



Four new caponiids species (Araneae, Caponiidae) from the West Indies and redescription of *Nops blandus* (Bryant)

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Abstract

We update the knowledge of the unusual Caponiidae spiders from the West Indies with the description of four new species, and the redescription of *Nops blandus* (Bryant) including the first description of the female. Specimens previously assigned to *N. blandus* from Hispaniola and Puerto Rico represents two new species: *Nops hispaniola* n. sp. and *Nops agnarssoni* n. sp. respectively; while the distribution of the former is limited to British and U. S. Virgin Islands. The others two new species are *Nops finisfurvus* n. sp. from British Virgin Islands and *Cubanops luquillo* n. sp. from Puerto Rico. Female internal genitalia of *Nops* species are described, photographed and illustrated for the first time.

Key words: *Nops*, *Cubanops*, taxonomy, Haplogynae, Caribbean

Introduction

The family Caponiidae is an unusual group of haplogynae spiders, typically found on the ground, under rocks, and in leaf litter. This family is currently represented by 15 genera and 90 species, distributed in the Americas, Africa and Asia (World Spider Catalog, 2015). The West Indies is represented by three genera: *Nops* MacLeay, distributed in almost all the Caribbean islands (Sánchez–Ruiz, 2010), *Cubanops* Sánchez–Ruiz, Platnick & Dupérré, occurring in Bahamas, Cuba and Hispaniola (Sánchez–Ruiz *et al.*, 2010), and *Caponina* Simon, with the species: *C. testacea* Simon occurring in the St. Vincent island, Lesser Antilles (Platnick, 1994). All West Indian caponiids have a remarkable endemism, and except *Nops blandus* (Bryant), *Nops glaucus* Hasselt and *Nops simla* Chickering, the remainder of the West Indian species are single island endemics. The species with a larger distribution area is *N. blandus*, which was recorded from U. S. Virgin Islands (Bryant, 1940; Chickering, 1964), Haiti (Bryant, 1948: as *Nops coccineus* Simon), Dominican Republic (Sánchez–Ruiz, 2005) and Puerto Rico (Armas, 2010).

The present paper provides description of four new caponiids species from West Indies: *Nops agnarssoni* n. sp., *Nops hispaniola* n. sp., *Nops finisfurvus* n. sp. and *Cubanops luquillo* n. sp. The first two species based on the material assigned to *N. blandus* from Puerto Rico and Hispaniola (Haiti and Dominican Republic) respectively. Additionally, we provide a redescription of *N. blandus*, including the first description of the female.

Female internal genitalia of *Nops* species was traditionally overlooked in previous papers describing females from this genus (Chickering, 1967; Sánchez–Ruiz, 2004, 2005; Dupérré, 2014). Therefore in this paper, female internal genitalia are described and illustrated for the first time.

Material and methods

Specimens examined were supplied by the following collections and curators: American Museum of Natural History, USA (AMNH, L. Prendini), Florida State Collection, USA (FSCA, G.B. Edwards), Instituto Butantan,

Brazil (IBSP, A.D. Brescovit), Museum of Comparative Zoology, USA (MCZ, G. Giribet), Museo Nacional de Historia Natural, Cuba (MNHNCu, G. Alayón) and Museo Nacional de Historia Natural de Santo Domingo, Dominican Republic (MNHNSD, C. Suriel).

All specimens were studied in 70% ethanol and morphological observations and illustrations were made using a Leica MZ12 stereomicroscope with camera lucida. Electron scanning microscope images were taken using a Quanta 250 SEM with attached SLR digital camera at Instituto Butantan. Multifocal photos were taken with a Leica DFC500 digital camera attached to a Leica MZ16A stereomicroscope, using Leica Application Suite ver. 3.3 software. All figures were edited using Adobe Photoshop CS5 ver. 12.0. Measurements are in millimeters (mm), and were made using a microscope micrometer eyepiece. The male genitalia of *Nops* species is divided into bulb (b) and embolus (e) that protrudes anteriorly from the prolateral or ventral surface of the bulb forming a remarkable anterior curvature (c) (Figs. 25, 26, 77). Two parts in the embolus are identified, the base (ba) and the tip (ti) (Figs. 77–80). Internal female genitalia were dissected and soft tissues were digested during 24 hours with Ultrazyme® enzymatic eye lens cleaner, diluted with distilled water in proportion 1 tablet/5 ml. Other abbreviations used: external sclerotization around spiracles (ess), anterior plate (ap), posterior plate (pp), lateral extensions of posterior plate (lep), membranous sac (ms), anterior margin of receptaculum (amr), anterior spiracles (as), posterior spiracles (ps) and tracheal trunk (t).

Locality coordinates are in round brackets and were obtained from specimens labels, or when not available, through online gazetteer Google Maps. Distribution maps were generated with ArcMap 10.0 and edited with Adobe Photoshop CS5 ver. 12.0.

Taxonomy

Family Caponiidae Simon, 1890

Genus *Nops* MacLeay, 1839

Type species: *Nops guanabacoae* MacLeay, 1839 by monotypy.

Diagnosis. *Nops* can be distinguished from Caponiinae genera by the presence of subsegmented tarsi (Sánchez–Ruiz, 2004: fig. 4), from other Nopinae genera (except *Nopsides* Chamberlin) by the elongated and reflexed unpaired claw at least on anterior tarsi, extending dorsally between the paired claws (Sánchez–Ruiz, 2004: fig. 5); and from *Nopsides* by having two, rather than four eyes, and for the presence of a translucent ventral keel on the anterior metatarsi, and a translucent extension of the membrane between the anterior metatarsi and tarsi (Dupérré, 2014: figs. 13–15).

Nops blandus (Bryant, 1942)

Figures 1–6, 25–36, 77, 81

Caponina blanda: Bryant, 1942: 328, fig.17 (Male holotype from Christiansted, St. Croix, U. S. Virgin Island (17° 44' 37" N, 64° 42' 54" W), H.A. Beatty, deposited in MCZ 20539, examined).

Nops blandus: Chickering, 1967: 4, fig. 1 (except specimen from Haiti MCZ 128296).

Nops blandus: Sánchez–Ruiz, 2005: 26, fig. 3 (except specimens from Dominican Republic IBSP 166393, 166394 and MNHNSD 09.1445).

Additional material examined. U.S. VIRGIN ISLANDS: *Saint John*: vii.1966, A.M. Chickering, 2♂ 4♀ 12 imm. (MCZ 128295). iii.1964, A.M. Chickering, 1♀ 2 imm. (MCZ 128243). 11.vii.1974, reef bay trail, W.B. Muchmore, 1♀ (AMNH). Coral Bay, near Butler's house (18° 20' N 64° 42' W), 22.vii.1975, W.B. Muchmore, 1imm. (AMNH). Coral Bay (18° 20' N 64° 42' W), 4.v.1984, W.B. Muchmore, 5 imm. (FSCA). Coral Bay (18° 20' N 64° 42' W), 9.iii.1984, W.B. Muchmore, litter rocks, 1♂ 1♀ 4 imm. (FSCA). Europa Bay (18° 19' N 64° 43' W), iii.1984, W.B. Muchmore, pitfall trap in woodland, 2♀ 2 imm. (FSCA). Europa Bay (18° 19' N 64° 43' W), iii–v.1984, W.B. Muchmore, pitfall trap, 5♂ 1 imm. (FSCA). Yawzi Point (18° 18' 56" N, 64° 43' 32" W), iii–v.1984, W.B. Muchmore, pitfall trap, 1♂ (FSCA). *Saint Thomas*: vii.1966, A.M. Chickering, 4 imm. (MCZ 128242).

ii.1964, A.M. Chickering, 1♀ 2 imm. (MCZ 128244). BRITISH VIRGIN ISLANDS: *Virgin Gorda*: 18.viii.1966, A. Chickering, 2♂ 1♀ 3 imm. (MCZ 128298).

Diagnosis. Males of *Nops blandus* resemble those of *Nops finisfurvus* n. sp. by having a short and weakly curved embolus, but can be distinguished by the form of the tip with just one small projection (Fig. 5), a broader embolar base (Fig. 77), and by having an oval bulb (Figs. 25–27). Females can be distinguished by the wide, straight and sclerotized anterior margin of receptaculum, with a median concavity on the posterior wall, and a large membranous sac (Figs. 33, 81).

Redescription. *Male* (MCZ 128295): Carapace immaculate orange, elongated oval with a black and slightly elevated ocular tubercle; pars cephalica not elevated, pars thoracica slightly sloping posteriorly (Fig. 28), thoracic groove absent. Two black, oval eyes of equal size, separated by about two-thirds their diameter (Fig. 29). Chelicerae light orange. Endites orange except for anterior tips due a white membranous projection, wide, convergent but not touching, with middle part wider than distal and proximal margins and forming an obtuse angle of about 120 degrees (Fig. 31), covered with scattered long setae. Labium orange, broad, fused to sternum along obsolete posterior groove, rounded and bordered in apical part (Fig. 31). Sternum orange, darker at the edge, oval, surface with fine reticular lines with few weak pits and numerous stiff setae around the edge (Fig. 31). Coxae light orange. Legs orange, formula 4123; metatarsi entire, anteriors with a median translucent ventral longitudinal keel and with a distal, translucent ventral extension of membrane between anterior tarsi and metatarsi; all tarsi subsegmented, with three claws, paired claws with 5 teeth, unpaired claw elongated and dorsally reflexed in all legs, without teeth. Trichobothria present on metatarsi and tarsi in a single row. Palp with tibia excavated ventrally; cymbium elongated rounded (Figs. 1–2), ventral surface densely covered with strong setae, and an oval pad of fine chemoreceptor hairs on dorsal distal part (Figs. 3–4), with a globose oval bulb (Figs. 25–27); embolus weakly curved, distinctly shorter than tibial length (Figs. 25, 27), base shorter than tibia width, tip of embolus with one small projection (Figs. 5–6). Abdomen grayish green dorsally (Fig. 29), lighter ventrally, but darker in distal part around spinnerets (Fig. 30), with only slightly sclerotized epigastric and postepigastric scuta. Spinnerets light gray, six, in typical caponiid arrangement. Total length 5.40, carapace 2.00 long, 1.50 wide. Eyes 0.12 major diameter, 0.07 minor diameter. Leg measurements: I: femur 6.20/ patella 1.50/ tibia 6.70/ metatarsus 6.70/ tarsus 1.50; II: 6.00/ 1.50/ 6.50/ 6.60/ 1.80; III: 7.30/ 1.40/ 6.50/ 7.50/ 1.60; IV: 7.20/ 1.40/ 7.60/ 7.70/ 1.70. Sternum 1.70 long, 1.20 wide. Palpal tibia 1.10 long, 0.70 wide.

