processes of endite relatively long, narrow. Femur I r0-1-1; tibia II v4-4-0. Embolus distal prong long, narrow, trifid; proximal prong appearing bifid due to fused basal spur ( $N = 21$ ).

FEMALE (PBI\_OON 29785, figs. 128–132): Total length 1.97. Spination typical. Genital atrium short, rectangular, with rebordered lateral margins ( $N = 15$ ).

DISTRIBUTION: Heredia.

***Costarina viejo*, new species (Figures 133–143)**

TYPES: Male holotype and female allotype from the Estación Biológica La Selva, Heredia, Costa Rica (Mar. 13, 1987; D. Olson), deposited in MCZ (PBI\_OON 37006).

ETYMOLOGY: The specific name is a noun in apposition taken from one of the localities (Puerto Viejo de Sarapiquí, Heredia) at which the species occurs.

DIAGNOSIS: Males resemble those of *C. upala* (cf. figs. 100–110) in having a relatively small, triangular distal embolar prong, but lack a prolaterally directed extension on that prong and have a very narrow proximal embolar prong (figs. 133–138); females resemble those of *C. carrillo* (cf. figs. 210–220) and *C. cerere* (cf. figs. 406–416) in having fully fused ventral scuta and a pair of dark sclerotizations at the sides of the genital atrium, but those sclerotizations are ledgelike rather than rounded (figs. 142–143).

MALE (PBI\_OON 37006, figs. 133–138): Total length 2.01. Endite ventral process sharply pointed; dorsal process with arched tip. Femora: I r1-1-0; II p0-0-1, r0-1-0; tibiae: I v4-4-2; II v4-4-0; metatarsus I v2-2-2. Embolus distal prong arched, ventral portion translucent; proximal prong narrow, abruptly bent at half its length ( $N = 23$ ).

FEMALE (PBI\_OON 37006, figs. 139–143): Total length 2.22. Femur II p0-0-2, r1-1-0. Genital atrium with pair of dark sclerotizations at lateral margins, anterior genitalic process

widened at about half its length ( $N = 18$ ).

DISTRIBUTION: Abundant in Heredia and Limón.

***Costarina rafael*, new species (Figures 144–154)**

TYPE: Male holotype taken from leaf litter near a stream at an elevation of 5600 feet at a site 3.2 km north of the junctions of Routes 126(9) and 140, and 0.3 km east on the road to San Rafael, Heredia, Costa Rica (Mar. 18, 1991; L. Herman), deposited in AMNH (PBI\_OON 85).

DIAGNOSIS: Males resemble those of *C. san* (cf. figs. 268–278) in having a short proximal embolar prong that parallels the much larger, squared distal prong, but the proximal prong is narrower (figs. 144–149); females have a pair of lateral extensions on the anterior margin of the genital atrium (fig. 153).

MALE (PBI\_OON 51214, figs. 144–149): Total length 2.01. Endite ventral process wide, short; dorsal process narrow, long. Femora: I r0-1-1; II p0-0-1. Embolus distal prong squared, prolateral portion translucent; proximal prong short, narrow ( $N = 9$ ).

FEMALE (PBI\_OON 51214, figs. 150–154): Total length 2.23. Spination typical. Genital atrium wide, with sinuous posterior margin, anterior margin continued anteriorly as conspicuous sclerotized band ( $N = 10$ ).

DISTRIBUTION: Heredia, Cartago, and northern Puntarenas.

***Costarina azul*, new species (Figures 155–165)**

TYPES: Male holotype and male paratype taken by sifting leaf litter in a cloud forest at an elevation of 1500 m at a site 1 km north of Montaña Azul, Heredia, Costa Rica (May 7–8, 1987; D. Ubick), deposited in CAS (PBI\_OON 51215).

DIAGNOSIS: Males resemble those of *C. cruz* (cf. figs. 326–336) in having the distal embolar prong deeply bifid, producing a distinctive appearance, with three parallel, prolaterally directed flanges, but the teeth on the embolar base are much shorter and the middle flange has a much narrower base and a blunter tip (figs. 155–160); females also have fully fused ventral scuta but have a much larger genital atrium with the posterior margin expanded near the midline (figs. 162–165).

MALE (PBI\_OON 51215, figs. 155–160): Total length 2.38. Endite ventral process wide, short; dorsal process narrow, short. Femora: I r1-1-0; II p0-0-2. Embolus distal prong deeply bifid, distal portion more heavily sclerotized; proximal prong long, narrow, sharply bent at half its length ( $N = 6$ ).

FEMALE (PBI\_OON 27674, figs. 161–165): Total length 2.38. Spination typical. Posterior margin of genital atrium medially expanded into wide, short triangle ( $N = 4$ ).

DISTRIBUTION: Heredia.

***Costarina carara*, new species (Figures 166–176)**

TYPE: Male holotype from Berlese sample taken on the trail to Quebrada Bonita in the Parque Nacional Carara, 9.774293°N, 84.527464°W, Puntarenas, Costa Rica (Mar. 14, 2008; C. Viquez), deposited in INBIO (PBI\_OON 27677).

DIAGNOSIS: Males resemble those of *C. leones* (cf. figs. 261–267) but have a longer, narrower proximal embolar prong (figs. 166–171); the female here tentatively matched with the male has a small, oval genital atrium with a thick posterior margin (figs. 175, 176).

MALE (PBI\_OON 27677, figs. 166–171): Total length 1.72. Endite ventral process ventrally arched, forming pincerlike arrangement with dorsal process. Femur II p0-0-2, r0-1-0. Embolus proximal prong very long, very narrow; distal prong with distal crest, crest pointed at both ends ( $N = 1$ ).

FEMALE (PBI\_OON 51267, figs. 172–176): Total length 2.02. Leg I missing, leg II spination typical. Genital atrium wide, with rebordered posterior margin ( $N = 1$ ).

DISTRIBUTION: Central Puntarenas.

***Costarina nara*, new species (Figures 177–187)**

TYPES: Male holotype and female allotype taken at an elevation of 1000 m at Cerro Nara, Quepos, Puntarenas, Costa Rica (May 29–31, 2010; A. Solis, T. Foso), deposited in INBIO (PBI\_OON 51268).

DIAGNOSIS: Males resemble those of *C. pity* (cf. figs. 373–383) but have a retrolaterally directed projection on the base of the proximal embolar prong (figs. 177–182); females have a larger genital atrium with a recurved posterior margin (figs. 186, 187).

MALE (PBI\_OON 51268, figs. 177–182): Total length 1.99. Endite ventral process very narrow; dorsal process with medially directed extension. Femur I r0-1-0. Embolus with long, narrow basal spur, proximal prong with distinct retrolaterally directed projection; distal prong with incised tip ( $N = 1$ ).

FEMALE (PBI\_OON 51268, figs. 183–187): Total length 2.27. Spination typical. Genital atrium with posterior margin thickened medially, producing recurved appearance ( $N = 1$ ).

DISTRIBUTION: Central Puntarenas.

***Costarina aguirre*, new species (Figures 188–198)**

TYPE: Male holotype from Cerro Nara, Quepos, Aguirre, Puntarenas, Costa Rica (May 28, 2010; M. Solis), deposited in INBIO (PBI\_OON 51270).

DIAGNOSIS: Males resemble those of *C. monte* (cf. figs. 67–77) in having a large, wide distal embolar prong, but have a much shorter proximal prong (figs. 188–193); the females here tentatively matched with the male have two closely spaced, triangular lobes extending posteriorly from the posterior margin of the genital atrium (figs. 197, 198).

MALE (PBI\_OON 51270, figs. 188–193): Total length 2.00. Both processes on endite relatively narrow, long. Femur II p0-0-1; metatarsus I v2-2-2. Embolus proximal prong short, triangular in ventral view; distal prong with doubly incised tip ( $N = 1$ ).

FEMALE (PBI\_OON 51274, figs. 194–198): Total length 2.03. Spination typical. Genital atrium with two rounded, closely spaced apodemal lobes extending posteriorly from posterior margin ( $N = 2$ ).

DISTRIBUTION: Central Puntarenas.

***Costarina quepos*, new species (Figures 199–209)**

TYPES: Male holotype, female allotype, and one female and two male paratypes from a mini-Winkler sample taken in the Parque Nacional Manuel Antonio, Quepos, Puntarenas, Costa Rica (May 24–31, 2010; M. Solis), deposited in INBIO (PBI\_OON 51271).

DIAGNOSIS: Males of this dark-bodied species can easily be recognized by the rounded retrolateral portion of the distal embolar prong, which has a long, narrow prolateral tip (figs. 199–204), females by the angular anterior margin of the genital atrium (figs. 208, 209).

MALE (PBI\_OON 51271, figs. 199–204): Total length 1.65. Endite ventral process relatively small, apically narrow; dorsal process long, distally arched. Femur I r0-1-0. Embolus proximal prong narrow; distal prong with rounded retrolateral portion and long, narrow prolateral prolongation ( $N = 3$ ).

FEMALE (PBI\_OON 51271, figs. 205–209): Total length 1.92. Tibia I v4-4-1p. Genital atrium with angular, recurved anterior margin ( $N = 3$ ).

DISTRIBUTION: Central Puntarenas.

*Costarina carrillo*, new species (Figures 210–220)

TYPES: Male holotype, female allotype, and female paratype taken at an elevation of 1100 m on a nature trail along a cloud-forest/rainforest transect in the Parque Nacional Braulio Carrillo, San José, Costa Rica (Apr. 28–30, 1983; D. Ubick), deposited in CAS (PBI\_OON 51235).

DIAGNOSIS: Males closely resemble those of *C. elena* (cf. figs. 56–66) in having an enlarged, distally flared distal embolar prong with a long, narrow basal extension and a basally widened proximal embolar prong, but have a rounded tip on the distal prong (figs. 210–215); females resemble those of *C. viejo* (cf. figs. 133–143) and *C. cerere* (cf. figs. 406–416) in having fully fused ventral scuta and a pair of round sclerotizations at the sides of the genital atrium, but the posterior genitalic elements lack the posteromedian lobe found in those species (figs. 217–220).

MALE (PBI\_OON 51235, figs. 210–215): Total length 2.35. Both processes on endite short, narrow. Femora: I r1-1-0; II p0-0-1; metatarsus I v2-2-2. Embolus distal prong long, anterior margin subdistally excavated; proximal prong gradually narrowing throughout its length ( $N = 1$ ).

FEMALE (PBI\_OON 51235, figs. 216–220): Total length 2.75. Spination typical. Genital atrium relatively large, with sclerotizations visible through anterolateral corners ( $N = 2$ ).

DISTRIBUTION: San José.

*Costarina meridina* (Chickering) (Figures 221–231)

*Dysderina meridina* Chickering, 1968: 20, figs. 40, 41 (male holotype from San José, Costa Rica, in AMNH; examined).

*Costarina meridina*: Platnick and Dupérré, 2011: 50.

DIAGNOSIS: This appears to be a southern vicariant of *C. murphyorum* (cf. figs. 78–88); males differ in having all parts of the embolus narrower (figs. 221–226), females in having straight posterolateral corners of the genital atrium and narrower paramedian lobes on the posterior genitalic elements (figs. 230, 231).

MALE (PBI\_OON 93, figs. 221–226): Total length 1.90. Endite ventral process produced ventrally, heavily sclerotized distally; dorsal process strongly arched. Femur II p0-0-2. Embolus distal prong greatly elongated, with translucent flange at about two-thirds its length; proximal prong distally arched ( $N = 16$ ).

FEMALE (PBI\_OON 93, figs. 227–231): Total length 2.20. Spination typical. Genital atrium short, wide, including transverse sclerotization ( $N = 21$ ).

DISTRIBUTION: Abundant in San José and adjacent parts of Heredia and Cartago.

*Costarina watina* (Chickering) (Figures 232–242)

*Dysderina watina* Chickering, 1968: 33, figs. 80–84 (male holotype from Turrialba, Cartago, Costa Rica, in MCZ; examined).

*Costarina watina*: Platnick and Dupérré, 2011: 50.

DIAGNOSIS: Males resemble those of *C. maritza* (cf. figs. 34–44) but have a shorter distal embolar prong and a bifid proximal embolar prong (figs. 232–237); females have a small, almost pentagonal rounded genital atrium (figs. 241, 242), and usually have fully fused ventral scuta (figs. 239, 240).

MALE (PBI\_OON 51236, figs. 232–237): Total length 2.02. Endite dorsal process elongated, abruptly bent at level of tip of ventral process, tip directed anteriorly. Femur II p0-0-2, r0-1-0; tibia I v4-4-2; metatarsus I v2-2-2. Embolus distal prong relatively narrow, abruptly bent; proximal prong V-shaped in ventral view ( $N = 3$ ).

FEMALE (PBI\_OON 51236, figs. 238–242): Total length 2.53. Femur II r0-1-1. Genital atrium oval triangle, anterior genitalic process very narrow as seen through cuticle, apodemes short, directed almost laterally ( $N = 5$ ).

DISTRIBUTION: San José and Cartago.

*Costarina ramon*, new species (Figures 243–253)

TYPES: Male holotype and female allotype from Berlese sample of humus taken at an elevation of 1425 m at San Ramón, Río María Aguilar, 9°56.085'N, 83°59.296'W, San José, Costa Rica (Sept. 30, 2010; B. Hernández, M. Moraga), deposited in INBIO (PBI\_OON 51238).

DIAGNOSIS: Males have an enlarged and distinctively twisted distal embolar prong (figs. 243–248); females have a short, wide genital atrium and a pair of winglike projections on the posterior genitalic elements (figs. 252, 253).

MALE (PBI\_OON 51238, figs. 243–248): Total length 1.90. Endite ventral process relatively long, distally arched; dorsal process relatively long, narrow. Femora: I r0-1-1; II p0-0-1; tibia II v4-4-0. Embolus distal prong with twisted, prolateral extension; proximal prong with sharp process ( $N = 5$ ).

FEMALE (PBI\_OON 51238, figs. 249–253): Total length 2.05. Spination typical. Genital atrium very wide, with slight anteromedian projection on posterior margin ( $N = 2$ ).

DISTRIBUTION: San José.

*Costarina isidro*, new species (Figures 254–260, 567–571)

TYPES: Male holotype and male paratype from cloud-forest litter taken at an elevation of 1800 m at km 117 on the Inter-American Highway, 19 km north of San Isidro, 9°28'N, 83°42'20"W, San José, Costa Rica (Feb. 15, 1998; R. Anderson), deposited in AMNH (PBI\_OON 49231).

DIAGNOSIS: Males are relatively dark, narrow bodied, and long legged; they resemble those of *C. alturas* (cf. figs. 472–482) in having a long, narrow, ventrally arched proximal embolar



prong but have a wider tip on the almost rectangular distal embolar prong (figs. 255–260). A single female from Monteverde in northern Puntarenas is not as dark as the male, but is here tentatively assigned to the species on the basis of the similarities of both sexes to those of *C. alturas*; this female is easily recognized by the fully fused ventral scuta and greatly enlarged posterior genitalic elements (figs. 568–571).

MALE (PBI\_OON 49231, figs. 254–260): Total length 2.22. Endite ventral process relatively wide, darkened distally; dorsal process relatively long, narrow. Femora: I r0-1-0; II p0-0-2. Embolus distal prong almost rectangular, distally notched; proximal prong long, narrow, sinuous ( $N = 2$ ).

FEMALE: (PBI\_OON 51309, figs. 567–571): Total length 2.58. Spination typical. Genital atrium short, wide, recurved; posterior genitalic elements hypertrophied, longer than apodemes ( $N = 1$ ).

DISTRIBUTION: Northern Puntarenas and San José.

***Costarina san*, new species (Figures 268–278)**

TYPES: Male holotype, female allotype, and two male and two female paratypes from cloud-forest litter taken at an elevation of 1800 m at km 117 on the Inter-American Highway, 19 km north of San Isidro, 9°28'N, 83°42'20"W, San José, Costa Rica (Feb. 15, 1998; R. Anderson), deposited in AMNH (PBI\_OON 49240).

DIAGNOSIS: Males can be distinguished by the relatively large, rectangular proximal embolar prong and the wide, short, distally directed distal prong (figs. 268–273), females by the very small genital atrium and the rounded paramedian lobes on the posterior genitalic elements (figs. 277, 278).

MALE (PBI\_OON 49240, figs. 268–273): Total length 2.04. Endite ventral process wide, heavily sclerotized distally; dorsal process narrow. Femur II p0-0-2, r0-1-0; metatarsus I v2-2-2. Embolus proximal prong rectangular, with sharp prolateral extension; distal prong with translucent flange ( $N = 3$ ).

FEMALE (PBI\_OON 49240, figs. 274–278): Total length 2.35. Spination typical. Conspicuous dark markings present lateral to right and left sides of genital atrium, posterior elements with rounded paramedian lobes ( $N = 3$ ).

DISTRIBUTION: San José.

***Costarina cuerici*, new species (Figures 279–289)**

TYPES: Male holotype and female allotype from leaf litter taken at an elevation of 2640–2700 m around the Estación Biológica de Cuerici, 4.6 km east of Villa Mills, San José, Costa Rica (Nov. 26, 1995; A. Picado), deposited in INBIO (45775, PBI\_OON 51240).

DIAGNOSIS: Males resemble those of *C. junio* (cf. figs. 290–300) in having a distally twisted distal embolar prong, but have the proximal prong broadly fused to the distal prong at its base (figs. 279–284); females have distinctively arched posterior genitalic elements (figs. 288, 289).

MALE (PBI\_OON 51240, figs. 279–284): Total length 2.40. Endite ventral process with arched ventral surface; dorsal process narrow. Femur II p0-0-1; tibia II v4-4-2. Embolus proximal prong tiny, spur shaped; distal prong huge, with translucent prolateral flange ( $N = 6$ ).

FEMALE (PBI\_OON 51240, figs. 285–289): Total length 2.54. Tibia II v4-4-2. Genital atrium containing distinctive triangular sclerotization, posterior genitalic elements strongly arched ( $N = 4$ ).

DISTRIBUTION: San José and Cartago.

***Costarina leones*, new species (Figures 261–267)**

TYPE: Male holotype from humus taken at an elevation of 2600 m on the Camino Quebrada Los Leones, Estación Biológica de Cuerici, 4.6 km east of Villa Mills, San José, Costa Rica (Sept. 20, 1995; A. Picado, B. Gamboa), deposited in INBIO (45767, PBI\_OON 29802).

DIAGNOSIS: Males resemble those of *C. carara* (cf. figs. 166–176) but have a shorter, wider proximal embolar prong (figs. 262–267).

MALE (PBI\_OON 29802, figs. 261–267): Total length 2.28. Both processes on endite relatively narrow, curved at tip. Femur II p0-0-2; tibia I v4-4-2. Embolus proximal prong relatively short, wide; distal prong with twisted, translucent flange ( $N = 2$ ).

FEMALE: Unknown.

DISTRIBUTION: San José.

***Costarina junio*, new species (Figures 290–300)**

TYPES: Male holotype and male paratype from wet cloud-forest litter taken at an elevation of 2900 m at a site near km 71 of the Inter-American Highway near Tres de Junio, 9°37'44"N, 83°50'13"W, on the San José/Cartago border, Costa Rica (June 23, 1999; R. Anderson), deposited in AMNH (PBI\_OON 51242).

DIAGNOSIS: Males and females have not been taken together, and are only tentatively matched here. Males resemble those of species like *C. poas* (cf. figs. 111–121), *C. rafael* (cf. figs. 144–154), and *C. cuerici* (cf. figs. 279–289) in having greatly enlarged, flange-shaped distal embolar prongs, but have a longer tip on the proximal embolar prong (figs. 290–295); females resemble those of *C. rafael* but have fully fused ventral scuta (figs. 297–300).

MALE (PBI\_OON 51242, figs. 290–295): Total length 2.43. Both processes on endite with narrow, curved, heavily sclerotized tips. Femur II p0-0-1. Embolus proximal prong long, narrow; distal prong enlarged, with narrow, translucent flange on prolateral side ( $N = 4$ ).

FEMALE (PBI\_OON 37016, figs. 296–300): Total length 2.35. Spination typical. Posterior margin of genital atrium recurved, apodemes enlarged, triangular ( $N = 1$ ).

DISTRIBUTION: San José and adjacent Cartago.

***Costarina reventazon*, new species (Figures 301–307)**

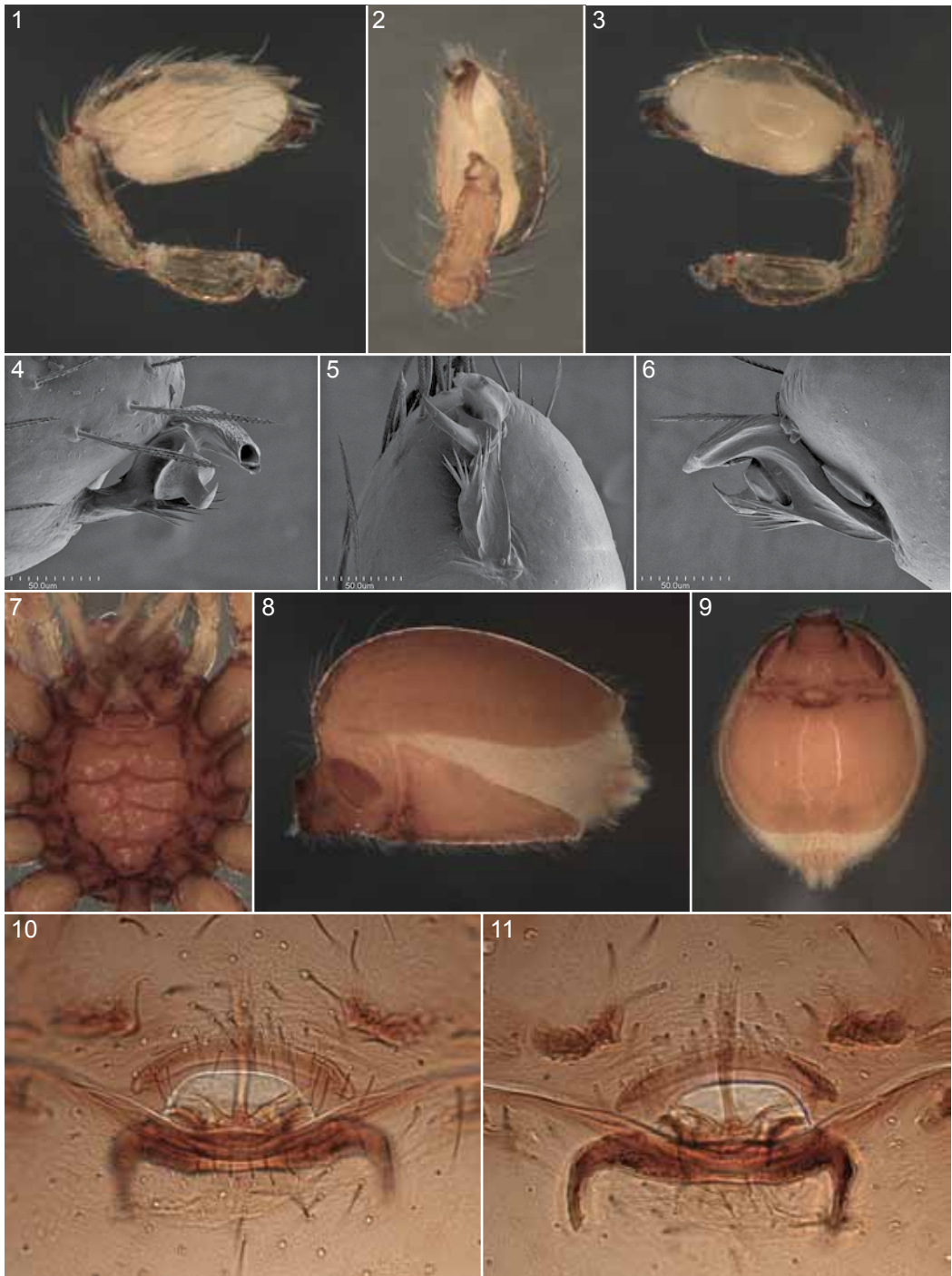
TYPE: Male holotype from Río Reventazón, 3–5 km east of Turrialba, Cartago, Costa Rica (Jan. 18–22, 1973; W. Brown), deposited in MCZ (PBI\_OON 38060).

DIAGNOSIS: Males resemble those of *C. pittier* (cf. figs. 461–471) in having a long, relatively simple embolus, but the embolus is evenly curved (figs. 302–307).

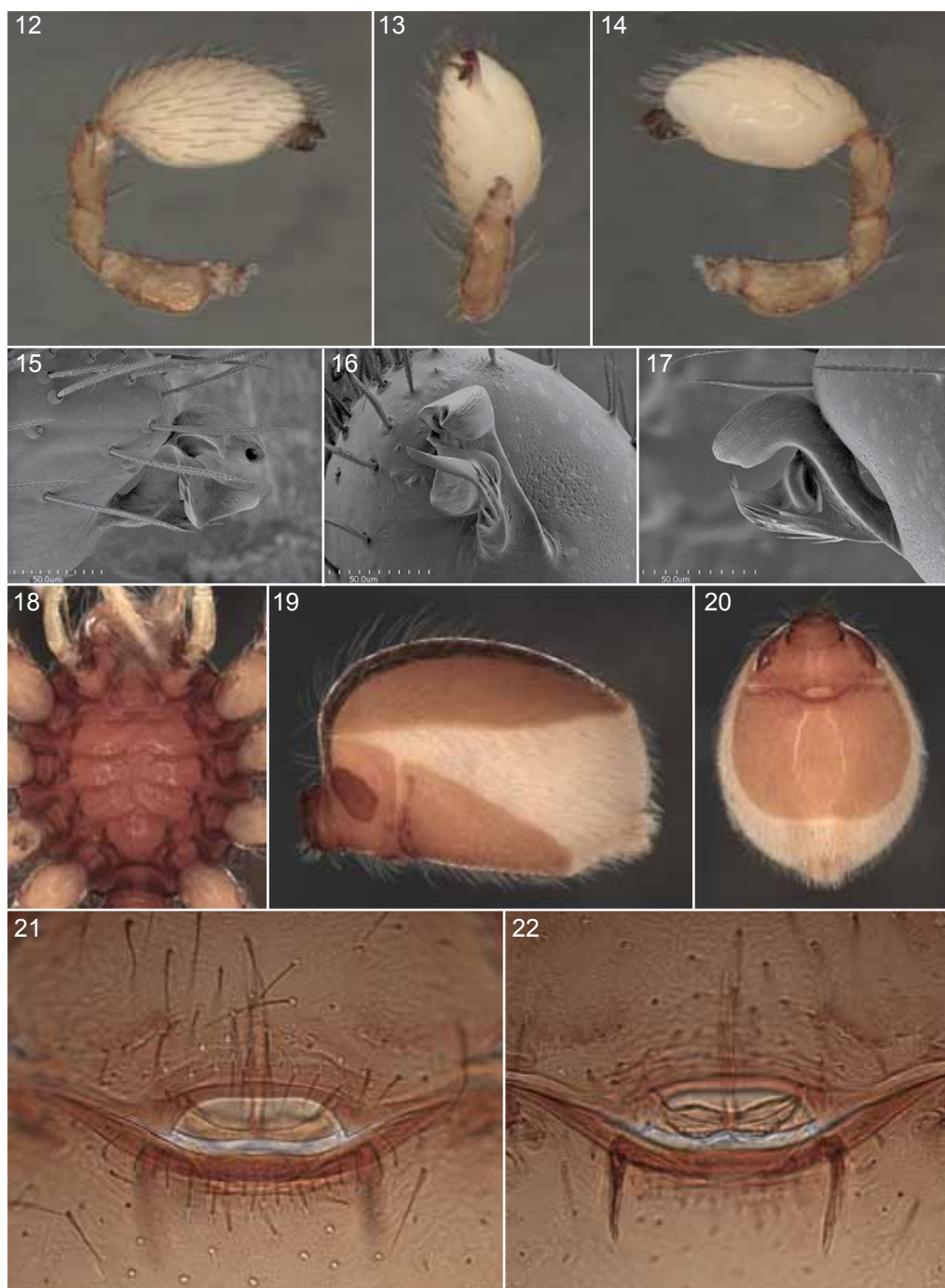
MALE (PBI\_OON 38060, figs. 301–307): Total length 1.76. Both processes on endite relatively short, basally wide. Tibiae I, II v4-4-0; metatarsus I v2-2-2. Embolus consisting of single long, narrow, sinuous prong ( $N = 6$ ).

FEMALE: Unknown.

DISTRIBUTION: Cartago and Limón.

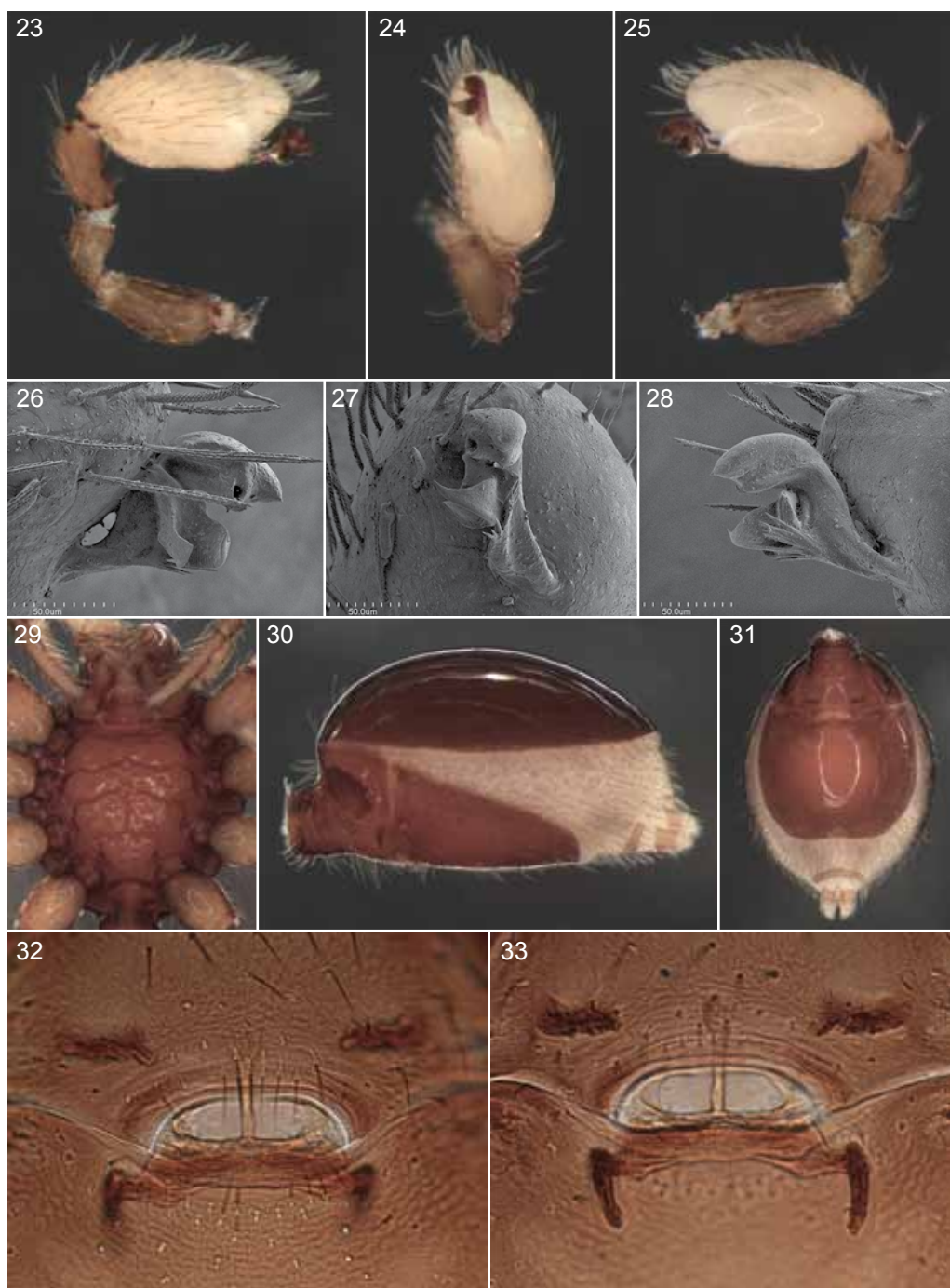


FIGURES 1–11. *Costarina plena* (O. P.-Cambridge), male (1–6) and female (7–11). 1. Left palp, prolateral view. 2. Same, ventral view. 3. Same, retrolateral view. 4. Left embolus, prolateral view. 5. Same, ventral view. 6. Same, retrolateral view. 7. Sternum, ventral view. 8. Abdomen, lateral view. 9. Same, ventral view. 10. Digested female genitalia, ventral view. 11. Same, dorsal view.

