THE ANDEAN GOBLIN SPIDERS OF THE NEW GENERA *NIARCHOS* AND *SCAPHIOS* (ARANEAE, OONOPIDAE)

NORMAN I. PLATNICK

Peter J. Solomon Family Curator
Division of Invertebrate Zoology
American Museum of Natural History;
Adjunct Professor, Department of Biology
City College, City University of New York;
Adjunct Professor, Department of Entomology
Cornell University;
Adjunct Senior Research Scientist
Center for Environmental Research and
Conservation, Columbia University

NADINE DUPÉRRÉ

Scientific Assistant, Division of Invertebrate Zoology
American Museum of Natural History

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ABSTRACT

A new genus, *Niarchos*, is established for a group of 22 new species from the Andean regions of Colombia, Ecuador, and Peru. Although the males of most of these species are obviously gamasomorphines, with a well-developed dorsal abdominal scutum, that scutum is reduced, in the males of two species, to just a narrow, sclerotized, longitudinal strip that covers only the cardiac area and is fused anteriorly to the epigastric scutum. Females of all species, in contrast, show no trace whatever of a dorsal abdominal scutum, have only short and lightly sclerotized epigastric and postepigastric scuta, and could therefore easily be misidentified as oonopines. Four species groups are recognized within the genus, each characterized by a distinctive form of male palp; the four groups are united by the presence of a triangular, posteriorly directed anterior projection on the male endites as well as by the sexual dimorphism in scutum morphology, reduced posterior eyes, and an unusual leg spination pattern (with spines absent on the anterior legs and present only as slightly enlarged but darkened macrosetae on tibiae, and sometimes metatarsi, III and/or IV). The *cotopaxi* group includes eight species, six from western Ecuador (*N. cotopaxi*, *N. barragani*, *N. keili*, *N. baehrae*, *N. tapiai*, and *N. elicioi*) and two from southwestern Colombia (*N. wygodzinskyi* and *N. florezi*); males of this group are united by a unique retroventral projection on the male palpal bulb. The *scutatus* group includes seven species from eastern Ecuador (*N. scutatus*, *N. ramirezi*, *N. bonaldoi*, *N. vegai*, *N. santosi*, *N. michaliki*, and *N. ligiae*); males of this group are united by an embolar base bent at a right angle at about half its length. The *loja* group includes two species from southern Ecuador and northern Peru (*N. loja* and *N. foreroi*) in which the embolus is elongated. The *palenque* group includes two species from western Ecuador (*N. palenque* and *N. facundoi*) in which the distal portion of the embolus is short and translucent. Three Ecuadorean species known only from females (*N. grismadoi, N. matiasi*, and *N. rheimsae*) are left unplaced, but apparently represent at least one additional, relatively widespread species group. A second new genus, *Scaphios*, is described for a group of seven new species from Ecuador (*S. yanayacu*, *S. napo*, *S. cayambe*, *S. wagra*, *S. jatun*, *S. orellana*, and *S. puyo*), plus one species from southwestern Colombia (*S. planada*), that resemble those of *Niarchos* in dorsal scutum morphology and leg spination, but have fully developed posterior eyes, a laterally directed anterior projection on the male endites, and a subdistally originating, sinuous embolus. Males of *S. orellana* also have reduced dorsal and postepigastric abdominal scuta, but (unlike the *Niarchos* males with reduced scuta) the dorsal scutum is separate from the epigastric scutum. A shared pattern of sexual dimorphism in ventral pedicel sclerite morphology suggests that *Niarchos* and *Scaphios* are sister groups.

INTRODUCTION

Our interest in the spiders detailed below was first piqued, near the beginning of the goblin spider Planetary Biodiversity Inventory (PBI) project, when preliminary sorting of Neotropical collections turned up a male of the Ecuadorean species described below as *Niarchos cotopaxi*. That handsome, hard-bodied (i.e., gamasomorphine) specimen had pedipalps that seemed bizarre, even by oonopid standards. The palpal bulb itself had a distinctive retroventral projection (fig. 17), and the embolar region seemed unlike that of any spider we had encountered. We made preliminary photographs available to the many participants in the PBI project, some of whom suggested that the specimen might be just a developmental anomaly (i.e., teratological). We were able to refute that entirely reasonable conjecture when an additional vial was found that included two more males, each of which had the same peculiar palpal morphology.

The second vial, however, created a new problem; it included a female that seemed to be conspecific, but lacked a dorsal scutum on the abdomen. The presence or absence of a dorsal scutum has often been used as a key character to separate the oonopid subfamilies Gamasomorphinae and Oonopinae, respectively. This character is not absolute, because the genus *Scaphiella* Simon (1891) has always been considered a gamasomorphine. Females of *Scaphiella* do not have the dorsal scutum found in males, but they have a ventral scutum that extends around the sides of the abdomen, producing a ''hard-bodied'' appearance that makes it easy to separate them from soft-bodied, female oonopines. The

female from Ecuador, in contrast, had only a weakly sclerotized epigastric scutum and a separate, very short, weakly sclerotized postepigastric scutum. When found in isolation, without accompanying males, such females would thus normally be identified in collections as oonopines, rather than gamasomorphines.

Additional sorting subsequently turned up males, also from Ecuador, of two other species that seemed congeneric with the first, indicating that additional fieldwork in the northern Andes might produce useful results. Thanks to support from the Constantine Niarchos Expedition Fund at the American Museum of Natural History, and also from the American Museum's Peter J. Solomon Family Spider Research Fund, we were able to organize a major expedition to Ecuador, in November and December of 2009, that allowed 15 participants to spend three weeks seeking oonopids, and other arthropods, at a wide variety of sites on both the eastern and western slopes of the Andes.

That expedition was remarkably successful. We were not surprised to find that almost all of the many oonopid species we collected were undescribed; aside from the species of *Scaphiella* and *Escaphiella* recently detailed by Platnick and Dupérré (2009b, 2010), no members of the family have previously been described from either the mainland of Ecuador or the Galapagos Islands. We were surprised, however, to find that almost all the oonopids we collected also belong to undescribed genera. The northern Andes clearly house a previously unsuspected, highly endemic, and highly diverse oonopid fauna, particularly of genera related to *Dysderina* Simon (1891). Those new genera will be discussed in future papers; we concentrate here on documenting the surprisingly diverse assemblage of species related to *N. cotopaxi*. Of interest, though, is that some of the new genera resembling *Dysderina* also include species in which dorsal abdominal scuta are found in males but not in females. Although the pairing of the sexes in these diverse species may seem surprising, given the high weight placed on this character in previous classifications, there is little doubt about its accuracy, as a male and female of the species described below as *Niarchos barragani* (and shown on the front cover) were taken together, in copulation, by Elicio Tapia during our expedition.

The males treated below as *Niarchos* fall into four very distinct groups, each easily recognizable by the form of the palp. In some of these species, the male palps are sufficiently different from those of *N. cotopaxi* that when we first encountered the animals in the field, we didn't even associate them with *N. cotopaxi*. A case could easily be made for considering each of these species groups to constitute a separate genus. Subsequent examination of additional Neotropical material suggests, however, that there are other undescribed genera that are closely related to the species detailed below. Those taxa also occur in Ecuador and Colombia, as well as in Venezuela, Trinidad, Tobago, Guyana, and northern Brazil. Although each of these undescribed genera is currently known from only a few species, they each have distinctive types of male endite modifications, and male palpal conformations, that are unlike those found in any of the species assigned below to *Niarchos*.

Members of all four of the species groups here assigned to *Niarchos* do share a triangular, posteriorly directed projection on the anterior portion of the male endites (figs. 49, 247, 497, 581), as well as a male palpal conformation with a short tibia (much shorter than the patella) and a palpal cymbium that is long, wide, and so completely fused to the palpal bulb that it is difficult to determine where the cymbium stops and the bulb begins (figs. 75, 270, 516, 608). Females of three of these groups are also united by a genitalic feature, the presence of a globose, tentlike anterior receptaculum (figs. 27, 311, 475). Both sexes also share an unusual leg spination pattern; spines are absent on the anterior legs, but at least tibia IV bears a modified seta on at least the prolateral side of the ventral tip of the segment. This macroseta is not much larger than the normal leg setae (fig. 57), but it is significantly darker and thus appears spiniform under light microscopy. Similar macrosetae (referred to as spines below) sometimes occur retrolaterally at the distal tip and/or medially on the prolateral side of the ventral surface of tibia IV, and prolaterally on the

distal tip of the ventral surface of metatarsi III and/or IV as well.

There are also two described genera that we suspect belong to this complex: *Pescennina* Simon (1903), which was described from Venezuela but actually occurs from Mexico south to Peru, and *Marsupopaea* Cooke (1972), which has been recorded only from Colombia but also occurs in Ecuador. It is also possible that the two species from southern Brazil misplaced in *Opopaea* Simon (1891) by Ott (2003) represent yet another genus in this complex; if so, the unknown female of *''Opopaea'' viamao* Ott (2003) could lack the dorsal abdominal scutum that is found in males, meaning that these females may already be in collections, just misidentified as oonopines.

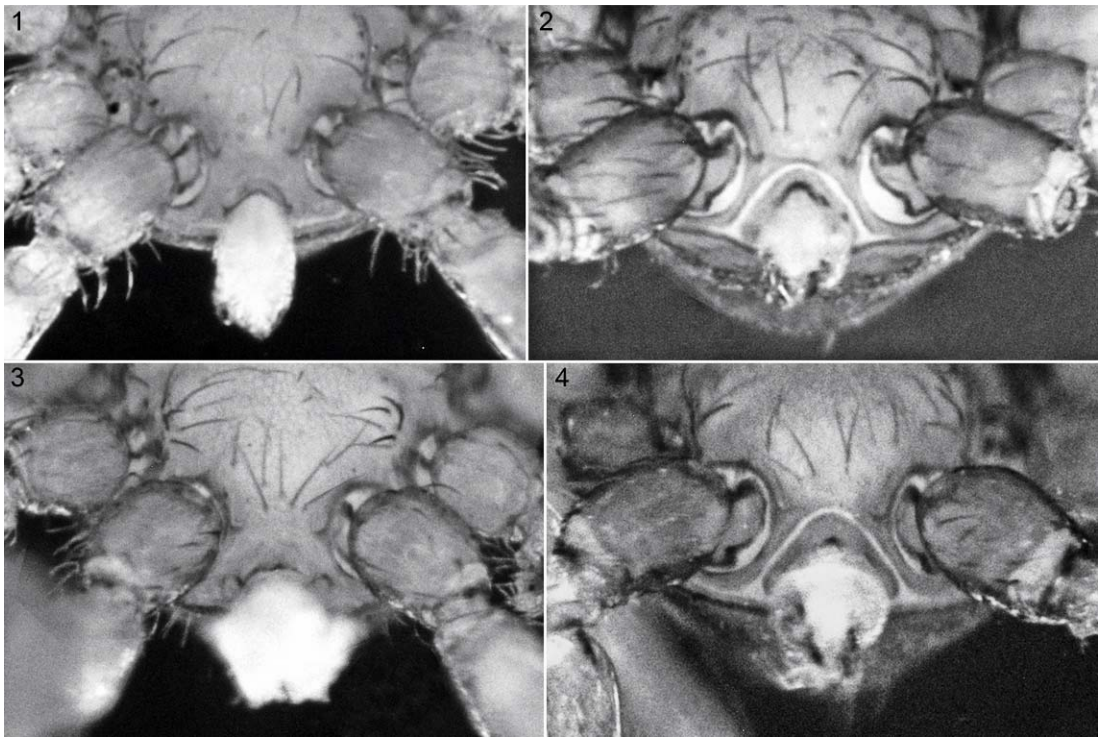
If our hypothesis that the *Niarchos* species treated below form a monophyletic group is correct, then there is evidence that dorsal abdominal scuta have been gained or lost multiple times within the Gamasomorphinae, as the males assigned below to *N. michaliki*, new species, and *N. ligiae*, new species, have the dorsal scutum represented only by a narrow, longitudinal, sclerotized strip covering just the cardiac area of the abdomen (figs. 407, 430). In both of those species, the narrow strip is fully fused, at its anterior end, with the portion of the epigastric scutum that extends dorsally around the pedicel. The postepigastric scutum, in males of those two species, is also atypical, being confined to the spiracular area (just as in females of all the species).

Because genitalic features (particularly the presence of a triangular ventral projection on the bent embolar base, figs. 415, 438) suggest that these two species are members of the *scutatus* group, rather than the sister group of all the other species in the genus (i.e., those with fully developed dorsal and postepigastric scuta in males), we conclude that the dorsal and postepigastric scuta have been reduced in the lineage containing *N. michaliki* and *N. ligiae*, rather than independently gained, or enlarged, in a lineage containing all the other species. One other character, however, could conceivably support the alternative hypothesis, with the reduced male scuta species as the sister group to all the others: the posterior eyes of *N. michaliki* and *N. ligiae* are not quite as reduced in size as are those of the remaining species.

Some of the localities on the eastern slope of the Ecuadorean Andes in which *Niarchos* have been collected also house species that resemble those of *Niarchos*, with the same pattern of sexual dimorphism in dorsal abdominal scutum morphology and a similar leg spination pattern. These and related species from elsewhere in Ecuador and Colombia, assigned below to the new genus *Scaphios*, differ in retaining normal-sized posterior eyes (figs. 712, 804) and in having a subdistally originating, sinuous embolus (figs. 717, 809). Of interest is that males of one species (*S. orellana*) have the dorsal abdominal scutum reduced to a narrow longitudinal strip covering just the cardiac area (fig. 867), and the postepigastric scutum confined to the spiracular area (fig. 873), just as in *N. michaliki* and *N. ligiae*. In males of *S. orellana*, however, the dorsal scutum is not fused to the epigastric scutum.

Species of both genera share another unusual instance of sexual dimorphism. In both genera, the ventral pedicel sclerite of males is fully fused with the sternum (figs. 1, 3), as seems generally to be the case in hard-bodied oonopids. In females of both genera, however, there is a clear, arched area of unsclerotized cuticle separating the posterior edge of the sternum from the anterior edge of the ventral pedicel sclerite (figs. 2, 4). We have noted similar modifications in two of the other genera that seem likely to include the closest relatives of *Niarchos*, but the conformation of the ventral pedicel sclerite, and the sexual dimorphism, in those undescribed genera are different. The details of this sexual dimorphism seem to be uniquely shared by *Niarchos* and *Scaphios*, which we therefore suggest are sister groups.

Our methods follow those of Platnick and Dupérré (2009a, b); only differences from the males (aside from the obvious lack of the male endite modifications) are mentioned in the descriptions of females. Leg spination descriptions mention only those surfaces bearing spines; all measurements are in mm. Full color and high-resolution versions of the images, and a distribution map for each



Figs. 1–4. Posterior views of sternum and pedicel. **1.** *Niarchos barragani*, new species, male. **2.** Same, female. **3.** *Scaphios yanayacu*, new species, male. **4.** Same, female.

species, will be available on the PBI project's website (http://research.amnh.org/oonopidae).

COLLECTIONS EXAMINED

AMNH American Museum of Natural History, New York
FMNH Field Museum of Natural History, Chicago
IBSP Instituto Butantan, São Paulo, Brazil
ICN Instituto de Ciencias Naturales, Universidad Nacional, Bogotá, Colombia
IAVH Instituto Alexander von Humboldt, Bogotá, Colombia
MACN Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina
MELM Museo de Entomología, Universidad Nacional Agraria, La Molina, Peru
MPEG Museu Paraense Emílio Goeldi, Belém, Brazil
QCAZ Museum of Invertebrates, Pontificia Universidad Católica, Quito, Ecuador
USNM National Museum of Natural History, Smithsonian Institution, Washington

Niarchos, new genus

TYPE SPECIES: *Niarchos cotopaxi*, new species.

ETYMOLOGY: The generic name honors Constantine Niarchos, in recognition of the vital support obtained from the Constantine Niarchos Expedition Fund; the gender is masculine.

DIAGNOSIS: Members of this genus resemble those of *Scaphiella* and *Escaphiella* in having a dorsal abdominal scutum in males that is absent in females, but they differ obviously in having much thicker emboli on the male palps and a much smaller postepigastric abdominal scutum in females. The closest relatives of the species treated here

(aside from those treated below as *Scaphios*) seem to be undescribed (which is hardly surprising in a family where 75% or more of the extant species have yet to be described), and occur in northern South America. Those undescribed taxa resemble *Niarchos* species also in their unusual leg spination patterns, with macrosetae absent on legs I and II, but occurring ventrally on tibiae and/or metatarsi III and/or IV (figs. 57, 58). The combined presence of a wide cymbium that lacks a distinct delimitation from the palpal bulb (figs. 75, 270, 516, 608), the reduced size of the posterior eyes (figs. 43, 242, 492, 575), and the triangular, posteriorly directed anterior projections on the male endites (figs. 49, 247, 497, 581) separates *Niarchos* species from each of their undescribed relatives that we have studied to date.

DESCRIPTION: Total length of males 1.1–2.1, of females 1.3–2.4; carapace orange, sternum, chelicerae, endites, labium, legs, and palpi pale orange; dorsal and ventral scuta of males pale orange, epigastric and postepigastric scuta of females yellow, soft portions of abdomen white, often iridescent. **Cephalothorax:** Carapace without any pattern, elongate oval in dorsal view, pars cephalica slightly elevated in lateral view, anteriorly narrowed to between 0.5 and 0.75 times its maximum width, with rounded posterolateral corners; posterolateral edge without pits, posterior margin not bulging below posterior rim, anterolateral corners with slightly sclerotized triangular projections, posterolateral surface without spikes, surface of elevated portion of pars cephalica smooth, sides finely reticulate; pars thoracica without depressions, fovea absent, without radiating rows of pits; lateral margin straight, smooth, without denticles; plumose setae near posterior margin of pars thoracica absent; nonmarginal pars cephalica setae dark, needlelike, scattered; nonmarginal pars thoracica setae absent; marginal setae dark, needlelike. Clypeus margin slightly reborder ed, curved downward in front view, vertical in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent; setae dark, needlelike. Chilum usually absent, but present as wide triangle in *N. cotopaxi*, as tiny sclerite in *N. barragani*. Eyes six, posterior eyes reduced in size, much smaller than ALE; all eyes oval; posterior eye row procurved from front, slightly procurved, straight, or slightly recurved from above; ALE separated by less than their radius, ALE-PLE separated by less than ALE radius, PME usually separated by less than their radius (exceptions noted in species descriptions). Sternum longer than wide, coloration uniform, not fused to carapace, median concavity absent, without hair tufts, with radial furrows between coxae I–II, II–III, III–IV, furrows smooth, radial furrow opposite coxae III absent; surface finely reticulate or smooth, without pits (other than setal bases), microsculpture covering entire surface, sickle-shaped structures absent; anterior margin unmodified, posterior margin extending posteriorly of coxae IV only as prongs reaching to sides of pedicel, anterior corner unmodified, lateral margin without infracoxal grooves, distance between coxae approximately equal, precoxal triangles present, lateral margins unmodified, without posterior hump; setae sparse, dark, needlelike, densest laterally, originating from surface; sternum of females followed posteriorly by small ventral pedicel sclerite. Chelicerae straight; without teeth on promargin or retromargin, anterior face with basal swelling; fang without toothlike projections, directed medially, shape normal, without prominent basal process, tip unmodified; setae dark, needlelike, densest medially; paturon inner margin with scattered setae, distal region abruptly narrowed, posterior surface unmodified, promargin unmodified, inner margin unmodified, laminate groove absent. Labium triangular, not fused to sternum, anterior margin indented at middle, same as sternum in sclerotization, with six or more setae on anterior margin, subdistal portion with unmodified setae. Endites distally not excavated, serrula present in single row, anteromedian tip with posteriorly directed triangular projection in males, unmodified in females, posteromedian part unmodified, same as sternum in sclerotization. Female palp without claw; with long bristles but without spines; tarsus unmodified, patella without prolateral row of ridges. **Abdomen:** Without color pattern, cylindrical, without long posterior extension, rounded posterior-

ly, interscutal membrane with setae, without rows of small sclerotized platelets. Book lung covers large, ovoid, without setae, anterolateral edge unmodified. Posterior spiracles connected by groove. Pedicel tube short, briefly ribbed in males but unmodified in females, scuto-pedicel region unmodified, scutum extending far dorsal of pedicel in males (but not females), plumose hairs absent, matted setae on anterior ventral abdomen in pedicel area absent, cuticular outgrowths near pedicel absent. Dorsal scutum present in males (but not females), strongly sclerotized, without color pattern, covering most of dorsum but not fused to epigastric scutum (except in *N. michaliki* and *N. ligiae*, where reduced to narrow longitudinal strip confined to cardiac area and fused to epigastric scutum), anteriorly narrowed, surface finely reticulate, anterior half without projecting denticles. Epigastric scutum of males strongly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent, fused to long, strongly sclerotized postepigastric scutum occupying most of venter (except in *N. michaliki* and *N. ligiae*, where confined to epigastric area); epigastric scutum of females weakly sclerotized, not surrounding pedicel, without lateral joints, not fused to postepigastric scutum, that scutum weakly sclerotized, yellow, confined to area between epigastric furrow and groove connecting posterior spiracles; postepigastric scutum anterior margin unmodified in both sexes, without posteriorly directed lateral apodemes in males, usually with apodemes in females. Supraanal scutum absent. Dorsum setae dark, needlelike, epigastric area setae uniform, dark, needlelike, postepigastric area setae dark, needlelike, dense patch of setae anterior to spinnerets absent. Spinneret scutum usually reduced to pair of small lateral plates, situated near bases of anterior lateral spinnerets, bearing setae, but apparently absent in *N. michaliki*, plates fused into single median triangle in *N. palenque* and *N. facundoi*, fused into single median strip in *N. loja*, consisting of four lateral plates (two anterior of others) in male *N. foreroi*, of two lateral plates and fused anterior strip in female *N. foreroi*. Dorsum setae dark, needlelike; epigastric area setae uniform, dark, needlelike; postepigastric setae dark, needlelike; dense patch of setae anterior to spinnerets absent. Interscutal membrane with setae. Colulus absent. Spinnerets scanned only in *N. barragani*, *N. scutatus*, and *N. palenque*; anterior laterals with single major ampullate gland spigot and three piriform gland spigots; posterior medians with one, two, or three spigots; posterior laterals with two or three spigots in males, three or five in females (figs. 69–72, 107, 263–266, 295–298, 589–592, 625–628). **Legs:** Without color pattern; femur IV not thickened, same size as femora I–III, patella plus tibia I shorter than carapace, tibia I unmodified, tibia IV specialized hairs on ventral apex absent, tibia IV ventral scopula absent, metatarsi I, II mesoapical comb absent, metatarsi III, IV weak ventral scopula absent. Leg spines present as slightly enlarged, greatly darkened macrosetae on ventral surface of tibiae (and sometimes metatarsi) IV (and sometimes III). Superior claws with few large teeth situated distally on lateral surface, many small teeth situated proximally on median surface, inner face striate; inferior claws absent. Trichobothrial base with opening longitudinally narrowed, aperture internal texture gratelike, hood covered by numerous low, closely spaced ridges (figs. 105, 292, 520, 588). Tarsal organ of legs I, II with three sensillae, of legs III, IV, and palp with two sensillae (figs. 59–63, 95–99, 250–254, 287–291, 509–513, 542–546, 602–606, 633–637). **Genitalia:** Male epigastric region with sperm pore situated at level of anterior spiracles, usually small, circular, unmodified; epigastric furrow without Ω-shaped insertions, without setae. Male palp of normal size, not strongly sclerotized, right and left palps symmetrical; trochanter of normal size, unmodified; femur of normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, attached to patella basally; patella about as long as femur, slightly wider than femur, without prolateral row of ridges, setae unmodified; tibia with two or three trichobothria (figs. 89, 268, 301, 514, 549, 609, 646); cymbium ovoid in dorsal view, completely fused with bulb, no seam visible, not extending beyond distal tip of bulb, plumose setae absent, without stout setae, without distal patch of setae; bulb elongated, 1–1.5 times as long as cymbium, stout;

embolus dark, prolateral excavation absent. Female genitalia often (but not always) with globose, tentlike anterior receptaculum (sometimes apparently enlarged, membranous), often (but not always) with obvious apodemes.

DISTRIBUTION: Known only from Ecuador and adjacent parts of southern Colombia and northern Peru; although most of the species are from sites on either the western or eastern slopes of the Andes, at elevations as high as 3685 m, a few occur at elevations as low as 216 m, in the Amazonian portions of Ecuador.

KEY TO SPECIES OF *NIARCHOS*

1. Males (those of *baehrae*, *grismadoi*, *matiasi*, and *rheimsae* unknown) 2
– Females (those of *keili* and *florezi* unknown). 19
2. Dorsal scutum covering most of abdomen 4
– Dorsal scutum covering cardiac area only (figs. 407, 430) 3
3. Dorsal scutum relatively long (fig. 407) . . . . . *michaliki*
– Dorsal scutum relatively short (fig. 430) . . . . . *ligiae*
4. Palpal bulb with retroventral projection (as in fig. 17) 5
– Palpal bulb without retroventral projection 11
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6. Embolar region relatively narrow (figs. 221, 224) . . . . . *florezi*
– Embolar region relatively wide (figs. 198, 201) . . . . . *wygodzinskyi*
7. Anterior projection on endites narrow (figs. 151, 174) 8
– Anterior projection on endites wide (figs. 12, 35, 128) 9
8. Embolar region relatively long (figs. 176–179) . . . . . *elicioi*
– Embolar region relatively short (figs. 153–156) . . . . . *tapiai*
9. Endites with rounded protrusion just posterior of anterior projection (fig. 128), chelicerae with distinct anterior projection (fig. 126) . . . *keili*
– Endites without rounded protrusion, chelicerae otherwise 10
10. Embolus relatively long, thin (figs. 36–40) . . . . . *barragani*
– Embolus relatively short, thick (figs. 13–17). . . . . *cotopaxi*
11. Embolar base bent near middle at right angle (as in figs. 234, 395) 15
– Embolar base not bent near middle at right angle 12
12. Embolus relatively short, with translucent tip (figs. 569, 665) 13
– Embolus relatively long, with dark tip (figs. 462, 485) 14
13. Translucent tip of embolus relatively long (figs. 664, 665) . . . . . *facundoi*
– Translucent tip of embolus relatively short (figs. 568, 569) . . . . . *palenque*
14. Embolus accompanied by long, basal projection (figs. 461, 462) . . . . . *loja*
– Embolus without basal projection (figs. 484, 485) . . . . . *foreroi*
15. Embolus bearing long, narrow distal flange (figs. 395, 396) . . . . . *santosi*
– Embolus without narrow distal flange. 16
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– Embolar base relatively thin (as in figs. 319, 344, 369) 17
17. Anterior projection on endites relatively small, directed medially (fig. 368), terminal palpal elements triangular (figs. 374, 375) . . . . . *vegai*
– Anterior projection on endites larger (figs. 318, 343) 18
18. Projection on embolar base relatively large (figs. 319–325). . . . . *ramirezi*
– Projection on embolar base relatively small (figs. 344–350). . . . . *bonaldoi*
19. Sternum surface finely reticulate (as in fig. 46) 20
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20. Genitalia with anteriorly expanded anterior process (figs. 474, 677). 21
– Genitalia without such a process 22
21. Genitalia with translucent atrium (figs. 677, 678) . . . . . *facundoi*
– Genitalia without translucent atrium (figs. 474, 475) . . . . . *loja*
22. Genitalia with thumblike anterior process (figs. 27, 119, 384). 23
– Genitalia without thumblike anterior process 25
23. Thumblike process extending anterior of receptaculum (fig. 385). . . . . *vegai*
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24. Posterior extensions of thumblike process diverging at wide angle (figs. 119, 120) . . . . . *barragani*

– Posterior extensions of thumblike process diverging at narrow angle (figs. 26, 27) . . . . . *cotopaxi*
25. Genitalia with distinct apodemes (figs. 143, 166, 189) 26
– Genitalia without distinct apodemes (figs. 211, 212) . . . . . *wygodzinskyi*
26. Anterior receptaculum containing distinct lateral ducts (figs. 143, 166) 27
– Anterior receptaculum without lateral ducts (figs. 188, 189) . . . . . *elicioi*
27. Epigynal atrium triangular (figs. 142, 143) . . . . . *baehrae*
– Epigynal atrium ovoid (figs. 165, 166) *tapiai*
28. Genitalia with thumblike anterior process extending anteriorly of receptaculum (figs. 310, 334, 359, 405) 29
– Genitalia without thumblike anterior process 32
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30. Sclerite connecting apodemes narrow at midline (fig. 335) . . . . . *ramirezi*
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– Apodemes absent (fig. 408) . . . . . *santosi*
32. Anterior receptaculum with M–shaped anterior protrusion (figs. 428, 451) 33
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36. Apodemes longer than epigastric scutum (figs. 707, 708) . . . . . *rheimsae*
– Apodemes much shorter than epigastric scutum 37
37. Anterior genitalic process greatly widened anteriorly (figs. 654, 655) . . . . . *palenque*
– Anterior genitalic process not greatly widened anteriorly (figs. 559, 560) . . . . . *foreroi*

The *cotopaxi* Group

Males of this group can easily be recognized by the presence of a retroventral projection on the palpal bulb (figs. 15–17); females resemble those of the *scutatus* group in having the postepigastric scutum so short that it does not fully reach the posterior spiracles and the groove connecting them (figs. 25–27). The known males clearly fall into three subgroups. The two species from Colombia uniquely share a distal bend on the retroventral palpal bulb projection (figs. 202, 225). The two most southern species (from Azuay province, Ecuador) uniquely share a greatly narrowed and ventrally directed anterior projection on the male endites (figs. 151, 174). The remaining Ecuadorean males uniquely share anterior endite projections shaped like the bill of a duck (figs. 12, 49). The group appears to be restricted to the western slopes of the Andes of Ecuador and southern Colombia.

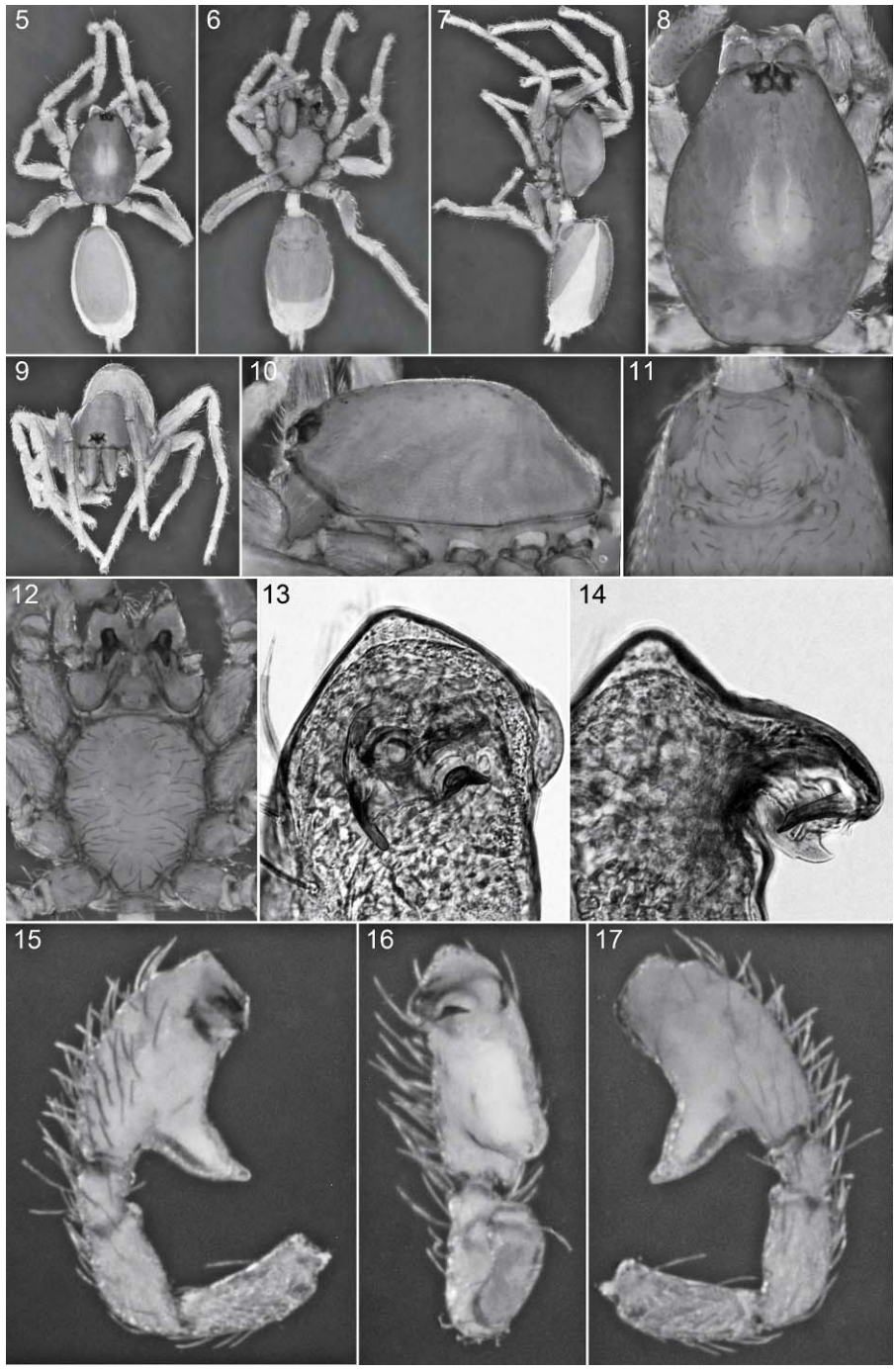
Niarchos cotopaxi, new species
Figures 5–27

TYPE: Male holotype taken by hand collecting at an elevation of 3650 m at Laguna Limpiopungo, Parque Nacional Cotopaxi, 0°36′49″S, 78°28′22″W, Cotopaxi, Ecuador (Dec. 9, 2009; B. Baehr, Niarchos Exped.), deposited in QCAZ (PBI_OON 433).

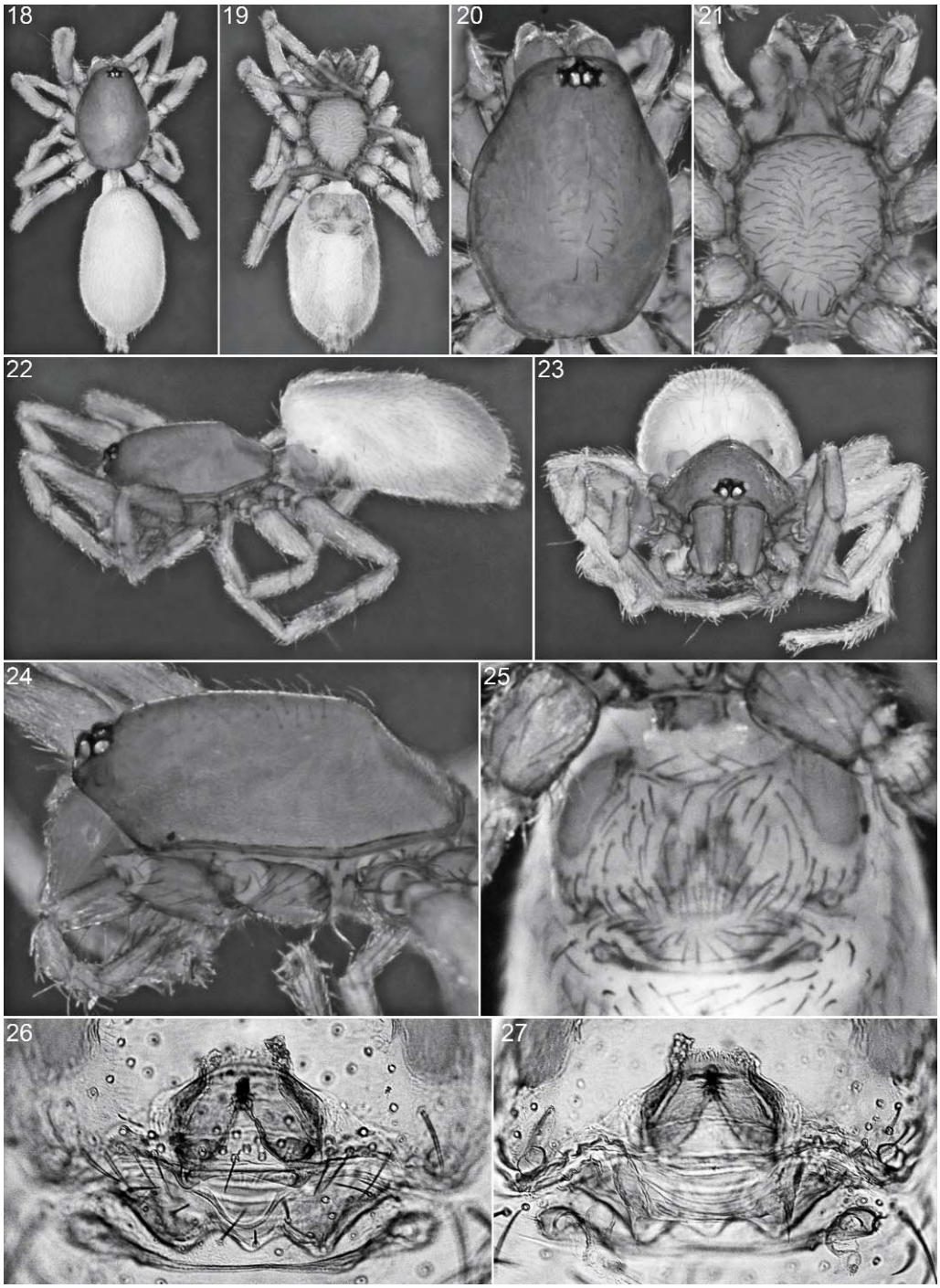
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: This seems to be the sister species of *N. barragani*, sharing with it a W-shaped posterior margin of the postepigastric scutum (figs. 25–27). Males differ from those of *N. barragani* in having a shorter, thicker embolus (figs. 13–17); females differ from those *N. barragani* by having a more strongly arched anterior margin on the anterior receptaculum and by having the posterior extensions of the thumblike anterior process diverging at a wide angle (figs. 26, 27).

MALE (PBI_OON 10202, figs. 5–17): Total length 2.05. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface finely reticulate. Endites with anterior process posteriorly directed, shaped like duck's beak.



Figs. 5–17. *Niarchos cotopaxi*, new species, male. **5.** Habitus, dorsal view. **6.** Same, ventral view. **7.** Same, lateral view. **8.** Carapace, dorsal view. **9.** Habitus, anterior view. **10.** Carapace, lateral view. **11.** Epigastric region, ventral view. **12.** Sternum and mouthparts, ventral view. **13.** Embolus, ventral view. **14.** Same, prolateral view. **15.** Palp, prolateral view. **16.** Same, ventral view. **17.** Same, retrolateral view.



Figs. 18–27. *Niarchos cotopaxi*, new species, female. **18.** Habitus, dorsal view. **19.** Same, ventral view. **20.** Carapace, dorsal view. **21.** Sternum and mouthparts, ventral view. **22.** Habitus, lateral view. **23.** Same, anterior view. **24.** Carapace, lateral view. **25.** Epigastric region, ventral view. **26.** Genitalia, ventral view. **27.** Same, dorsal view.

Leg spination: tibiae III, IV v0-0-1p. Embolus short, directed retrolaterally; bulb with strong basal projection on retroventral side (figs. 13–17).

FEMALE (PBI_OON 10202, figs. 18–27): Total length 2.34. Leg spination: tibiae: III v0-0-1p; IV v0-1p-1p. Anterior genitalic elements visible through epigastric scutum, forming inverted Y flanked laterally by anterior receptaculum (figs. 26, 27).

OTHER MATERIAL EXAMINED: **Ecuador:** *Cotopaxi:* Laguna Limpiopungo, Parque Nacional Cotopaxi, 0°36′49″S, 78°28′22″W, Dec. 3–8, 2009, pitfalls, elev. 3865 m (N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 393), 2♂ (one without abdomen), 0.61407°S, 78.47341°W, Dec. 9, 2009, elev. 3830 m (M. Ramírez, C. Grismado, M. Izquierdo, F. Labarque, Niarchos Exped., MACN PBI_OON 30551), 1♀; along road to Laguna Limpiopungo, Parque Nacional Cotopaxi, 0°36′49″S, 78°28′22″W, Dec. 3–5, 2009, hand collecting, elev. 3650 m (N. Dupérré, E. Tapia, A. Bonaldo, M. Izquierdo, Niarchos Exped., AMNH, MACN, MPEG, QCAZ PBI_OON 394, 395), 5♀, same, sifting moss (N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 396), 1♀; 45 km NE Latacunga, July 19–25, 1985, carrion trap, shrub/grass paramo, elev. 3700 m (S., J. Peck, AMNH PBI_OON 29616), 1♂; on Volcán Cotopaxi, NNE Latacunga, June 23, 1975, Berlese, paramo moss and shrub litter, elev. 11,000 ft (S. Peck, FMNH 33700, PBI_OON 10202), 2♂, 1♀, same (FMNH 33712, PBI_OON 10214), 1♂.

DISTRIBUTION: Known only from the vicinity of Volcán Cotopaxi, Ecuador.

Niarchos barragani, new species
Figures 1, 2, 28–120

TYPE: Male holotype from Berlese sample of cloud forest litter with palm taken at an elevation of 1405 m at Tandapi, 2 km from the main road to Quito, 0°23′17″S, 78°49′04″W, Pichincha, Ecuador (Dec. 7, 2009; N. Dupérré, E. Tapia, Niarchos Exped.), deposited in QCAZ (PBI_OON 399).

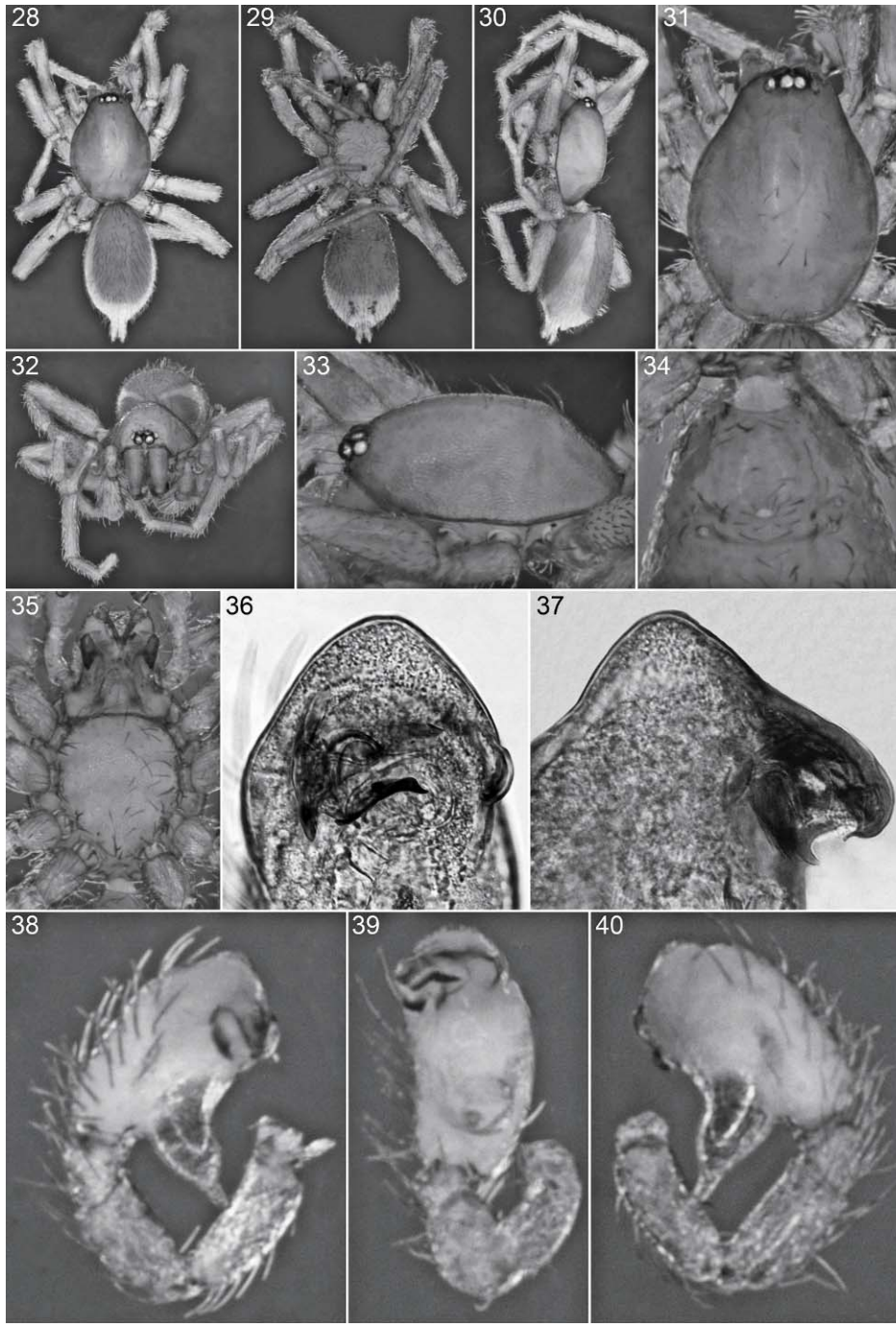
ETYMOLOGY: The specific name is a patronym in honor of Álvaro Barragán, of the Pontificia Universidad Católica del Ecuador, in recognition of his vital collaboration in the planning and execution of the Niarchos Expedition.

DIAGNOSIS: Males resemble those of *N. cotopaxi* but have a longer, thinner embolus (figs. 36–40); females also resemble those of *N. cotopaxi* but have a shorter and anteriorly wider anterior process near the tip of the anterior receptaculum and have the posterior extensions of the anterior thumblike process diverging at a narrow angle (figs. 119, 120).

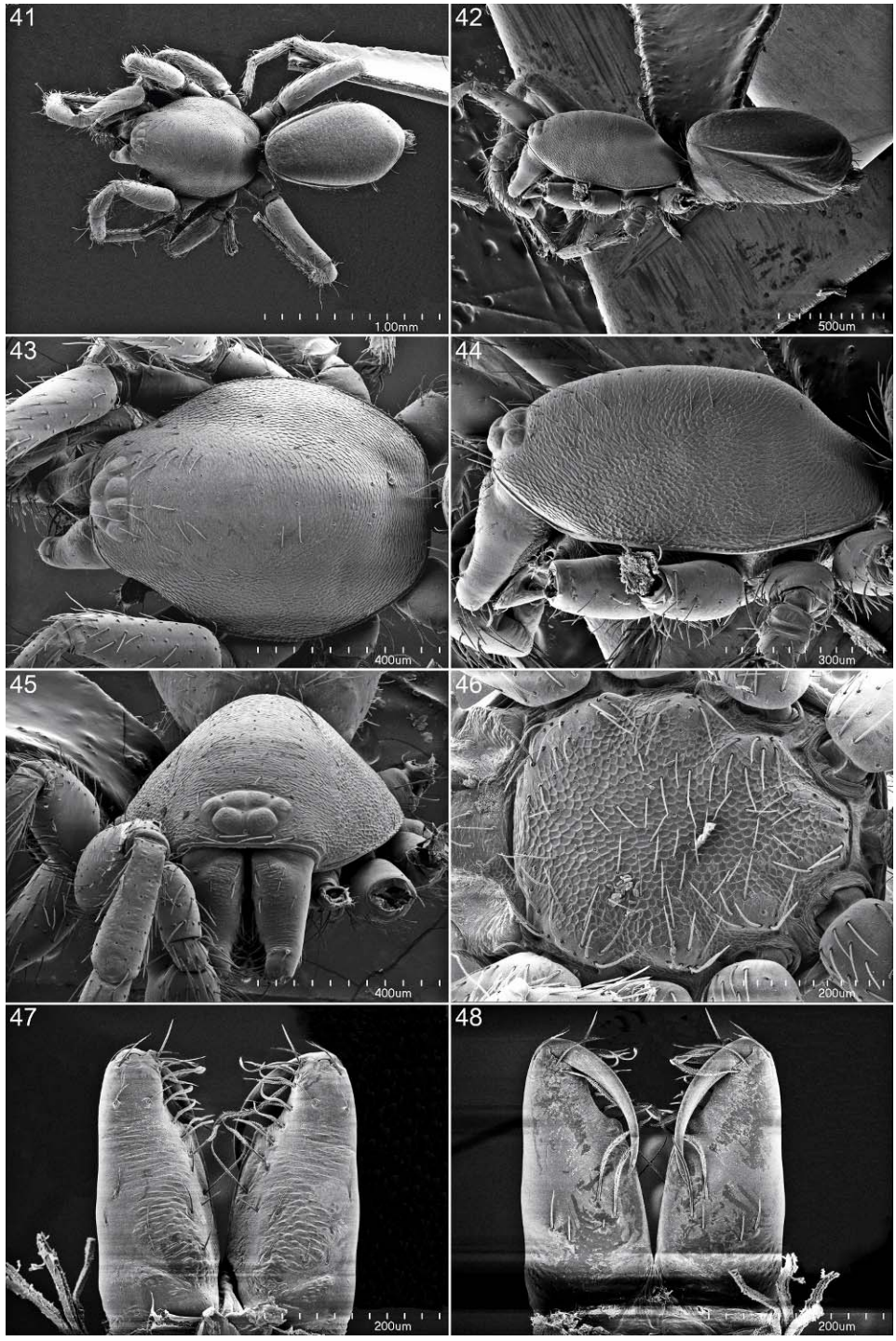
MALE (PBI_OON 400, figs. 1, 28–75): Total length 1.67. Posterior eye row recurved from above; PLE-PME separated by less than PME radius. Sternum surface finely reticulate. Endites with posteriorly directed process shaped like duck's beak. Leg spination: tibiae: III v0-0-1p; IV v0-1p-1p; metatarsi IV v0-0-1p. Embolar region widened, about as wide as bulb; bulb with strong basal projection on retroventral side (figs. 36–40).

FEMALE (PBI_OON 400, figs. 2, 76–120): Total length 1.83. Leg spination: tibiae: III v0-0-1p; IV v0-1p-1p; metatarsi IV v0-0-1p. Posterior margin of epigastric scutum with pair of paramedian extensions overhanging atrium (figs. 119, 120).

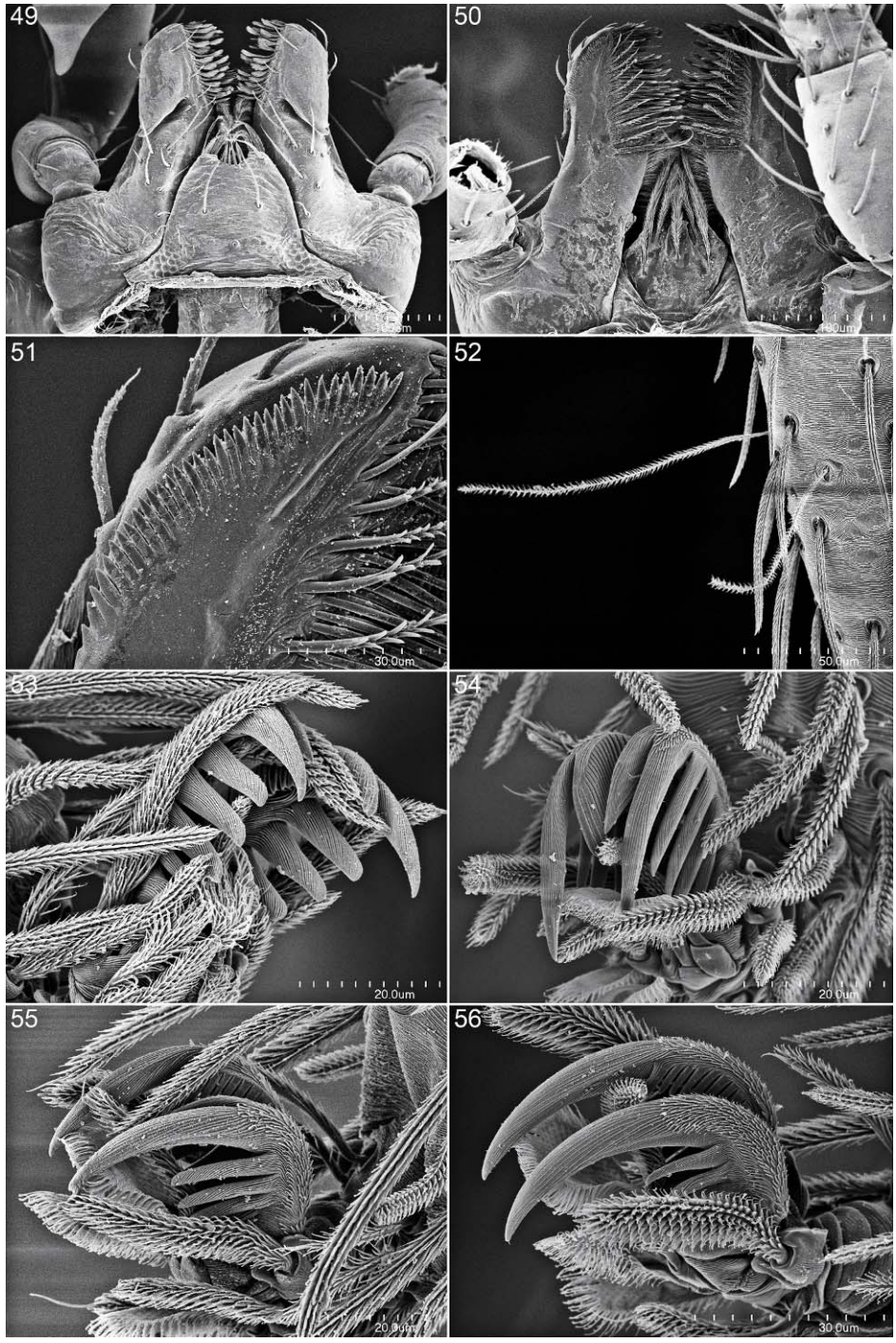
OTHER MATERIAL EXAMINED: **Ecuador:** *Cotopaxi:* Otonga, 0°25′11″S, 78°59′41″W, Dec. 8, 2009, hand collecting, forest litter, elev. 1705 m (N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 397), 2♂, same (AMNH PBI_OON 431), 1♀, same, canopy fogging (AMNH, MACN PBI_OON 30552), 2♂. *Pichincha:* Tandapi, 2 km from main road to Quito, 0°23′17″S, 78°49′04″W, Dec. 7, 2009, hand collecting, elev. 1405 m (N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 400), 3♂, 1♀; 15 km E Tandapi, June 7, 1976, Berlese, moss, forest litter, elev. 2300 m (S. Peck, FMNH PBI_OON 10562), 1♀; 16 km E Tandapi, June 20, 1975, Berlese, dry litter, bamboo-moss forest, elev. 6600 ft (S. Peck, FMNH PBI_OON 10536), 1♂, same (S. Peck, FMNH PBI_OON 37833), 1♀; 21 km N Tandapi on main road to Quito, 0°27′20.3″S, 78°45′15.5″W, Dec. 7, 2009, Berlese, sifted cloud forest litter, elev. 2150 m (N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 398), 1♀. *Santo Domingo de Los Tsáchilas:* Otongachi, 0°19′15″S, 78°57′06″W, Dec. 6, 2009, hand collecting, forest litter, elev. 855 m (N.



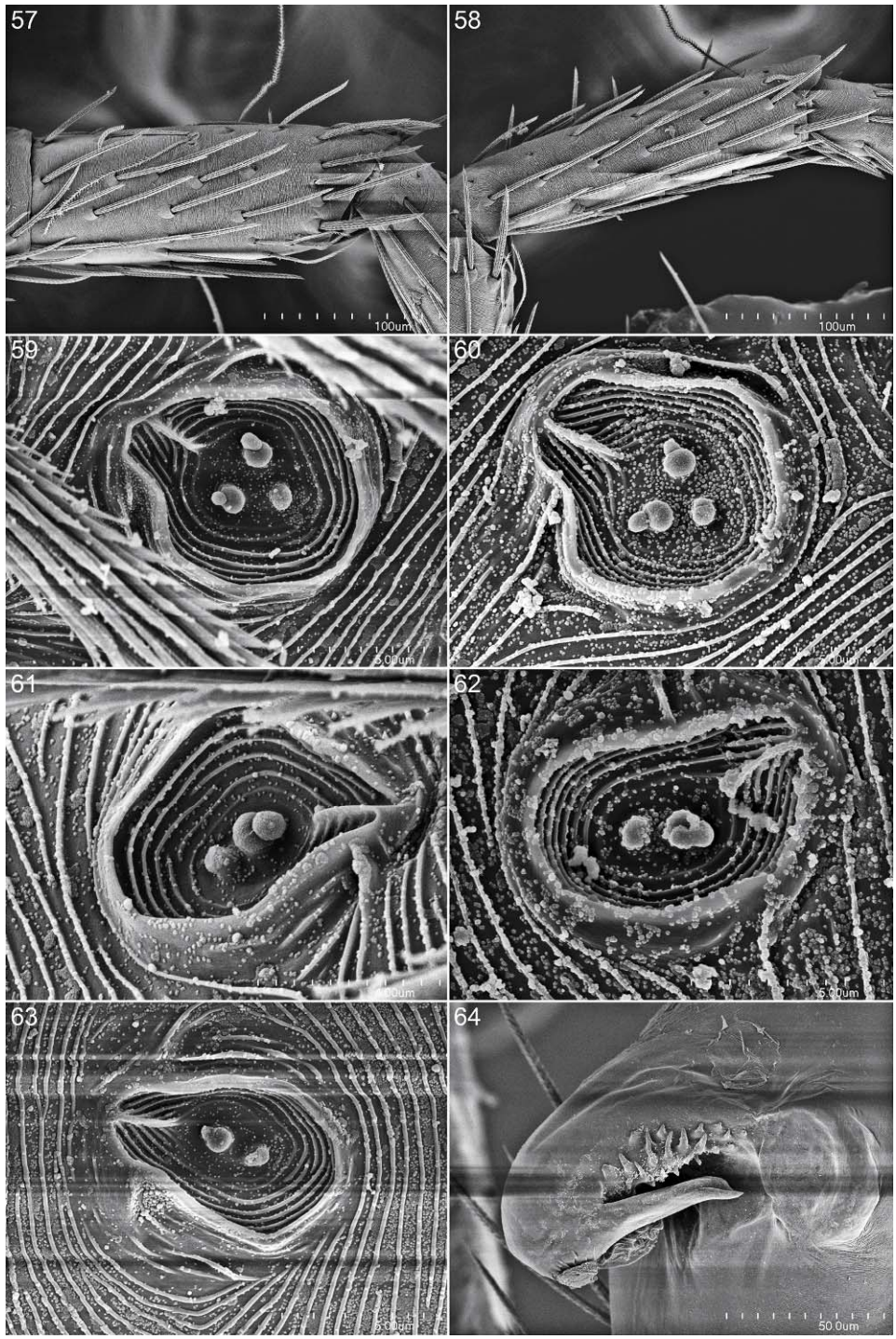
Figs. 28–40. *Niarchos barragani*, new species, male. **28.** Habitus, dorsal view. **29.** Same, ventral view. **30.** Same, lateral view. **31.** Carapace, dorsal view. **32.** Habitus, anterior view. **33.** Carapace, lateral view. **34.** Epigastric region, ventral view. **35.** Sternum and mouthparts, ventral view. **36.** Embolus, ventral view. **37.** Same, prolateral view. **38.** Palp, prolateral view. **39.** Same, ventral view. **40.** Same, retrolateral view.