Female (MCZ 128295): Carapace, chelicerae, labium, legs, coxae, endites and sternum as in the male (Figs. 34, 36). Abdomen as in the male, but darker. Anterior plate (ap) weakly sclerotized, almost reaching proximal part of abdomen (Fig. 32); external sclerotization of spiracles (ess) darker, small, anteriorly starting from anterior spiracles (as), passing close to the lateral extensions of posterior plate (lep), extending posteriorly less than the width of posterior spiracles and ending in the posterior edge of posterior spiracles (Figs 32, 81). Internal genitalia with a wide, straight and sclerotized anterior margin of receptaculum (amr) with a concavity on the posterior wall, and a large membranous sac (ms) (Figs. 33, 81). Spinnerets as in male (Fig. 35). Total length 5.80. Carapace 1.90 long, 1.30 wide. Eyes 0.12 major diameter, 0.07 minor diameter. Leg measurements: I: femur 7.00/ patella 1.40/ tibia 7.80/ metatarsus 7.90/ tarsus 1.90; II: 7.90/ 1.40/ 8.50/ 8.60/ 1.80; III: 7.60/ 1.40/ 7.50/ 8.60/ 1.60; IV: 7.00/ 1.40/ 7.40/ 7.30/ 1.70. Sternum 1.80 long, 1.40 wide. Palpal tibia 1.30 long, 0.80 wide.

Variation. Males from Virgin Gorda Island have slight differences in the base of embolus. Males (n=4): Total length 4.20–5.40, carapace 2.30–3.00 long, femur I 4.60–7.00 long. Palpal tibia 0.80–0.95 long, 0.40–0.45 wide. Females (n=6): total length 5.10–6.20, carapace 2.10–3.10 long, femur I 4.00–5.80. Palpal tibia 0.60–1.00 long, 0.20–0.25 wide. Palpal tarsus 0.70–1.05 long.

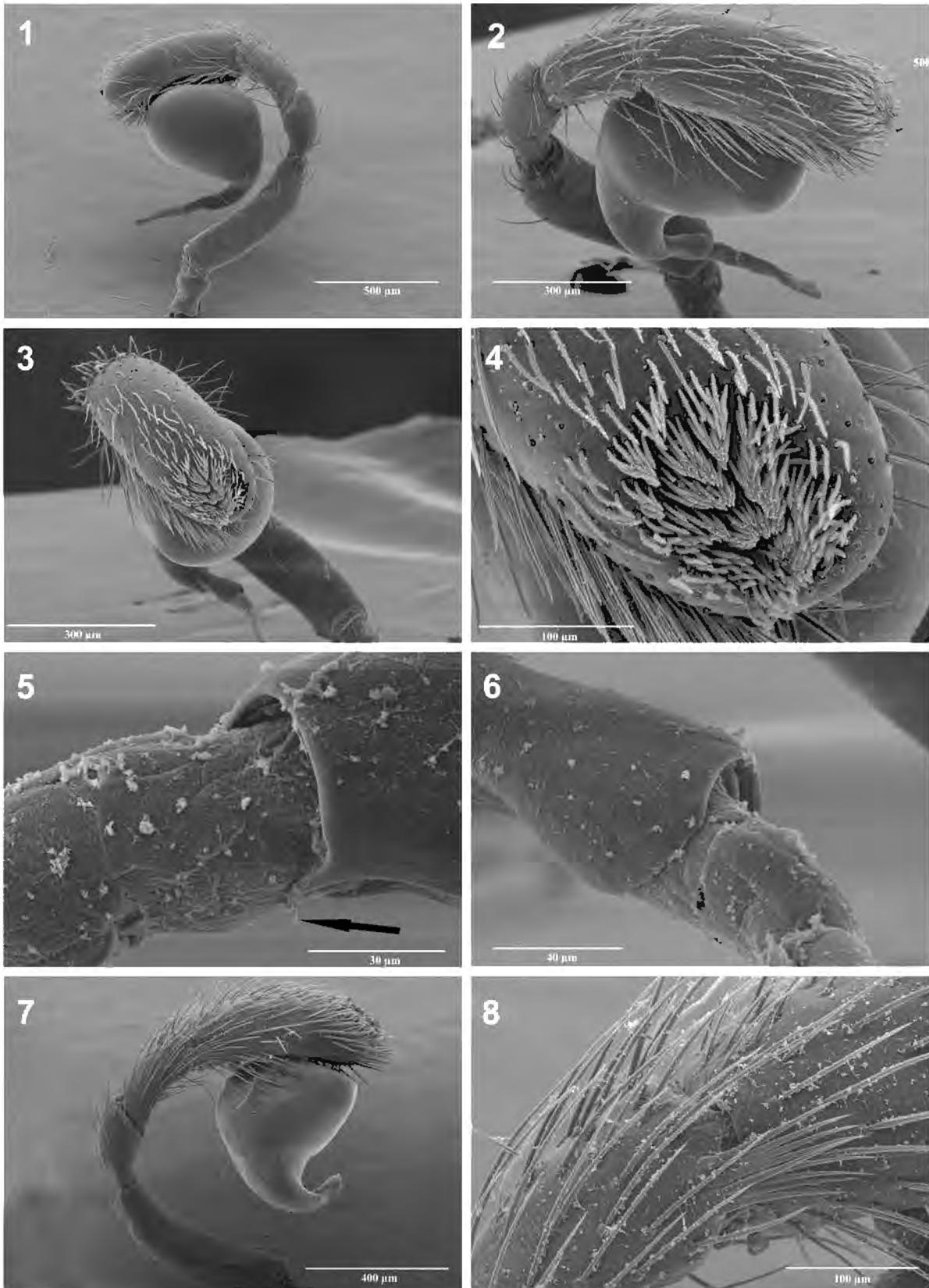
Distribution. British and U. S. Virgin Islands (Fig. 84).

Nops agnarssoni, new species

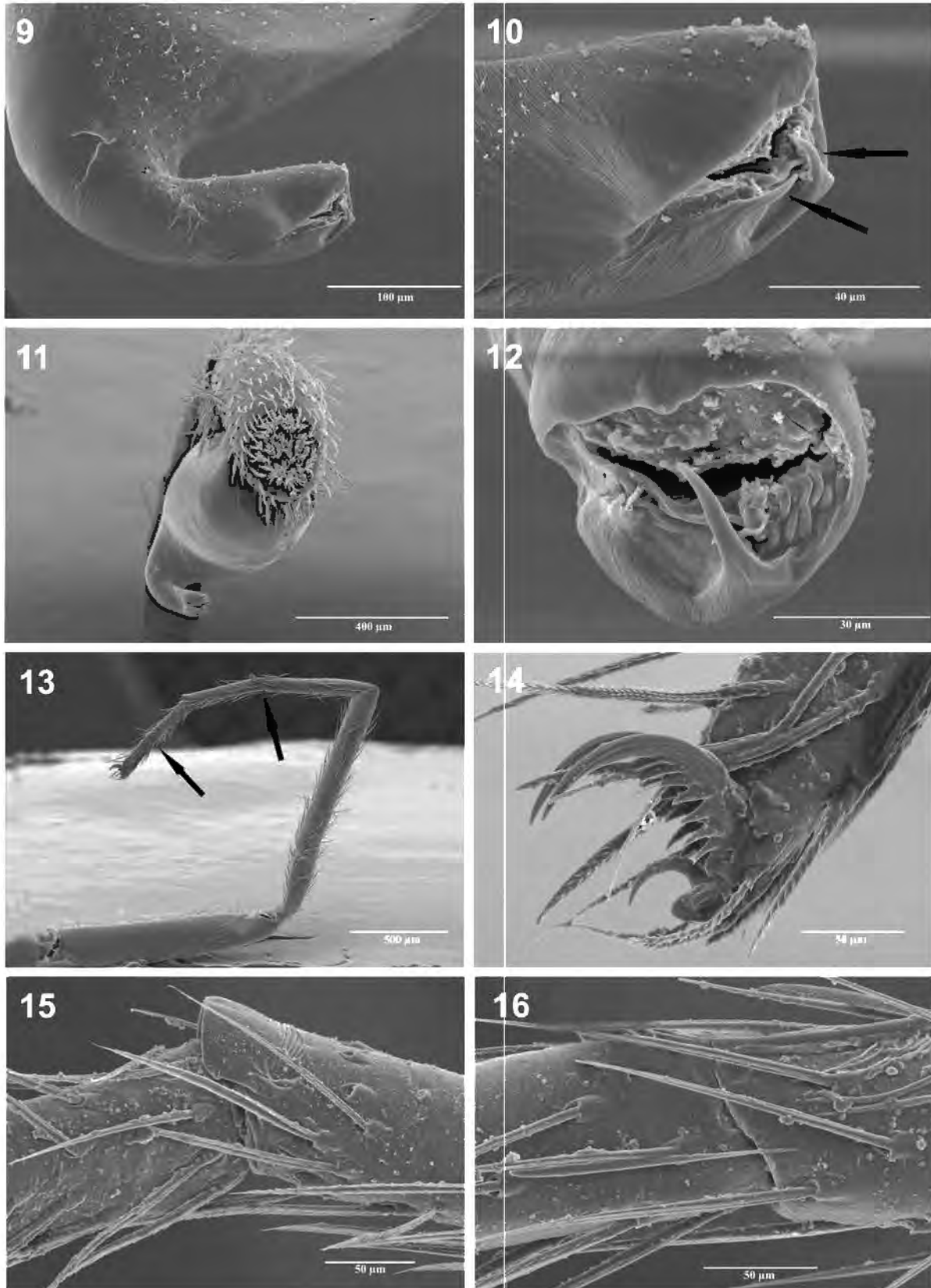
Figures 37–43, 78

Nops blandus: Armas, 2010: 60 (misidentification, only male paratype).