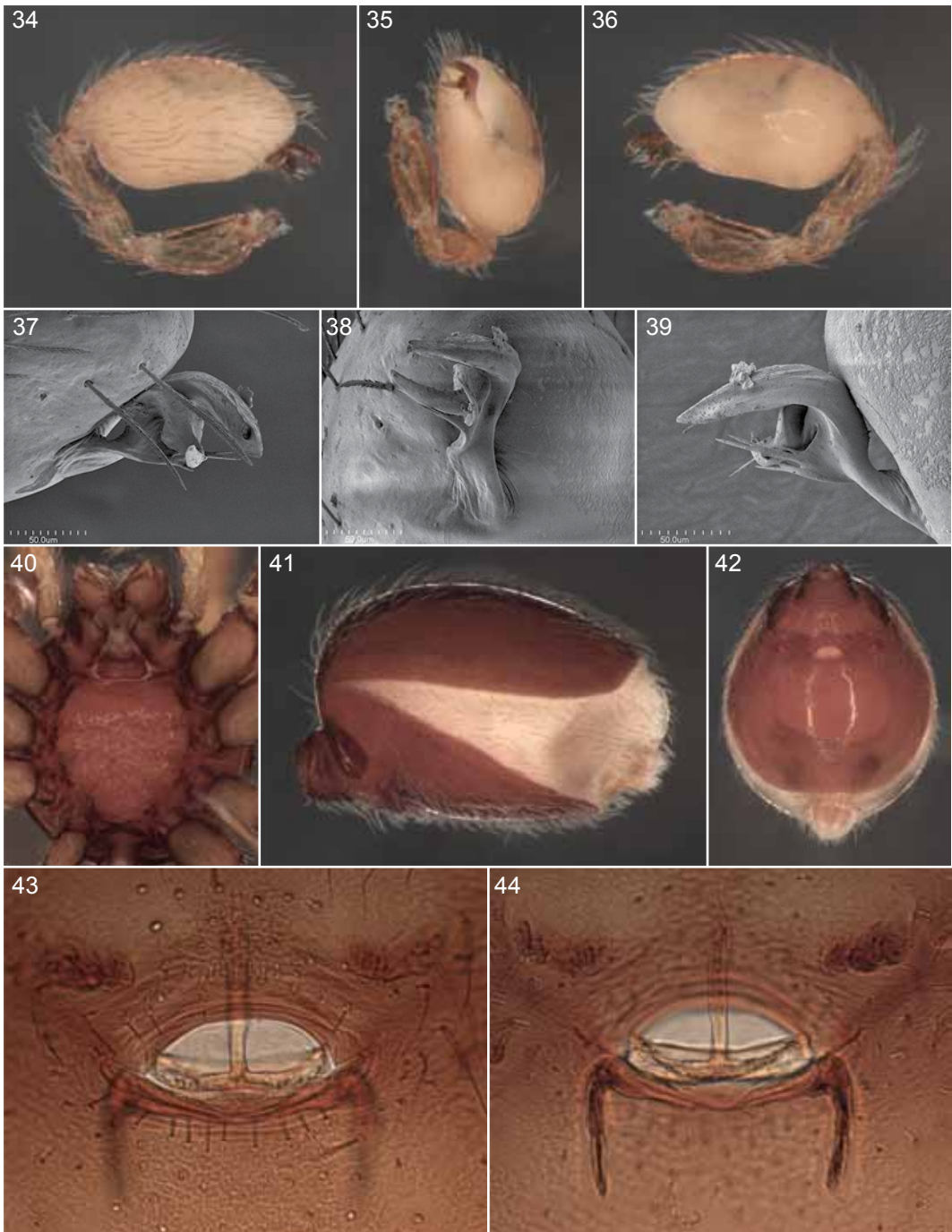


FIGURES 12–22. *Costarina paraplana*, new species, male (12–17) and female (18–22). 12. Left palp, prolateral view. 13. Same, ventral view. 14. Same, retrolateral view. 15. Left embolus, prolateral view. 16. Same, ventral view. 17. Same, retrolateral view. 18. Sternum, ventral view. 19. Abdomen, lateral view. 20. Same, ventral view. 21. Digested female genitalia, ventral view. 22. Same, dorsal view.

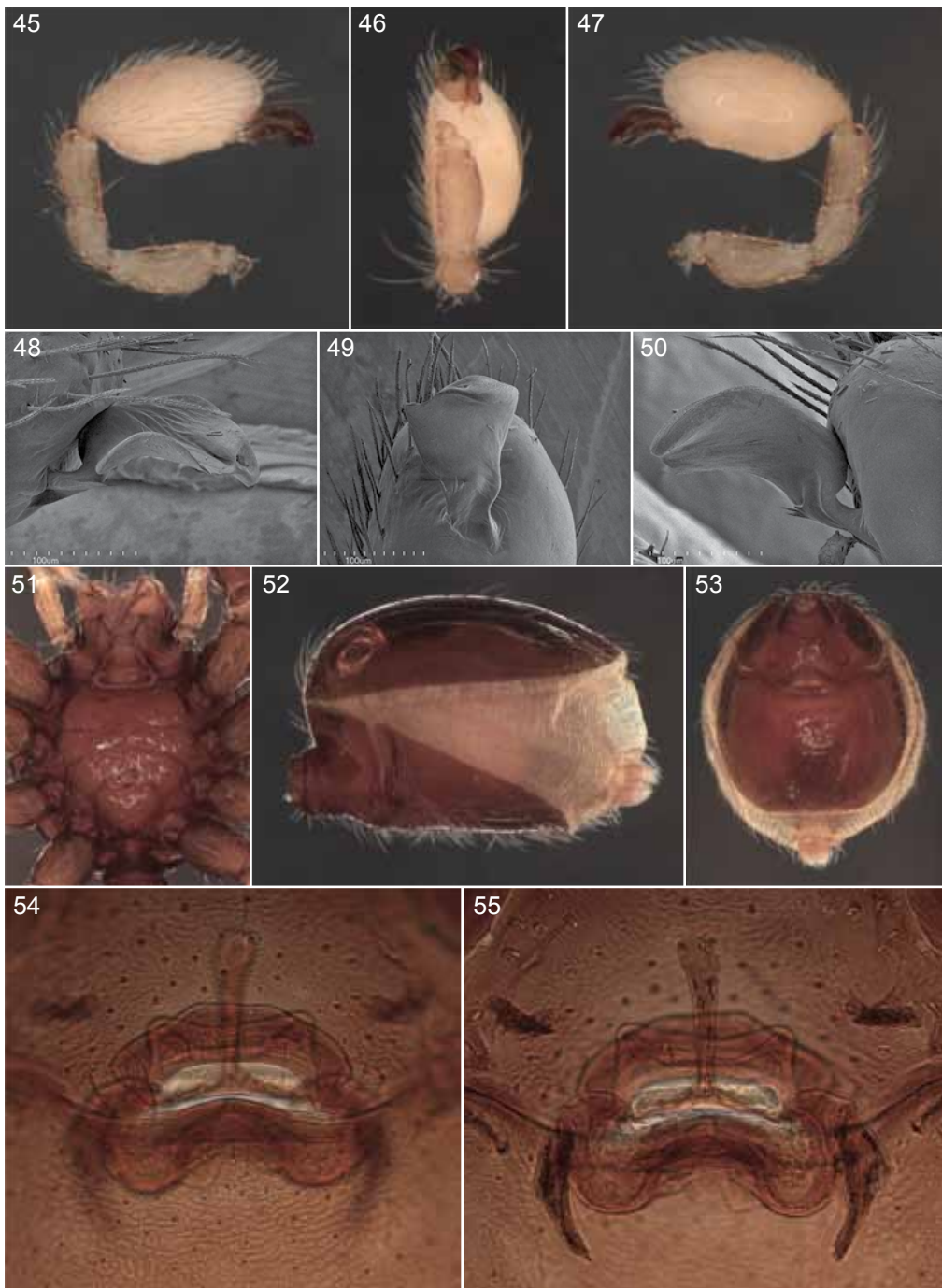




FIGURES 23–33. *Costarina superplena*, new species, male (23–28) and female (29–33). 23. Left palp, prolateral view. 24. Same, ventral view. 25. Same, retrolateral view. 26. Left embolus, prolateral view. 27. Same, ventral view. 28. Same, retrolateral view. 29. Sternum, ventral view. 30. Abdomen, lateral view. 31. Same, ventral view. 32. Digested female genitalia, ventral view. 33. Same, dorsal view.

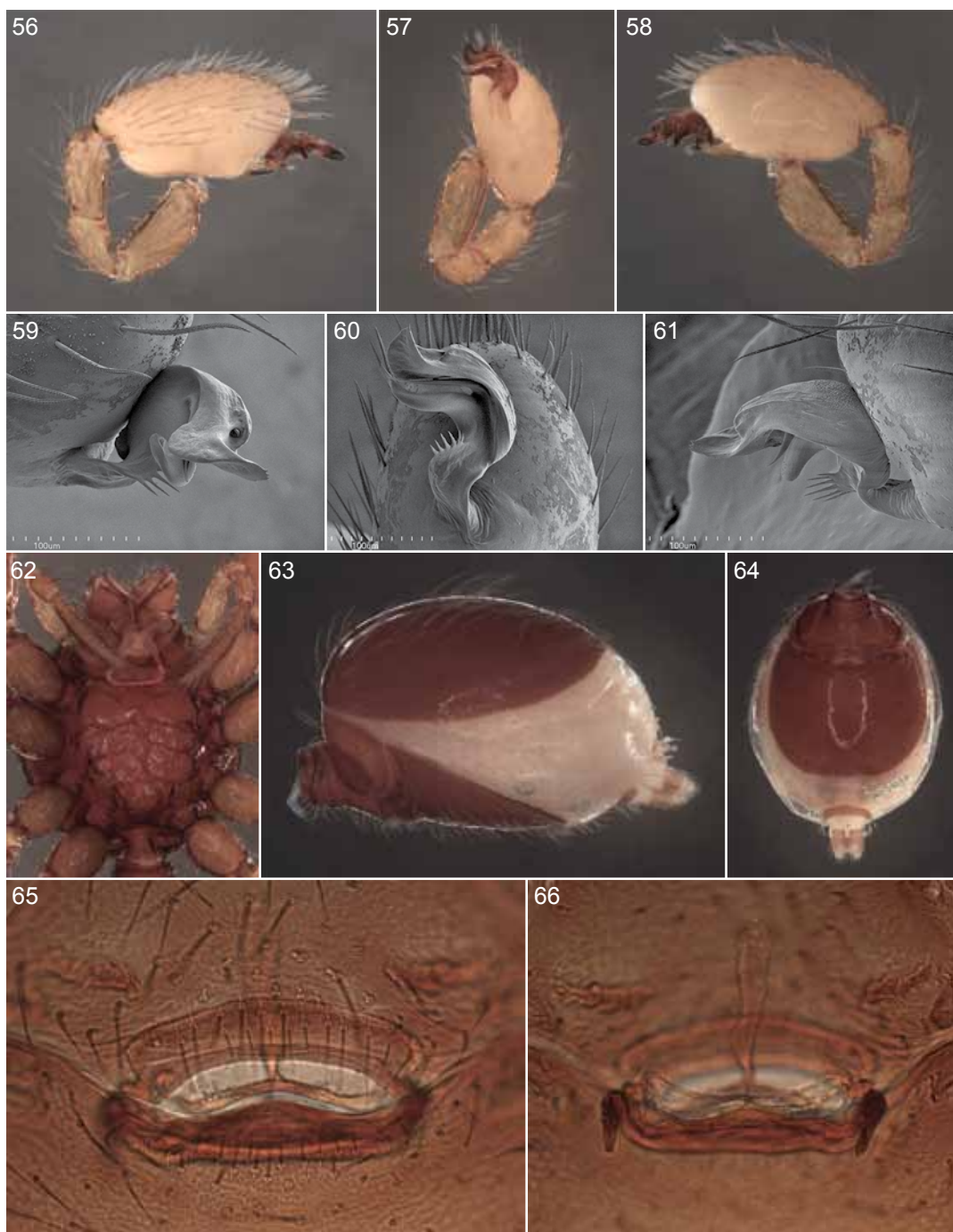


FIGURES 34–44. *Costarina maritza*, new species, male (34–39) and female (40–44). 34. Left palp, prolateral view. 35. Same, ventral view. 36. Same, retrolateral view. 37. Left embolus, prolateral view. 38. Same, ventral view. 39. Same, retrolateral view. 40. Sternum, ventral view. 41. Abdomen, lateral view. 42. Same, ventral view. 43. Digested female genitalia, ventral view. 44. Same, dorsal view.



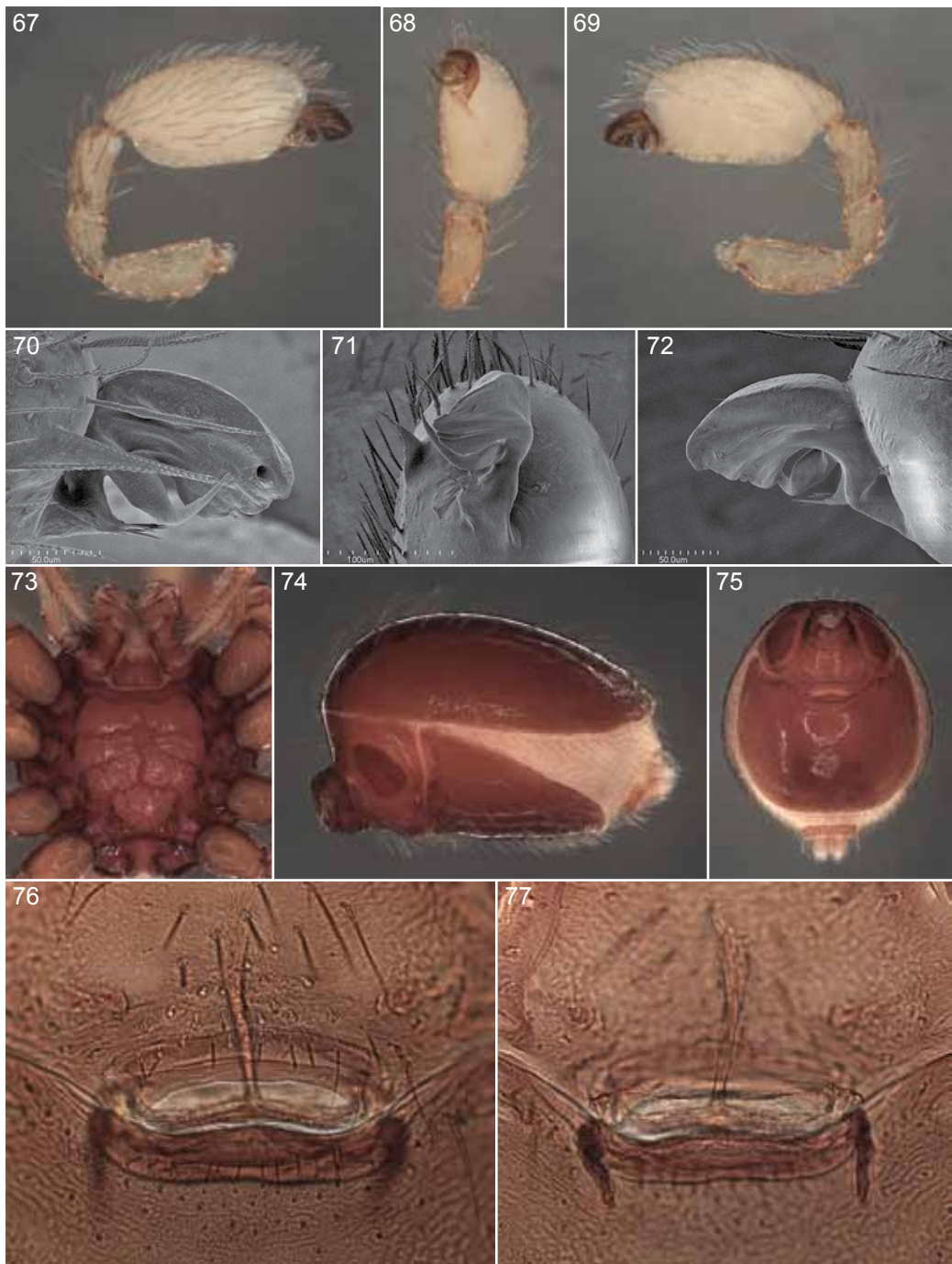
FIGURES 45–55. *Costarina cima*, new species, male (45–50) and female (51–55). **45.** Left palp, prolateral view. **46.** Same, ventral view. **47.** Same, retrolateral view. **48.** Left embolus, prolateral view. **49.** Same, ventral view. **50.** Same, retrolateral view. **51.** Sternum, ventral view. **52.** Abdomen, lateral view. **53.** Same, ventral view. **54.** Digested female genitalia, ventral view. **55.** Same, dorsal view.



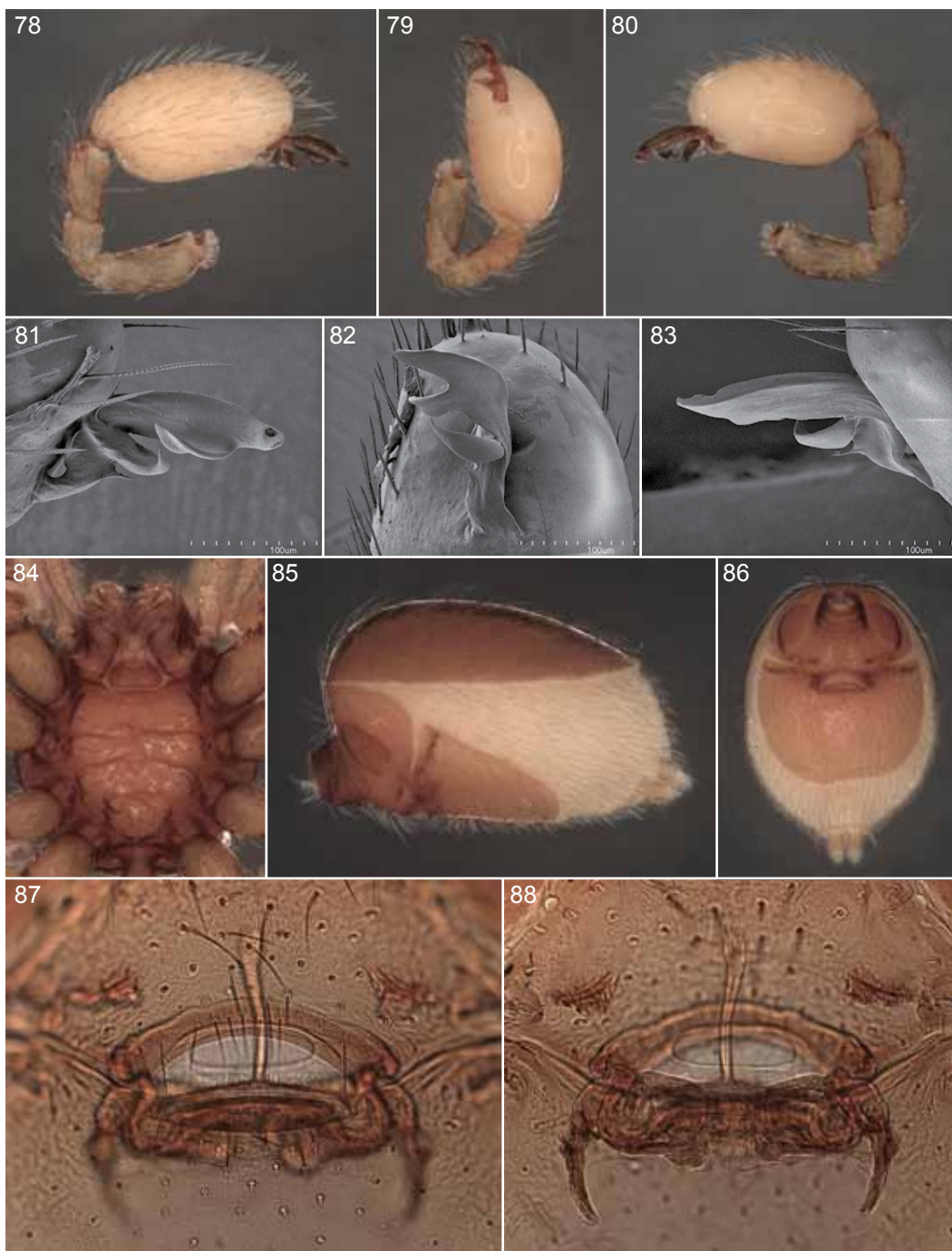


FIGURES 56–66. *Costarina elena*, new species, male (56–61) and female (62–66). **56.** Left palp, prolateral view. **57.** Same, ventral view. **58.** Same, retrolateral view. **59.** Left embolus, prolateral view. **60.** Same, ventral view. **61.** Same, retrolateral view. **62.** Sternum, ventral view. **63.** Abdomen, lateral view. **64.** Same, ventral view. **65.** Digested female genitalia, ventral view. **66.** Same, dorsal view.

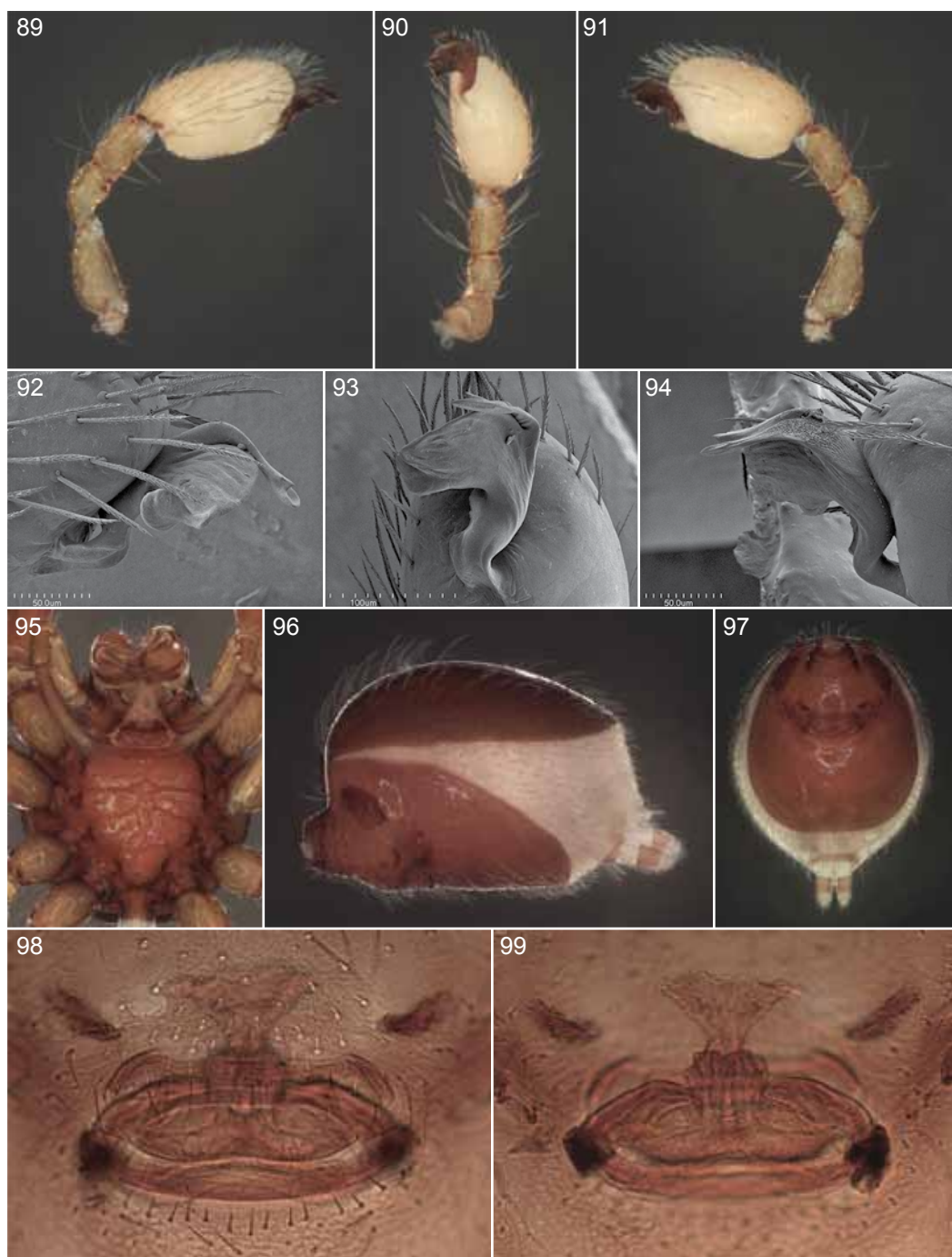




FIGURES 67–77. *Costarina monte*, new species, male (67–72) and female (73–77). 67. Left palp, prolateral view. 68. Same, ventral view. 69. Same, retrolateral view. 70. Left embolus, prolateral view. 71. Same, ventral view. 72. Same, retrolateral view. 73. Sternum, ventral view. 74. Abdomen, lateral view. 75. Same, ventral view. 76. Digested female genitalia, ventral view. 77. Same, dorsal view.

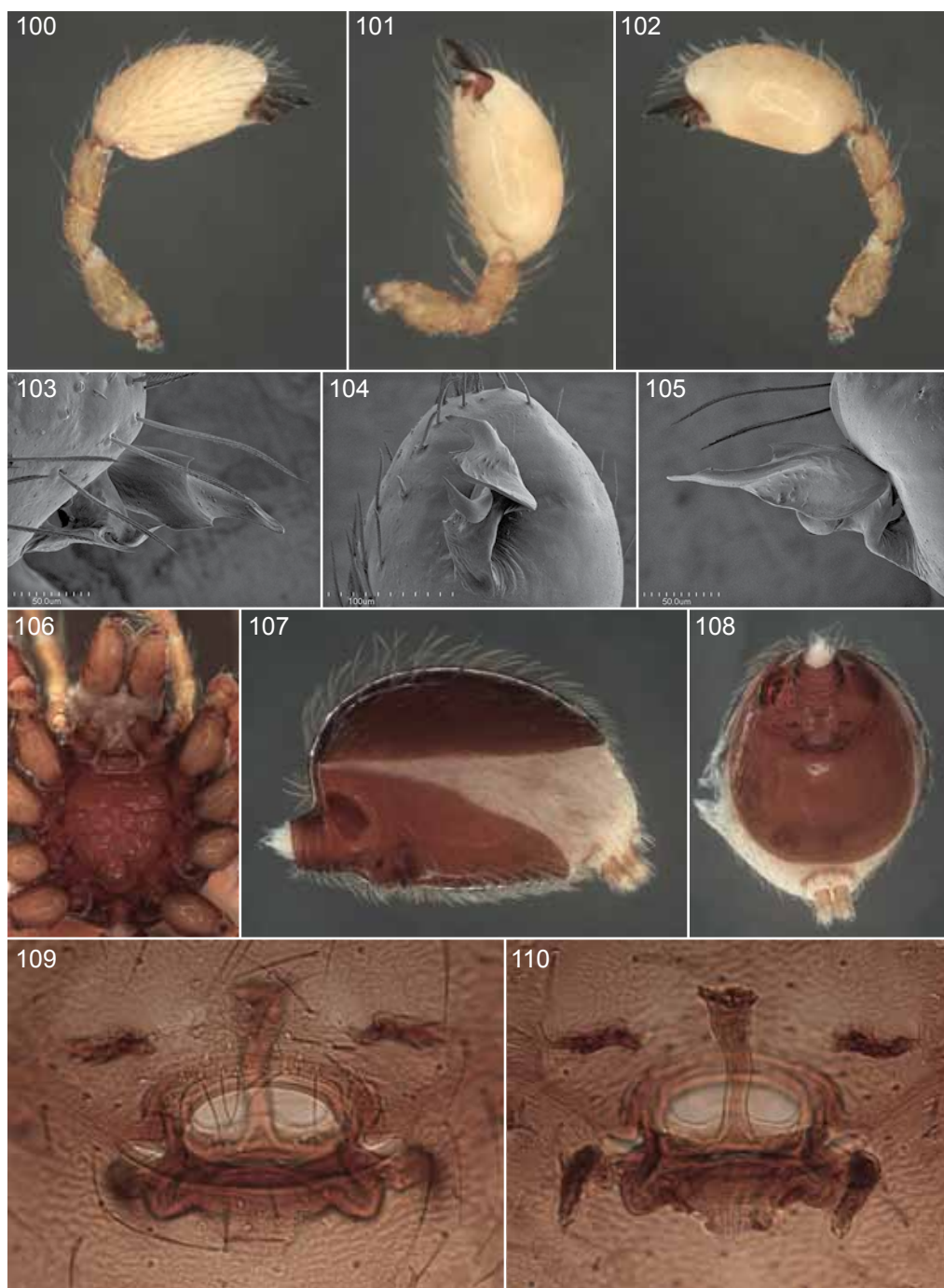


FIGURES 78–88. *Costarina murphyorum*, new species, male (78–83) and female (84–88). **78.** Left palp, prolateral view. **79.** Same, ventral view. **80.** Same, retrolateral view. **81.** Left embolus, prolateral view. **82.** Same, ventral view. **83.** Same, retrolateral view. **84.** Sternum, ventral view. **85.** Abdomen, lateral view. **86.** Same, ventral view. **87.** Digested female genitalia, ventral view. **88.** Same, dorsal view.

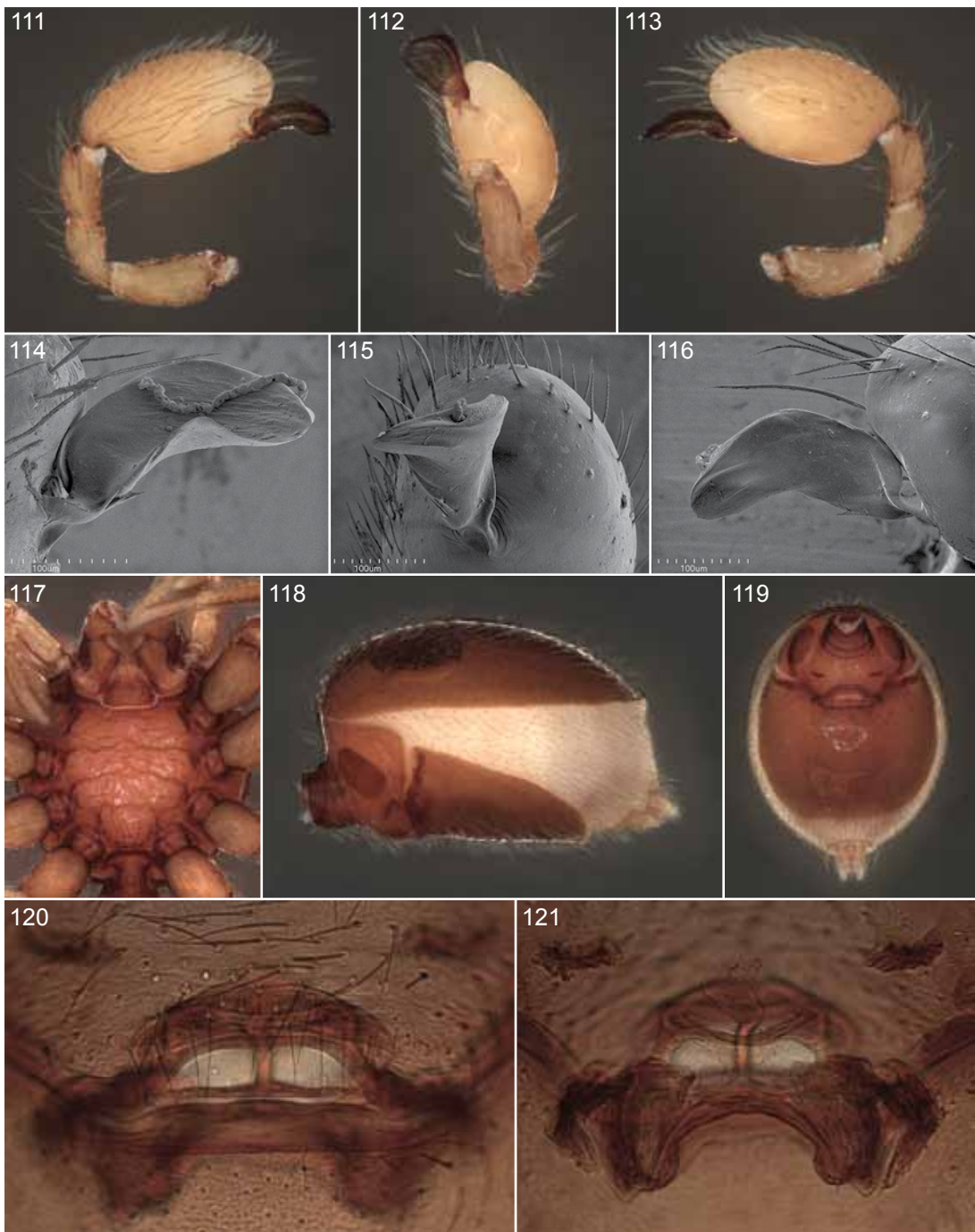


FIGURES 89–99. *Costarina chiles*, new species, male (89–94) and female (95–99). **89.** Left palp, prolateral view. **90.** Same, ventral view. **91.** Same, retrolateral view. **92.** Left embolus, prolateral view. **93.** Same, ventral view. **94.** Same, retrolateral view. **95.** Sternum, ventral view. **96.** Abdomen, lateral view. **97.** Same, ventral view. **98.** Digested female genitalia, ventral view. **99.** Same, dorsal view.