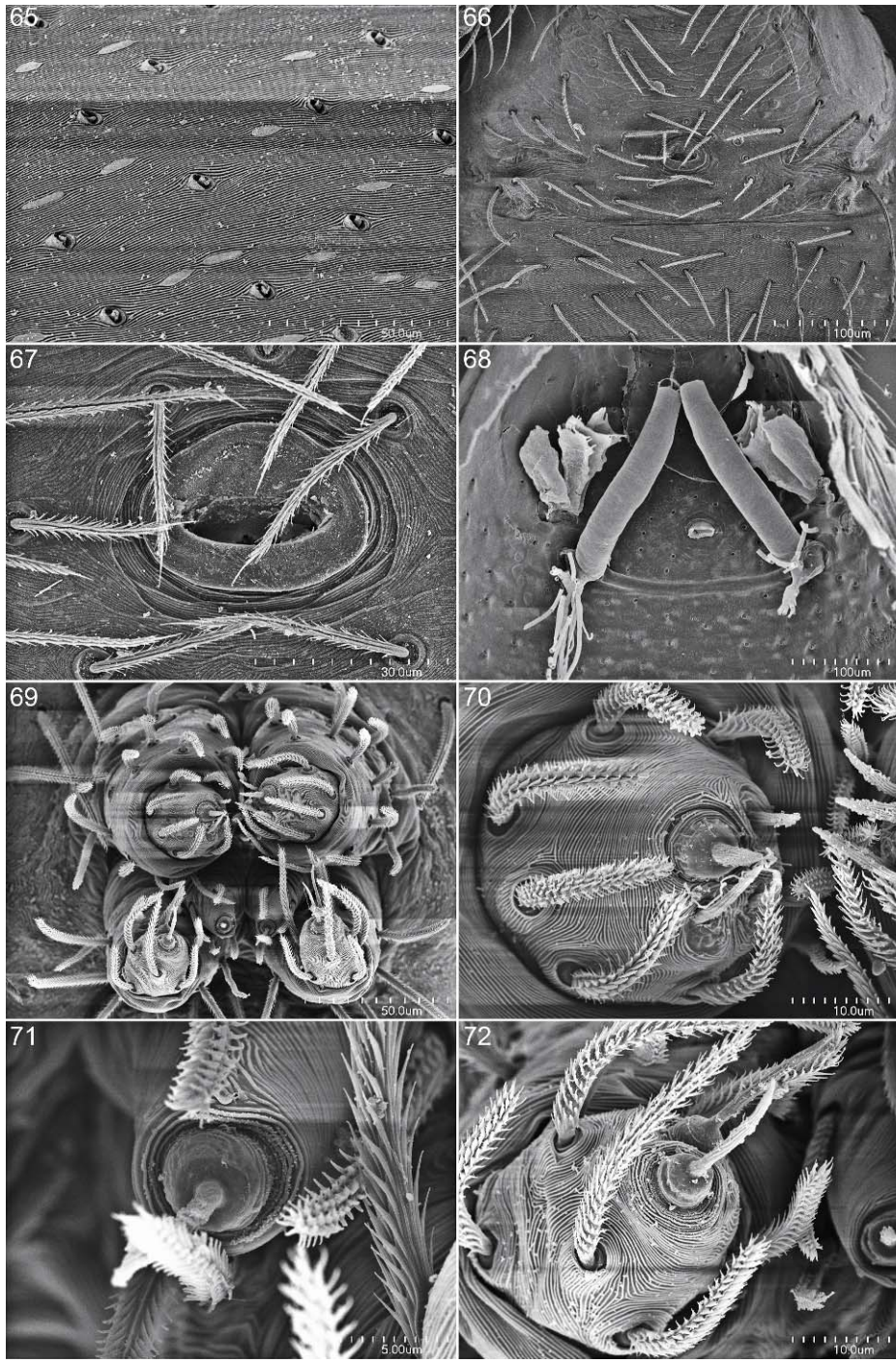
Figs. 41–48. *Niarchos barragani*, new species, male. **41.** Habitus, dorsal view. **42.** Same, lateral view. **43.** Carapace, dorsal view. **44.** Same, lateral view. **45.** Same, anterior view. **46.** Sternum, ventral view. **47.** Chelicerae, anterior view. **48.** Same, posterior view.



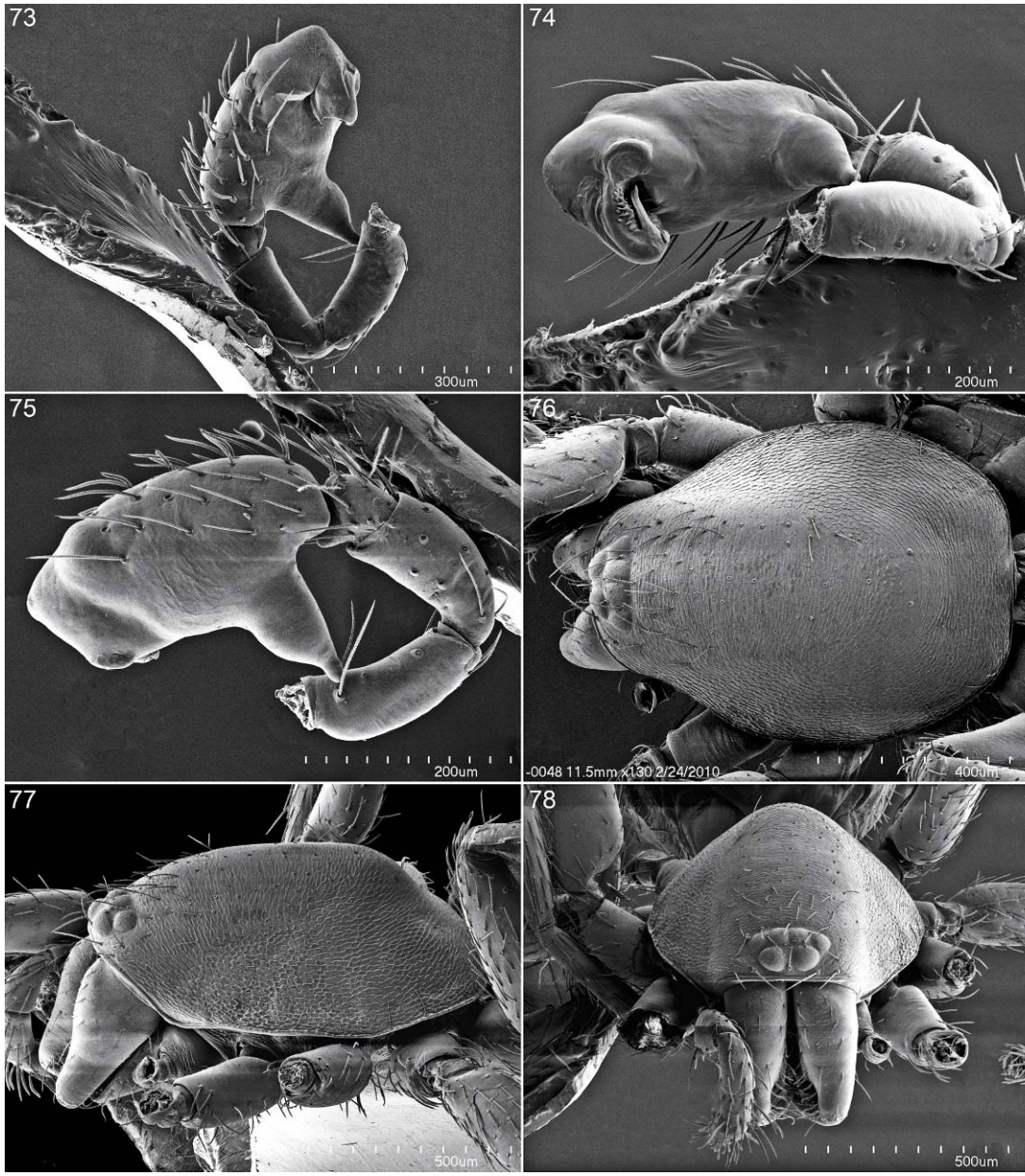
Figs. 49–56. *Niarchos barragani*, new species, male. **49.** Labium and endites, ventral view. **50.** Labrum and endites, dorsal view. **51.** Serrula, dorsal view. **52.** Trichobothrium, tibia II, lateral view. **53.** Claws, leg I, oblique lateral view. **54.** Same, leg II, distal view. **55.** Same, leg III, lateral view. **56.** Same, leg IV, lateral view.



Figs. 57–64. *Niarchos barragani*, new species, male. **57.** Tibia III, prolateral view. **58.** Metatarsus III, same. **59.** Tarsal organ, leg I, dorsal view. **60.** Same, leg II. **61.** Same, leg III. **62.** Same, leg IV. **63.** Same, palp. **64.** Embolus, ventral view.

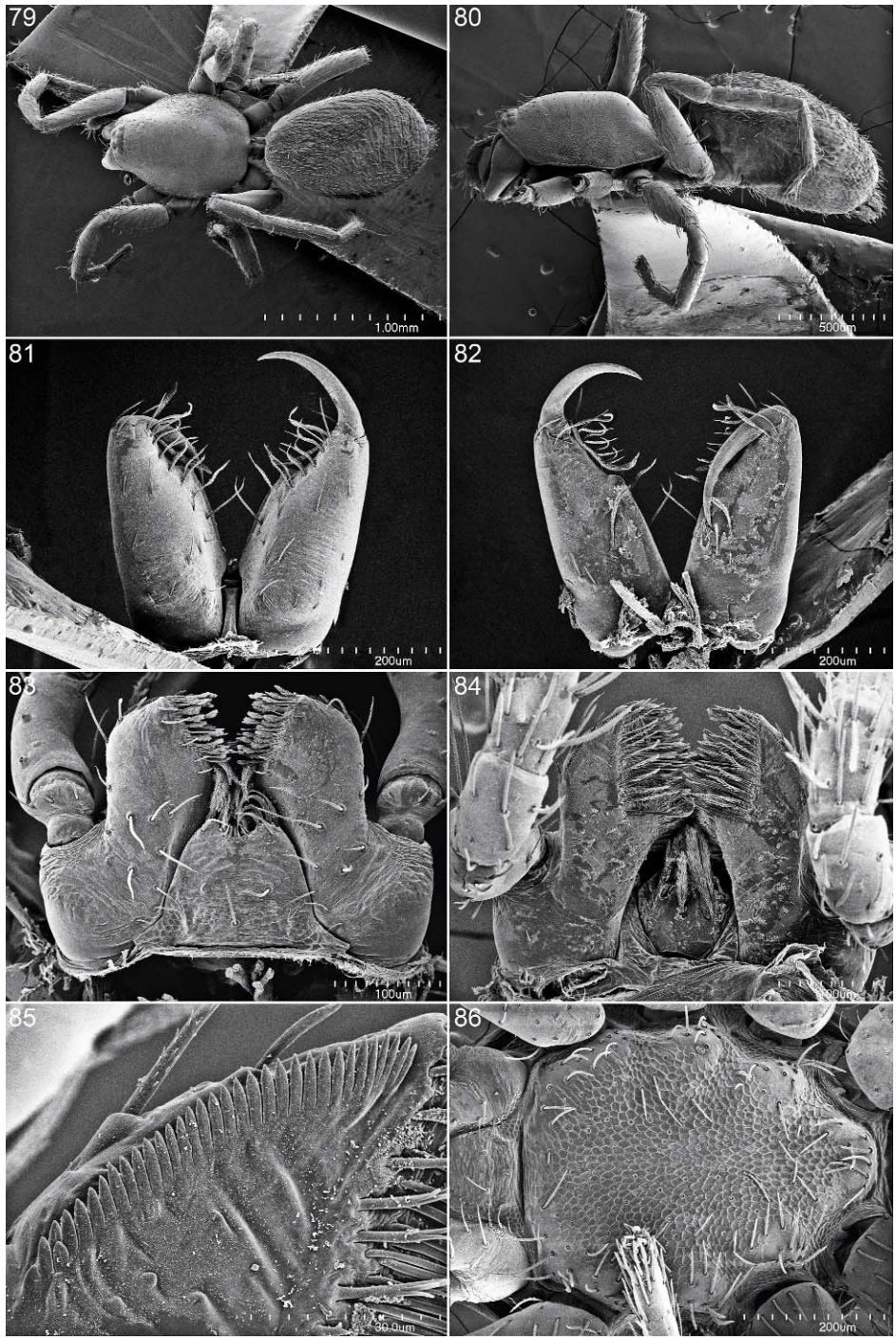


Figs. 65–72. *Niarchos barragani*, new species, male. **65.** Cuticle of dorsal abdominal scutum, dorsal view. **66.** Epigastric region, ventral view. **67.** Sperm pore, ventral view. **68.** Respiratory system, dorsal view. **69.** Spinnerets, distal view. **70.** Anterior lateral spinneret, same. **71.** Posterior median spinneret, same. **72.** Posterior lateral spinneret, same.

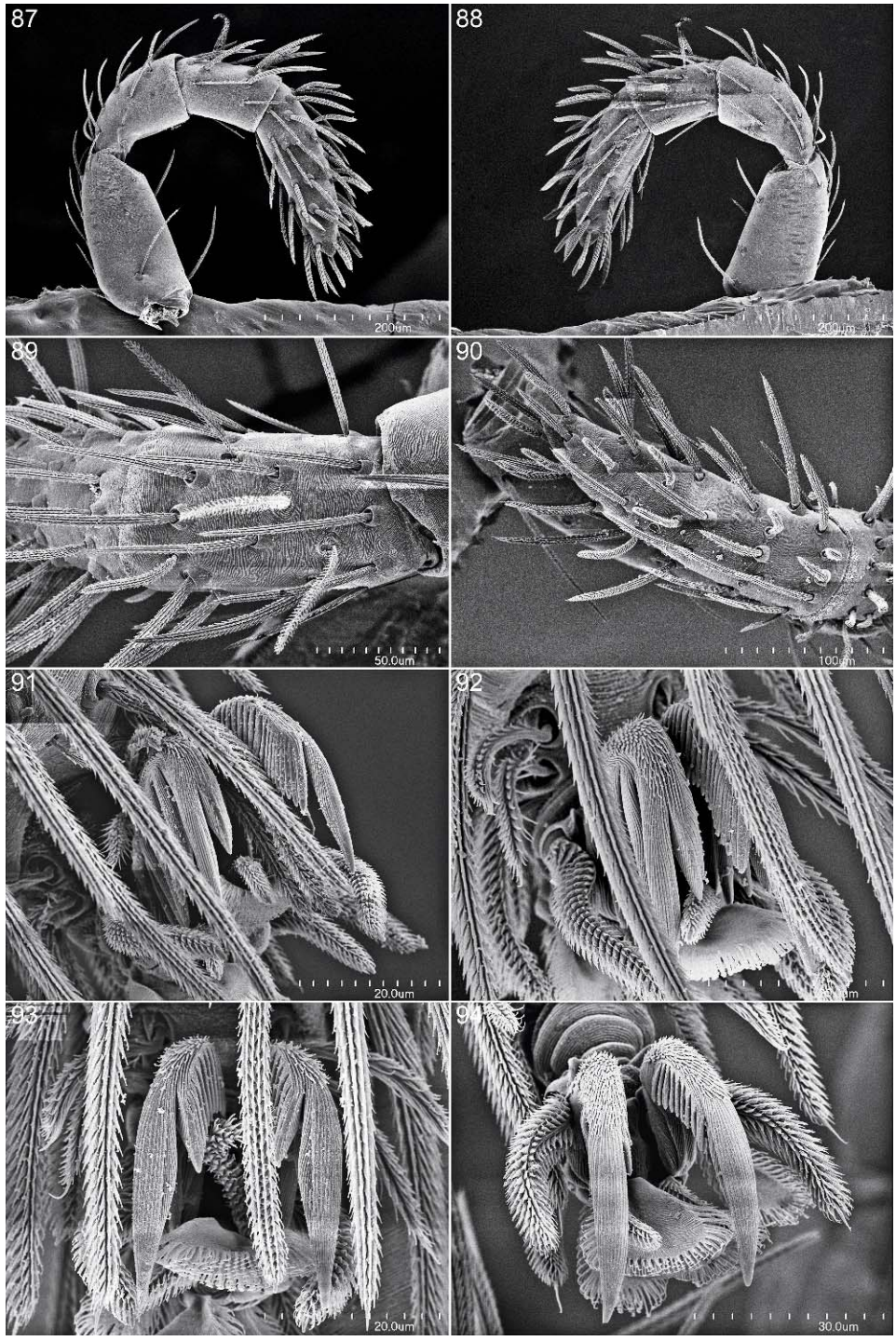


Figs. 73–78. *Niarchos barragani*, new species. **73.** Male palp, prolateral view. **74.** Same, ventral view. **75.** Same, retrolateral view. **76.** Female carapace, dorsal view. **77.** Same, lateral view. **78.** Same, anterior view.

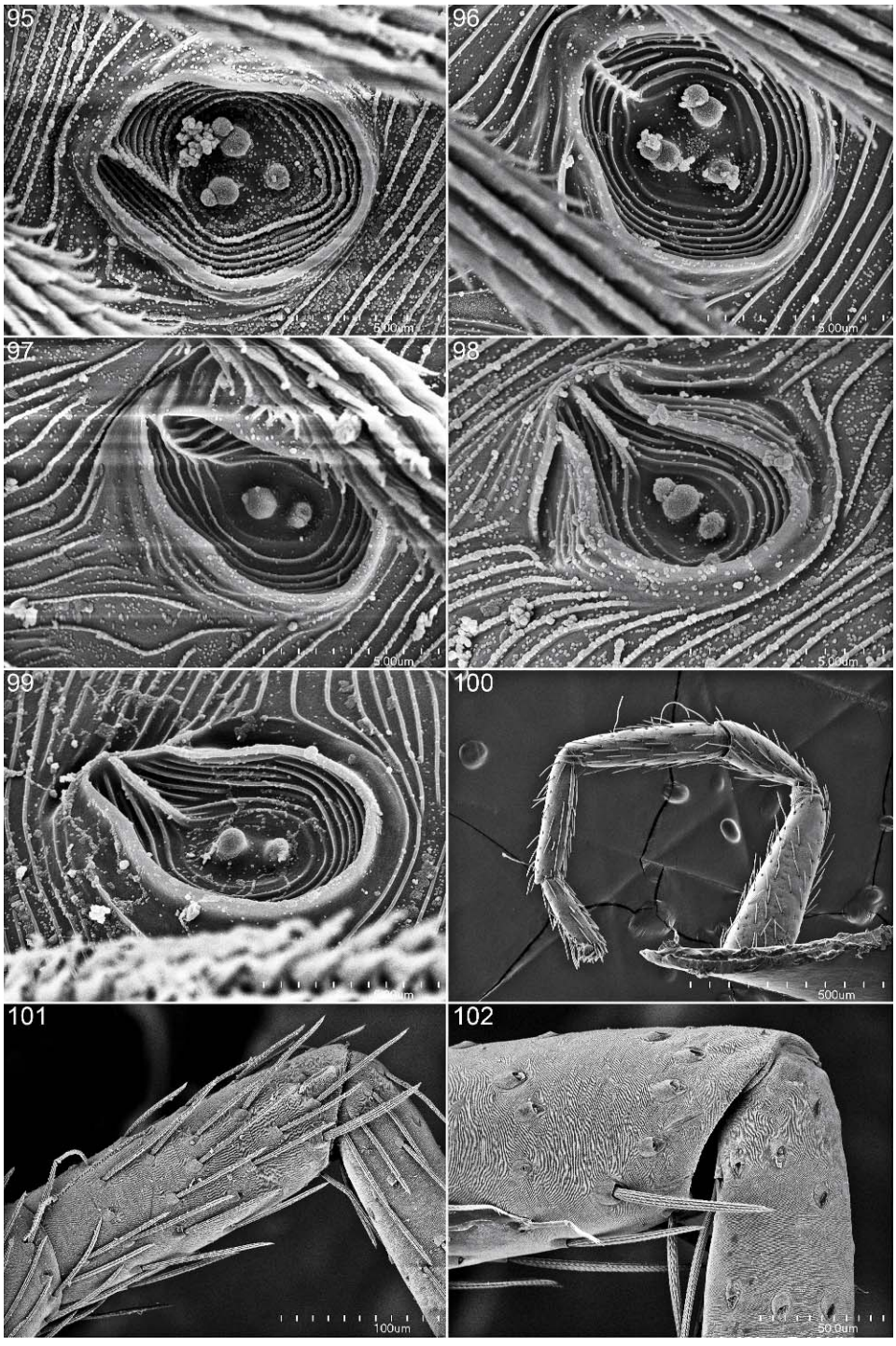
Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 405), 1♂, 1♀; Tinalandia, 0°17′56″S, 79°03′09″W, Dec. 6, 2009, hand collecting, forest litter, elev. 720 m, pair taken in copulation (E. Tapia, Niarchos Exped., AMNH PBI_OON 401), 1♂, 1♀, same, Berlese, forest litter (N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 402), 1♀, same, forest litter, hand collecting (B. Baehr, Niarchos Exped., AMNH PBI_OON 403), 1♀, same (N. Dupérré, E. Tapia, Niarchos Exped., AMNH, QCAZ, MACN



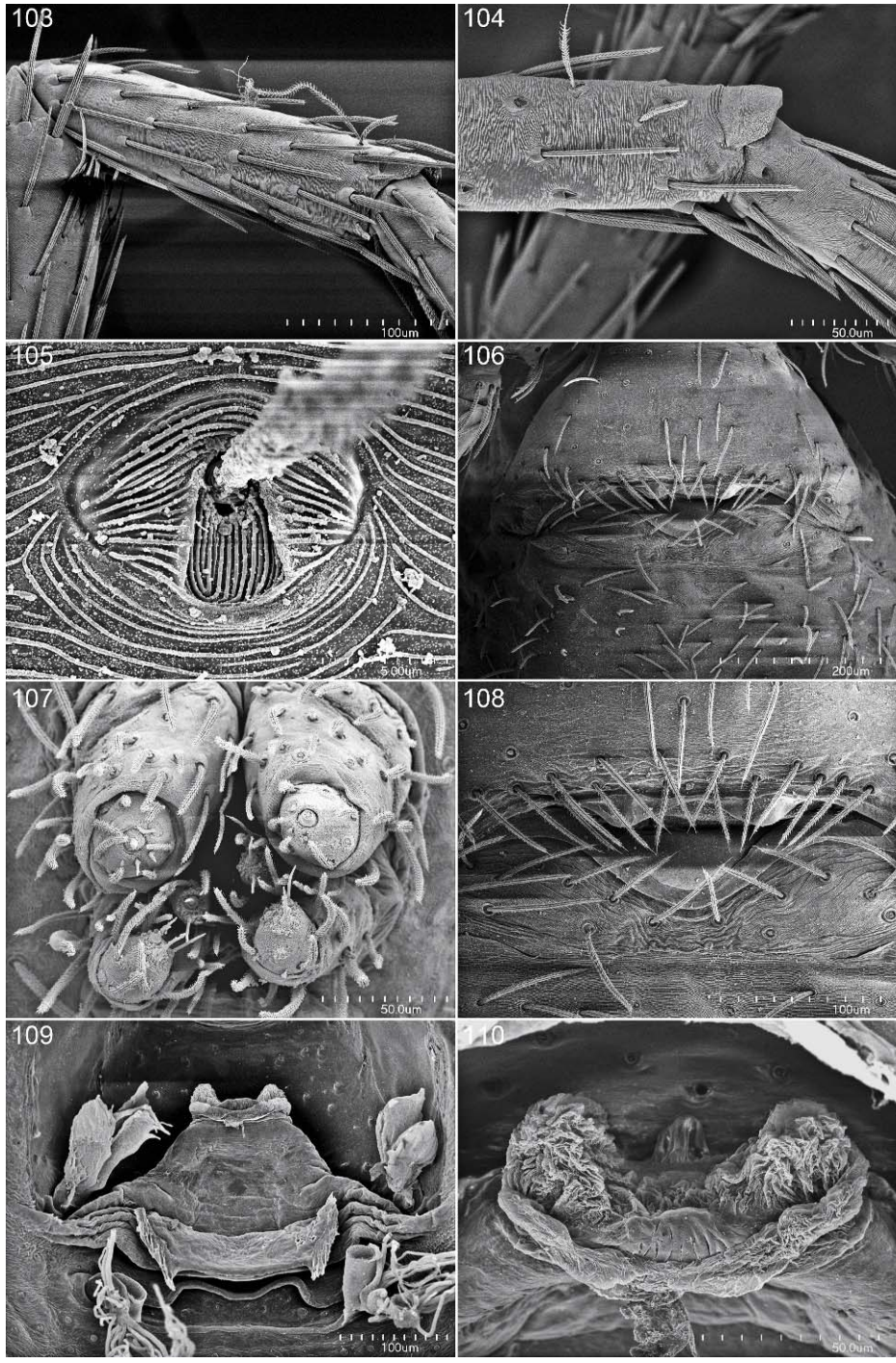
Figs. 79–86. *Niarchos barragani*, new species, female. **79.** Habitus, dorsal view. **80.** Same, lateral view. **81.** Chelicerae, anterior view. **82.** Same, posterior view. **83.** Labium and endites, ventral view. **84.** Labrum and endites, dorsal view. **85.** Serrula, dorsal view. **86.** Sternum, ventral view.



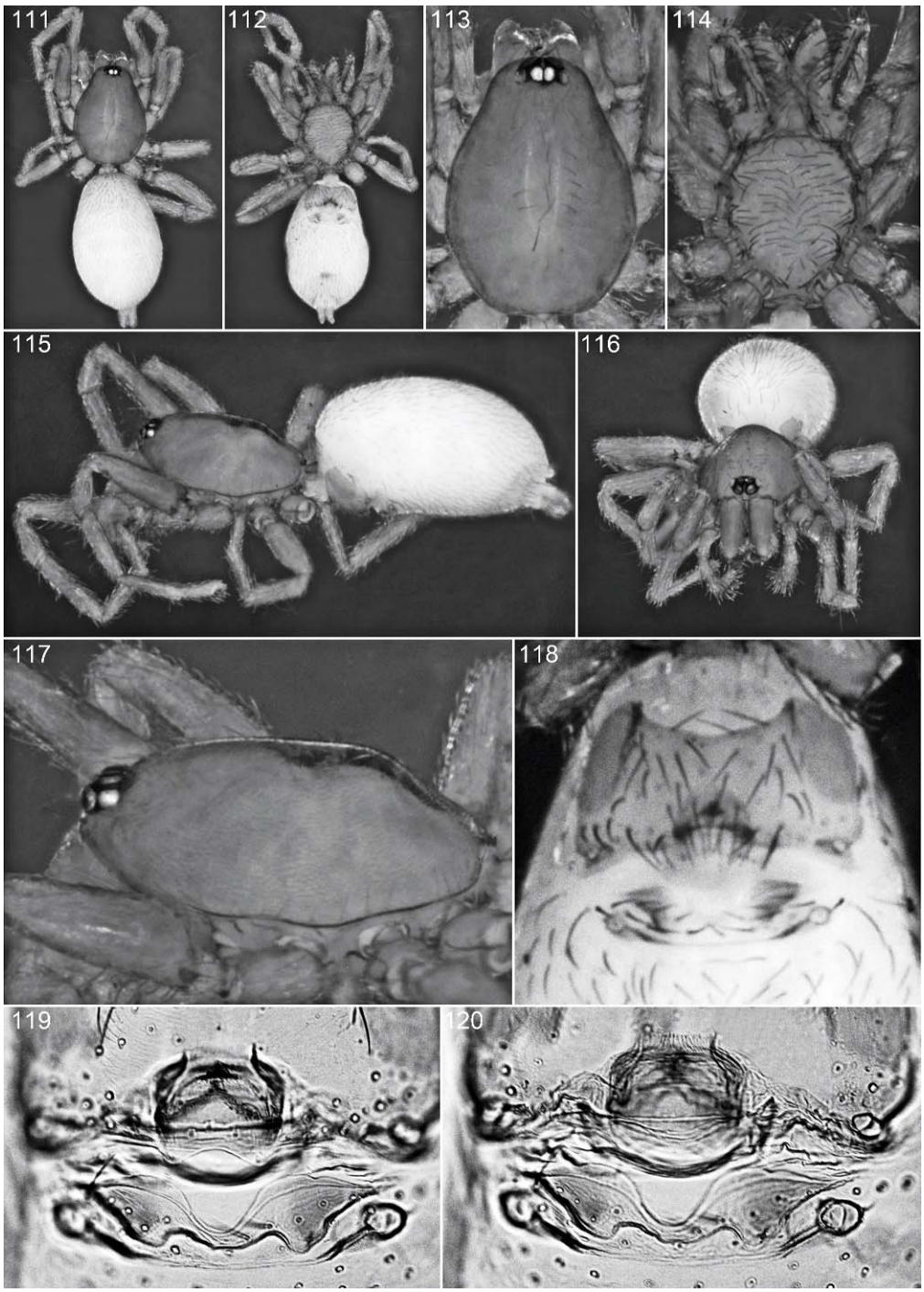
Figs. 87–94. *Niarchos barragani*, new species, female. **87.** Palp, prolateral view. **88.** Palp, retrolateral view. **89.** Palpal tibia, dorsal view. **90.** Palpal tarsus, dorsal view. **91.** Claws of leg I, distal view. **92.** Same, leg II. **93.** Same, leg III. **94.** Same, leg IV.



Figs. 95–102. *Niarchos barragani*, new species, female. **95.** Tarsal organ, leg I, dorsal view. **96.** Same, leg II. **97.** Same, leg III. **98.** Same, leg IV. **99.** Same, palp. **100.** Leg I, retrolateral view. **101.** Tibia III, lateral view. **102.** Tibia IV, same.



Figs. 103–110. *Niarchos barragani*, new species, female. **103.** Metatarsus III, lateral view. **104.** Metatarsus IV, lateral view. **105.** Trichobothrial base, tibia IV, dorsal view. **106.** Epigastric region, ventral view. **107.** Spinnerets, distal view. **108.** Genitalia, ventral view. **109.** Same, dorsal view. **110.** Same, anterior view.



Figs. 111–120. *Niarchos barragani*, new species, female. **111.** Habitus, dorsal view. **112.** Same, ventral view. **113.** Carapace, dorsal view. **114.** Sternum and mouthparts, ventral view. **115.** Habitus, lateral view. **116.** Same, anterior view. **117.** Carapace, lateral view. **118.** Epigastric region, ventral view. **119.** Genitalia, ventral view. **120.** Same, dorsal view.

PBI_OON 404), 9♂, 5♀; Tinalandia, 16 km NE Santo Domingo, June 5, 1976, Berlese, forest litter, elev. 700 m (S. Peck, FMNH 33711, PBI_OON 10213), 2♂, Berlese, debris from termite nests (S. Peck, FMNH PBI_OON 37832), 1♀.

DISTRIBUTION: Western slopes of the Andes, in the Santo Domingo region of central Ecuador.

Niarchos keili, new species
Figures 121–133

TYPE: Male holotype from Berlese sample of rain forest litter taken at an elevation of 1700 ft at a site 4 km E of Santo Domingo, Santo Domingo de Los Tsáchilas, Ecuador (June 22, 1975; S. Peck), deposited in FMNH (PBI_OON 10534).

ETYMOLOGY: The specific name is a patronym in honor of Clifford Keil, Director of the Museum of Invertebrates at the Pontificia Universidad Católica del Ecuador, in recognition of his vital collaboration in the planning and execution of the Niarchos Expedition.

DIAGNOSIS: Males can easily be recognized by the distinct anterior projections on the chelicerae (fig. 126), the rounded protrusions just behind the anterior process on the endites (fig. 128), and the basally narrowed embolar region (figs. 129–133).

MALE (PBI_OON 10534, figs. 121–133): Total length 1.58. Posterior eye row straight from above; PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Endites with posterior directed process shaped like duck's beak, followed posteriorly by rounded protuberance (fig. 128). Leg spination: tibiae III, IV v0-0-1p. Embolar region basally narrowed, distally expanded, preceded by dorsal protrusion; bulb with strong basal projection on retroventral side (figs. 129–133).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Western slopes of the Andes, in the Santo Domingo region of central Ecuador.

Niarchos baehrae, new species
Figures 134–143

TYPE: Female holotype taken by hand collecting from forest litter at an elevation of 1625 m at Otonga, 0°25′11″S, 78°59′41″W, Cotopaxi, Ecuador (Dec. 8, 2009, B. Baehr, Niarchos Exped.), deposited in QCAZ (PBI_OON 429).

ETYMOLOGY: The specific name is a patronym in honor of Barbara Baehr, collector of the holotype and many other fascinating oonopids and a participant in the Niarchos Expedition.

DIAGNOSIS: Females can easily be recognized by the triangular epigynal atrium (fig. 141) and the presence of both anterior and posterior apodemes, as well as tubular pockets within the anterior receptaculum (figs. 142, 143). The large size difference makes it unlikely that this could be the female of *N. keili*.

MALE: Unknown.

FEMALE (PBI_OON 429, figs. 134–143): Total length 2.37. Posterior eye row recurved from above; PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Leg spination: tibiae III, IV v0-0-1p; metatarsi IV v0-0-2. Genitalia with distinct atrium (figs. 142, 143).

OTHER MATERIAL EXAMINED: None.

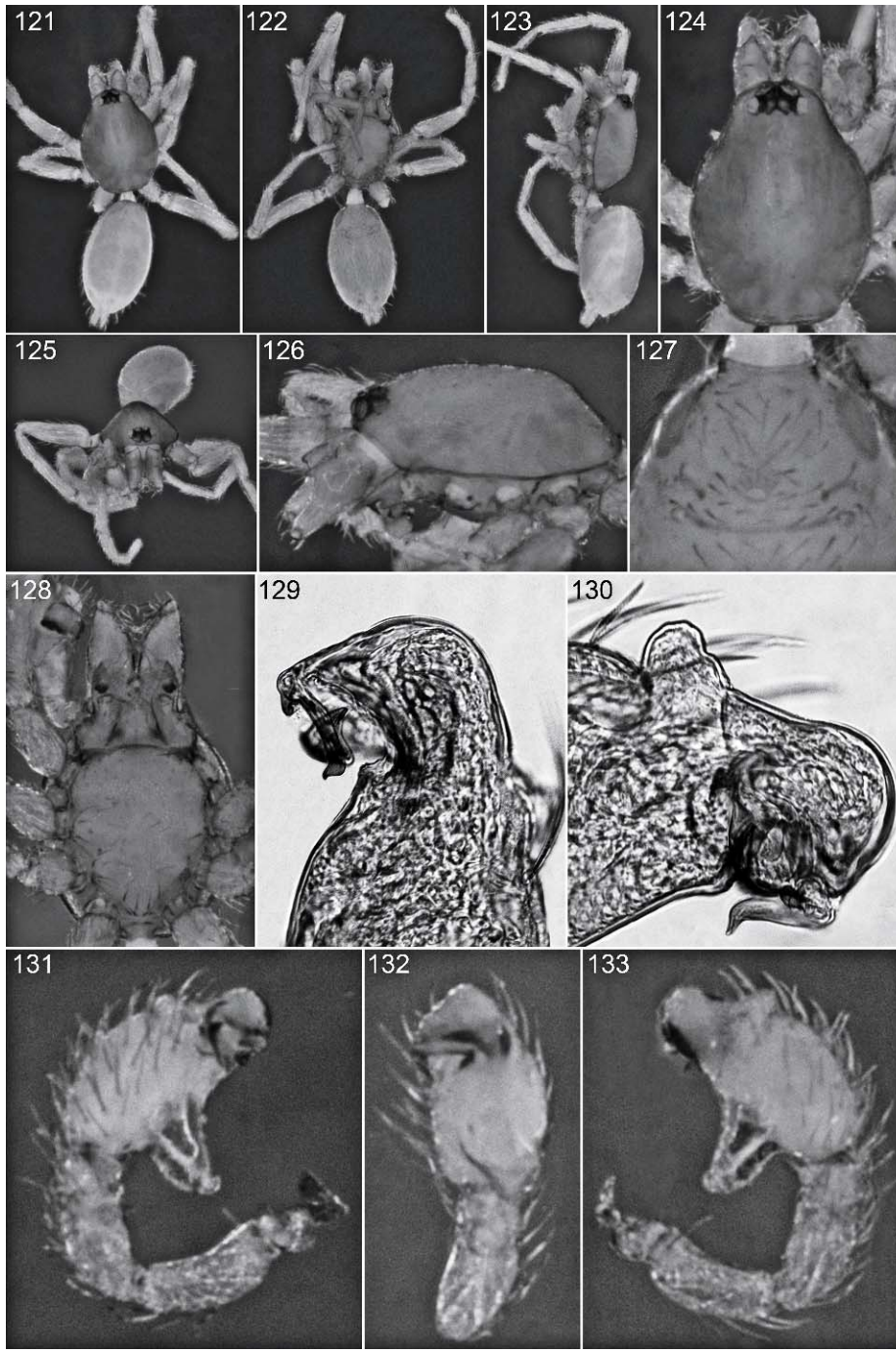
DISTRIBUTION: Known only from the vicinity of the Bosque Integral Otonga on the western slope of the Ecuadorean Andes.

Niarchos tapiai, new species
Figures 144–166

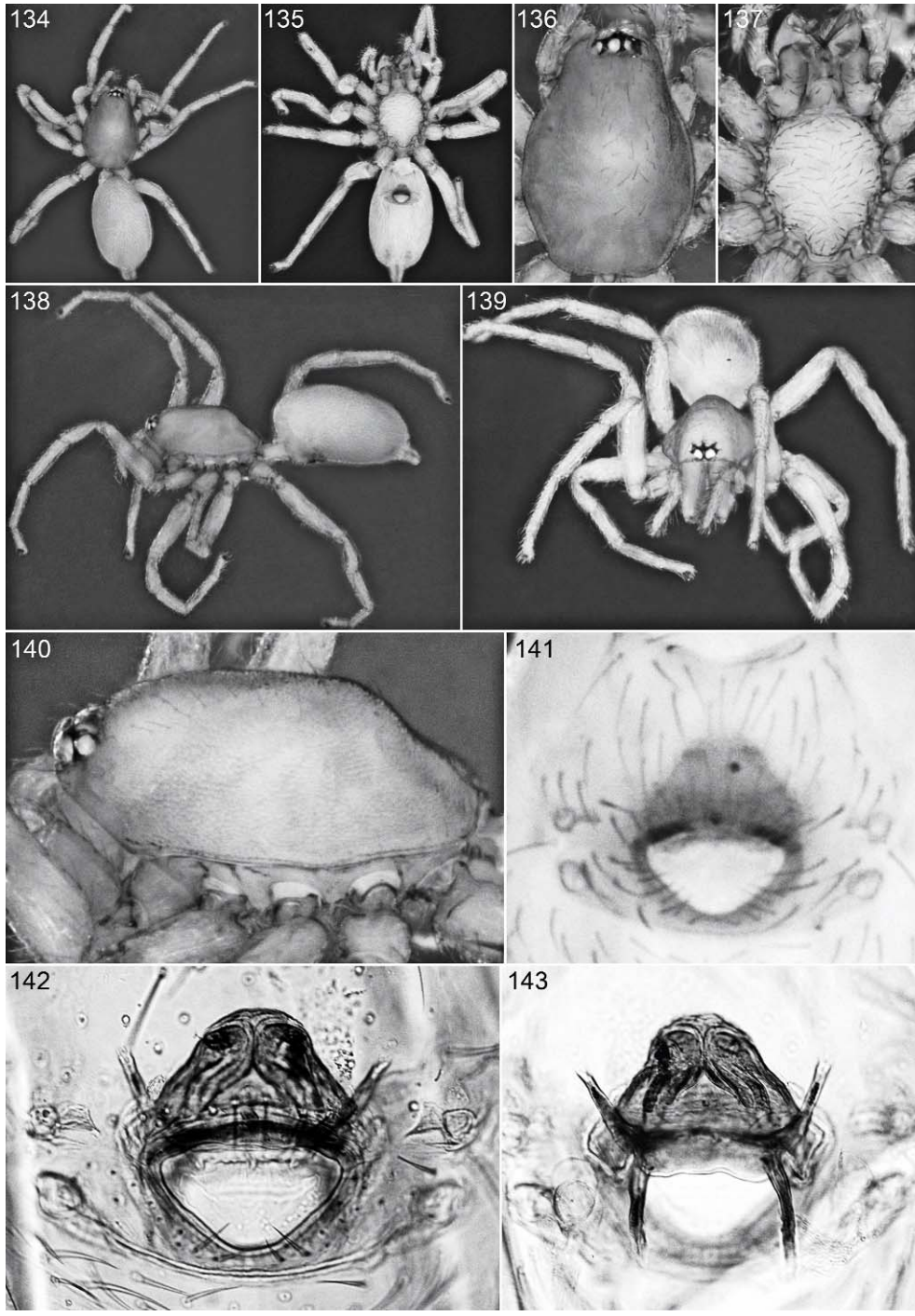
TYPES: Holotype male and allotype female taken in pitfall trap at an elevation of 2500 m at Río Chipia, Molleturo, Cuenca, 2.74572°S, 79.40892°W, Azuay, Ecuador (Jan. 20, 2010; E. Tapia), deposited in QCAZ (PBI_OON 434).

ETYMOLOGY: The specific name is a patronym in honor of Elicio Tapia, collector of the only known specimens, in recognition of his tremendous contributions to the success of the Niarchos Expedition.

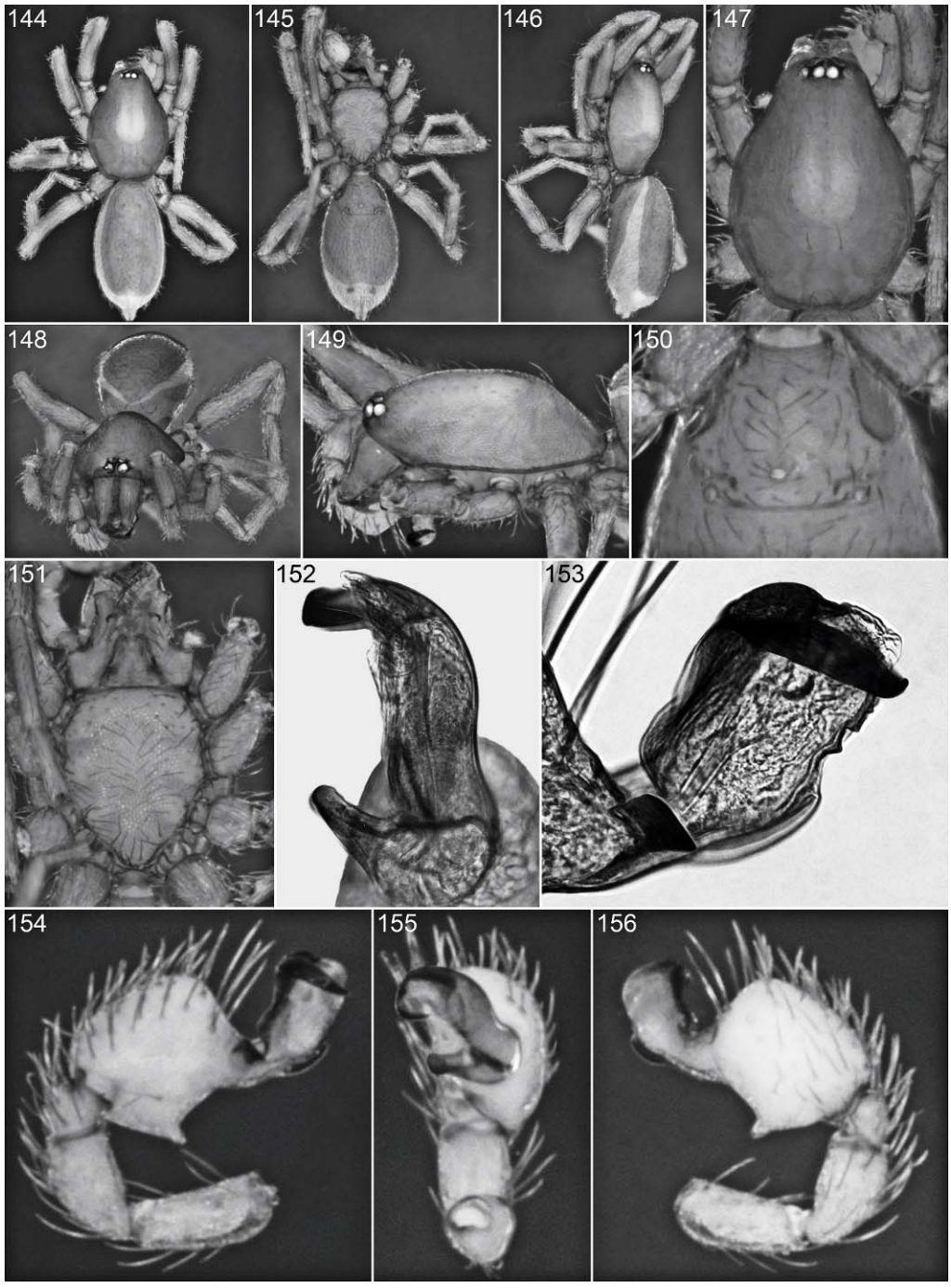
DIAGNOSIS: This species is clearly most closely related to *N. elicioi*, sharing with it a greatly narrowed anterior projection on the male endites, a tiny retroventral projection on the male palpal bulb, and a hypertrophied embolar region, but can easily be distinguished by the shorter embolar region (figs. 152–156) of males and the arched



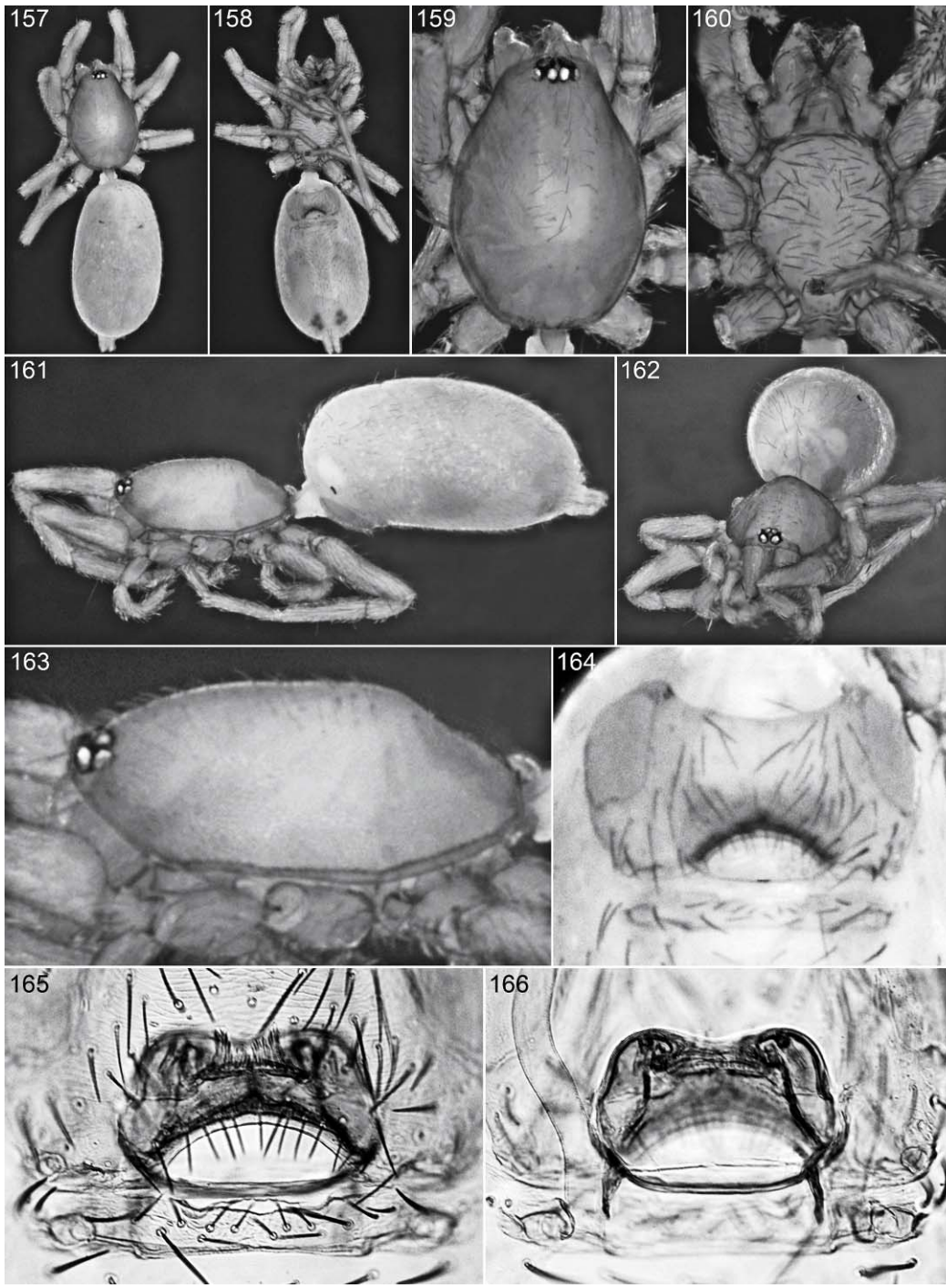
Figs. 121–133. *Niarchos keili*, new species, male. **121.** Habitus, dorsal view. **122.** Same, ventral view. **123.** Same, lateral view. **124.** Carapace, dorsal view. **125.** Habitus, anterior view. **126.** Carapace, lateral view. **127.** Epigastric region, ventral view. **128.** Sternum and mouthparts, ventral view. **129.** Embolus, ventral view. **130.** Same, prolateral view. **131.** Palp, prolateral view. **132.** Same, ventral view. **133.** Same, retrolateral view.



Figs. 134–143. *Niarchos baehrae*, new species, female. **134.** Habitus, dorsal view. **135.** Same, ventral view. **136.** Carapace, dorsal view. **137.** Sternum and mouthparts, ventral view. **138.** Habitus, lateral view. **139.** Same, anterior view. **140.** Carapace, lateral view. **141.** Epigastric region, ventral view. **142.** Genitalia, ventral view. **143.** Same, dorsal view.



Figs. 144–156. *Niarchos tapiai*, new species, male. **144.** Habitus, dorsal view. **145.** Same, ventral view. **146.** Same, lateral view. **147.** Carapace, dorsal view. **148.** Habitus, anterior view. **149.** Carapace, lateral view. **150.** Epigastric region, ventral view. **151.** Sternum and mouthparts, ventral view. **152.** Embolus, ventral view. **153.** Same, prolateral view. **154.** Palp, prolateral view. **155.** Same, ventral view. **156.** Same, retrolateral view.



Figs. 157–166. *Niarchos tapiai*, new species, female. **157.** Habitus, dorsal view. 158**.** Same, ventral view. **159.** Carapace, dorsal view. **160.** Sternum and mouthparts, ventral view. **161.** Habitus, lateral view. **162.** Same, anterior view. **163.** Carapace, lateral view. **164.** Epigastric region, ventral view. **165.** Genitalia, ventral view. **166.** Same, dorsal view.

posterior margin of the epigastric sclerite (figs. 165, 166) of females.

MALE (PBI_OON 434, figs. 144–156): Total length 1.85. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface finely reticulate. Endites with anterior projections erect, very narrow, tip curved posteriorly. Leg spination: tibiae: III v0-0-1p; IV v0-1p-1p; metatarsi III v0-0-1p. Embolar region almost as long as bulb; bulb with tiny basal projection on retroventral side (figs. 152–156).

FEMALE (PBI_OON 434, figs. 157–166): Total length 2.27. Posterior eye row procurved from above. Leg spination: tibiae: III v0-0-1p; IV v0-1p-2; metatarsi: III v0-0-1p; IV v0-1p-2. Posterior margin of epigastric furrow strongly arched, followed posteriorly by triangular, unsclerotized atrium (figs. 165, 166).

OTHER MATERIAL EXAMINED: **Ecuador:** *Azuay:* Luz María, Molleturo, Cuenca, 2.68918°S, 79.41537°W, Jan. 25, 2010, elev. 1910 m (E. Tapia, AMNH, MACN, QCAZ PBI_OON 435), 7♂, 2♀.

DISTRIBUTION: Known only from Azuay province, Ecuador.

Niarchos elicioi, new species
Figures 167–189

TYPE: Male holotype taken at an elevation of 3400 m at Yumate, via Pan de Azúcar, Molleturo, 2.76757°S, 79.43222°W, Azuay, Ecuador (Jan. 23, 2010; E. Tapia), deposited in QCAZ (PBI_OON 436).

ETYMOLOGY: The specific name is another patronym in honor of Elicio Tapia, collector of the only known specimens, in recognition of his continuing efforts to help us document the oonopid fauna of Ecuador.

DIAGNOSIS: This species is clearly most closely related to *N. tapiai*, sharing with it a greatly narrowed anterior projection on the male endites, a tiny retroventral projection on the male palpal bulb, and a hypertrophied embolar region, but can easily be distinguished by the longer embolar region (figs. 175–179) of males and the less arched posterior margin of the epigastric sclerite (figs. 188, 189) of females.

MALE (PBI_OON 436, figs. 167–179): Total length 1.86. Posterior eye row straight from above; PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Anterior projections on endites long, narrow, directed ventrally. Leg spination: tibiae: III v0-0-1p; IV v0-1p-1p; metatarsi IV v0-0-1p. Embolus strong, strongly arched; bulb with relatively small projection on retroventral side, distal part embolar region elongated, almost as long as bulb, with basal process (figs. 175–179).

FEMALE (PBI_OON 437, figs. 180–189): Total length 1.93. Leg spination: tibiae: III v0-0-1p; IV v0-0-2; metatarsi III, IV v0-0-1p. Posterior margin of epigastric scutum broadly arched, indented at middle (figs. 188, 189).

OTHER MATERIAL EXAMINED: **Ecuador:** *Azuay:* Yumate, via Pan de Azúcar, Molleturo, 2.76757°S, 79.43222°W, Jan. 23, 2010, elev. 2450 m (E. Tapia, AMNH, MACN, QCAZ PBI_OON 437), 3♂, 2♀.

DISTRIBUTION: Known only from Azuay province, Ecuador.

Niarchos wygodzinskyi, new species
Figures 190–212

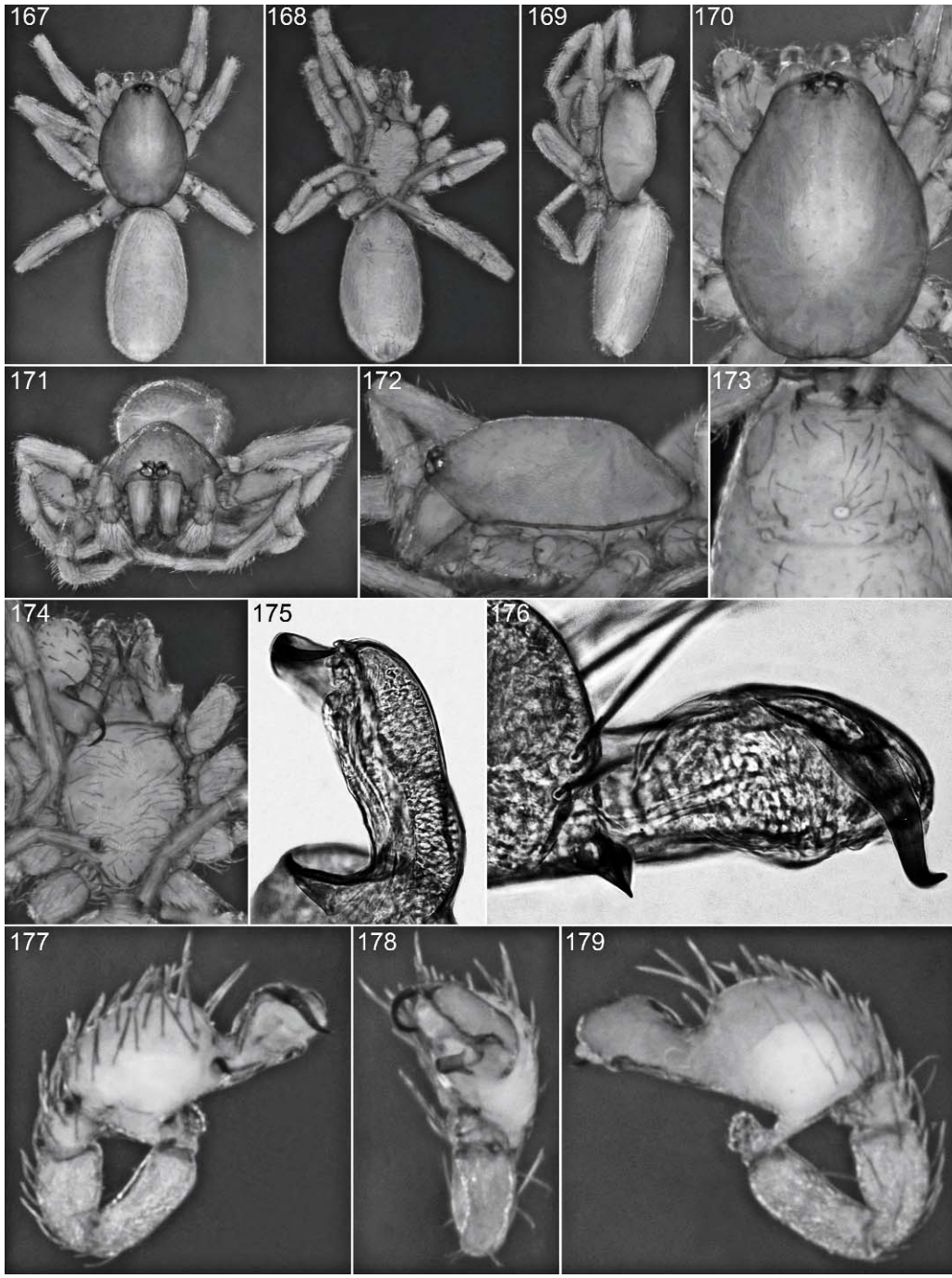
TYPE: Male holotype taken at an elevation of 2000 m at El Saladito, Valle del Cauca, Colombia (Aug. 29, 1967; P. and B. Wygodzinsky), deposited in AMNH (PBI_OON 58).

ETYMOLOGY: The specific name is a patronym in honor of the late Pedro Wygodzinsky, one of the collectors of the type.

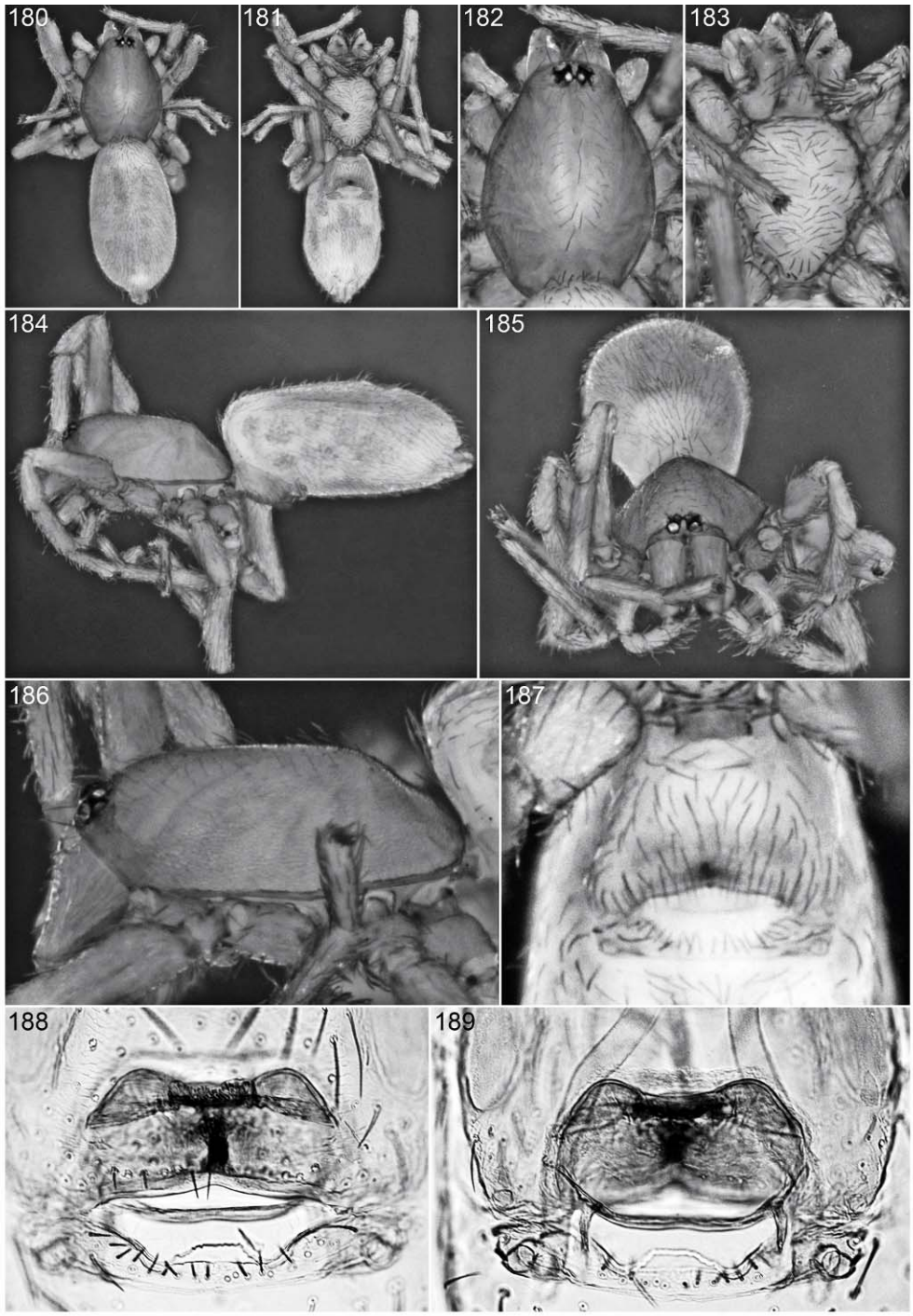
DIAGNOSIS: Males have a long, relatively narrow retroventral projection on the palpal bulb and a dorsoventrally expanded embolar region (figs. 198–202); females have a pair of anteriorly expanded, lateral processes on the anterior receptaculum (figs. 211, 212).