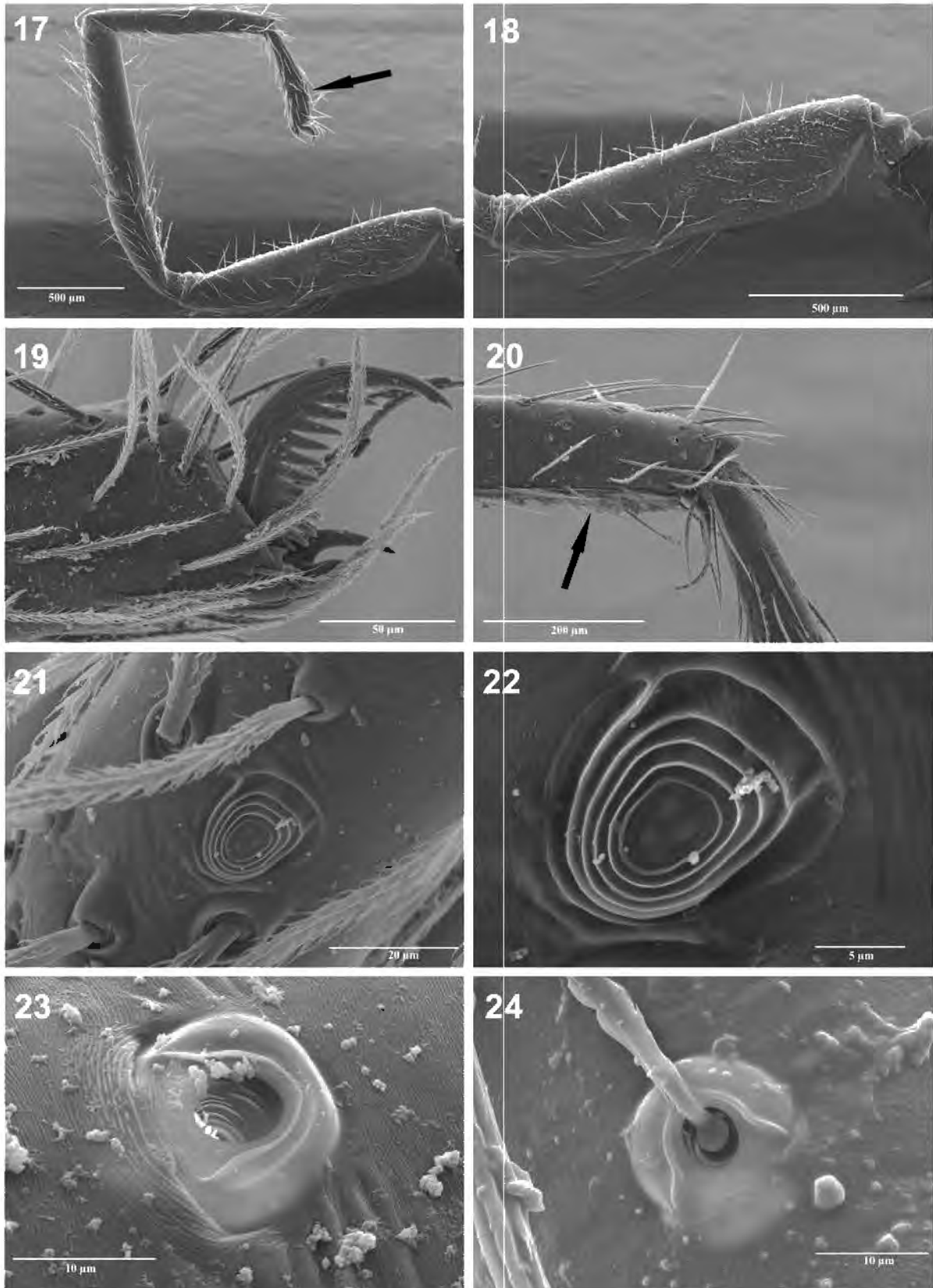
Types. Male holotype from Isla Caja de Muertos, Puerto Rico (17° 53' 15.7" N, 66° 31' 37.2" W); 24.vii.2010. L.F. Armas & A. Perez-Asso, deposited in IBSP 166240. Male paratype, same data as holotype, deposited in IBSP 166241.



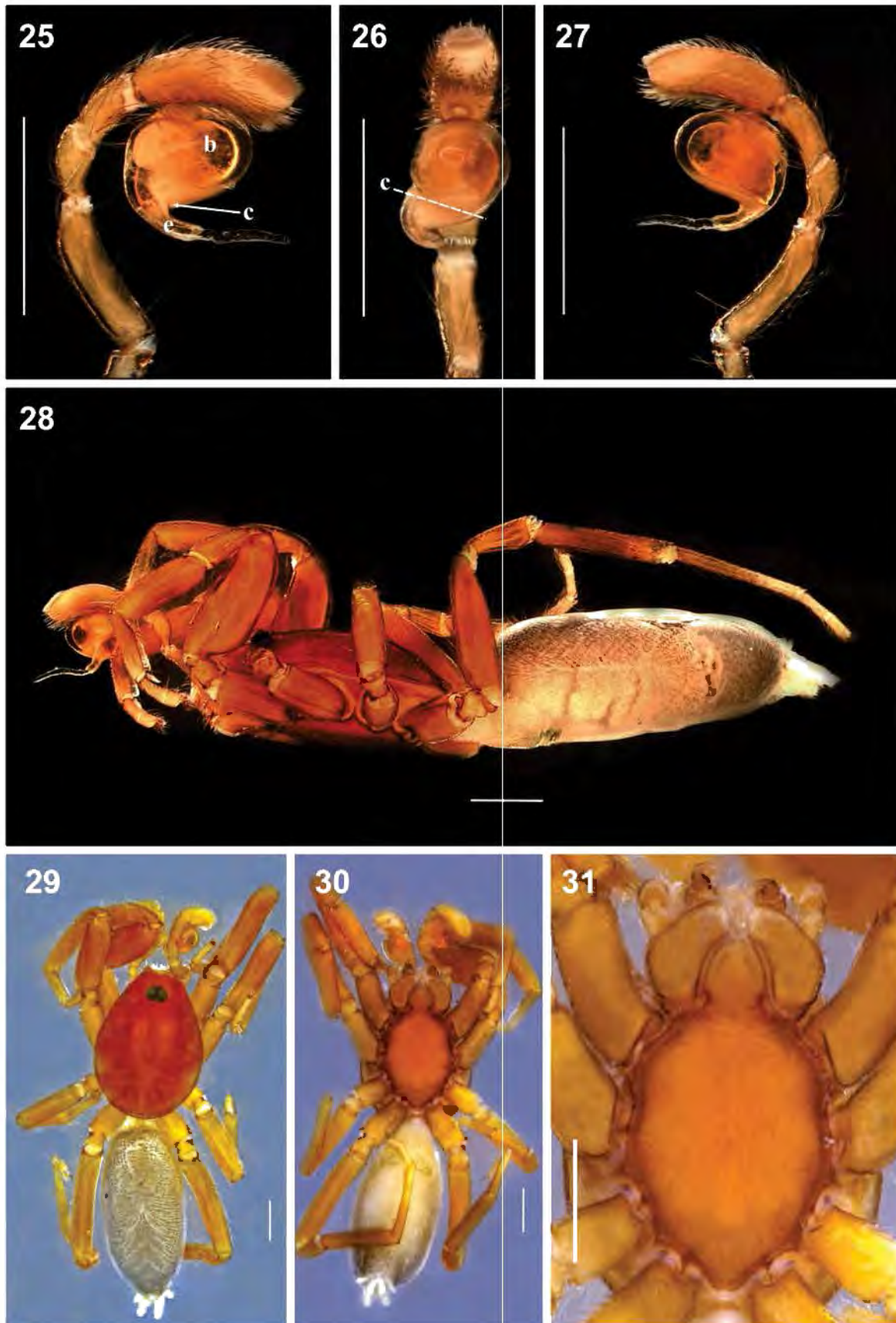
FIGURES 1–6. *Nops blandus* (Bryant), male left palp. **7–8.** *Nops finisfarvus* n. sp., male left palp. 1. Retrolateral view. 2. Dorsal oblique view. 3. Dorsal view. 4. Detail of oval pad of fine chemoreceptor hairs, dorsal distal view. 5. Tip of embolus, retrolateral view, arrow point at projection of tip. 6. Tip of embolus, prolateral view. 7. Prolateral view. 8. Tibial brush, prolateral view.



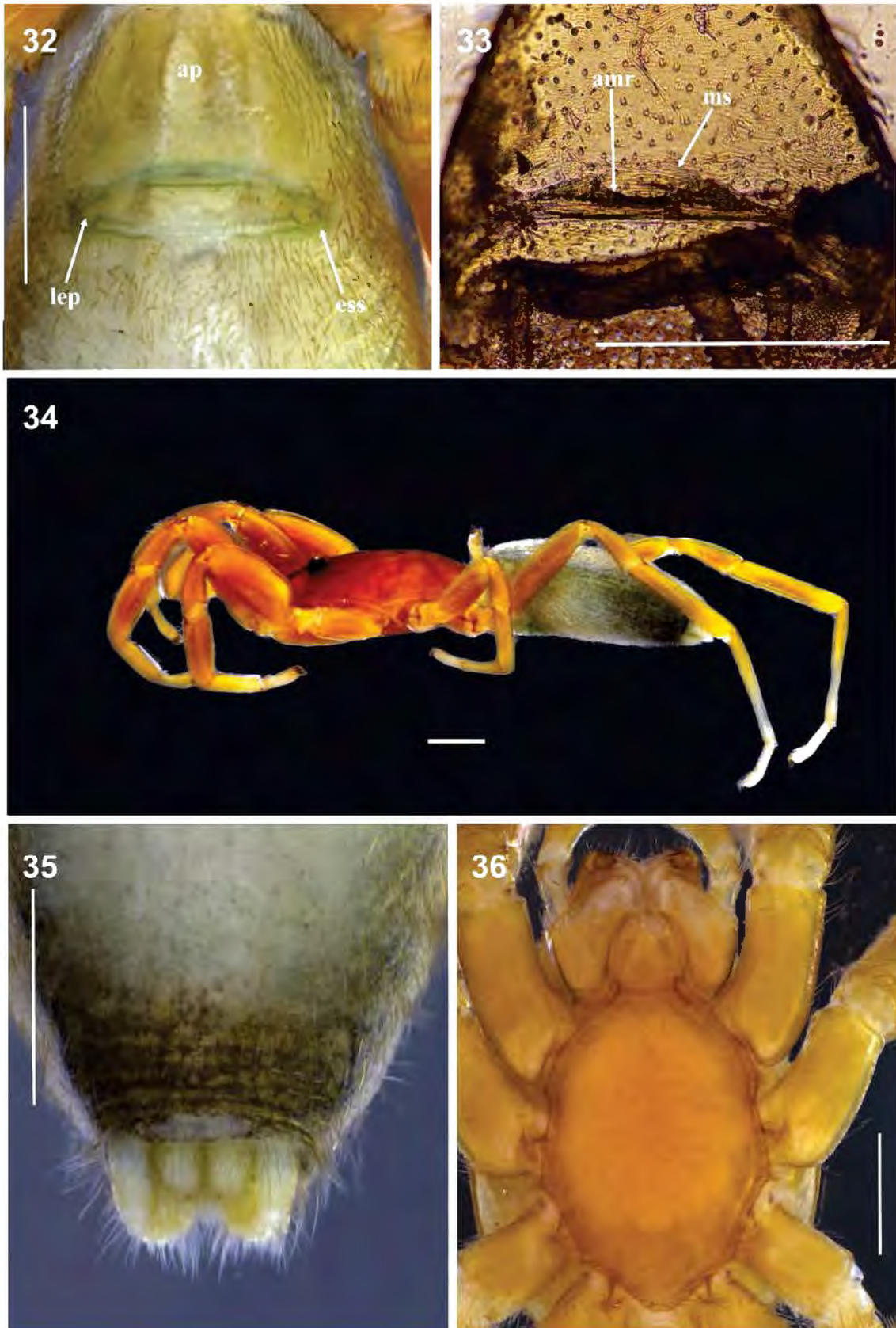
FIGURES 9–12. *Nops finisfurvus* n. sp., male left palp. **13–16.** *Cubanops huquillo* n. sp., male left leg IV. 9. Embolus, prolateral view. 10. Tip of embolus, prolateral view, arrows point at projections. 11. Palp, dorsal view. 12. Tip of embolus, distal view. 13. Retrolateral view, arrows point at false sutures on tarsus and metatarsus, respectively. 14. Tarsal claws, retrolateral view. 15. Join of tarsus and metatarsus, retrolateral view. 16. False suture on metatarsus, retrolateral view.