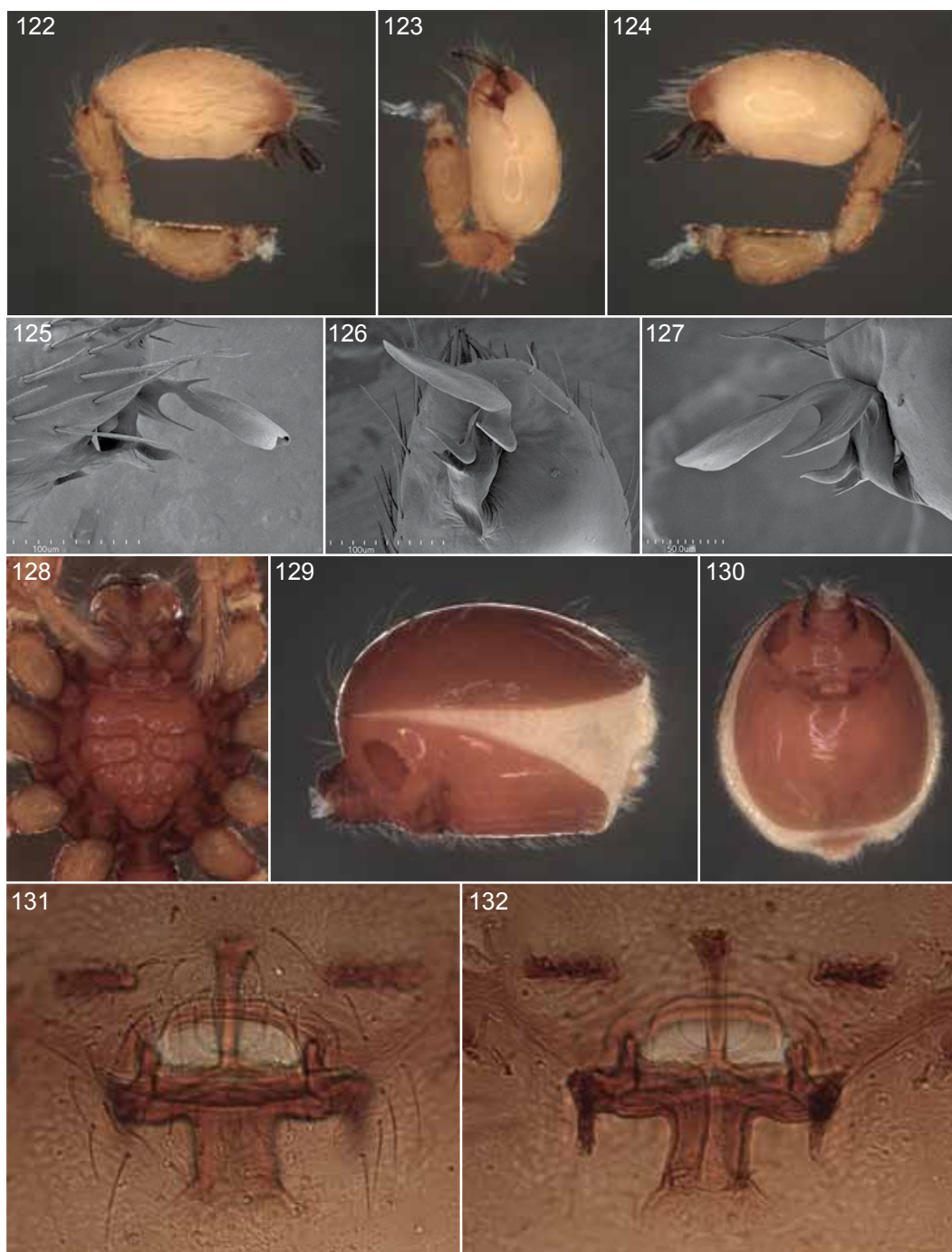




FIGURES 100–110. *Costarina upala*, new species, male (100–105) and female (106–110). **100.** Left palp, prolateral view. **101.** Same, ventral view. **102.** Same, retrolateral view. **103.** Left embolus, prolateral view. **104.** Same, ventral view. **105.** Same, retrolateral view. **106.** Sternum, ventral view. **107.** Abdomen, lateral view. **108.** Same, ventral view. **109.** Digested female genitalia, ventral view. **110.** Same, dorsal view.

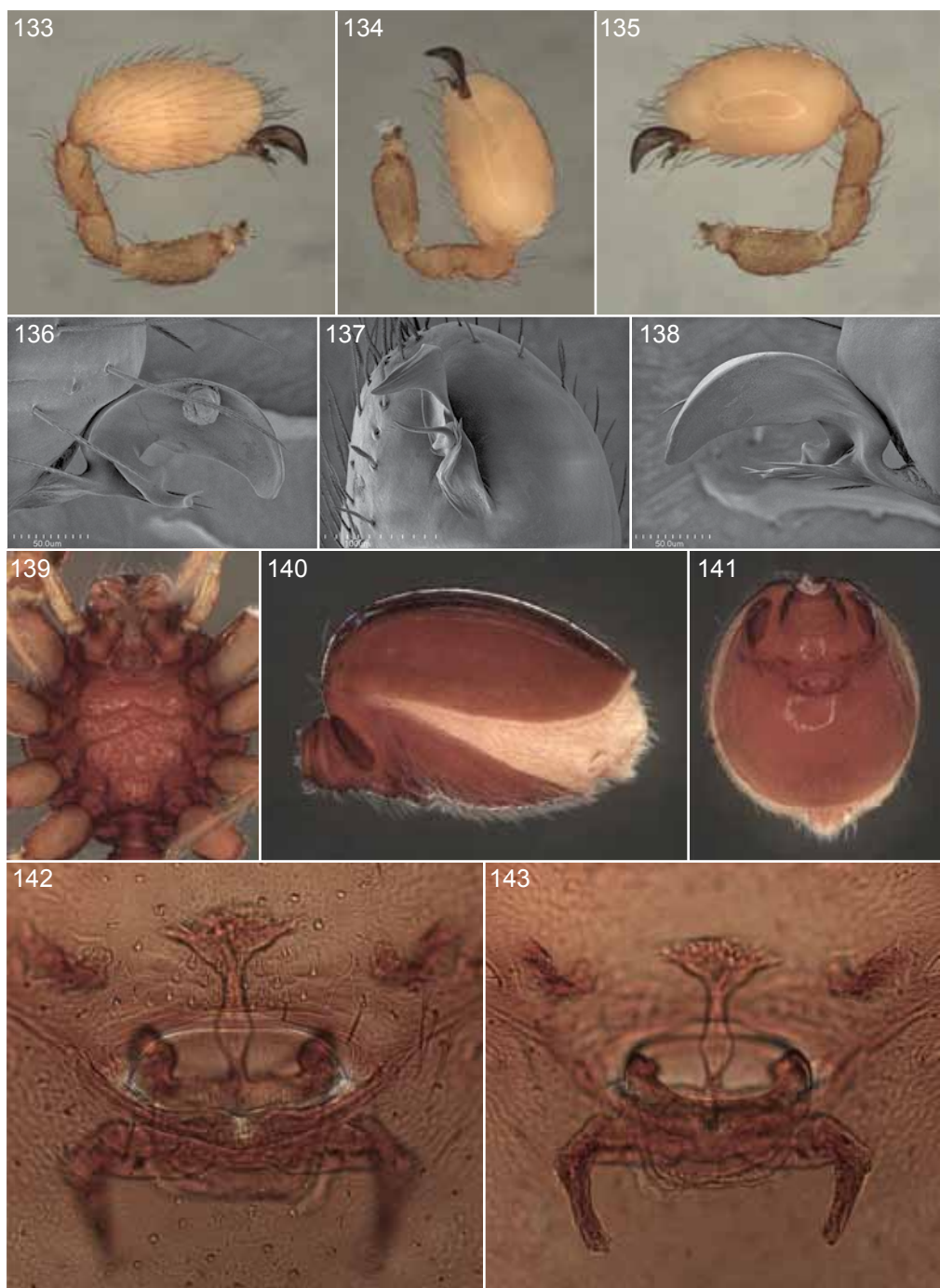


FIGURES 111–121. *Costarina poas*, new species, male (111–116) and female (117–121). **111.** Left palp, prolateral view. **112.** Same, ventral view. **113.** Same, retrolateral view. **114.** Left embolus, prolateral view. **115.** Same, ventral view. **116.** Same, retrolateral view. **117.** Sternum, ventral view. **118.** Abdomen, lateral view. **119.** Same, ventral view. **120.** Digested female genitalia, ventral view. **121.** Same, dorsal view.

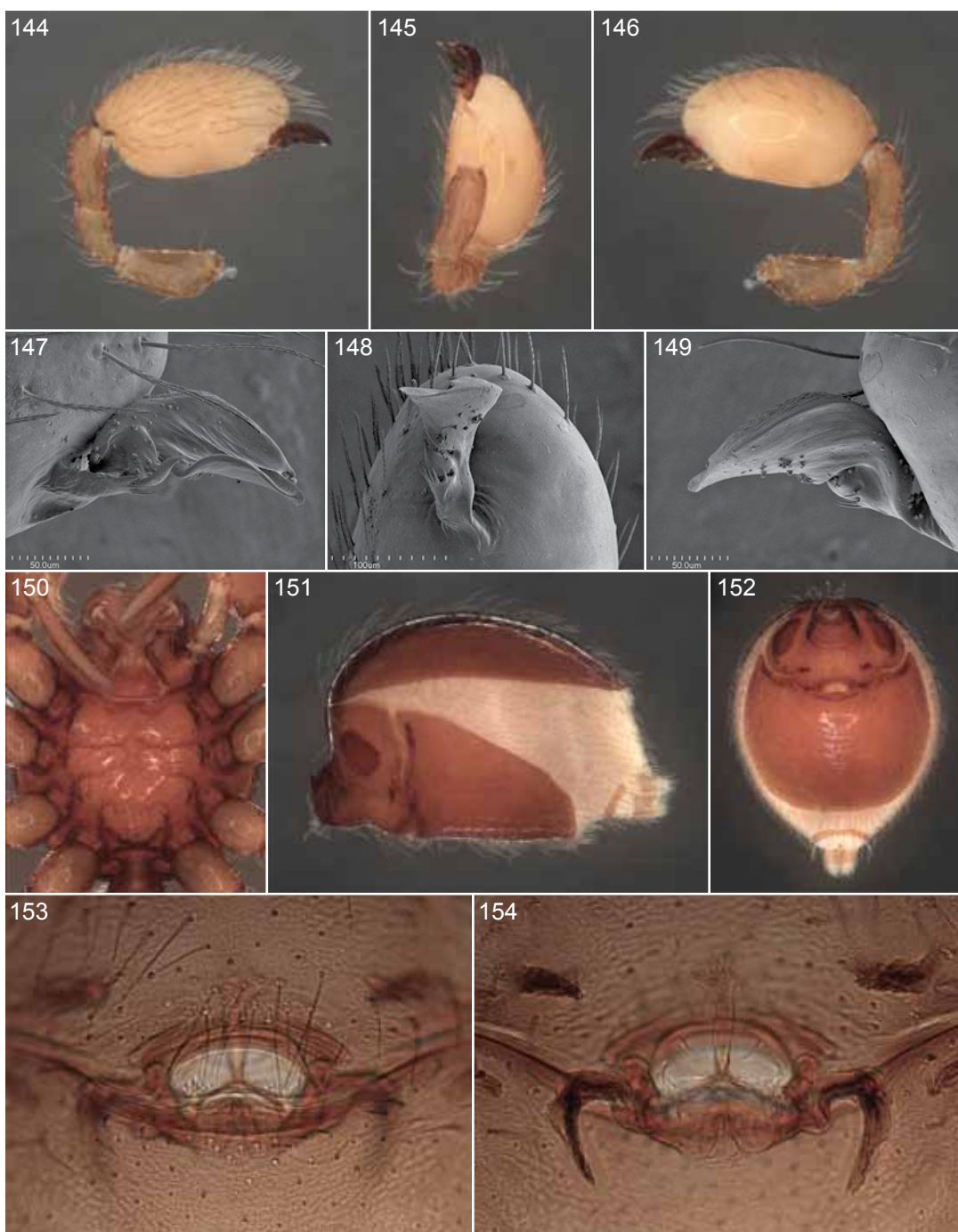


FIGURES 122–132. *Costarina selva*, new species, male (122–127) and female (128–132). **122.** Left palp, prolateral view. **123.** Same, ventral view. **124.** Same, retrolateral view. **125.** Left embolus, prolateral view. **126.** Same, ventral view. **127.** Same, retrolateral view. **128.** Sternum, ventral view. **129.** Abdomen, lateral view. **130.** Same, ventral view. **131.** Digested female genitalia, ventral view. **132.** Same, dorsal view.



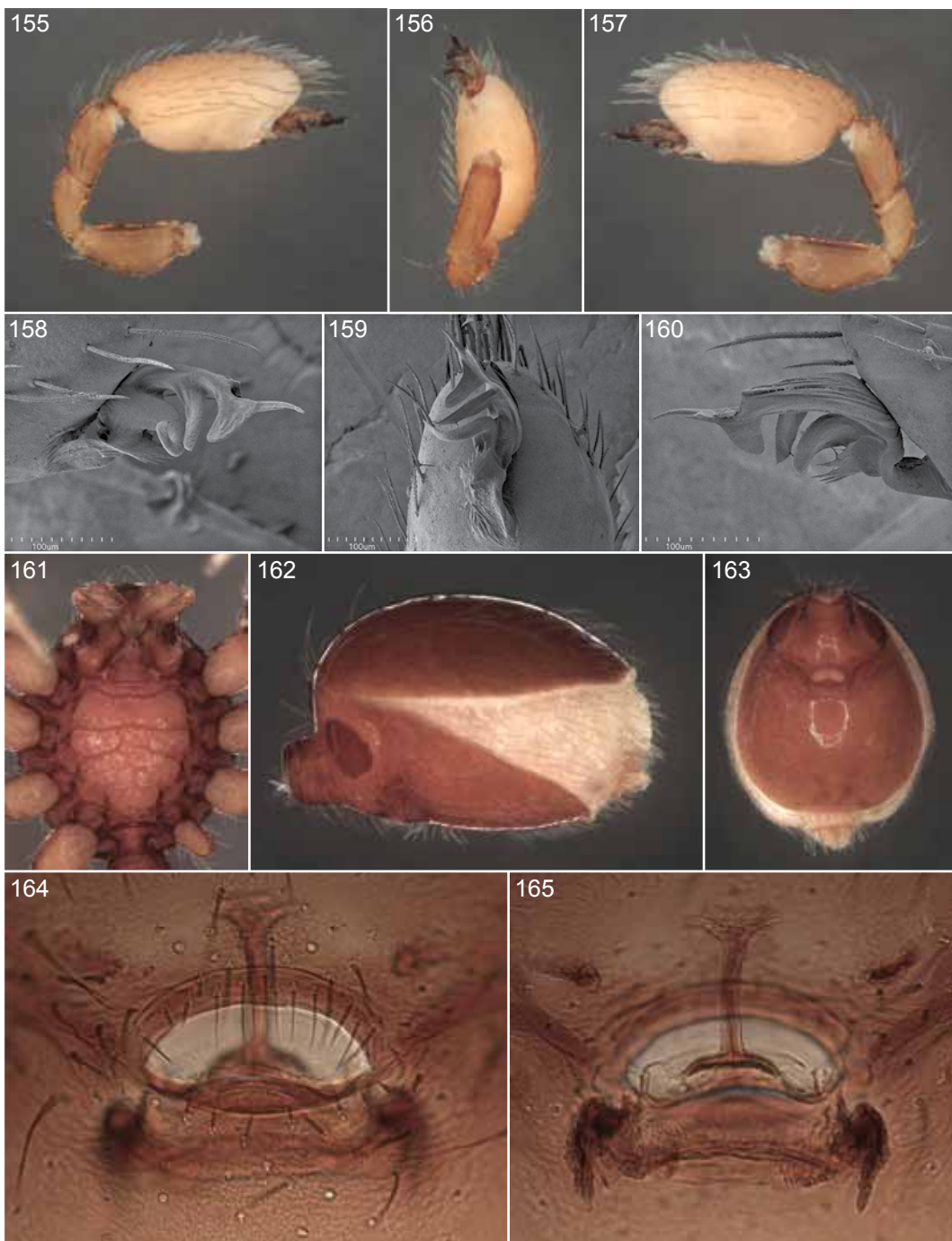


FIGURES 133–143. *Costarina viejo*, new species, male (133–138) and female (139–143). **133.** Left palp, prolateral view. **134.** Same, ventral view. **135.** Same, retrolateral view. **136.** Left embolus, prolateral view. **137.** Same, ventral view. **138.** Same, retrolateral view. **139.** Sternum, ventral view. **140.** Abdomen, lateral view. **141.** Same, ventral view. **142.** Digested female genitalia, ventral view. **143.** Same, dorsal view.

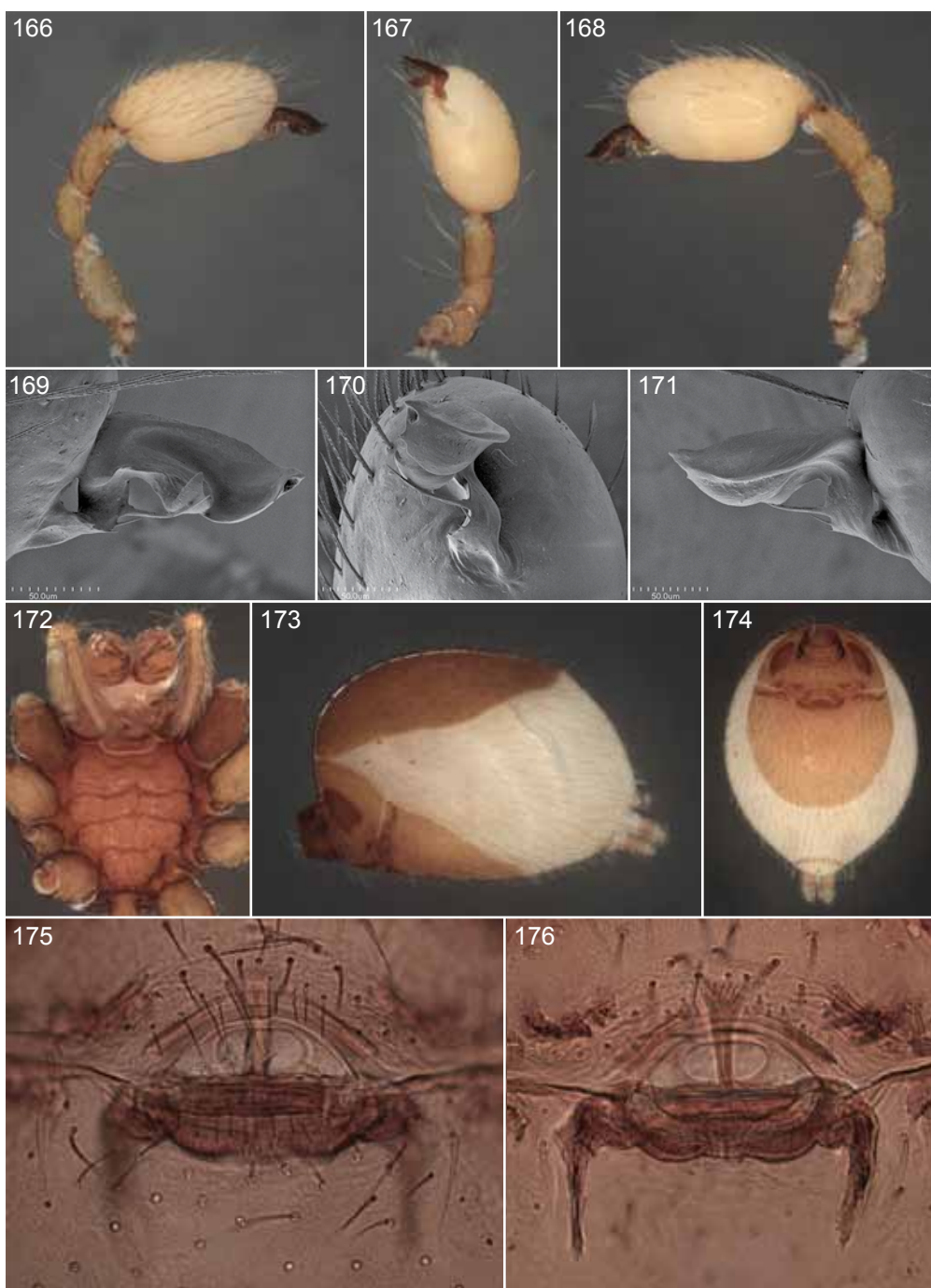


FIGURES 144–154. *Costarina raphael*, new species, male (144–149) and female (150–154). **144.** Left palp, prolateral view. **145.** Same, ventral view. **146.** Same, retrolateral view. **147.** Left embolus, prolateral view. **148.** Same, ventral view. **149.** Same, retrolateral view. **150.** Sternum, ventral view. **151.** Abdomen, lateral view. **152.** Same, ventral view. **153.** Digested female genitalia, ventral view. **154.** Same, dorsal view.

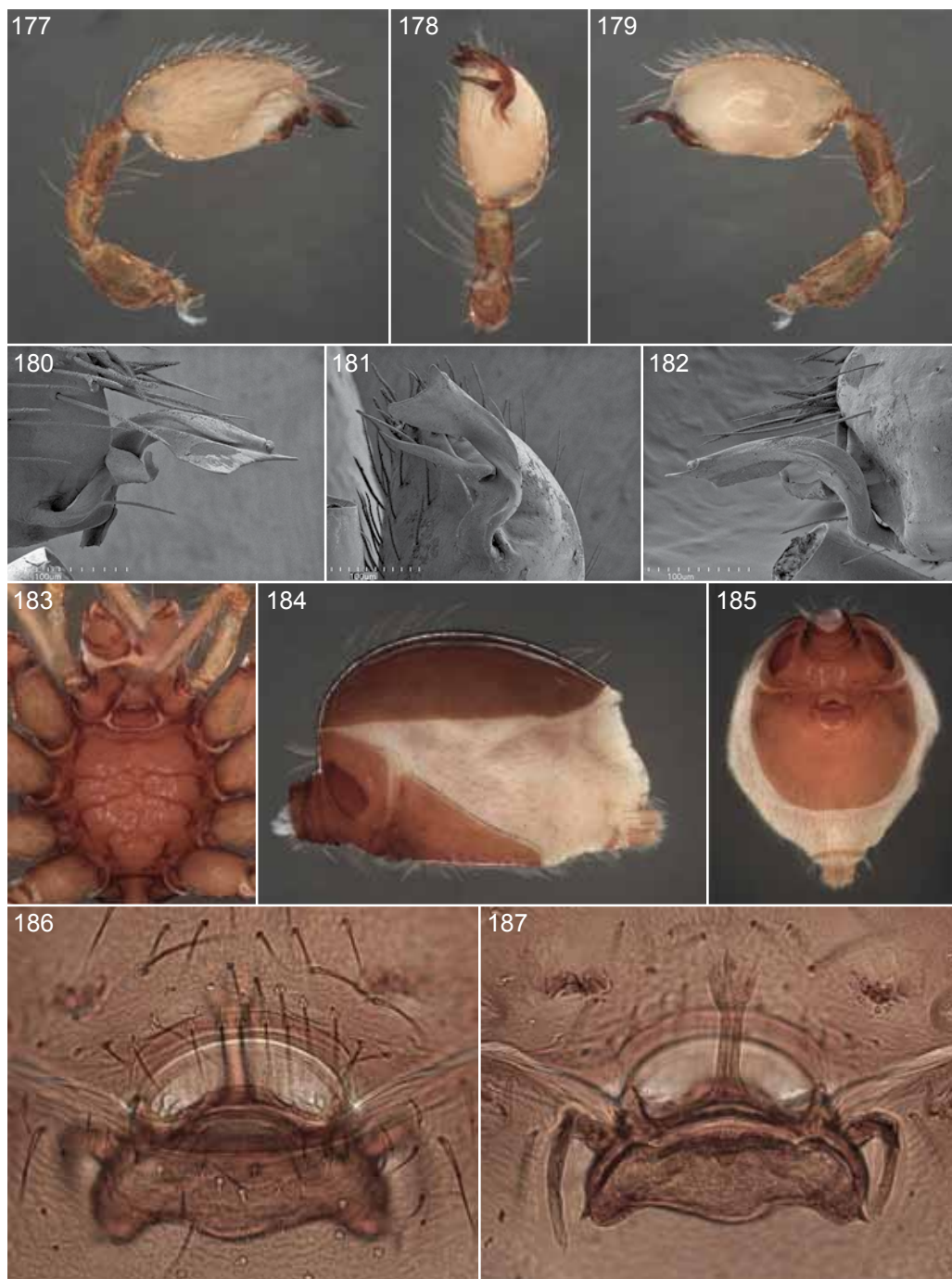




FIGURES 155–165. *Costarina azul*, new species, male (155–160) and female (161–165). **155.** Left palp, prolateral view. **156.** Same, ventral view. **157.** Same, retrolateral view. **158.** Left embolus, prolateral view. **159.** Same, ventral view. **160.** Same, retrolateral view. **161.** Sternum, ventral view. **162.** Abdomen, lateral view. **163.** Same, ventral view. **164.** Digested female genitalia, ventral view. **165.** Same, dorsal view.

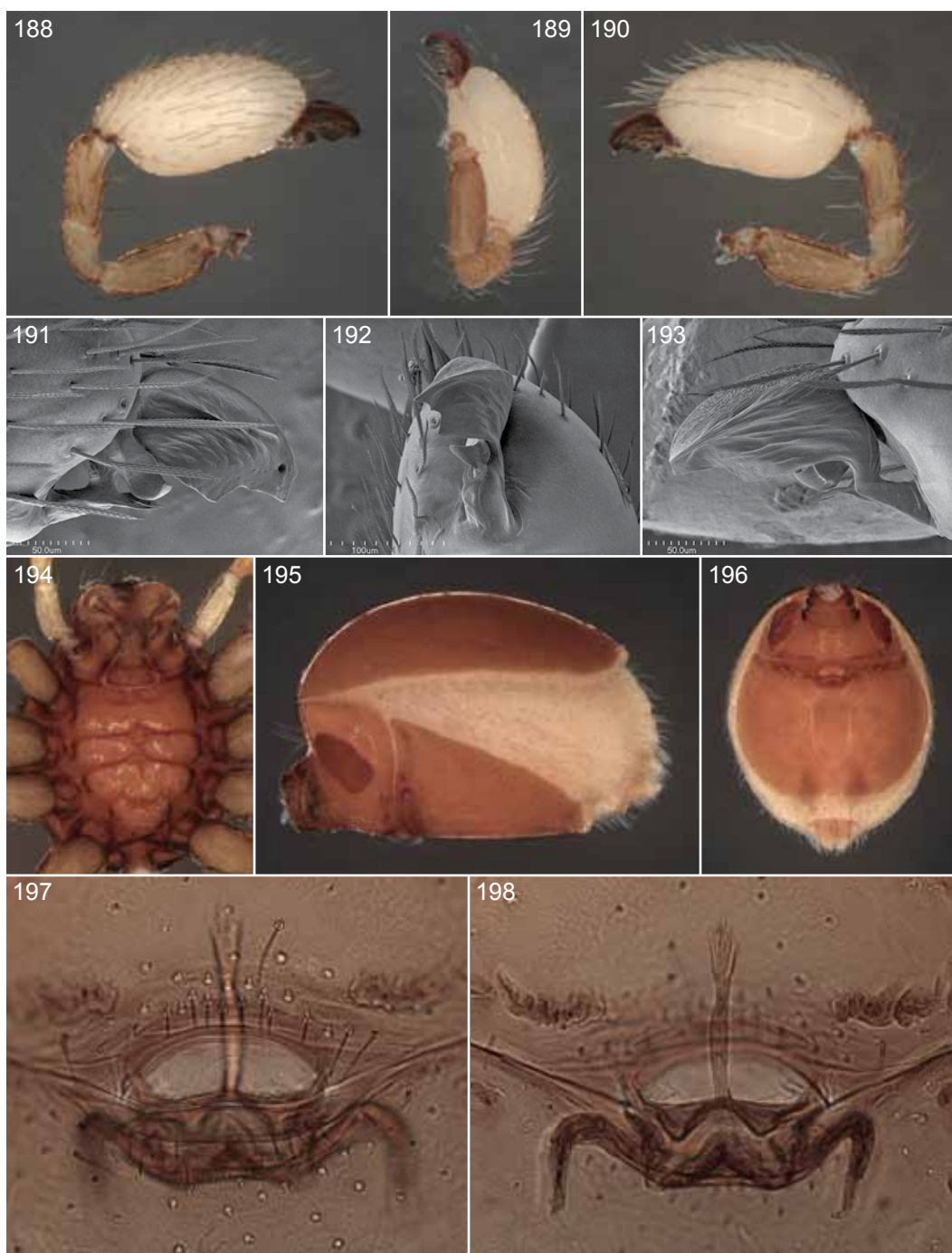


FIGURES 166–176. *Costarina carara*, new species, male (166–171) and female (172–176). **166.** Left palp, prolateral view. **167.** Same, ventral view. **168.** Same, retrolateral view. **169.** Left embolus, prolateral view. **170.** Same, ventral view. **171.** Same, retrolateral view. **172.** Sternum, ventral view. **173.** Abdomen, lateral view. **174.** Same, ventral view. **175.** Digested female genitalia, ventral view. **176.** Same, dorsal view.

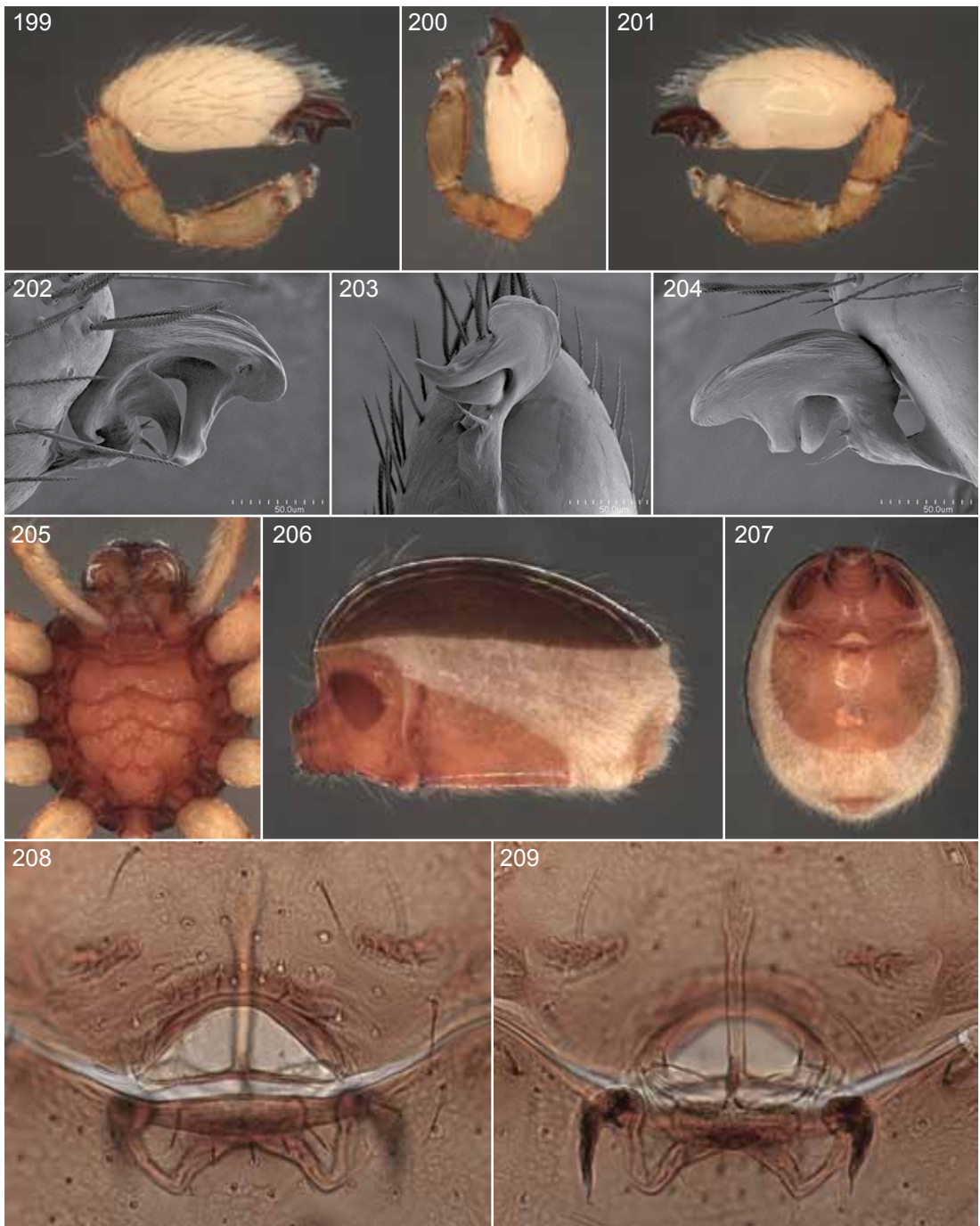


FIGURES 177–187. *Costarina nara*, new species, male (177–182) and female (183–187). **177.** Left palp, prolateral view. **178.** Same, ventral view. **179.** Same, retrolateral view. **180.** Left embolus, prolateral view. **181.** Same, ventral view. **182.** Same, retrolateral view. **183.** Sternum, ventral view. **184.** Abdomen, lateral view. **185.** Same, ventral view. **186.** Digested female genitalia, ventral view. **187.** Same, dorsal view.