MALE (PBI_OON 58, figs. 190–202): Total length 1.41. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface finely reticulate. Endites with anteriorly narrowed, triangular anterior process. Leg spination: tibiae III, IV v0-0-1p. Embolar region dorsoventrally elongated, embolus relatively short, small; retroventral projection of bulb with distally bent tip (figs. 198–202).

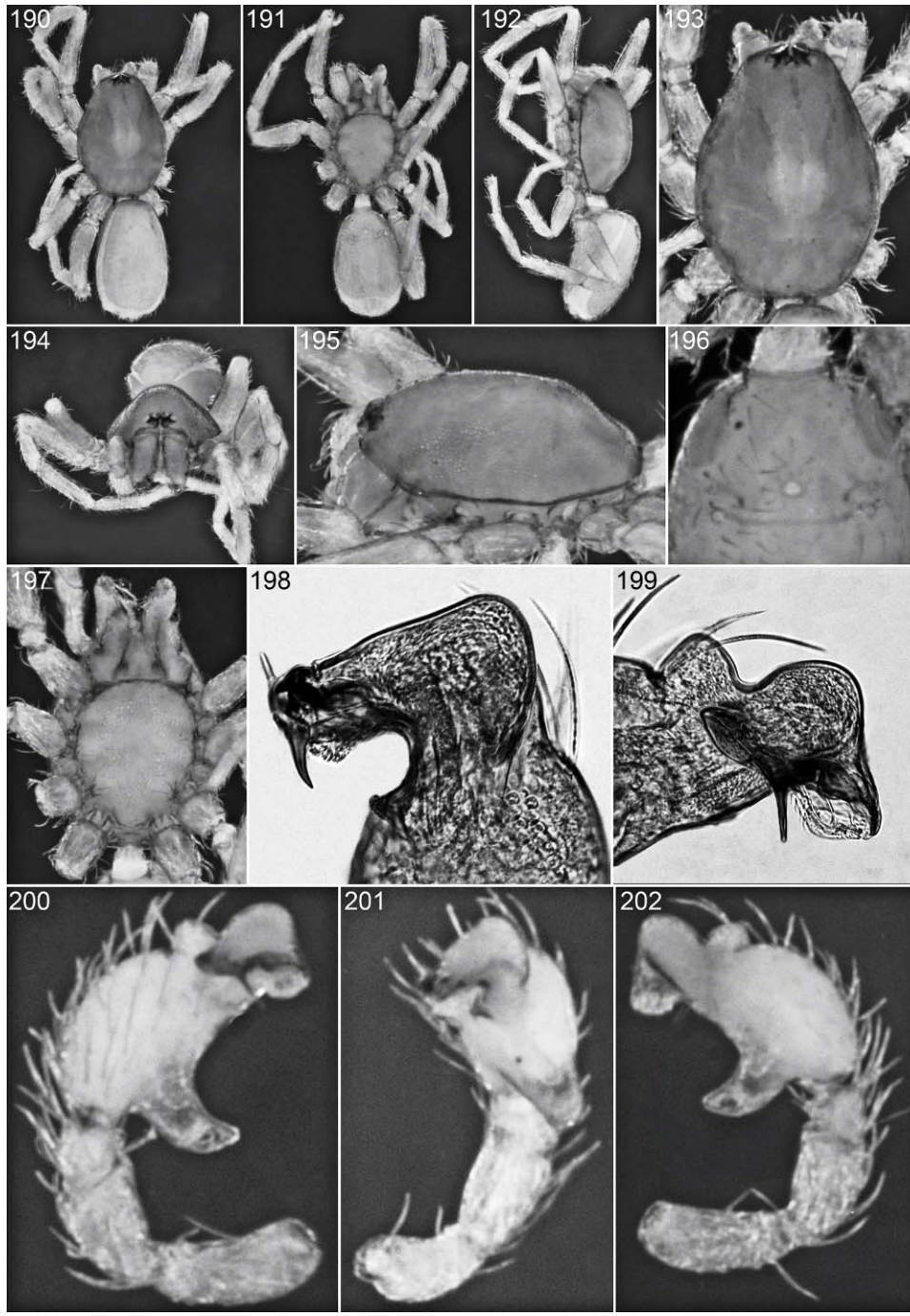
FEMALE (PBI_OON 31164, figs. 203–212): Total length 1.77. Leg spination: tibiae:



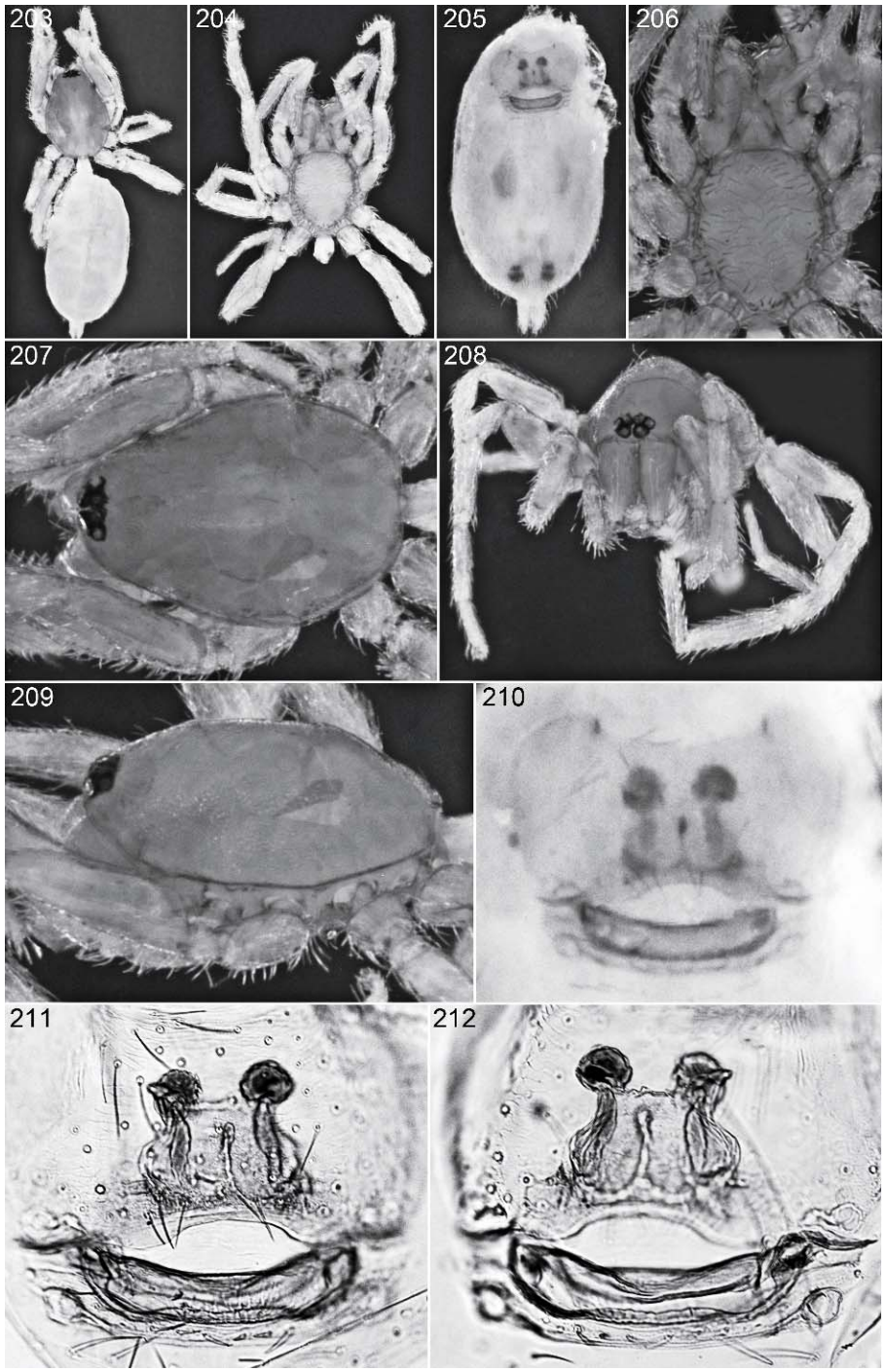
Figs. 167–179. *Niarchos elicioi*, new species, male. **167.** Habitus, dorsal view. **168.** Same, ventral view. **169.** Same, lateral view. **170.** Carapace, dorsal view. **171.** Habitus, anterior view. **172.** Carapace, lateral view. **173.** Epigastric region, ventral view. **174.** Sternum and mouthparts, ventral view. **175.** Embolus, ventral view. **176.** Same, prolateral view. **177.** Palp, prolateral view. **178.** Same, ventral view. **179.** Same, retrolateral view.



Figs. 180–189. *Niarchos elicioi*, new species, female. **180.** Habitus, dorsal view. **181.** Same, ventral view. **182.** Carapace, dorsal view. **183.** Sternum and mouthparts, ventral view. **184.** Habitus, lateral view. **185.** Same, anterior view. **186.** Carapace, lateral view. **187.** Epigastric region, ventral view. **188.** Genitalia, ventral view. **189.** Same, dorsal view.



Figs. 190–202. *Niarchos wygodzinskyi*, new species, male. **190.** Habitus, dorsal view. **191.** Same, ventral view. **192.** Same, lateral view. **193.** Carapace, dorsal view. **194.** Habitus, anterior view. **195.** Carapace, lateral view. **196.** Epigastric region, ventral view. **197.** Sternum and mouthparts, ventral view. **198.** Embolus, ventral view. **199.** Same, prolateral view. **200.** Palp, prolateral view. **201.** Same, ventral view. **202.** Same, retrolateral view.



Figs. 203–212. *Niarchos wygodzinskyi*, new species, female. **203.** Habitus, dorsal view. **204.** Cephalothorax, ventral view. **205.** Abdomen, ventral view. **206.** Sternum and mouthparts, ventral view. **207.** Carapace, dorsal view. **208.** Same, anterior view. **209.** Same, lateral view. **210.** Epigastric region, ventral view. **211.** Genitalia, ventral view. **212.** Same, dorsal view.

III v0-0-1p; IV v0-0-2; metatarsi IV v0-0-2. Anterior genitalic elements with short median and two longer paramedian anterior extensions, latter extension expanded anteriorly (figs. 211, 212).

OTHER MATERIAL EXAMINED: **Colombia:** *Valle del Cauca:* El Saladito, Aug. 29, 1967, elev. 2000 m (P., B. Wygodzinsky, AMNH PBI_OON 58), 1♂; Pichindé, Aug. 28, 1967, elev. 1900 m (P., B. Wygodzinsky, AMNH PBI_OON 31164), 1♀; San Antonio, near El Saladito, 3°29′49.2″N, 76°37′29.1″W, Feb. 16, 1998, sifting litter at night, elev. 2085 m (G. Hormiga, J. Coddington, J. Miller, USNM 2046648, PBI_OON 28218), 1♀.

DISTRIBUTION: Known only from Valle del Cauca department, Colombia.

Niarchos florezi, new species
Figures 213–225

TYPE: Male holotype from a Berlese sample of litter taken at an elevation of 1800 m in a secondary forest at ''Pereira, correg. La Florida, yda. La Suiza, Otun Quimbaya,'' 4°44′N, 75°35′W, Risaralda, Colombia (Mar. 25, 2005; A. Sabogal), deposited in ICN (PBI_OON 438).

ETYMOLOGY: The specific name is a patronym in honor of Eduardo Florez (ICN), a distinguished Colombian arachnologist who has made available for study many fascinating Colombian oonopids.

DIAGNOSIS: Males resemble those of *N. wygodzinskyi* in having a distally bent tip on the relatively narrow retroventral projection on the palpal bulb, and an elongated embolar region, but have a larger, thicker embolus (figs. 221–225).

MALE (PBI_OON 438, figs. 213–225): Total length 1.78. Posterior eye row straight from above; PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Endites with anterior projection triangular, expanded posteriorly. Leg spination: tibiae III, IV v0-0-1p. Embolus long, strong, curved; bulb with short, distally bent retroventral projection (figs. 221–225).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: Four males taken with the holotype (ICN, AMNH PBI_OON 40823).

DISTRIBUTION: Known only from Risaralda department, Colombia.

The *scutatus* Group

Males of this group lack a retroventral projection on the palpal bulb, but have a well-developed embolar base from which the embolus originates at a right angle (figs. 234, 319). Females resemble those of the *cotopaxi* group in having the postepigastric scutum so short that it does not fully reach the posterior spiracles and the groove connecting them, but the epigastric scutum has a much less modified posterior margin (figs. 309, 333). The group appears to be restricted to the eastern slopes of the Ecuadorean Andes.

Niarchos scutatus, new species
Figures 226–311

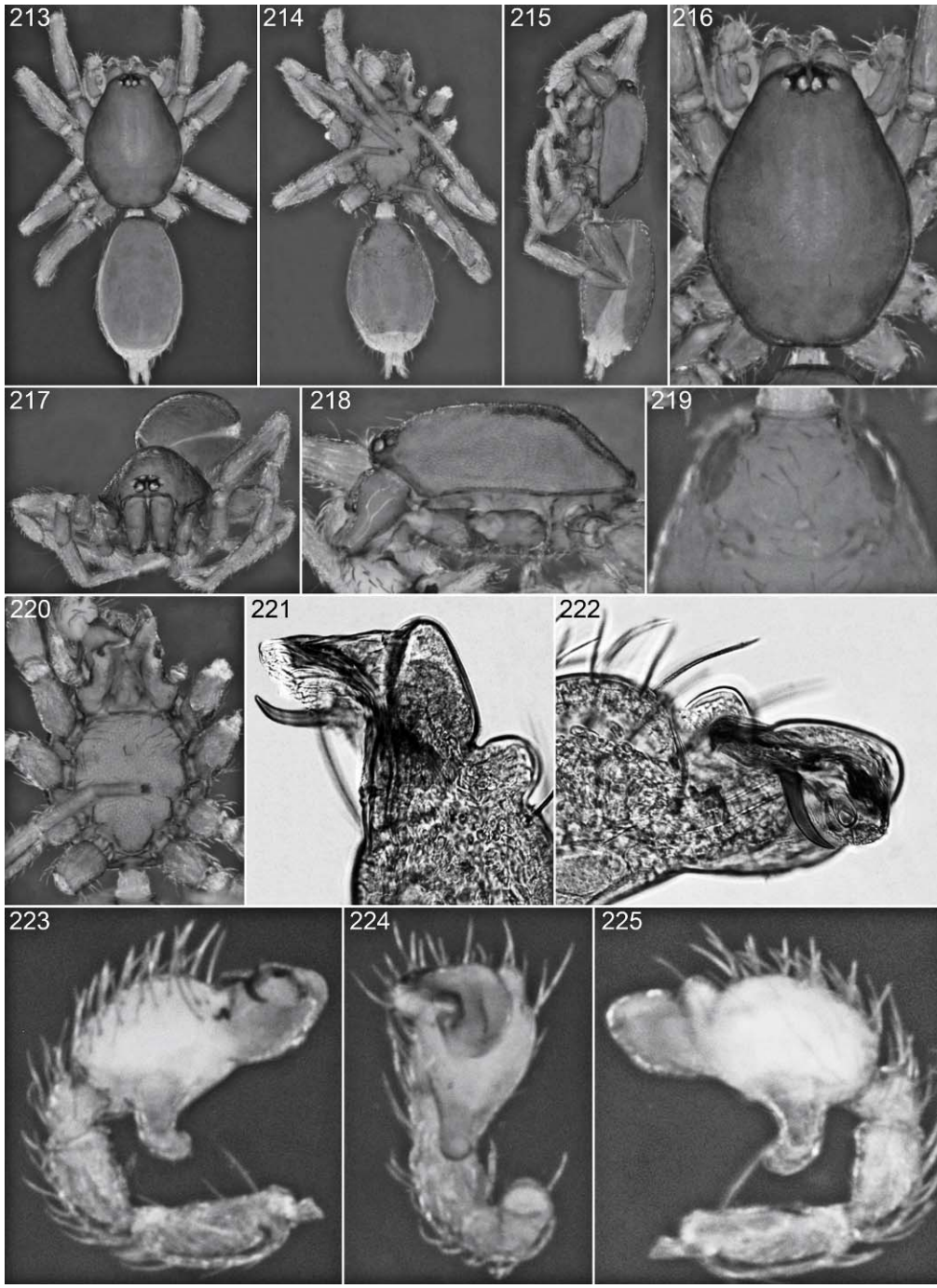
TYPES: Male holotype and female paratype taken from litter along stream trail at an elevation of 2130 m at the Yanayacu Biological Station, 0°35.955′S, 77°53.431′W, Napo, Ecuador (Nov. 25, 2009; Niarchos Exped.), deposited in QCAZ (PBI_OON 409).

ETYMOLOGY: The specific name is Latin, meaning ''armed with a shield,'' referring to the dorsal abdominal scutum found in males (but not females).

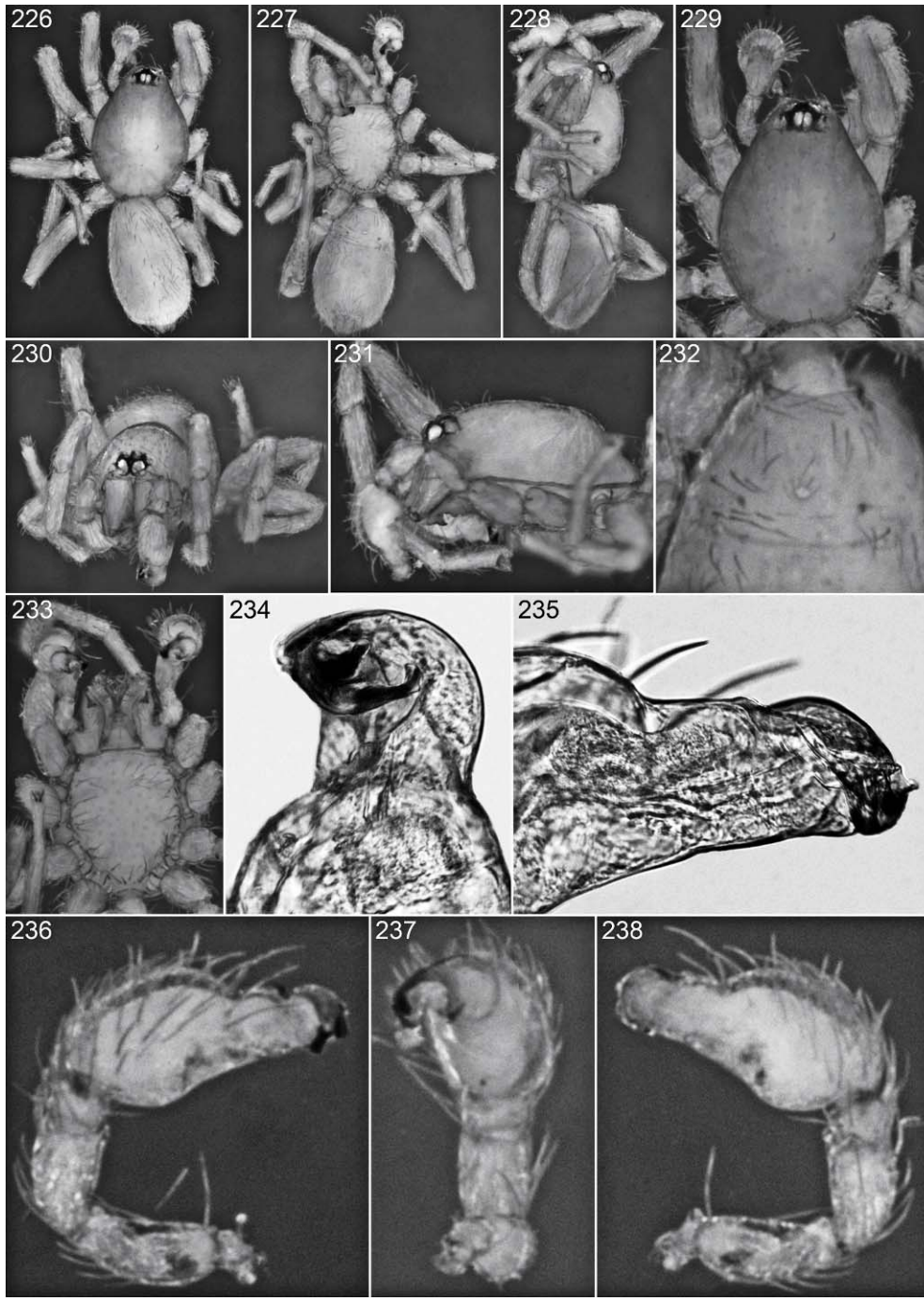
DIAGNOSIS: Males resemble those of *N. ramirezi* and its relatives, but have a thicker embolar base (figs. 234–238); females resemble those of *N. ramirezi* and *N. bonaldoi* in having a thumblike anterior process on the anterior receptaculum, but have a thick transverse sclerite connecting distally narrower apodemes (figs. 310, 311).

MALE (PBI_OON 407, figs. 226–272): Total length 1.41. Posterior eye row straight from above. Sternum surface smooth. Endites with anterior projection triangular, laterally directed. Leg spination: tibiae IV v0-0-2. Embolus on wide base about half as long as rest of bulb, tip bent at right angle (figs. 234–238).

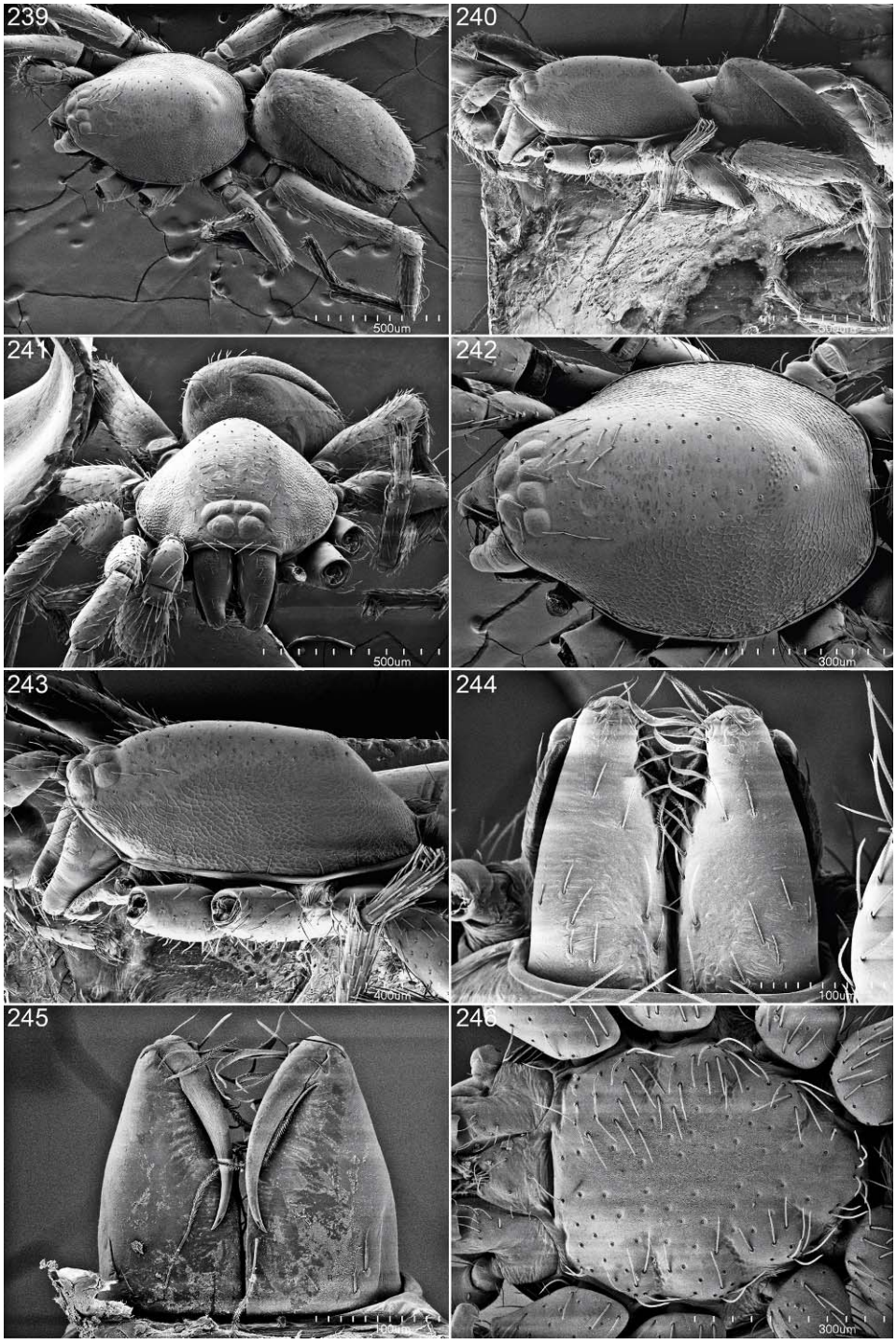
FEMALE (PBI_OON 407, figs. 273–311): Total length 1.76. Leg spination: tibiae IV v0-0-2. Epigastric scutum with posterior margin only slightly invaginated at middle, postepigastric scutum short, occupying only about



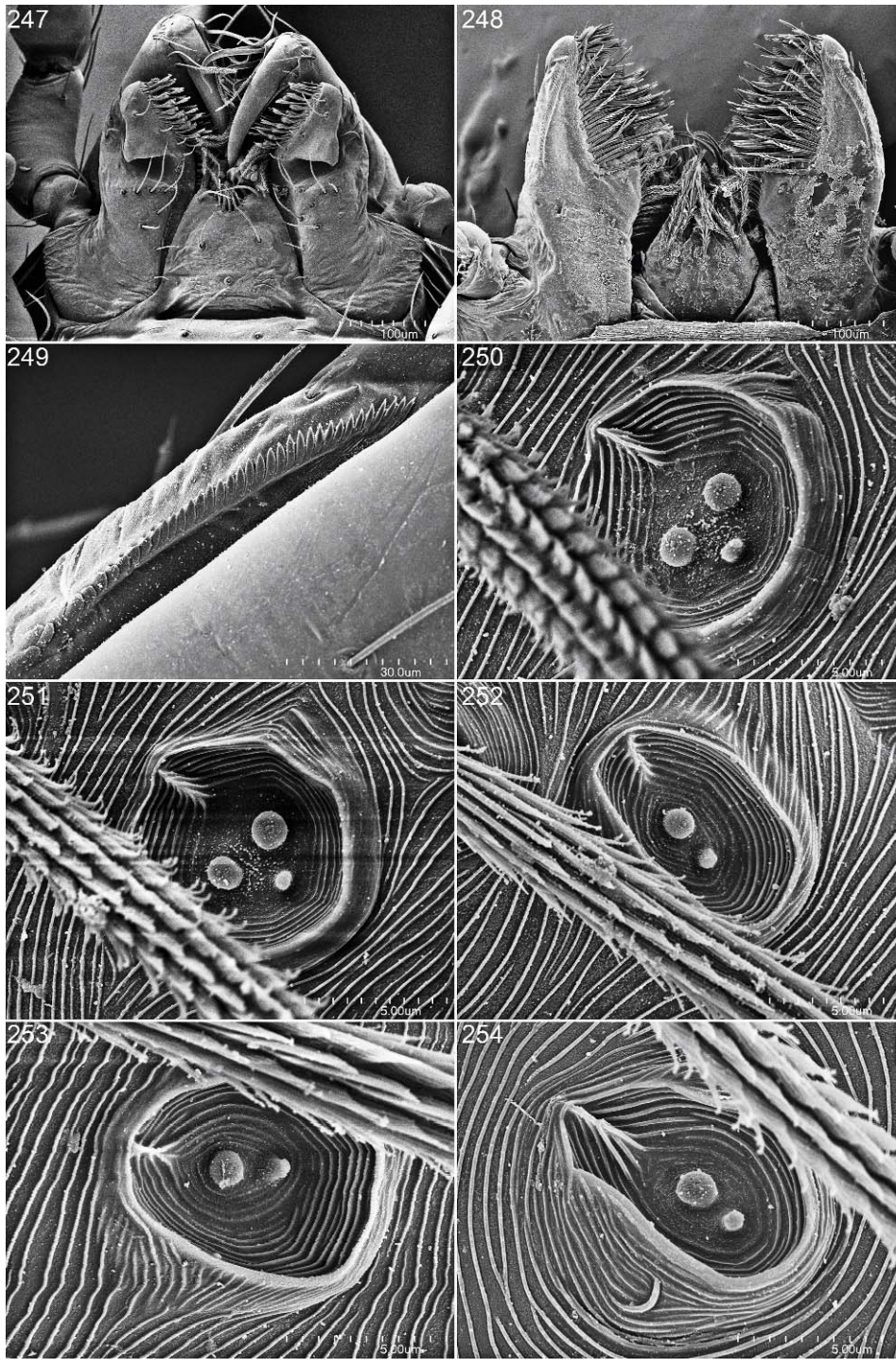
Figs. 213–225. *Niarchos florezi*, new species, male. **213.** Habitus, dorsal view. **214.** Same, ventral view. **215.** Same, lateral view. **216.** Carapace, dorsal view. **217.** Habitus, anterior view. **218.** Carapace, lateral view. **219.** Epigastric region, ventral view. **220.** Sternum and mouthparts, ventral view. **221.** Embolus, ventral view. **222.** Same, prolateral view. **223.** Palp, prolateral view. **224.** Same, ventral view. **225.** Same, retrolateral view.



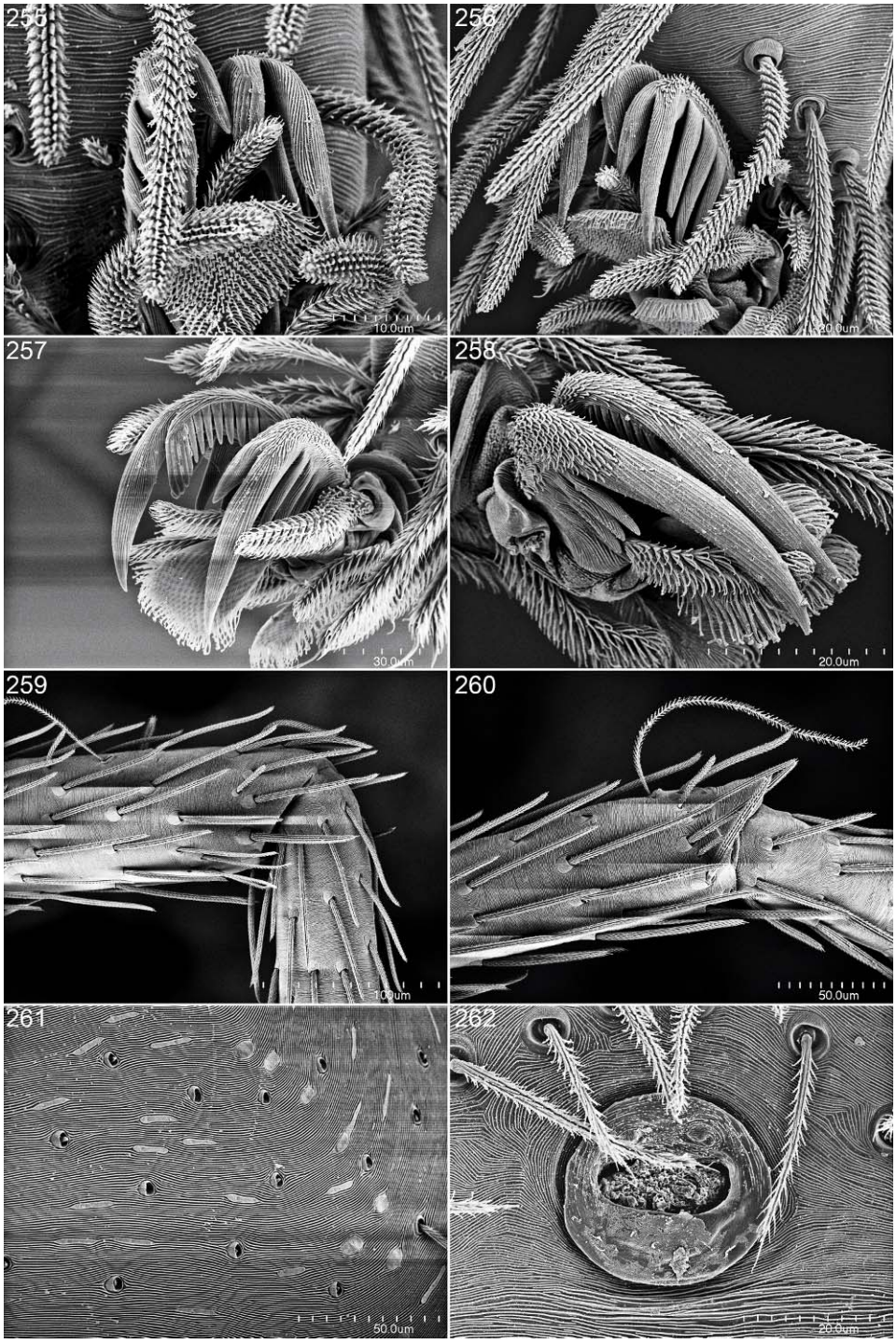
Figs. 226–238. *Niarchos scutatus*, new species, male. **226.** Habitus, dorsal view. **227.** Same, ventral view. **228.** Same, lateral view. **229.** Carapace, dorsal view. **230.** Habitus, anterior view. **231.** Carapace, lateral view. **232.** Epigastric region, ventral view. **233.** Sternum and mouthparts, ventral view. **234.** Embolus, posterior view. **235.** Same, prolateral view. **236.** Palp, prolateral view. **237.** Same, ventral view. **238.** Same, retrolateral view.



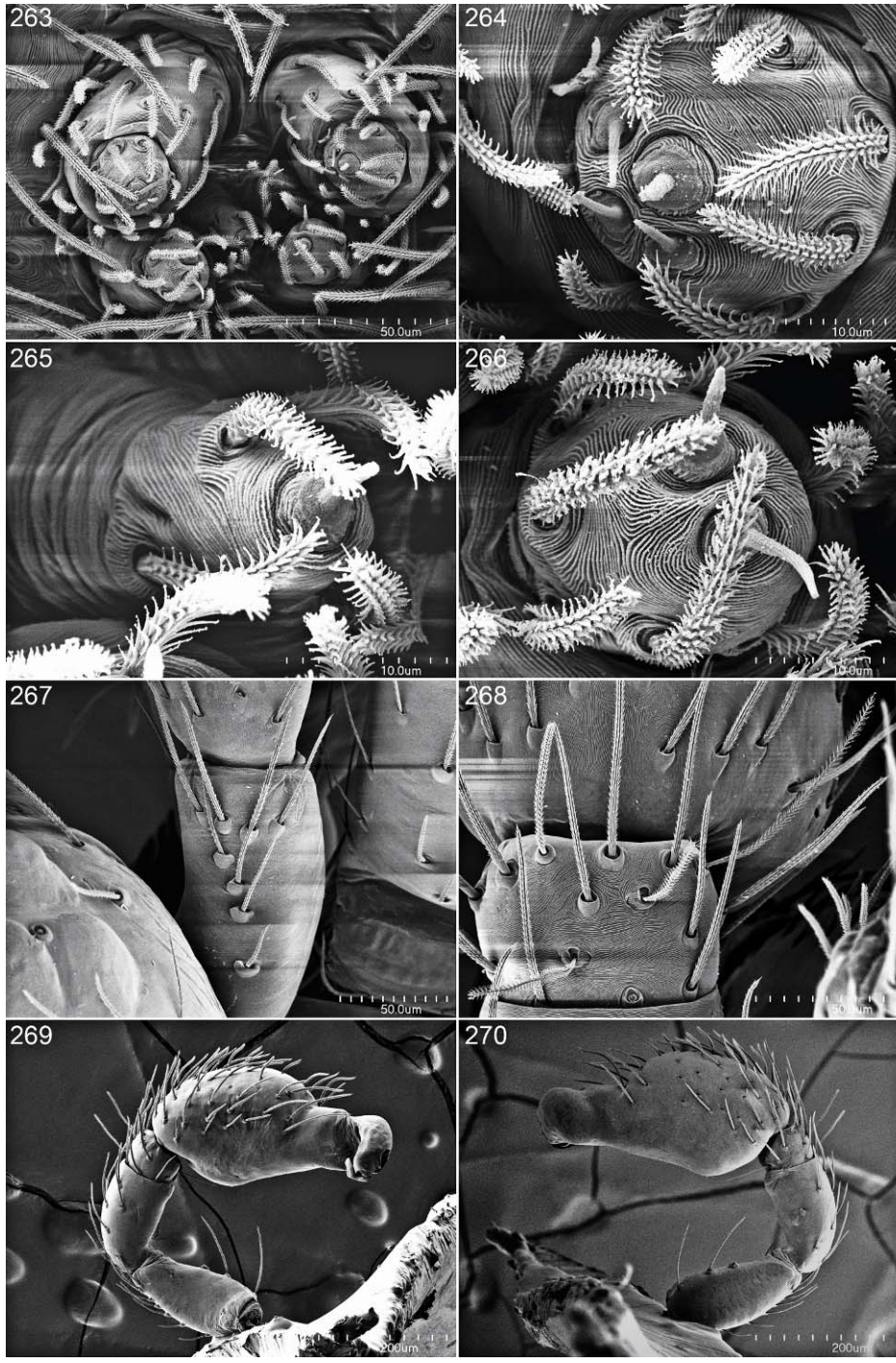
Figs. 239–246. *Niarchos scutatus*, new species, male. **239.** Habitus, dorsal view. **240.** Same, lateral view. **241.** Same, anterior view. **242.** Carapace, dorsal view. **243.** Same, lateral view. **244.** Chelicerae, anterior view. **245.** Same, posterior view. **246.** Sternum, ventral view.



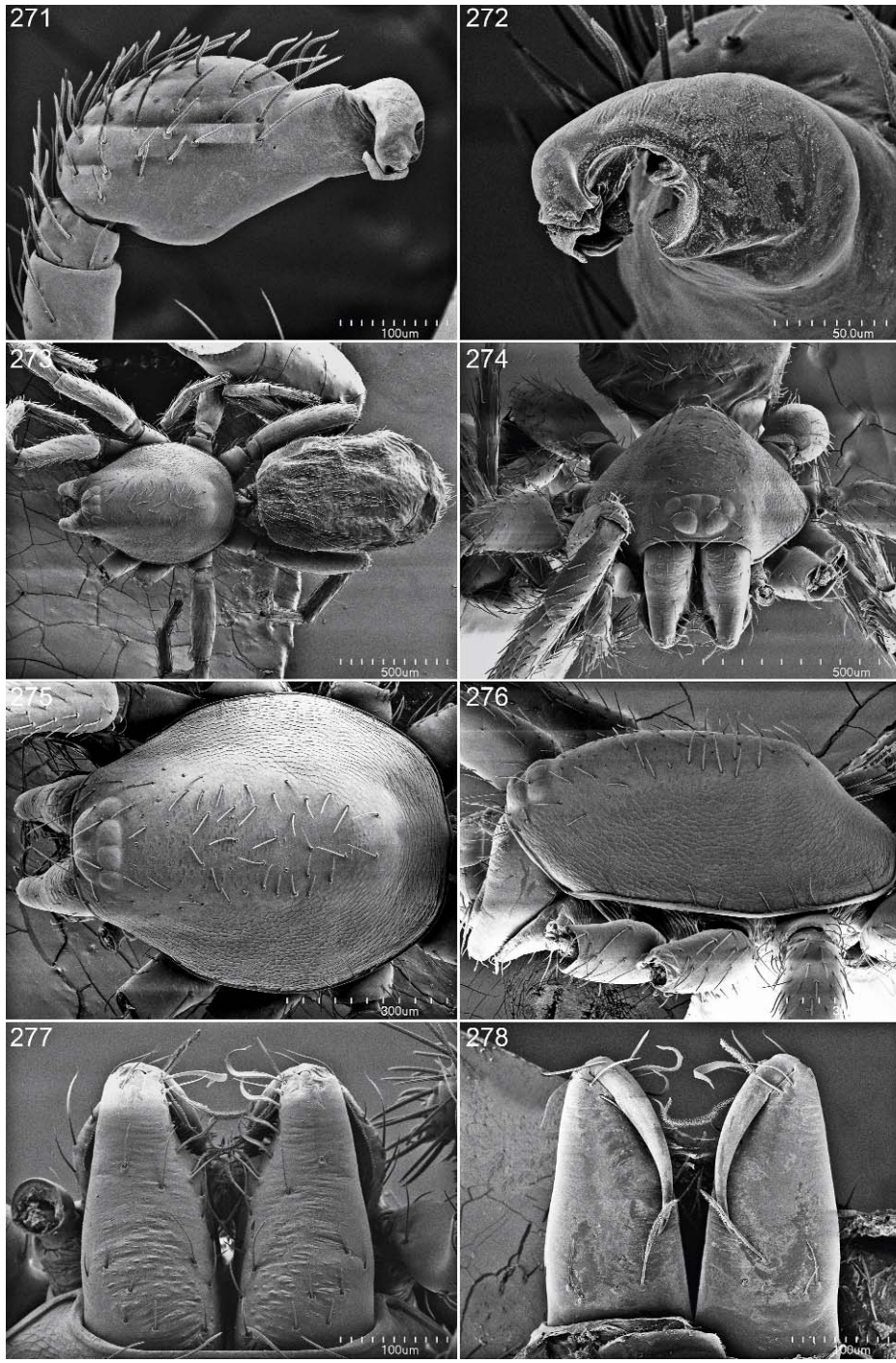
Figs. 247–254. *Niarchos scutatus*, new species, male. **247.** Labium and endites, ventral view. **248.** Labrum and endites, dorsal view. **249.** Serrula, dorsal view. **250.** Tarsal organ, leg I, dorsal view. **251.** Same, leg II. **252.** Same, leg III. **253.** Same, leg IV. **254.** Same, palp.



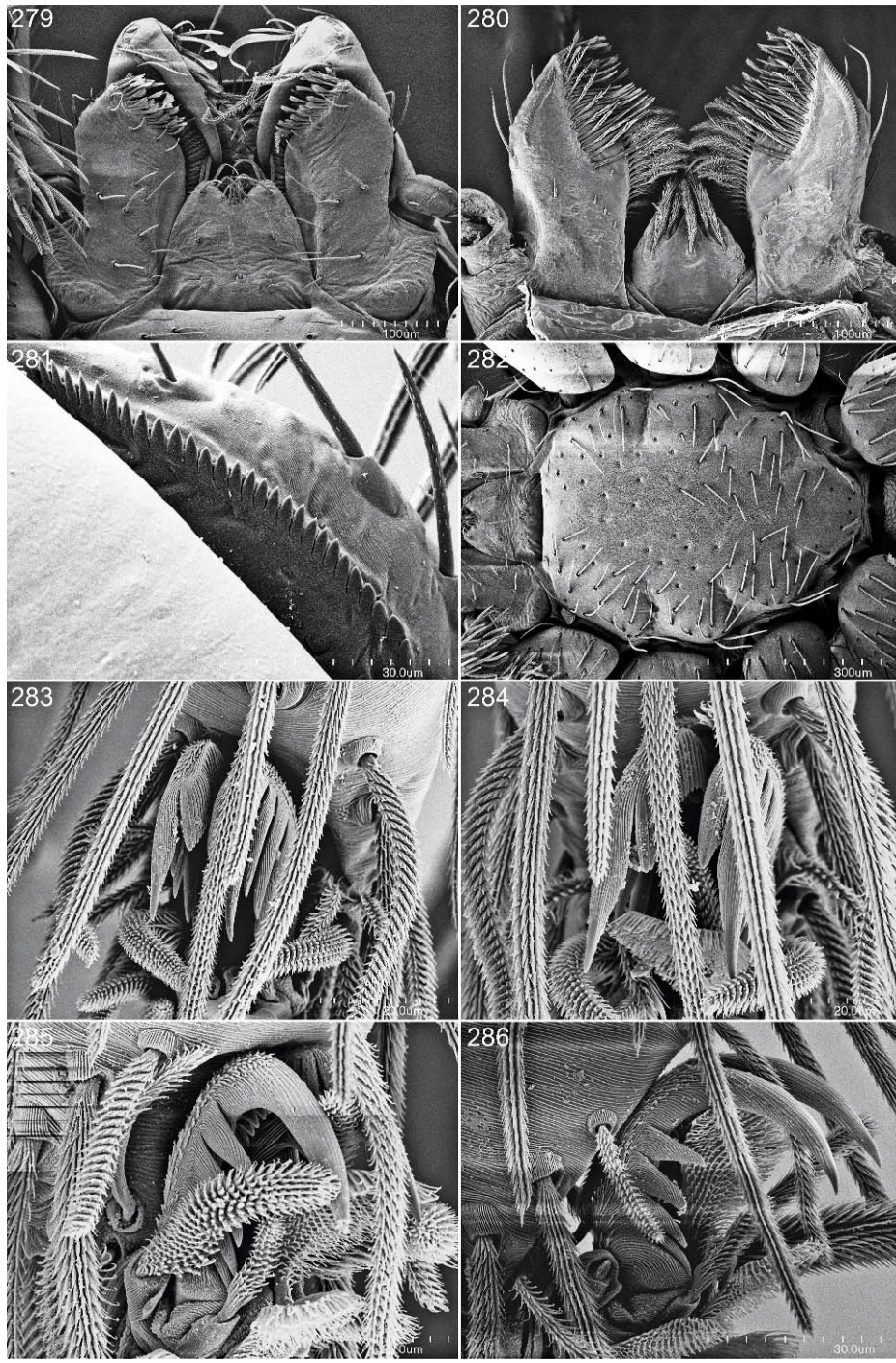
Figs. 255–262. *Niarchos scutatus*, new species, male. **255.** Claws, leg I, distal view. **256.** Same, leg II. **257.** Same, leg III. **258.** Same, leg IV. **259.** Distal portion of tibia III, lateral view. **260.** Same, metatarsus III. **261.** Dorsal scutum, dorsal view. **262.** Sperm pore, ventral view.



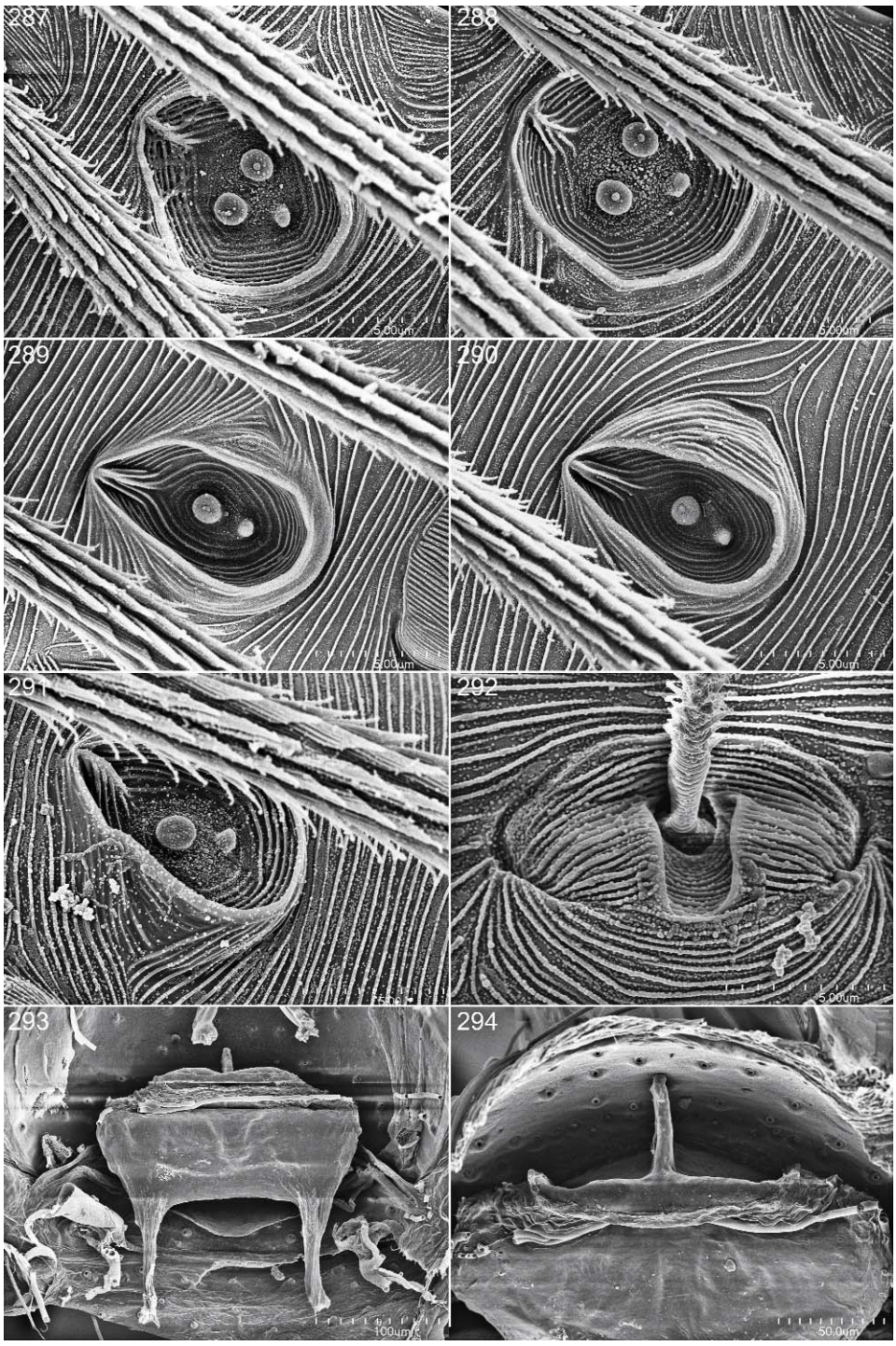
Figs. 263–270. *Niarchos scutatus*, new species, male. **263.** Spinnerets, distal view. **264.** Anterior lateral spinneret, same. **265.** Posterior median spinneret, same. **266.** Posterior lateral spinneret, same. **267.** Palpal femur, dorsal view. **268.** Palpal tibia, dorsal view. **269.** Palp, prolateral view. **270.** Palp, retrolateral view.



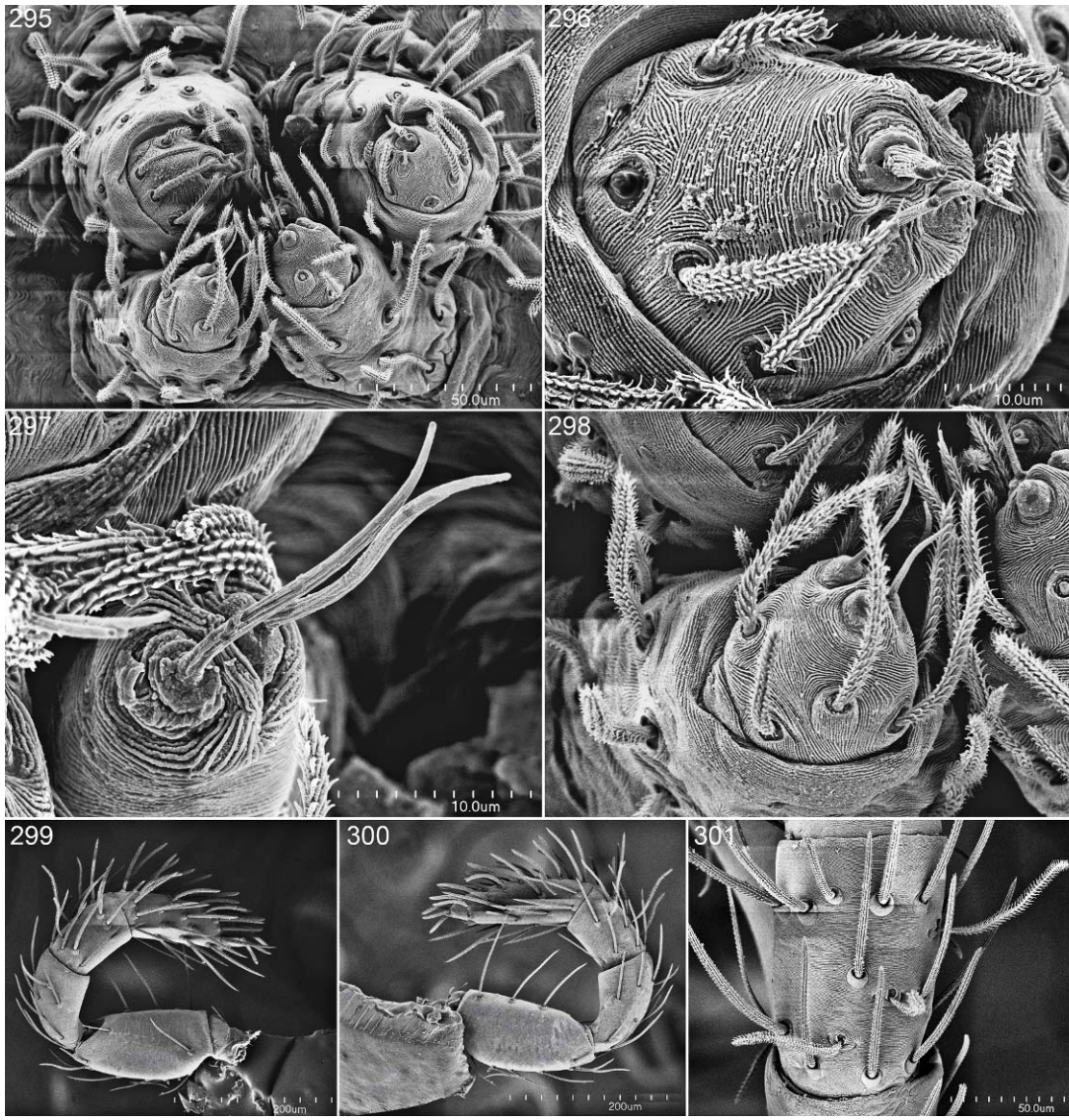
Figs. 271–278. *Niarchos scutatus*, new species. **271.** Male palpal bulb, prolateral view. **272.** Male embolus, ventral view. **273.** Female habitus, dorsal view. **274.** Same, anterior view. **275.** Female carapace, dorsal view. **276.** Same, lateral view. **277.** Female chelicerae, anterior view. **278.** Same, posterior view.



Figs. 279–286. *Niarchos scutatus*, new species, female. **279.** Labium and endites, ventral view. **280.** Labrum and endites, dorsal view. **281.** Serrula, dorsal view. **282.** Sternum, ventral view. **283.** Claws of leg I, distal view. **284.** Same, leg II. **285.** Claws of leg III, lateral view. **286.** Same, leg IV.



Figs. 287–294. *Niarchos scutatus*, new species, female. **287.** Tarsal organ, leg I, dorsal view. **288.** Same, leg II. **289.** Same, leg III. **290.** Same, leg IV. **291.** Same, palp. **292.** Trichobothrial base, metatarsus I, dorsal view. **293.** Genitalia, dorsal view. **294.** Same, anterior view.

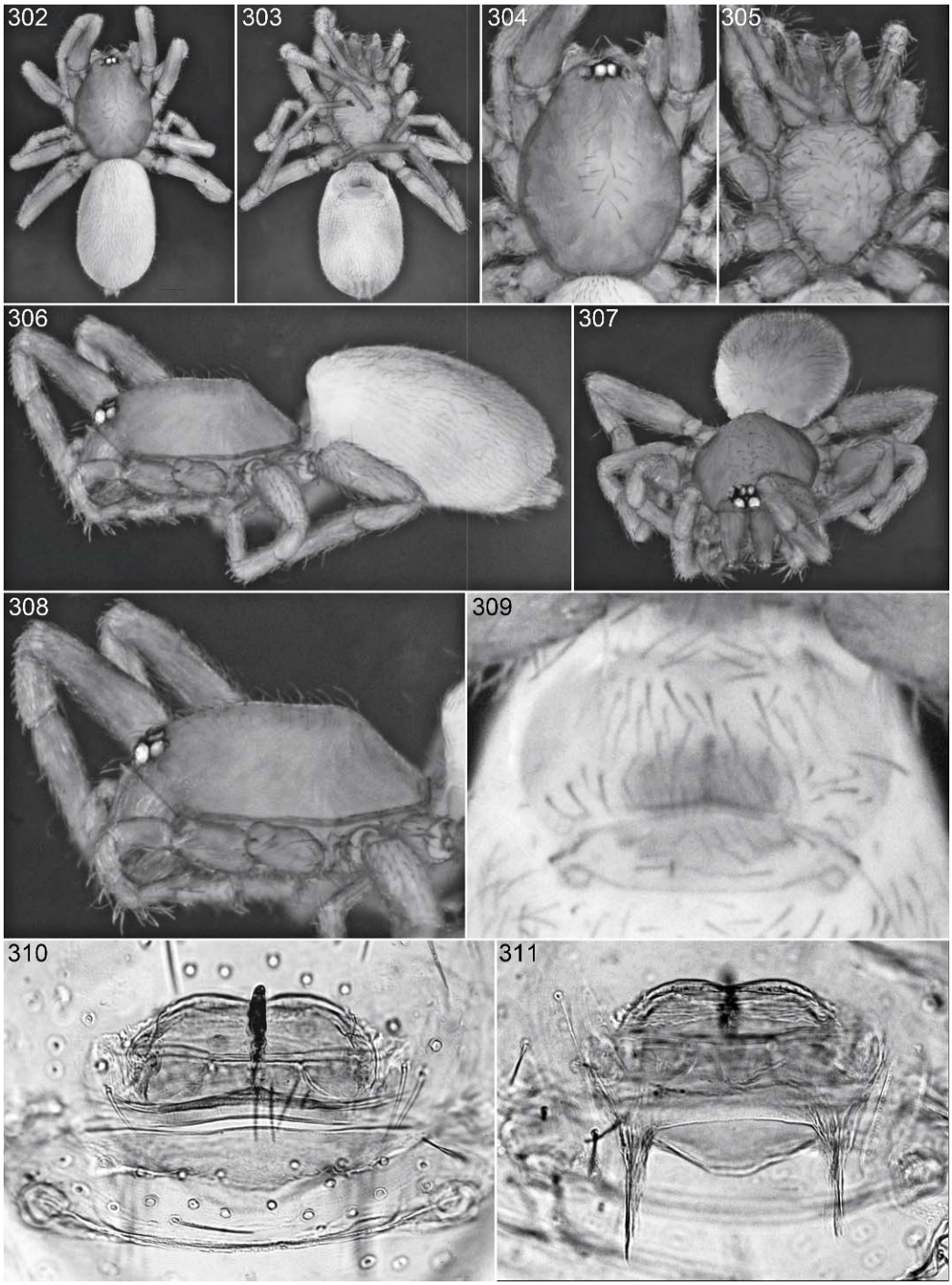


Figs. 295–301. *Niarchos scutatus*, new species, female. **295.** Spinnerets, distal view. **296.** Anterior lateral spinneret, same. **297.** Posterior median spinneret, same. **298.** Posterior lateral spinneret, same. **299.** Palp, prolateral view. **300.** Same, retrolateral view. **301.** Palpal tibia, dorsal view.

half of space between epigastric furrow and posterior spiracles (figs. 310, 311).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Yanayacu Biological Station, trail to San Jorge de Yanayacu Wildlife Refuge, 0.58813°S, 77.88428°W, Nov. 26, 2009, elev. 2140 m (Niarchos Exped., AMNH PBI_OON 40819), 1♀, same, Nov. 30, 2009 (Niarchos Exped., MACN PBI_OON 40820), 1♀, same, Nov. 25–30, 2009 (MACN PBI_OON 439). 1♂; Yanayacu Biological Station, stream trail, 0°35.955′S, 77°53.431′W, Nov. 25, 2009, from epiphytes, elev. 2130 m (Niarchos Exped., AMNH, MACN, QCAZ PBI 407), 3♂, 3♀ (including 1♂ P. Michalik voucher EC-004).

DISTRIBUTION: Known only from the Yanayacu Biological Station in Napo province, Ecuador.



Figs. 302–311. *Niarchos scutatus*, new species, female. **302.** Habitus, dorsal view. **303.** Same, ventral view. **304.** Carapace, dorsal view. **305.** Sternum and mouthparts, ventral view. **306.** Habitus, lateral view. **307.** Same, anterior view. **308.** Carapace, lateral view. **309.** Epigastric region, ventral view. **310.** Genitalia, ventral view. **311.** Same, dorsal view.

Niarchos ramirezi, new species
Figures 312–335

TYPE: Male holotype taken from litter along the Río Perdido trail at an elevation of 2085 m at the Yanayacu Biological Station, 0°36.496′S, 77°52.947′W, Napo, Ecuador (Nov. 26, 2009; Niarchos Exped.), deposited in QCAZ (PBI_OON 410).

ETYMOLOGY: The specific name is a patronym in honor of Martín Ramírez of the Museo Argentino de Ciencias Naturales, in recognition of his enormous contributions to the organization and success of the Niarchos Expedition.