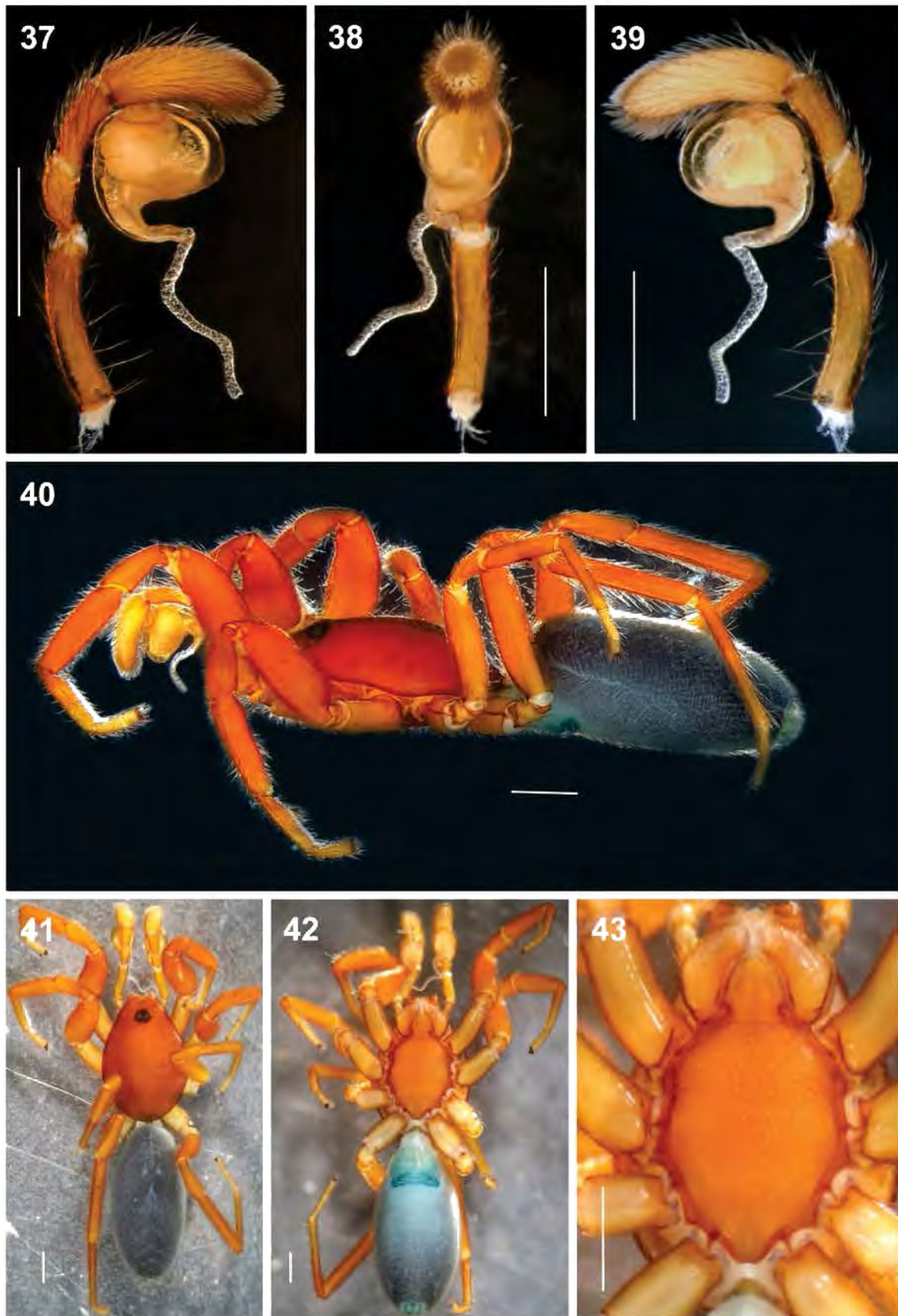
FIGURES 17–24. *Cubanops luquillo* n. sp., male. 17. Left leg I, prolateral view, arrow point at false suture on tarsus. 18. Same, femur, prolateral view. 19. Same, tarsal claws, prolateral view. 20. Same, join of tarsus and metatarsus, prolateral view, arrow point at translucent ventral longitudinal keel. 21. Same, tarsal organ, dorsal view. 22. Same, detail of tarsal organ, dorsal view. 23. Same, trichobotrial base, dorsal view. 24. Left leg IV, trichobotrial base, dorsal view.



FIGURES 25–31. *Nops blandus* (Bryant), male. 25–27. Left palp. 25. Prolateral view. 26. Ventral view. 27. Retrolateral view. 28. Habitus, lateral view. 29. Habitus, dorsal view. 30. Habitus, ventral view. 31. Sternum and endites, ventral view. Scale line 0.5 mm. Abbreviations: bulb (b), embolus (e) and anterior curvature (c).



FIGURES 32–36. *Nops blandus* (Bryant), female. 32. Genital plate, ventral view. 33. Internal genitalia, dorsal view. 34. Habitus, lateral view. 35. Spinnerets, ventral view. 36. Sternum and endites, ventral view. Scale line 0.5 mm. Abbreviations: anterior plate (ap), lateral extensions of posterior plate (lep), external sclerotization around spiracles (ess), membranous sac (ms) and anterior margin of receptaculum (amr).



FIGURES 37–43. *Nops agnarssoni* n. sp., male holotype. 37–39. Left palp. 37. Prolateral view. 38. Ventral view. 39. Retrolateral view. 40. Habitus, lateral view. 41. Habitus, dorsal view. 42. Habitus, ventral view. 43. Sternum and endites, ventral view. Scale line 0.5 mm.

Etymology. The specific name is a patronymic in honor of Ingi Agnarsson, for his help and support during fieldwork in Puerto Rico looking for caponiids.

Diagnosis. Males of *Nops agnarssoni* n. sp. resemble those of *Nops blandus* (Figs. 25–27, 77) and *Nops finisfurvus* n. sp. (Figs. 44–46, 79) by having a curved embolus; but it can be distinguished by its middle part strongly curved and a weakly sinuous tip (Figs. 37–39, 78).

Description. *Male* (holotype): Carapace dark orange, elongated oval with a black and slightly elevated ocular tubercle (Figs. 40, 41); pars cephalica not elevated, pars thoracica slightly sloping posteriorly (Fig. 40), thoracic groove absent. Two black, oval eyes of equal size, separated by about two-thirds their diameter. Chelicerae orange. Endites orange except for anterior tips due a white membranous projection, wide, convergent but not touching, with middle part wider than the distal and proximal and forming an obtuse angle of about 120 degrees (Fig. 43), covered with scattered long setae. Labium orange, broad, fused to sternum along obsolete posterior groove, rounded and reborded in apical part (Fig. 43). Sternum orange, darker at the edge, oval, surface with fine reticular lines with few weak pits and numerous stiff setae around the edge (Fig. 43). Coxae light orange. Legs orange, formula 4123; metatarsi entire, anteriors with a median translucent ventral longitudinal keel and with a distal, translucent ventral extension of membrane between anterior tarsi and metatarsi; all tarsi subsegmented, with three claws, paired claws with 5 teeth, unpaired claw elongated and dorsally reflexed in all legs, without teeth. Trichobothria present on metatarsi and tarsi in a single row. Palp with tibia excavated ventrally; cymbium elongated rounded, ventral surface densely covered with strong setae, with globose oval bulb (Figs. 37–39), embolus strongly curved at middle part, distinctly shorter than tibial length, on a base of the same size as the width of the tibia, and a weakly sinuous tip (Figs. 37–39). Abdomen grayish green dorsally with fine light gray lines forming a pattern (Fig. 41), lighter ventrally, but darker in distal part around spinnerets, with only slightly sclerotized epigastric and postepigastric scuta (Fig. 42). Spinnerets light gray, six, in typical caponiid arrangement. Total length 6.50. Carapace 3.40 long, 2.80 wide. Eyes 0.10 major diameter, 0.06 minor diameter. Leg measurements: I: femur 8.60/ patella 1.90/ tibia 9.90/ metatarsus 9.90/ tarsus 1.80; II: 8.70/ 1.30/ 10.40/ 10.10/ 1.30; III: 7.80/ 1.50/ 7.60/ 10.80/ 1.20; IV: 8.50/ 1.70/ 9.70/ 9.90/ 1.80. Sternum 1.90 long, 1.60 wide. Palpal tibia 1.40 long, 0.70 wide.

Female: Unknown.

Distribution: Known only from the type locality in Puerto Rico (Fig. 84).

Nops finisfurvus new species

Figures 7–12, 44–56, 79, 83

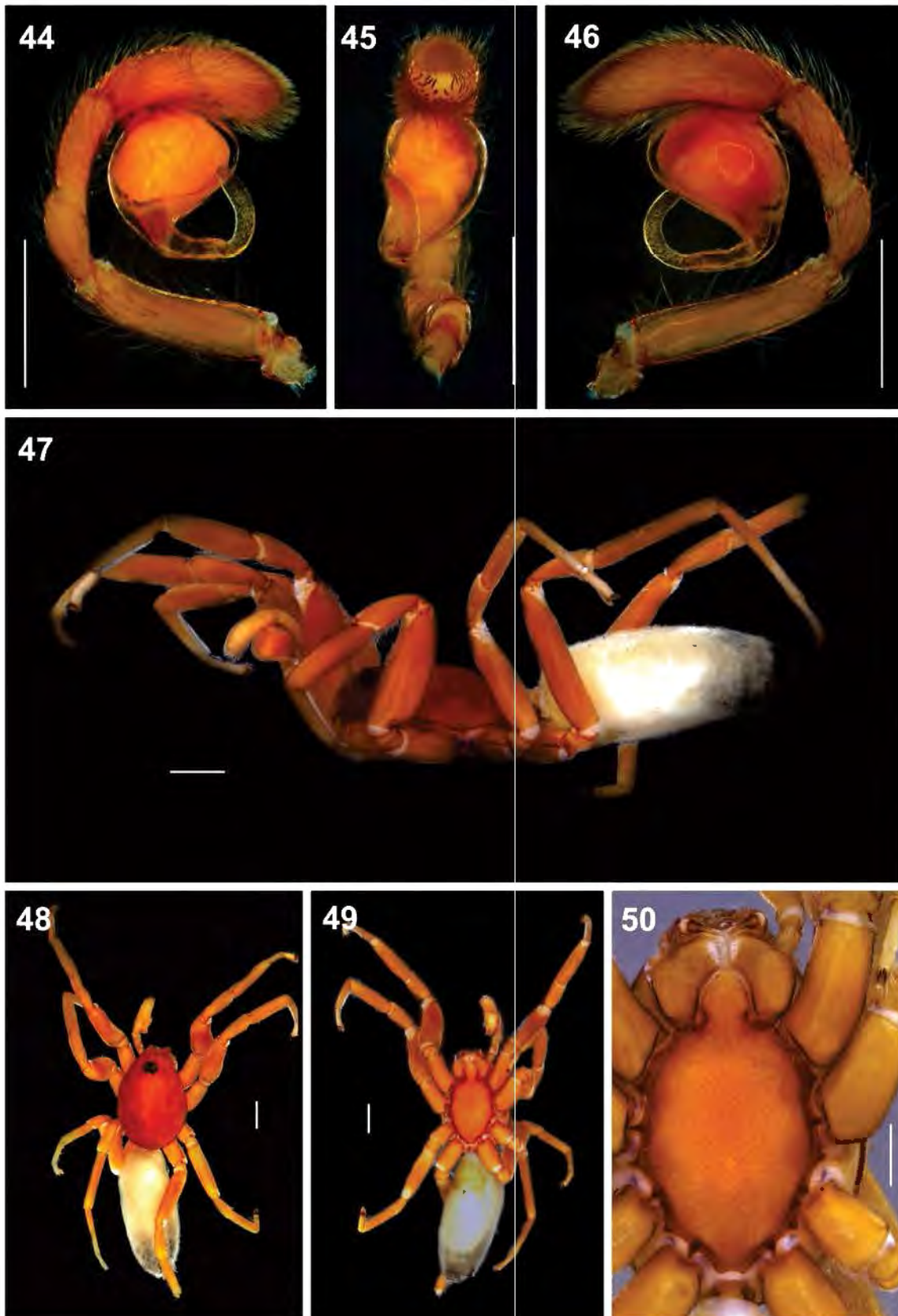
Types. Male holotype from Fallen Jerusalem Island (18° 24' 58.0" N, 64° 27' 8.0" W), 24.v.1966, Project Island Staff, University of Puerto Rico, deposited in AMNH. Female paratype from Peter Island, 6.vii.1965, Project Island staff, University of Puerto Rico, deposited in AMNH.