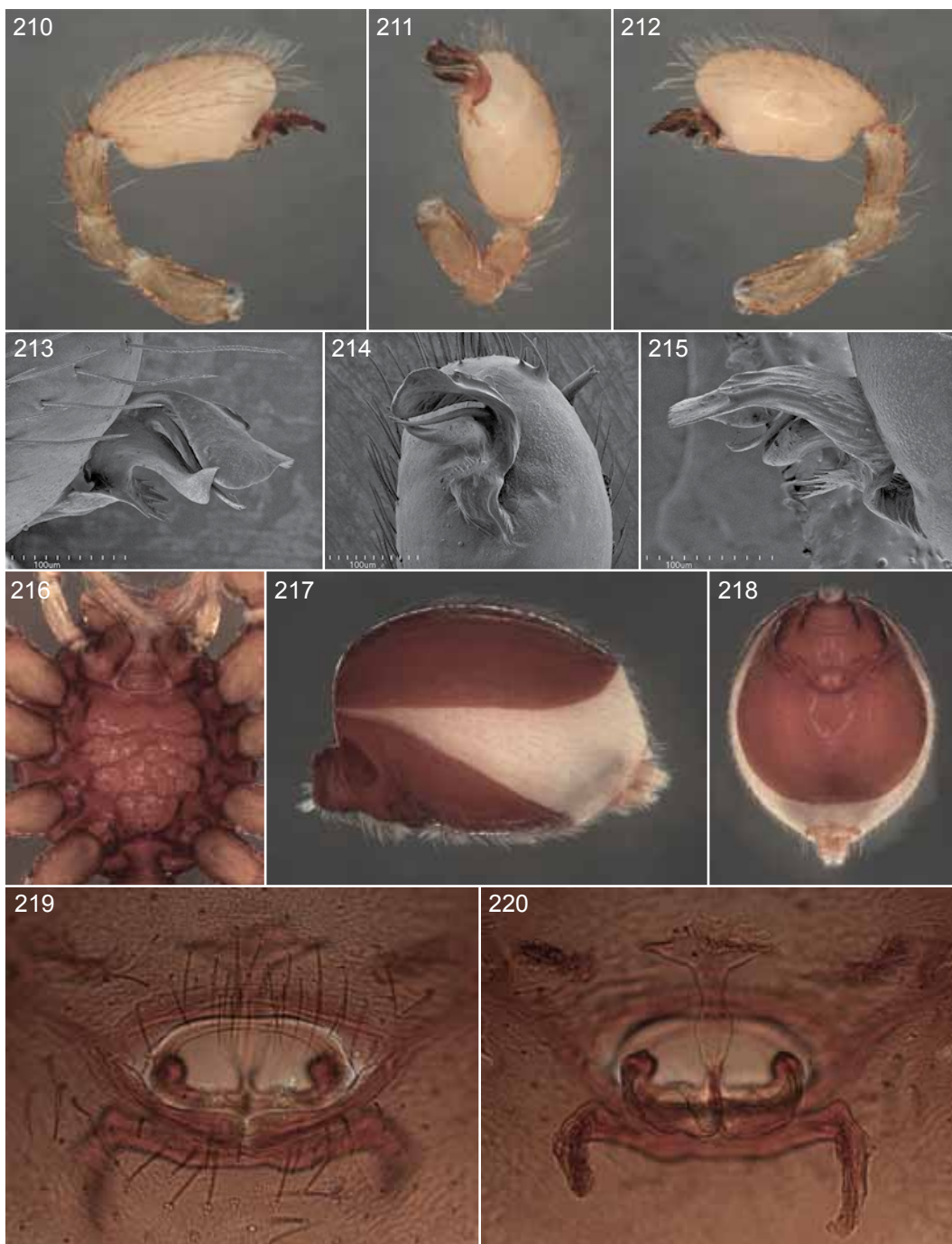




FIGURES 188–198. *Costarina aguirre*, new species, male (188–193) and female (194–198). **188.** Left palp, prolateral view. **189.** Same, ventral view. **190.** Same, retrolateral view. **191.** Left embolus, prolateral view. **192.** Same, ventral view. **193.** Same, retrolateral view. **194.** Sternum, ventral view. **195.** Abdomen, lateral view. **196.** Same, ventral view. **197.** Digested female genitalia, ventral view. **198.** Same, dorsal view.

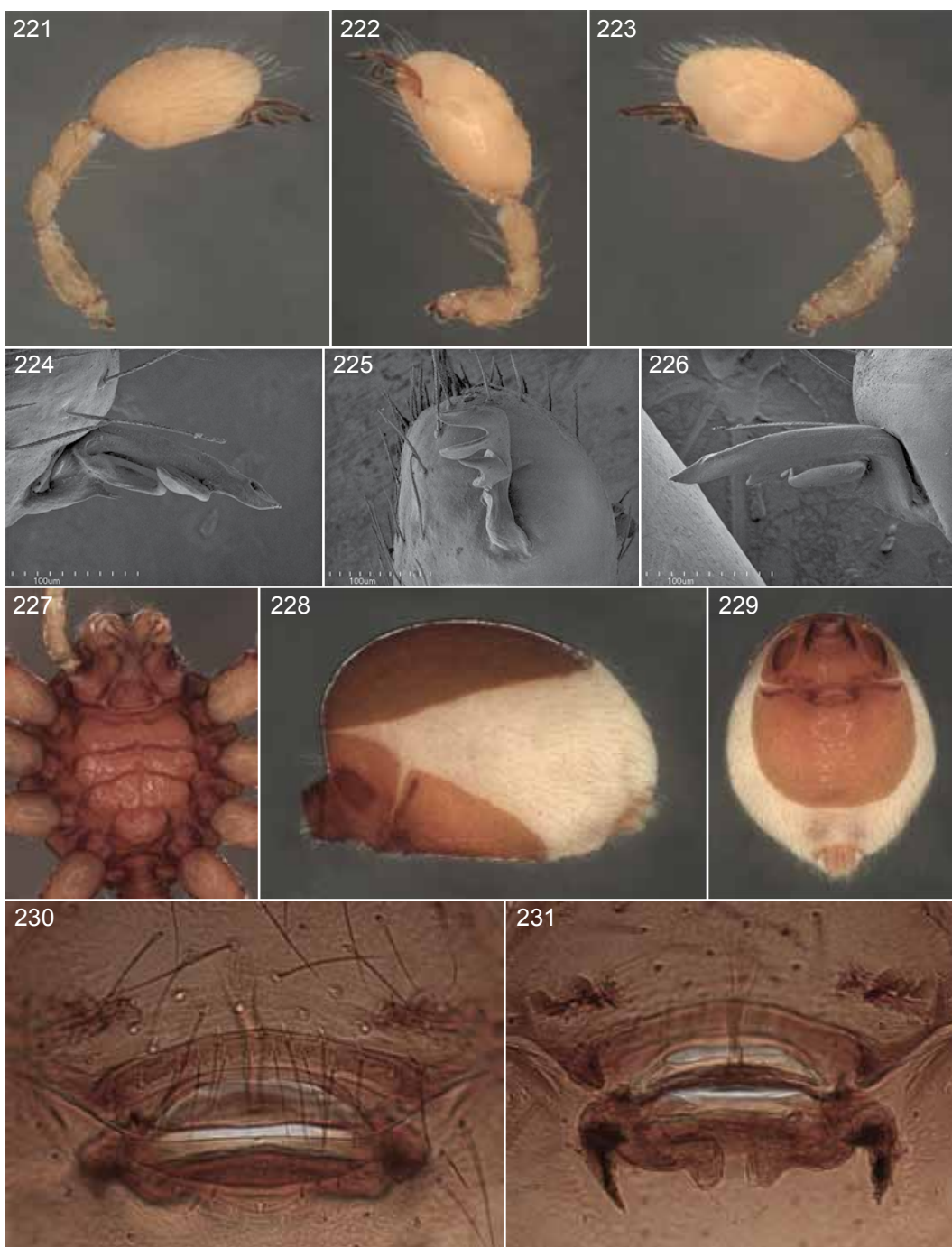


FIGURES 199–209. *Costarina quepos*, new species, male (199–204) and female (205–209). **199.** Left palp, prolateral view. **200.** Same, ventral view. **201.** Same, retrolateral view. **202.** Left embolus, prolateral view. **203.** Same, ventral view. **204.** Same, retrolateral view. **205.** Sternum, ventral view. **206.** Abdomen, lateral view. **207.** Same, ventral view. **208.** Digested female genitalia, ventral view. **209.** Same, dorsal view.

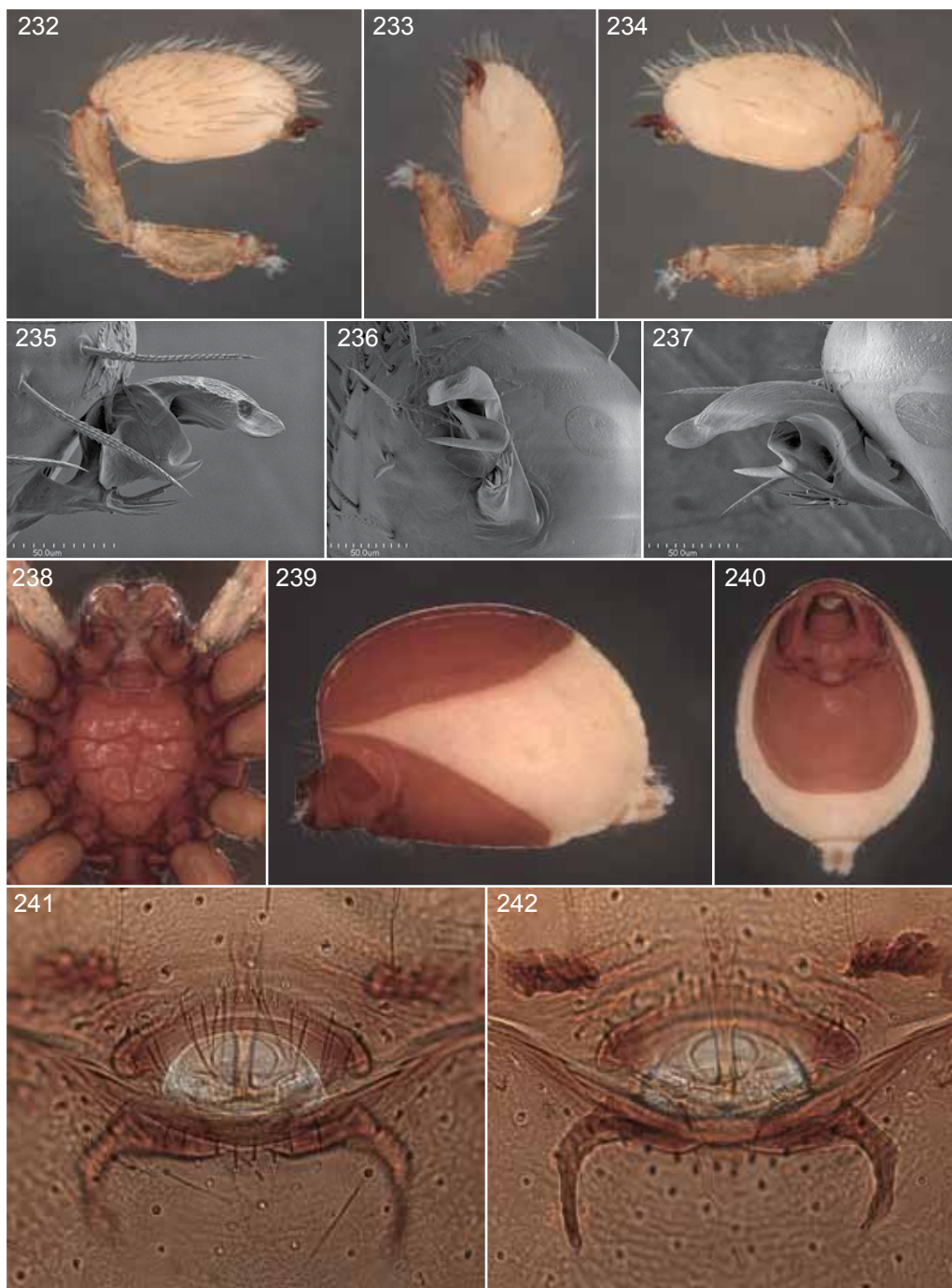


FIGURES 210–220. *Costarina carrillo*, new species, male (210–215) and female (216–220). **210.** Left palp, prolateral view. **211.** Same, ventral view. **212.** Same, retrolateral view. **213.** Left embolus, prolateral view. **214.** Same, ventral view. **215.** Same, retrolateral view. **216.** Sternum, ventral view. **217.** Abdomen, lateral view. **218.** Same, ventral view. **219.** Digested female genitalia, ventral view. **220.** Same, dorsal view.



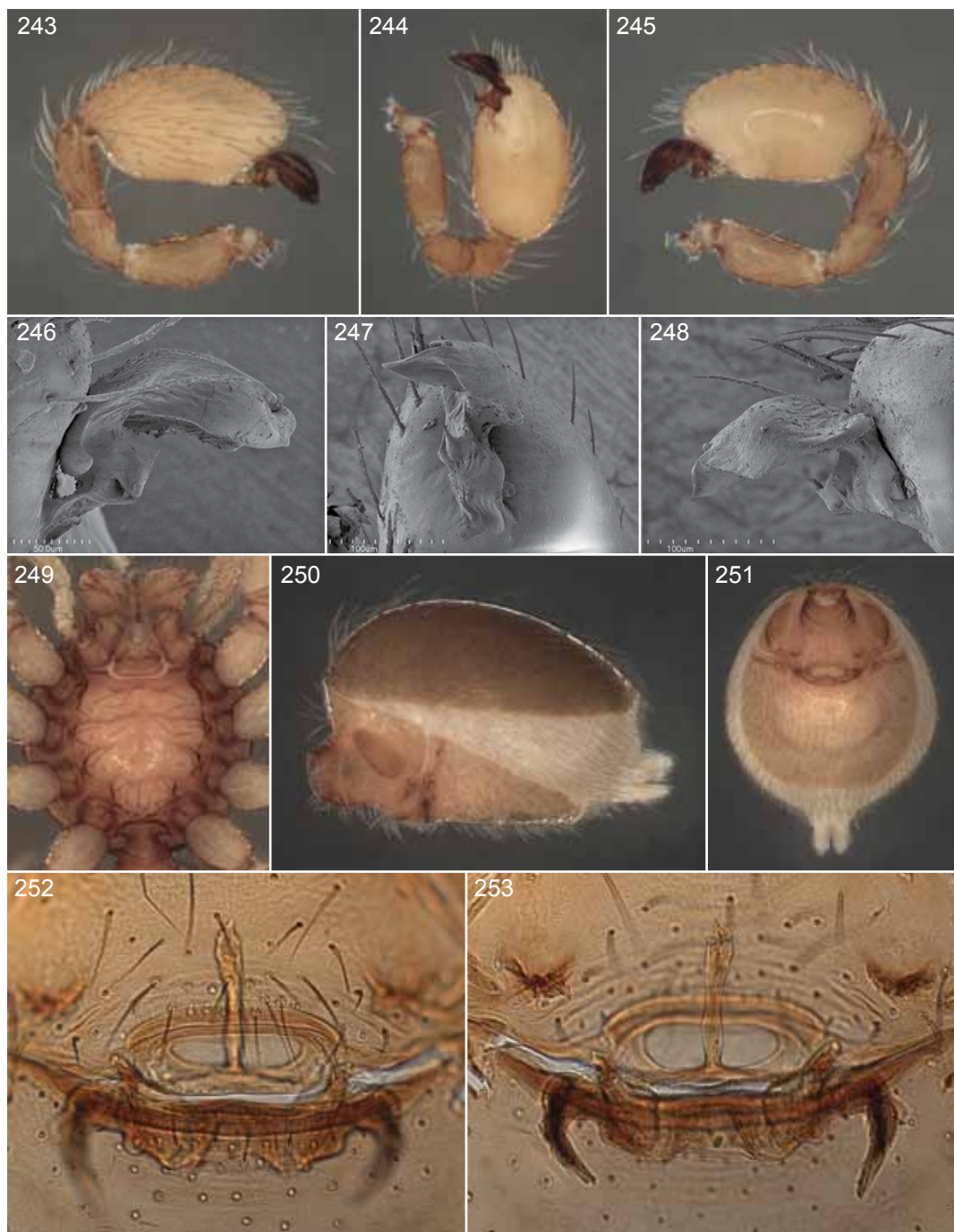


FIGURES 221–231. *Costarina meridina* (Chickering), male (221–226) and female (227–231). **221.** Left palp, prolateral view. **222.** Same, ventral view. **223.** Same, retrolateral view. **224.** Left embolus, prolateral view. **225.** Same, ventral view. **226.** Same, retrolateral view. **227.** Sternum, ventral view. **228.** Abdomen, lateral view. **229.** Same, ventral view. **230.** Digested female genitalia, ventral view. **231.** Same, dorsal view.

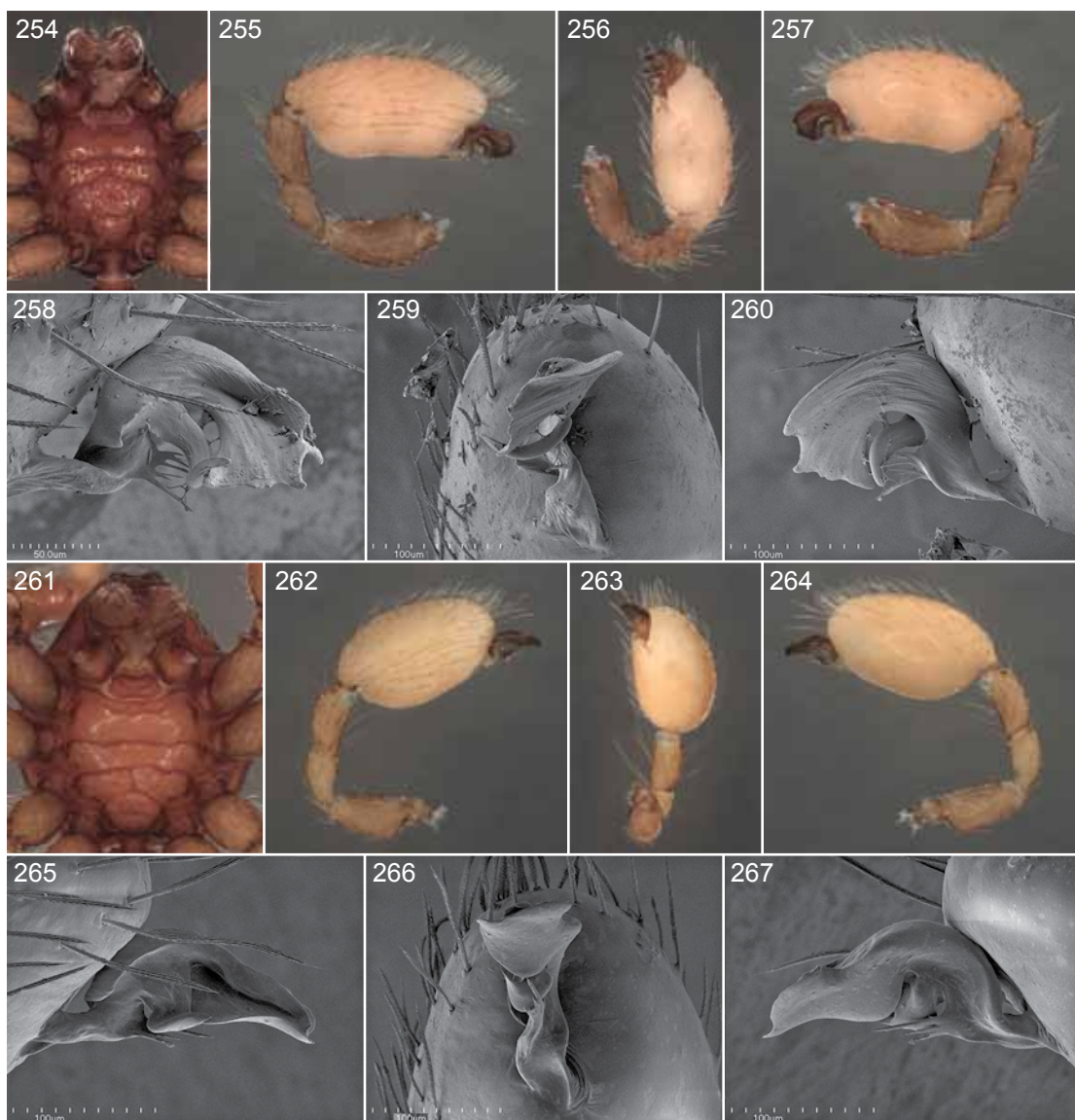


FIGURES 232–242. *Costarina watina* (Chickering), male (232–237) and female (238–242). **232.** Left palp, prolateral view. **233.** Same, ventral view. **234.** Same, retrolateral view. **235.** Left embolus, prolateral view. **236.** Same, ventral view. **237.** Same, retrolateral view. **238.** Sternum, ventral view. **239.** Abdomen, lateral view. **240.** Same, ventral view. **241.** Digested female genitalia, ventral view. **242.** Same, dorsal view.

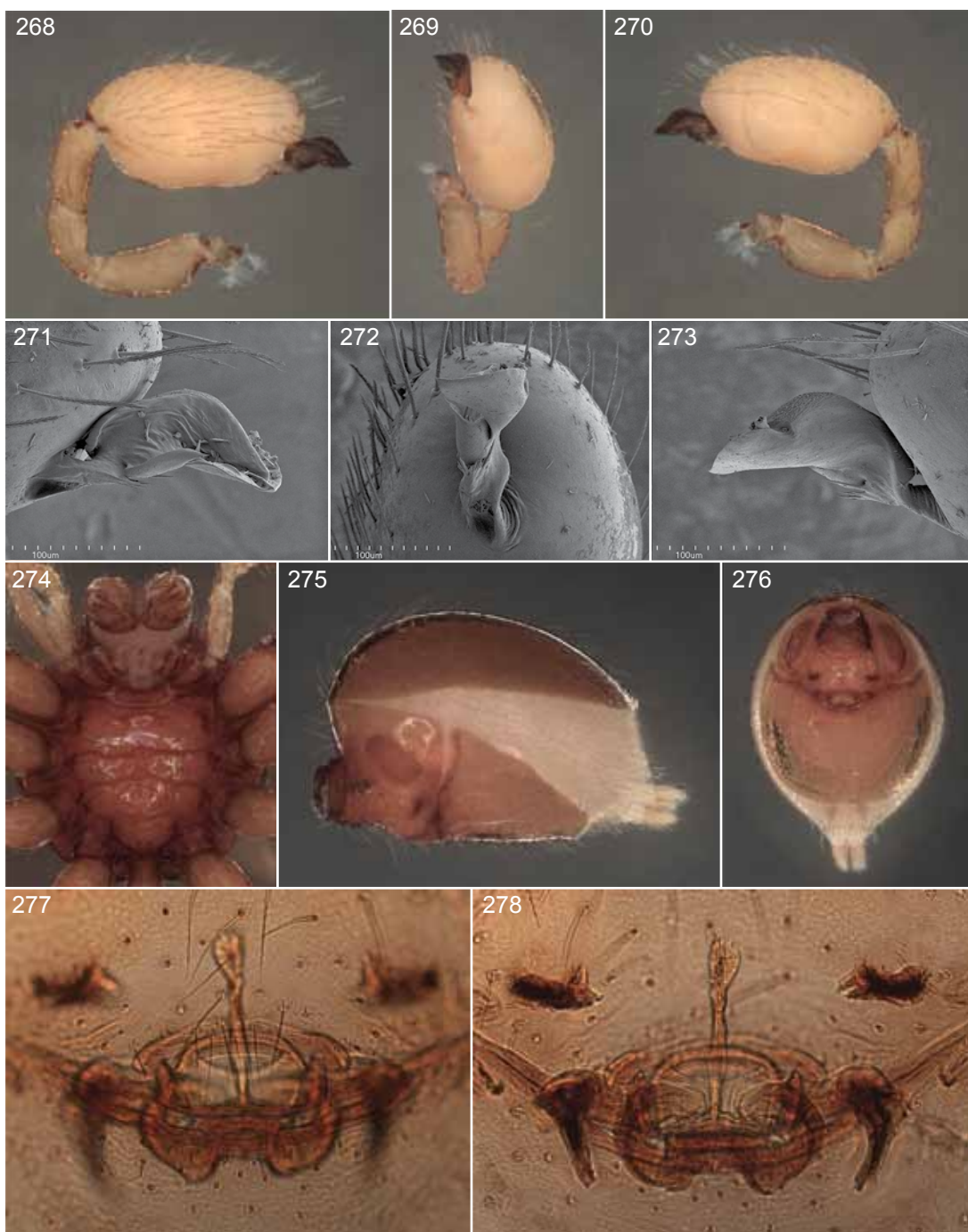




FIGURES 243–253. *Costarina ramon*, new species, male (243–248) and female (249–253). **243.** Left palp, prolateral view. **244.** Same, ventral view. **245.** Same, retrolateral view. **246.** Left embolus, prolateral view. **247.** Same, ventral view. **248.** Same, retrolateral view. **249.** Sternum, ventral view. **250.** Abdomen, lateral view. **251.** Same, ventral view. **252.** Digested female genitalia, ventral view. **253.** Same, dorsal view.

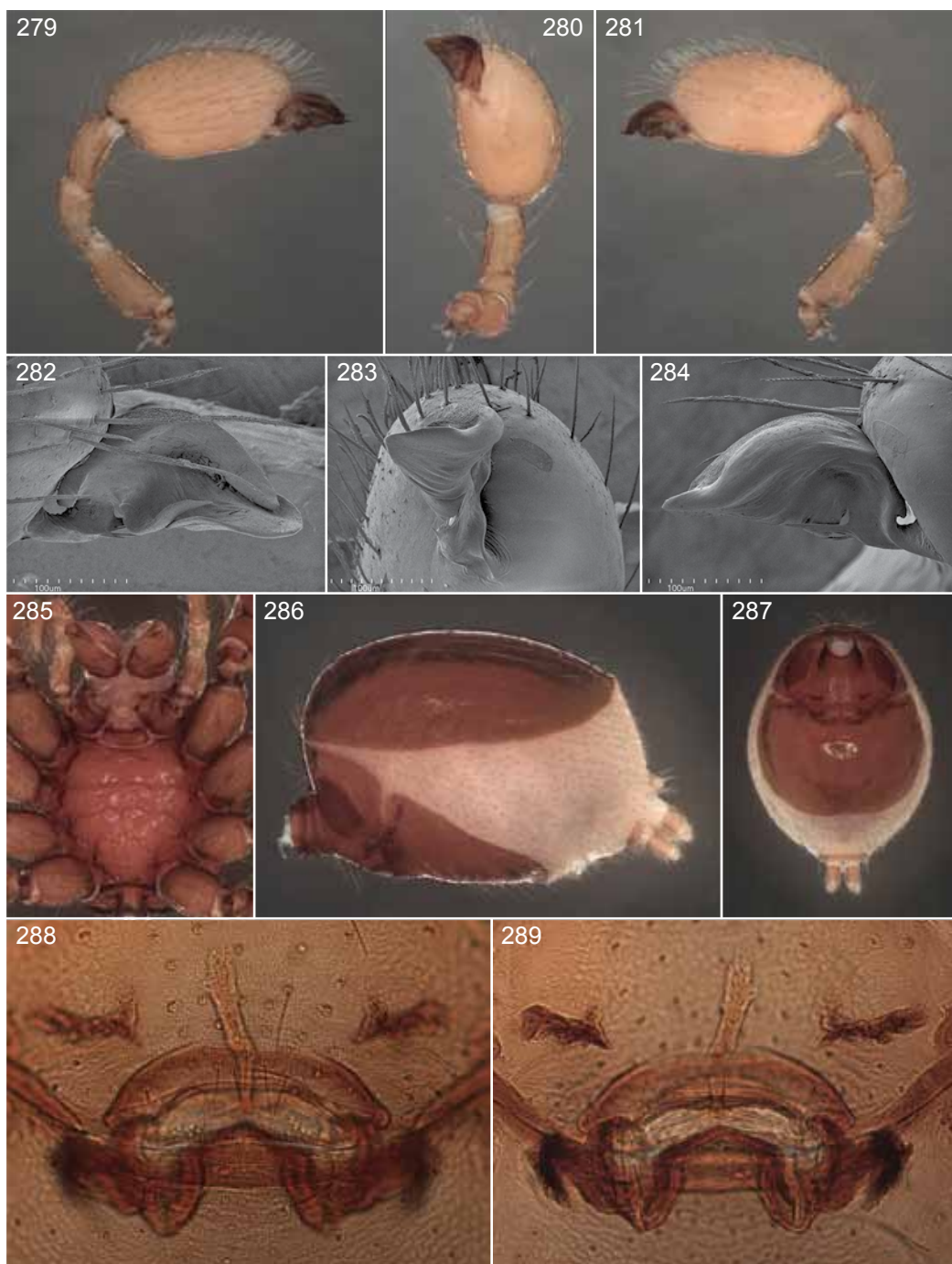


FIGURES 254–267. 254–260. *Costarina isidro*, new species, male. 261–267. *C. leones*, new species, male. 254, 261. Sternum, ventral view. 255, 262. Left palp, prolateral view. 256, 263. Same, ventral view. 257, 264. Same, retrolateral view. 258, 265. Left embolus, prolateral view. 259, 266. Same, ventral view. 260, 267. Same, retrolateral view.

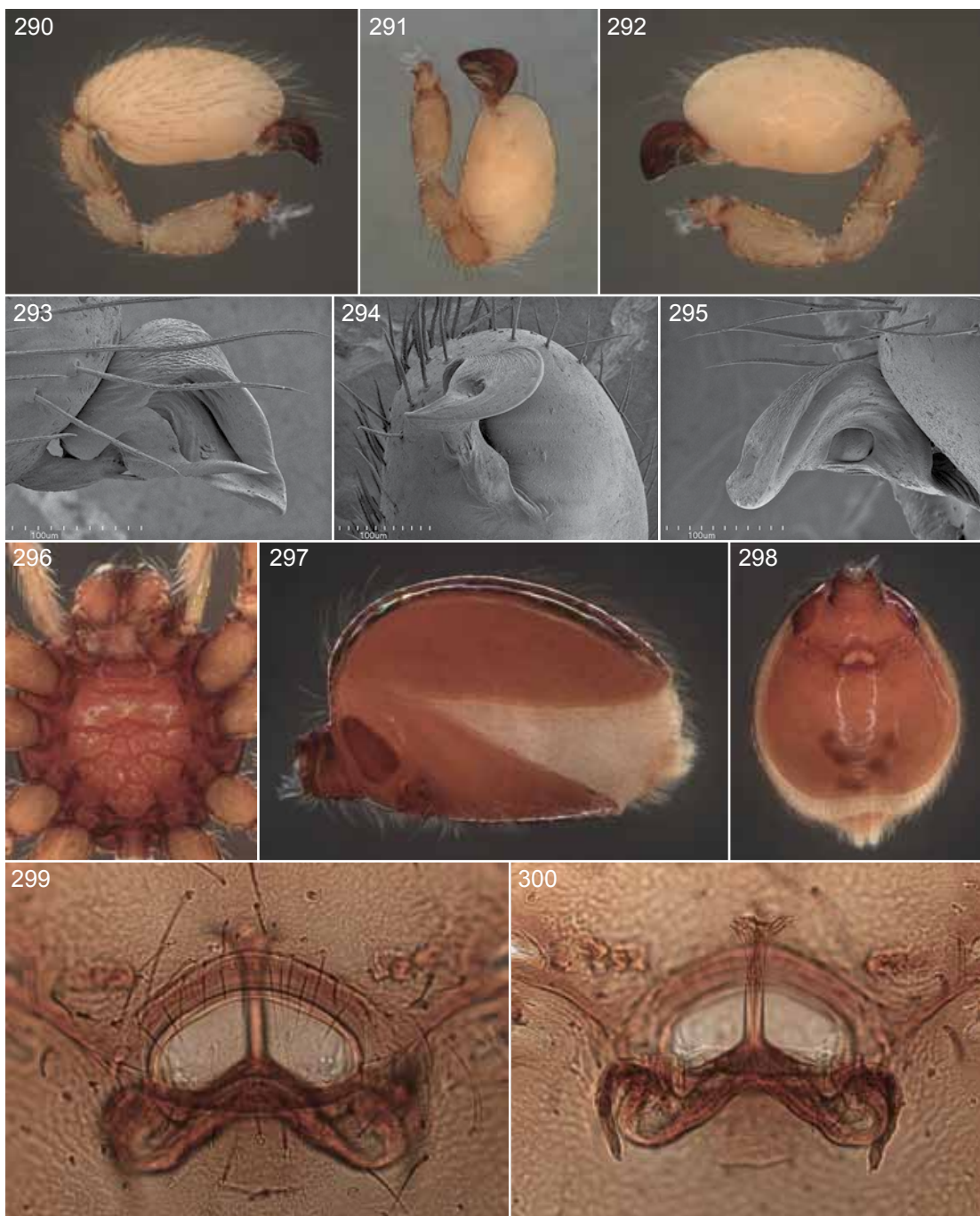


FIGURES 268–278. *Costarina san*, new species, male (268–273) and female (274–278). **268.** Left palp, prolateral view. **269.** Same, ventral view. **270.** Same, retrolateral view. **271.** Left embolus, prolateral view. **272.** Same, ventral view. **273.** Same, retrolateral view. **274.** Sternum, ventral view. **275.** Abdomen, lateral view. **276.** Same, ventral view. **277.** Digested female genitalia, ventral view. **278.** Same, dorsal view.