DIAGNOSIS: Males resemble those of *N. scutatus* but have a thinner embolar base and a longer, free embolus (figs. 319–322), and differ from those of *N. bonaldoi* by having a larger protrusion near the embolar base (figs. 324, 325); females resemble those of *N. scutatus* and *N. bonaldoi* but have the sclerite connecting the apodemes narrower at the midline than in those species (figs. 334, 335).

MALE (PBI_OON 410, figs. 312–325): Total length 1.41. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with heavily sclerotized triangular projections directed obliquely. Leg spination: tibiae: III v0-0-1p; IV v0-0-2. Embolus twisted at about half its length; distal part of bulb with triangular protrusion near embolar base (figs. 319–322).

FEMALE (PBI_OON 410, figs. 326–335): Total length 1.68. Leg spination: tibiae: III v0-0-1p; IV v0-1p-2. Anterior receptaculum relatively short, wide, invaginated at middle; postepigastric scutum triangular (figs. 334, 335).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Yanayacu Biological Station, stream trail, 0°35.955′S, 77°53.431′W, Nov. 24–Dec. 2, 2009, pitfall, elev. 2130 m (N. Platnick, N. Dupérré, E. Tapia, Niarchos Exped., AMNH, MACN PBI_OON 408), 2♂ (1 without abdomen); Yanayacu Biological Station, Río Perdido trail, 0°36.496′S, 77°52.947′W, Nov. 26, 2009, litter, elev. 2085 m (Niarchos Exped., AMNH PBI_OON 40821), 1♂, 1♀.

DISTRIBUTION: Known only from the Yanayacu Biological Station in Napo province, Ecuador.

Niarchos bonaldoi, new species
Figures 336–360

TYPES: Male holotype and female allotype from a Berlese sample of litter taken at an elevation of 1005 m in the Parque Nacional Napo-Galeras, 0°44′00″S, 77°28′07″W, Napo, Ecuador (Nov. 27, 2009; Niarchos Expedition), deposited in QCAZ (PBI_OON 440).

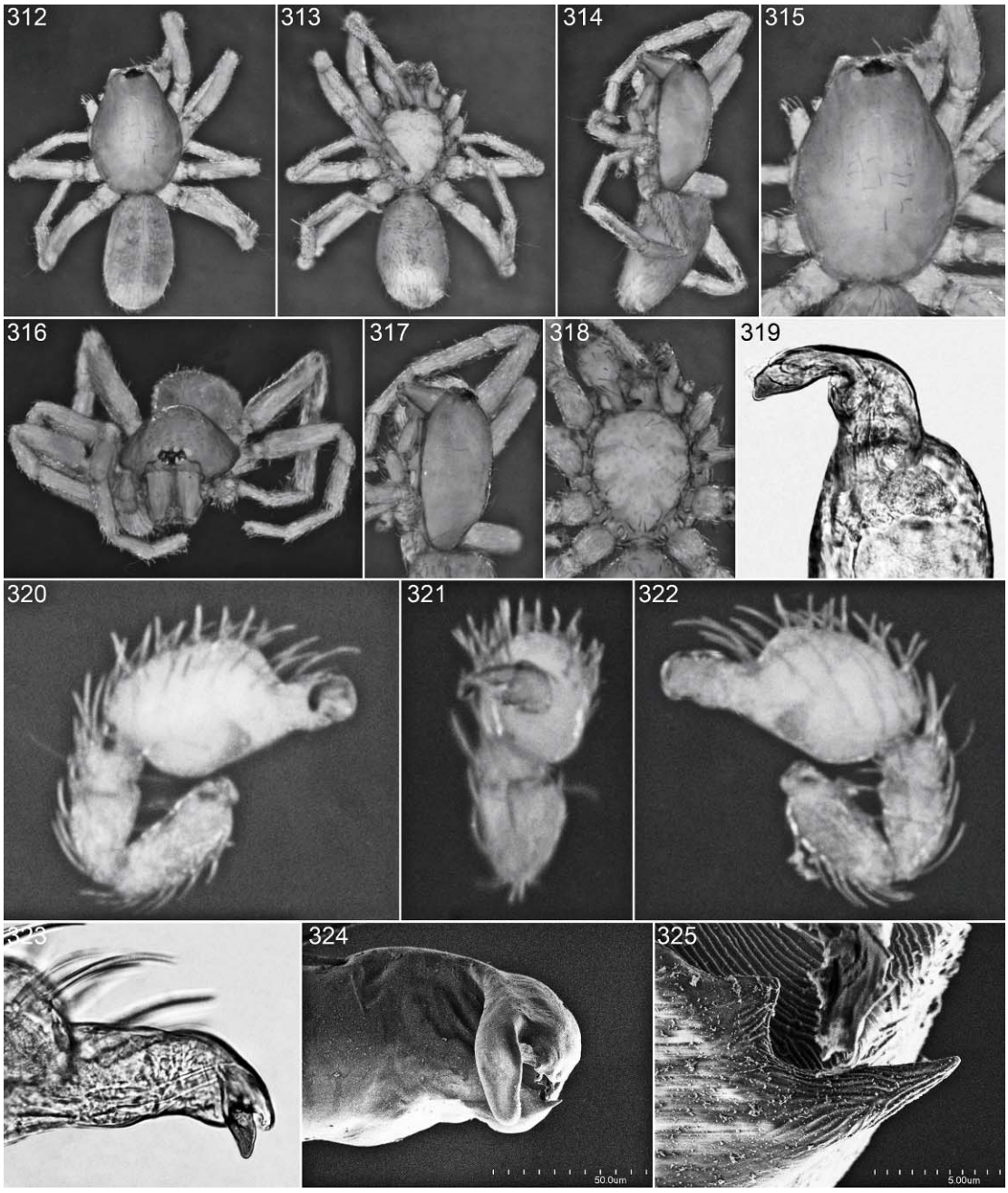
ETYMOLOGY: The specific name is a patronym in honor of Alexandre Bonaldo of the Museu Paraense Emílio Goeldi, in recognition of his enormous contributions to the organization and success of the Niarchos Expedition.

DIAGNOSIS: Males closely resemble those of *N. ramirezi* but have a distally thicker embolus and a less pronounced projection at the base of the embolus (figs. 344–350); females also closely resemble those of *N. ramirezi* but lack the median, distal invagination on the anterior receptaculum and have a shorter postepigastric scutum and thicker, less widely separated apodemes (figs. 359, 360).

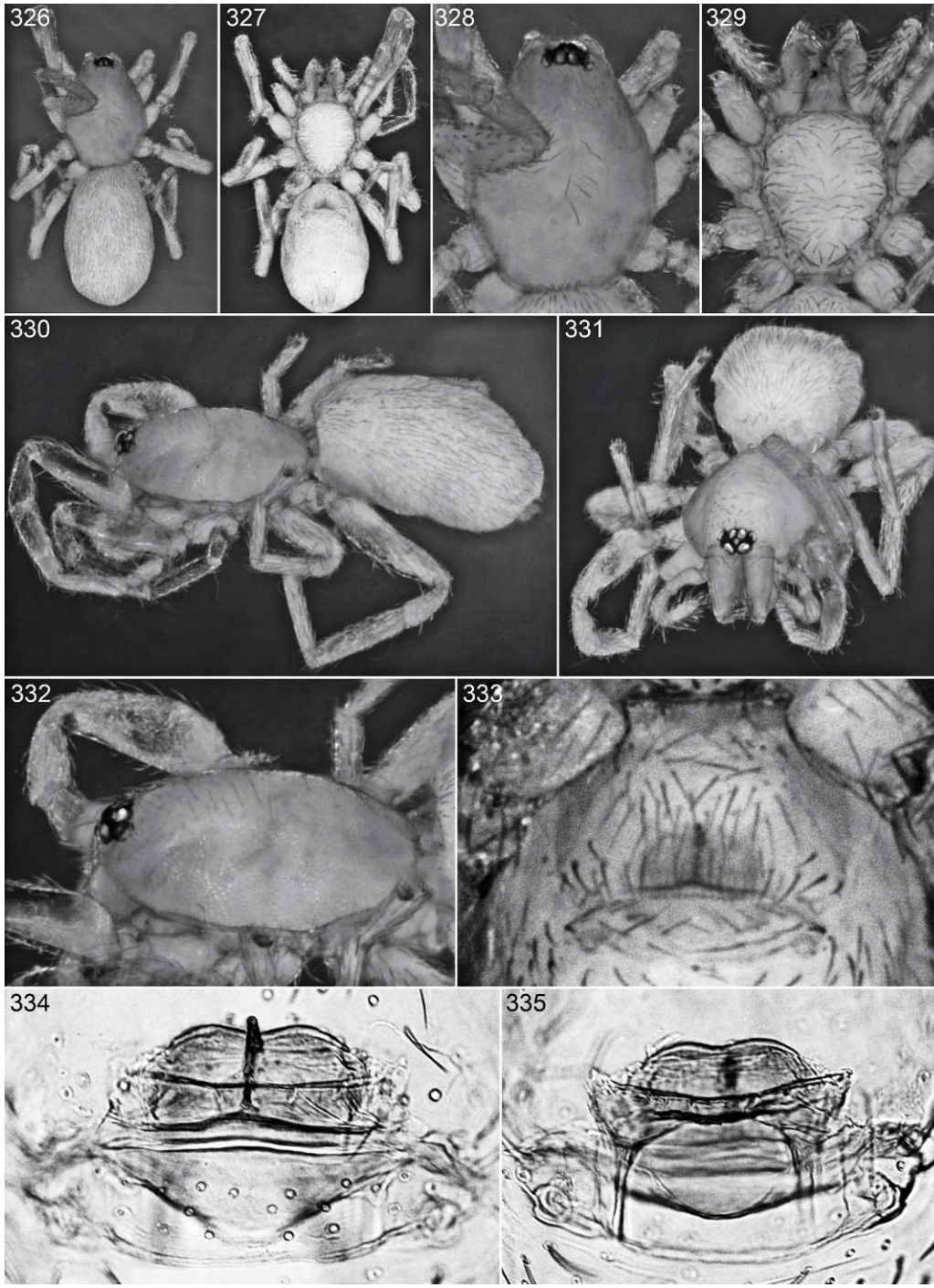
MALE (PBI_OON 440, figs. 336–350): Total length 1.32. Posterior eye row recurved from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with anterior processes triangular, obliquely oriented. Leg spination: tibiae III, IV v0-0-1p. Embolus narrowed at tip; distal part of bulb about half as long, half as wide as basal portion (figs. 344–350).

FEMALE (PBI_OON 440, figs. 351–360): Total length 1.32. Leg spination: tibiae III, IV v0-0-1p. Anterior receptaculum with arched anterior margin not invaginated at middle; epigastric scutum very short; apodemes relatively wide, with relatively thick base (figs. 359, 360).

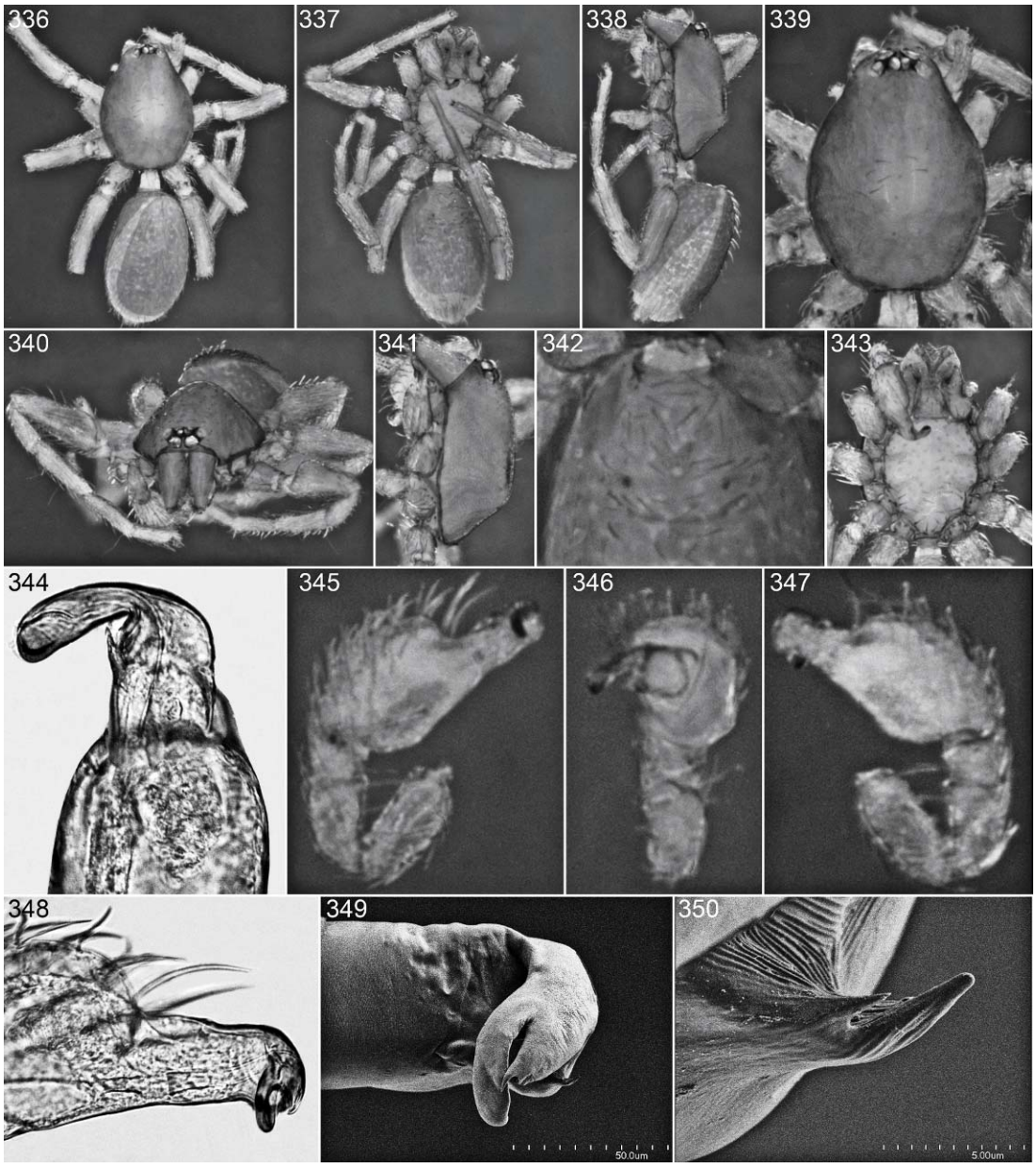
OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Parque Nacional Napo-Galeras, 0°44′00″S, 77°28′07″W, Nov. 27, 2009, litter, elev. 1005 m (Niarchos Exped., AMNH PBI_OON 412), 1♂, 1♀; Parque Nacional Napo-Galeras, 0°44′37″S, 77°35′29″W, Nov. 27, 2009, litter, elev. 1065 m (Niarchos Exped., AMNH PBI_OON 413), 1♀.



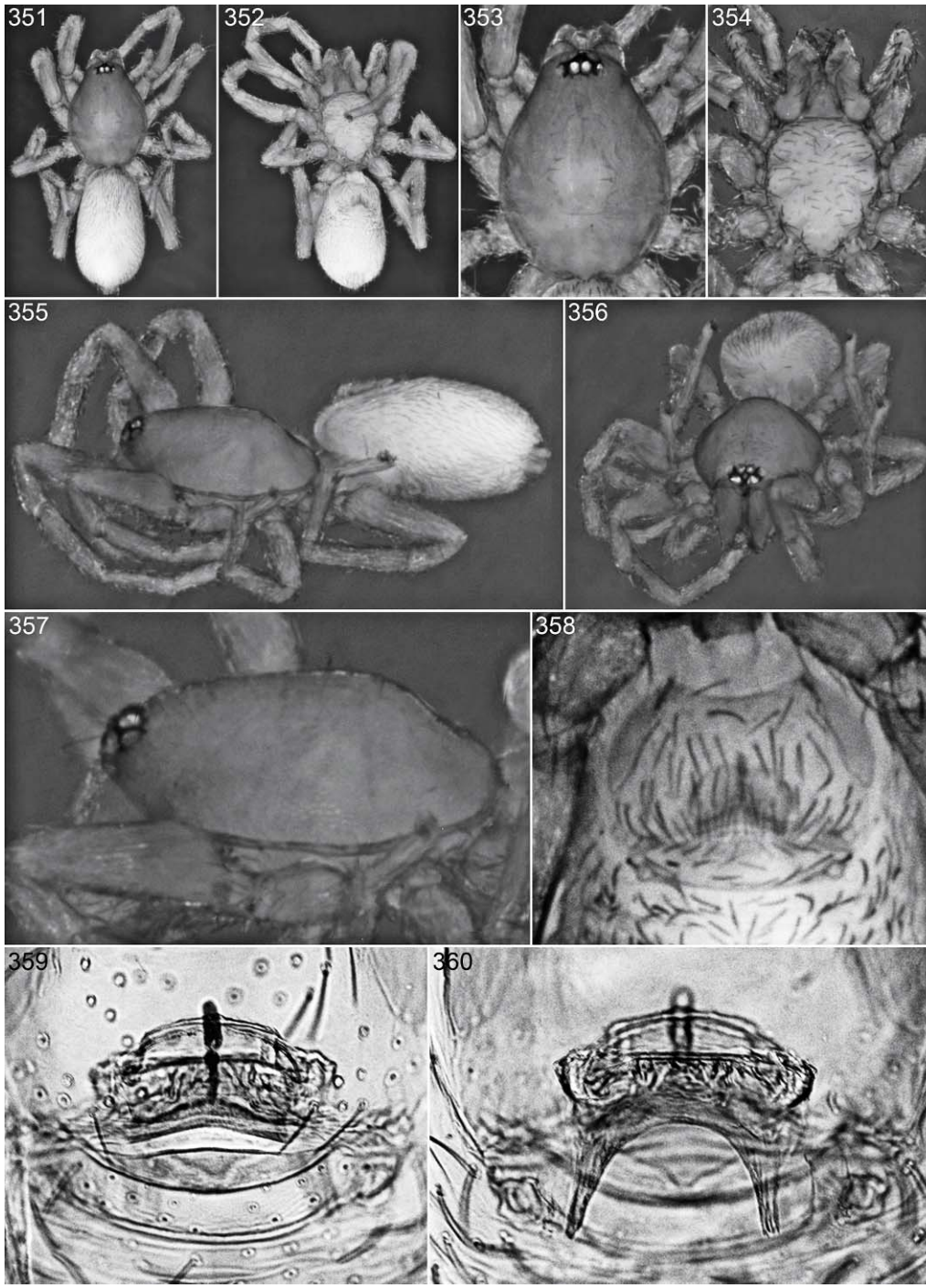
Figs. 312–325. *Niarchos ramirezi*, new species, male. **312.** Habitus, dorsal view. **313.** Same, ventral view. **314.** Same, lateral view. **315.** Carapace, dorsal view. **316.** Habitus, anterior view. **317.** Carapace, lateral view. **318.** Sternum and mouthparts, ventral view. **319.** Embolus, posterior view. **320.** Palp, prolateral view. **321.** Same, ventral view. **322.** Same, retrolateral view. **323.** Embolus, prolateral view. **324.** Tip of palp, prolateral view. **325.** Same, enlarged.



Figs. 326–335. *Niarchos ramirezi*, new species, female. **326.** Habitus, dorsal view. **327.** Same, ventral view. **328.** Carapace, dorsal view. **329.** Sternum and mouthparts, ventral view. **330.** Habitus, lateral view. **331.** Same, anterior view. **332.** Carapace, lateral view. **333.** Epigastric region, ventral view. **334.** Genitalia, ventral view. **335.** Same, dorsal view.



Figs. 336–350. *Niarchos bonaldoi*, new species, male. **336.** Habitus, dorsal view. **337.** Same, ventral view. **338.** Same, lateral view. **339.** Carapace, dorsal view. **340.** Habitus, anterior view. **341.** Carapace, lateral view. **342.** Epigastric region, ventral view. **343.** Sternum and mouthparts, ventral view. **344.** Embolus, posteroventral view. **345.** Palp, prolateral view. **346.** Same, ventral view. **347.** Same, retrolateral view. **348.** Embolus, prolateral view. **349.** Tip of palp, prolateral view. **350.** Same, detail.



Figs. 351–360. *Niarchos bonaldoi*, new species, female. **351.** Habitus, dorsal view. **352.** Same, ventral view. **353.** Carapace, dorsal view. **354.** Sternum and mouthparts, ventral view. **355.** Habitus, lateral view. **356.** Same, anterior view. **357.** Carapace, lateral view. **358.** Epigastric region, ventral view. **359.** Genitalia, ventral view. **360.** Same, dorsal view.

DISTRIBUTION: Known only from the Parque Nacional Napo-Galeras in Napo province, Ecuador.

Niarchos vegai, new species
Figures 361–385

TYPE: Female holotype taken from litter at an elevation of 410 m at the Jatun Sacha Biological Station, 1°03′57.5″S, 77°37′00.2″W, Napo, Ecuador (Dec. 1–5, 2009; L. Benavides, Niarchos Exped.), deposited in QCAZ (PBI_OON 445).

ETYMOLOGY: The specific name is a patronym in honor of Mauricio Vega, in recognition of his enormous contributions to the organization and success of the Niarchos Expedition.

DIAGNOSIS: Males and females have not been taken together, but are here tentatively paired on the basis of geography and the similarities of both sexes to those of the preceding three species. Males closely resemble those of *N. ramirezi* and *N. bonaldoi,* but the embolus is distally thicker than in either of those species (figs. 369–375) and the anterior projection on the endites is smaller and more medially directed (fig. 368). Females have heavily sclerotized apodemes readily visible in ventral view (figs. 384, 385).

MALE (PBI_OON 415, figs. 361–375): Total length 1.10. Posterior eye row recurved from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with anterior processes small, heavily sclerotized only near tip, tip directed posteriorly. Leg spination: tibiae IV v0-0-1p. Embolus long, straight, distally widened (figs. 369–375).

FEMALE (PBI_OON 445, figs. 376–385): Total length 1.56. PME separated by their radius to diameter, PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Leg spination: tibiae: III v0-0-1p; IV v0-1p-2. Posterior margin of anterior receptaculum outlined by heavily sclerotized apodemes visible in ventral view (figs. 384, 385).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Sacha Wagra Lodge, Río Hollín, 10 km from Archidona, 0°57′18″S, 77°44′51.3″W, Nov. 29, 2009, Berlese, litter from moist forest with karst rocks, elev. 750 m (M. Ramírez, C. Grismado, M. Izquierdo, F. Labarque, Niarchos Exped., MACN PBI_OON 441), 1♂; Sacha Wagra Lodge, Río Hollín, 0°57′18″S, 77°44′51″W, Nov. 29, 2009, litter, elev. 665 m (Niarchos Exped., QCAZ PBI_OON 415), 1♂.

DISTRIBUTION: Known only from Napo province, Ecuador.

Niarchos santosi, new species
Figures 386–406

TYPE: Male holotype from Berlese sample of forest litter taken at an elevation of 250 m at Limoncocha, Sucumbios, Ecuador (June 25, 1976; S. Peck), deposited in FMNH (33720, PBI_OON 10212).

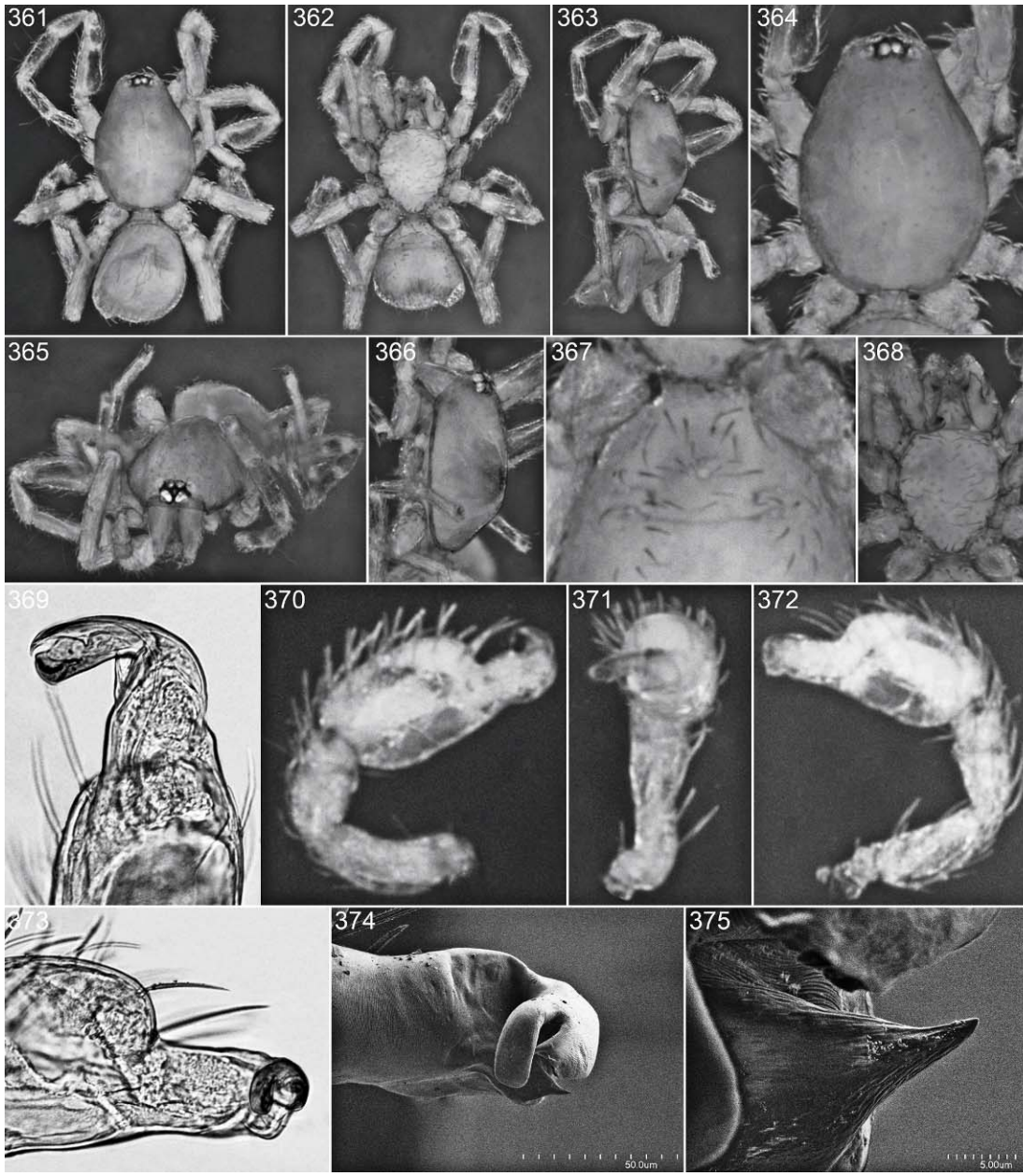
ETYMOLOGY: The specific name is a patronym in honor of Adalberto Santos, of the Universidade Federal de Minas Gerais, in recognition of his many contributions to the success of the Niarchos Expedition.

DIAGNOSIS: Males can easily be recognized by the long, narrow distal flange on the embolus (figs. 392–396), females by the procurved sclerotization near the posterior margin of the epigastric scutum (figs. 404–406).

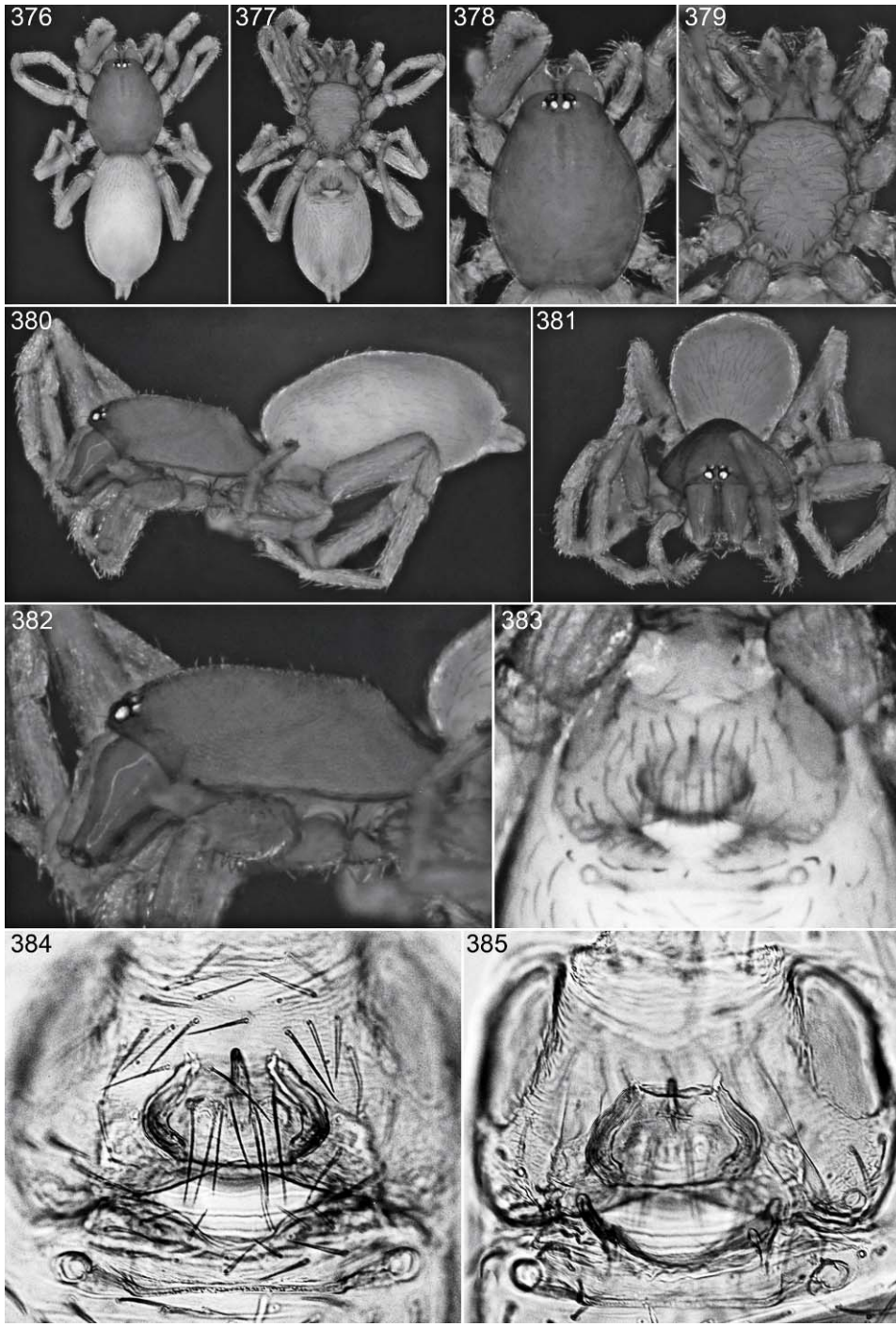
MALE (PBI_OON 10212, figs. 386–396): Total length 1.25. Posterior eye row recurved from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with anterior projections situated almost apically. Leg spination: tibiae IV v0-0-1p. Embolus with long, narrow distal flange (figs. 392–396).

FEMALE (PBI_OON 10225, figs. 397–406): Total length 1.34. Leg spination: tibiae IV v0-0-1p. Anterior receptaculum with narrow median rod (figs. 405, 406).

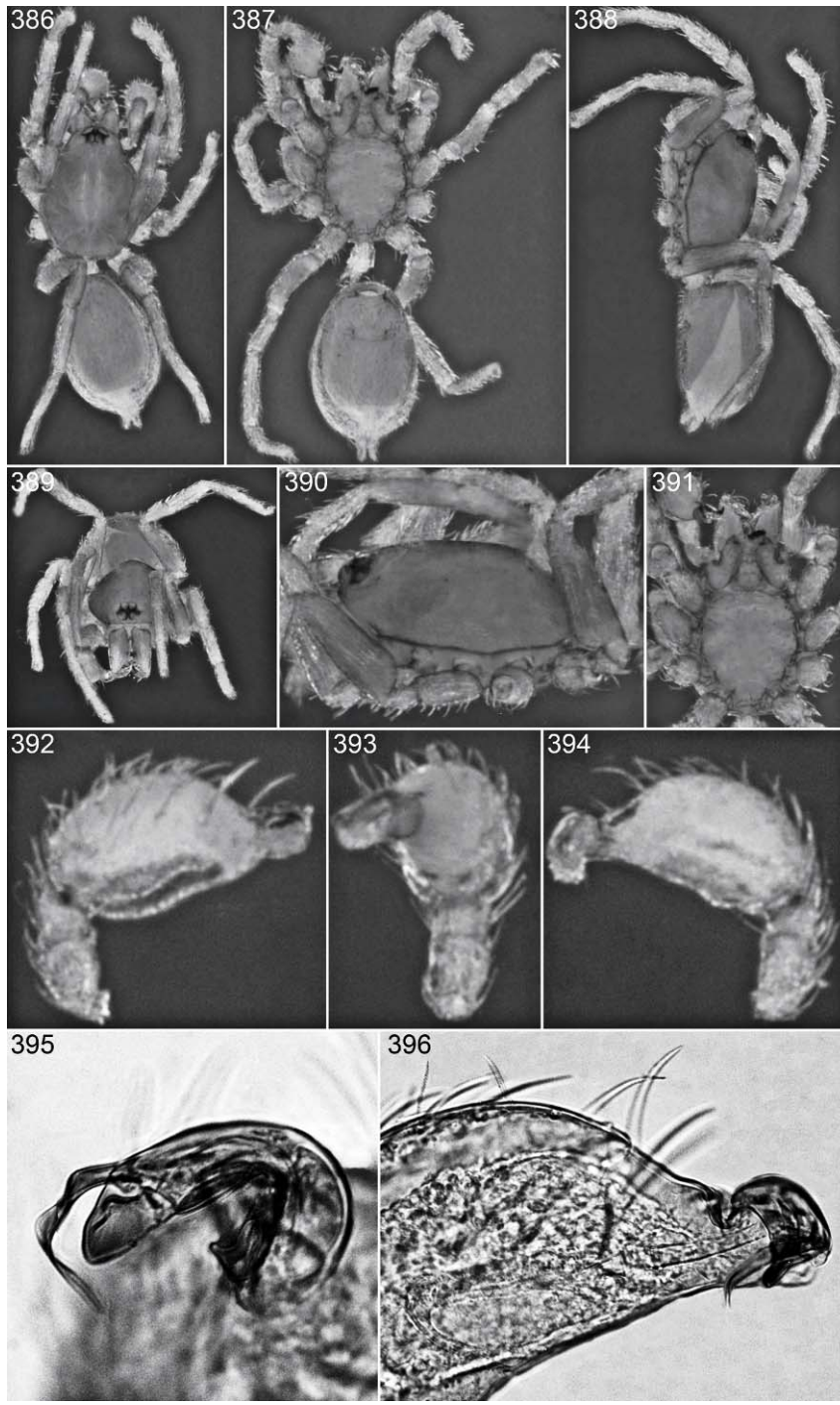
OTHER MATERIAL EXAMINED: **Ecuador:** *Orellana:* Reserva Etnica Waorani, 1 km S Onkone Gare Camp, 0°39′25.77″S, 76°27′10.8″W, Oct. 8, 1995, elev. 216 m (T. Erwin et al., USNM 2044717, PBI_OON 442), 1♂, 3♀. *Sucumbios:* Limoncocha, June 18, 1976, Berlese, *Ficus* litter with fruits, elev. 250 m (S. Peck, FMNH PBI_OON 38347), 1♀, June 21, 1976, Berlese, *Bactris* spiny palm, elev. 250 m (S. Peck, FMNH 33723, PBI_OON 10225), 2♂, 1♀.



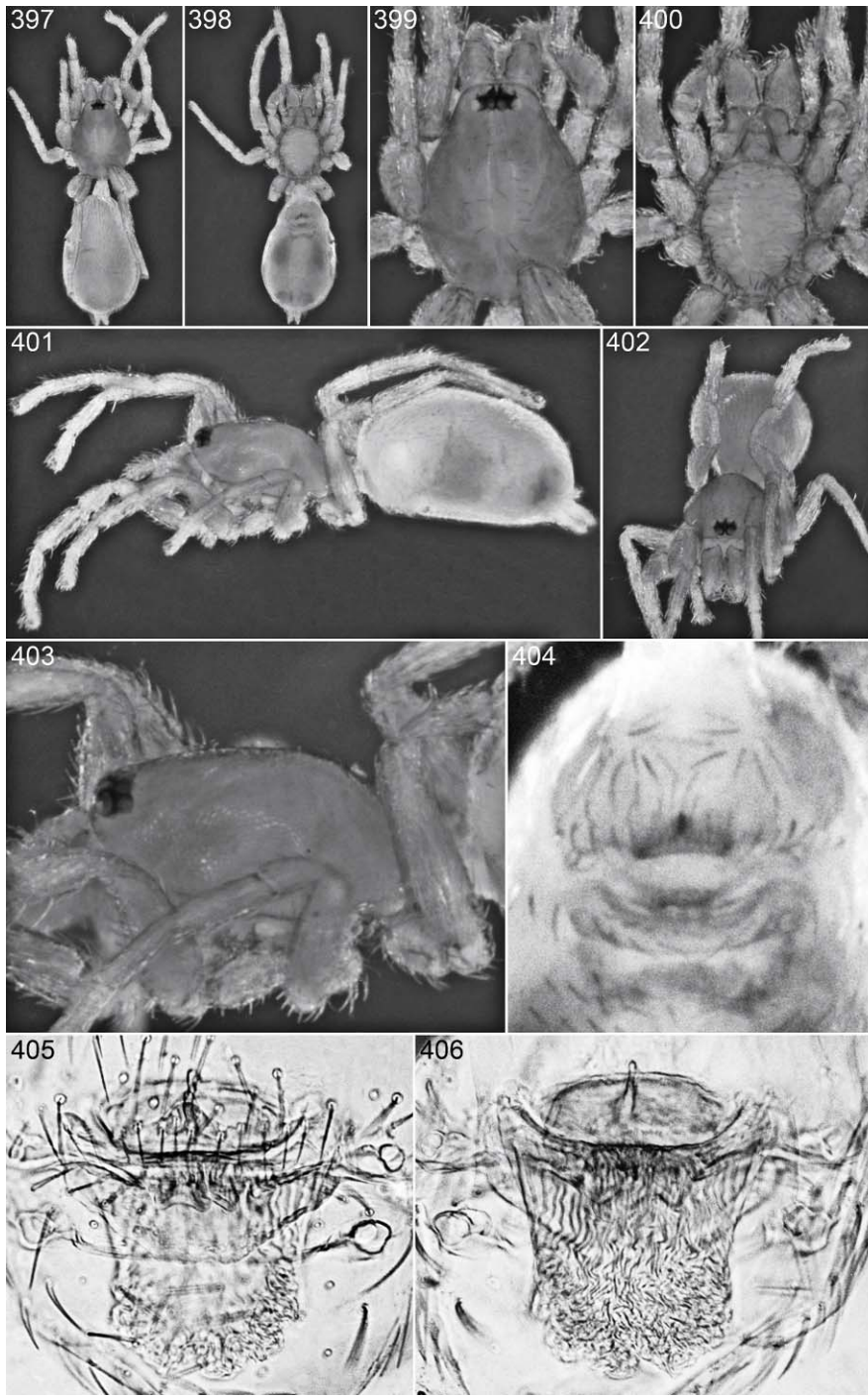
Figs. 361–375. *Niarchos vegai*, new species, male. **361.** Habitus, dorsal view. **362.** Same, ventral view. **363.** Same, lateral view. **364.** Carapace, dorsal view. **365.** Habitus, anterior view. **366.** Carapace, lateral view. **367.** Epigastric region, ventral view. **368.** Sternum and mouthparts, ventral view. **369.** Embolus, posteroventral view. **370.** Palp, prolateral view. **371.** Same, ventral view. **372.** Same, retrolateral view. **373.** Embolus, prolateral view. **374.** Tip of palp, prolateral view. **375.** Same, detail.



Figs. 376–385. *Niarchos vegai*, new species, female. **376.** Habitus, dorsal view. **377.** Same, ventral view. **378.** Carapace, dorsal view. **379.** Sternum and mouthparts, ventral view. **380.** Habitus, lateral view. **381.** Same, anterior view. **382.** Carapace, lateral view. **383.** Epigastric region, ventral view. **384.** Genitalia, ventral view. **385.** Same, dorsal view.



Figs. 386–396. *Niarchos santosi*, new species, male. **386.** Habitus, dorsal view. **387.** Same, ventral view. **388.** Same, lateral view. **389.** Same, anterior view. **390.** Carapace, lateral view. **391.** Sternum and mouthparts, ventral view. **392.** Palp, prolateral view. **393.** Same, ventral view. **394.** Same, retrolateral view. **395.** Embolus, posteroventral view. **396.** Same, prolateral view.



Figs. 397–406. *Niarchos santosi*, new species, female. **397.** Habitus, dorsal view. **398.** Same, ventral view. **399.** Carapace, dorsal view. **400.** Sternum and mouthparts, ventral view. **401.** Habitus, lateral view. **402.** Same, anterior view. **403.** Carapace, lateral view. **404.** Epigastric region, ventral view. **405.** Genitalia, ventral view. **406.** Same, dorsal view.

DISTRIBUTION: Relatively lowland areas in Orellana and Sucumbios provinces of northeastern Ecuador.

Niarchos michaliki, new species
Figures 407–429

TYPES: Male holotype and female allotype taken from litter at an elevation of 1005 m in the Parque Nacional Napo-Galeras, 0°44′00″S, 77°28′07″W, Napo, Ecuador (Nov. 27, 2009; Niarchos Exped.), deposited in QCAZ (PBI_OON 411).

ETYMOLOGY: The specific name is a patronym in honor of Peter Michalik of the Zoological Institute, University of Greifswald, in recognition of his many contributions to the success of the Niarchos Expedition.

DIAGNOSIS: Males resemble those of *N. ligiae* in having the dorsal abdominal scutum reduced to just a narrow strip covering the cardiac area (fig. 407) and the epigastric scutum reduced to the spiracular area (fig. 413), but can be distinguished by the shorter, thicker dorsal prong of the embolus (figs. 415–419). Females also resemble those of *N. ligiae* but have a much longer median section of the postepigastric scutum (figs. 428, 429).

MALE (PBI_OON 411, figs. 407–419): Total length 1.17. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with triangular anterior projections, tip pointing laterally. Leg spination: tibiae: III v0-0-1p; IV v0-0-2. Embolar base with strongly sclerotized ventral projection and hairlike, curved dorsal projection (figs. 415–419).

FEMALE (PBI_OON 411, figs. 420–429): Total length 1.78. Leg spination: tibiae: III v0-0-1p; IV v0-0-2. Anterior receptaculum with wide median sclerotization extending slightly farther anteriorly than rounded anterior margin; postepigastric scutum with relatively long median sclerotization, reaching almost to posterior spiracular groove (figs. 428, 429).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from the Parque Nacional Napo-Galeras in Napo province, Ecuador.

Niarchos ligiae, new species
Figures 430–452

TYPE: Male holotype taken in litter at an elevation of 665 m at Sacha Wagra Lodge, Río Hollín, 0°57′18″S, 77°44′51″W, Napo, Ecuador (Nov. 29, 2009; Niarchos Exped.), deposited in QCAZ (PBI_OON 414).

ETYMOLOGY: The specific name is a patronym in honor of Ligia Benavides, in recognition of her many contributions to the success of the Niarchos Expedition and her continuing assistance with our efforts to document the oonopid faunas of Colombia and Ecuador.

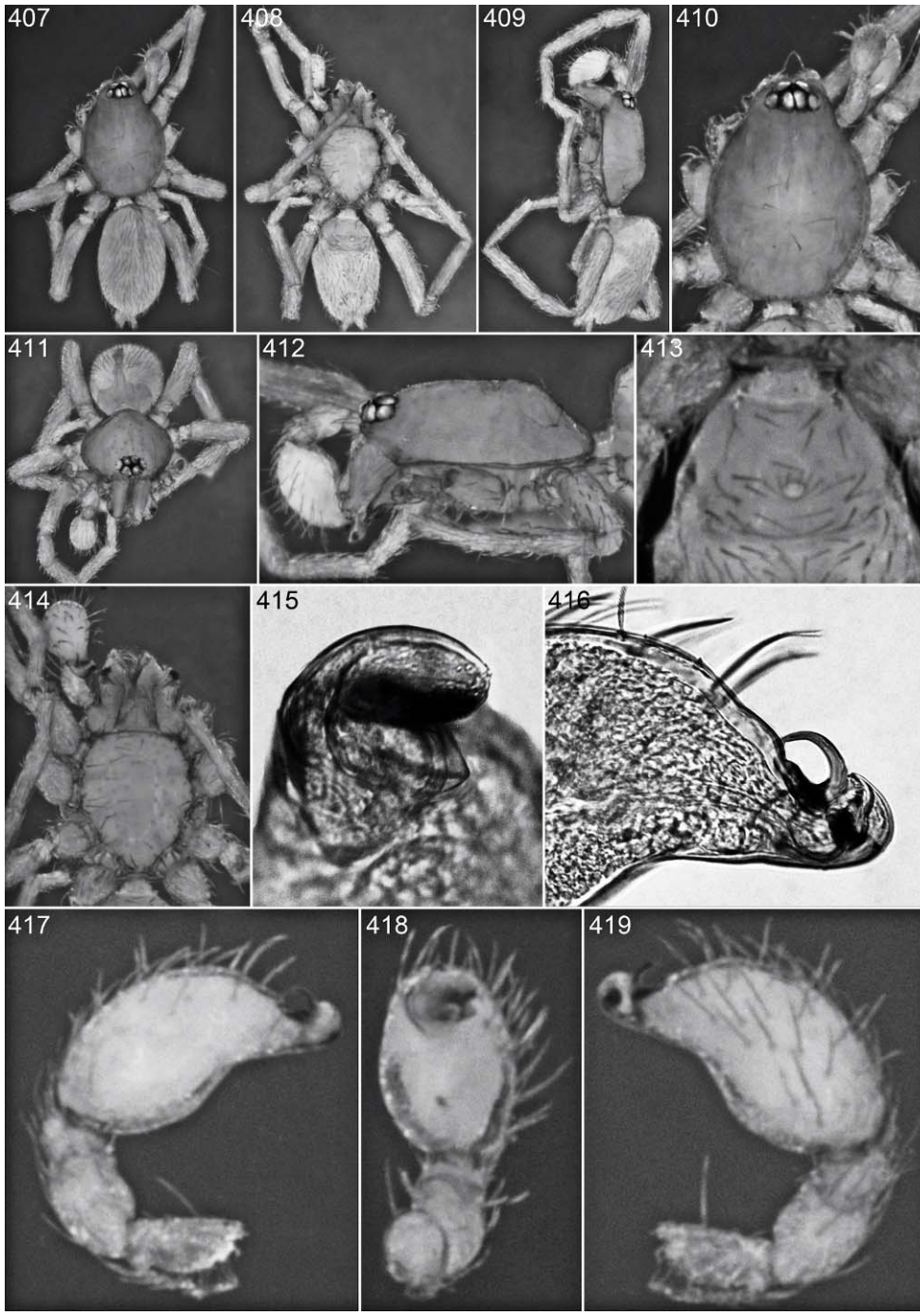
DIAGNOSIS: Males and females have not been collected together, but are tentatively matched here because they appear to be the closest relatives of the males and females of *N. michaliki*, respectively. Males have the dorsal abdominal scutum reduced even more than in that species (fig. 430), and have a longer, narrower dorsal prong of the embolus (figs. 439–442); females have a much shorter median section of the postepigastric scutum (figs. 451, 452).

MALE (PBI_OON 414, figs. 430–442): Total length 1.32. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with triangular anterior projections directed laterally. Leg spination: tibiae III, IV v0-0-1p. Embolar base with triangular projection on ventral side, hairlike projection on dorsal side (figs. 439–442.

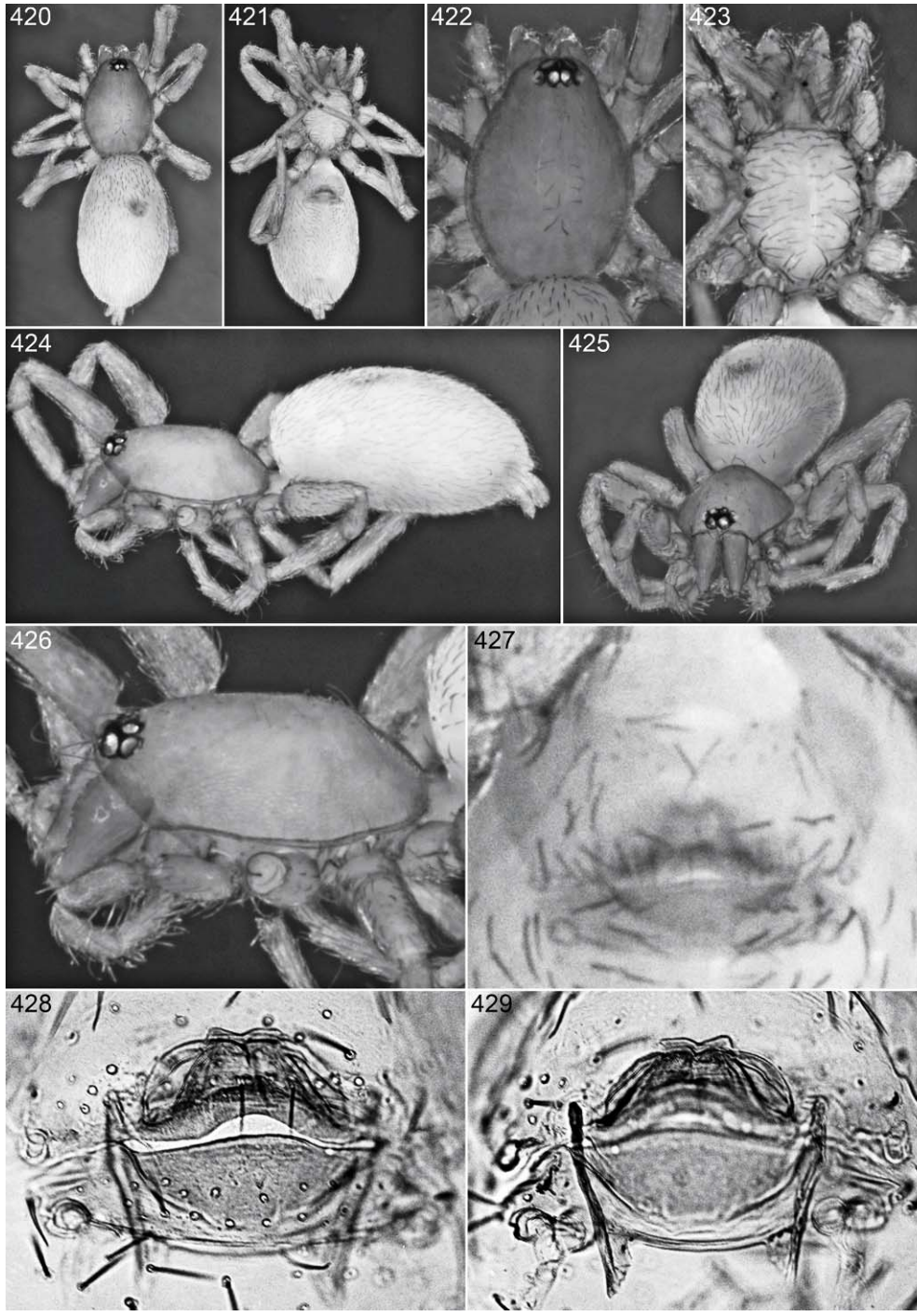
FEMALE (PBI_OON 430, figs. 443–452): Total length 1.68. Posterior eye row procurved from above. Leg spination: tibiae III, IV v0-0-2. Anterior receptaculum with wide median sclerotization extending about as far anteriorly as rounded anterior margin; postepigastric scutum with relatively short median sclerotization, not reaching close to posterior spiracular groove (figs. 451, 452).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Jatun Sacha Biological Station, 1°03′57.5″S, 77°37′00.2″W, Dec. 1–5, 2009, pitfall, elev. 410 m (A. Santos, C. Rheims, Niarchos Exped., IBSP PBI_OON 430), 1♀.

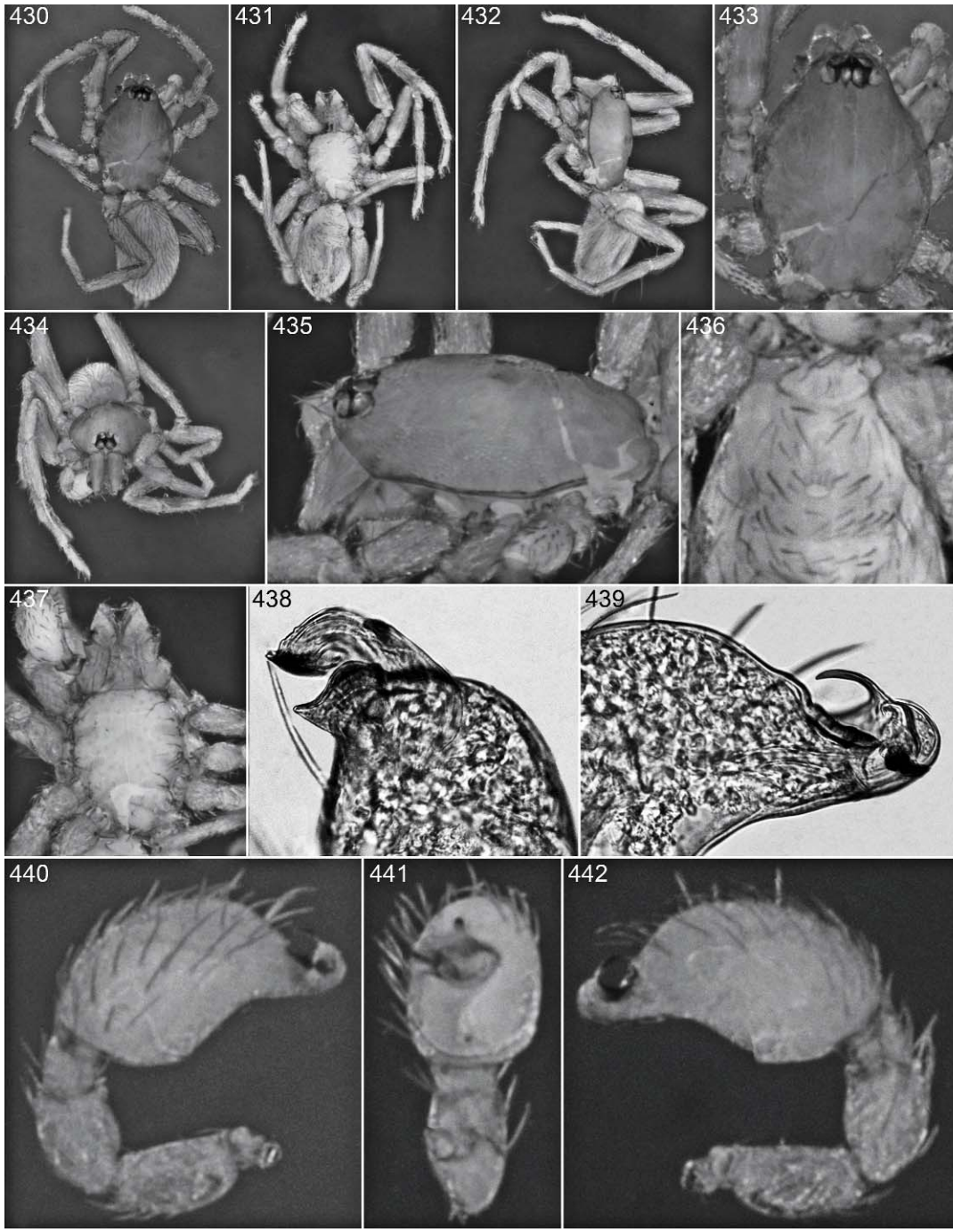
DISTRIBUTION: Known only from Napo province, Ecuador.



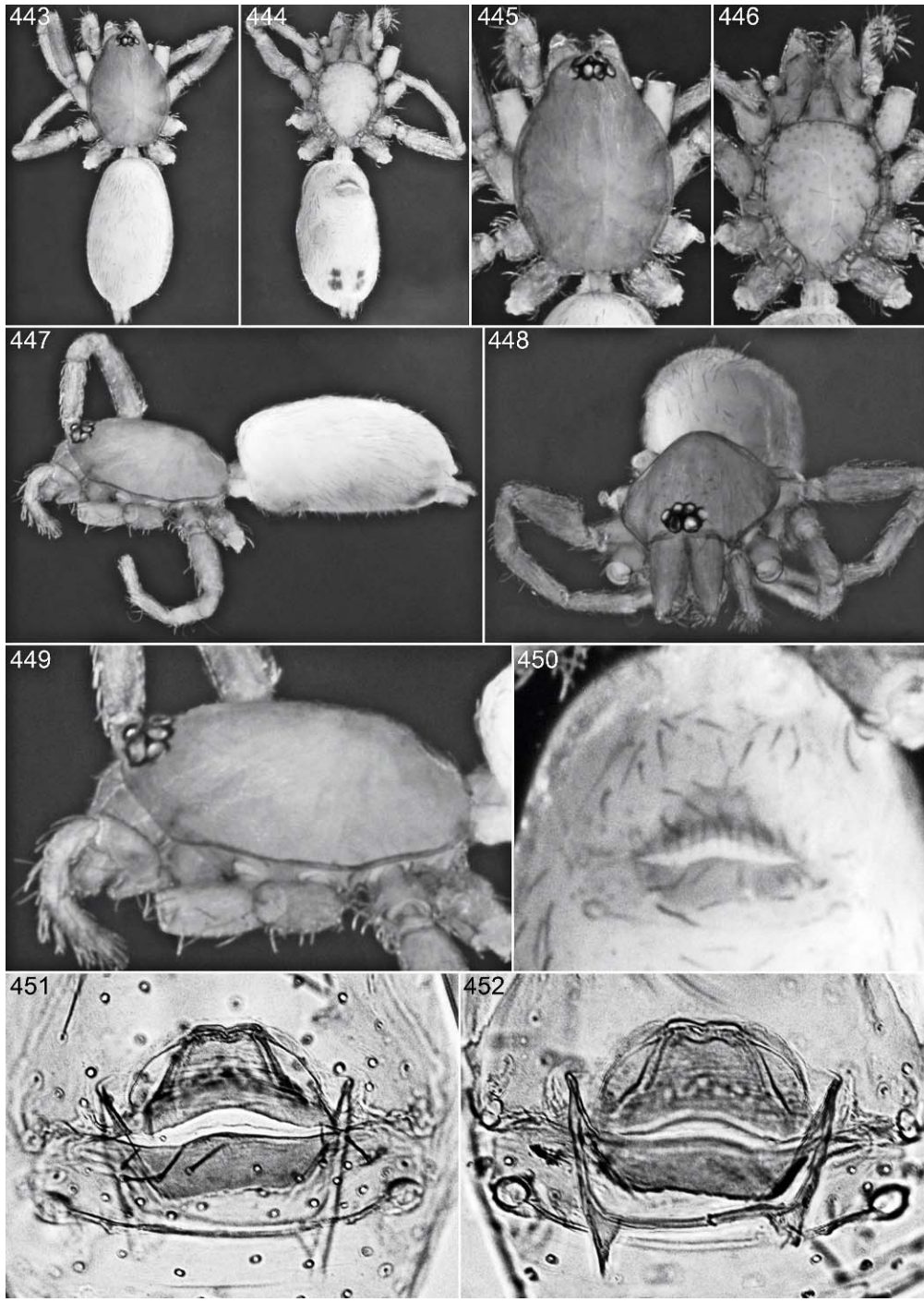
Figs. 407–419. *Niarchos michaliki*, new species, male. **407.** Habitus, dorsal view. **408.** Same, ventral view. **409.** Same, lateral view. **410.** Carapace, dorsal view. **411.** Habitus, anterior view. **412.** Carapace, lateral view. **413.** Epigastric region, ventral view. **414.** Sternum and mouthparts, ventral view. **415.** Embolus, posteroventral view. **416.** Same, prolateral view. **417.** Palp, prolateral view. **418.** Same, ventral view. **419.** Same, retrolateral view.



Figs. 420–429. *Niarchos michaliki*, new species, female. **420.** Habitus, dorsal view. **421.** Same, ventral view. **422.** Carapace, dorsal view. **423.** Sternum and mouthparts, ventral view. **424.** Habitus, lateral view. **425.** Same, anterior view. **426.** Carapace, lateral view. **427.** Epigastric region, ventral view. **428.** Genitalia, ventral view. **429.** Same, dorsal view.