Additional material examined. BRITISH VIRGIN ISLANDS: Little Jost Van Dyke (18° 27' 13" N, 64° 43' 19" W), 27.vii.1965, Project Island Staff, University of Puerto Rico, 1♀ (AMNH). East Seal Dog (18° 30' 24" N, 64° 25' 56" W), 7.vi.1966, Project Island Staff, University of Puerto Rico, 1♀ imm. (AMNH). Peter Island (18° 21' 6" N, 64° 34' 9" W), 6.vii.1965, Project Island Staff, University of Puerto Rico, 1♀ imm. (AMNH). Virgin Gorda Mountains (18° 28' 52.9" N, 64° 24' 21.7" W), Virgin Gorda Island, 26.vi.1966, Project Island Staff, University of Puerto Rico, 1♂ (AMNH). PUERTO RICO: Culebra Island, near Dewey (18° 18' 9" N, 65° 18' 12" W), 10.viii.1965, Island Project Staff, University of Puerto Rico, 1♀ imm. (AMNH).

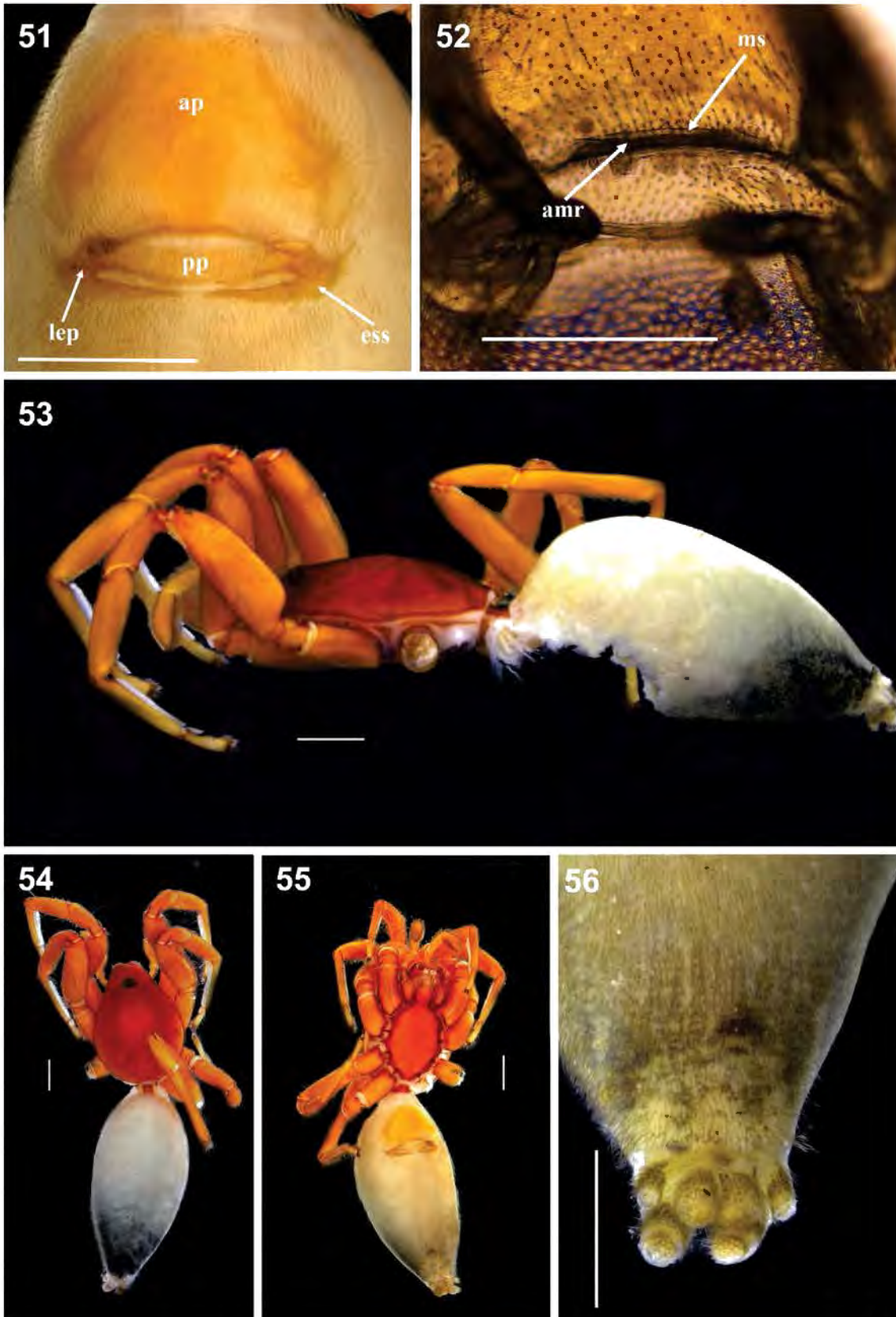
Etymology. The specific name is a Latin combination of the words *finis* (=end) and *furvus* (=dark), referring to the dark coloration at the distal part of abdomen (Figs 54–61).

Diagnosis. Males and females can be distinguished from other congeners by the distal part of abdomen distinctly darker than basal and median part. Males with a pear-shaped bulb (Figs. 44–46) and the tip with two projections, one greater than the other (Figs. 10, 12). Females with a thin and convex anterior margin of receptaculum, and a small membranous sac (Figs. 52, 83).

Description. *Male* (holotype): Carapace immaculate dark orange, elongated oval with a black and slightly elevated ocular tubercle (Fig. 48); pars cephalica not elevated, pars thoracica slight sloping posteriorly (Fig. 47), thoracic groove absent. Two black, oval eyes of equal size, separated by about two-thirds their diameter.



FIGURES 44–50. *Nops finisfurvus* n. sp., male holotype. 44–46. Left palp. 44. Prolateral view. 45. Ventral view. 46. Retrolateral view. 47. Habitus, lateral view. 48. Habitus, dorsal view. 49. Habitus, ventral view. 50. Sternum and endites, ventral view. Scale line 0.5 mm.



FIGURES 51–56. *Nops finisfarvus* n. sp., female paratype. 51. Genital plate, ventral view. 52. Internal genitalia, dorsal view. 53. Habitus, lateral view. 54. Habitus, dorsal view. 55. Habitus, ventral view. 56. Spinnerets, ventral view. Scale line 0.5 mm. Abbreviations: anterior plate (ap), posterior plate (pp), lateral extensions of posterior plate (lep), external sclerotization around spiracles (ess), membranous sac (ms) and anterior margin of receptaculum (amr).

Chelicerae orange. Endites orange except for anterior tips due a white membranous projection, wide, convergent but not touching, with middle part wider than the distal and proximal and forming an obtuse angle of about 120 degrees (Fig. 50), covered with scattered long setae. Labium orange, broad, fused to sternum along obsolete posterior groove, rounded and reborded in apical part (Fig. 50). Sternum orange, darker at the edge, oval, surface with fine reticular lines with few weak pits and numerous stiff setae around the edge (Fig. 50). Coxae orange. Legs orange, formula 4123; metatarsi entire, anteriors with a median translucent ventral longitudinal keel and with a distal, translucent ventral extension of membrane between anterior tarsi and metatarsi; all tarsi subsegmented, with three claws, unpaired claw elongated and dorsally reflexed in anterior legs, without teeth. Trichobothria present on metatarsi and tarsi in a single row. Palp with tibia excavated ventrally; cymbium elongated rounded (Fig. 7), ventral surface densely covered with strong setae, and an oval pad of fine chemoreceptor hairs on dorsal distal part (Fig. 11), with a pear shaped bulb (Figs. 44–46); embolus weakly curved (Fig. 9), distinctly shorter than tibial length, on a base shorter than tibia width (Figs. 44, 46), tip of embolus with two projections, one greater than the other (Figs. 10, 12). Abdomen light gray dorsally, with a darker area at distal part (Figs. 47–49). Spinnerets dark gray, six, in typical caponiid arrangement. Total length 7.40. Carapace 3.50 long, 2.70 wide. Eyes 0.16 major diameter, 0.09 minor diameter. Leg measurements: I: femur 8.90/ patella 1.80/ tibia 9.90/ metatarsus 9.70/ tarsus 1.70; II: 9.40/ 1.70/ 9.90/ 9.80/ 1.90; III: 7.90/ 1.80/ 8.80/ 9.40/ 1.60; IV: 8.80/ 1.70/ 9.80/ 9.70/ 1.70. Sternum 1.80 long, 1.40 wide. Palpal tibia 1.50 long, 0.90 wide.

Female (paratype): Carapace, chelicerae, labium, legs, coxae, endites and sternum as in the male (Figs 53–55). Abdomen as in the male (Figs. 53–54). Anterior plate (ap) strongly sclerotized, almost reaching proximal part of abdomen (Fig. 51); external sclerotization of spiracles (ess) darker, large, anteriorly starting from anterior spiracles (as), with a pronounced peak anteriorly directed, extending posteriorly more than the width of posterior spiracles (ps) and ending beyond interior edge of posterior spiracles (Figs 51, 83). Internal genitalia with a thin, convex and sclerotized anterior margin of receptaculum (amr), and a short membranous sac (ms) (Figs. 52, 83). Spinnerets gray, six, in typical caponiid arrangement (Fig. 56). Total length 8.10. Carapace 3.10 long, 2.80 wide. Eyes 0.17 major diameter, 0.09 minor diameter. Leg measurements: I: femur 9.00/ patella 2.10/ tibia 7.30/ metatarsus 7.00/ tarsus 2.30; II: 8.90/ 1.40/ 7.50/ 7.60/ 1.80; III: 7.60/ 1.40/ 7.50/ 7.60/ 1.60; IV: 8.00/ 1.40/ 9.40/ 9.30/ 1.70. Sternum 1.90 long, 1.50 wide. Palpal tibia 1.30 long, 0.80 wide.

Variation. Male (n=3): Total length 6.80–7.40, carapace 3.30–3.50 long, femur I 8.60–8.90 long. Palpal tibia 1.20–1.50 long, 0.40–0.90 wide. Female (n=3): Total length 7.20–8.10, carapace 2.60–3.10 long, femur I 8.40–9.00. Palpal tibia 0.60–1.00 long, 1.10–1.30 wide.