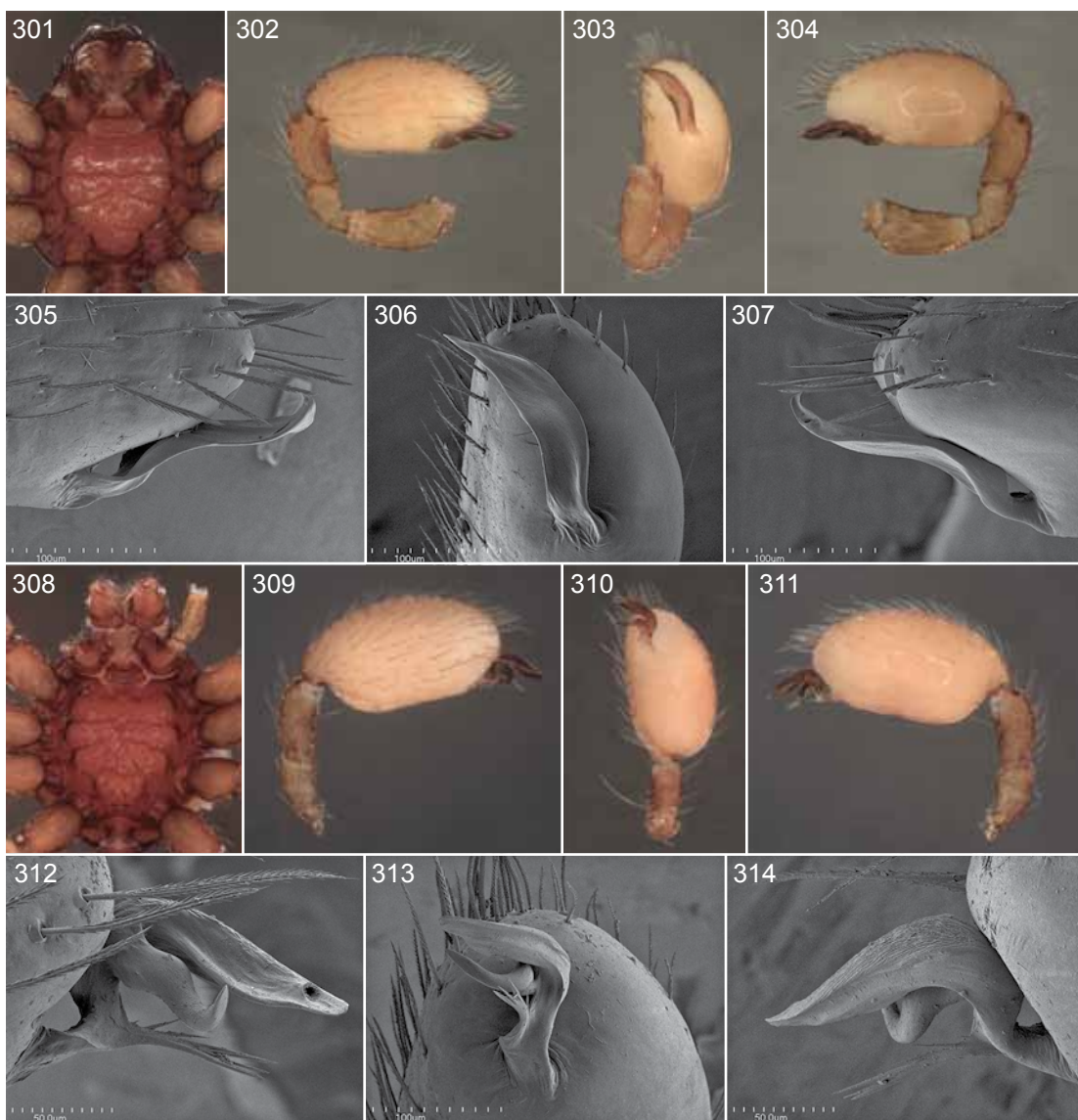




FIGURES 279–289. *Costarina cuerici*, new species, male (279–284) and female (285–289). **279.** Left palp, prolateral view. **280.** Same, ventral view. **281.** Same, retrolateral view. **282.** Left embolus, prolateral view. **283.** Same, ventral view. **284.** Same, retrolateral view. **285.** Sternum, ventral view. **286.** Abdomen, lateral view. **287.** Same, ventral view. **288.** Digested female genitalia, ventral view. **289.** Same, dorsal view.

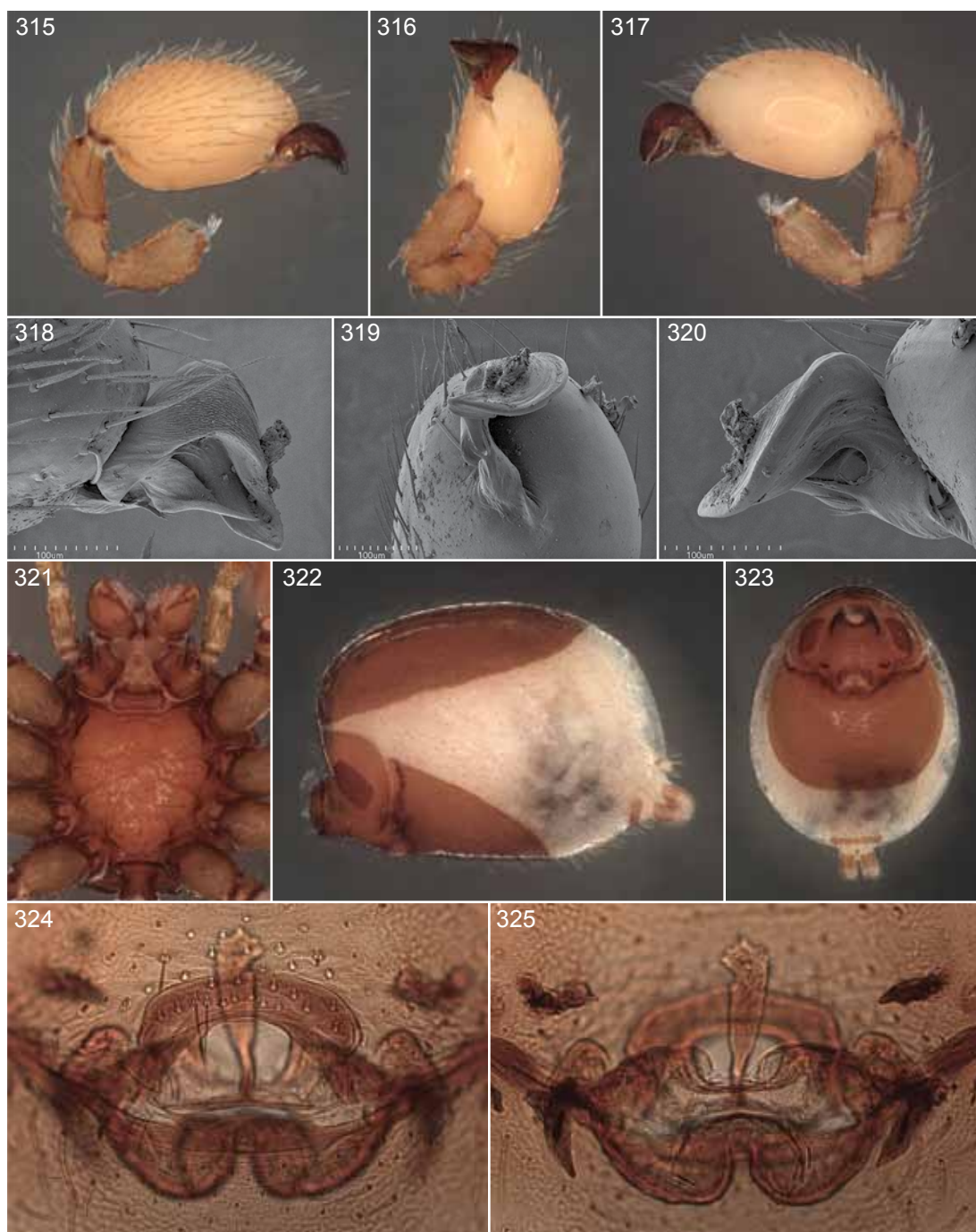


FIGURES 290–300. *Costarina junio*, new species, male (290–295) and female (296–300). **290.** Left palp, prolateral view. **291.** Same, ventral view. **292.** Same, retrolateral view. **293.** Left embolus, prolateral view. **294.** Same, ventral view. **295.** Same, retrolateral view. **296.** Sternum, ventral view. **297.** Abdomen, lateral view. **298.** Same, ventral view. **299.** Digested female genitalia, ventral view. **300.** Same, dorsal view.

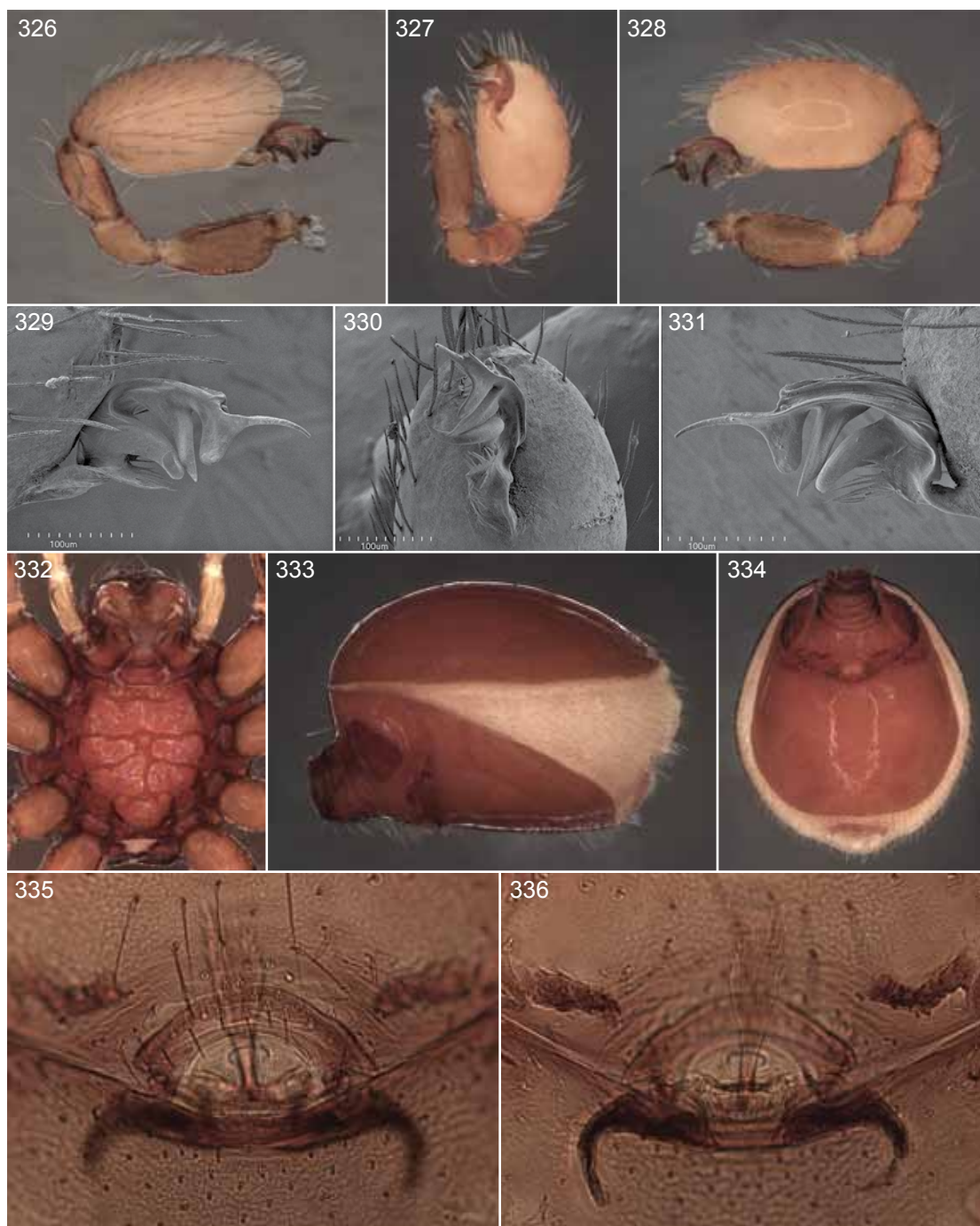


FIGURES 301–314. 301–307. *Costarina reventazon*, new species, male. 308–314. *C. barbilla*, new species, male. **301, 308.** Sternum, ventral view. **302, 309.** Left palp, prolateral view. **303, 310.** Same, ventral view. **304, 311.** Same, retrolateral view. **305, 312.** Left embolus, prolateral view. **306, 313.** Same, ventral view. **307, 314.** Same, retrolateral view.



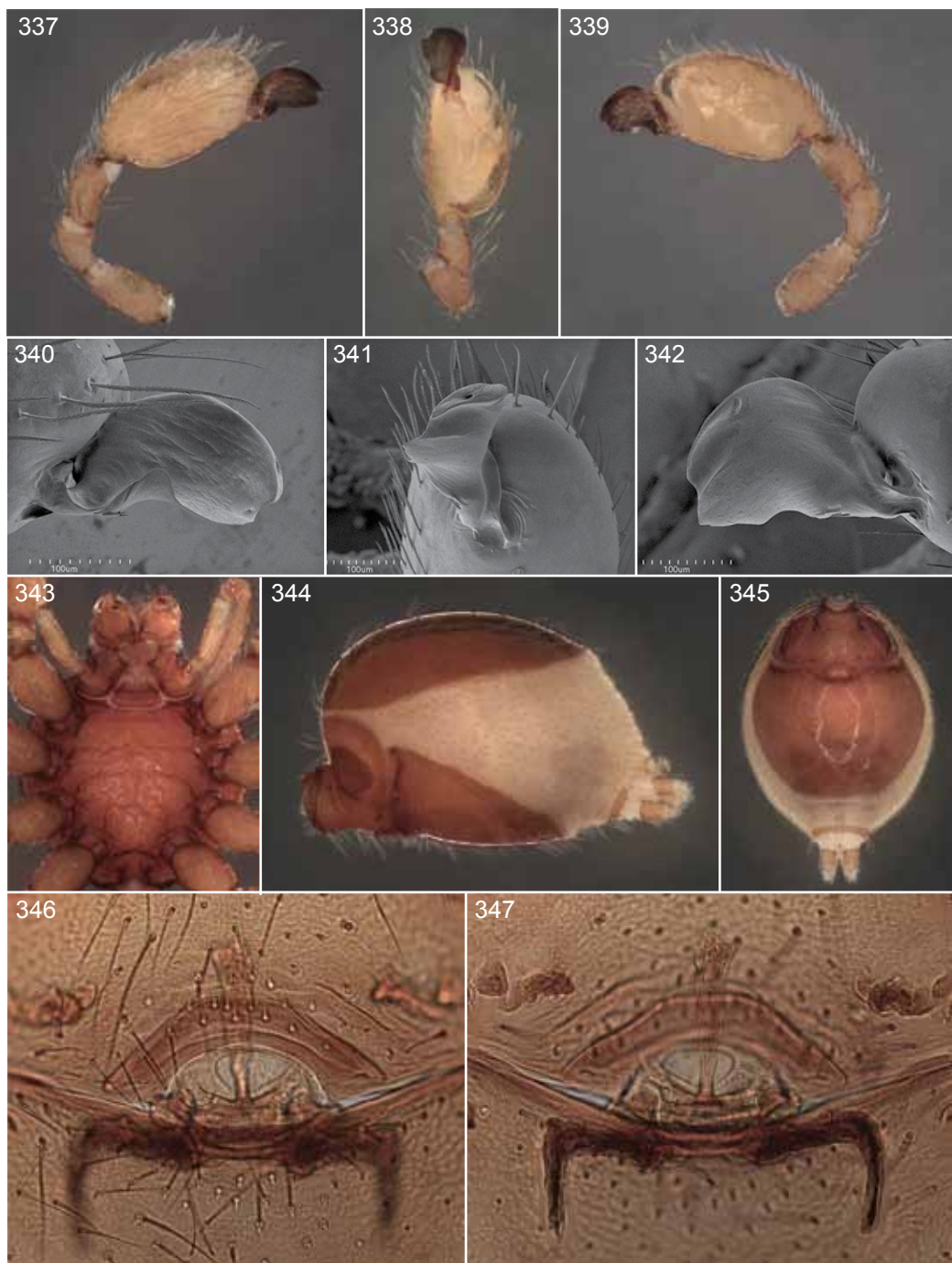


FIGURES 315–325. *Costarina macho*, new species, male (315–320) and female (321–325). **315.** Left palp, prolateral view. **316.** Same, ventral view. **317.** Same, retrolateral view. **318.** Left embolus, prolateral view. **319.** Same, ventral view. **320.** Same, retrolateral view. **321.** Sternum, ventral view. **322.** Abdomen, lateral view. **323.** Same, ventral view. **324.** Digested female genitalia, ventral view. **325.** Same, dorsal view.

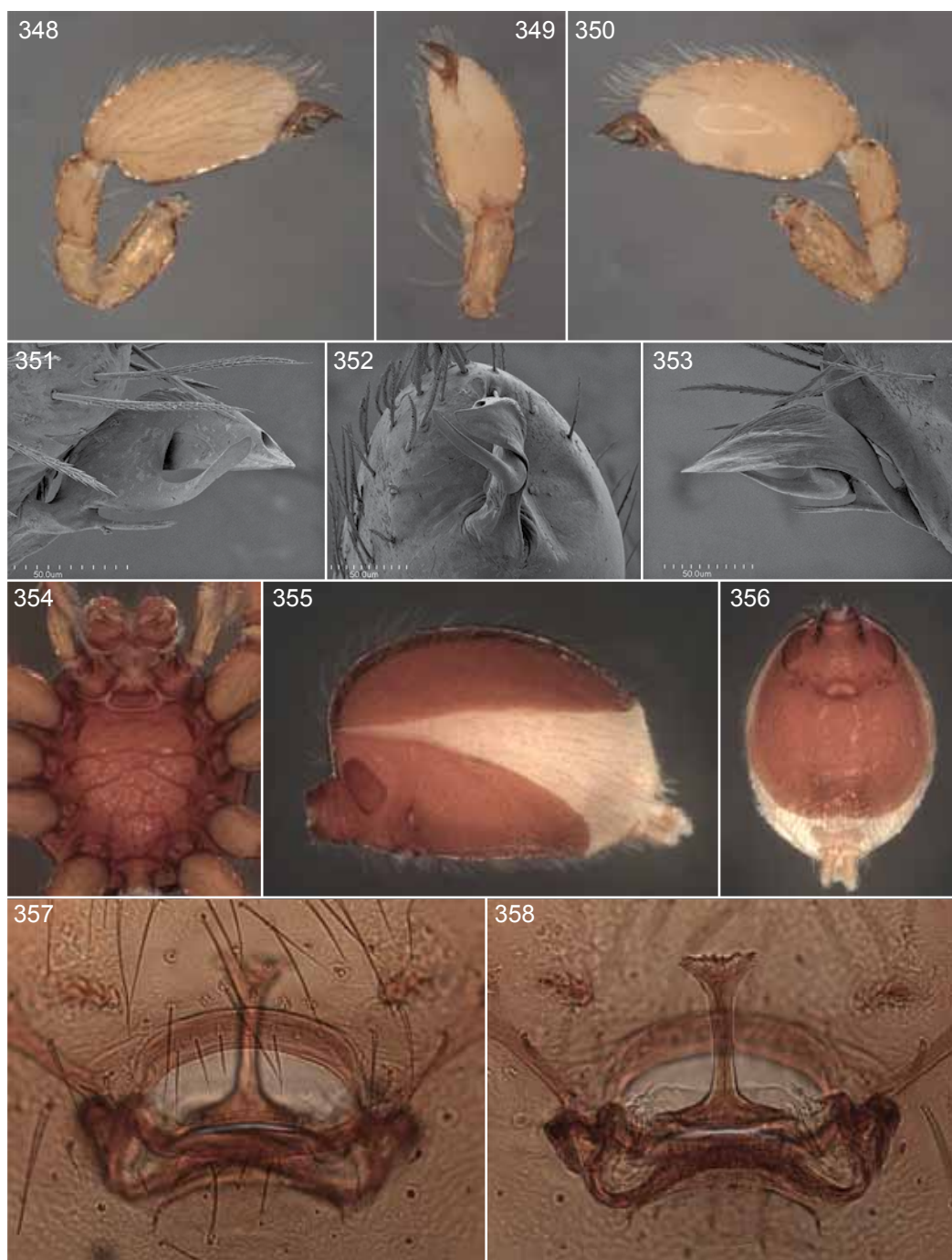


FIGURES 326–336. *Costarina cruz*, new species, male (326–331) and female (332–336). **326.** Left palp, prolateral view. **327.** Same, ventral view. **328.** Same, retrolateral view. **329.** Left embolus, prolateral view. **330.** Same, ventral view. **331.** Same, retrolateral view. **332.** Sternum, ventral view. **333.** Abdomen, lateral view. **334.** Same, ventral view. **335.** Digested female genitalia, ventral view. **336.** Same, dorsal view.

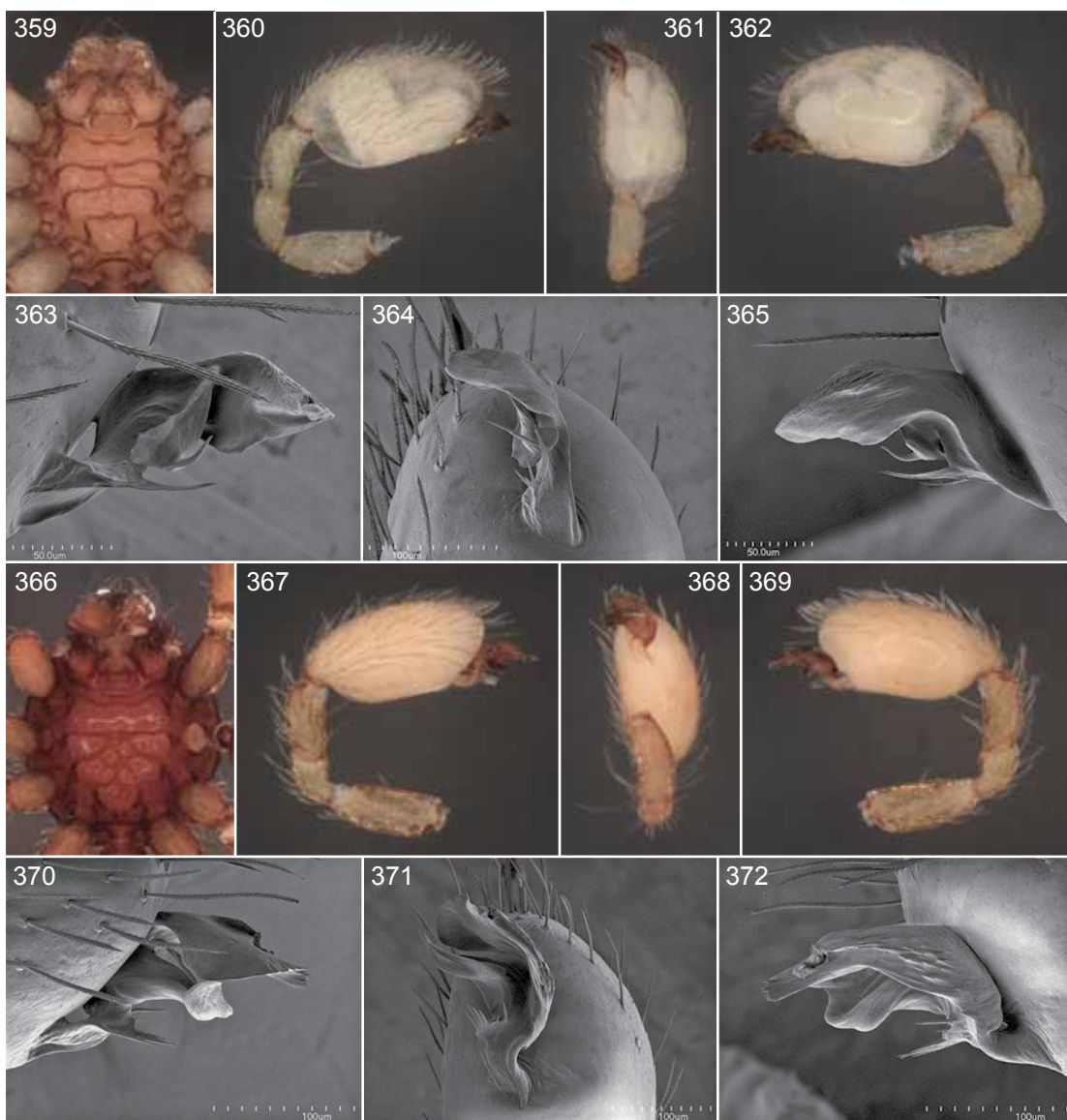




FIGURES 337–347. *Costarina chonta*, new species, male (337–342) and female (343–347). 337. Left palp, prolateral view. 338. Same, ventral view. 339. Same, retrolateral view. 340. Left embolus, prolateral view. 341. Same, ventral view. 342. Same, retrolateral view. 343. Sternum, ventral view. 344. Abdomen, lateral view. 345. Same, ventral view. 346. Digested female genitalia, ventral view. 347. Same, dorsal view.

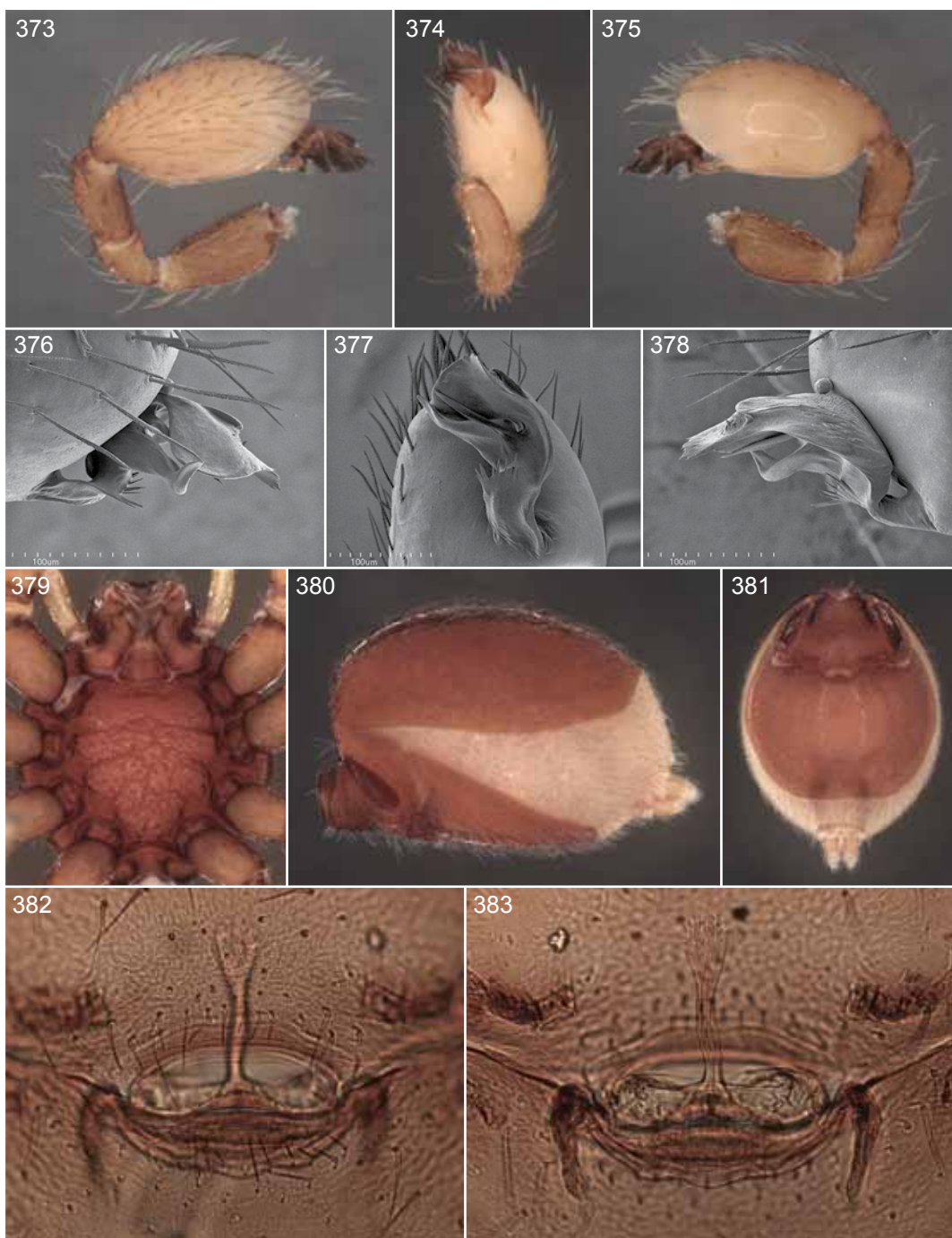


FIGURES 348–358. *Costarina espavel*, new species, male (348–353) and female (354–358). **348.** Left palp, prolateral view. **349.** Same, ventral view. **350.** Same, retrolateral view. **351.** Left embolus, prolateral view. **352.** Same, ventral view. **353.** Same, retrolateral view. **354.** Sternum, ventral view. **355.** Abdomen, lateral view. **356.** Same, ventral view. **357.** Digested female genitalia, ventral view. **358.** Same, dorsal view.

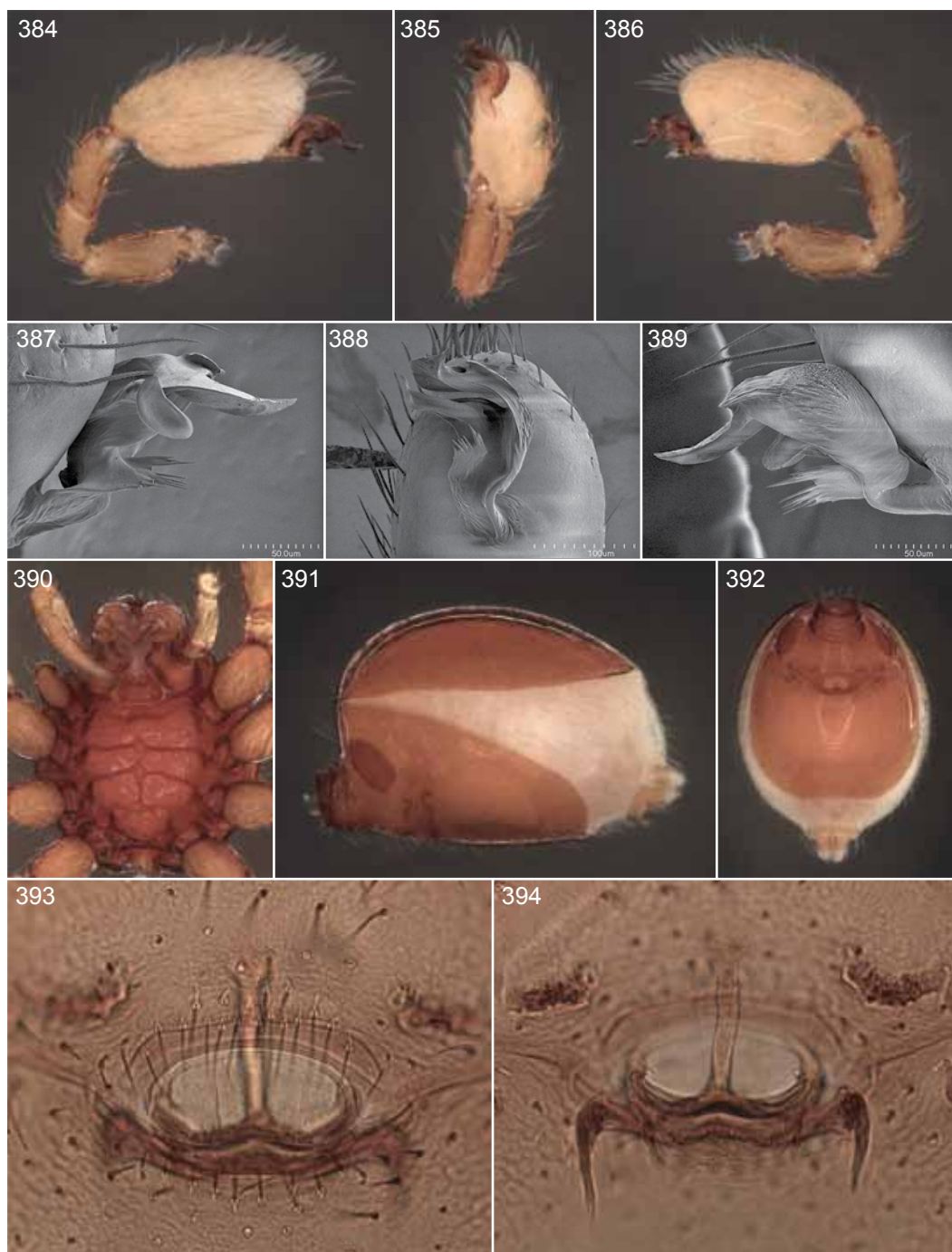


FIGURES 359–372. 359–365. *Costarina veragua*, new species, male. 366–372. *C. penshurst*, new species, male. 359, 366. Sternum, ventral view. 360, 367. Left palp, prolateral view. 361, 368. Same, ventral view. 362, 369. Same, retrolateral view. 363, 370. Left embolus, prolateral view. 364, 371. Same, ventral view. 365, 372. Same, retrolateral view.