Figs. 430–442. *Niarchos ligiae*, new species, male. **430.** Habitus, dorsal view. **431.** Same, ventral view. **432.** Same, lateral view. **433.** Carapace, dorsal view. **434.** Habitus, anterior view. **435.** Carapace, lateral view. **436.** Epigastric region, ventral view. **437.** Sternum and mouthparts, ventral view. **438.** Embolus, posteroventral view. **439.** Same, prolateral view. **440.** Palp, prolateral view. **441.** Same, ventral view. **442.** Same, retrolateral view.



Figs. 443–452. *Niarchos ligiae*, new species, female. **443.** Habitus, dorsal view. **444.** Same, ventral view. **445.** Carapace, dorsal view. **446.** Sternum and mouthparts, ventral view. **447.** Habitus, lateral view. **448.** Same, anterior view. **449.** Carapace, lateral view. **450.** Epigastric region, ventral view. **451.** Genitalia, ventral view. **452.** Same, dorsal view.

The *loja* Group

This group includes two species from southern Ecuador and northern Peru that are united by an elongated embolus originating distally on the bulb and protruding far beyond the bulb itself (figs. 461, 484). Females resemble those of the *cotopaxi* and *scutatus* groups in having a globose, tentlike anterior receptaculum (figs. 475, 560).

Niarchos loja, new species
Figures 453–475

TYPES: Male holotype and female allotype taken under mossy stones at an elevation of 2100 m at Celica, 4.09896°S, 79.97994°W, Loja, Ecuador (Feb. 25, 2010; E. Tapia), deposited in QCAZ (PBI_OON 449).

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

DIAGNOSIS: Males can easily be recognized by the deeply bifid embolus accompanied by a long, basal process (figs. 461–465), females by the heavily sclerotized, Y-shaped anterior genitalic process (figs. 474, 475).

MALE (PBI_OON 449, figs. 453–465): Total length 1.72. Posterior eye row straight from above; PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Endites with anterior projections distally situated, small, at apex of longitudinal ridge. Leg spination: tibiae: III v0-0-1p; IV v0-0-2. Embolus darkened, narrowed at tip, accompanied for full length by long, dark, narrow, basal projection (figs. 461–465).

FEMALE (PBI_OON 449, figs. 466–475): Total length 2.22. Leg spination as in male. Anterior genitalic process heavily sclerotized, Y-shaped (figs. 474, 475).

OTHER MATERIAL EXAMINED: One male and one female taken with the types (AMNH PBI_OON 4082), and one female from Peru: Cajamarca: San Ignacio, Santuario Nacional Tabaconas-Namballe, Oct. 2007 (S. Castro, MELM PBI_OON 15054).

DISTRIBUTION: Known only from southern Ecuador and northern Peru.

Niarchos foreroi, new species
Figures 476–560

TYPES: Male holotype and female allotype taken under mossy stones at an elevation of 2100 m at Celica, 4.09896°S, 79.97994°W, Loja, Ecuador (Feb. 25, 2010; E. Tapia), deposited in QCAZ (PBI_OON 450).

ETYMOLOGY: The specific name is a patronym in honor of Dimitri Forero, in recognition of his many helpful contributions to the Niarchos expedition.

DIAGNOSIS: Males can easily be recognized by the sinuous and distally narrowed embolus (figs. 484–488), females by the long, narrow anterior genitalic process (figs. 559, 560).

MALE (PBI_OON 450, figs. 476–519): Total length 1.83. Posterior eye row straight from above. Sternum surface smooth. Endites with anterior projections distally situated, small, at apex of longitudinal ridge. Leg spination: tibiae IV v0-0-1p. Embolus darkened, narrowed at tip, accompanied by membranous element (figs. 484–488, 515–519).

FEMALE (PBI_OON 450, figs. 520–560): Total length 1.94. Leg spination: tibiae: III v0-0-1p; IV v0-0-2; metatarsi: III v0-0-1p; IV v0-0-2. Anterior genitalic projection straight, narrow, not distally expanded (figs. 559, 560).

OTHER MATERIAL EXAMINED: Five males and eight females taken with the types (AMNH, MACN, QCAZ PBI_OON 40824).

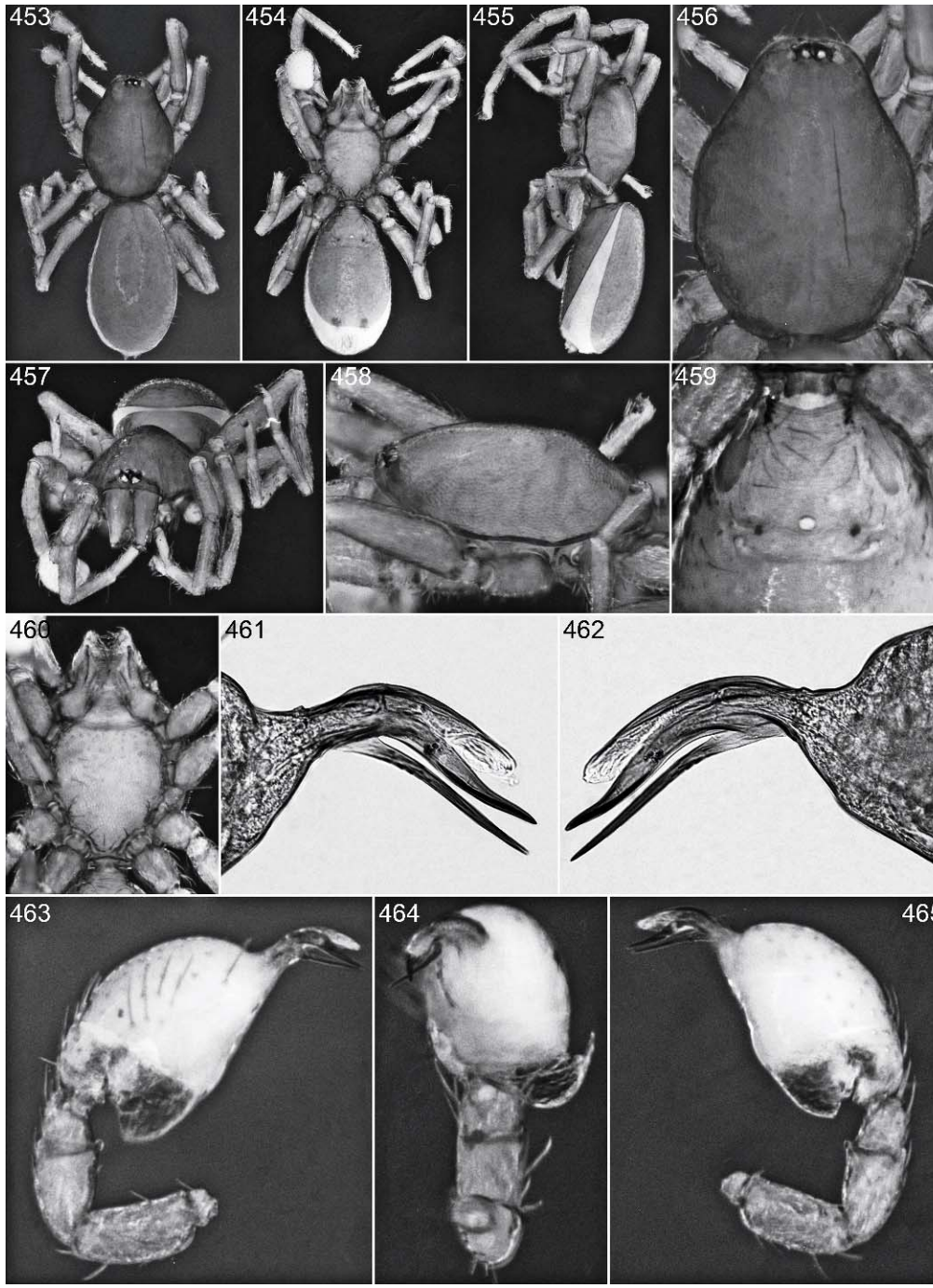
DISTRIBUTION: Known only from Loja province, Ecuador.

The *palenque* Group

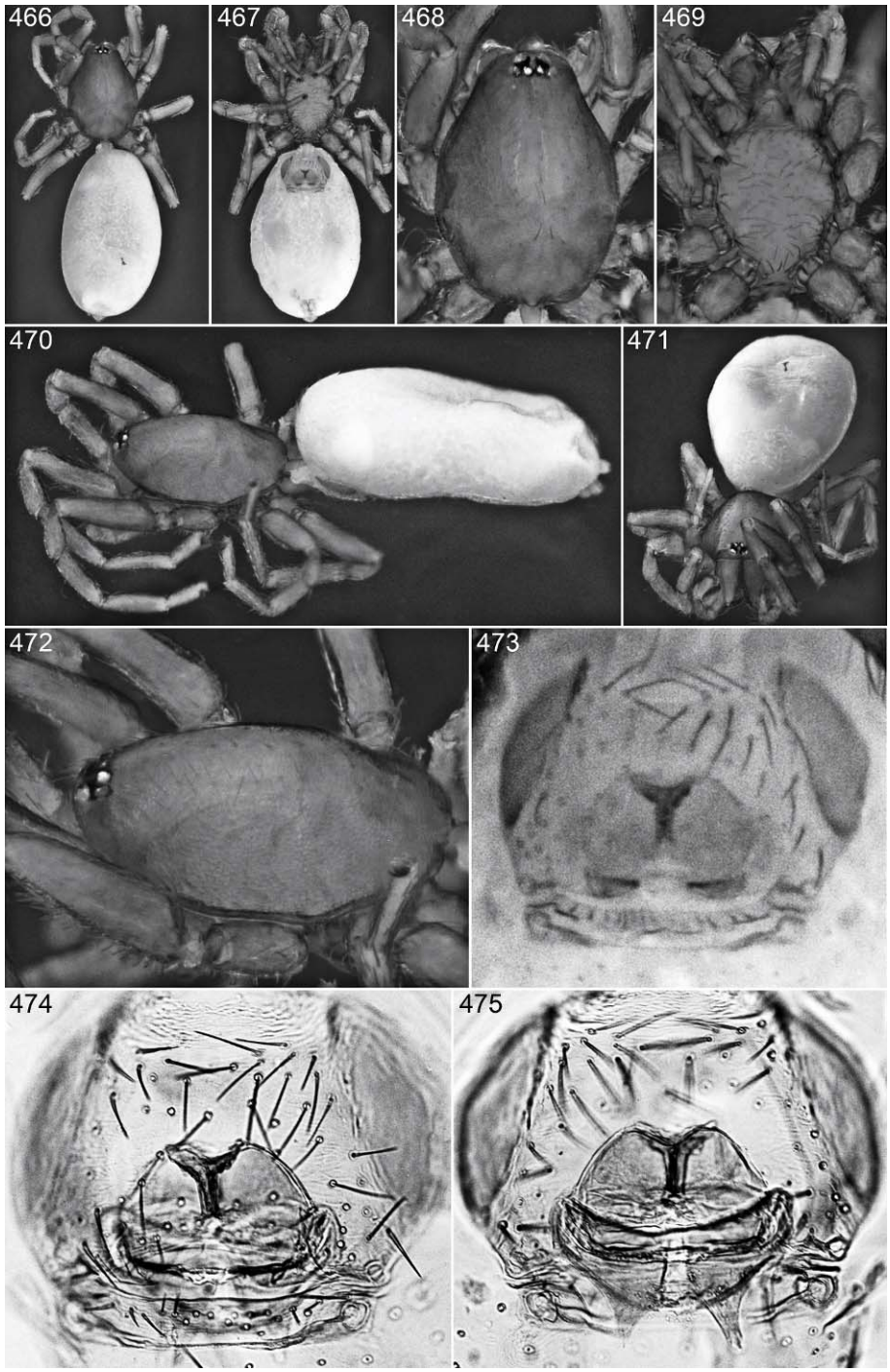
Males of this group have distinctively bipartite embolar regions, with a sclerotized basal portion and a translucent distal portion (figs. 568, 664); the anterior projections on the endites are narrow, distally situated, and ventrally directed (figs. 567, 663). The group appears to be restricted to the western slopes of the Ecuadorean Andes.

Niarchos palenque, new species
Figures 561–655

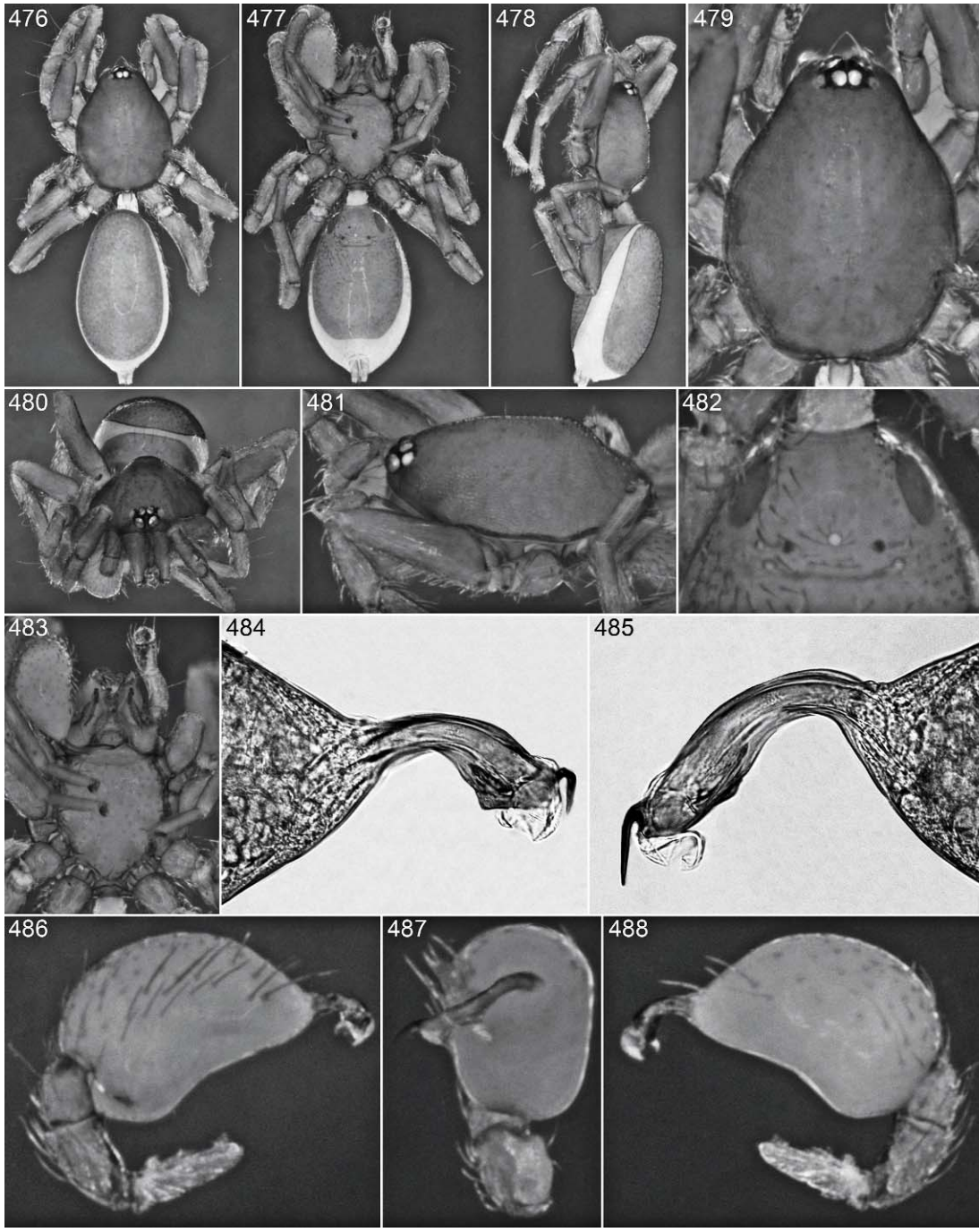
TYPE: Male holotype from Berlese sample of forest litter taken at an elevation of 700 ft at the Río Palenque Station, 47 km S of Santo Domingo, Los Ríos, Ecuador (June 18–30, 1975; S., J. Peck), deposited in FMNH (PBI_OON 37749).



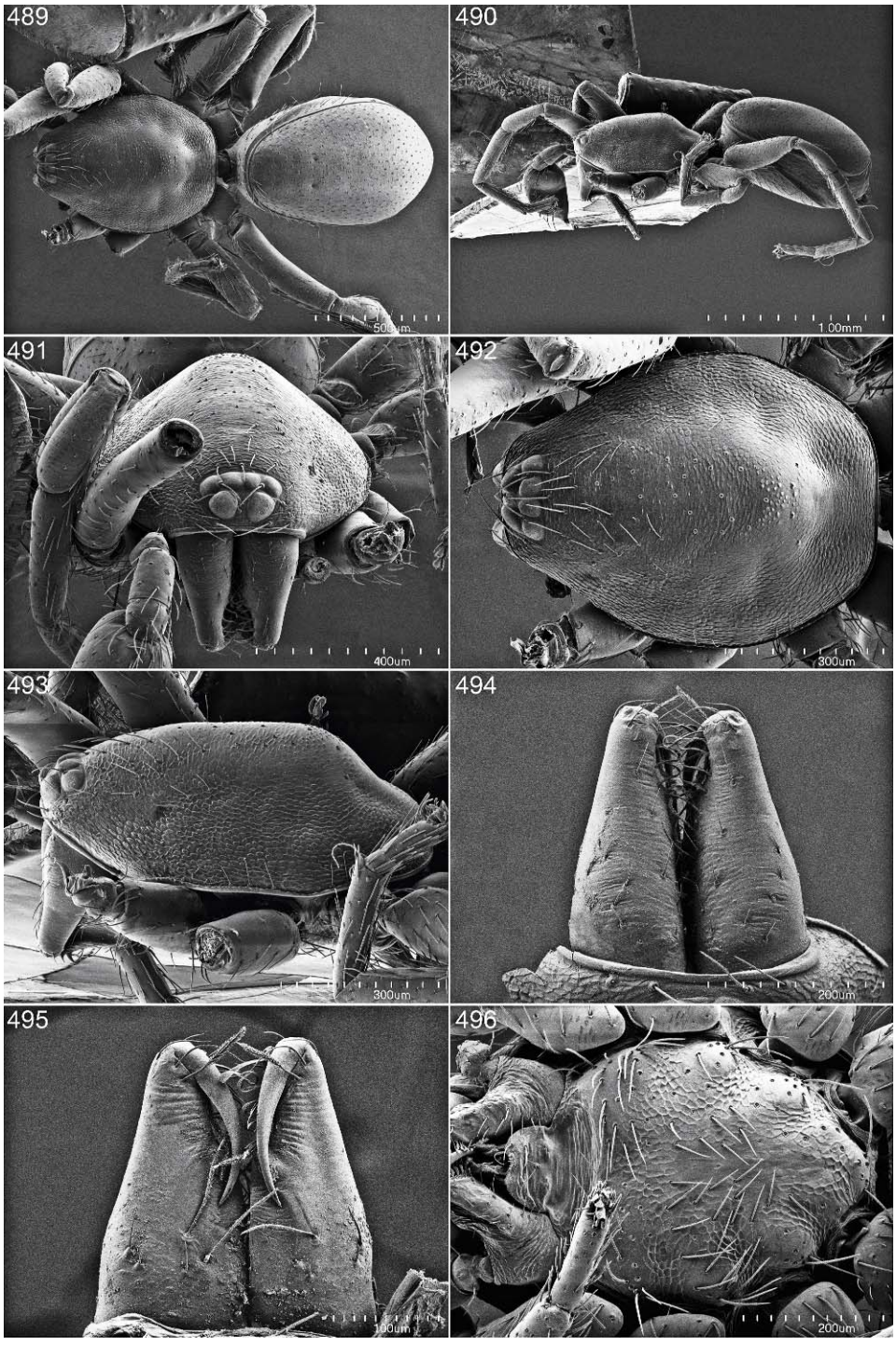
Figs. 453–465. *Niarchos loja*, new species, male. **453.** Habitus, dorsal view. **454.** Same, ventral view. **455.** Same, lateral view. **456.** Carapace, dorsal view. **457.** Habitus, anterior view. **458.** Carapace, lateral view. **459.** Epigastric region, ventral view. **460.** Sternum and mouthparts, ventral view. **461.** Embolus, prolateral view. **462.** Same, retrolateral view. **463.** Palp, prolateral view. **464.** Same, ventral view. **465.** Same, retrolateral view.



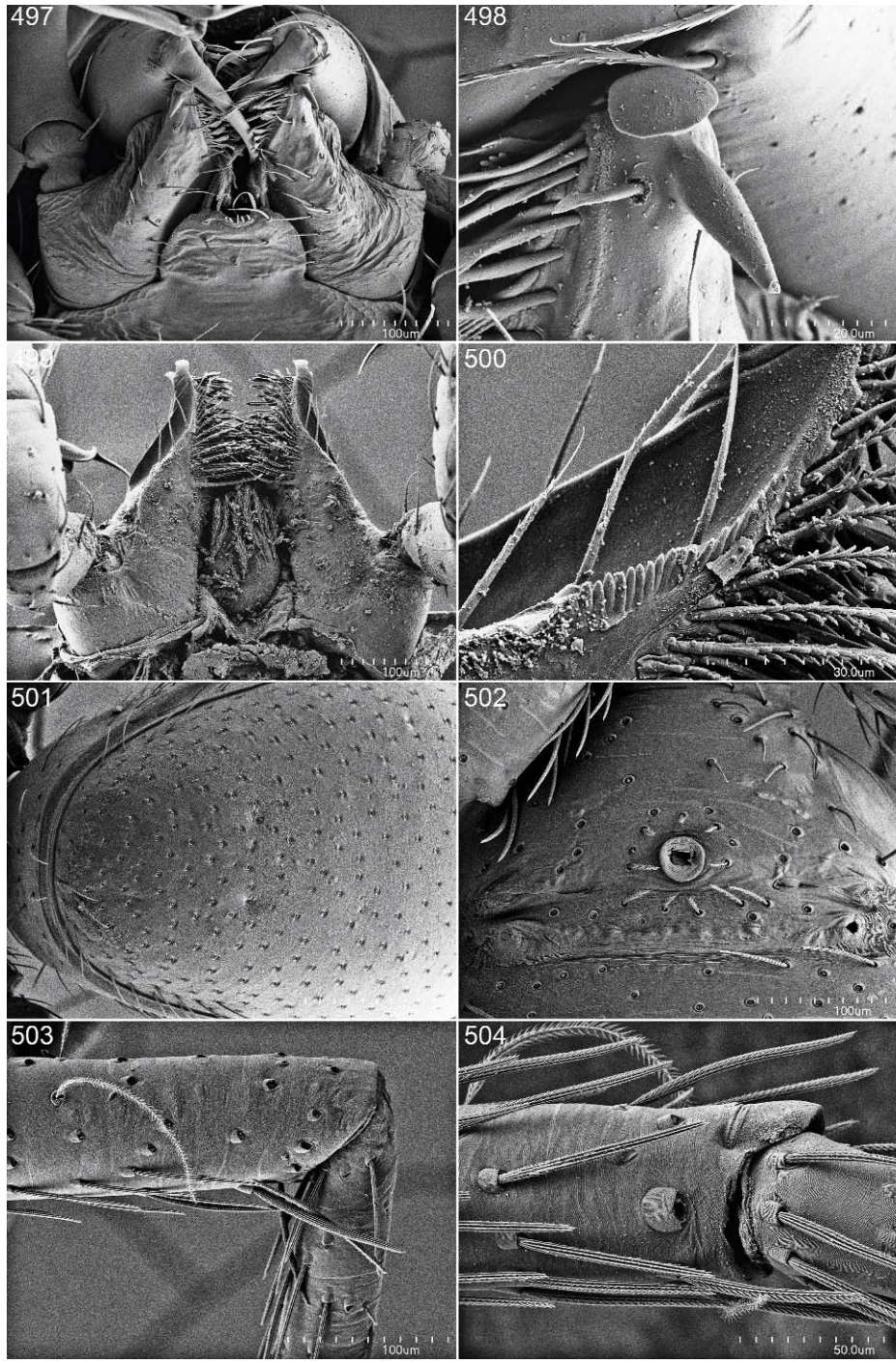
Figs. 466–475. *Niarchos loja*, new species, female. **466.** Habitus, dorsal view. **467.** Same, ventral view. **468.** Carapace, dorsal view. **469.** Sternum and mouthparts, ventral view. **470.** Habitus, lateral view. **471.** Same, anterior view. **472.** Carapace, lateral view. **473.** Epigastric region, ventral view. **474.** Genitalia, ventral view. **475.** Same, dorsal view.



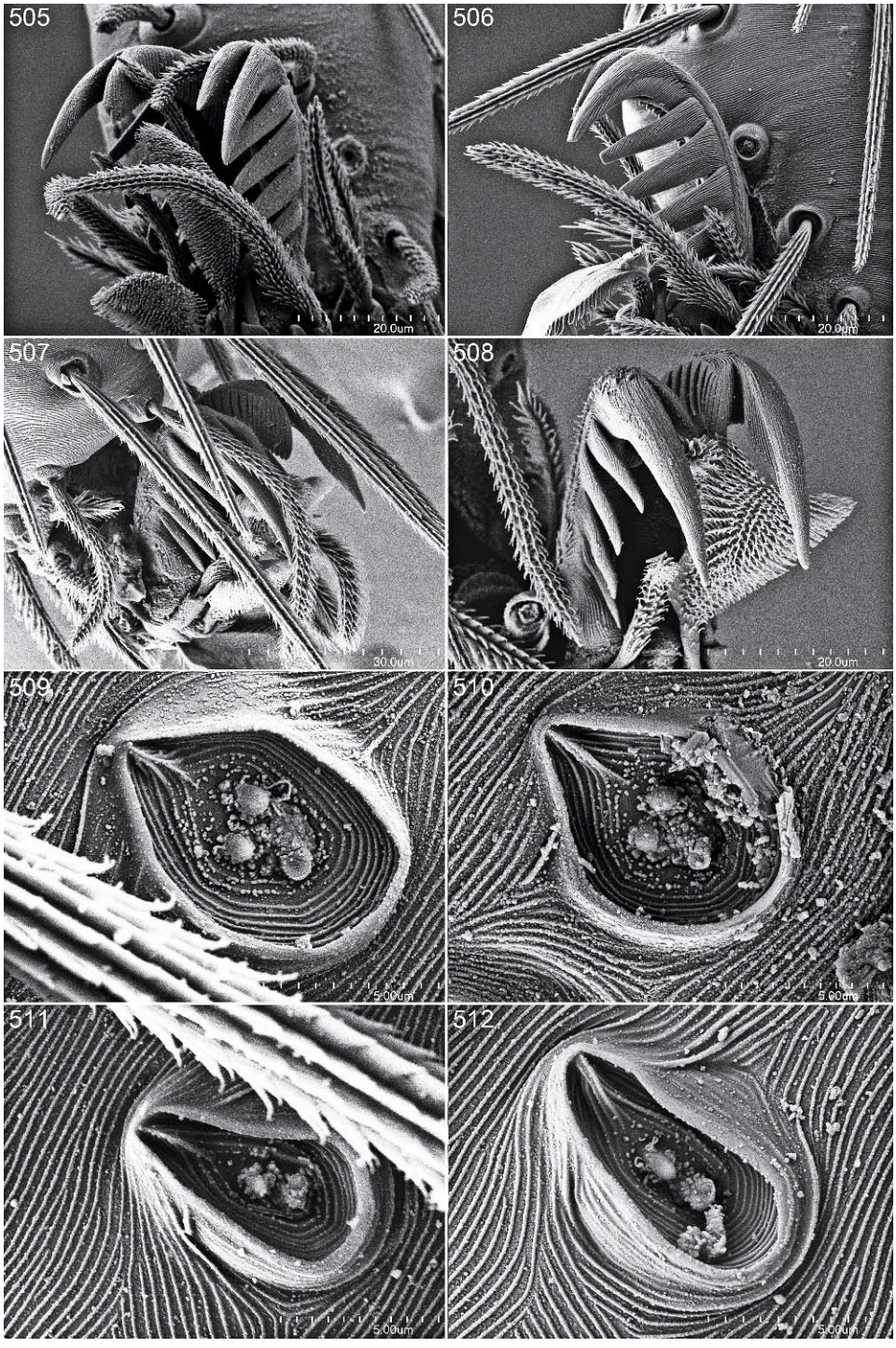
Figs. 476–488. *Niarchos foreroi*, new species, male. **476.** Habitus, dorsal view. **477.** Same, ventral view. **478.** Same, lateral view. **479.** Carapace, dorsal view. **480.** Habitus, anterior view. **481.** Carapace, lateral view. **482.** Epigastric region, ventral view. **483.** Sternum and mouthparts, ventral view. **484.** Embolus, prolateral view. **485.** Same, retrolateral view. **486.** Palp, prolateral view. **487.** Same, ventral view. **488.** Same, retrolateral view.



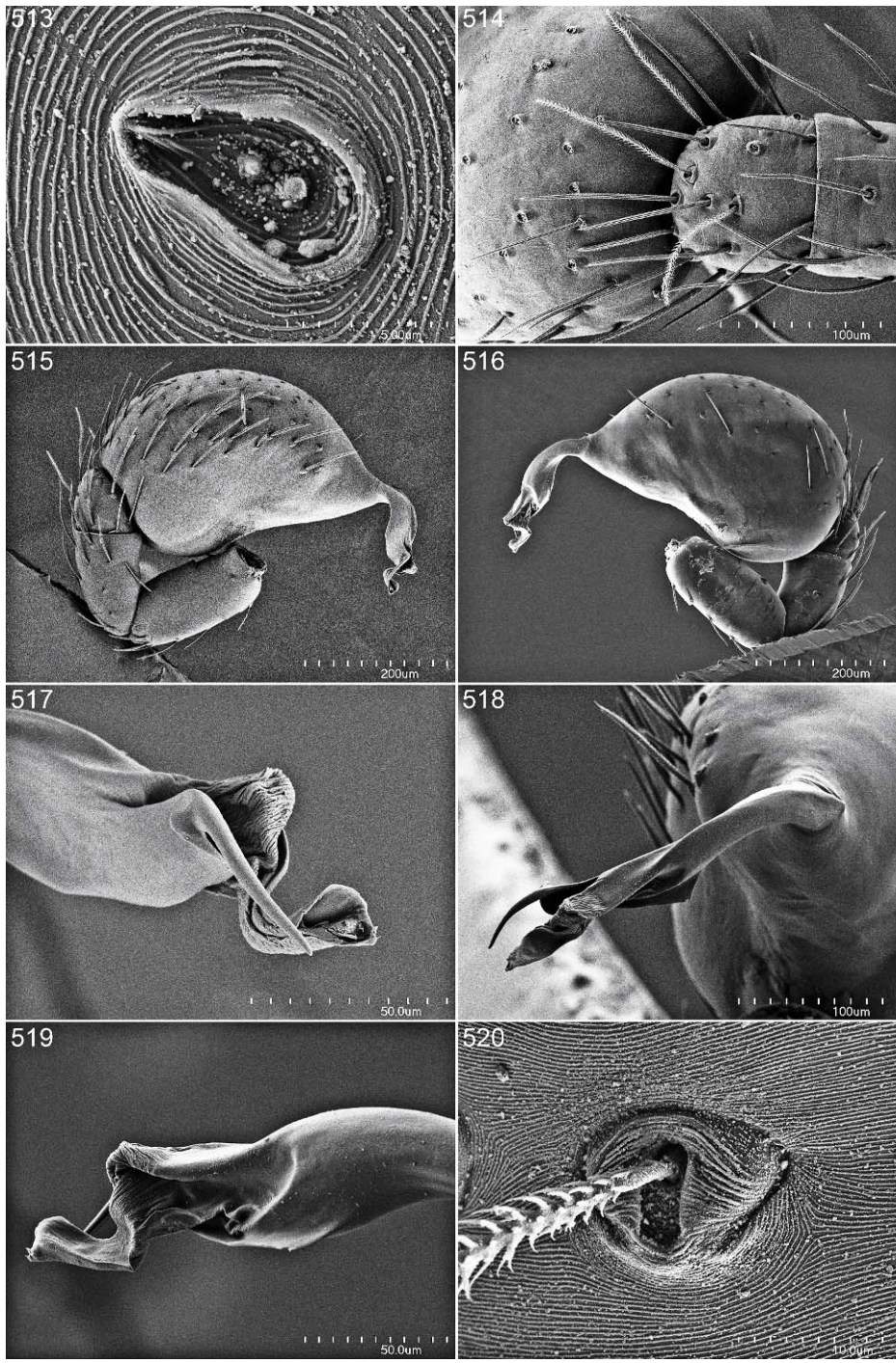
Figs. 489–496. *Niarchos foreroi*, new species, male. **489.** Habitus, dorsal view. **490.** Same, lateral view. **491.** Carapace, anterior view. **492.** Same, dorsal view. **493.** Same, lateral view. **494.** Chelicerae, anterior view. **495.** Same, posterior view. **496.** Sternum, ventral view.



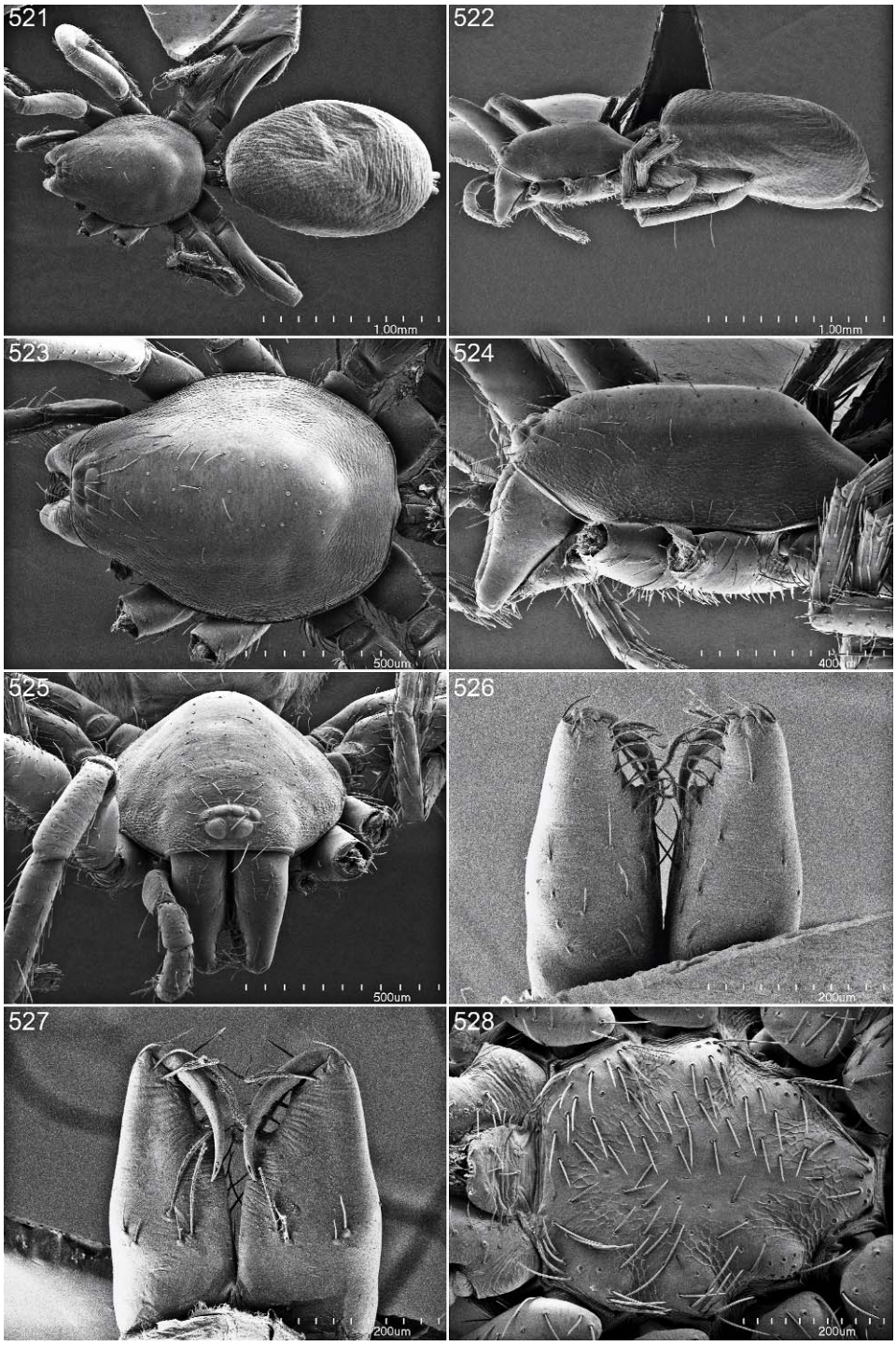
Figs. 497–504. *Niarchos foreroi*, new species, male. **497.** Labium and endites, ventral view. **498.** Tip of endite, ventral view. **499.** Labrum and endites, dorsal view. **500.** Serrula, dorsal view. **501.** Dorsal scutum, anterior portion, dorsal view. **502.** Sperm pore, ventral view. **503.** Tip of tibia IV, prolateral view. **504.** Tip of metatarsus IV, same.



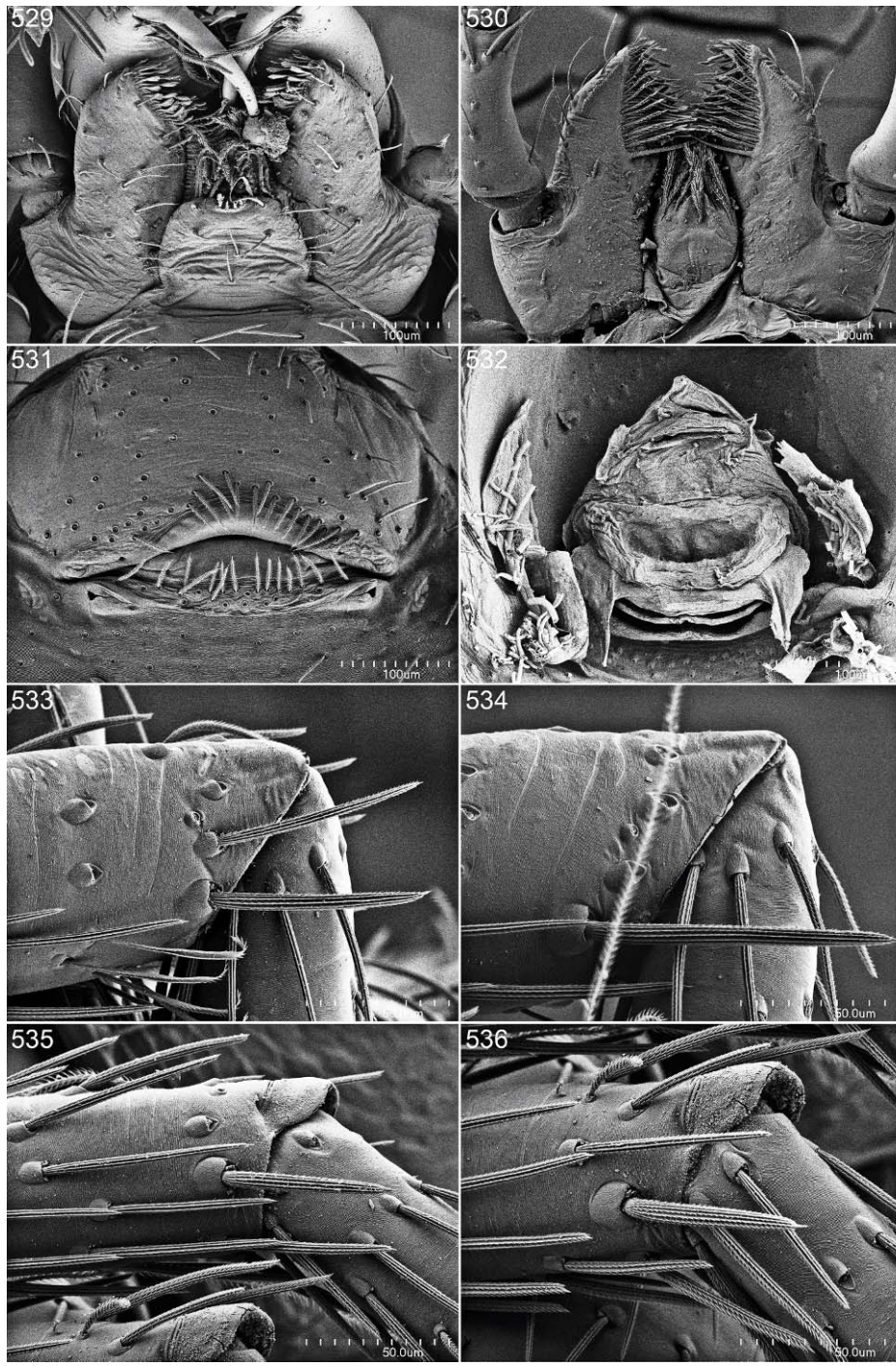
Figs. 505–512. *Niarchos foreroi*, new species, male. **505.** Claws of leg I, distal view. **506.** Same, leg II. **507.** Same, leg III. **508.** Same, leg IV. **509.** Tarsal organ, leg I, dorsal view. **510.** Same, leg II. **511.** Same, leg III. **512.** Same, leg IV.



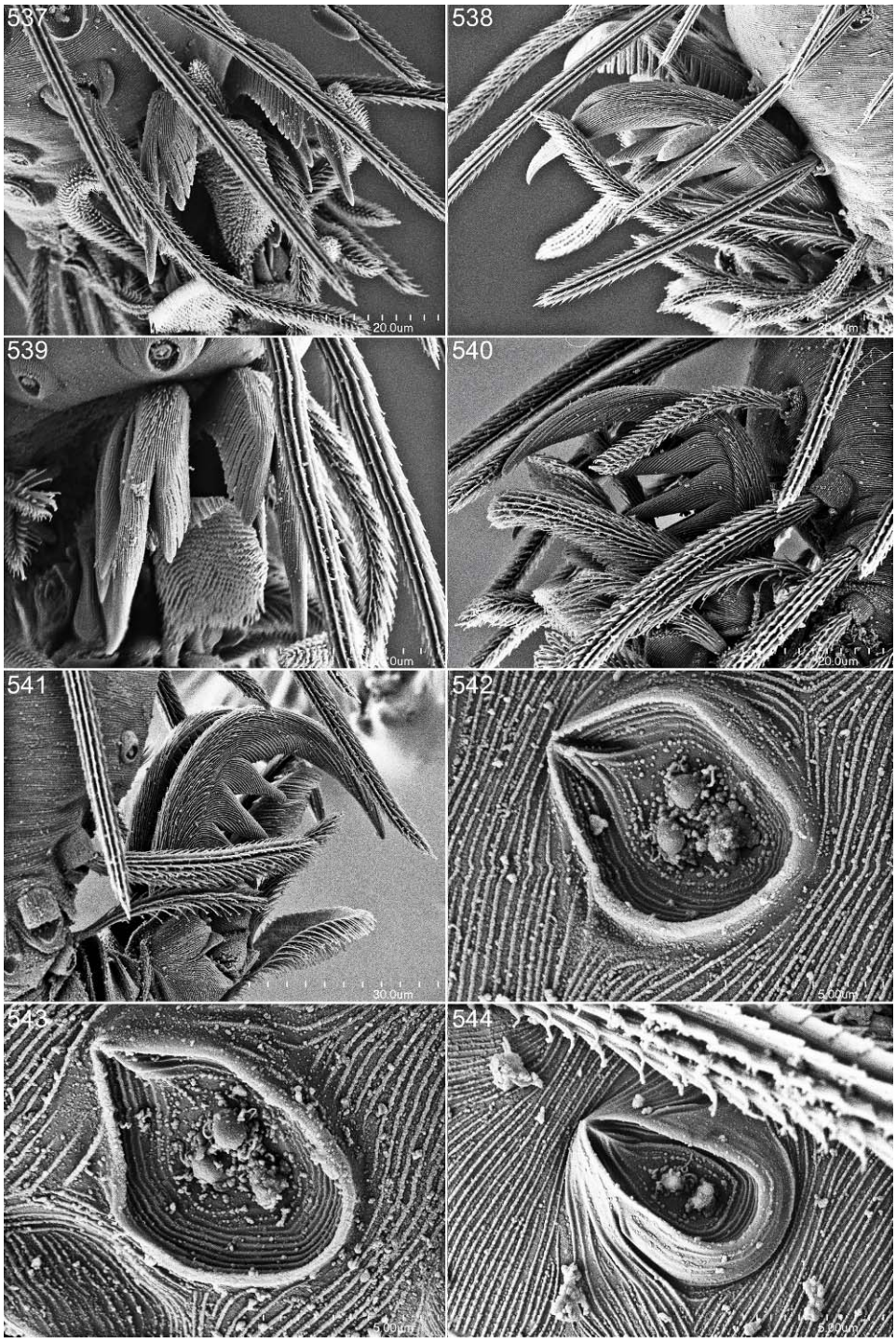
Figs. 513–520. *Niarchos foreroi*, new species. **513.** Male, tarsal organ, palp, dorsal view. **514.** Male palpal tibia, dorsal view. **515.** Male palp, prolateral view. **516.** Same, retrolateral view. **517.** Embolus, prolateral view. **518.** Same, ventral view. **519.** Same, retrolateral view. **520.** Female, trichobothrial base, tibia I, dorsal view.



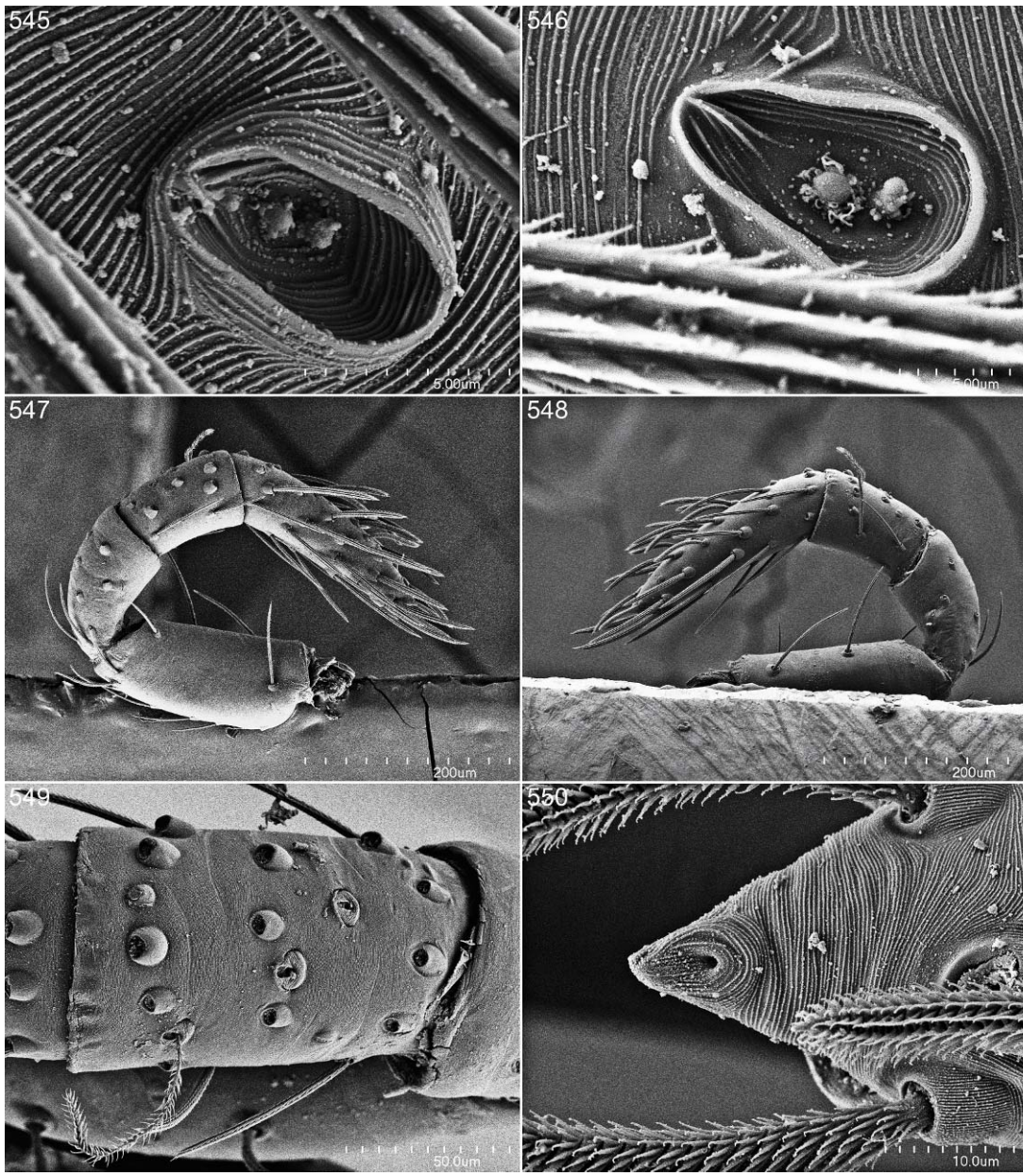
Figs. 521–528. *Niarchos foreroi*, new species, female. **521.** Habitus, dorsal view. **522.** Same, lateral view. **523.** Carapace, dorsal view. **524.** Same, lateral view. **525.** Same, anterior view. **526.** Chelicerae, anterior view. **527.** Same, posterior view. **528.** Sternum, ventral view.



Figs. 529–536. *Niarchos foreroi*, new species, female. **529.** Labium and endites, ventral view. **530.** Labrum and endites, dorsal view. **531.** Epigastric region, ventral view. **532.** Genitalia, dorsal view. **533.** Tip of tibia III, prolateral view. **534.** Same, tibia IV. **535.** Same, metatarsus III. **536.** Same, metatarsus IV.



Figs. 537–544. *Niarchos foreroi*, new species, female. **537.** Claws of leg I, distal view. **538.** Same, lateral view. **539.** Claws of leg II, distal view. **540.** Claws of leg III, lateral view. **541.** Same, leg IV. **542.** Tarsal organ, leg I, dorsal view. **543.** Same, leg II. **544.** Same, leg III.

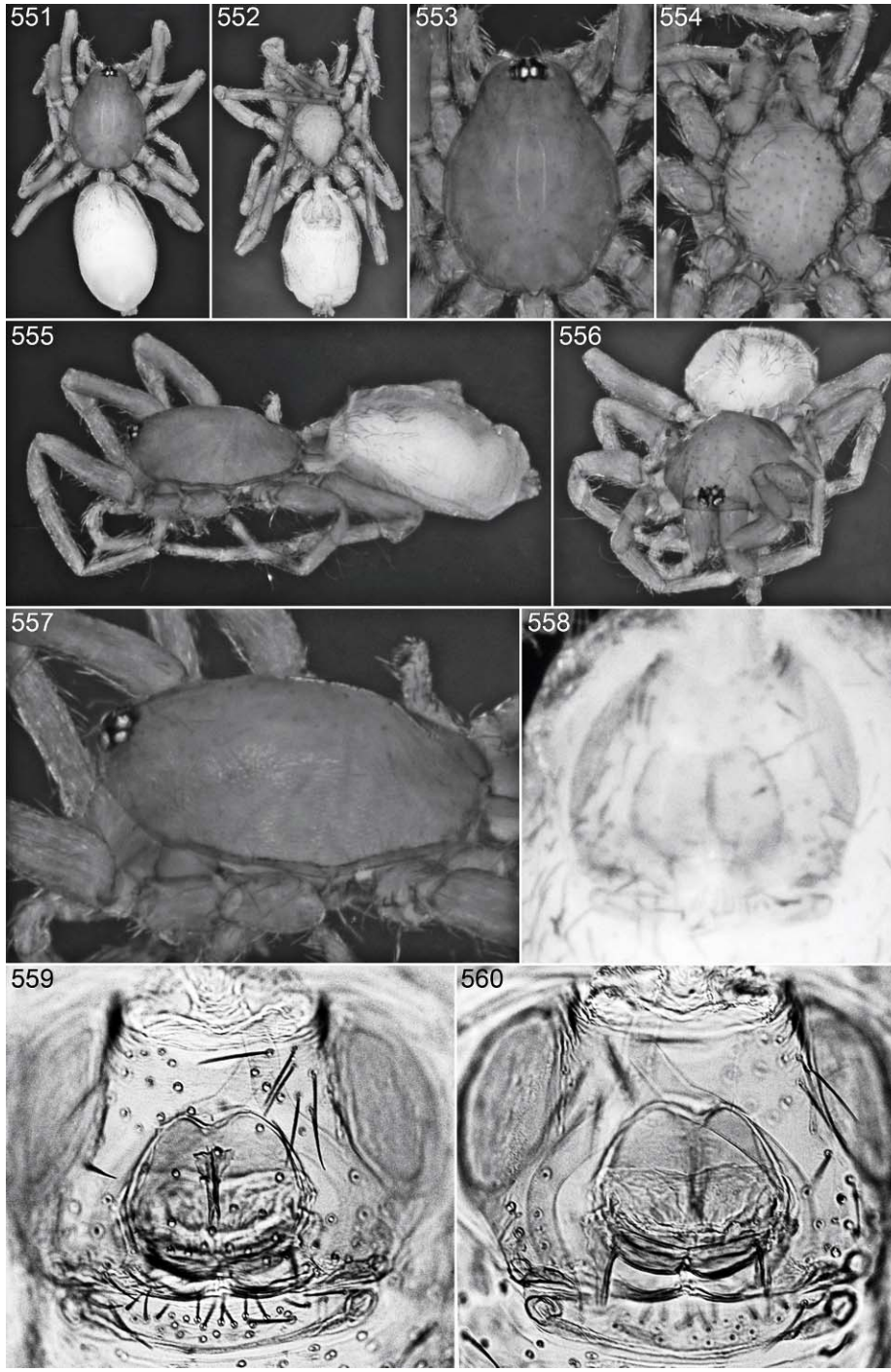


Figs. 545–550. *Niarchos foreroi*, new species, female. **545.** Tarsal organ, leg IV, dorsal view. **546.** Same, palp. **547.** Palp, prolateral view. **548.** Same, retrolateral view. **549.** Palpal tibia, dorsal view. **550.** Tip of palpal tarsus, dorsal view.

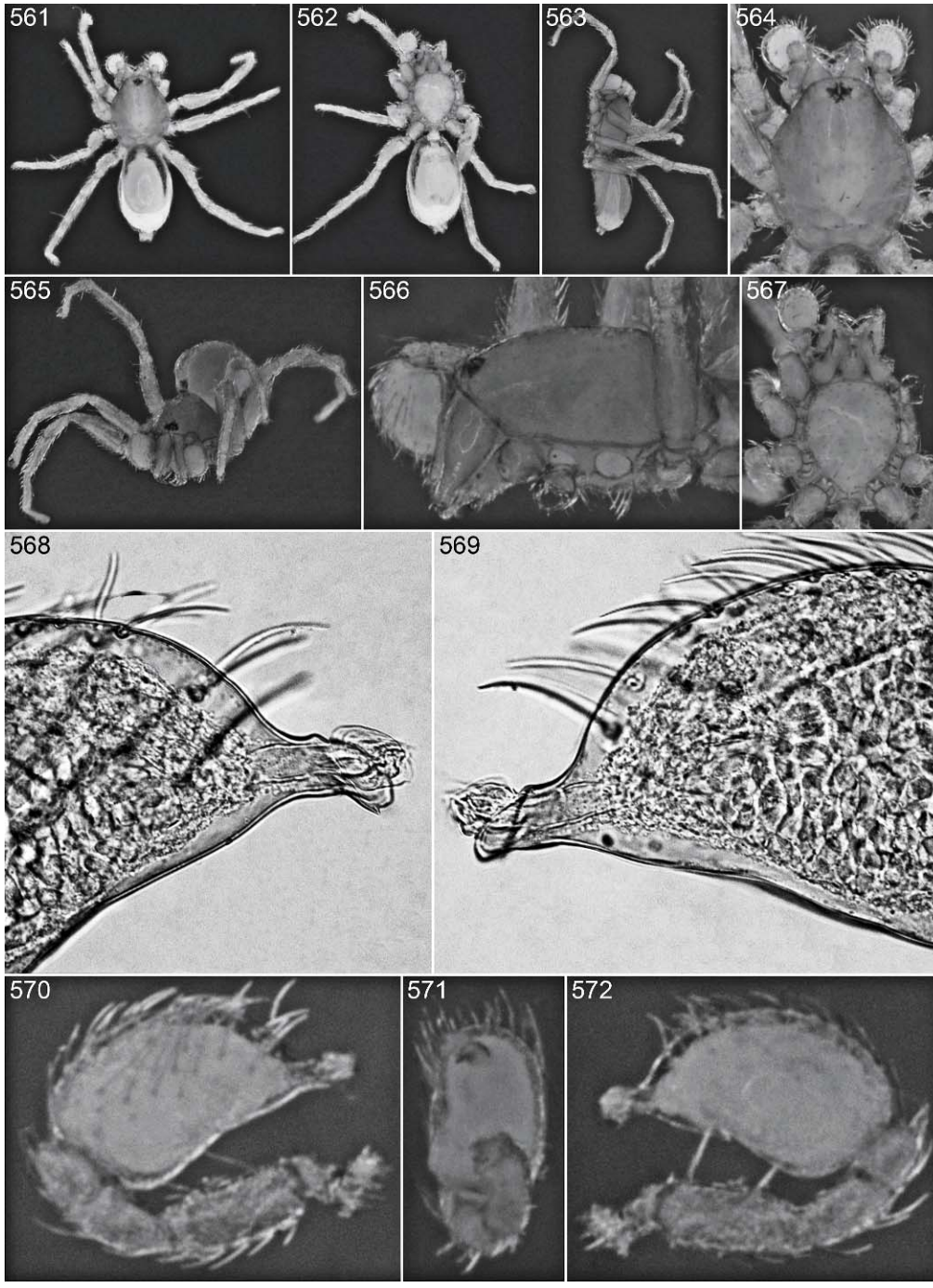
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males resemble those of *N. facundoi* but have a much shorter translucent tip on the embolus (figs. 568–572); females lack the ovoid sclerotization between the epigastric and postepigastric scuta found in those of *N. facundoi*, and have a shorter, anteriorly wider anterior genitalic process (figs. 654, 655).