Distribution. British Virgin Islands and Culebra Island (Fig. 84).

Nops hispaniola, new species

Figures 57–69, 80, 82

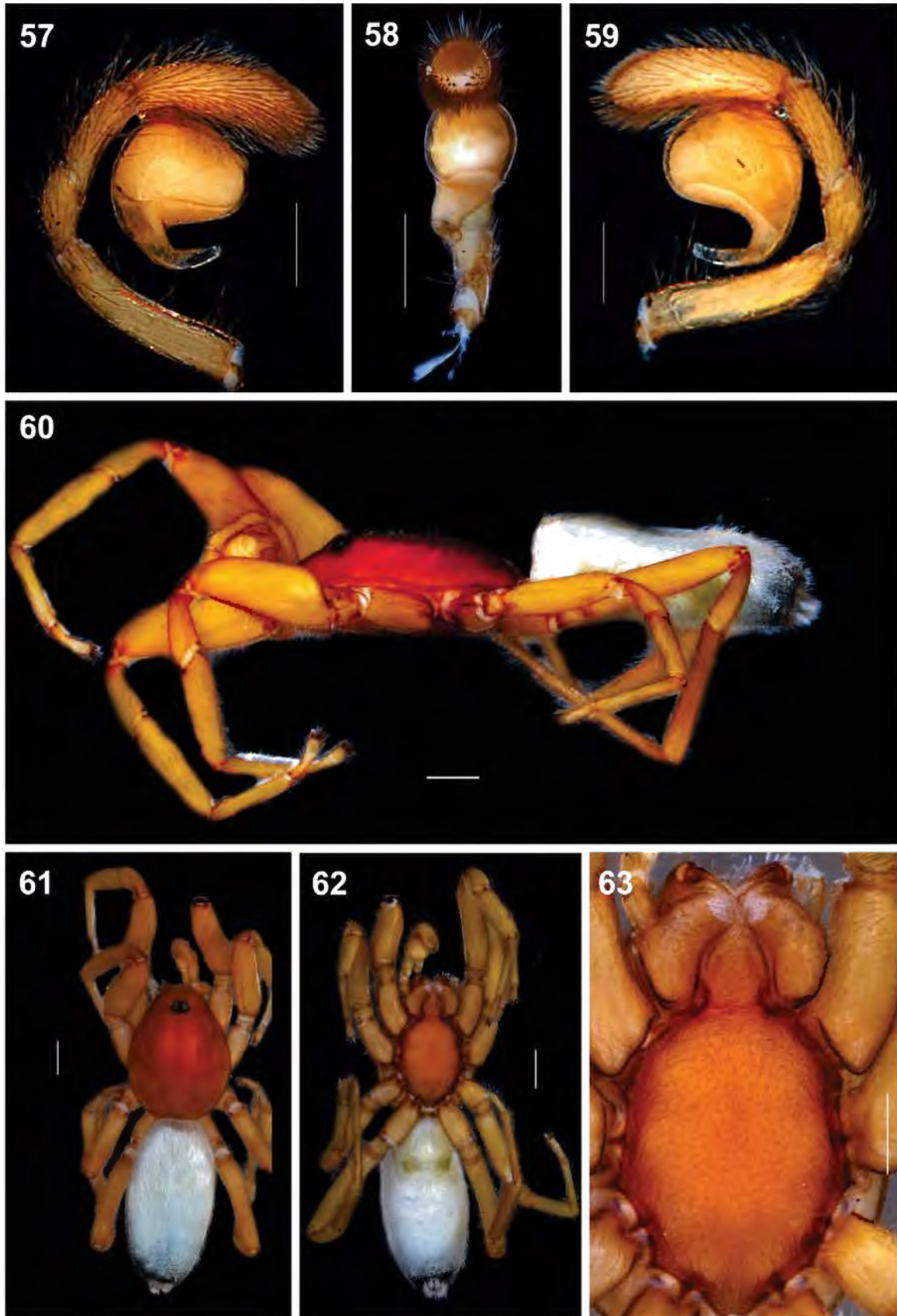
Nops coccineus: Bryant, 1948: 344 (specimen from Haiti, not *N. coccineus* Simon, MCZ 128296).

Nops blandus: Chickering, 1967: 4 (same specimen from Haiti, misidentification, MCZ 128296).

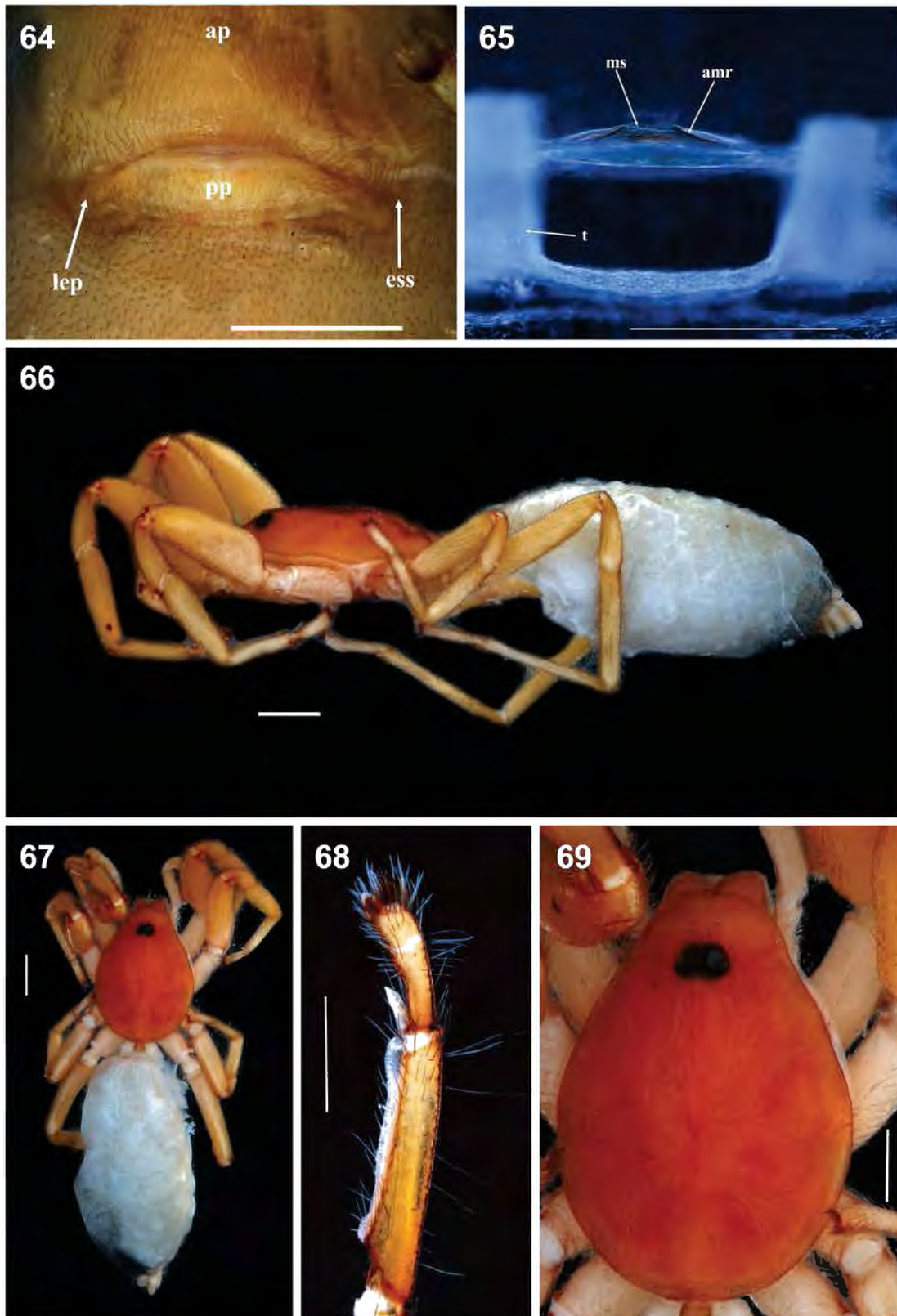
Nops blandus: Sánchez-Ruiz, 2005: 23 (only specimens from Hispaniola, misidentification, see types).

Types. Male holotype from Puerto Escondido, Independencia, República Dominicana, (18° 19' 36.50" N, 71° 34' 52.18" W), 1.ii.2005, A. Sánchez-Ruiz, under *Agave* plants, deposited in IBSP 166393. Two females paratypes, same data as holotype, deposited in IBSP 166394. One male paratype, same data as holotype, deposited in MNHNSD 09.1445.

Additional material examined. HAITI: Port au Prince, N. Banks, (not more data), 1♂ (MCZ 128296). Near Miragoâne (18° 26' 58.4" N, 73° 4' 17.5" W), i.1974, R. Bell, 1♂ 1 imm. (MNHNCu). DOMINICAN REPUBLIC: *Azua*: Montilla, Parque Nacional Sierra Martín García (18° 23' 50.8" N, 71° 04' 45.8" W), 419 m asl, 7.ix.2013, P. Torres, F. Paz, G. de los Santos, 1♂ 1♀ (MNHNSD 09.1429). (18° 23' 38.0" N, 71° 07' 11.5" W), 153 m asl, 7.ix.2013, P. Torres, K. Rodriguez, G. de los Santos, 1♂ (MNHNSD 09.1428). *Barahona*: Camino Charco frio-Cañada Azul (18° 22' 22.2" N, 71° 01' 10.4" W), 1060 m asl, 2.vii.2013, C. Marte, G. de los Santos, 1♂ 1 imm. (MNHNSD 09.1426). Loma El Curro (18° 22' 42.2" N, 71° 01' 21.8" W), 1323 m asl, 1.viii.2013, C. Suriel, P. Torres, G. de los Santos, 1♀ (MNHNSD 09.1427).



FIGURES 57–63. *Nops hispaniola* n. sp., male holotype. 57–59. Left palp. 57. Prolateral view. 58. Ventral view. 59. Retrolateral view. 60. Habitus, lateral view. 61. Habitus, dorsal view. 62. Habitus, ventral view. 63. Sternum and endites, ventral view. Scale line 0.5 mm.



FIGURES 64–69. *Nops hispaniola* n. sp., female paratype. 64. Genital plate, ventral view, 65. Internal genitalia, dorsal view. 66. Habitus, lateral view. 67. Habitus, dorsal view. 68. Metatarsus and tarsus on left leg I, retrolateral view. 69. Carapace, dorsal view. Scale line 0.5 mm. Abbreviations: anterior plate (ap), posterior plate (pp), lateral extensions of posterior plate (lep), external sclerotization around spiracles (ess), membranous sac (ms), anterior margin of receptaculum (amr) and tracheal trunk (t).

Etymology. The specific name is a noun in apposition taken from Hispaniola Island where these spiders inhabit.

Diagnosis. Males of *Nops hispaniola* n. sp. resemble those of *Nops gertschi* Chickering (see Chickering, 1967: figs 7–8) by having a straight embolus with strongly curved tip and a base with same width than tibia, but can be distinguished by having the embolus tip narrower and less sclerotized (Figs. 57–59). Females can be distinguished by a thin and slightly convex anterior margin of receptaculum, with a median concavity on the posterior wall, and a very small membranous sac (Figs. 52, 82). Also, males and females of *Nops hispaniola* n. sp. with abdomen immaculate, lacking the dorsal pattern of dark transversal bands present in *Nops gertschi*.