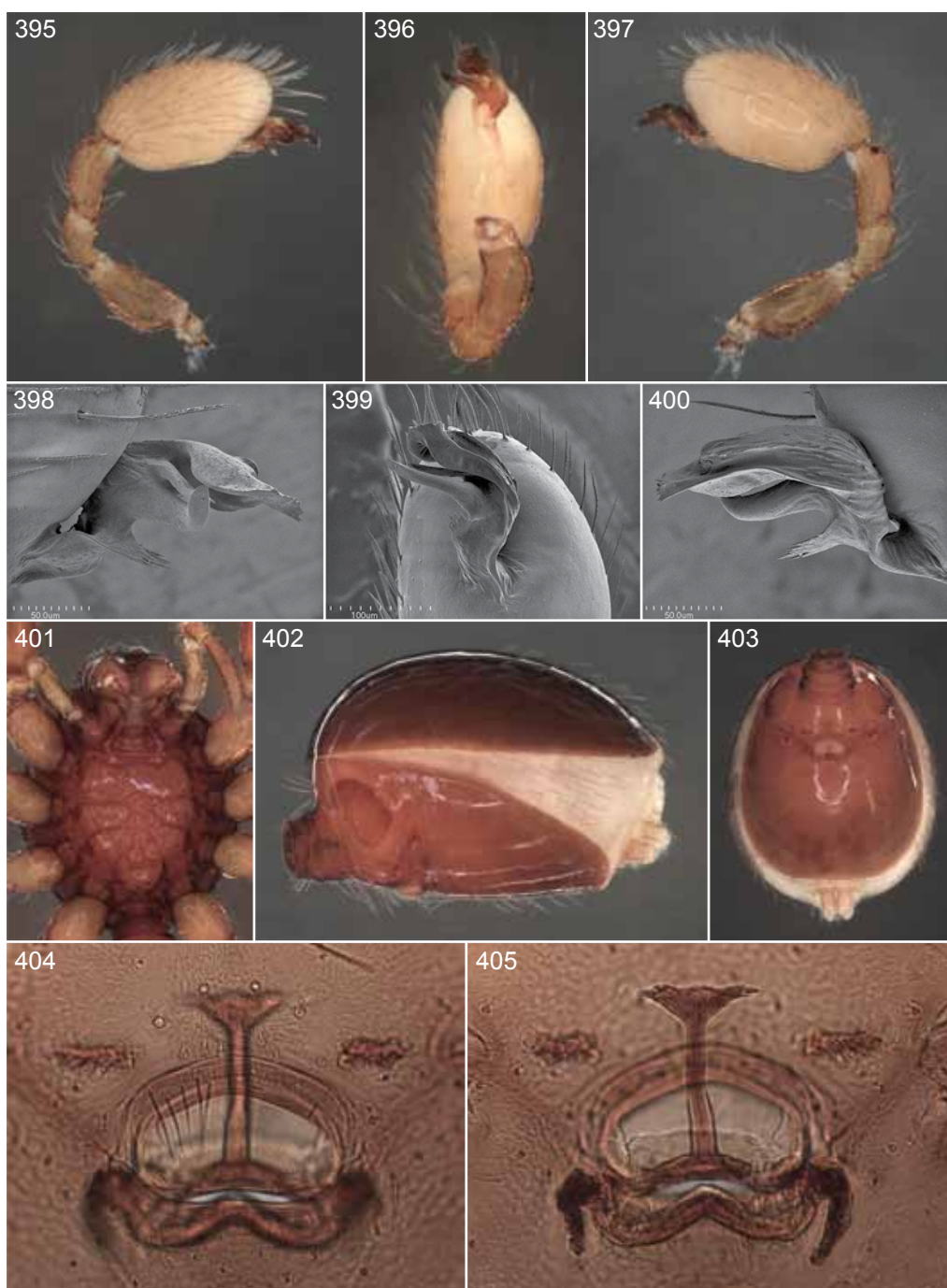


FIGURES 373–383. *Costarina pity*, new species, male (373–378) and female (379–383). **373.** Left palp, prolateral view. **374.** Same, ventral view. **375.** Same, retrolateral view. **376.** Left embolus, prolateral view. **377.** Same, ventral view. **378.** Same, retrolateral view. **379.** Sternum, ventral view. **380.** Abdomen, lateral view. **381.** Same, ventral view. **382.** Digested female genitalia, ventral view. **383.** Same, dorsal view.

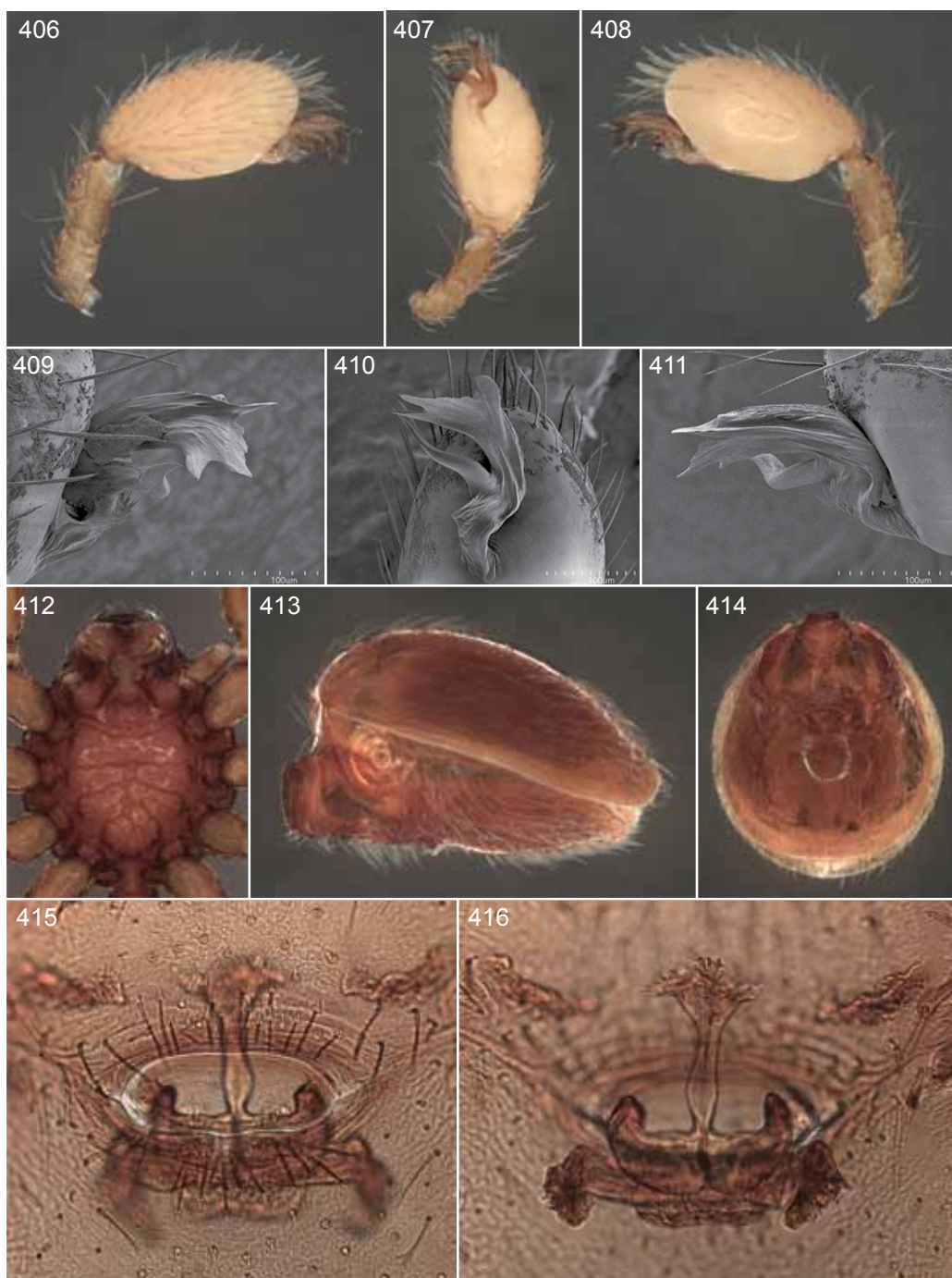


FIGURES 384–394. *Costarina hitoy*, new species, male (384–389) and female (390–394). **384.** Left palp, prolateral view. **385.** Same, ventral view. **386.** Same, retrolateral view. **387.** Left embolus, prolateral view. **388.** Same, ventral view. **389.** Same, retrolateral view. **390.** Sternum, ventral view. **391.** Abdomen, lateral view. **392.** Same, ventral view. **393.** Digested female genitalia, ventral view. **394.** Same, dorsal view.

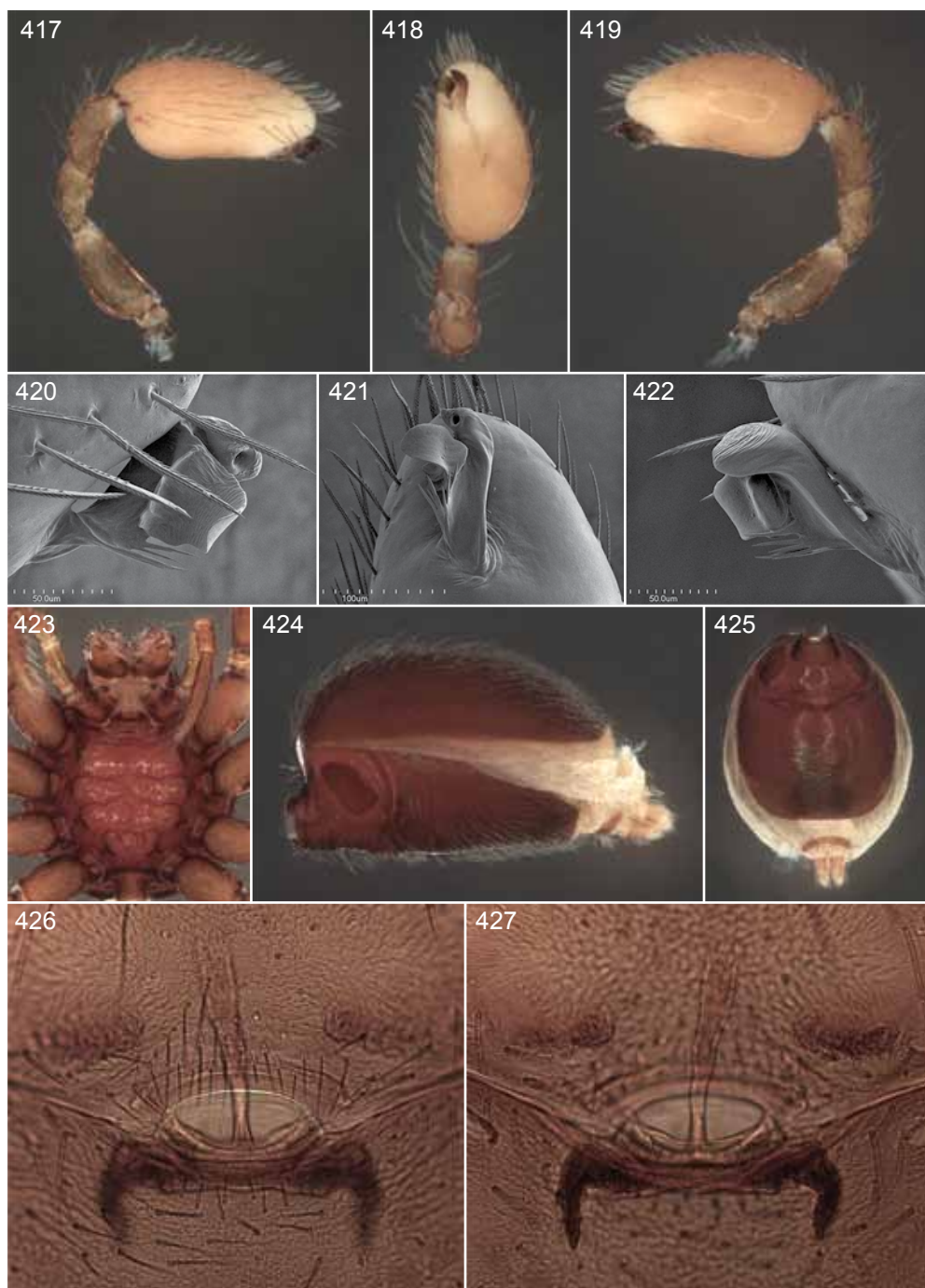




FIGURES 395–405. *Costarina mooreorum*, new species, male (395–400) and female (401–405). **395.** Left palp, prolateral view. **396.** Same, ventral view. **397.** Same, retrolateral view. **398.** Left embolus, prolateral view. **399.** Same, ventral view. **400.** Same, retrolateral view. **401.** Sternum, ventral view. **402.** Abdomen, lateral view. **403.** Same, ventral view. **404.** Digested female genitalia, ventral view. **405.** Same, dorsal view.

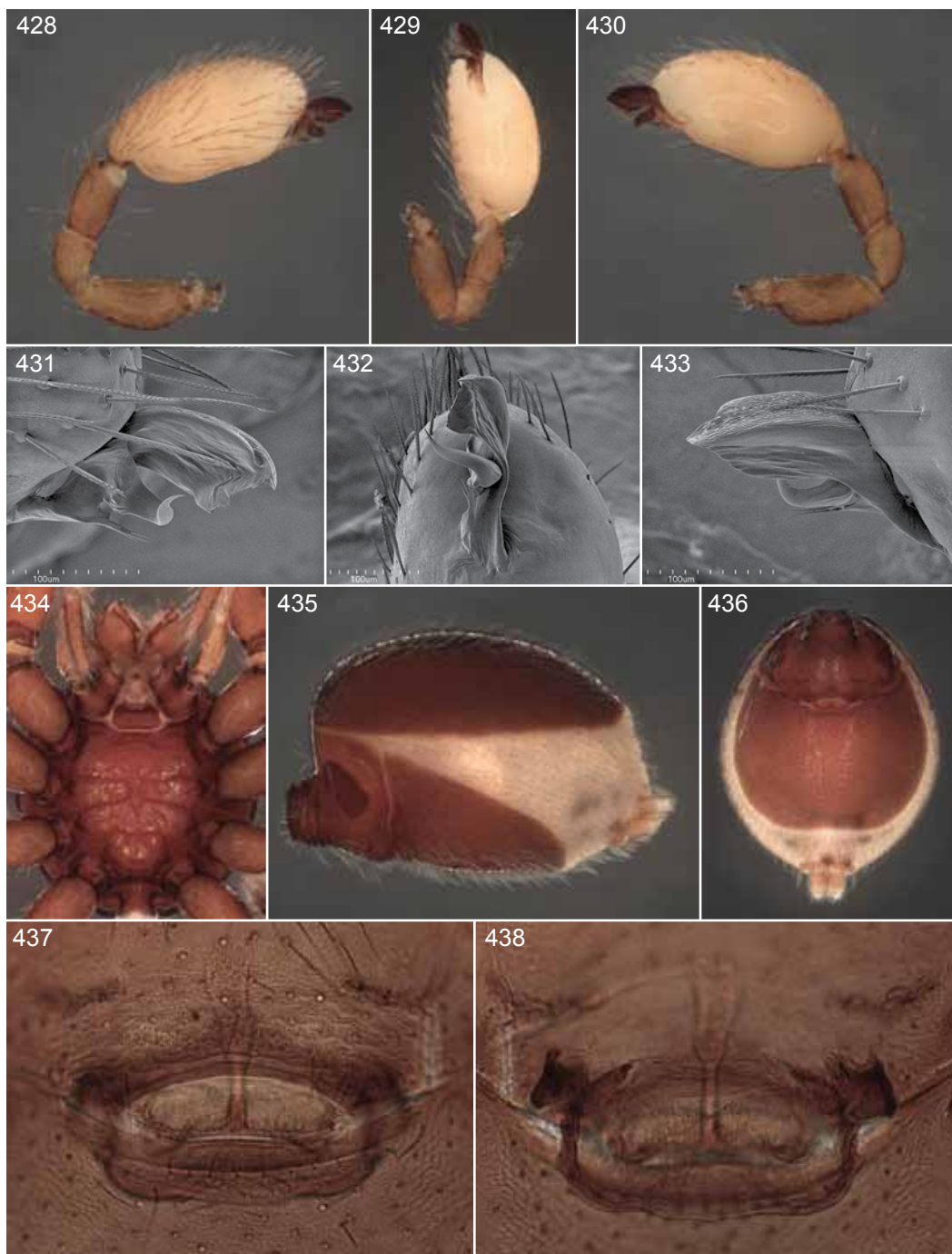


FIGURES 406–416. *Costarina cerere*, new species, male (406–412) and female (413–416). **406.** Left palp, prolateral view. **407.** Same, ventral view. **408.** Same, retrolateral view. **409.** Left embolus, prolateral view. **410.** Same, ventral view. **411.** Same, retrolateral view. **412.** Sternum, ventral view. **413.** Abdomen, lateral view. **414.** Same, ventral view. **415.** Digested female genitalia, ventral view. **416.** Same, dorsal view.



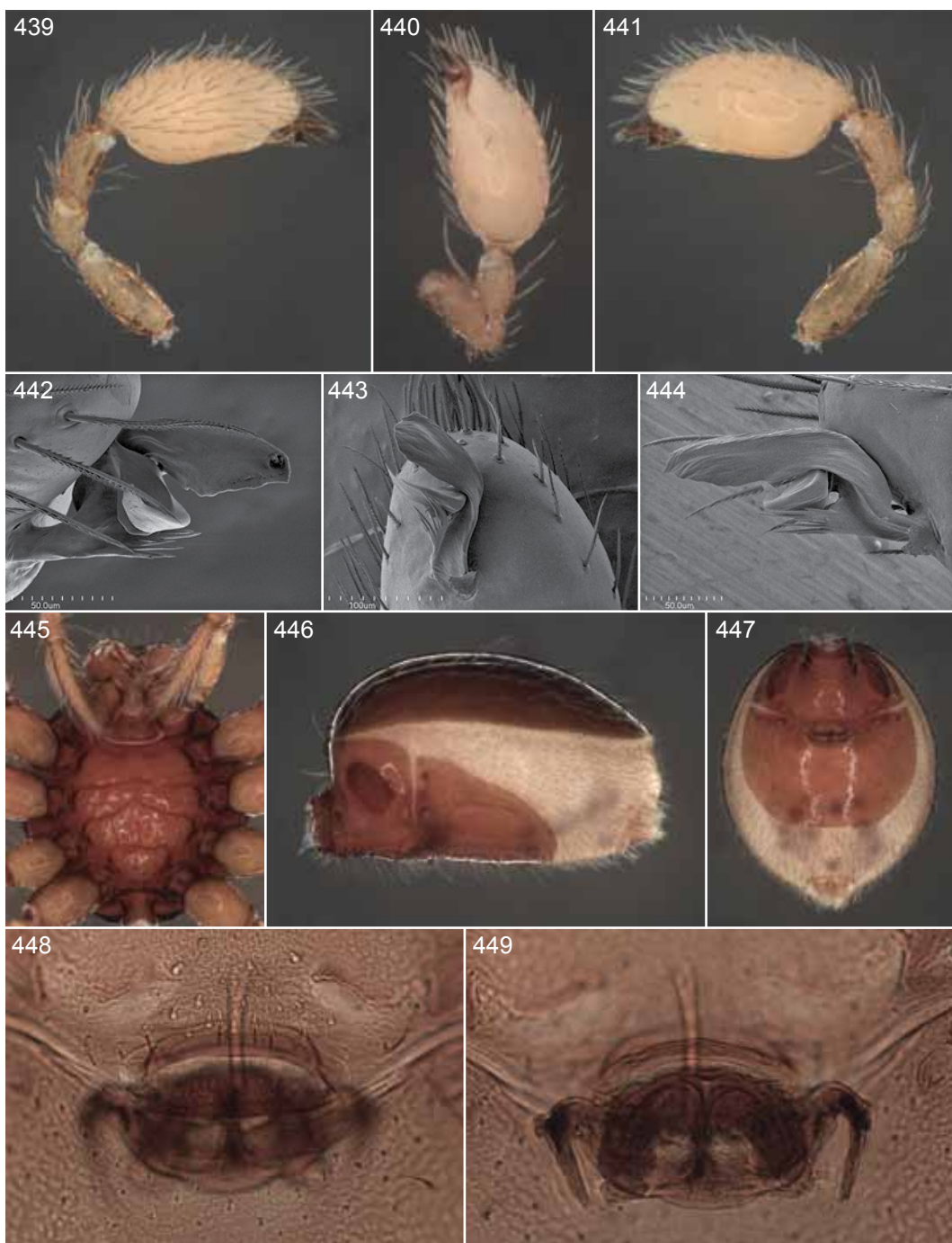
FIGURES 417–427. *Costarina concinna* (Chickering), male (417–422) and female (423–427). **417.** Left palp, prolateral view. **418.** Same, ventral view. **419.** Same, retrolateral view. **420.** Left embolus, prolateral view. **421.** Same, ventral view. **422.** Same, retrolateral view. **423.** Sternum, ventral view. **424.** Abdomen, lateral view. **425.** Same, ventral view. **426.** Digested female genitalia, ventral view. **427.** Same, dorsal view.



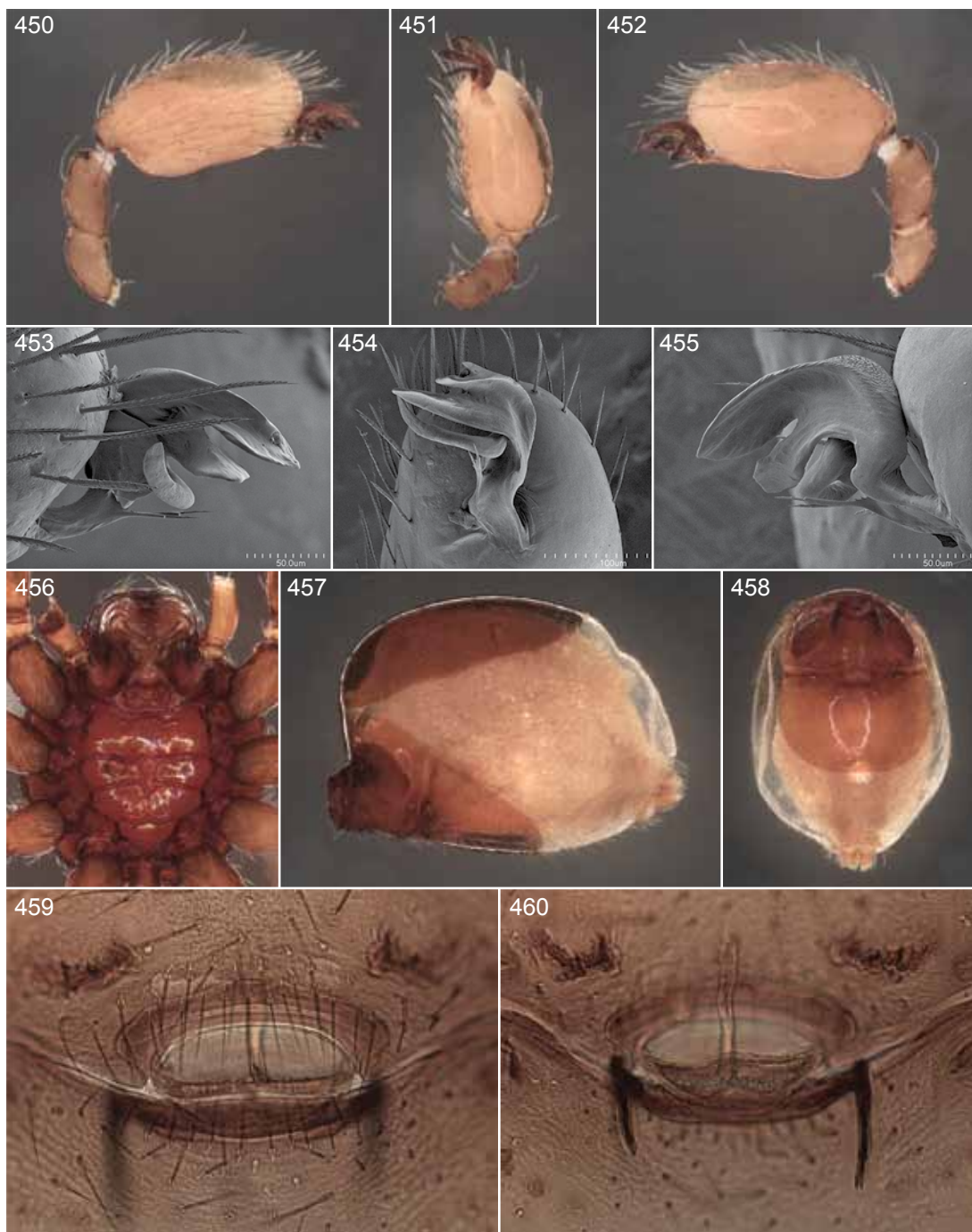


FIGURES 428–438. *Costarina frantzius*, new species, male (428–433) and female (434–438). **428.** Left palp, prolateral view. **429.** Same, ventral view. **430.** Same, retrolateral view. **431.** Left embolus, prolateral view. **432.** Same, ventral view. **433.** Same, retrolateral view. **434.** Sternum, ventral view. **435.** Abdomen, lateral view. **436.** Same, ventral view. **437.** Digested female genitalia, ventral view. **438.** Same, dorsal view.

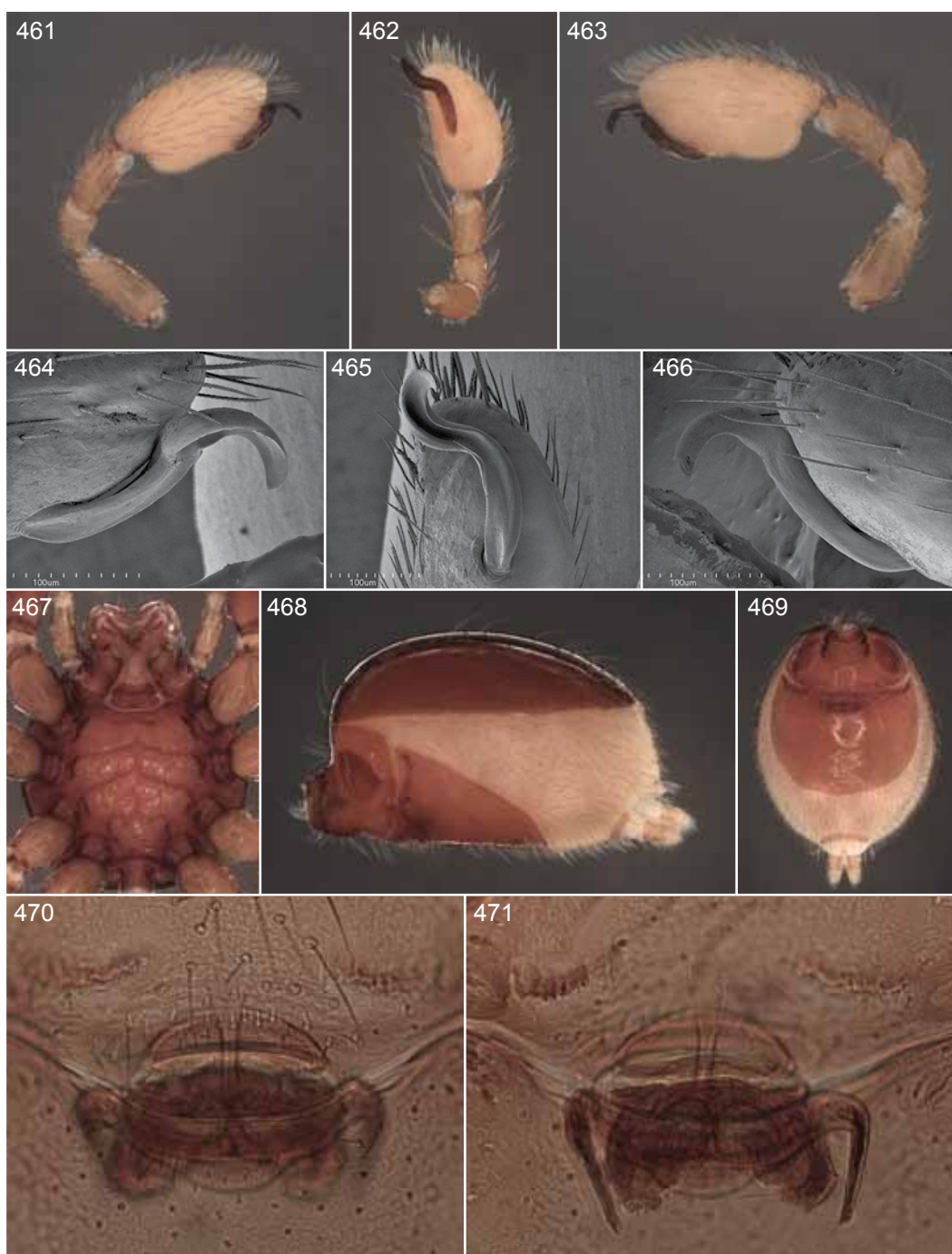




FIGURES 439–449. *Costarina obtina* (Chickering), male (439–444) and female (445–449). **439.** Left palp, prolateral view. **440.** Same, ventral view. **441.** Same, retrolateral view. **442.** Left embolus, prolateral view. **443.** Same, ventral view. **444.** Same, retrolateral view. **445.** Sternum, ventral view. **446.** Abdomen, lateral view. **447.** Same, ventral view. **448.** Digested female genitalia, ventral view. **449.** Same, dorsal view.

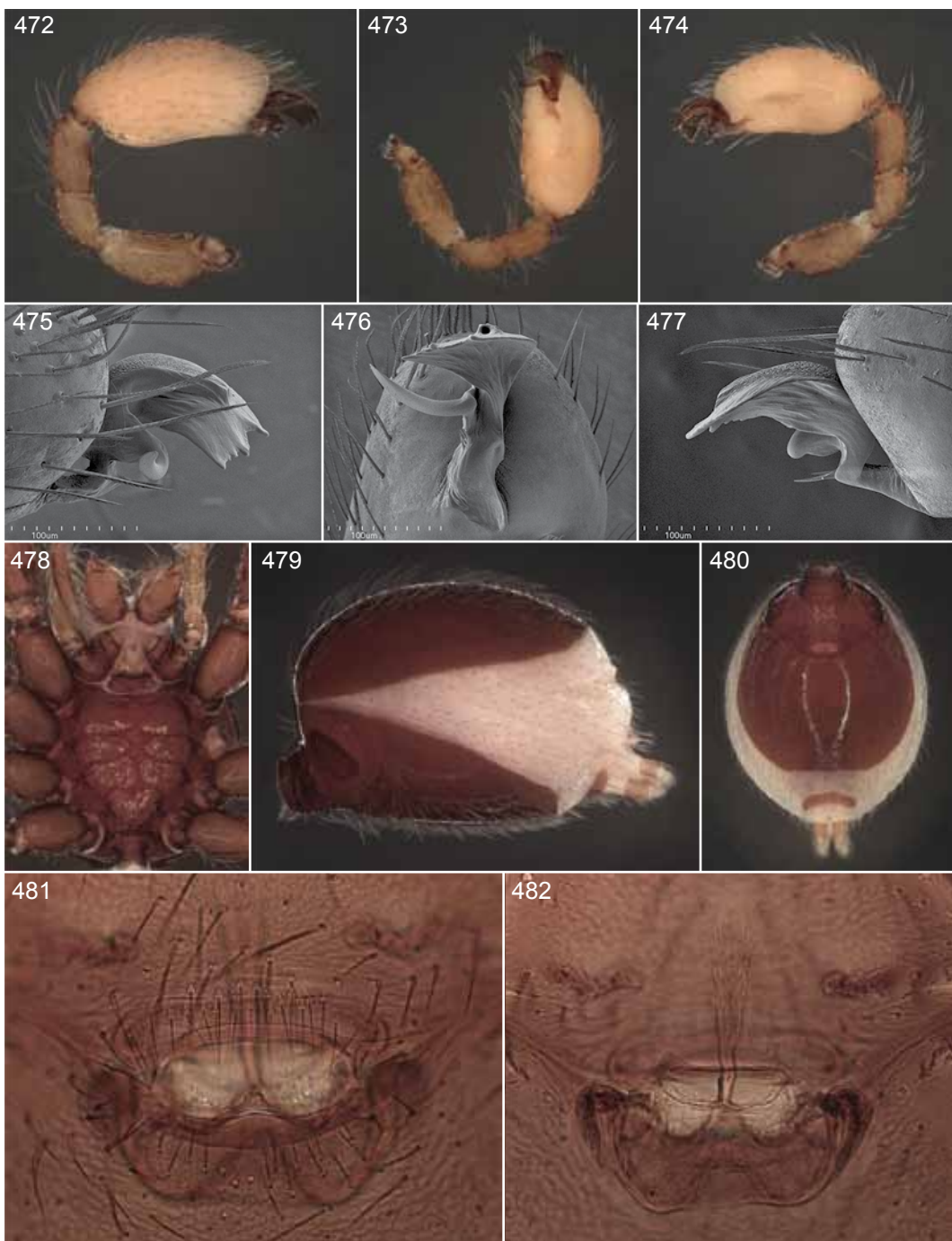


FIGURES 450–460. *Costarina gemelo*, new species, male (450–456) and female (457–460). **450.** Left palp, prolateral view. **451.** Same, ventral view. **452.** Same, retrolateral view. **453.** Left embolus, prolateral view. **454.** Same, ventral view. **455.** Same, retrolateral view. **456.** Sternum, ventral view. **457.** Abdomen, lateral view. **458.** Same, ventral view. **459.** Digested female genitalia, ventral view. **460.** Same, dorsal view.