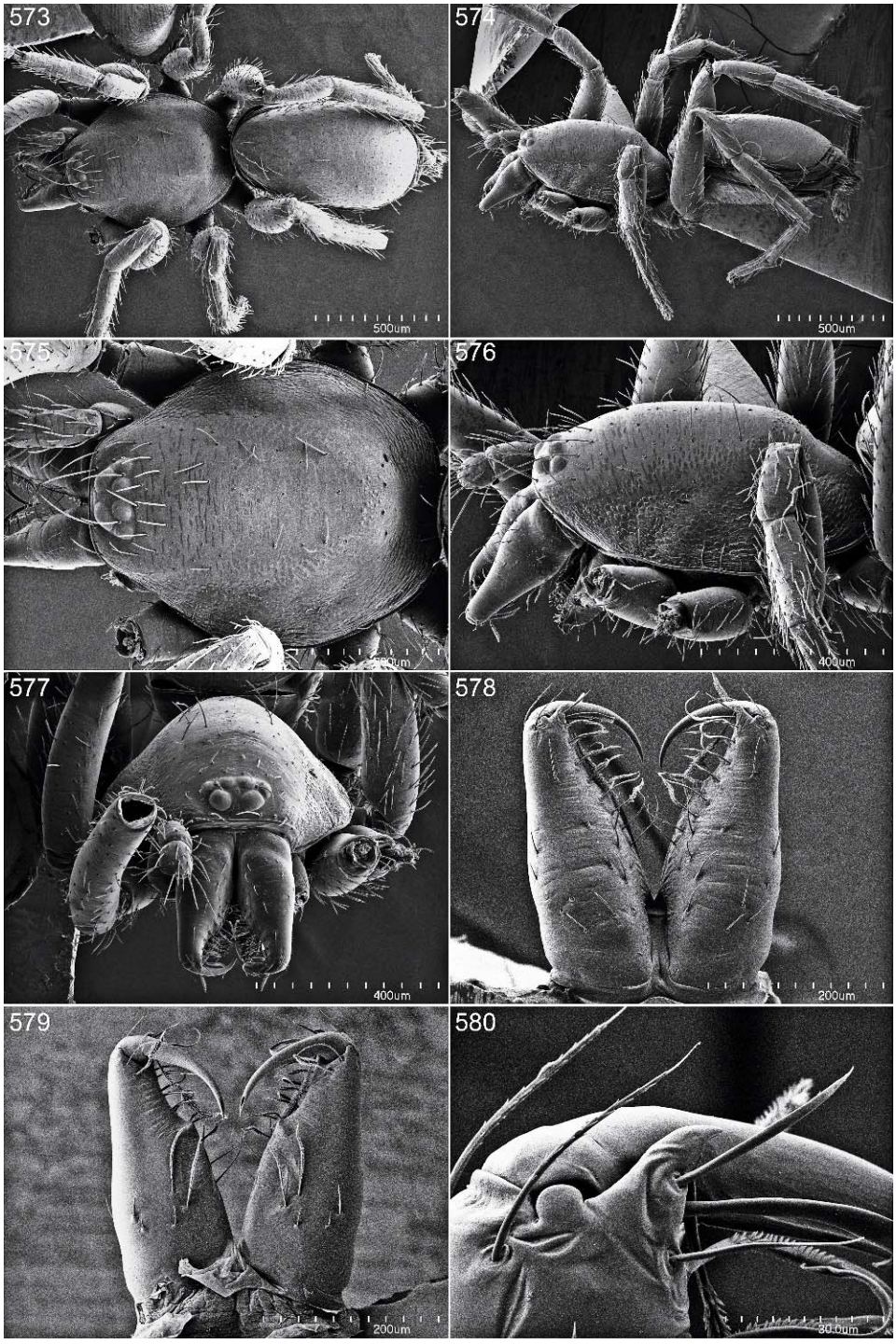
MALE (PBI_OON 37749, figs. 561–611): Total length 1.17. Posterior eye row pro-



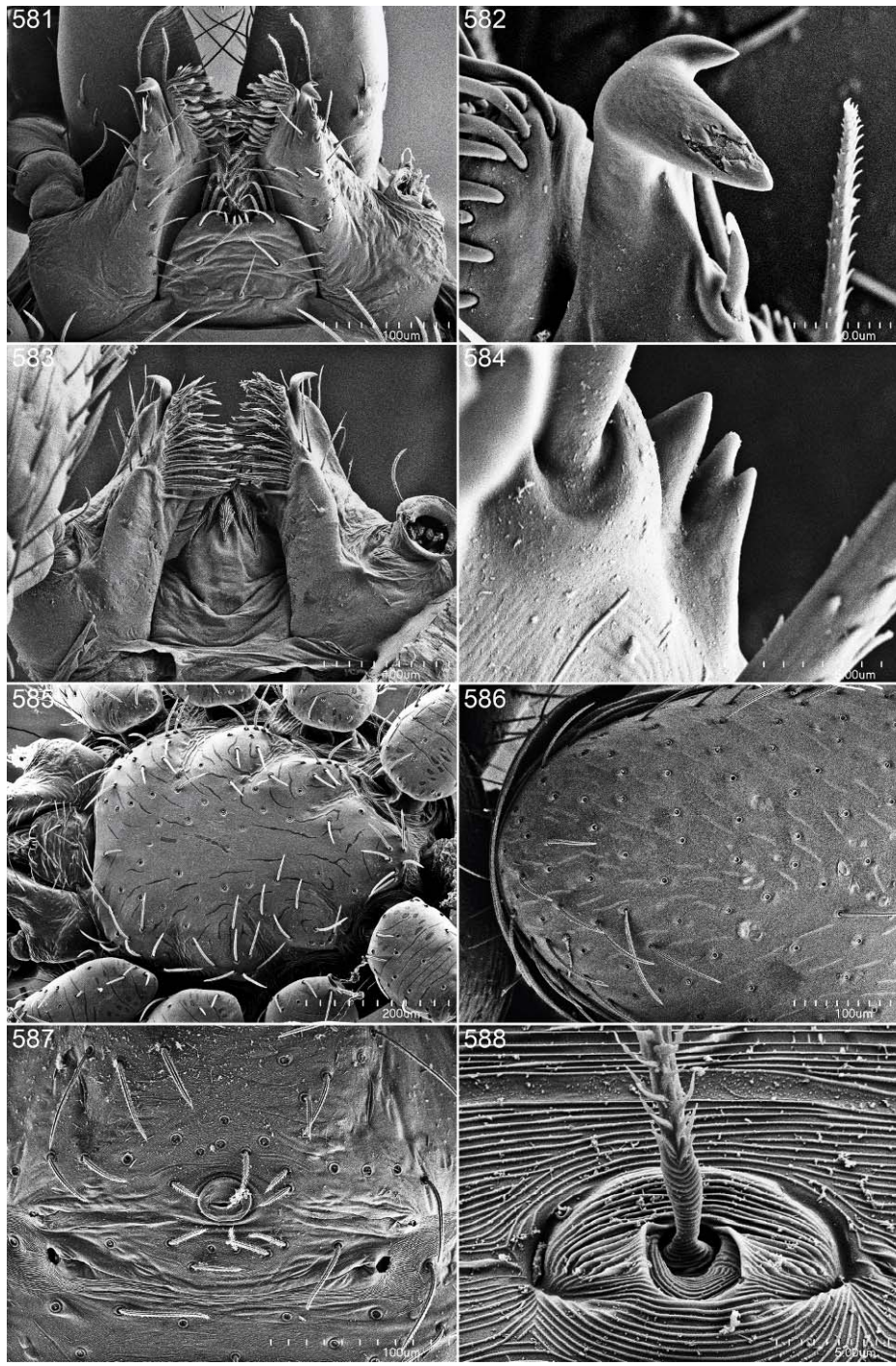
Figs. 551–560. *Niarchos foreroi*, new species, female. **551.** Habitus, dorsal view. **552.** Same, ventral view. **553.** Carapace, dorsal view. **554.** Sternum and mouthparts, ventral view. **555.** Habitus, lateral view. **556.** Same, anterior view. **557.** Carapace, lateral view. **558.** Epigastric region, ventral view. **559.** Genitalia, ventral view. **560.** Same, dorsal view.



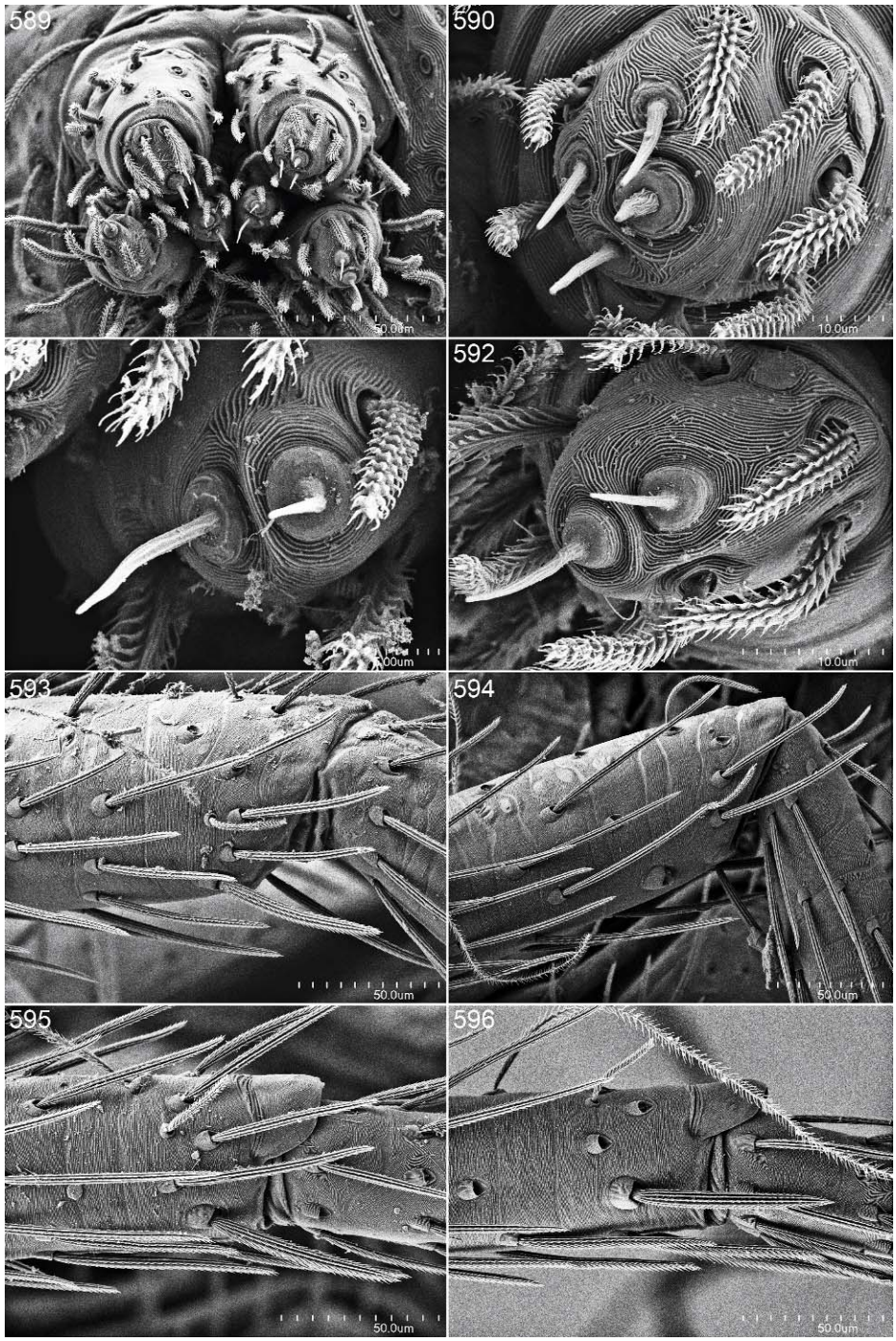
Figs. 561–572. *Niarchos palenque*, new species, male. **561.** Habitus, dorsal view. **562.** Same, ventral view. **563.** Same, lateral view. **564.** Carapace, dorsal view. **565.** Habitus, anterior view. **566.** Carapace, lateral view. **567.** Sternum and mouthparts, ventral view. **568.** Embolus, prolateral view. **569.** Same, retrolateral view. **570.** Palp, prolateral view. **571.** Same, ventral view. **572.** Same, retrolateral view.



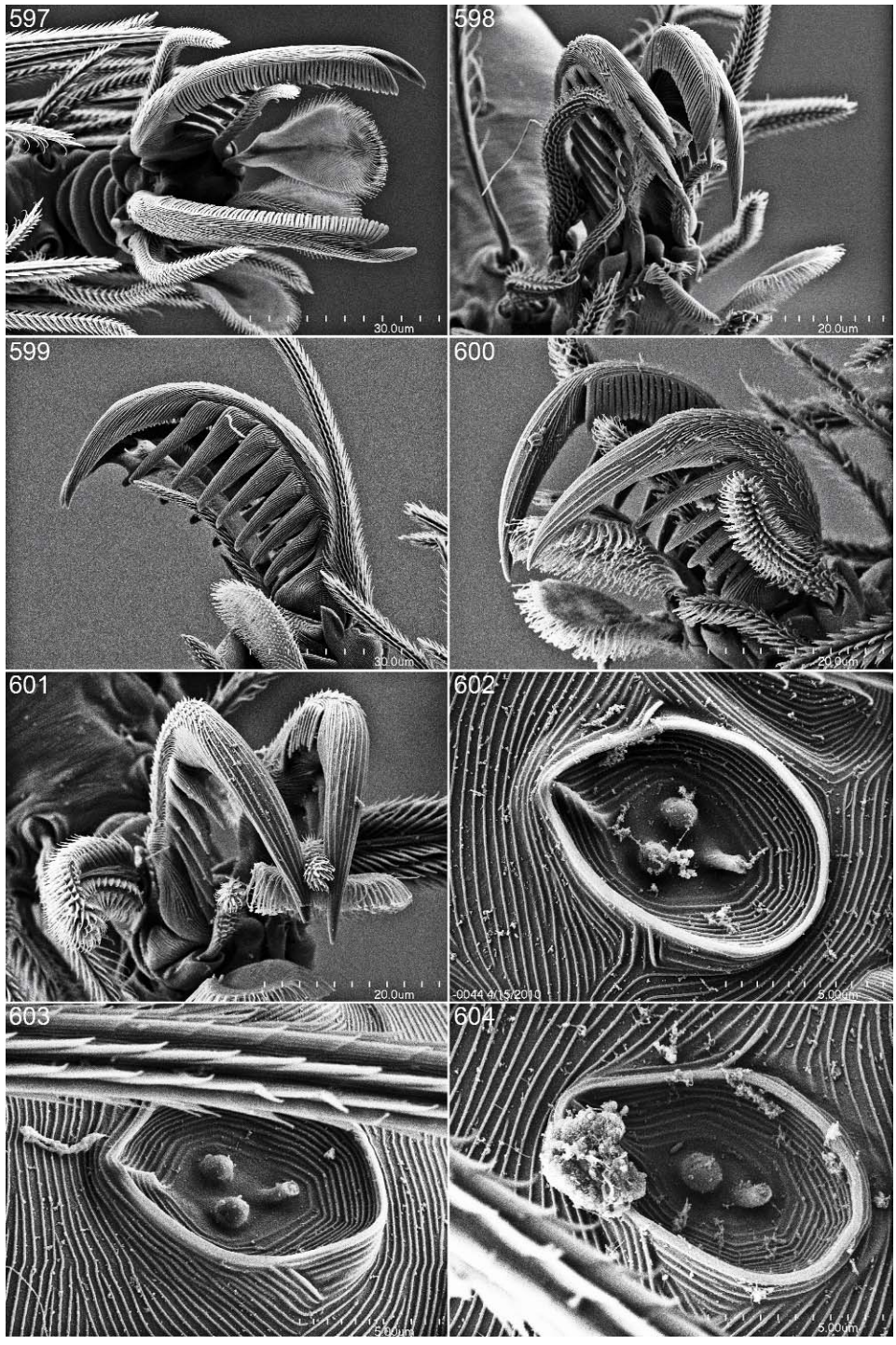
Figs. 573–580. *Niarchos palenque*, new species, male. **573.** Habitus, dorsal view. **574.** Same, lateral view. **575.** Carapace, dorsal view. **576.** Same, lateral view. **577.** Same, anterior view. **578.** Chelicerae, anterior view. **579.** Same, posterior view. **580.** Base of fang, anterior view.



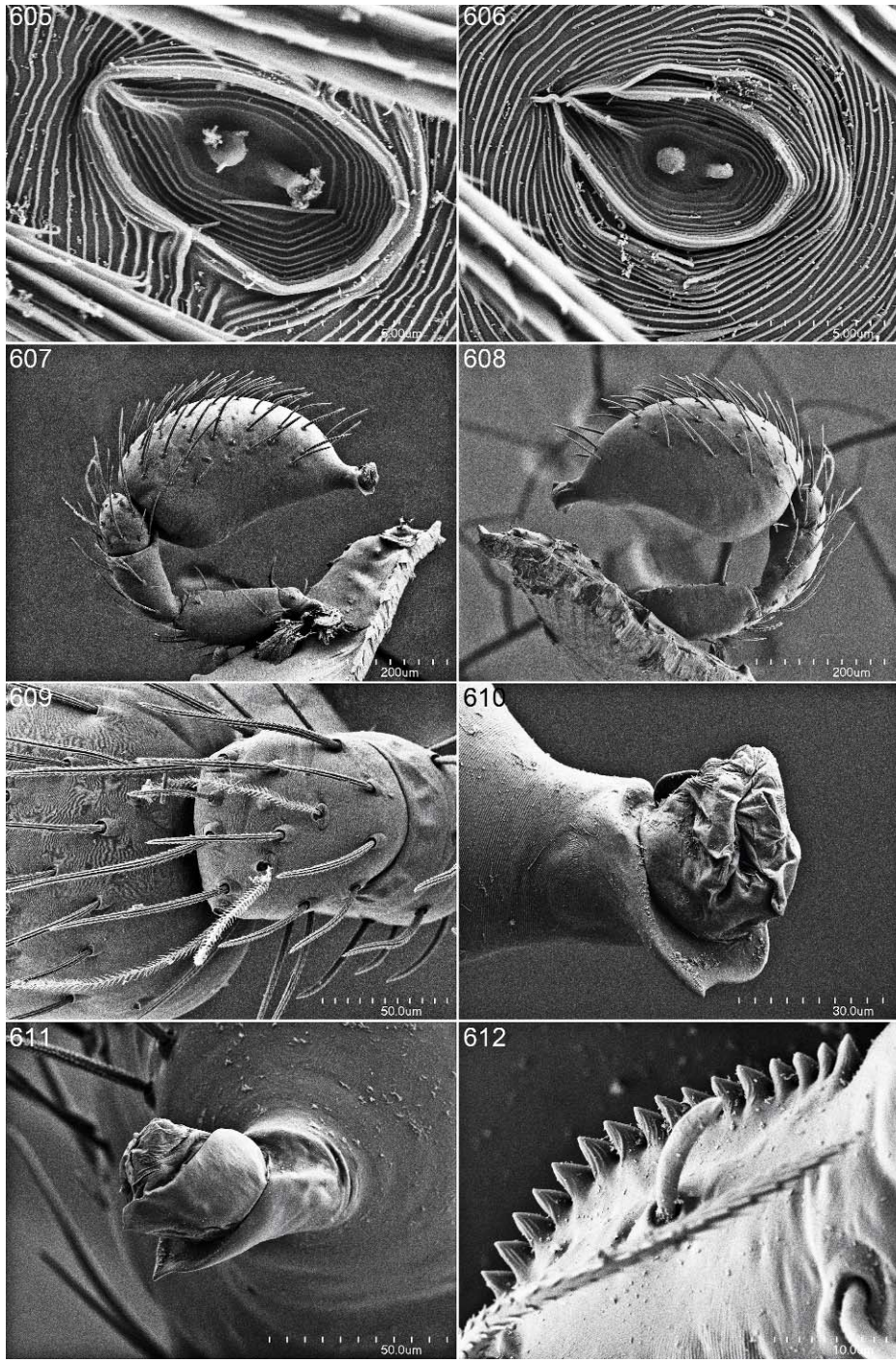
Figs. 581–588. *Niarchos palenque*, new species, male. **581.** Labium and endites, ventral view. **582.** Tip of endite, ventral view. **583.** Labrum and endites, dorsal view. **584.** Serrula, ventral view. **585.** Sternum, ventral view. **586.** Dorsal scutum, anterior portion, dorsal view. **587.** Sperm pore, ventral view. **588.** Trichobothrial base, tibia II, dorsal view.



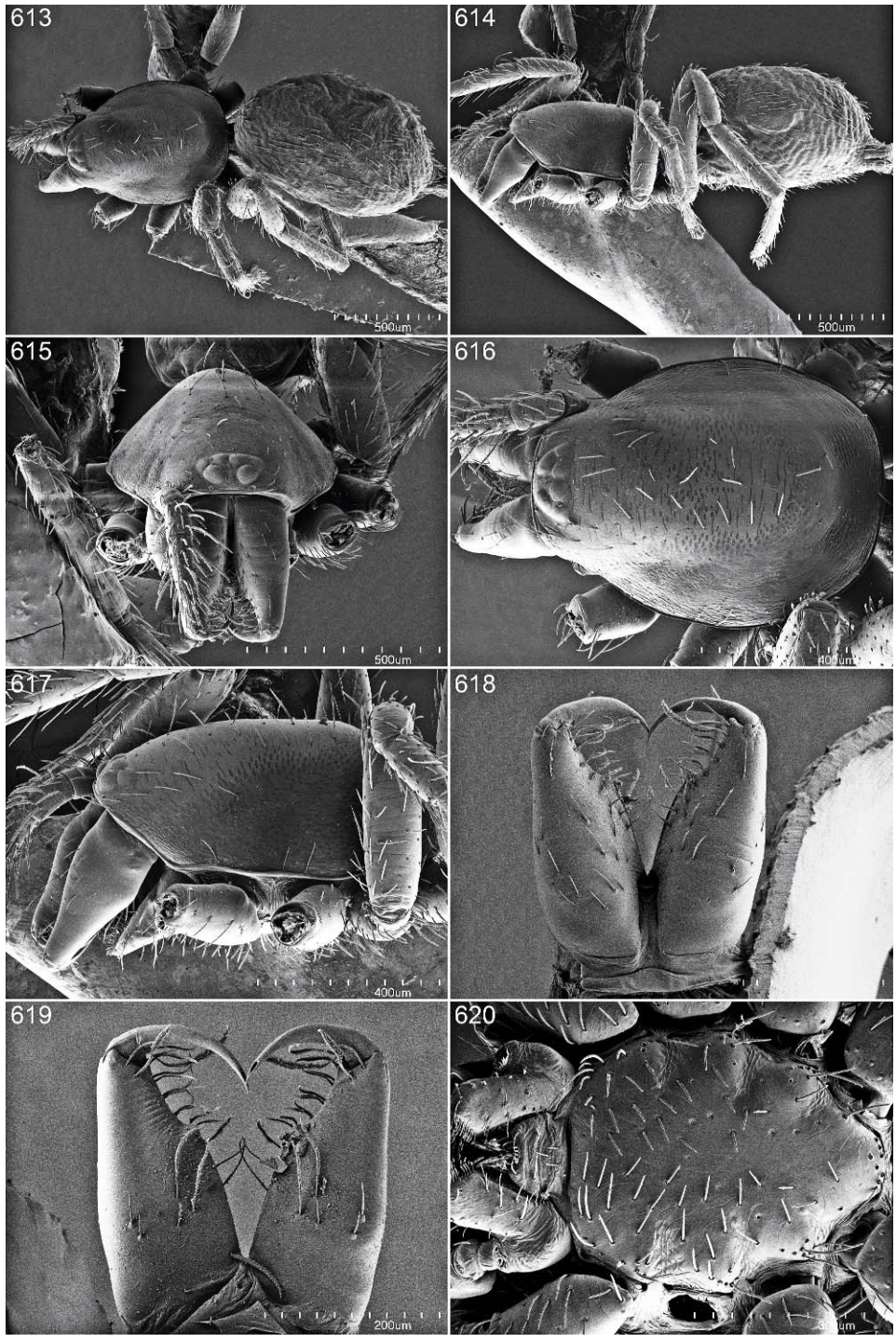
Figs. 589–596. *Niarchos palenque*, new species, male. **589.** Spinnerets, distal view. **590.** Anterior lateral spinneret, same. **591.** Posterior median spinneret, same. **592.** Posterior lateral spinneret, same. **593.** Tip of tibia III, lateral view. **594.** Same, tibia IV. **595.** Same, metatarsus III. **596.** Same, metatarsus IV.



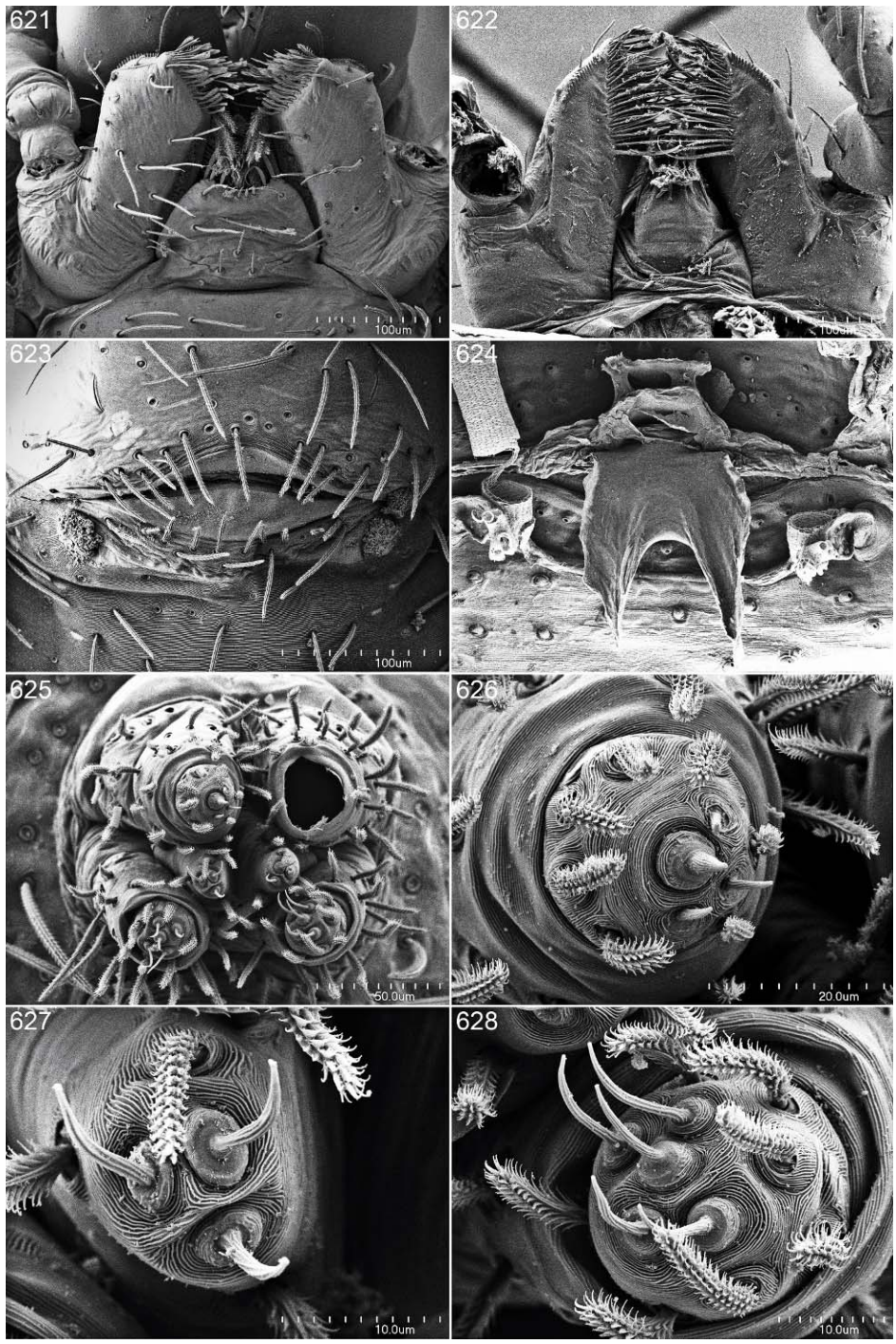
Figs. 597–604. *Niarchos palenque*, new species, male. **597.** Claws of leg I, dorsal view. **598.** Claws of leg II, distal view. **599.** Same, lateral view. **600.** Same, leg III. **601.** Claws of leg IV, distal view. **602.** Tarsal organ, leg I, dorsal view. **603.** Same, leg II. **604.** Same, leg III.



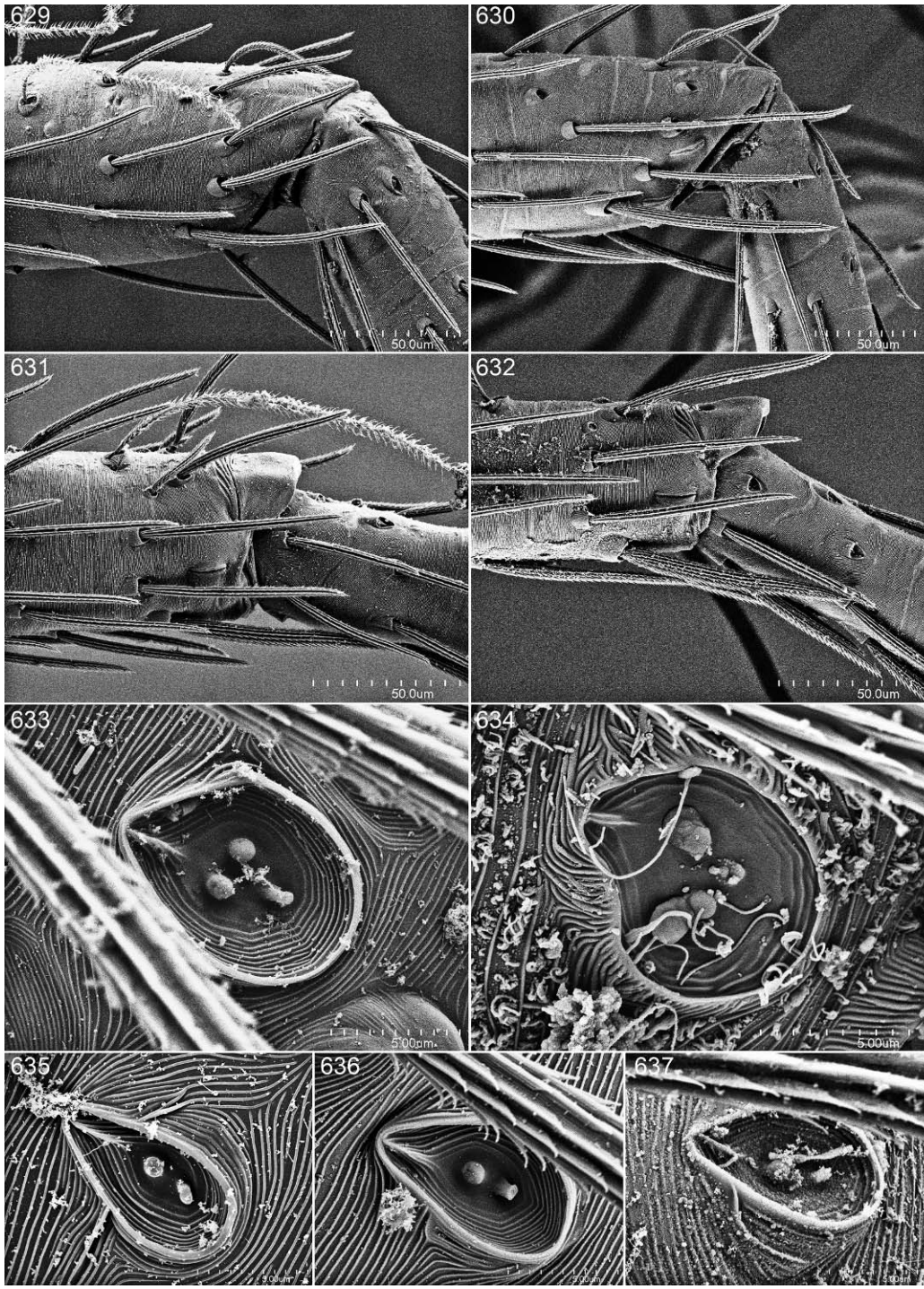
Figs. 605–612. *Niarchos palenque*, new species. **605.** Male, tarsal organ, leg IV. **606.** Same, palp. **607.** Male palp, prolateral view. **608.** Same, retrolateral view. **609.** Male palpal tibia, dorsal view. **610.** Embolus, prolateral view. **611.** Same, retrolateral view. **612.** Female serrula, ventral view.



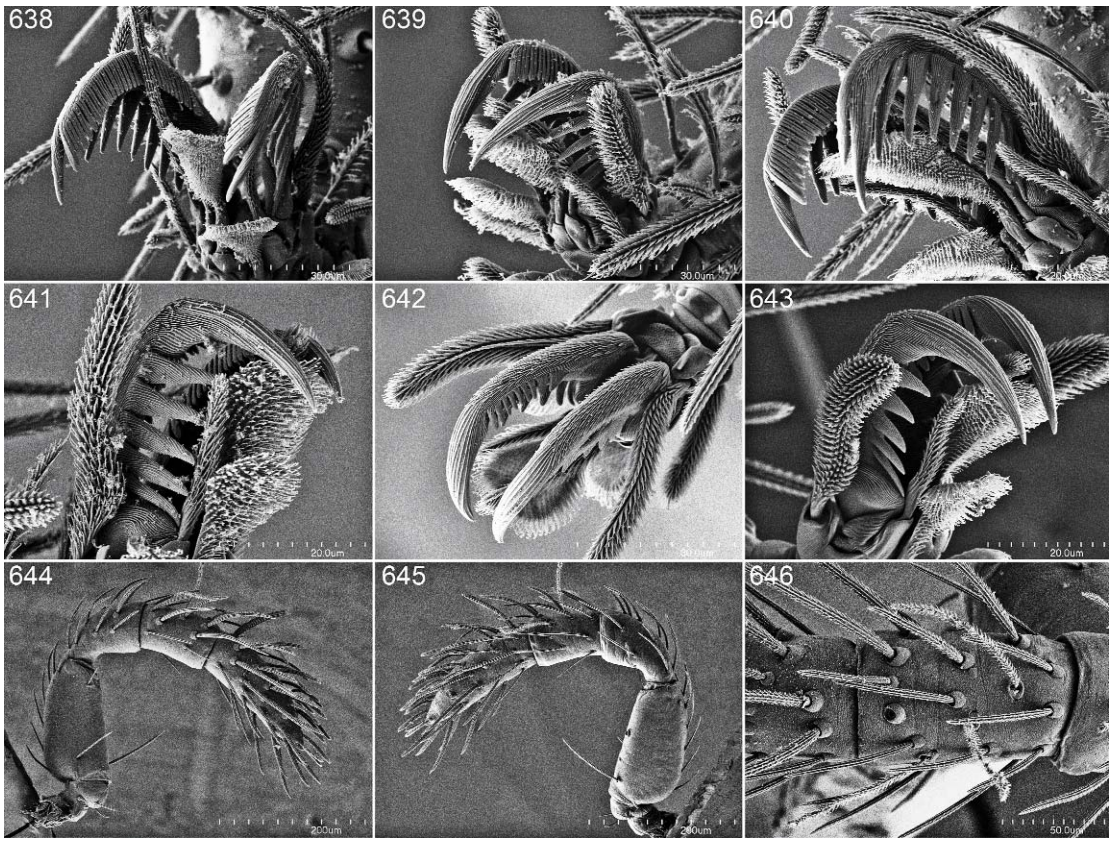
Figs. 613–620. *Niarchos palenque*, new species, female. **613.** Habitus, dorsal view. **614.** Same, lateral view. **615.** Carapace, anterior view. **616.** Same, dorsal view. **617.** Same, lateral view. **618.** Chelicerae, anterior view. **619.** Same, posterior view. **620.** Sternum, ventral view.



Figs. 621–628. *Niarchos palenque*, new species, female. **621.** Labium and endites, ventral view. **622.** Labrum and endites, dorsal view. **623.** Epigastric region, ventral view. **624.** Genitalia, dorsal view. **625.** Spinnerets, distal view. **626.** Anterior lateral spinneret, same. **627.** Posterior median spinneret, same. **628.** Posterior lateral spinneret, same.



Figs. 629–637. *Niarchos palenque*, new species, female. **629.** Tip of tibia III, lateral view. **630.** Same, tibia IV. **631.** Same, metatarsus III. **632.** Same, metatarsus IV. **633.** Tarsal organ, leg I, dorsal view. **634.** Same, leg II. **635.** Same, leg III. **636.** Same, leg IV. **637.** Same, palp.



Figs. 638–646. *Niarchos palenque*, new species, female. **638.** Claws of leg I, distal view. **639.** Claws of leg II, lateral view. **640.** Claws of leg III, oblique distal view. **641.** Same, lateral view. **642.** Claws of leg IV, distal view. **643.** Same, lateral view. **644.** Palp, prolateral view. **645.** Same, retrolateral view. **646.** Palpal tibia, dorsal view.

curved from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Endites with anteromedian projections narrow, distally situated, directed ventrally. Leg spination: tibiae IV v0-0-2. Embolus relatively short, distal portion translucent (figs. 568–572).

FEMALE (PBI_OON 37830, figs. 612–655): Total length 1.41. Leg spination: tibiae IV v0-0-2. Internal genitalic sclerotizations visible externally in weakly sclerotized area between epigastric and postepigastric scutum (figs. 654, 655).

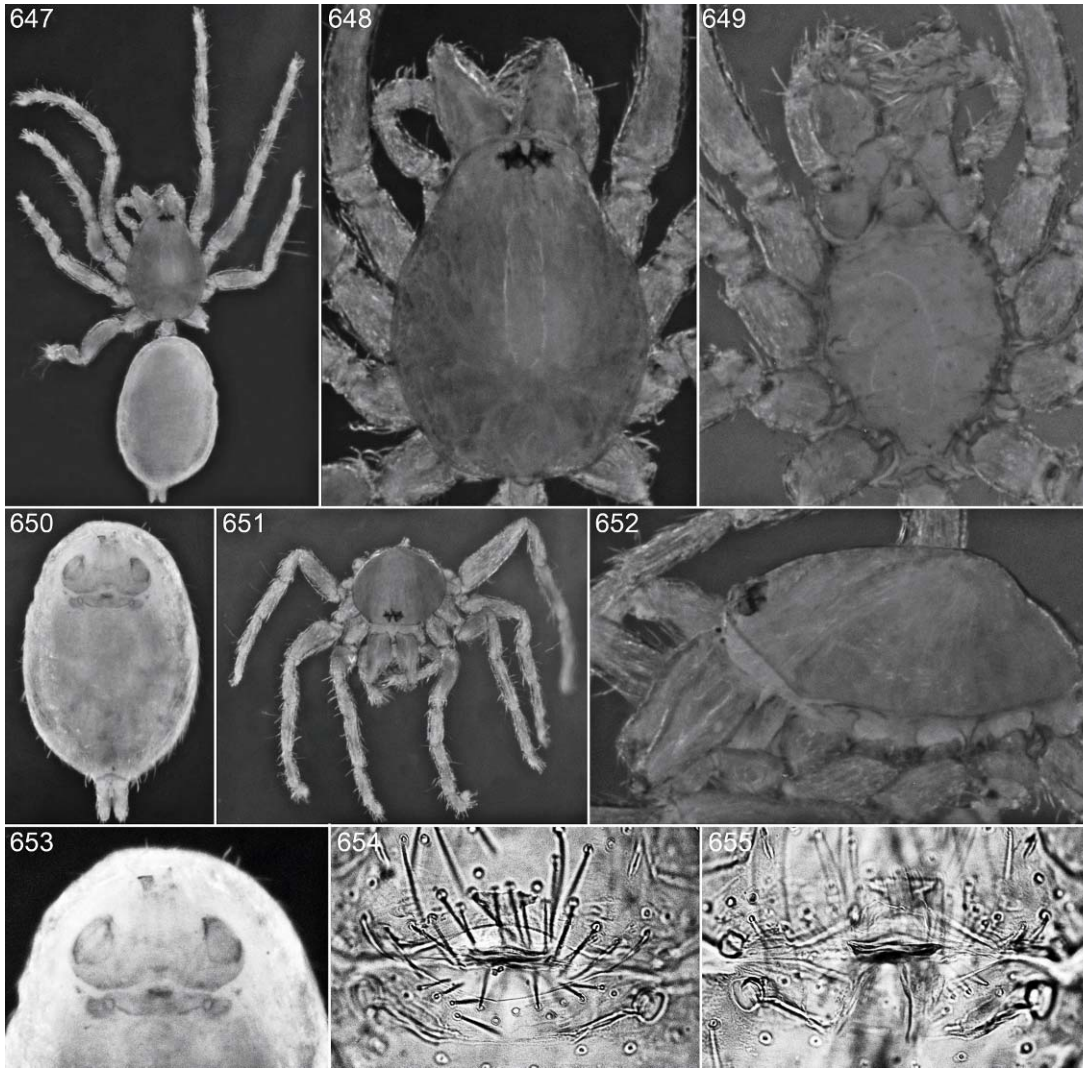
OTHER MATERIAL EXAMINED: **Ecuador:** *Los Ríos:* Río Palenque Station, 47 km S Santo Domingo, June 18–30, 1975, Berlese, forest litter, elev. 700 ft (S., J. Peck, AMNH, MACN, QCAZ PBI_OON 40822), 4♂, (same, AMNH, FMNH 33699, QCAZ PBI_OON 10201), 1♂, 7♀, (same, FMNH PBI_OON 37830), 1♀, Feb. 21–24, 1976, Berlese, leaf litter with palm fruits, elev. 260 m (S. Peck, FMNH PBI_OON 37834), 2♀.

DISTRIBUTION: Known only from the Río Palenque Station in Los Ríos province, Ecuador.

Niarchos facundoi, new species
Figures 656–678

TYPE: Male holotype taken at an elevation of 3400 m at Shoupshe, Yumate, Molleturo, 2.76961°S, 79.42543°W, Azuay, Ecuador (Jan. 20, 2010; E. Tapia), deposited in QCAZ (PBI_OON 446).

ETYMOLOGY: The specific name is a patronym in honor of Facundo Labarque,



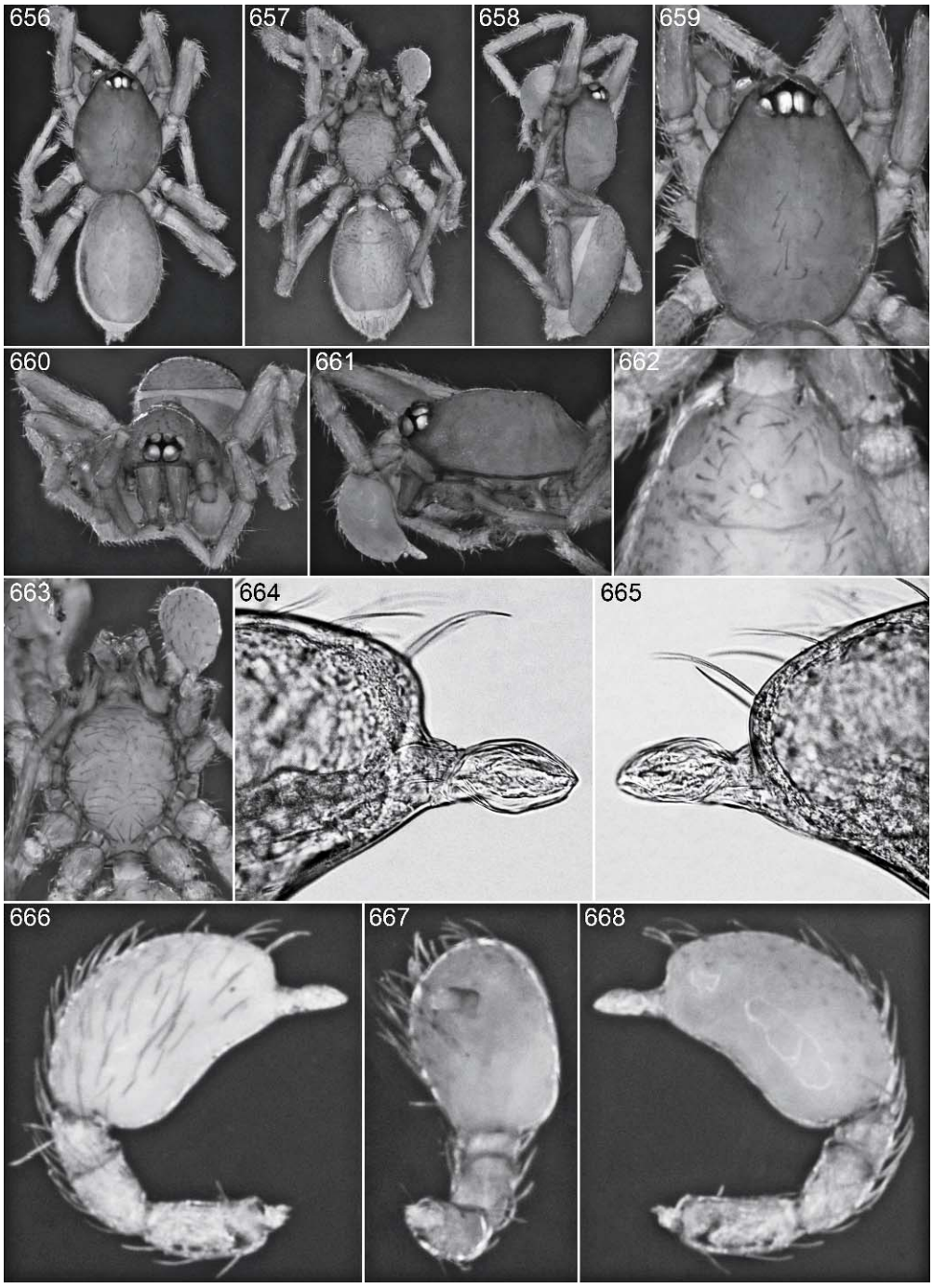
Figs. 647–655. *Niarchos palenque*, new species, female. **647.** Habitus, dorsal view. **648.** Carapace, dorsal view. **649.** Sternum, ventral view. **650.** Abdomen, ventral view. **651.** Carapace, dorsal view. **652.** Same, lateral view. **653.** Epigastric region, ventral view. **654.** Genitalia, ventral view. **655.** Same, dorsal view.

in recognition of his many contributions to the success of the Niarchos Expedition.

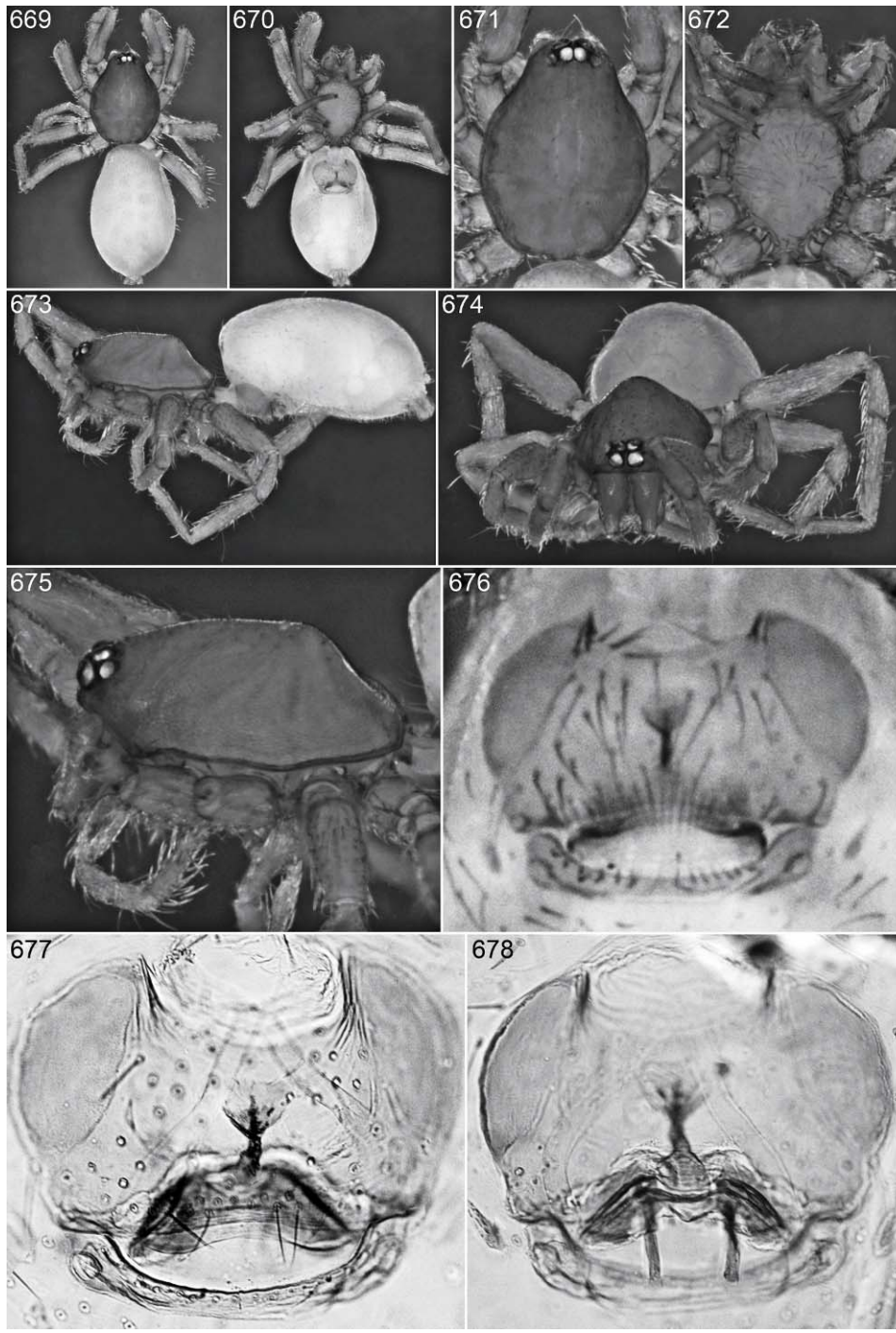
DIAGNOSIS: Males resemble those of *N. palenque* but have a much longer translucent tip on the embolus (figs. 664–668); females have a distinctive, oval sclerotization between the epigastric and postepigastric scuta (figs. 677, 678).

MALE (PBI_OON 446, figs. 656–668): Total length 1.83. Posterior eye row straight from above; PLE-PME separated by PME radius to PME diameter. Sternum surface finely reticulate. Endites with anterior processes narrow, very long, with tip directed laterally. Leg spination: tibiae: III v0-0-1p; IV v0-0-2; metatarsi III, IV v0-0-2. Embolus relatively long, distal portion translucent (figs. 664–668).

FEMALE (PBI_OON 448, figs. 669–678): Total length 1.83. Posterior eye row recurved



Figs. 656–668. *Niarchos facundoi*, new species, male. **656.** Habitus, dorsal view. **657.** Same, ventral view. **658.** Same, lateral view. **659.** Carapace, dorsal view. **660.** Habitus, anterior view. **661.** Carapace, lateral view. **662.** Epigastric region, ventral view. **663.** Sternum and mouthparts, ventral view. **664.** Embolus, prolateral view. **665.** Same, retrolateral view. **666.** Palp, prolateral view. **667.** Same, ventral view. **668.** Same, retrolateral view.



Figs. 669–678. *Niarchos facundoi*, new species, female. **669.** Habitus, dorsal view. **670.** Same, ventral view. **671.** Carapace, dorsal view. **672.** Sternum and mouthparts, ventral view. **673.** Habitus, lateral view. **674.** Same, anterior view. **675.** Carapace, lateral view. **676.** Epigastric region, ventral view. **677.** Genitalia, ventral view. **678.** Same, dorsal view.

from above. Leg spination: tibiae III, IV v0-0-1p. Area between epigastric and postepigastric scuta occupied by wide, oval sclerotization (figs. 677, 678).

OTHER MATERIAL EXAMINED: **Ecuador:** *Azuay:* Luz María, Molleturo, Cuenca, 2.68918°S, 79.41537°W, Jan. 25, 2010, elev. 1910 m (E. Tapia, AMNH, MACN, QCAZ PBI_OON 448), 2♂, 5♀; Yumate, via Pan de Azúcar, Molleturo, 2.76757°S, 79.43222°W, Jan. 23, 2010, elev. 2450 m (E. Tapia, AMNH, QCAZ PBI_OON 447), 4♂, 3♀.

DISTRIBUTION: Known only from Azuay province, Ecuador.

UNPLACED SPECIES

The three species described below are known only from females; based on their unusual genitalic morphology, we suspect that they represent at least one additional species group for which no males are currently known.

Niarchos grismadoi, new species
Figures 679–688

TYPE: Female holotype taken by hand collecting from forest litter at an elevation of 855 m at Otongachi, 0°19′15″S, 78°57′06″W, Santo Domingo de Los Tsáchilas, Ecuador (Dec. 6, 2009; B. Baehr, Niarchos Exped.), deposited in QCAZ (PBI_OON 406).

ETYMOLOGY: The specific name is a patronym in honor of Cristian Grismado, in recognition of his many contributions to the success of the Niarchos Expedition and especially his dedicated sorting of the bulk collections resulting from that fieldwork.

DIAGNOSIS: Females closely resemble those of *N. matiasi* in having an enlarged but membranous anterior receptaculum that occupies most of the distance between the epigastric furrow and pedicel, but the anterior sclerotization on that receptaculum is much smaller (figs. 687, 688).

MALE: Unknown.

FEMALE (PBI_OON 406, figs. 679–688): Total length 1.57. Posterior eye row straight from above; PLE-PME separated by PME radius to PME diameter. Sternum surface smooth. Leg spination: tibiae: III v0-0-1p; IV v0-1p-2; metatarsi IV v0-0-1p. Anterior receptaculum enlarged, membranous, with small anterior sclerotization (figs. 687, 688).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from the type locality in Santo Domingo de Los Tsáchilas province, Ecuador.

Niarchos matiasi, new species
Figures 689–698

TYPE: Female holotype from Berlese sample of rainforest litter taken at an elevation of 295 m at the Estación Científica Yasuni, Río Tiputini, Puerto Francisco de Orellana, Parroquia, Cantón Francisco de Orellana, 0.067428°S, 76.39764°W, Orellana, Ecuador (Dec. 1–5, 2009; M. Ramírez, Niarchos Exped.), deposited in QCAZ (PBI_OON 443).

ETYMOLOGY: The specific name is a patronym in honor of Matias Izquierdo, a student of the collector of the holotype, in recognition of his many contributions to the success of the Niarchos Expedition.

DIAGNOSIS: Females resemble those of *N. grismadoi* in having an enlarged but membranous anterior receptaculum and boomerang-shaped apodemes of the postepigastric scutum, but have a much larger anterior sclerotization on the anterior receptaculum (figs. 697, 698).

MALE: Unknown.

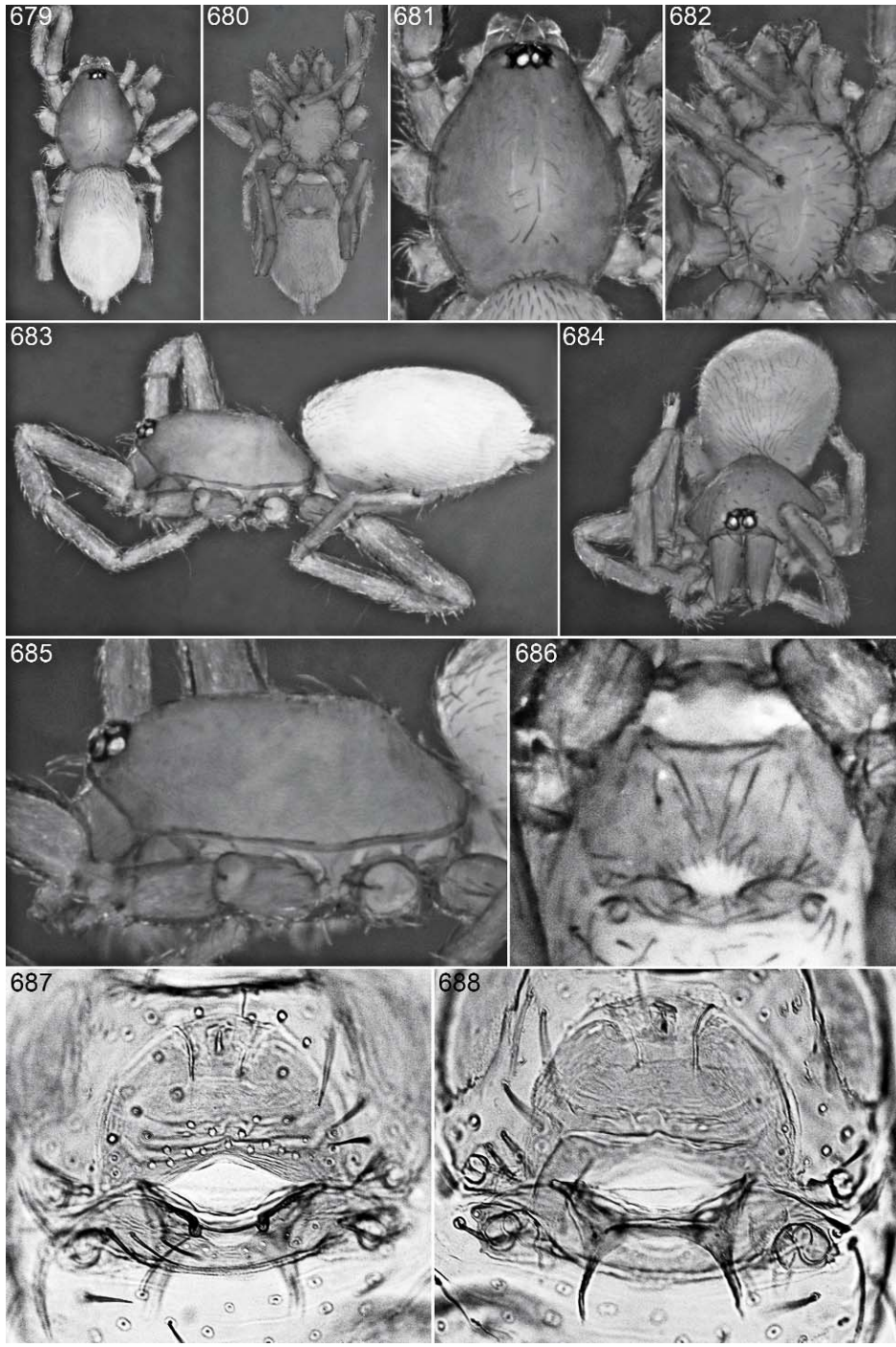
FEMALE (PBI_OON 443, figs. 689–698): Total length 1.54. Posterior eye row straight from above; PLE-PME separated by less than PME radius. Sternum surface smooth. Leg spination: tibiae IV v0-0-2; metatarsi IV v0-0-1p. Anterior receptaculum enlarged, occupying most of distance between epigastric furrow and pedicel, with wide anterior sclerotization (figs. 697, 698).

OTHER MATERIAL EXAMINED: One female taken with the holotype (MACN PBI_OON 444).

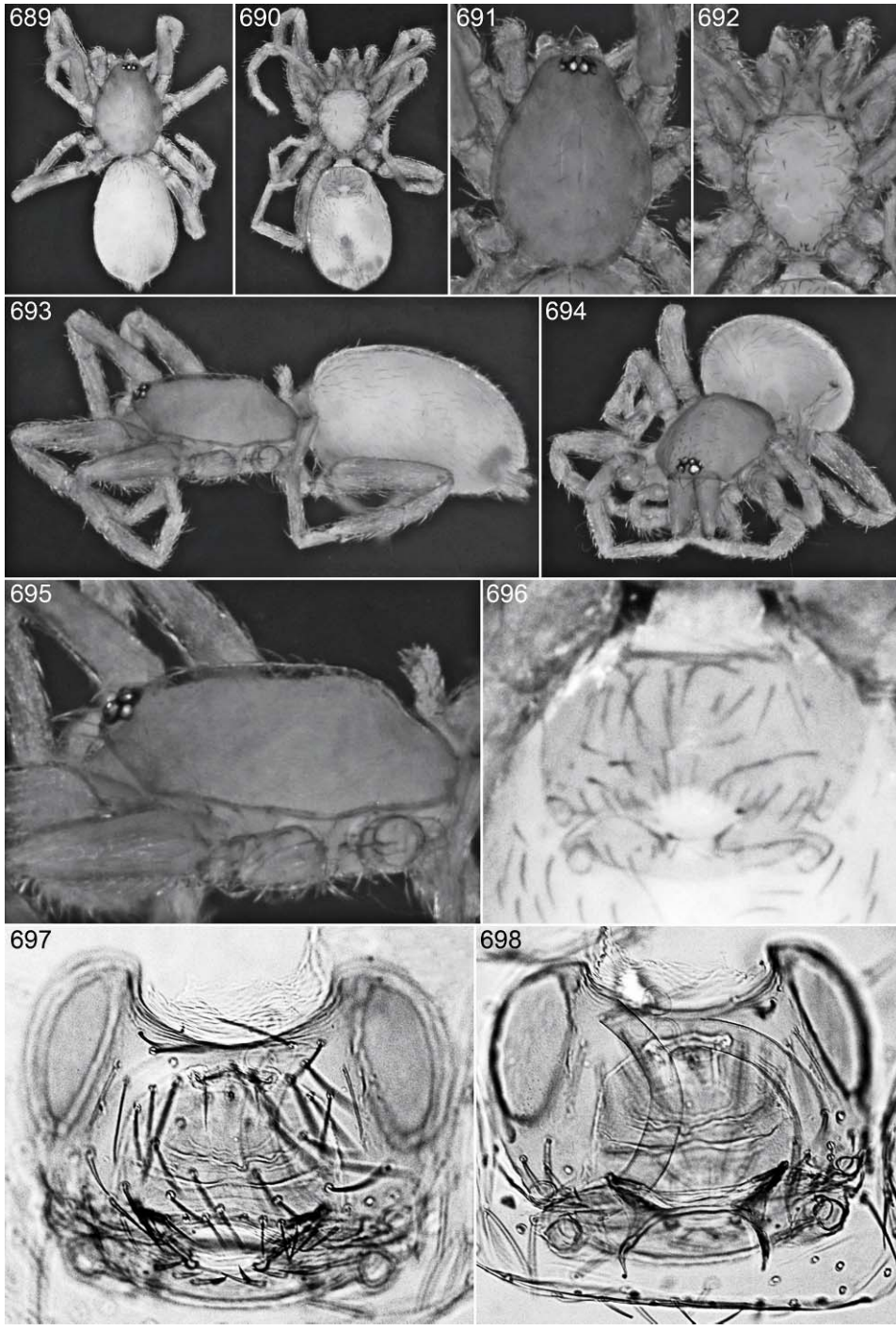
DISTRIBUTION: Known only from the Yasuni Biological Station in lowland Orellana province, Ecuador.