Description. *Male* (holotype): Carapace immaculate orange, elongated oval with a black and slightly elevated ocular tubercle (Fig. 61); pars cephalica not elevated, pars thoracica slight sloping posteriorly (Fig. 60), thoracic groove absent. Two black, oval eyes of equal size, separated by about two-thirds their diameter. Chelicerae light orange. Endites light orange except for anterior tips due a white membranous projection, wide, convergent but not touching, with middle part wider than the distal and proximal and forming an obtuse angle of about 120 degrees (Fig. 63), covered with scattered long setae. Labium light orange, broad, fused to sternum along obsolete posterior groove, rounded and reborded in apical part (Fig. 63). Sternum light orange, darker at the edge, oval, surface with fine reticular lines with few weak pits and numerous stiff setae around the edge (Fig. 63). Coxae light orange. Legs light orange, formula 4123; metatarsi entire, anteriors with a median translucent ventral longitudinal keel and with a distal, translucent ventral extension of membrane between anterior tarsi and metatarsi; all tarsi subsegmented, with three claws, unpaired claw elongated and dorsally reflexed in anterior legs, without teeth. Trichobothria present on metatarsi and tarsi in a single row. Palp with tibia excavated ventrally; cymbium elongated rounded, ventral surface densely covered with strong setae, with globose oval bulb (Figs. 57–59); embolus straight, distinctly shorter than tibial length, with curved, narrow and slightly sclerotized tip, and a base with same width than tibia (Figs. 57, 59). Abdomen immaculate, light gray dorsally, with darker area around spinnerets (Figs. 61, 62). Spinnerets light gray, six, in typical caponiid arrangement. Total length 6.60, carapace 2.60 long, 1.50 wide. Eyes 0.12 major diameter, 0.07 minor diameter. Leg measurements: I: femur 8.00/ patella 1.60/ tibia 9.70/ metatarsus 9.40/ tarsus 1.50; II: 8.80/ 1.40/ 9.40/ 9.50/ 1.70; III: 7.00/ 1.20/ 7.40/ 9.40/ 1.40; IV: 8.10/ 1.40/ 9.50/ 9.30/ 1.60. Sternum 1.60 long, 1.10 wide. Palpal tibia 1.00 long, 0.60 wide.

Female (paratype IBSP 166394): Carapace (Fig. 69), chelicerae, labium, legs, coxae, endites and sternum as in the male. Abdomen as in the male (Figs. 66, 67). Anterior plate (ap) weakly sclerotized, almost reaching proximal part of abdomen (Fig. 64); external sclerotization of spiracles (ess) darker, large, anteriorly starting from lateral extensions of posterior plate (lep), extending posteriorly more than the width of posterior spiracles (ps), but ending before interior edge of posterior spiracles (Figs 64, 82). Internal genitalia with a thin, slightly convex and sclerotized anterior margin of receptaculum (amr), and a very short membranous sac (ms) (Figs. 65, 82). Spinnerets light gray, six, in typical caponiid arrangement. Total length 6.90. Carapace 3.00 long, 2.10 wide. Eyes 0.10 major diameter, 0.08 minor diameter. Leg measurements: I: femur 8.30/ patella 1.80/ tibia 9.80/ metatarsus 9.90/ tarsus 1.90; II: 8.90/ 1.40/ 7.40/ 7.20/ 1.80; III: 7.60/ 1.40/ 7.50/ 7.20/ 1.60; IV: 8.20/ 1.40/ 9.60/ 9.30/ 1.70. Sternum 1.80 long, 1.40 wide. Palpal tibia 1.30 long, 0.80 wide.

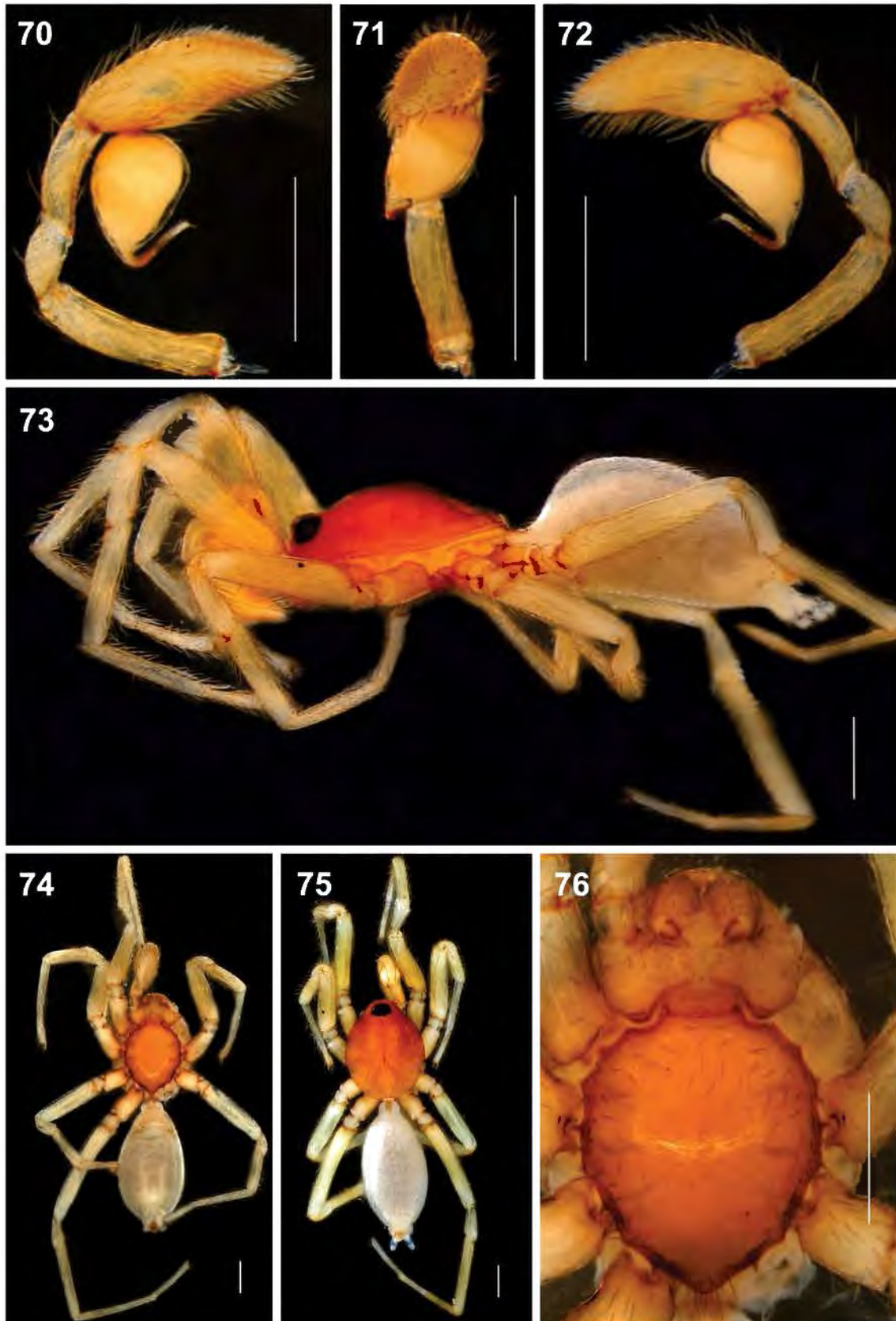
Variation. Male (n=2): Total length 6.00–6.60, carapace 2.30–2.60 long, femur I 7.60–8.00 long. Palpal tibia 0.80–1.00 long, 0.40–0.60 wide. Female (n=2): Total length 5.90–6.90, carapace 2.20–3.00 long, femur I 7.60–8.30. Palpal tibia 1.00–1.30 long, 0.60–0.80 wide.

Distribution. Hispaniola (Fig. 85).

Genus *Cubanops* Sánchez–Ruiz, Platnick & Dupérré, 2010

Type species: *Cubanops ludovicorum* (Alayón, 1976) by original designation.

Diagnosis: *Cubanops* can be distinguished from Caponiinae genera by the presence of subsegmented tarsi (Figs. 13, 17), from other Nopinae genera (except *Tarsonops* Chamberlin) by having a bisegmented metatarsi IV (Figs. 13, 16); and from *Tarsonops* by having entire anterior metatarsi (Fig. 17), a widened labium and a distally rounded and medially narrowed endites (Fig. 76).



FIGURES 70–76. *Cubanops luquillo* n. sp. male holotype. 70–72. Left palp. 70. Prolateral view. 71. Ventral view. 72. Retrolateral view. 73. Habitus, lateral view. 74. Habitus, ventral view. 75. Habitus, dorsal view. 76. Sternum and endites, ventral view. Scale line 0.5 mm.

Cubanops luquillo, new species

Figures 13–24, 70–76

Type. Male holotype from Pico del Este, Luquillo, Puerto Rico (18° 16' 06.0" N, 65° 45' 32.0" W), 7–9.x.1996, A. J. Vargas, deposited in IBSP 166242.

Additional material examined. 1 ♀ imm., same data as holotype, deposited in IBSP 166243.

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

Diagnosis. Easily distinguished from other known congeners by having the carapace and dorsal part of abdomen immaculate, lacking the distinctly pattern (Figs. 73, 75), translucent ventral keel on the anterior metatarsi occupying only about half the length of the metatarsus (Figs. 17, 20). Also, males can be distinguished by a pear-shaped bulb and straight large embolus on a distinctively strongly curved base (Figs. 70–72).

Description. *Male* (holotype): Carapace immaculate yellowish orange, broadly oval, with a slightly elevated black ocular tubercle, pars cephalica slightly depressed, pars thoracica short, sloping posteriorly (Fig. 73); thoracic groove short (Fig. 75). Two black, oval eyes of equal size separated by about two-thirds their diameter. Chelicerae, labium and endites yellowish orange, lighter than carapace. Endites broadly convergent, but not touching, distally rounded, medially narrowed, covered with scattered long setae (Fig. 76). Labium much wider than long (Fig. 76), separated from sternum by depressed groove, with distinct medial invagination at tip. Sternum yellowish orange, darker at the edge, about as wide as long, with few weak pits and numerous stiff setae around the edge (Fig. 76). Coxae yellowish white. Legs pale yellow, femur I elongate, almost four times longer than wide (Fig. 18); anterior legs with ventral translucent keel occupying only about half the length of the anterior metatarsi (Figs. 17, 20), and a translucent fan-shaped extension of the membrane between the anterior metatarsi and tarsi (Fig. 20); metatarsi I–III entire, metatarsus IV and tarsi divided into two subsegments (Figs. 13, 16); tarsi with three claws, inferior claw shorter than paired ones (Figs. 14, 19), anterior paired claws with 12 teeth (Fig. 19) and posterior with 8 (Fig. 14). Tarsal organ exposed, large, with five pronounced, concentric marginal ridges and three large proprioceptors (Figs. 21, 22). Trichobothria present on metatarsi and tarsi in a single row, bases with semicircular rim bearing two slight longitudinal ridges (Figs. 23, 24). Palp pale yellow, with tibia excavated ventrally; cymbium elongated pointed, prolateral surface densely covered with strong setae; with a pear shaped bulb (Figs. 70–72); embolus straight and large, on a distinctively strongly curved base (Figs. 70–72); tip of embolus with a fine and long extension. Abdomen immaculate light gray (Figs. 74, 75). Spinnerets light gray, six, in typical caponiid arrangement. Total length 3.9. Carapace 1.8 long, 1.4 wide. Eyes 0.15 major diameter, 0.08 minor diameter. Leg measurements: I: femur 3.23/ patella 1.84/ tibia 2.72/ metatarsus 2.72/ tarsus 1.2; II: 3.4/ 1.22/ 2.96/ 2.96/ 1.73; III: 2.82/ 1.43/ 2.39/ 2.7/ 1.7; IV: 3.71/ 1.63/ 3.23/ 3.24/ 2.25. Leg formula: 4213. Sternum 2.23 long, 1.95 wide. Palpal tibia 1.05 long, 0.85 wide.