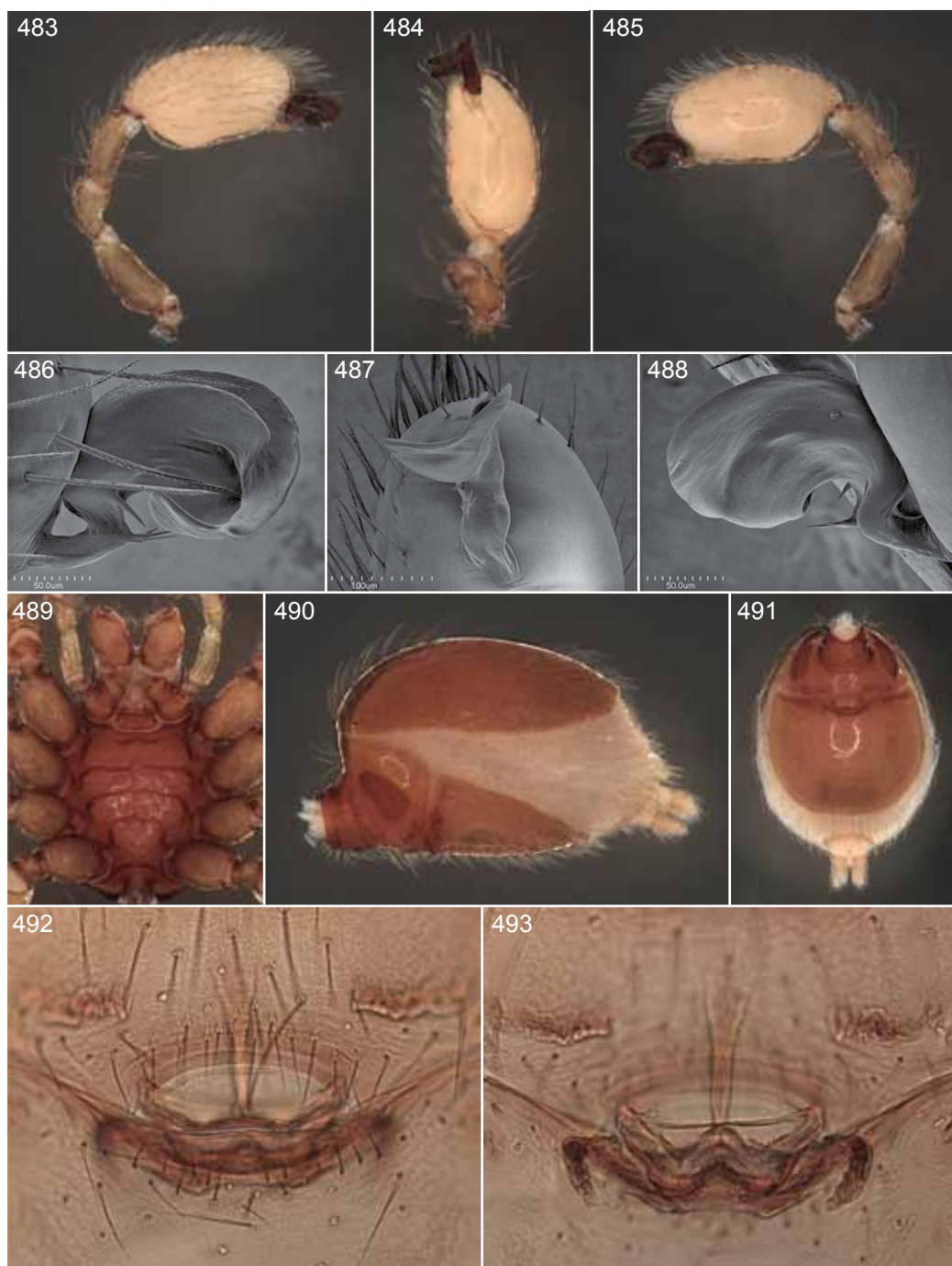
FIGURES 461–471. *Costarina pittier* new species, male (461–466) and female (467–471). **461.** Left palp, prolateral view. **462.** Same, ventral view. **463.** Same, retrolateral view. **464.** Left embolus, prolateral view. **465.** Same, ventral view. **466.** Same, retrolateral view. **467.** Sternum, ventral view. **468.** Abdomen, lateral view. **469.** Same, ventral view. **470.** Digested female genitalia, ventral view. **471.** Same, dorsal view.



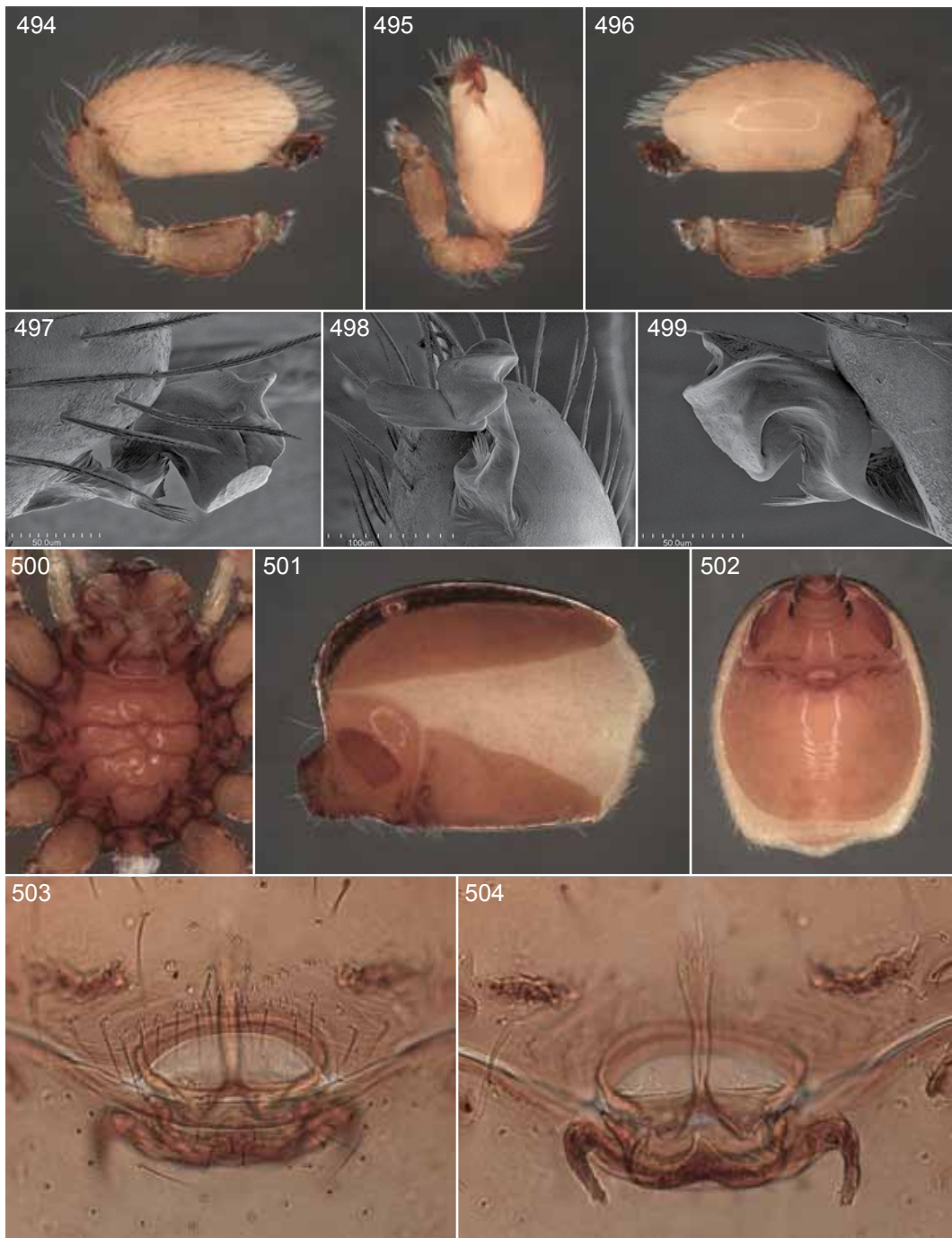


FIGURES 472–482. *Costarina alturas*, new species, male (472–477) and female (478–482). **472.** Left palp, prolateral view. **473.** Same, ventral view. **474.** Same, retrolateral view. **475.** Left embolus, prolateral view. **476.** Same, ventral view. **477.** Same, retrolateral view. **478.** Sternum, ventral view. **479.** Abdomen, lateral view. **480.** Same, ventral view. **481.** Digested female genitalia, ventral view. **482.** Same, dorsal view.

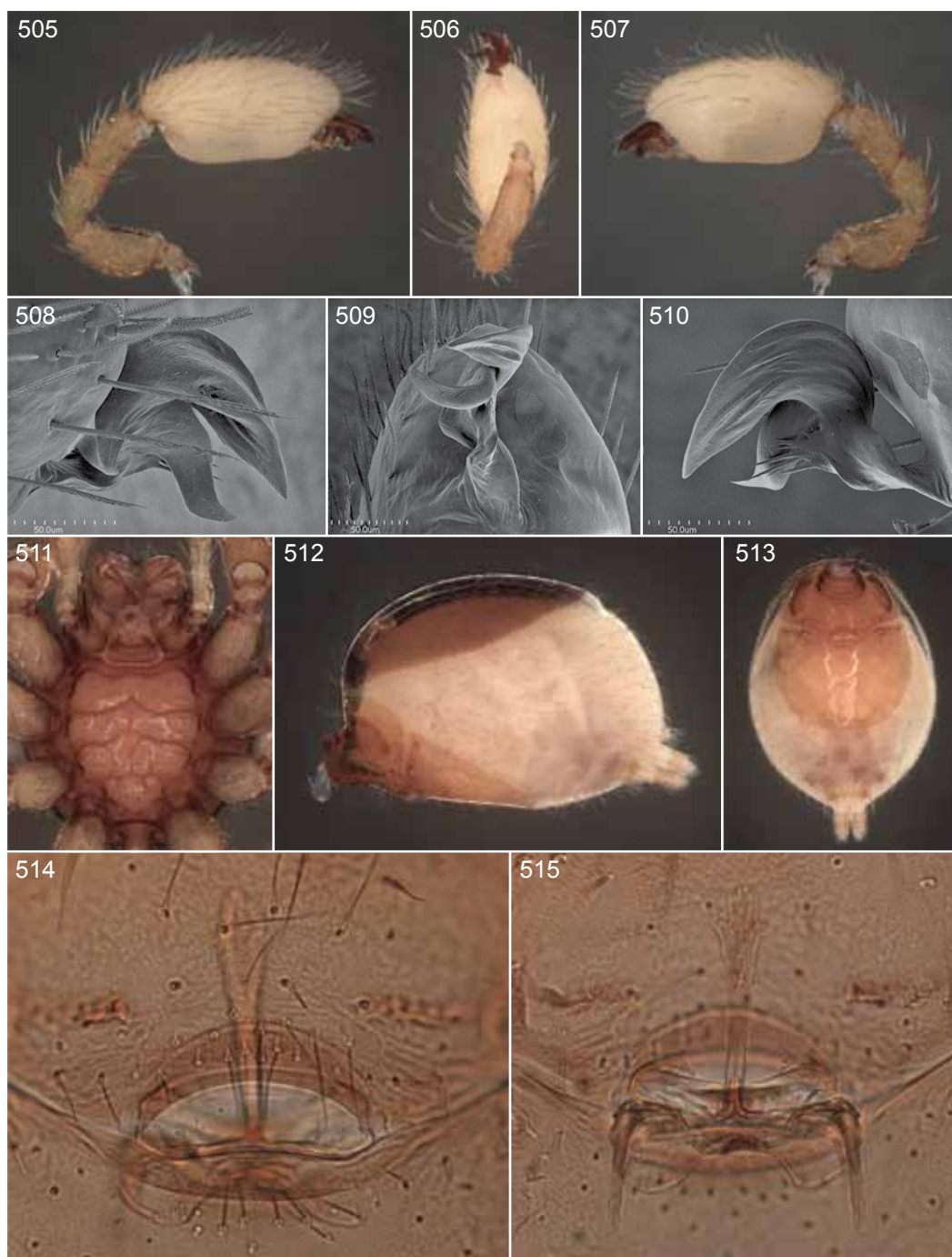




FIGURES 483–493. *Costarina cruces*, new species, male (483–488) and female (489–493). **483.** Left palp, prolateral view. **484.** Same, ventral view. **485.** Same, retrolateral view. **486.** Left embolus, prolateral view. **487.** Same, ventral view. **488.** Same, retrolateral view. **489.** Sternum, ventral view. **490.** Abdomen, lateral view. **491.** Same, ventral view. **492.** Digested female genitalia, ventral view. **493.** Same, dorsal view.

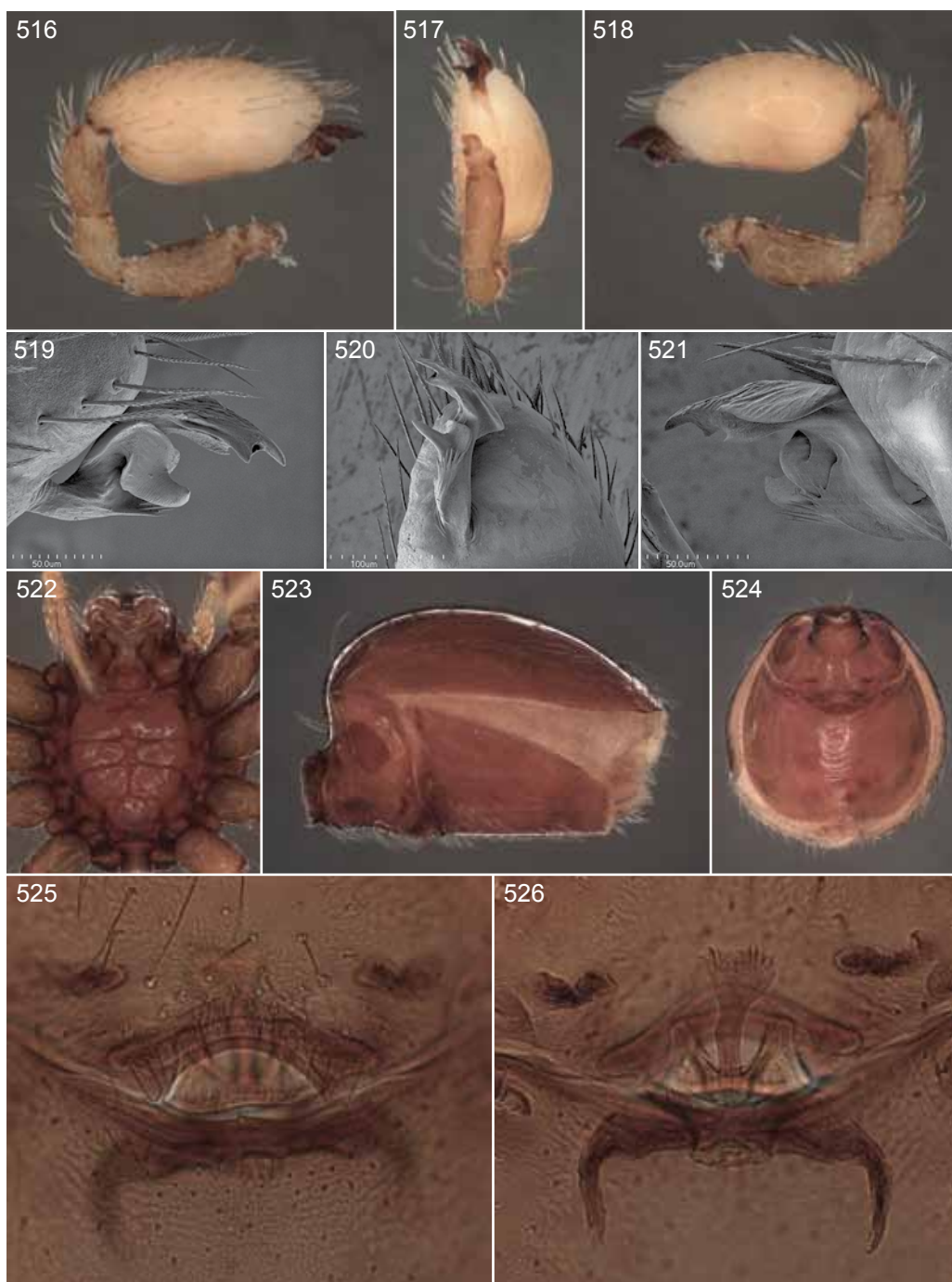


FIGURES 494–504. *Costarina ubicki*, new species, male (494–499) and female (500–504). **494.** Left palp, prolateral view. **495.** Same, ventral view. **496.** Same, retrolateral view. **497.** Left embolus, prolateral view. **498.** Same, ventral view. **499.** Same, retrolateral view. **500.** Sternum, ventral view. **501.** Abdomen, lateral view. **502.** Same, ventral view. **503.** Digested female genitalia, ventral view. **504.** Same, dorsal view.

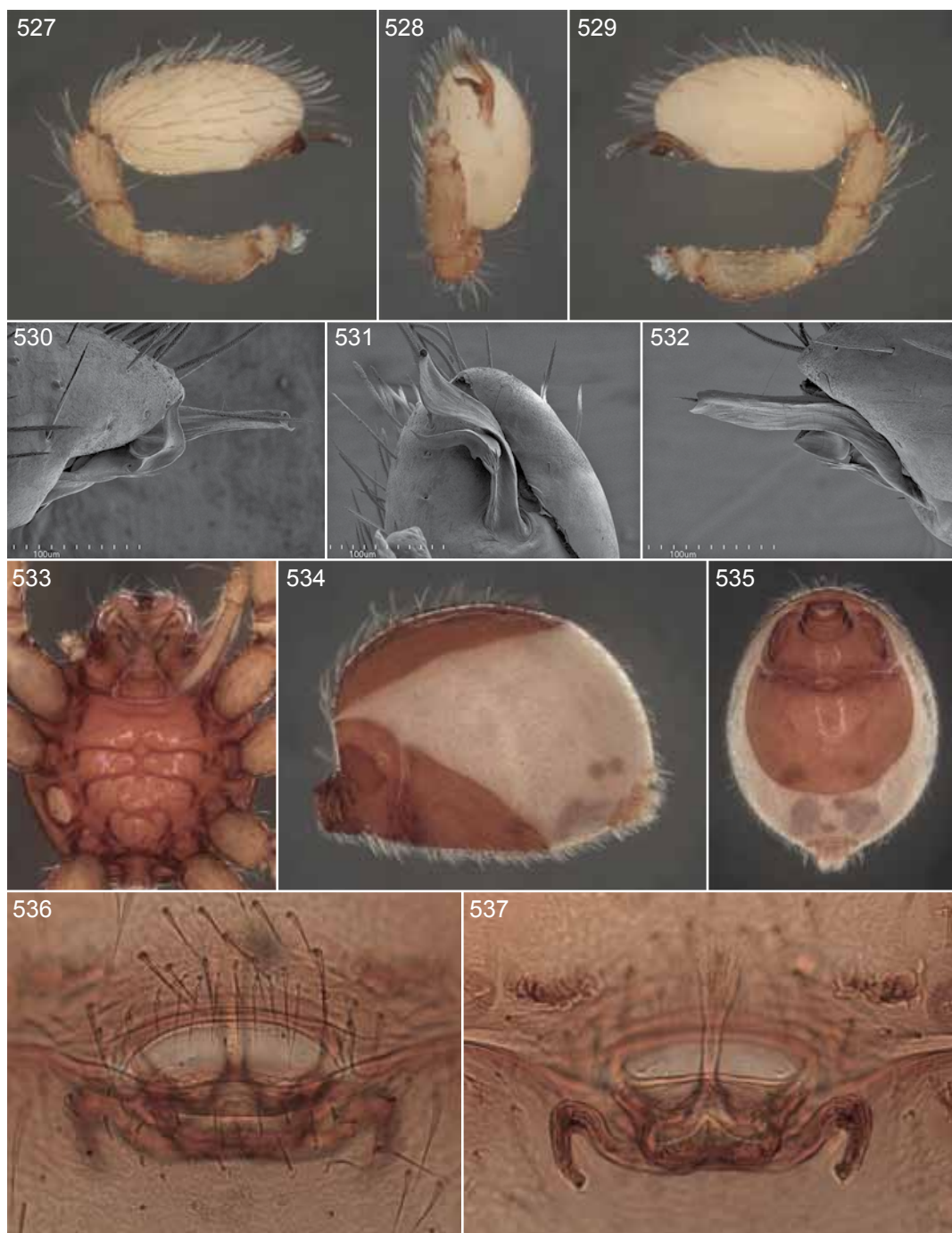


FIGURES 505–515. *Costarina palmar*, new species, male (505–510) and female (511–515). **505.** Left palp, prolateral view. **506.** Same, ventral view. **507.** Same, retrolateral view. **508.** Left embolus, prolateral view. **509.** Same, ventral view. **510.** Same, retrolateral view. **511.** Sternum, ventral view. **512.** Abdomen, lateral view. **513.** Same, ventral view. **514.** Digested female genitalia, ventral view. **515.** Same, dorsal view.

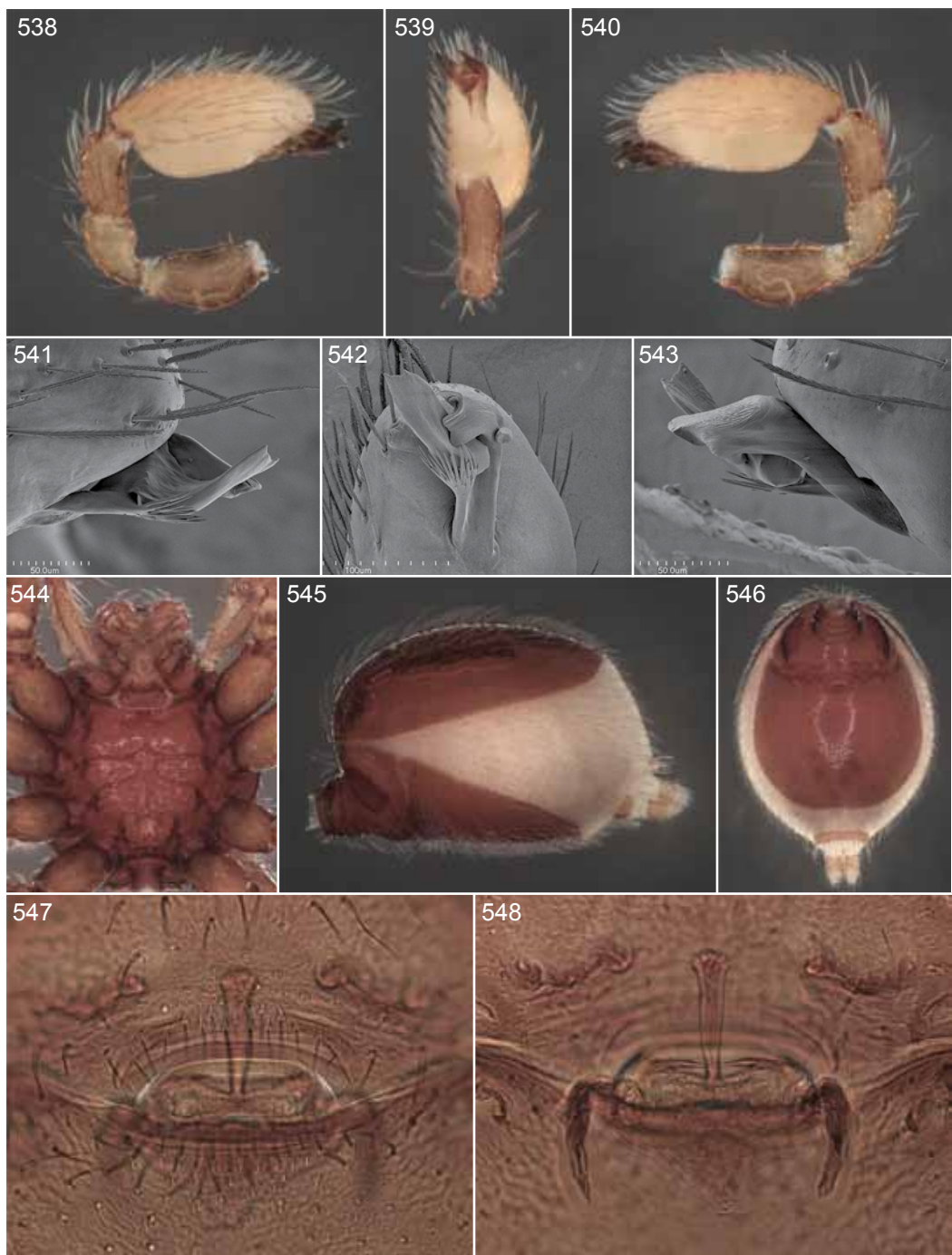




FIGURES 516–526. *Costarina parabio*, new species, male (516–521) and female (522–526). **516.** Left palp, prolateral view. **517.** Same, ventral view. **518.** Same, retrolateral view. **519.** Left embolus, prolateral view. **520.** Same, ventral view. **521.** Same, retrolateral view. **522.** Sternum, ventral view. **523.** Abdomen, lateral view. **524.** Same, ventral view. **525.** Digested female genitalia, ventral view. **526.** Same, dorsal view.

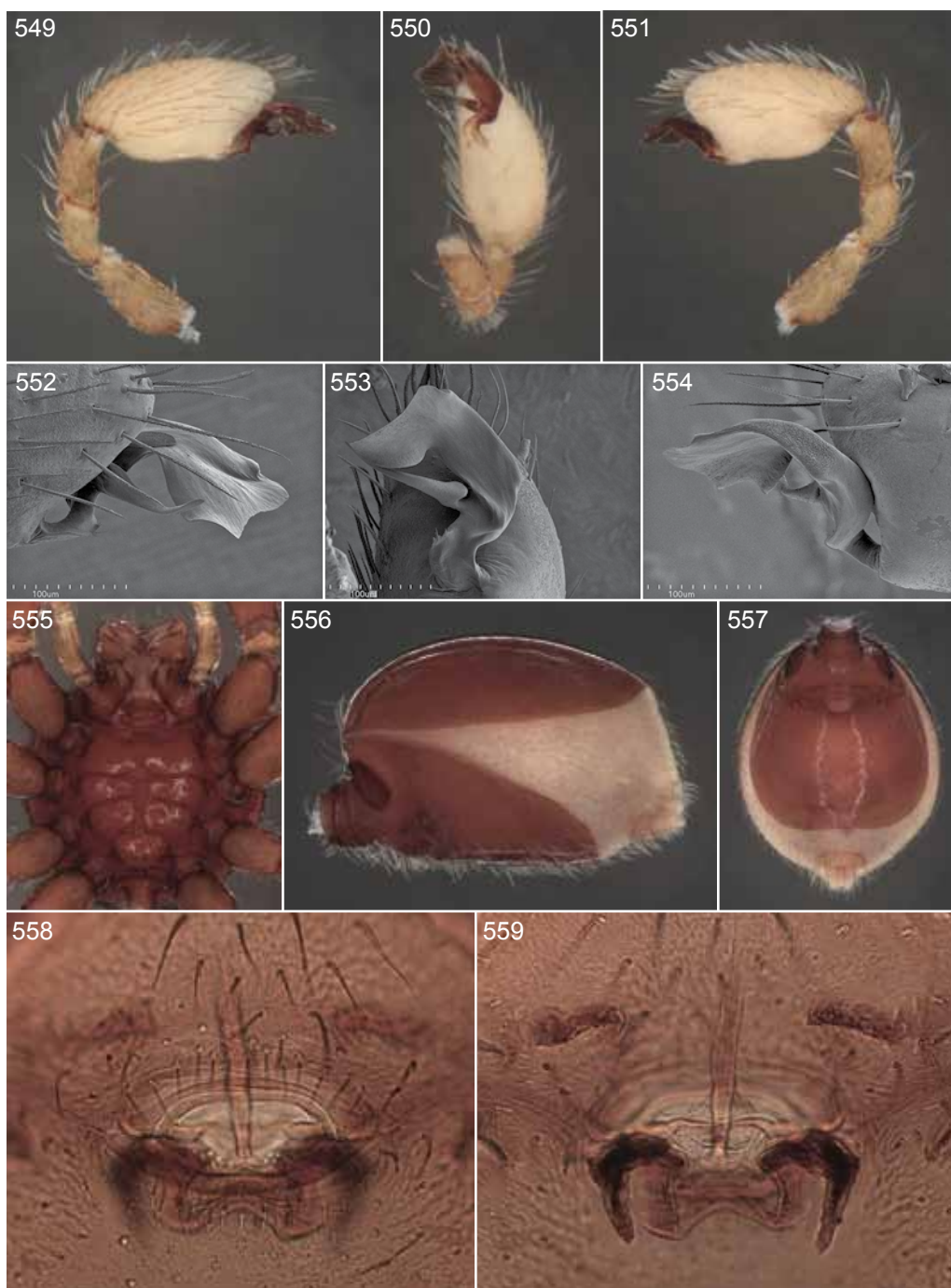


FIGURES 527–537. *Costarina semibio*, new species, male (527–532) and female (533–537). **527.** Left palp, prolateral view. **528.** Same, ventral view. **529.** Same, retrolateral view. **530.** Left embolus, prolateral view. **531.** Same, ventral view. **532.** Same, retrolateral view. **533.** Sternum, ventral view. **534.** Abdomen, lateral view. **535.** Same, ventral view. **536.** Digested female genitalia, ventral view. **537.** Same, dorsal view.

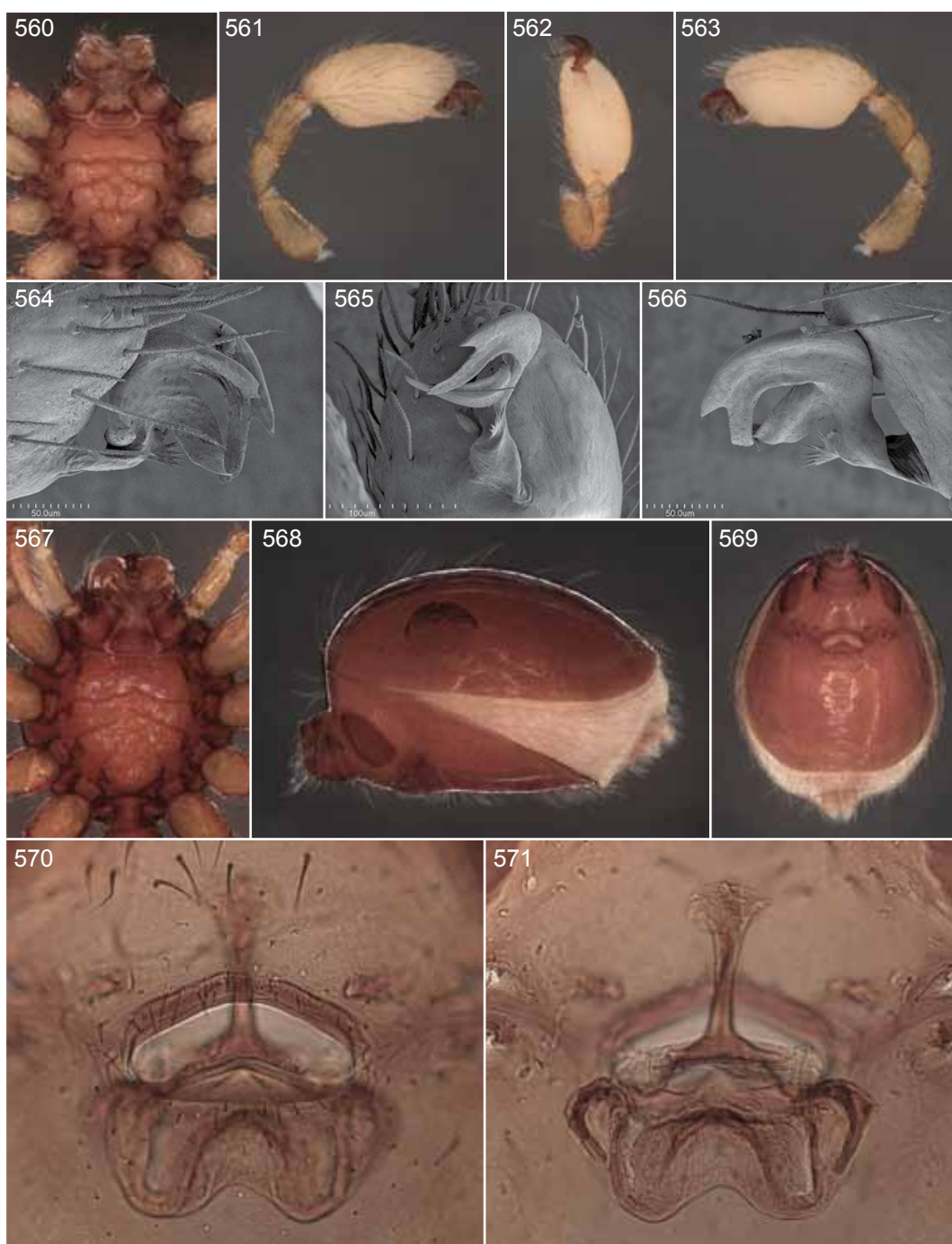


FIGURES 538–548. *Costarina jimenez*, new species, male (538–543) and female (544–548). **538.** Left palp, prolateral view. **539.** Same, ventral view. **540.** Same, retrolateral view. **541.** Left embolus, prolateral view. **542.** Same, ventral view. **543.** Same, retrolateral view. **544.** Sternum, ventral view. **545.** Abdomen, lateral view. **546.** Same, ventral view. **547.** Digested female genitalia, ventral view. **548.** Same, dorsal view.