Niarchos rheimsae, new species
Figures 699–708

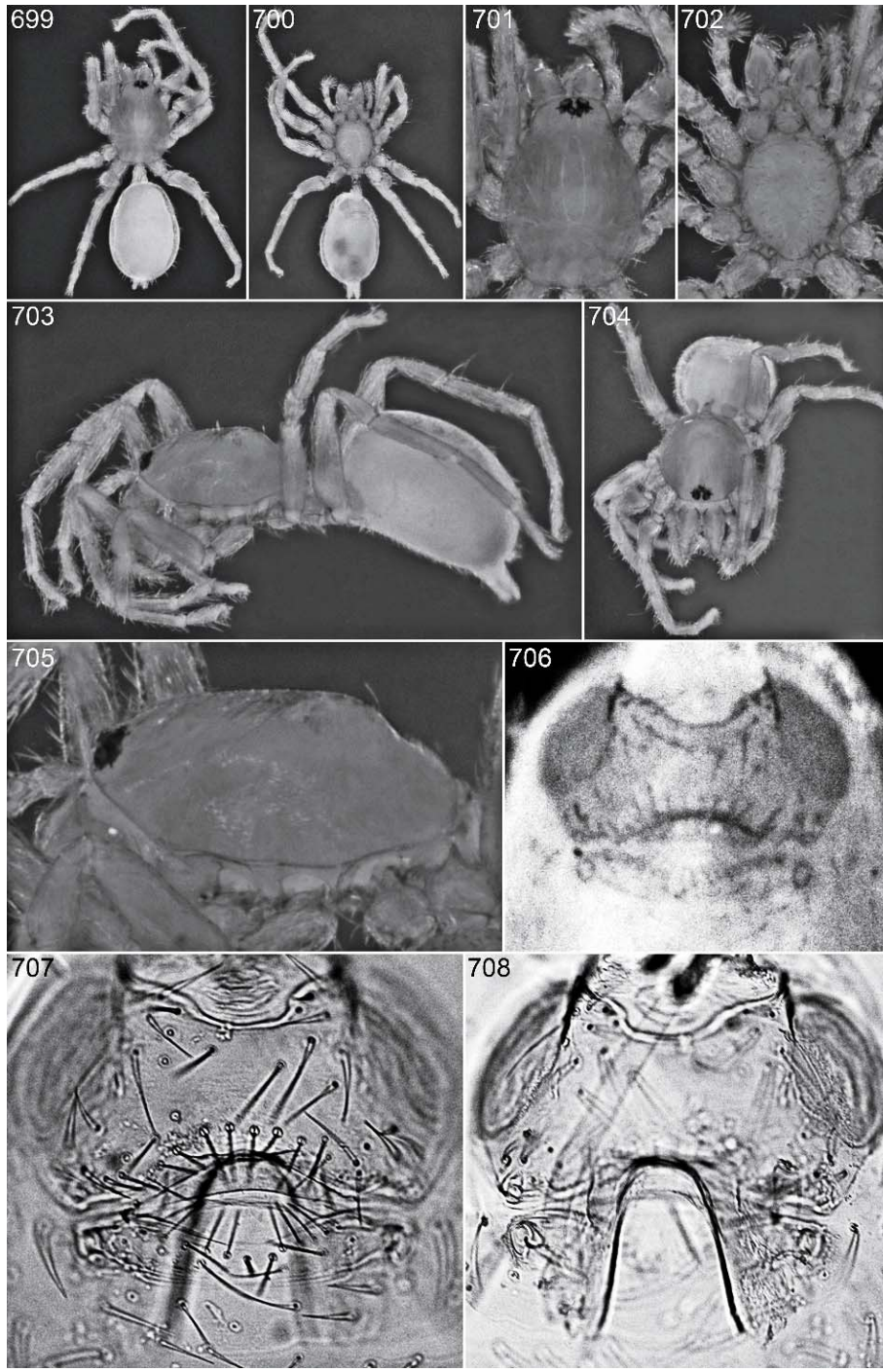
TYPE: Female holotype from Berlese sample of forest litter taken at an elevation of 300 m at a site 73 km NE of Chone and



Figs. 679–688. *Niarchos grismadoi*, new species, female. **679.** Habitus, dorsal view. **680.** Same, ventral view. **681.** Carapace, dorsal view. **682.** Sternum and mouthparts, ventral view. **683.** Habitus, lateral view. **684.** Same, anterior view. **685.** Carapace, lateral view. **686.** Epigastric region, ventral view. **687.** Genitalia, ventral view. **688.** Same, dorsal view.



Figs. 689–698. *Niarchos matiasi*, new species, female. **689.** Habitus, dorsal view. **690.** Same, ventral view. **691.** Carapace, dorsal view. **692.** Sternum and mouthparts, ventral view. **693.** Habitus, lateral view. **694.** Same, anterior view. **695.** Carapace, lateral view. **696.** Epigastric region, ventral view. **697.** Genitalia, ventral view. **698.** Same, dorsal view.



Figs. 699–708. *Niarchos rheimsae*, new species, female. **699.** Habitus, dorsal view. **700.** Same, ventral view. **701.** Carapace, dorsal view. **702.** Sternum and mouthparts, ventral view. **703.** Habitus, lateral view. **704.** Same, anterior view. **705.** Carapace, lateral view. **706.** Epigastric region, ventral view. **707.** Genitalia, ventral view. **708.** Same, dorsal view.

85 km W of Santo Domingo, Manabí, Ecuador (June 12, 1976; S., J. Peck), deposited in FMNH (PBI_OON 37831).

ETYMOLOGY: The specific name is a patronym in honor of Cristina Rheims of the Instituto Butantan, in recognition of her many contributions to the success of the Niarchos Expedition.

DIAGNOSIS: Males are unknown; the single known female has enigmatic genitalia, possibly including a membranous anterior receptaculum that was lost in preparation, but easily distinguishable from all the other known females by the shape of the posterior apodemes, which are almost as long as the entire epigastric scutum (figs. 707, 708).

MALE: Unknown.

FEMALE (PBI_OON 37831, figs. 699–708): Total length 1.82. Posterior eye row procurved from above; PME separated by their radius to diameter, PLE-PME separated by PME radius to PME diameter. Sternum surface smooth. Leg spination: tibiae IV v0-0-2. Postepigastric scutum with long apodemes bearing sinuous anterior margins; details of anterior receptaculum unknown (figs. 707, 708).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Manabí province, Ecuador.

Scaphios, new genus

TYPE SPECIES: *Scaphios yanayacu*, new species.

ETYMOLOGY: The generic name is a contraction of "*Scaphiella*-like *Niarchos,*" referring to the male palpal similarities with *Scaphiella* (a globose palpal bulb bearing a narrow, subdistally originating embolus); the gender is masculine.

DIAGNOSIS: These species resemble those of *Niarchos* in having a separate ventral pedicel sclerite in females (but not males, figs. 3, 4), but differ in having normal-sized (rather than reduced) posterior eyes (figs. 712, 793), a sinuous, subdistally originating embolus (figs. 717, 809) in males, and large M-shaped apodemes (figs. 800, 823) posteriorly in the female genitalia.

DESCRIPTION: Total length of males 1.3–1.8, of females 1.5–2.4; carapace orange, sternum, chelicerae, endites, labium, legs, and palpi pale orange, dorsal and ventral scuta of males pale orange, epigastric and postepigastric scuta of females yellow, soft portions of abdomen white, often iridescent. **Cephalothorax:** Carapace without any pattern, ovoid in dorsal view, pars cephalica slightly elevated in lateral view, anteriorly narrowed to between 0.5 and 0.75 times its maximum width, with rounded posterolateral corners; posterolateral edge without pits, posterior margin not bulging below posterior rim, anterolateral corners with slightly sclerotized triangular projections, posterolateral surface without spikes, surface of elevated portion of pars cephalica smooth, sides finely reticulate; pars thoracica without depressions, fovea absent, without radiating rows of pits; lateral margin straight, rebordered, without denticles; plumose setae near posterior margin of pars thoracica absent; nonmarginal pars cephalica setae dark, needlelike, scattered; nonmarginal pars thoracica setae absent; marginal setae dark, needlelike. Clypeus margin unmodified, curved downward in front view, vertical in lateral view, low, ALE separated from edge of carapace by less than their radius, median projection absent; setae dark, needlelike. Chilum absent. Eyes well developed, ALE largest, oval, PME oval or squared, PLE oval; posterior eye row usually (but not always) recurved from above, procurved from front; ALE separated by less than their radius to more than their diameter, ALE-PLE separated by less than ALE radius, PME separated by less than their radius, PME-PLE separated by less than their PME radius to PME diameter. Sternum longer than wide, coloration uniform, not fused to carapace, median concavity absent, without hair tufts, with radial furrows between coxae I–II, II–III, III–IV, furrows smooth, radial furrow opposite coxae III absent; surface finely reticulate, without pits, microsculpture covering entire surface, sickle-shaped structures absent; anterior margin unmodified, posterior margin not extending posteriorly of coxae IV, anterior corner unmodified, lateral margin without infracoxal grooves, distance between coxae approximately equal, precoxal triangles present, lateral margins unmodified, without posterior hump; setae sparse, dark, needlelike, densest laterally, originating from

surface; sternum of females followed posteriorly by small ventral pedicel sclerite. Chelicerae straight; without teeth on promargin or retromargin, anterior face with basal swelling; fang without toothlike projections, directed medially, shape normal, without prominent basal process, tip unmodified; setae dark, needlelike, densest medially; paturon inner margin with scattered setae, distal region abruptly narrowed, posterior surface unmodified, promargin unmodified, inner margin unmodified, laminate groove absent. Labium triangular, not fused to sternum, anterior margin indented at middle, same as sternum in sclerotization, with six or more setae on anterior margin, subdistal portion with unmodified setae. Endites distally not excavated, serrula present in single row, anteromedian tip with one strong, toothlike projection in males, unmodified in females, posteromedian part unmodified, same as sternum in sclerotization. Female palp without claw; with long bristles but without spines; tarsus unmodified, patella without prolateral row of ridges. **Abdomen:** Without color pattern (except in *S. orellana*, where dorsum soft portions show transverse rows of slightly darkened spots), cylindrical, without long posterior extension, rounded posteriorly, interscutal membrane with setae, without rows of small sclerotized platelets. Book lung covers large, ovoid, without setae, anterolateral edge unmodified. Posterior spiracles connected by groove. Pedicel tube short, ribbed, scuto-pedicel region unmodified, scutum extending far dorsal of pedicel in males (but not females), plumose hairs absent, matted setae on anterior ventral abdomen in pedicel area absent, cuticular outgrowths near pedicel absent. Dorsal scutum present in males (but not females), strongly sclerotized, without color pattern, covering most of dorsum (except in *S. orellana*, where reduced to narrow longitudinal strip confined to cardiac area), not fused to epigastric scutum, surface finely reticulate, anterior half without projecting denticles. Epigastric scutum of males strongly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent, fused to long, strongly sclerotized postepigastric scutum occupying most of venter (except in *S. orellana*, where confined to epigastric area), anterior margin unmodified, with short posteriorly directed lateral apodemes; epigastric scutum of females weakly sclerotized, not surrounding pedicel, without lateral joints, postepigastric scutum weakly sclerotized, short, only around epigastric furrow, not fused to epigastric scutum, with long posteriorly directed lateral apodemes. Spinneret scutum present as narrow transverse ridge anterior to ALS. Supraanal scutum absent. Dorsum setae dark, needlelike, epigastric area setae uniform, dark, needlelike, postepigastric area setae dark, needlelike; dense patch of setae anterior to spinnerets absent. Spinneret scutum with fringe of stout setae. Interscutal membrane with setae. Colulus absent. Spinnerets scanned only in *S. yanayacu*; anterior laterals with single major ampullate gland spigot and three piriform gland spigots; posterior medians with two spigots; posterior laterals with three spigots (figs. 735–738, 782–785). **Legs:** Without color pattern; femur IV not thickened, same size as femora I–III, patella plus tibia I shorter than carapace, tibia I unmodified, tibia IV specialized hairs on ventral apex absent, tibia IV ventral scopula absent, metatarsi I, II mesoapical comb absent, metatarsi III, IV weak ventral scopula absent. Leg spines present as slightly enlarged, greatly darkened macrosetae on ventral surface of tibiae (and sometimes metatarsi) IV (and sometimes III). Superior claws with few large teeth situated distally on lateral surface, many small teeth situated proximally on median surface, inner face striate; inferior claws absent. Trichobothrial base with opening longitudinally narrowed, aperture internal texture gratelike, hood covered by numerous low, closely spaced ridges (fig. 744). Tarsal organs of legs I, II with three sensillae, of legs III, IV, and palp with two sensillae (figs. 739–743, 786–790). **Genitalia:** Male epigastric region with sperm pore large, oval, situated in front of anterior spiracles, unmodified; furrow without Ω-shaped insertions, without setae. Male palp of normal size, not strongly sclerotized, right and left palps symmetrical, proximal segments pale orange; trochanter of normal size, unmodified; femur of normal size, two or more times as long as trochanter, without posteriorly rounded lateral dilation, attaching to patella basally; patella shorter than

femur, slightly wider than femur, without prolateral row of ridges, setae unmodified; tibia with three trichobothria; cymbium yellow, ovoid in dorsal view, completely fused with bulb, no seam visible, not extending beyond distal tip of bulb, plumose setae absent, without stout setae, without distal patch of setae; bulb yellow, 1–1.5 times as long as cymbium, stout; embolus dark, prolateral excavation absent. Female genitalia without tentlike anterior receptaculum, with obvious posterior apodemes.

DISTRIBUTION: Known only from Ecuador and Colombia, at an extraordinary range of altitudes, from lowland areas near the Amazon to as high as 3850 m in the Andes.

KEY TO SPECIES OF *SCAPHIOS*

1. Males (those of *wagra* and *jatun* unknown) 2
– Females (those of *puyo* unknown). 7
2. Dorsal scutum covering most of dorsum . . . 3
– Dorsal scutum covering cardiac area only (fig. 867). . . . . *orellana*
3. Base of embolus much wider than tip (figs. 809, 906) 4
– Base of embolus not much wider than tip (figs. 717, 832, 895) 5
4. Base of embolus longer than tip (fig. 809) . . . . . *napo*
– Base of embolus shorter than tip (fig. 906) . . . . . *planada*
5. Base of embolus very long, narrow (fig. 895) . . . . . *puyo*
– Base of embolus otherwise (figs. 717, 832) 6
6. Tip of embolus directed distally (fig. 717) . . . . . *yanayacu*
– Tip of embolus directed ventrally (fig. 832) . . . . . *cayambe*
7. Genitalia with distinct atrium (figs. 865, 888) 8
– Genitalia without distinct atrium 9
8. Anterior genitalic projection relatively long (fig. 865). . . . . *jatun*
– Anterior genitalic projection relatively short (fig. 888). . . . . *orellana*
9. Transverse bar of genitalia strongly procurved (figs. 845, 919) 10
– Transverse bar of genitalia slightly procurved (figs. 799, 822, 855) 11
10. Anterior genitalic process expanded anteriorly (fig. 845). . . . . *cayambe*
– Anterior genitalic process narrow anteriorly (fig. 919). . . . . *planada*
11. Anterior genitalic process expanded anteriorly (figs. 799, 855). 12
– Anterior genitalic process narrow anteriorly (fig. 822). . . . . *napo*
12. Transverse bar of genitalia relatively thick (fig. 800). . . . . *yanayacu*
– Transverse bar of genitalia relatively thin (fig. 856). . . . . *wagra*

Scaphios yanayacu, new species
Figs. 3, 4, 709–800

TYPES: Male holotype and female allotype from Winkler samples of litter taken at an elevation of 2100 m on the circuit trail at Yanayacu Biological Station, Napo, Ecuador (Nov. 25, 2009; B. Baehr, Niarchos Exped.), deposited in QCAZ (PBI_OON 452).

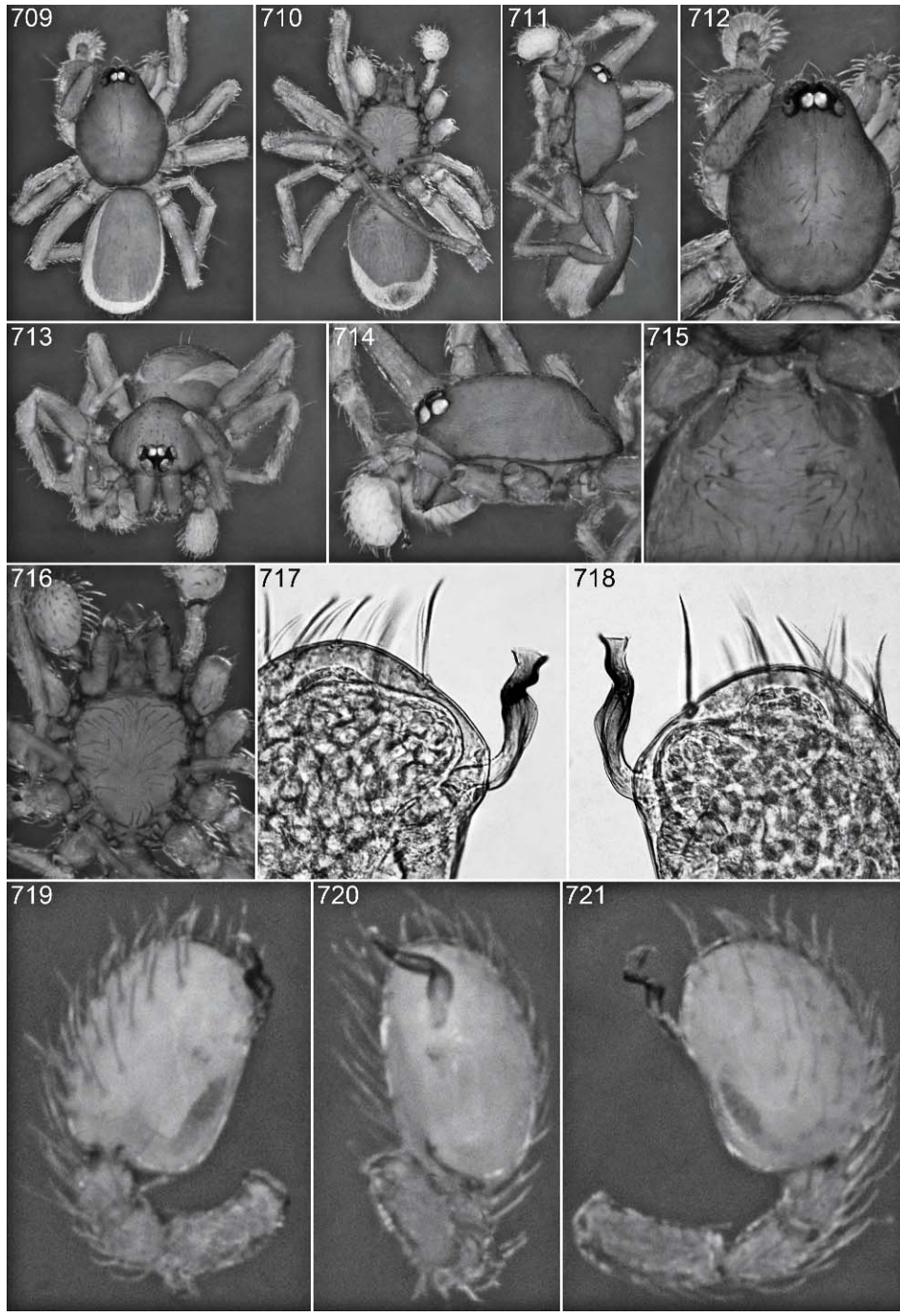
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males resemble those of *S. napo* but have a shorter embolus (figs. 717–721); females have the transverse sclerite at the base of the anterior genitalic projection longer than in that species (figs. 799, 800).

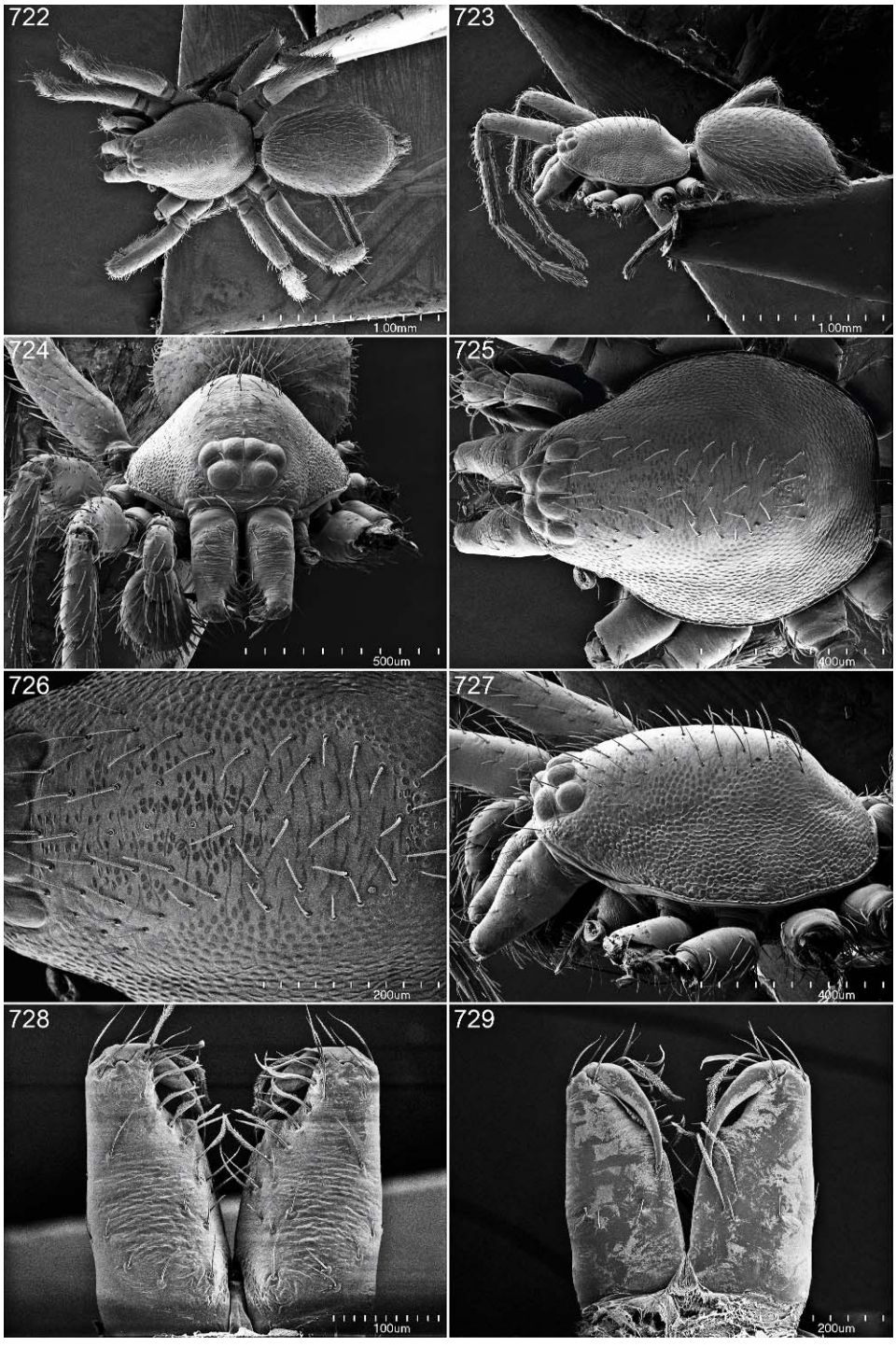
MALE (PBI_OON 452, figs. 3, 709–757): Total length 1.36. PME oval; ALE separated by less than their radius; PLE-PME separated by less than PME radius. Endites with anterior projection beaklike, directed laterally. Leg spination: tibiae IV v0-0-2. Embolus relatively short, sinuous, distally darkened; bulb elongated (figs. 717–721).

FEMALE (PBI_OON 452, figs. 4, 758–800): Total length 1.76. Posterior eye row recurved from above, procurved from front. Leg spination: tibiae: III, IV v0-0-2. Anterior genitalic process anteriorly expanded, leaflike, transverse bar at base of anterior process long, procurved; apodemes large, occupying full distance between posterior spiracles (figs. 799, 800).

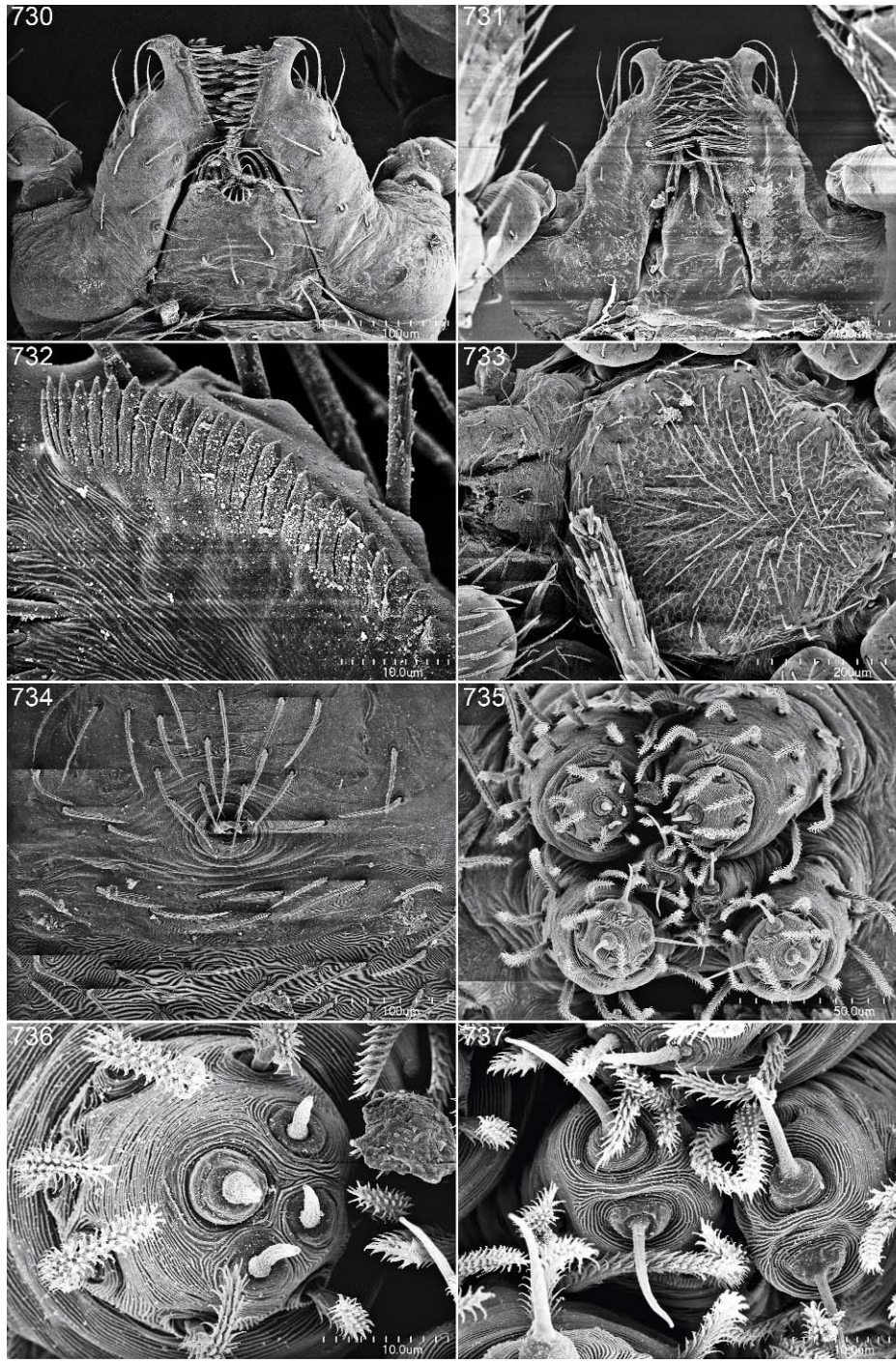
OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Yanayacu Biological Station, 0°36.496′S, 77°52.947′W, Nov. 28, 2009, litter, hand collecting, elev. 2405 m (B. Baehr, Niarchos Exped., AMNH PBI_OON 419), 2♂; Yanayacu Biological Station, circuit trail, Nov. 25, 2009, Winkler trap, litter, elev. 2100 m (B. Baehr, Niarchos Exped., AMNH PBI_OON 452), 1♀; Yanayacu Biological Station, Macucoloma trail, 0°36.196′S, 77°53.407′W, Nov. 25–30, 2009, beating foliage, elev. 2100 m (Niarchos Exped.,



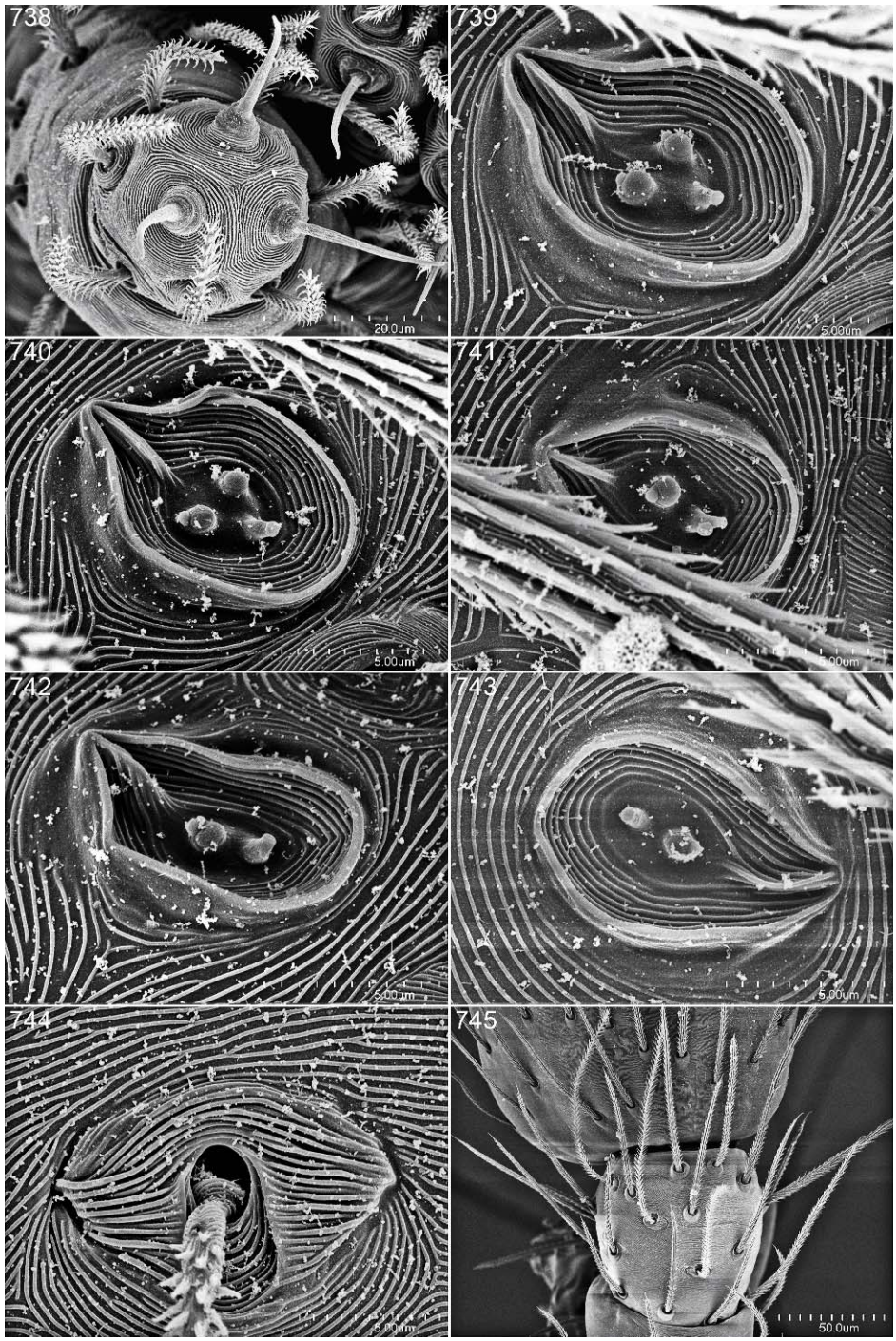
Figs. 709–721. *Scaphios yanayacu*, new species, male. **709.** Habitus, dorsal view. **710.** Same, ventral view. **711.** Same, lateral view. **712.** Carapace, dorsal view. **713.** Habitus, anterior view. **714.** Carapace, lateral view. **715.** Epigastric region, ventral view. **716.** Sternum and mouthparts, ventral view. **717.** Embolus, prolateral view. **718.** Same, retrolateral view. **719.** Palp, prolateral view. **720.** Same, ventral view. **721.** Same, retrolateral view.



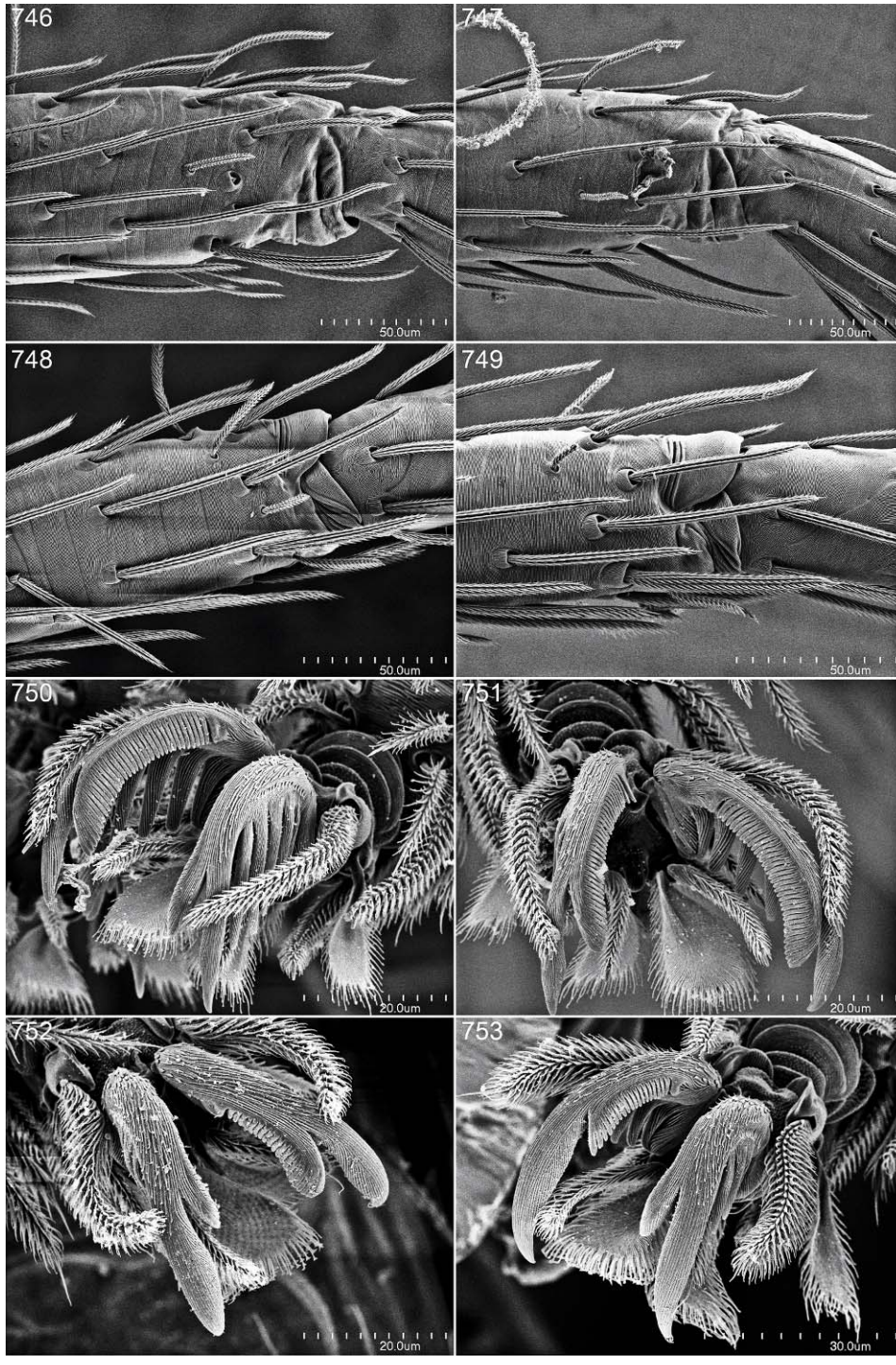
Figs. 722–729. *Scaphios yanayacu*, new species, male. **722.** Habitus, dorsal view. **723.** Same, lateral view. **724.** Same, anterior view. **725.** Carapace, dorsal view. **726.** Same, detail. **727.** Same, lateral view. **728.** Chelicerae, anterior view. **729.** Same, posterior view.



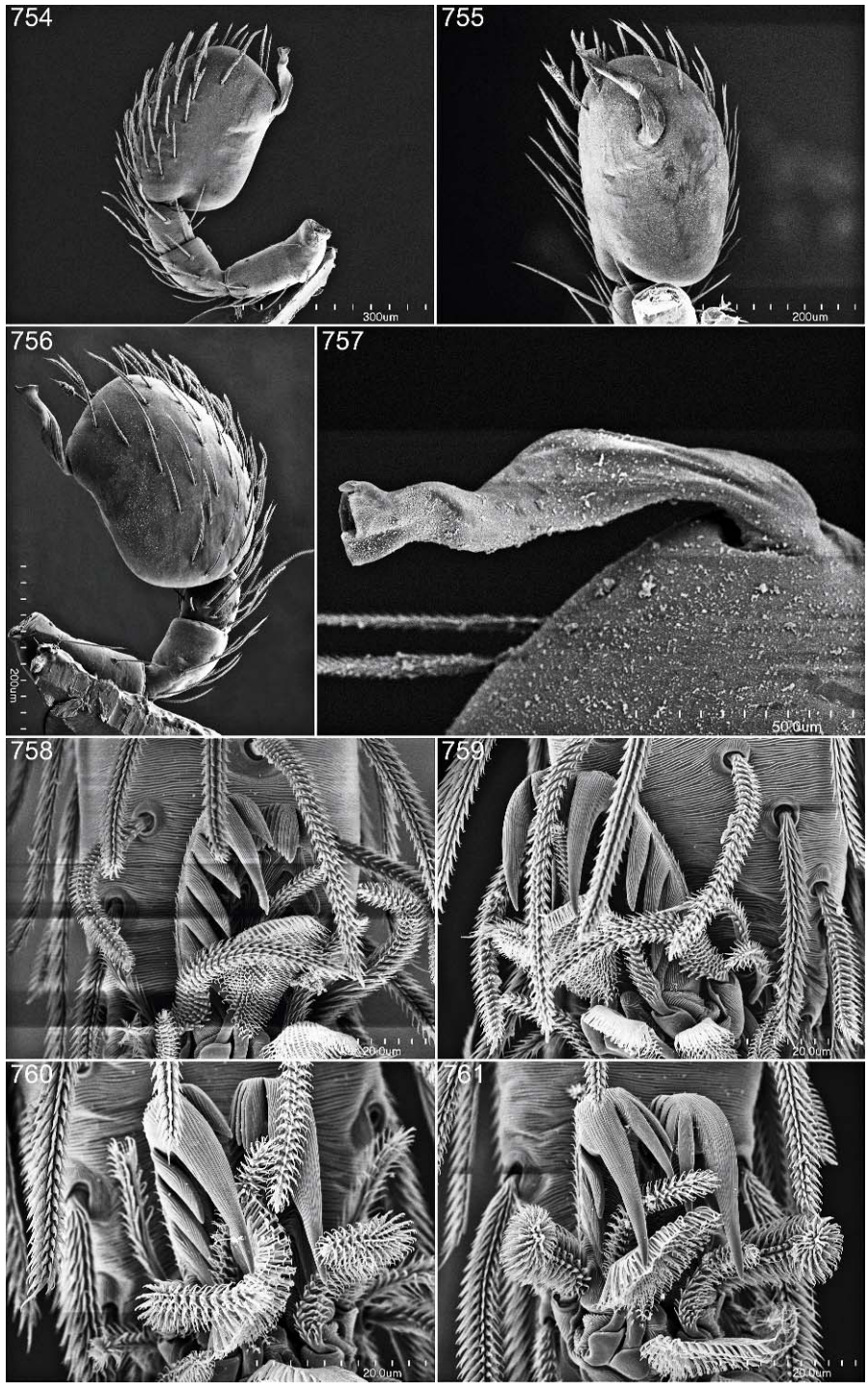
Figs. 730–737. *Scaphios yanayacu*, new species, male. **730.** Labium and endites, ventral view. **731.** Labrum and endites, dorsal view. **732.** Serrula, dorsal view. **733.** Sternum, ventral view. **734.** Sperm pore, ventral view. **735.** Spinnerets, distal view. **736.** Anterior lateral spinneret, same. **737.** Posterior median spinneret, same.



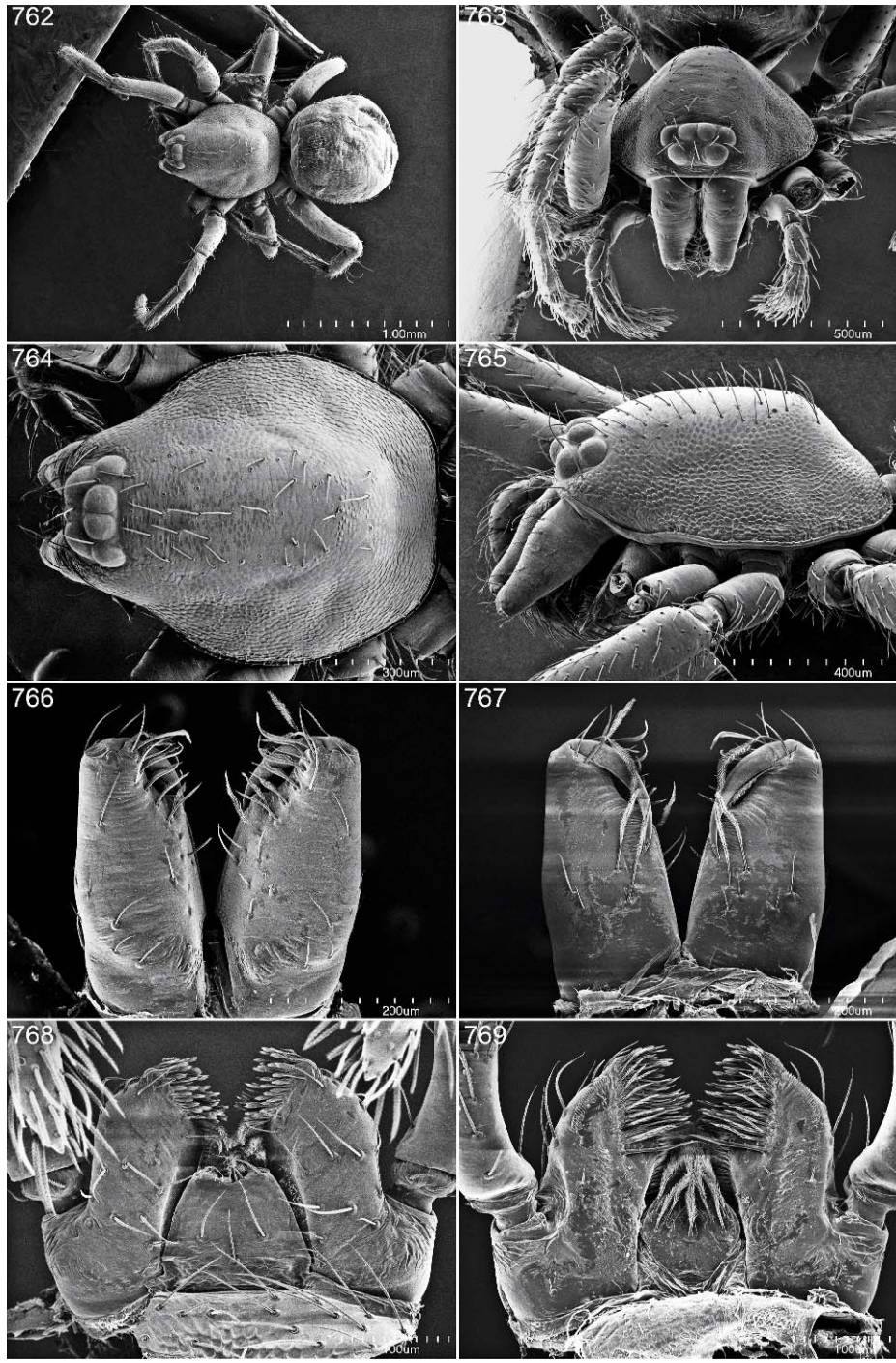
Figs. 738–745. *Scaphios yanayacu*, new species, male. **738.** Posterior lateral spinneret, distal view. **739.** Tarsal organ, leg I, dorsal view. **740.** Same, leg II. **741.** Same, leg III. **742.** Same, leg IV. **743.** Same, palp. **744.** Trichobothrial base, tibia III, dorsal view. **745.** Palpal tibia, dorsal view.



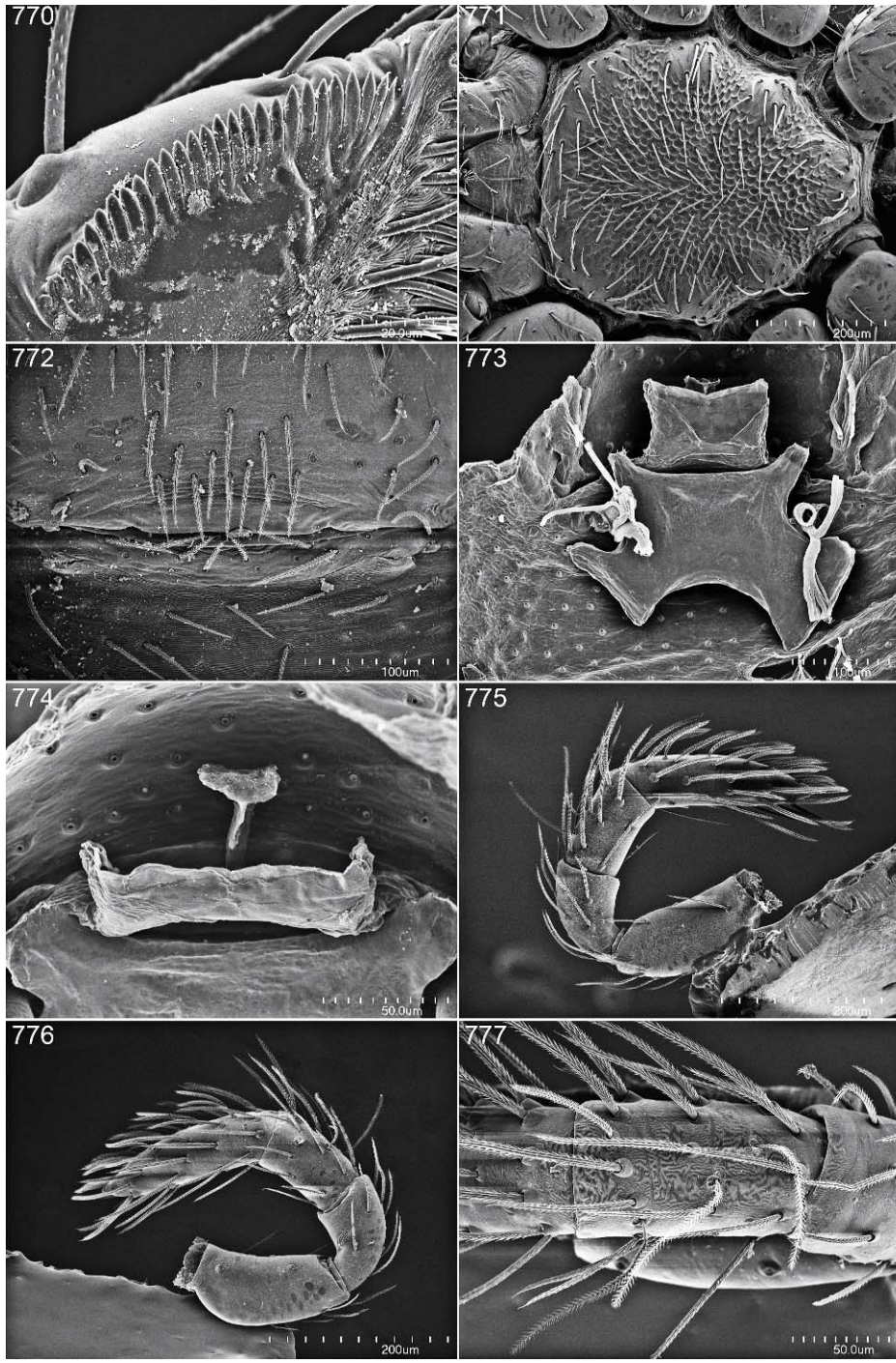
Figs. 746–753. *Scaphios yanayacu*, new species, male. **746.** Tip of tibia III, lateral view. **747.** Same, tibia IV. **748.** Same, metatarsus III. **749.** Same, metatarsus IV. **750.** Claws, leg I, distal view. **751.** Same, leg II. **752.** Same, leg III. **753.** Same, leg IV.



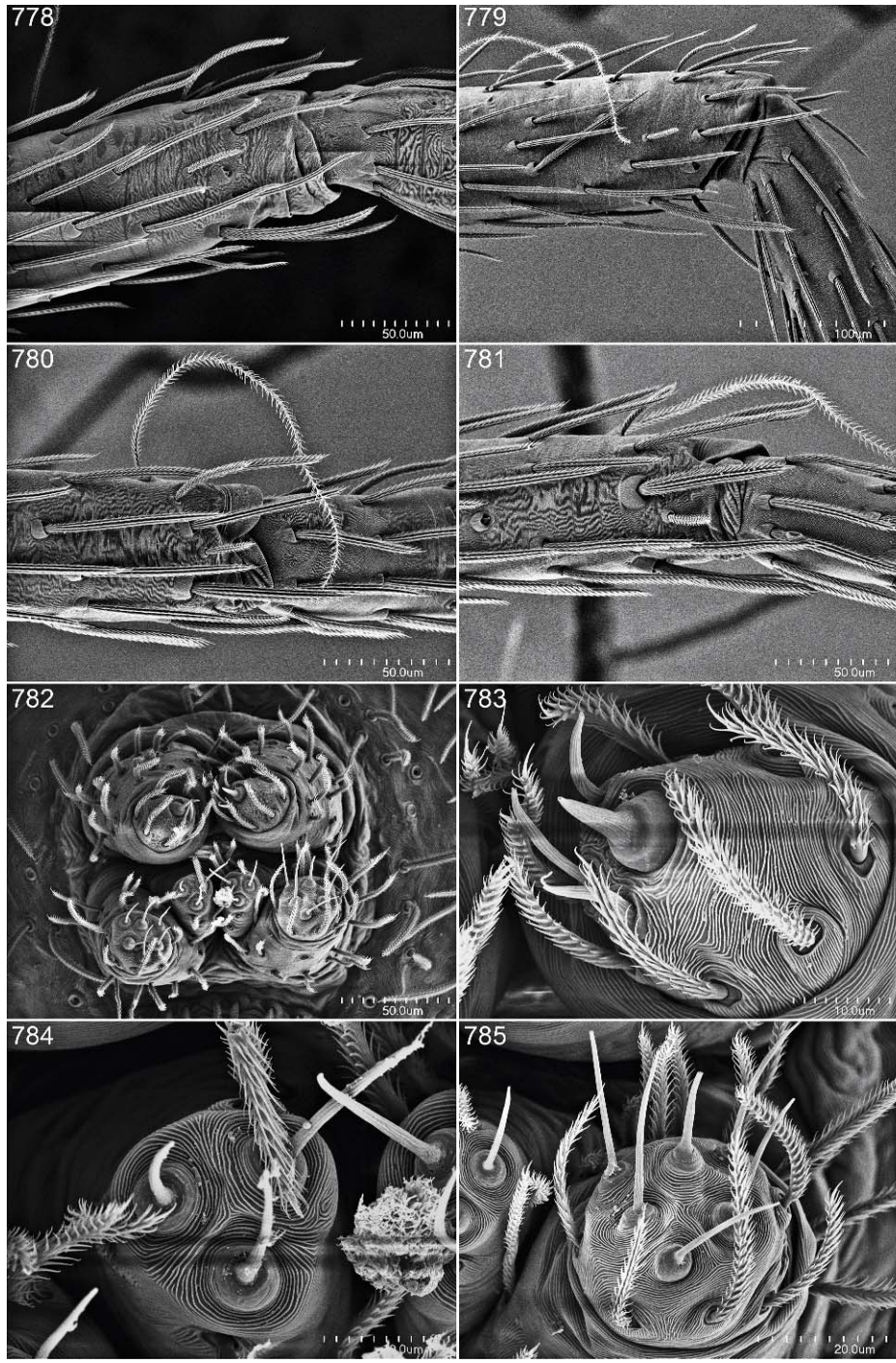
Figs. 754–761. *Scaphios yanayacu*, new species. **754.** Male palp, prolateral view. **755.** Same, ventral view. **756.** Same, retrolateral view. **757.** Embolus, prolateral view. **758.** Female, claws of leg I, distal view. **759.** Same, leg II. **760.** Same, leg III. **761.** Same, leg IV.



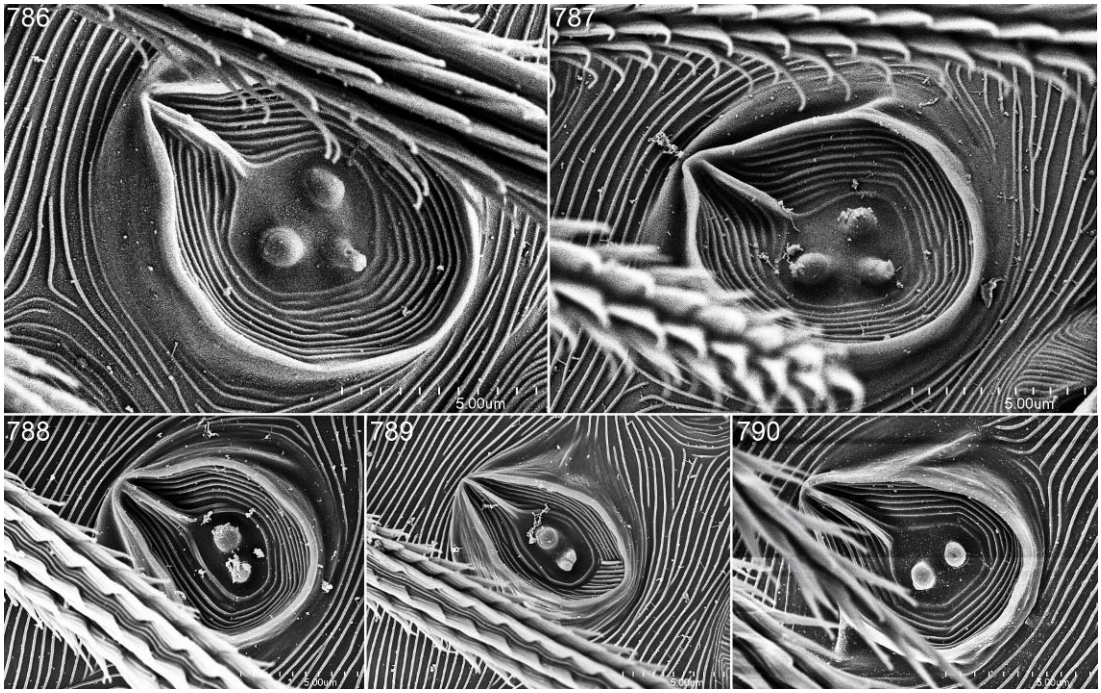
Figs. 762–769. *Scaphios yanayacu*, new species, female. **762.** Habitus, dorsal view. **763.** Same, anterior view. **764.** Carapace, dorsal view. **765.** Same, lateral view. **766.** Chelicerae, anterior view. **767.** Same, posterior view. **768.** Labium and endites, ventral view. **769.** Labrum and endites, dorsal view.



Figs. 770–777. *Scaphios yanayacu*, new species, female. **770.** Serrula, dorsal view. **771.** Sternum, ventral view. **772.** Epigastric region, ventral view. **773.** Genitalia, dorsal view. **774.** Same, anterior view. **775.** Palp, prolateral view. **776.** Palp, retrolateral view. **777.** Palpal tibia, dorsal view.



Figs. 778–785. *Scaphios yanayacu*, new species, female. **778.** Tip of tibia III, lateral view. **779.** Same, tibia IV. **780.** Same, metatarsus III. **781.** Same, metatarsus IV. **782.** Spinnerets, distal view. **783.** Anterior lateral spinneret, same. **784.** Posterior median spinneret, same. **785.** Posterior lateral spinneret, same.



Figs. 786–790. *Scaphios yanayacu*, new species, female. **786.** Tarsal organ, leg I, dorsal view. **787.** Same, leg II. **788.** Same, leg III. **789.** Same, leg IV. **790.** Same, palp.

MACN OON_PBI 456), 1♂; Yanayacu Biological Station, Río Perdido trail, 0°36.496′S, 77°52.947′W, Nov. 26, 2009, litter, elev. 2085 m (Niarchos Exped., AMNH PBI_OON 420), 4♂, 5♀, Nov. 25–26, 2009, same, beating (Niarchos Exped., MACN PBI_OON 455, 458), 2♀; Yanayacu Biological Station, stream trail, 0°35.955′S, 77°53.431′W, Nov. 24–25, 2009, litter, elev. 2130 m (Niarchos Exped., AMNH PBI_OON 417), 6♂, 5♀ (including 2♂, 1♀ P. Michalik vouchers EC-005, 045, 047), Nov. 24–Dec. 2, 2009, pitfalls, elev. 2130 m (N. Platnick, N. Dupérré, E. Tapia, Niarchos Exped., AMNH PBI_OON 416), 19♂, 6♀, same, pitfalls, Winkler traps (B. Baehr, Niarchos Exped, AMNH PBI_OON 451), 3♂, 3♀, Nov. 25–30, 2009, Berlese (Niarchos Exped., MACN PBI_OON 453), 1♂, sifting (Niarchos Exped., MACN PBI_OON 456), 1♂; Yanayacu Biological Station, trail to San Jorge de Yanayacu Wildlife Refuge, 0.58818°S, 77.88428°W, Nov. 30, 2009, elev. 2140 m (Niarchos Exped., AMNH PBI_OON 424), 2♂, Nov. 25–30, 2009, sifting (Niarchos, Exped., MACN PBI_OON 454, 457), 3♂, 1♀.

DISTRIBUTION: Known only from the Yanayacu Biological Station in Napo province, Ecuador, where it is sympatric with *S. napo*.

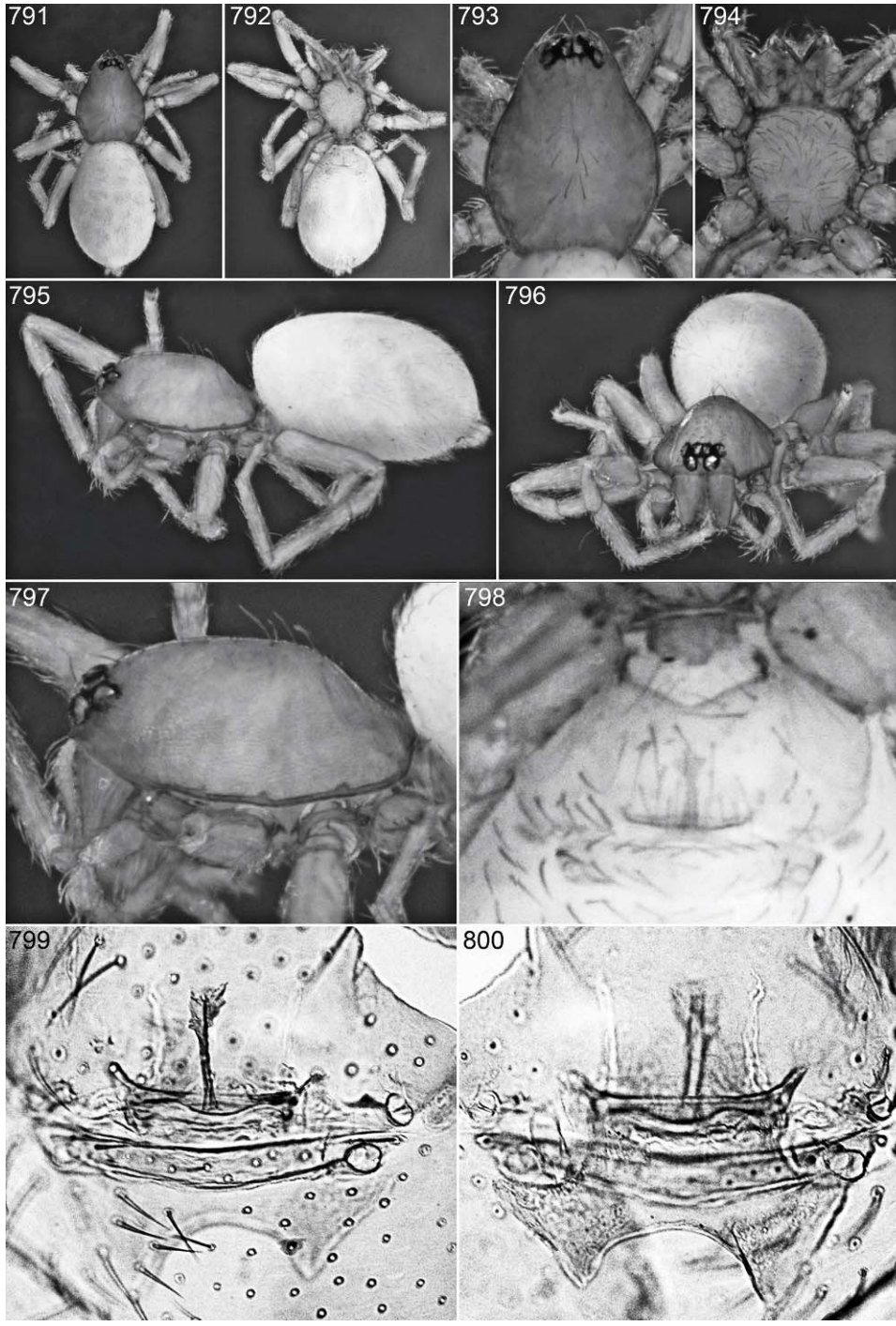
Scaphios napo, new species
Figs. 801–823

TYPES: Male holotype and female allotype from Winkler samples of litter taken at an elevation of 2100 m on the circuit trail at Yanayacu Biological Station, Napo, Ecuador (Nov. 25, 2009; B. Baehr, Niarchos Exped.), deposited in QCAZ (PBI_OON 459).