FIGURES 549–559. *Costarina osa*, new species, male (549–554) and female (555–559). **549.** Left palp, prolateral view. **550.** Same, ventral view. **551.** Same, retrolateral view. **552.** Left embolus, prolateral view. **553.** Same, ventral view. **554.** Same, retrolateral view. **555.** Sternum, ventral view. **556.** Abdomen, lateral view. **557.** Same, ventral view. **558.** Digested female genitalia, ventral view. **559.** Same, dorsal view.



FIGURES 560–571. 560–566. *Costarina parapalmar*, new species, male. 567–571. *C. isidro*, new species, female. 560. Sternum, ventral view. 561. Left palp, prolateral view. 562. Same, ventral view. 563. Same, retrolateral view. 564. Left embolus, prolateral view. 565. Same, ventral view. 566. Same, retrolateral view. 567. Sternum, ventral view. 568. Abdomen, lateral view. 569. Same, ventral view. 570. Digested female genitalia, ventral view. 571. Same, dorsal view.

***Costarina macho***, new species (Figures 315–325)

TYPES: Male holotype, female allotype, and male paratype sifted from forest litter taken at an elevation of 2850 m in the Reserva Forestal Río Macho, km 70 on the Inter-American Highway, 9°39'N, 83°51'W, Cartago, Costa Rica (Mar. 22–26, 1999; J. Miller), deposited in USNM (PBI\_OON 27842).

DIAGNOSIS: Males resemble those of *C. cuerici* (cf. figs. 279–289 and *C. junio* (cf. figs. 290–300) but the lightly sclerotized portion of the distal embolar prong is much smaller and the distal prong is wider than in those species (figs. 315–320). Females resemble those of *C. cuerici* but have a much narrower, rectangular genital atrium (figs. 324, 325).

MALE (PBI\_OON 27842, figs. 315–320): Total length 2.46. Both processes on endite basally widened. Femur II p0-0-1; tibia I v4-4-2. Embolus proximal prong elongated, narrow; distal prong reflexed ventrally, with narrow translucent flange on prolateral side ( $N = 6$ ).

FEMALE (PBI\_OON 27842, figs. 321–325): Total length 2.51. Spination typical. Genital atrium short, anterior margin medially excavated, posterior margin weak ( $N = 6$ ).

DISTRIBUTION: Cartago.

***Costarina cruz***, new species (Figures 326–336)

TYPES: Male holotype and female allotype from litter taken at an elevation of 5500 ft near a stream 1 km west of Santa Cruz de Turrialba on Route 230, Cartago, Costa Rica (Mar. 13, 1991; L. Herman), deposited in AMNH (PBI\_OON 49230).

DIAGNOSIS: Males resemble those of *C. azul* (cf. figs. 155–165) in having the distal embolar prong deeply bifid, producing a distinctive appearance, with three parallel, prolaterally directed flanges, but the teeth on the embolar base are much longer and the middle flange has a much wider base and a narrower tip (figs. 326–331); females also have fully fused ventral scuta but have a much smaller genital atrium (figs. 333–336).

MALE (PBI\_OON 49230, figs. 326–331): Total length 2.22. Endite ventral process arched ventrally; dorsal process long, narrow. Femur I r1-1-0; metatarsus I v2-2-2. Embolus proximal prong curving near tip; distal prong deeply bifid, with narrow tip ( $N = 1$ ).

FEMALE (PBI\_OON 49230, figs. 332–336): Total length 2.47. Spination typical. Genital atrium almost completely filled by protuberant sclerotization ( $N = 1$ ).

DISTRIBUTION: Cartago.

***Costarina chonta***, new species (Figures 337–347)

TYPE: Male holotype sifted from moss and litter in a bog at an elevation of 2500 m at La Chonta, km 54 on the Inter-American Highway, 9°43'N, 83°56'W, Cartago, Costa Rica (Mar. 26–27, 1999; J. Miller), deposited in USNM (PBI\_OON 27839).

DIAGNOSIS: Males resemble those of *C. poas* (cf. figs. 111–121), but the heavily sclerotized portion of the distal embolar prong is shorter and more rounded (figs. 337–342); the female here associated resembles that of *C. plena* (cf. figs. 1–11) but has a small, triangular genital atrium (figs. 346, 347).

MALE (PBI\_OON 27839, figs. 337–342): Total length 2.44. Endite ventral process ventrally arched; dorsal process with sharply pointed tip. Femur I r1-1-0. Embolus proximal prong



almost obsolete; distal prong with wide translucent flange which is much larger than more heavily sclerotized, retrolateral portion of prong ( $N = 2$ ).

FEMALE (PBI\_OON 29829, figs. 343–347): Total length 2.17. Spination typical. Genital atrium relatively small, almost completely filled with protuberant sclerotization ( $N = 1$ ).

DISTRIBUTION: Cartago.

***Costarina barbilla*, new species (Figures 308–314)**

TYPE: Male holotype taken at the Estación Biológica Barbilla in the Parque Nacional Barbilla, Cartago, Costa Rica (Mar. 10, 2001; C. Viquez), deposited in INBIO (PBI\_OON 29763).

DIAGNOSIS: Males can easily be recognized by the long, narrow, almost parallel embolar prongs (figs. 309–314).

MALE (PBI\_OON 29763, figs. 308–314): Total length 2.13. Endite ventral process basally widened; dorsal process distally narrowed. Femur II p0-0-1, r0-1-0; tibia I v4-4-2. Embolus proximal and distal prongs both long, narrow ( $N = 2$ ).

FEMALE: Unknown.

DISTRIBUTION: Cartago.

***Costarina espavel*, new species (Figures 348–358)**

TYPES: Male holotype and male paratype from dry litter taken at an elevation of 200 m on the Espavel trail in the Reserva Biológica Hitoy Cerere, Limón, Costa Rica (Mar. 28, 2002; P. Thomas), deposited in INBIO (PBI\_OON 29747).

DIAGNOSIS: Males resemble those of *C. obtina* (cf. figs. 439–449) in having a translucent flange on the distal embolar prong, but have a longer proximal embolar prong (figs. 348–353); females have fully fused ventral scuta, a relatively large, semicircular genital atrium, and a basally widened anterior genitalic process (figs. 355–358).

MALE (PBI\_OON 29747, figs. 348–353): Total length 1.72. Both processes on endite relatively long, narrow. Femur I r0-1-1; tibiae: I v4-4-2; II v4-4-0; metatarsus I v2-2-2. Embolus proximal prong long, narrow, straight; distal prong with translucent flange along proximal edge ( $N = 8$ ).

FEMALE (PBI\_OON 51266, figs. 354–358): Total length 2.66. Spination typical. Genital atrium relatively large, oval, posterior margin anteriorly produced at midline ( $N = 8$ ).

DISTRIBUTION: Northern Puntarenas, Cartago, and Limón.

***Costarina veragua*, new species (Figures 359–365)**

TYPE: Male holotype from mini-Winkler trap sample taken at an elevation of 300–400 m at Los Gigantes, Veragua Rainforest, Limón, Costa Rica (Mar. 17, 2009; M. Solis, B. Hernández), deposited in INBIO (96612, PBI\_OON 51256).

DIAGNOSIS: Males resemble those of *C. watina* (cf. figs. 232–242) but have a longer, wider distal embolar prong (figs. 360–365).

MALE (PBI\_OON 51256, figs. 359–365): Total length 2.05. Endite dorsal process larger than ventral process. Femur II p0-0-1, r0-1-0; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong with retrolaterally directed protrusion at base; distal prong relatively narrow ( $N = 2$ ).

FEMALE: Unknown.

DISTRIBUTION: Limón.

***Costarina pity*, new species (Figures 373–383)**

TYPES: Male holotype, female allotype, male paratype, and female paratype from a mini-Winkler sample taken on the El Pity path in the Veragua Rainforest, Limón, Costa Rica (Mar. 19, 2009; M. Solis), deposited in INBIO (PBI\_OON 51258).

DIAGNOSIS: Males resemble those of *C. nara* (cf. figs. 177–187) and *C. mooreorum* (cf. figs. 395–405) but have a wider tip on the distal embolar prong (figs. 373–378); females have the posterior margin of the genital atrium medially enlarged (figs. 382, 383), and the epigastric furrow enlarged lateral to the spiracles (fig. 381).

MALE (PBI\_OON 51258, figs. 373–378): Total length 2.08. Both processes on endite relatively long, narrow, forming pincerlike structure. Femora: I r1-1-0; II p0-0-1; metatarsus I v2-2-2. Embolus proximal prong long, narrow, distally sinuous; distal prong bifid, with long, straight, narrow, basal protrusion ( $N = 2$ ).

FEMALE (PBI\_OON 51258, figs. 379–383): Total length 2.33. Spination typical. Genital atrium wide, posterior margin produced anteriorly at midline ( $N = 3$ ).

DISTRIBUTION: Limón.

***Costarina penshurst*, new species (Figures 366–372)**

TYPES: Male holotype and male paratype from leaf litter taken in a humid forest with cacao at Penshurst, 10 km north of Cahuita, Limón, Costa Rica (Apr. 13–15, 1983; D. Ubick), deposited in CAS (PBI\_OON 51259).

DIAGNOSIS: Males resemble those of *C. nara* (cf. figs. 177–187), *C. pity* (cf. figs. 373–383), and *C. mooreorum* (cf. figs. 395–405) but have a distinctively widened tip on the proximal embolar prong (figs. 367–372).

MALE (PBI\_OON 51259, figs. 366–372): Total length 2.04. Both processes on endite relatively long, narrow, with medially directed tips. Femora: I r1-1-0; II p0-0-1; metatarsus I v2-2-2. Embolus proximal prong distally widened; distal prong with dorsally projecting lobe on distal edge ( $N = 2$ ).

FEMALE: Unknown.

DISTRIBUTION: Limón.

***Costarina hitoy*, new species (Figures 384–394)**

TYPES: Male holotype from wet litter taken at an elevation of 500 m in the Reserva Biológica Hitoy Cerere, 9°40'N, 83°02'W, Limón, Costa Rica (Aug. 30, 1985; J. Longino), deposited in FMNH (56546, PBI\_OON 10764).

DIAGNOSIS: Males resemble those of *C. penshurst* (cf. figs. 366–372) but have a more sharply pointed distal embolar prong and a distally narrowed proximal prong (figs. 384–389); females have fully fused ventral scuta and resemble those of *C. rafael* (cf. figs. 144–154), but have a larger genital atrium and differently shaped posterior genitalic elements (figs. 391–394).

MALE (PBI\_OON 10764, figs. 384–389): Total length 2.08. Endite ventral process sharply pointed; dorsal process distally long, narrow, tip directed medially. Femora: I r1-1-0; II p0-0-2. Embolus with both prongs large, expanded distally, distal prong with prolaterally directed dorsal projection behind tip ( $N = 13$ ).

FEMALE (PBI\_OON 49599, figs. 390–394): Total length 1.95. Spination typical. Genital atrium relatively large, posterior margin with triangular, anteriorly directed projection at mid-line ( $N = 4$ ).

DISTRIBUTION: Limón.

***Costarina mooreorum*, new species (Figures 395–405)**

TYPE: Male holotype and female allotype from humus taken in a cacao/cordia/banana parcel on the farm of Alberto Moore at Hone Creek, Limón, Costa Rica (Oct. 21–23, 2005; C. Viquez), deposited in INBIO (1918, PBI\_OON 27689).

ETYMOLOGY: The specific name is a patronym in honor of the Moore family, in recognition of their long-term support of a cacao spider project.

DIAGNOSIS: Males resemble those of *C. nara* (cf. figs. 177–187) and *C. pity* (cf. figs. 373–383) but have a narrower tip on the distal embolar prong (figs. 395–400); females have fully fused ventral scuta and a long genital atrium with a sinuous posterior margin and sinuous posterior genitalic elements (figs. 404, 405).

MALE (PBI\_OON 27689, figs. 395–400): Total length 1.95. Endite ventral process relatively short, wide; dorsal process with hooked, medially directed tip. Femur II p0-0-1, r0-1-0; metatarsus I v2-2-2. Embolus proximal prong narrow, tip directed dorsally; distal prong sinuous, with relatively narrow tip ( $N = 9$ ).

FEMALE (PBI\_OON 27689, figs. 401–405): Total length 2.02. Spination typical. Genital atrium relatively long, posterior margin sinuous ( $N = 4$ ).

DISTRIBUTION: Limón.

***Costarina cerere*, new species (Figures 406–416)**

TYPE: Male holotype taken on the Espavel trail in the Reserva Biológica Hitoy Cerere, Limón, Costa Rica (Mar. 31, 1998; E. Rojas), deposited in INBIO (PBI\_OON 29777).

DIAGNOSIS: Males resemble those of *C. selva* (cf. figs. 122–132) but have one short and two long processes on the distal embolar prong (figs. 406–411); females resemble those of *C. viejo* (cf. figs. 133–143) and *C. carrillo* (cf. figs. 210–220) in having fully fused ventral scuta and a pair of round sclerotizations at the sides of the genital atrium, but have shorter apodemes and a narrower tip on the anterior genitalic process (figs. 413–416).

MALE (PBI\_OON 29777, figs. 406–412): Total length 2.06. Both processes on endite with long, strong, medially directed tips. Femur II p0-0-1, r0-1-0; metatarsus I v2-2-2. Embolus proximal prong very long, strongly tapering to tip; distal prong with one short and two long processes ( $N = 3$ ).

FEMALE (PBI\_OON 29814, figs. 413–416): Total length 2.20. Leg II missing, leg I spination typical. Genital atrium with sclerotizations along lateral margins ( $N = 1$ ).

DISTRIBUTION: Limón.

***Costarina concinna* (Chickering) (Figures 417–427)**

*Dysderina concinna* Chickering, 1968: 9, figs. 13–19 (male holotype from Volcán, Chiriquí, Panama, in MCZ; examined).



*Dysderina potena* Chickering, 1968: 24, figs. 50–52 (female holotype from Volcán, Chiriquí, Panama, in MCZ; examined). NEW SYNONYMY.

*Costarina concinna*: Platnick and Dupérré, 2011: 50.

*Costarina potena*: Platnick and Dupérré, 2011: 50.

DIAGNOSIS: This appears to be a southern vicariant of the widespread species *C. plena* (cf. figs. 1–11); the two species have been collected together only in the Reserva Biológica Hitoy Cerere in Limón. Males have a much larger, wider, more rectangular proximal embolar prong (figs. 417–422) and females have a larger, less triangular genital atrium (figs. 426, 427).

MALE (PBI\_OON 29753, figs. 417–422): Total length 2.22. Endite ventral process very short, tip heavily sclerotized; dorsal process long, narrow, tip widely separated from tip of ventral process. Femur II p0-0-2, r1-1-0; metatarsus I v2-2-2. Embolus proximal prong wide, flag shaped; distal prong long, bent only at apex ( $N = 2$ ).

FEMALE (PBI\_OON 29815, figs. 423–427): Total length 2.38. Spination typical. Genital atrium relatively large, almost completely filled with protuberant sclerotization, anterior margin rebordered ( $N = 4$ ).

DISTRIBUTION: Southern Limón, southeastern Puntarenas, and northern Panama.

SYNONYMY: Chickering collected at Volcán, Chiriquí, Panama, from Aug. 9–14, 1950, and described five species of *Dysderina* based on specimens he captured there: three based exclusively on males, and two based exclusively on females. He recognized that the female holotype of *D. potena* “appears to be closely related to *D. plena*,” so it is surprising that he did not match that specimen with the males of *D. concinna*, which closely resemble the males of *C. plena*. Both sexes have since been taken together in Panama.

### *Costarina frantzius*, new species (Figures 428–438)

TYPES: Male holotype and female allotype taken at an elevation of 2200 m on Cerro Frantzius, Puntarenas, Costa Rica (Feb. 26–28, 2005; R. Anderson), deposited in INBIO (PBI\_OON 29755).

DIAGNOSIS: Males of this relatively large species can easily be recognized by the abruptly bent, translucent tip of the distal embolar prong (figs. 428–433), females by the overhanging anterior margin of the genital atrium and the very short apodemes (figs. 437, 438).

MALE (PBI\_OON 29755, figs. 428–433): Total length 2.38. Endite ventral process long, narrow; dorsal process with long, arched anteromedially directed extension. Femora: I r0-1-1; II p0-0-1; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong gradually tapering to fine tip; distal prong with abruptly bent prolateral edge ( $N = 1$ ).

FEMALE (PBI\_OON 29755, figs. 434–438): Total length 2.68. Spination typical. Genital atrium with wide, ventrally protruding sclerotization, anterior margin overhanging protrusion ( $N = 1$ ).

DISTRIBUTION: Southeastern Puntarenas.

### *Costarina obtina* (Chickering) (Figures 439–449)

*Dysderina obtina* Chickering, 1968: 21, figs. 42–45 (male holotype from Volcán, Chiriquí, Panama, in MCZ; examined).

*Costarina obtina*: Platnick and Dupérré, 2011: 50.

DIAGNOSIS: Males of this dark-bodied species resemble those of *C. espavel* (cf. figs. 348–358) in having a translucent flange on the distal embolar prong, but have a shorter proximal embolar prong (figs. 439–444); females have heavily sclerotized, arched posterior genitalic elements (figs. 448, 449).

MALE (PBI\_OON 29756, figs. 439–444): Total length 2.10. Endite ventral process relatively wide; distal process with arched, medially directed extension. Femora: I r0-1-1; II p0-0-1; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong excavated on distal side; distal prong with translucent, relatively narrow proximal flange ( $N = 13$ ).

FEMALE (PBI\_OON 29756, figs. 445–449): Total length 2.12. Spination typical. Genital atrium almost rectangular, followed posteriorly by medially divided sclerotization ( $N = 4$ ).

DISTRIBUTION: Southeastern Puntarenas.

***Costarina gemelo*, new species (Figures 450–460)**

TYPES: Male holotype and female allotype from humus taken at an elevation of 1670 m in the Estación Pittier, 4 km southwest of Cerro Gemelo, 9.025663°N, 82.962695°W, Puntarenas, Costa Rica (July 4, 1995; C. Viquez), deposited in INBIO (PBI\_OON 29741).

DIAGNOSIS: Males can be recognized by the three long, parallel projections on the embolus (figs. 450–455), females resemble those of *C. pittier* (cf. figs. 461–471) and *C. palmar* (cf. figs. 505–515) in having long apodemes, a distally narrow anterior genitalic process, and a short postepigastric scutum, but have a larger genital atrium (figs. 459, 460).

MALE (PBI\_OON 29741, figs. 450–456): Total length 2.18. Endite ventral process relatively wide; distal process with long, arched, medially directed extension. Femur I p0-0-2, r0-1-1; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong and both arms of bifid distal prong nearly parallel ( $N = 1$ ).

FEMALE (PBI\_OON 29741, figs. 457–460): Total length 2.40. Spination typical. Genital atrium with long apodemal extensions ( $N = 1$ ).

DISTRIBUTION: Southeastern Puntarenas.

***Costarina pittier*, new species (Figures 461–471)**

TYPES: Male holotype and male paratype from humus taken at an elevation of 1670 m in the Estación Pittier, 4 km southwest of Cerro Gemelo, 9.025663°N, 82.962695°W, Puntarenas, Costa Rica (July 4, 1995; C. Viquez), deposited in INBIO (8577, PBI\_OON 29780).

DIAGNOSIS: Males of this dark-bodied species resemble those of *C. reventazon* (cf. figs. 301–307) in having a long embolus without obvious prongs, but differ in having the embolus abruptly bent (figs. 461–466); females resemble those of *C. gemelo* (cf. figs. 450–460) and *C. palmar* (cf. figs. 505–515) in having long apodemes and a short postepigastric scutum, but have large, heavily sclerotized posterior genitalic elements (figs. 470, 471).

MALE (PBI\_OON 29780, figs. 461–466): Total length 2.09. Both processes on endite wide at base, heavily sclerotized. Femur I r0-1-0. Embolus with single prong, bent prolaterally at about two-thirds its length, with recurved tip ( $N = 20$ ).

FEMALE (PBI\_OON 10032, figs. 467–471): Total length 2.60. Tibia II v4-4-2. Genital atrium, with short, rounded apodemal lobes at posterolateral corners ( $N = 8$ ).

DISTRIBUTION: Abundant in southern Puntarenas, including the Osa Peninsula.

***Costarina alturas***, new species (Figures 472–482)

TYPES: Male holotype, female allotype, and female paratype from litter taken along a montane/cloud-forest transect at an elevation of 1520 m in the Estación Biológica Las Alturas, 2 km northeast of Alturas, 8°56'56"N, 82°50'01"W, Puntarenas, Costa Rica (June 20, 1998; R. Anderson), deposited in AMNH (PBI\_OON 49241).

DIAGNOSIS: Males resemble those of *C. isidro* (cf. figs. 254–260) in having a long, narrow, ventrally arched proximal embolar prong but have a narrower tip on the distal embolar prong (figs. 472–477); females also resemble those of *C. isidro* (cf. figs. 567–571) but have shorter posterior genitalic elements (figs. 479–482).

MALE (PBI\_OON 49241, figs. 472–477): Total length 2.20. Endite ventral process relatively long, narrow; dorsal process with angular, anteromedially directed projection. Femur I r0-1-1; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong long, narrow, scythe-shaped in ventral view; distal prong with serrated tip ( $N = 7$ ).

FEMALE (PBI\_OON 49241, figs. 478–482): Total length 2.42. Spination typical. Genital atrium short, wide, with W-shaped posterior margin ( $N = 9$ ).

DISTRIBUTION: Southeastern Puntarenas.

***Costarina cruces***, new species (Figures 483–493)

TYPES: Male holotype and female allotype from wet cloud-forest litter taken at an elevation of 1400 m at a site 5 km southwest of the Estación Biológica Las Cruces, 8°47'13"N, 82°59'13"W, Puntarenas, Costa Rica (June 22, 1998; R. Anderson), deposited in AMNH (PBI\_OON 51286).

DIAGNOSIS: Males resemble those of *C. ubicki* (cf. figs. 494–504) in having the distal embolar prong bent at a 90° angle, but lack a triangular projection on the distal edge of that prong (figs. 483–488); females also resemble those of *C. ubicki* but have posteriorly narrower posterior genitalic elements (figs. 492, 493).

MALE (PBI\_OON 51286, figs. 483–488): Total length 2.46. Endite ventral process long, with curved tip; dorsal process with angular, medially directed projection. Femur II p0-0-1; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong short, narrow; distal prong with retrolaterally directed projection ( $N = 3$ ).

FEMALE (PBI\_OON 49244, figs. 489–493): Total length 2.60. Spination typical. Genital atrium short, wide, filled with protuberant sclerotization, anterior genitalic process visible through cuticle as very narrow sclerite ( $N = 5$ ).

DISTRIBUTION: Southeastern Puntarenas.

***Costarina ubicki***, new species (Figures 494–504)

TYPES: Male holotype and female allotype from moist tropical forest litter taken at an elevation of 100 m at a site 3 km south of Palmar Norte, Puntarenas, Costa Rica (May 24, 1987; D. Ubick), deposited in CAS (PBI\_OON 51289).

**ETYMOLOGY:** The specific name is a patronym in honor of the collector of the types, Darrell Ubick, of the California Academy of Sciences.

**DIAGNOSIS:** This species seems closest to *C. cruces* (cf. figs. 483–493), but males have a much shorter distal embolar prong with a triangular projection on its distal margin (figs. 494–499) and females have posteriorly wider posterior genitalic elements (figs. 503, 504).

**MALE** (PBI\_OON 51289, figs. 494–499): Total length 1.89. Endite ventral process wide, short; dorsal process with arched tip. Femur II p0-0-2; tibia I v4-4-2; metatarsus I v2-2-2. Embolus proximal prong reduced to short lobe; distal prong with straight, prolaterally directed extension ( $N = 11$ ).

**FEMALE** (PBI\_OON 51289, figs. 500–504): Total length 2.13. Spination typical. Genital atrium with relatively large posterior margin ( $N = 2$ ).

**DISTRIBUTION:** Southern Puntarenas, including the Osa Peninsula.

***Costarina palmar*, new species (Figures 505–515)**

**TYPES:** Male holotype and two male paratypes taken by sifting litter in a tropical moist forest at an elevation of 100 m at a site 3 km south of Palmar Norte, Puntarenas, Costa Rica (May 24, 1987; D. Ubick), deposited in CAS (PBI\_OON 51290).

**DIAGNOSIS:** Males can be recognized by the arched distal embolar prong and transversely oriented proximal embolar prong (figs. 505–510); females resemble those of *C. gemelo* (cf. figs. 450–460) and *C. pittier* (cf. figs. 461–471) in having long apodemes, a distally narrow anterior genitalic process, and a short postepigastric scutum, but have a smaller genital atrium than do those of *C. gemelo*, and lack the heavily sclerotized posterior genitalic elements found in those of *C. pittier* (figs. 512–515).

**MALE** (PBI\_OON 51290, figs. 505–510): Total length 1.63. Endite ventral process small; dorsal process elongated. Femur I r0-1-0. Embolus proximal prong transverse, scoop shaped in ventral view; distal prong arched ( $N = 17$ ).

**FEMALE** (PBI\_OON 29771, figs. 511–515): Total length 2.05. Spination typical. Genital atrium almost rectangular ( $N = 13$ ).

**DISTRIBUTION:** Southern Puntarenas, including the Osa Peninsula.

***Costarina parabio*, new species (Figures 516–526)**

**TYPES:** Male holotype and male paratype taken by sifting litter in a tropical moist forest at an elevation of 100 m at a site 3 km south of Palmar Norte, Puntarenas, Costa Rica (May 24, 1987; D. Ubick), deposited in CAS (PBI\_OON 49595).

**ETYMOLOGY:** The specific name is an arbitrary combination of letters.

**DIAGNOSIS:** Males resemble those of *C. obtina* (cf. figs. 439–449), but have a narrower, more angular distal embolar prong (figs. 516–521); females have two small sclerotizations reaching to near the anterior margin of the genital atrium (figs. 525, 526).

**MALE** (PBI\_OON 49595, figs. 516–521): Total length 1.77. Endite ventral process relatively short, wide; dorsal process narrow, arched. Femur I r0-1-1; tibia I v4-4-1; metatarsus I v2-2-2. Embolus proximal prong with retrolaterally directed spur; distal prong with angularly notched tip ( $N = 5$ ).



FEMALE (PBI\_OON 29768, figs. 522–526): Total length 1.98. Spination typical. Genital atrium with pair of small sclerotizations near anterior margin ( $N = 1$ ).

DISTRIBUTION: Southern Puntarenas, including the Osa Peninsula.

***Costarina semibio***, new species (Figures 527–537)

TYPES: Male holotype, female allotype, and two male paratypes taken at an elevation of 130 m at a site 13 km south-southwest of Puerto Jiménez, 8.40667°N, 83.32833°W, Puntarenas, Costa Rica (Mar. 10, 2008; J. Longino), deposited in MCZ (PBI\_OON 38101).

ETYMOLOGY: The specific name is an arbitrary combination of letters.

DIAGNOSIS: Males resemble those of *C. obtina* (cf. figs. 439–449) but have a longer distal embolar prong (figs. 527–532); females have a wider anterior genitalic process and shorter, more widely separated apodemes (figs. 536, 537).

MALE (PBI\_OON 38101, figs. 527–532): Total length 1.97. Endite ventral process long, sharply pointed; dorsal process strongly arched. Femur I r0-1-1; tibia I v4-4-2; metatarsus I v2-2-2. Embolus with both prongs sinuous, distal prong with tip directed distally ( $N = 11$ ).

FEMALE (PBI\_OON 38101, figs. 533–537): Total length 2.00. Spination typical. Genital atrium with pair of widely separated, posterolateral apodemal lobes ( $N = 12$ ).

DISTRIBUTION: Southern Puntarenas (known only from the Osa Peninsula).

***Costarina jimenez***, new species (Figures 538–548)

TYPES: Male holotype, female allotype, male paratype, and female paratype taken by sifting leaf litter at an elevation of 100 m in a tropical moist forest 8 km west of Puerto Jiménez, Puntarenas, Costa Rica (May 19, 1987; D. Ubick), deposited in CAS (PBI\_OON 51295).

DIAGNOSIS: Males can be recognized by the enlarged proximal embolar prong, which is much longer than the distal prong (figs. 538–543), females by the tiny genital atrium and weakly sclerotized, triangular posterior genitalic elements (figs. 547, 548).

MALE (PBI\_OON 51295, figs. 538–543): Total length 1.85. Endite ventral process sharply pointed; dorsal process basally widened. Femur II p0-0-1. Embolus proximal prong greatly enlarged, longer than distal prong ( $N = 10$ ).

FEMALE (PBI\_OON 51295, figs. 544–548): Total length 2.26. Spination typical. Genital atrium short, wide, oval, filled with protuberant sclerotization, anterior, posterior margins rebordered ( $N = 7$ ).

DISTRIBUTION: Southern Puntarenas, including the Osa Peninsula.

***Costarina parapalmar***, new species (Figures 560–566)

TYPE: Male holotype taken by sifting leaf litter at an elevation of 100 m in a tropical moist forest 8 km west of Puerto Jiménez, Puntarenas, Costa Rica (May 19, 1987; D. Ubick), deposited in CAS (PBI\_OON 51297).

ETYMOLOGY: The specific name refers to the similarities to *C. palmar*.

DIAGNOSIS: Males resemble those of *C. palmar* (cf. figs. 505–515) in having a wide, arched distal embolar prong, but differ in having a bifid tip on that prong (figs. 561–566).

MALE (PBI\_OON 51297, figs. 560–566): Total length 1.76. Both processes on endite long,

narrow. Femur I r0-1-0. Embolus proximal prong long, gradually tapering to tip; distal prong arched, with incised tip ( $N = 6$ ).

FEMALE: Unknown.

DISTRIBUTION: Southern Puntarenas, including the Osa Peninsula.

***Costarina osa***, new species (Figures 549–559)

TYPE: Male holotype from lowland forest litter taken at an elevation of 250 m at Cerro Helado, 17 km northeast of Rincón, Península de Osa, 8°45'30"N, 83°25'00"W, Puntarenas, Costa Rica (June 21, 1997; R. Anderson), deposited in INBIO (PBI\_OON 29776).

DIAGNOSIS: Males resemble those of *C. nara* (cf. figs. 177–187), but have a broader, distally bent tip on the distal embolar prong (figs. 549–554); females have fully fused ventral scuta, a tiny genital atrium, and heavily sclerotized apodemes (figs. 556–559).

MALE (PBI\_OON 29776, figs. 549–554): Total length 1.83. Both processes on endite elongated, dorsal process directed anteriorly. Femur I r0-1-0. Embolus proximal prong with retro-laterally directed knob at base; distal prong sharply bent distally ( $N = 1$ ).

FEMALE (PBI\_OON 51307, figs. 555–559): Total length 2.21. Spination typical. Genital atrium oval, filled with protruding sclerotization, anterior, posterior margins both rebordered ( $N = 4$ ).

DISTRIBUTION: Southern Puntarenas (known only from the Osa Peninsula).

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## REFERENCES

- Cambridge, O.P-. 1889–1902. Arachnida-Araneida, vol. 1. *In* Biologia centrali americana. London: R. H. Porter.
- Chickering, A.M. 1968. The genus *Dysderina* (Araneae, Oonopidae) in Central America and the West Indies. *Breviora* 296: 1–37.
- Platnick, N.I., and N. Dupérré. 2009. The goblin spider genera *Opopaea* and *Epectris* (Araneae, Oonopidae) in the New World. *American Museum Novitates* 3649: 1–43.
- Platnick, N.I., and N. Dupérré. 2011. The Andean goblin spiders of the new genus *Scaphidysderina* (Araneae, Oonopidae), with notes on *Dysderina*. *American Museum Novitates* 3712: 1–51.
- Platnick, N.I., and N. Dupérré. 2012. The goblin spider genus *Costarina* (Araneae, Oonopidae), Part 1. *American Museum Novitates* 3730: 1–64.

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