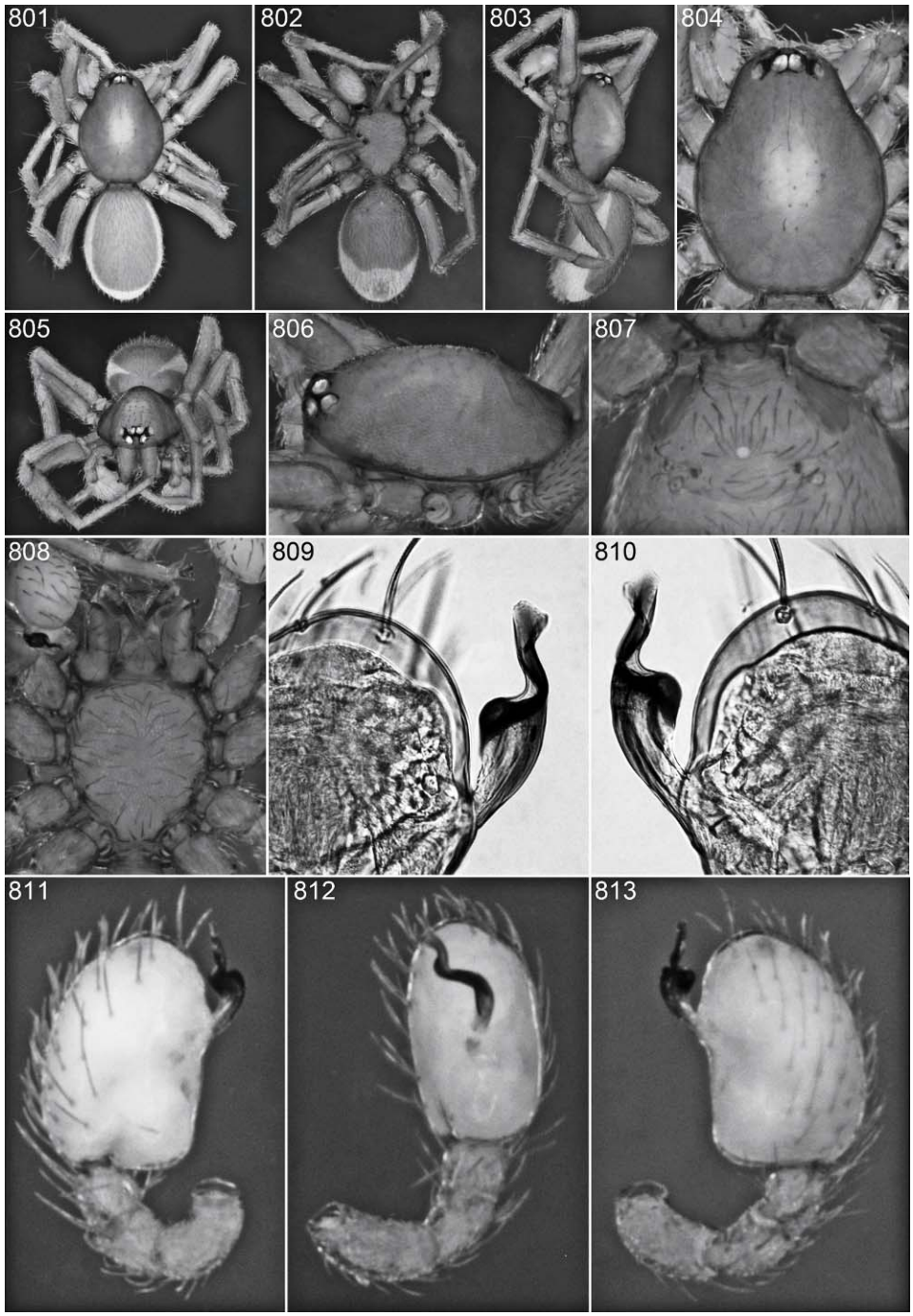
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males resemble those of *S. yanayacu* but have a longer, humped embolus (figs. 809–813); females have the transverse sclerite at the base of the anterior genitalic projection shorter than in that species (figs. 822, 823).

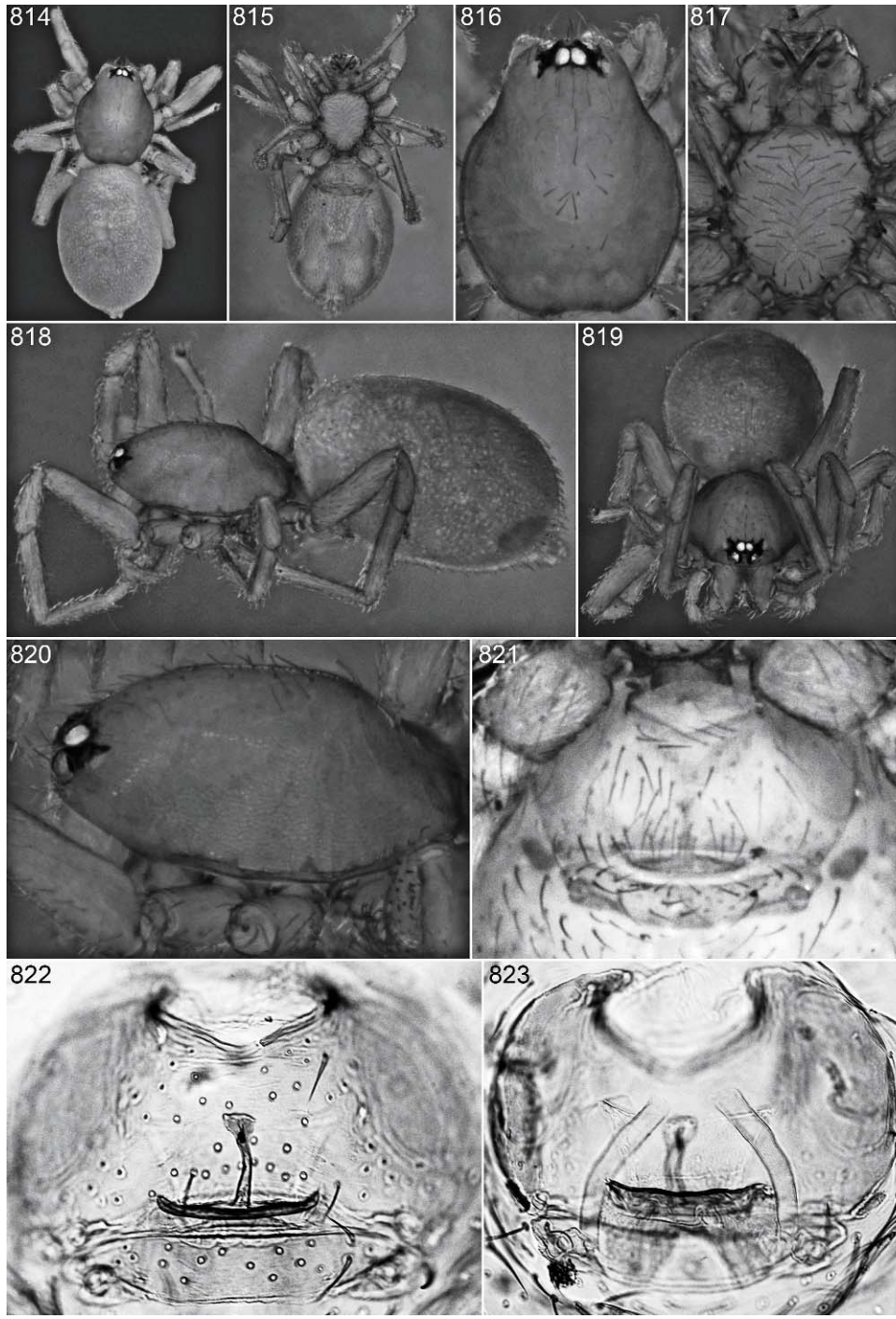
MALE (PBI_OON 459, figs. 801–813): Total length 1.80. PME squared; ALE separated by their radius to diameter, PLE-PME separated by PME radius to PME



Figs. 791–800. *Scaphios yanayacu*, new species, female. **791.** Habitus, dorsal view. **792.** Same, ventral view. **793.** Carapace, dorsal view. **794.** Sternum and mouthparts, ventral view. **795.** Habitus, lateral view. **796.** Same, anterior view. **797.** Carapace, lateral view. **798.** Epigastric region, ventral view. **799.** Genitalia, ventral view. **800.** Same, dorsal view.



Figs. 801–813. *Scaphios napo*, new species, male. **801.** Habitus, dorsal view. **802.** Same, ventral view. **803.** Same, lateral view. **804.** Carapace, dorsal view. **805.** Habitus, anterior view. **806.** Carapace, lateral view. **807.** Epigastric region, ventral view. **808.** Sternum and mouthparts, ventral view. **809.** Embolus, prolateral view. **810.** Same, retrolateral view. **811.** Palp, prolateral view. **812.** Same, ventral view. **813.** Same, retrolateral view.



Figs. 814–823. *Scaphios napo*, new species, female. **814.** Habitus, dorsal view. **815.** Same, ventral view. **816.** Carapace, dorsal view. **817.** Sternum and mouthparts, ventral view. **818.** Habitus, lateral view. **819.** Same, anterior view. **820.** Carapace, lateral view. **821.** Epigastric region, ventral view. **822.** Genitalia, ventral view. **823.** Same, dorsal view.

diameter. Endites with anterior projection beaklike, directed laterally. Leg spination: tibiae III, IV v0-0-1p. Embolus with distinct hump at about half its length, tip slightly expanded; bulb elongated (figs. 809–813).

FEMALE (PBI_OON 459, figs. 814–823): Total length 2.40. Posterior eye row recurved from above, straight from front; ALE separated by more than their diameter. Leg spination: tibiae III, IV v0-0-2; metatarsi III v0-0-2. Anterior genitalic projection distally triangular, transverse sclerite at its base relatively short, apodemes M-shaped (figs. 822, 823).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Yanayacu Biological Station, Río Perdido trail, 0°36.496′S, 77°52.947′W, Nov. 26, 2009, litter, elev. 2085 m (Niarchos Exped., AMNH PBI_OON 421), 1♀; Yanayacu Biological Station, stream trail, 0°35.955′S, 77°53.431′W, Nov. 24, 2009, litter, elevation 2130 m (Niarchos Exped., AMNH PBI_OON 418), 1♂, 1♀, Nov. 24–Dec. 2, 2009, pitfall, elev. 2130 m (N. Platnick, N. Dupérré, E. Tapia, Niarchos Exped., AMNH, QCAZ PBI_OON 460), 5♂; Yanayacu Biological Station, trail to San Jorge de Yanayacu Wildlife Refuge, 0.58818°S, 77.88428°W, Nov. 26, 2009, elev. 2140 m (Niarchos Exped., AMNH PBI_OON 422), 3♂, 2♀, same, Nov. 30, 2009 (Niarchos Exped., AMNH PBI_OON 423), 2♂, 1♀, Nov. 25–30, 2009, sifting litter (Niarchos Exped., MACN PBI_OON 461), 1♂, 1♀, Berlese (Niarchos Exped., MACN PBI_OON 462), 1♂.

DISTRIBUTION: Known only from the Yanayacu Biological Station in Napo province, Ecuador, where it is sympatric with *S. yanayacu*.

Scaphios cayambe, new species
Figs. 824–846

TYPES: Male holotype and female allotype taken in pitfall traps in *Polylepis* forest at an elevation of 3850 m on the road from Papallacta to Oyacachi in the Reserva Ecológica Cayambe-Coca, 0°16′13″S, 78°05′36″W, Napo, Ecuador (Dec. 1–2, 2009; N. Platnick, N. Dupérré, E. Tapia, Niarchos Exped.), deposited in QCAZ (PBI_OON 463).

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

DIAGNOSIS: Males resemble those of *S. napo* but have the embolus tip directed ventrally (figs. 832–836); females have the transverse sclerite at the base of the anterior genitalic projection long and boat shaped (figs. 845, 846).

MALE (PBI_OON 463, figs. 824–836): Total length 1.80. PME oval; ALE separated by more than their diameter; PLE-PME separated by less than PME radius. Endites with anterior projection relatively wide, directed laterally. Leg spination: tibiae III, IV v0-0-1p. Embolus basally thickened, subdistally bent, producing steplike appearance; bulb elongated (figs. 832–836).

FEMALE (PBI_OON 463, figs. 837–846): Total length 2.40. PME squared; posterior eye row recurved from above, procurved from front; PLE-PME separated by PME radius to PME diameter. Leg spination: tibiae III, IV v0-0-1p. Transverse bar at base of anterior projection very long, boat shaped; postepigastric scutum with distinct anterior and posterior margins (figs. 845, 846).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Reserva Ecológica Cayambe-Coca, road from Papallacta to Oyacachi, 0°16′13″S, 78°05′36″W, Dec. 1, 2009, litter, elev. 3850 m (N. Platnick, N. Dupérré, E. Tapia, Niarchos Exped., AMNH, MACN, QCAZ PBI_OON 425), 5♂.

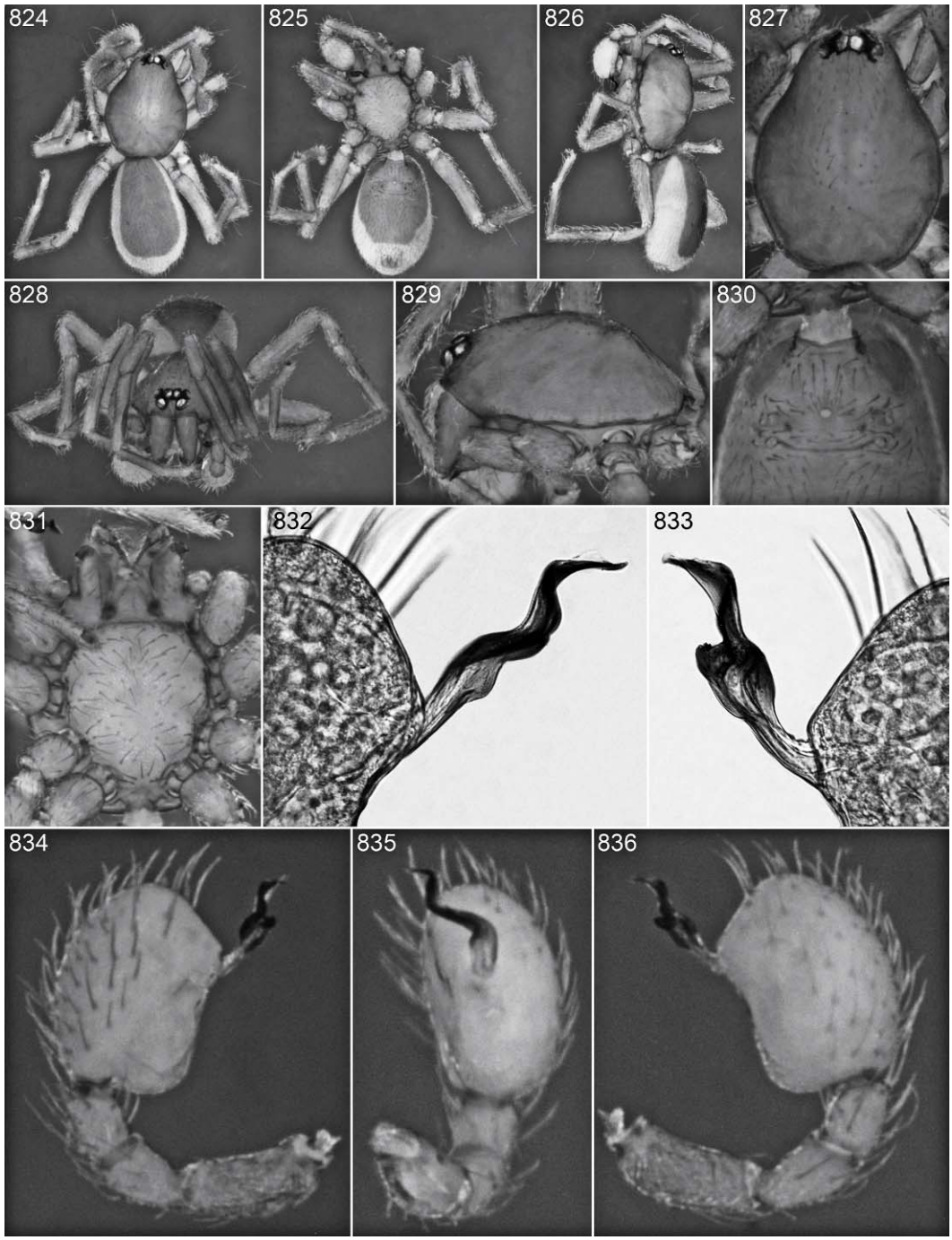
DISTRIBUTION: Known only from a high elevation *Polylepis* forest in the Reserva Ecológica Cayambe-Coca of Napo province, Ecuador.

Scaphios wagra, new species
Figs. 847–856

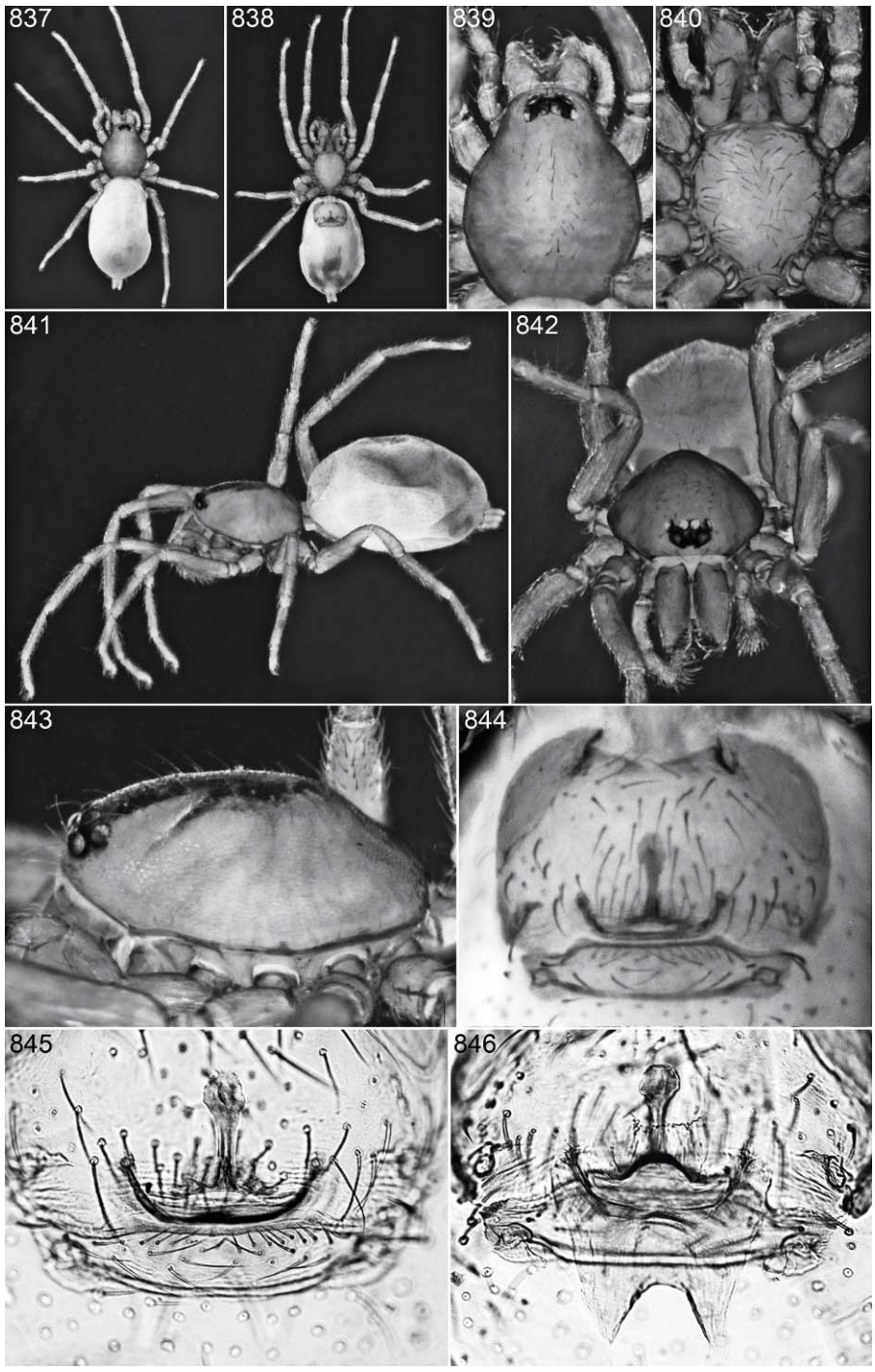
TYPE: Female holotype taken in litter at an elevation of 665 m above the Sacha Wagra Lodge, Río Hollín, 0°57′18″S, 77°44′51″W, Napo, Ecuador (Nov. 29, 2009; Niarchos Exped.), deposited in QCAZ (PBI_OON 426).

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

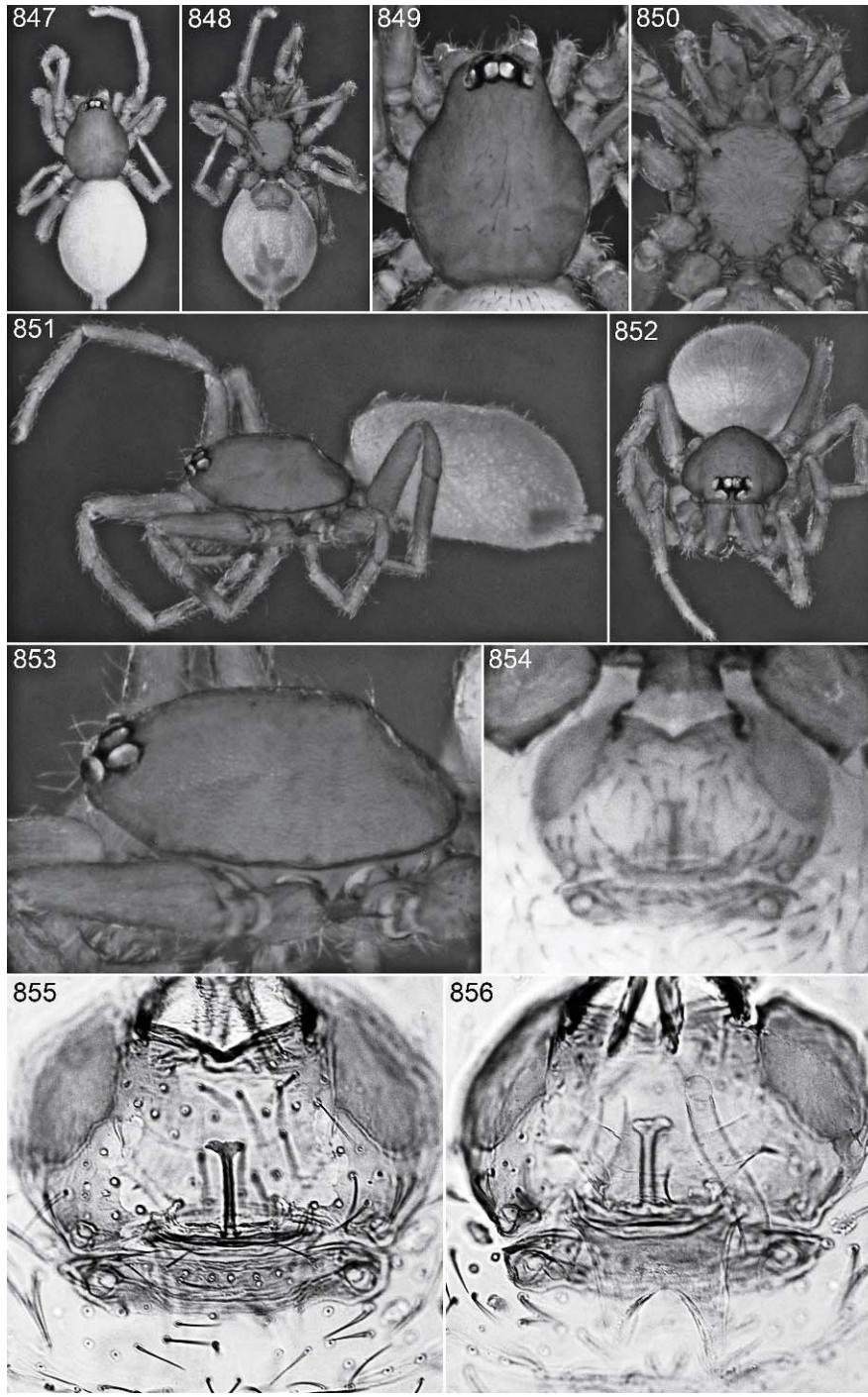
DIAGNOSIS: Females resemble those of *S. jatun* in having a T-shaped tip on the anterior genitalic process, but lack the distinct epigy-



Figs. 824–836. *Scaphios cayambe*, new species, male. **824.** Habitus, dorsal view. **825.** Same, ventral view. **826.** Same, lateral view. **827.** Carapace, dorsal view. **828.** Habitus, anterior view. **829.** Carapace, lateral view. **830.** Epigastric region, ventral view. **831.** Sternum and mouthparts, ventral view. **832.** Embolus, prolateral view. **833.** Same, retrolateral view. **834.** Palp, prolateral view. **835.** Same, ventral view. **836.** Same, retrolateral view.



Figs. 837–846. *Scaphios cayambe*, new species, female. **837.** Habitus, dorsal view. **838.** Same, ventral view. **839.** Carapace, dorsal view. **840.** Sternum and mouthparts, ventral view. **841.** Habitus, lateral view. **842.** Same, anterior view. **843.** Carapace, lateral view. **844.** Epigastric region, ventral view. **845.** Genitalia, ventral view. **846.** Same, dorsal view.



Figs. 847–856. *Scaphios wagra*, new species, female. **847.** Habitus, dorsal view. **848.** Same, ventral view. **849.** Carapace, dorsal view. **850.** Sternum and mouthparts, ventral view. **851.** Habitus, lateral view. **852.** Same, anterior view. **853.** Carapace, lateral view. **854.** Epigastric region, ventral view. **855.** Genitalia, ventral view. **856.** Same, dorsal view.

nal atrium found in that species (figs. 855, 856).

MALE: Unknown.

FEMALE (PBI_OON 426, figs. 847–856): Total length 1.83. PME squared; posterior eye row recurved from above, procurved from front; ALE separated by less than their radius; PLE-PME separated by less than PME radius. Leg spination: tibiae III, IV v0-0-1p. Anterior genitalic projection long, narrow, with T-shaped tip, apodemes shaped like tooth roots, no atrium present (figs. 855, 856).

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from a relatively low elevation site in Napo province, Ecuador.

Scaphios jatun, new species
Figs. 857–866

TYPE: Female holotype taken in litter at an elevation of 410 m at the Jatun Sacha Biological Station, 1°03′57.5″S, 77°37′00.2″W, Napo, Ecuador (Dec. 1, 2009; A. Santos, C. Rheims, Niarchos Exped.), deposited in QCAZ (PBI_OON 427).

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

DIAGNOSIS: Females resemble those of *S. wagra* in having a T-shaped tip on the anterior genitalic projection, but have a distinct epigynal atrium (figs. 865, 866).

MALE: Unknown.

FEMALE (PBI_OON 427, figs. 857–866): Total length 1.65. PME oval; posterior eye row recurved from above, straight from front; ALE separated by less than their radius, PLE-PME separated by less than PME radius. Leg spination: tibiae: III, IV v0-0-1p; metatarsi IV v0-0-1p. Anterior genitalic projection relatively wide, with thickened, T-shaped tip, separated by atrium from laterally angular transverse bar (figs. 865, 866).

OTHER MATERIAL EXAMINED: **Ecuador:** *Napo:* Jatun Sacha Biological Station, 1°03′57.5″S, 77°37′00.2″W, Dec. 1–5, 2009, pitfall, elev. 410 m (A. Santos, C. Rheims, Niarchos Exped., IBSP PBI_OON 428), 1♀; 20 km S Tena, July 11, 1976, Berlese, forest litter, elev. 600 m (S. Peck, FMNH 33715, PBI_OON 10217), 1♀, same, Berlese, broken termite nests (S. Peck, FMNH 33727, PBI_OON 10229), 1♀.

DISTRIBUTION: Known only from relatively lowland sites in Napo province, Ecuador.

Scaphios orellana, new species
Figs. 867–889

TYPE: Male holotype taken in rainforest litter at an elevation of 295 m at the Estación Científica Yasuni, Río Tiputini, Puerto Francisco de Orellana, Parroquia, Puerto Francisco de Orellana, 0.067428°S, 76.39764°W, Orellana, Ecuador (Dec. 1–5, 2009; M. Ramírez, Niarchos Exped.), deposited in QCAZ (PBI_OON 464).

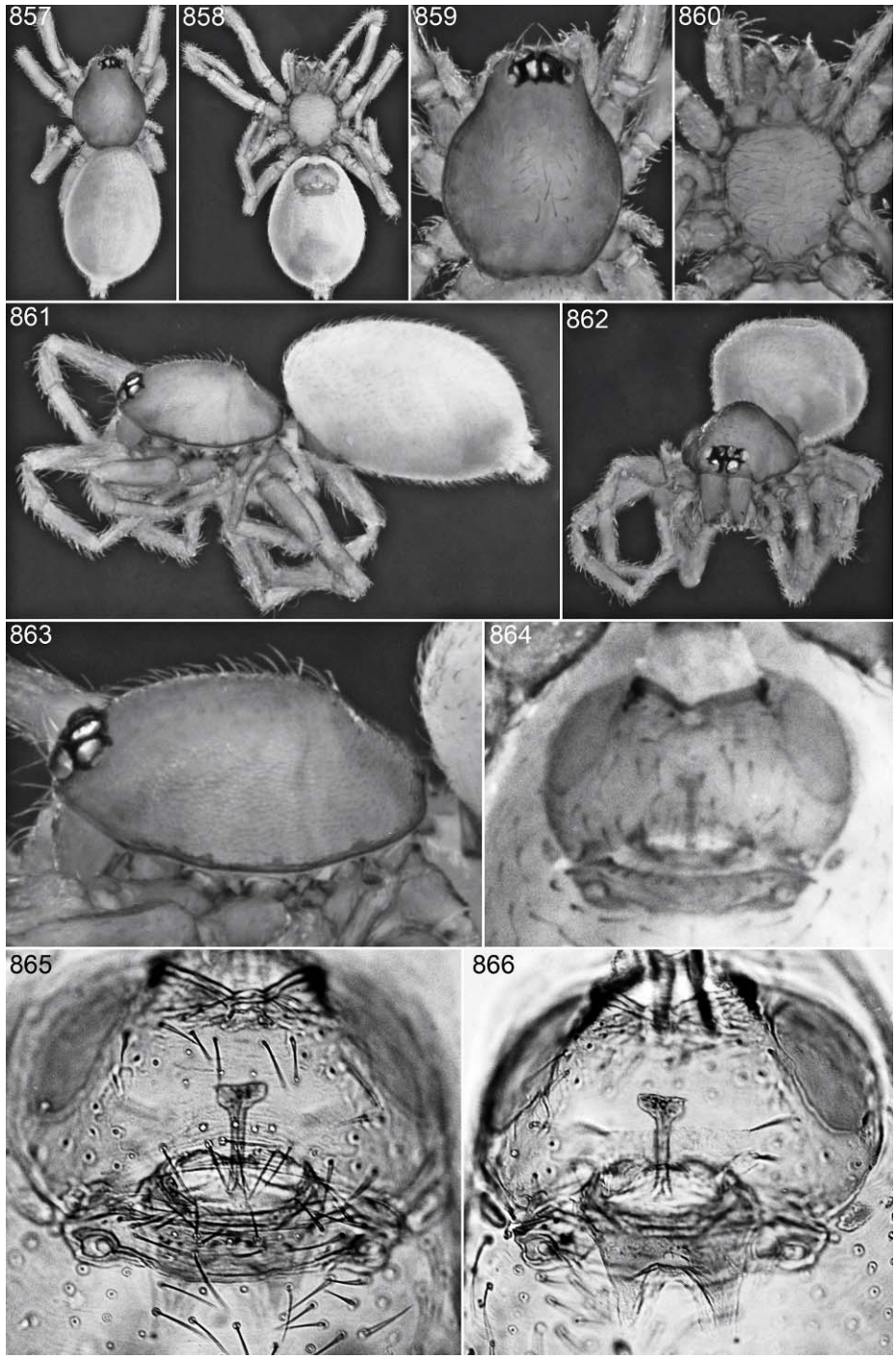
ETYMOLOGY: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: Males can be recognized by the reduced abdominal scuta (figs. 867, 873) and the relatively short distal portion of the embolus (figs. 875–879), females by the procurved transverse bar situated anteriorly of a much wider epigynal atrium (figs. 888, 889).

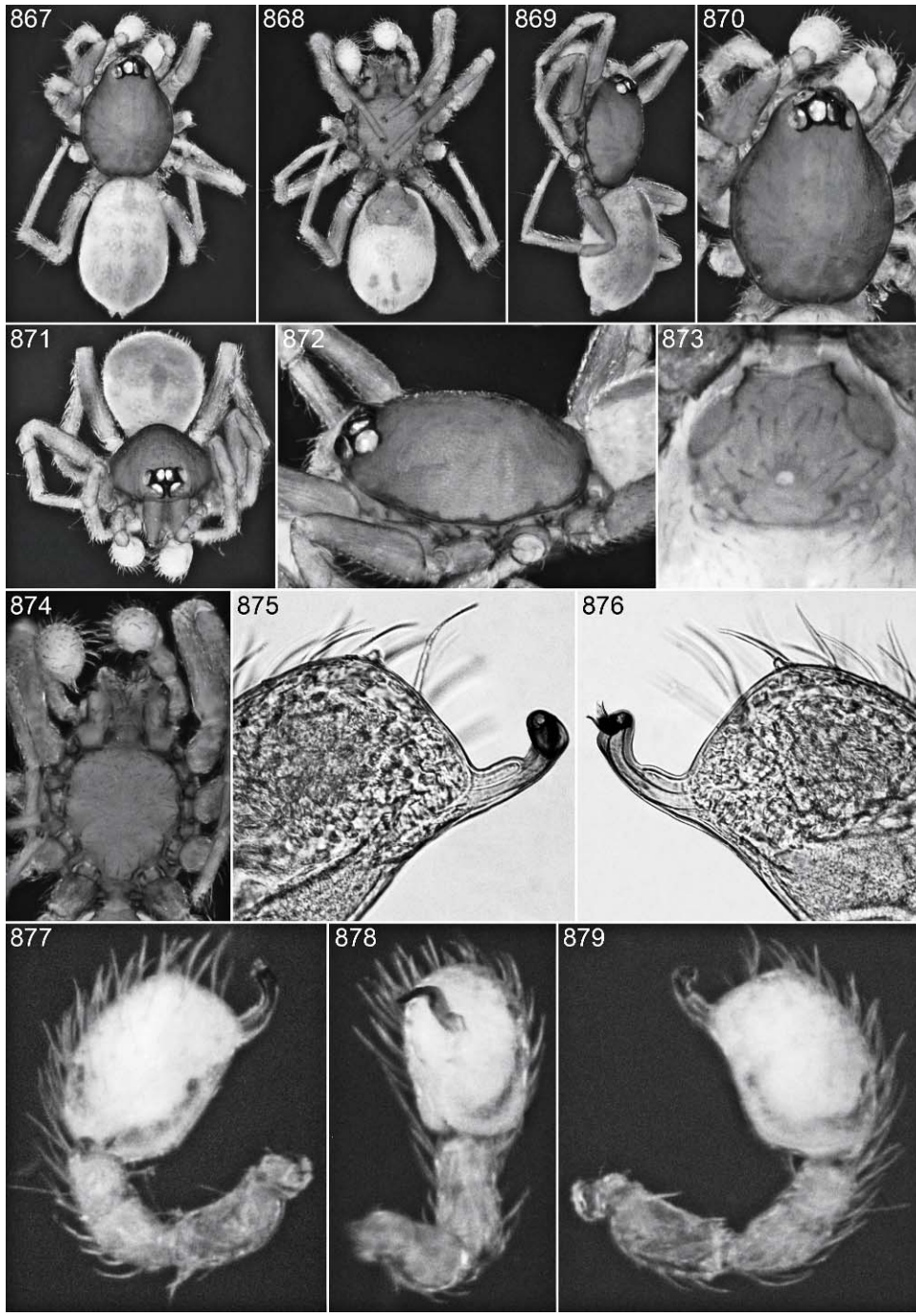
MALE (PBI_OON 464, figs. 867–879): Total length 1.32. PME oval; ALE separated by less than their radius; PLE-PME separated by less than PME radius. Endites with anterior projections beaklike, directed laterally. Leg spination: tibiae IV v0-0-1p. Embolus relatively short, bent prolaterally at about 2/3 its length, tip bent, directed posteriorly; bulb tapering apically (figs. 875–879).

FEMALE (PBI_OON 465, figs. 880–889): Total length 1.56. Posterior eye row straight from above, procurved from front. Leg spination: tibiae IV v0-0-1p. Transverse bar at base of anterior projection relatively short, procurved, situated anteriorly of widely oval atrium (figs. 888, 889).

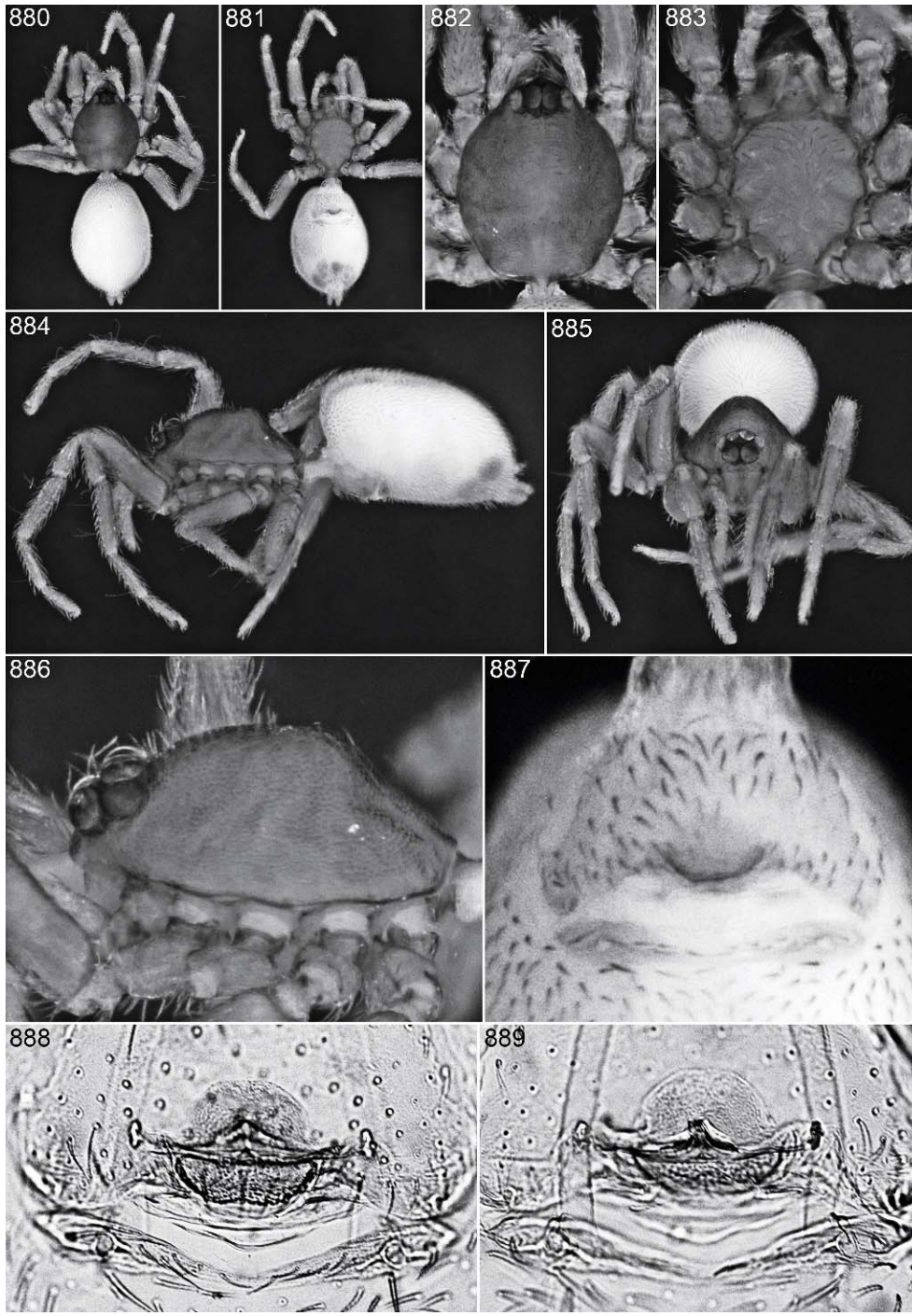
OTHER MATERIAL EXAMINED: **Ecuador:** *Orellana:* Estación Científica Yasuní, Río Tiputini, Puerto Francisco de Orellana, Parroquia, Puerto Francisco de Orellana, 0.067428°S, 76.39764°W, Dec. 1–5, 2009, rainforest litter, elev. 295 m (M. Ramírez, Niarchos Exped., MACN PBI_OON 465), 1♀; Reserva Etnica Waorani, 1 km S Onkone Gare Camp, 0°39′25.77″S, 76°27′10.8″W, Oct. 8, 1995, elev. 215 m (T. Erwin, USNM PBI_OON 469), 2♀, same Feb. 7, 1996 (T. Erwin, USNM PBI_OON 471), 1♀, same,



Figs. 857–866. *Scaphios jatun*, new species, female. **857.** Habitus, dorsal view. **858.** Same, ventral view. **859.** Carapace, dorsal view. **860.** Sternum and mouthparts, ventral view. **861.** Habitus, lateral view. **862.** Same, anterior view. **863.** Carapace, lateral view. **864.** Epigastric region, ventral view. **865.** Genitalia, ventral view. **866.** Same, dorsal view.



Figs. 867–879. *Scaphios orellana*, new species, male. **867.** Habitus, dorsal view. **868.** Same, ventral view. **869.** Same, lateral view. **870.** Carapace, dorsal view. **871.** Habitus, anterior view. **872.** Carapace, lateral view. **873.** Epigastric region, ventral view. **874.** Sternum and mouthparts, ventral view. **875.** Embolus, prolateral view. **876.** Same, retrolateral view. **877.** Palp, prolateral view. **878.** Same, ventral view. **879.** Same, retrolateral view.



Figs. 880–889. *Scaphios orellana*, new species, female. **880.** Habitus, dorsal view. **881.** Same, ventral view. **882.** Carapace, dorsal view. **883.** Sternum and mouthparts, ventral view. **884.** Habitus, lateral view. **885.** Same, anterior view. **886.** Carapace, lateral view. **887.** Epigastric region, ventral view. **888.** Genitalia, ventral view. **889.** Same, dorsal view.

June 26, 1996 (T. Erwin, USNM PBI_OON 473), 2♀, same, Oct. 4, 1996 (T. Erwin, USNM PBI_OON 472), 1♀; Tiputini Biodiversity Station, near Parque Nacional Yasuní, 0°37′55″S, 76°08′39″W, July 1, 1998, elev. 220–250 m (T. Erwin, USNM PBI_OON 468), 1♀, same, Oct. 24, 1998 (USNM PBI_OON 470), 1♀.

DISTRIBUTION: Known only from extremely lowland sites in Orellana province, Ecuador.

Scaphios puyo, new species
Figs. 890–899

TYPE: Male holotype (missing abdomen) from Berlese sample of cloud forest litter taken at an elevation of 1000 m at a site 25 km N of Puyo, Pastaza, Ecuador (July 13, 1976; S. Peck), deposited in FMNH (33724, PBI_OON 10226).

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

DIAGNOSIS: Males can be recognized by the very narrow, subbasally and subdistally bent embolus (figs. 895–899).

MALE (PBI_OON 10226, figs. 890–899): Carapace length 0.64 (abdomen missing). PME oval; ALE separated by less than their radius; PLE-PME separated by less than PME radius. Endites with anterior projections situated distally, beaklike, directed laterally. Leg spination: tibiae IV v0-0-1p. Embolus elongated, narrow, distally sinuous; bulb elongated (figs. 895–899).

FEMALE: Unknown.

OTHER MATERIAL EXAMINED: None.

DISTRIBUTION: Known only from Pastaza province, Ecuador.

Scaphios planada, new species
Figs. 900–920

TYPE: Male holotype from Winkler sample of litter taken at an elevation of 1850 m at Parcela Olga, Reserva Natural La Planada, 1°15′N, 78°15′W, Nariño, Colombia (Apr. 4–6, 2001; G. Oliva), deposited in IAVH (108090, PBI_OON 466).

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

DIAGNOSIS: Males can be recognized by the medially widened embolus (figs. 906–910), females by the laterally sinuous transverse bar at the base of the anterior genitalic projection (figs. 919, 920).

MALE (PBI_OON 466, figs. 900–910): Total length 1.54. PME oval; ALE separated by less than their radius; PLE-PME separated by less than PME radius. Endites with anterior projection situated distally, short, directed laterally. Leg spination: tibiae: III v0-0-1p; IV v0-0-2; metatarsi IV v0-0-1p. Embolus distinctly widened at about half its length; bulb elongated (figs. 906–910).

FEMALE (PBI_OON 467, figs. 911–920): Total length 1.76. Posterior eye row recurved from above, procurved from front. Leg spination: tibiae IV v0-0-2; metatarsi IV v0-0-1p. Transverse bar at base of anterior genitalic projection wide, sinuous (figs. 919, 920).

OTHER MATERIAL EXAMINED: **Colombia:** *Nariño:* Parcela Permanente, Reserva Natural La Planada, 1°15′N, 78°15′W, Dec. 2–6, 2001, Winkler, elev. 1855 m (G. Oliva, IAVH 108087, PBI_OON 467), 1♀.

DISTRIBUTION: Known only from Nariño province in southwestern Colombia.

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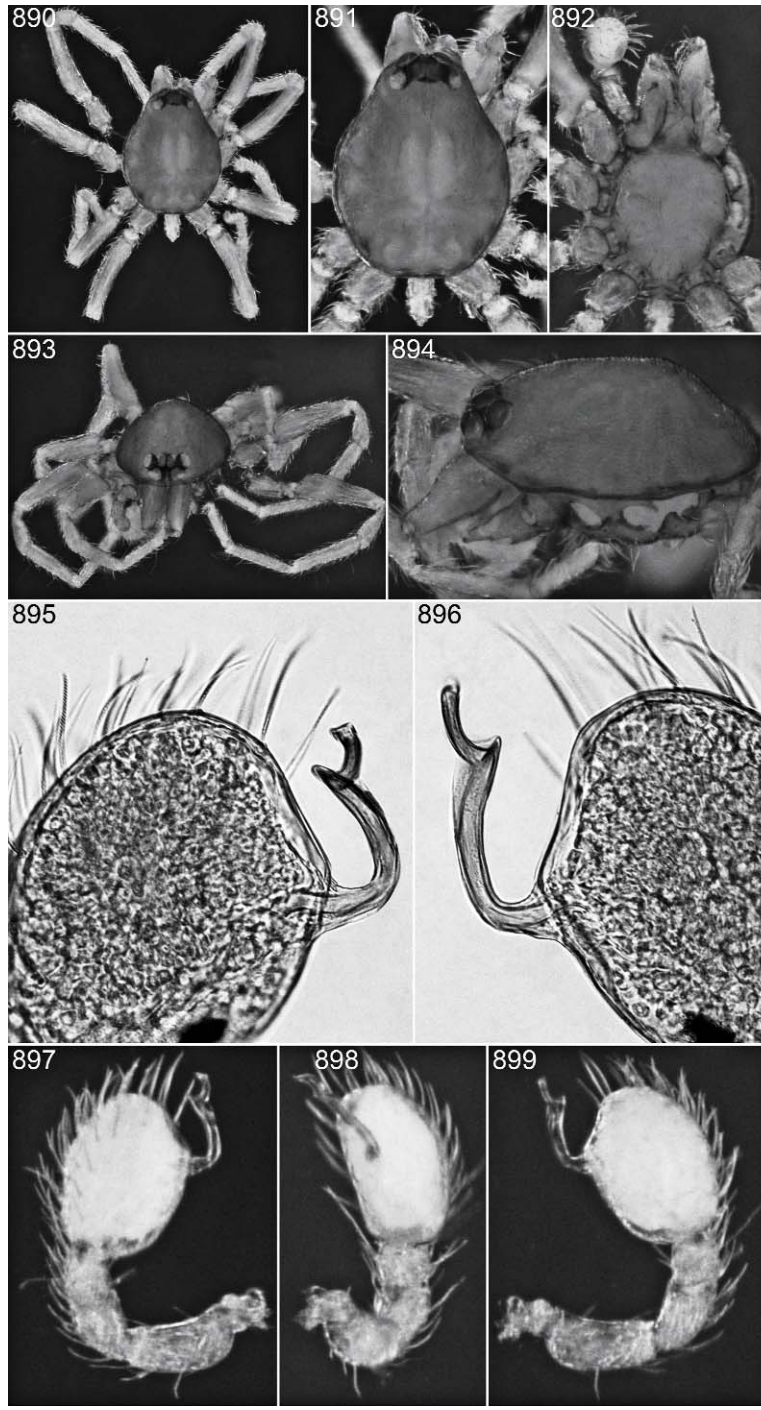
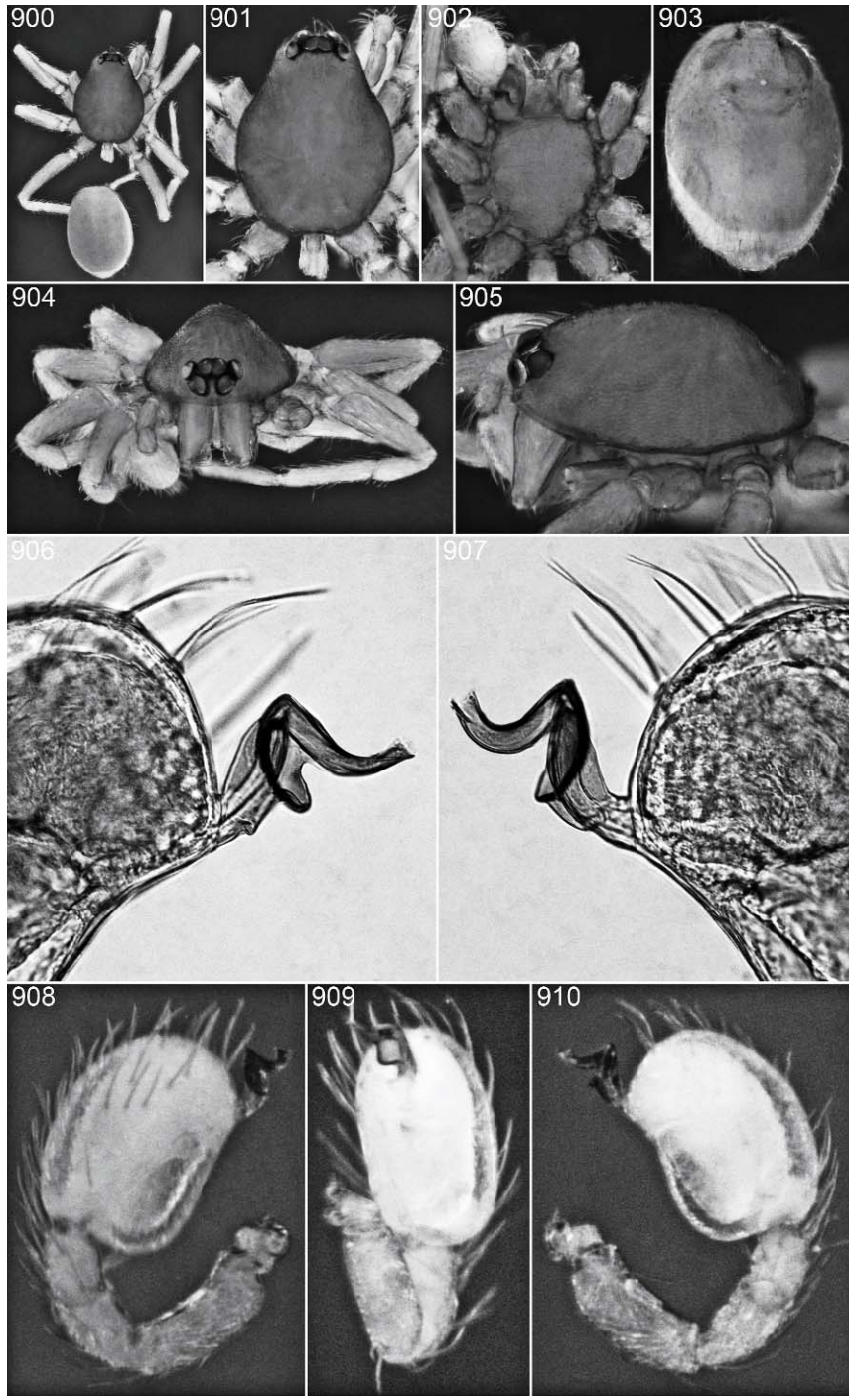
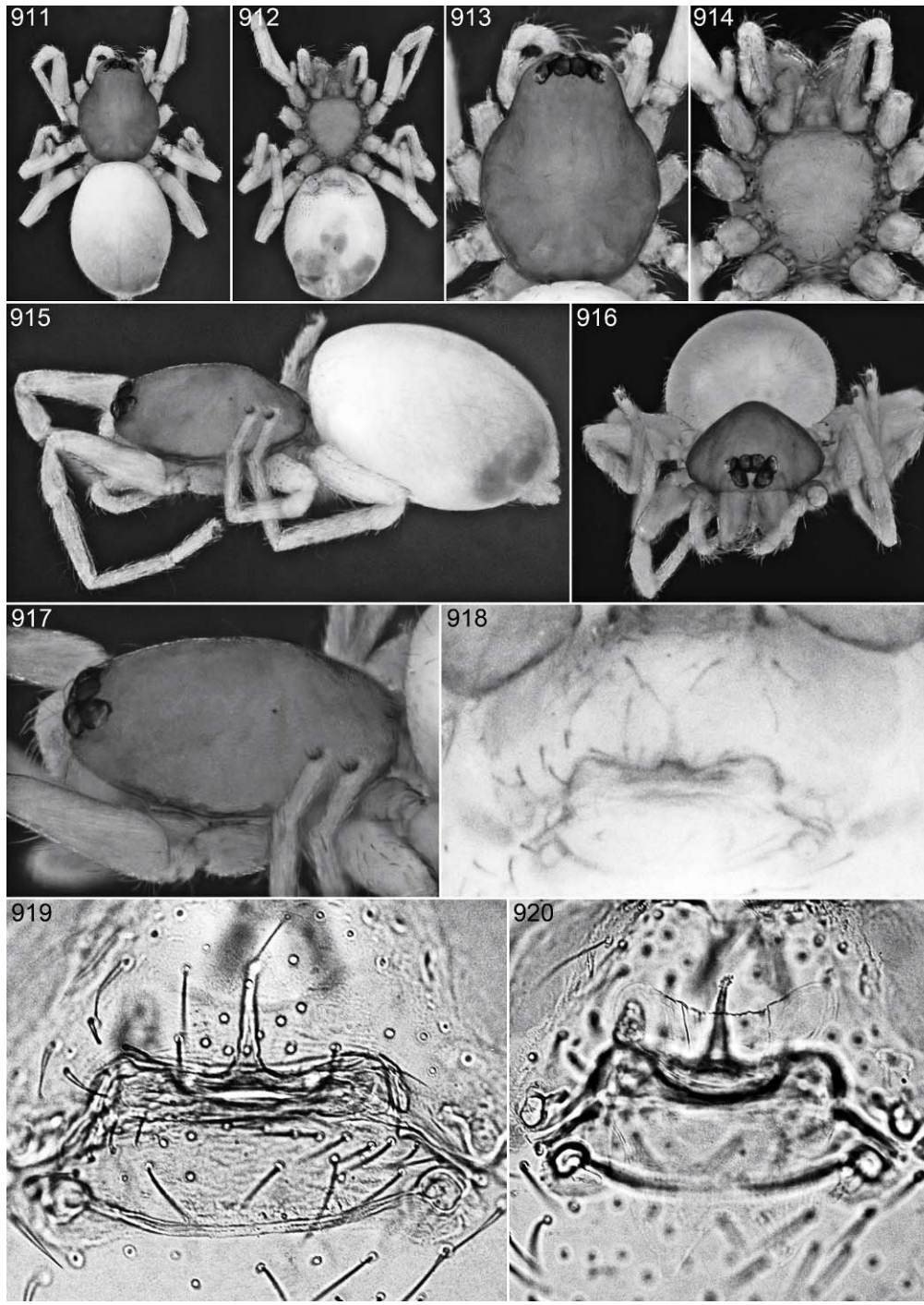


Figs. 890–899. *Scaphios puyo*, new species, male. **890.** Cephalothorax, dorsal view. **891.** Carapace, dorsal view. **892.** Cephalothorax, ventral view. **893.** Same, anterior view. **894.** Carapace, lateral view. **895.** Embolus, prolateral view. **896.** Same, retrolateral view. **897.** Palp, prolateral view. **898.** Same, ventral view. **899.** Same, retrolateral view.



Figs. 900–910. *Scaphios planada*, new species, male. **900.** Habitus, dorsal view. **901.** Carapace, dorsal view. **902.** Sternum, ventral view. **903.** Abdomen, ventral view. **904.** Cephalothorax, anterior view. **905.** Carapace, lateral view. **906.** Embolus, prolateral view. **907.** Same, retrolateral view. **908.** Palp, prolateral view. **909.** Same, ventral view. **910.** Same, retrolateral view.



Figs. 911–920. *Scaphios planada*, new species, female. **911.** Habitus, dorsal view. **912.** Same, ventral view. **913.** Carapace, dorsal view. **914.** Sternum and mouthparts, ventral view. **915.** Habitus, lateral view. **916.** Same, anterior view. **917.** Carapace, lateral view. **918.** Epigastric region, ventral view. **919.** Genitalia, ventral view. **920.** Same, dorsal view.

Medina (IAVH), Martín Ramírez (MACN), and Petra Sierwald (FMNH). We are indebted to Alexandre Bonaldo and Ricardo Ott for their exceptionally thorough comments on a draft of the manuscript, and to Steve Thurston for composing the plates.

REFERENCES

Cooke, J.A.L. 1972. A new genus and species of oonopid spider from Colombia with a curious method of embolus protection. Bulletin of the British Arachnological Society 2: 90–92.

Ott, R. 2003. Descrição de duas espécies novas de *Opopaea* do sul do Brasil (Oonopidae, Araneae). Iheringia, Série Zoologia 93: 177–182.

Platnick, N.I., and N. Dupérré. 2009a. 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. 2009b. The American goblin spiders of the new genus *Escaphiella* (Araneae, Oonopidae). Bulletin of the American Museum of Natural History 328: 1–151.

Platnick, N.I., and N. Dupérré. 2010. The goblin spider genus *Scaphiella* (Araneae, Oonopidae). Bulletin of the American Museum of Natural History 332: 1–156.

Simon, E. 1891. On the spiders of the island of St. Vincent. Part 1. Proceedings of the Zoological Society of London 1891: 549–575.

Simon, E. 1903. Descriptions d'arachnides nouveaux. Annales de la Société Entomologique de Belgique 47: 21–39.

INDEX OF SPECIFIC NAMES