Female: Adult females unknown.

Distribution. Known only from the type locality in Puerto Rico (Fig. 84).

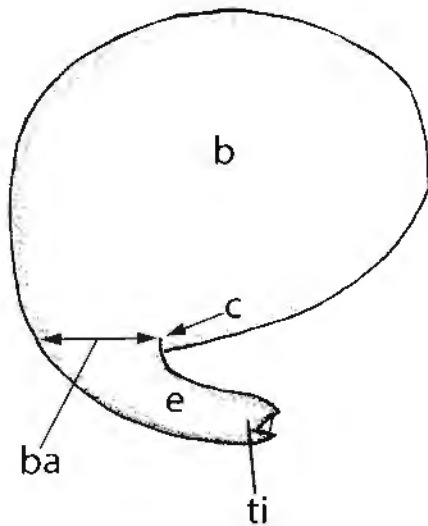
Discussion

Chickering (1967) transferred *N. blandus* from *Caponina* and synonymized a male from Haiti recorded by Bryant (1948) as *Nops coccineus* Simon. Chickering (1967) also tentatively assigned to *N. blandus* other specimens from St. John, St. Thomas (U. S. Virgin Islands), and Virgin Gorda (British Virgin Islands), pending more data on the *Nops* populations of these islands. We examined all those specimens and can be assigned to *N. blandus*, except by the male from Haiti. This male is actually conspecific with specimens recorded from Dominican Republic by Sánchez-Ruiz (2005), also misinterpreted as *N. blandus*. A detailed comparative study of those Hispaniolan specimens, including additional material from recent collections in Hispaniola held at MNHNSD, the male holotype of *N. blandus* and additional specimens examined from Virgin Islands held at AMHN, MCZ and FSCA, showed that the Hispaniolan specimens are a different species, which is described in this paper as *Nops hispaniola* n. sp. This hypothesis is also supported by the differences in the female genitalia between *N. blandus* and *Nops hispaniola* n. sp. Furthermore, Armas (2010) recorded two males from Isla Caja de Muertos at South of Puerto Rico, one of them belonging to *N. blandus* and the other specimen belonging to an undescribed species. After examination, we found that these specimens were conspecific and belong to a new species described here as *Nops*

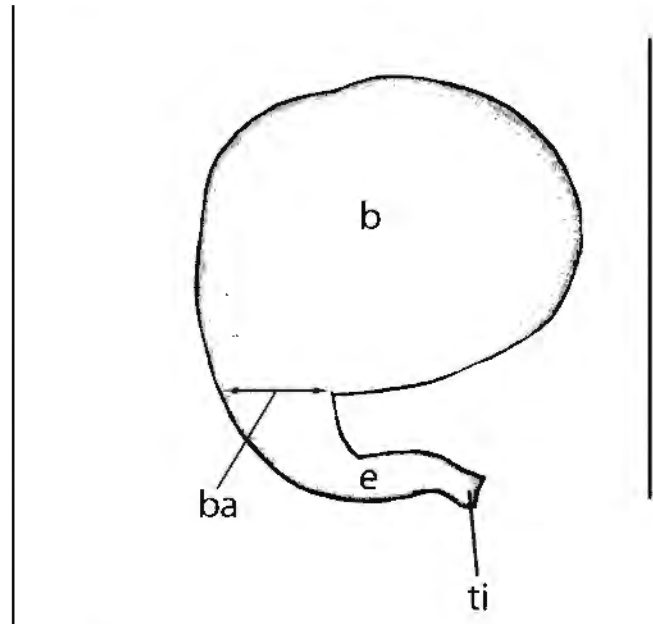
agnarssoni n. sp. Based on these findings, the distribution of *N. blandus* is currently restricted to U. S. and British Virgin Islands (Fig. 84).

We also had the opportunity to examine others specimens from British Virgin Islands borrowed from AMNH, some of them identified as *N. blandus* with a question mark. These specimens are almost twice the size of any known specimen of *N. blandus*, and they also have the distal part of abdomen distinctly darker than proximal and median part (Figs. 47, 48, 53, 54). After comparison with the male holotype and the females of *N. blandus*, all these specimens were determined to belong to another new species that is described in this paper as *Nops finisfurvus* n. sp.

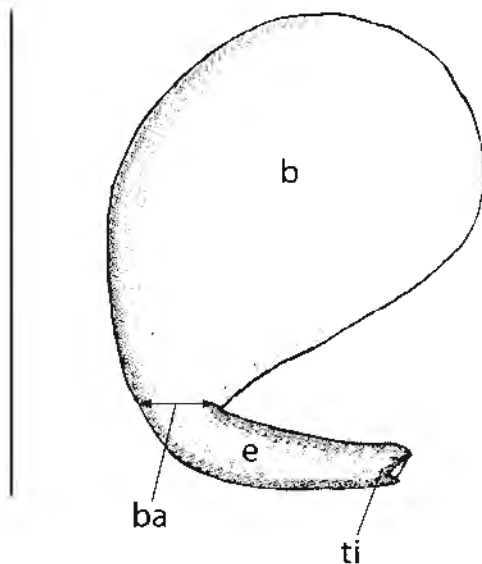
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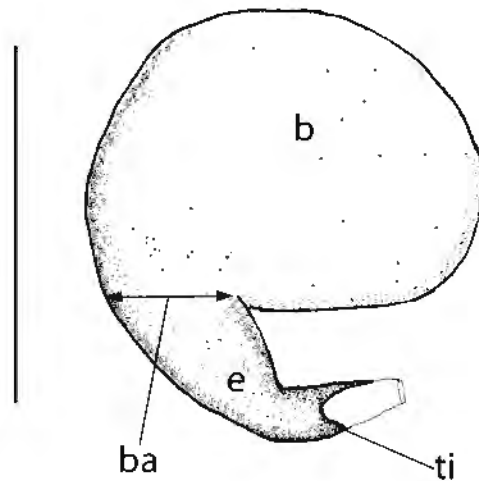
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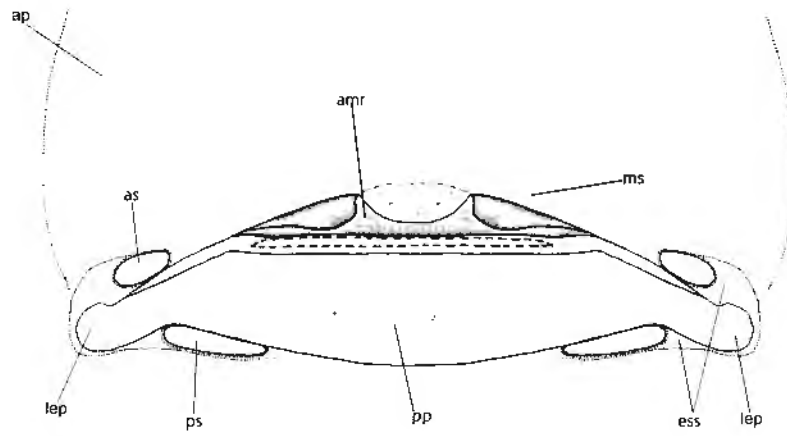


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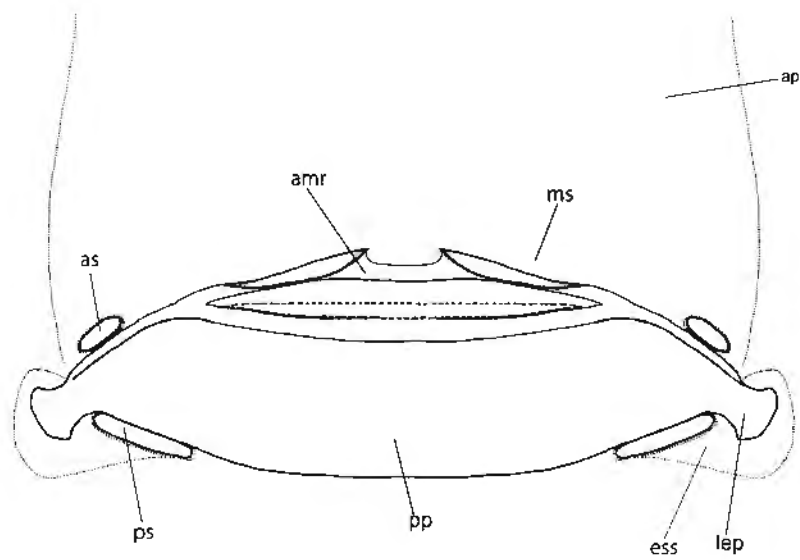


FIGURES 77–80. Line drawings of male genitalia of *Nops* species. 77. *Nops blandus* (Bryant). 78. *Nops agnarssoni* n. sp. 79. *Nops finisfurvus* n. sp. 80. *Nops hispaniola* n. sp. Scale line 0.5 mm. Abbreviations: bulb (b), embolus (e), embolar tip (ti), embolar base (ba) and anterior curvature (c).

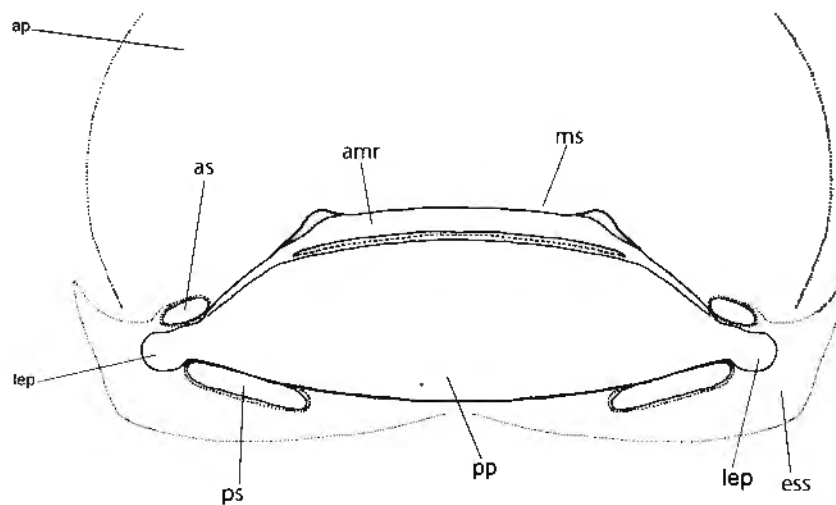
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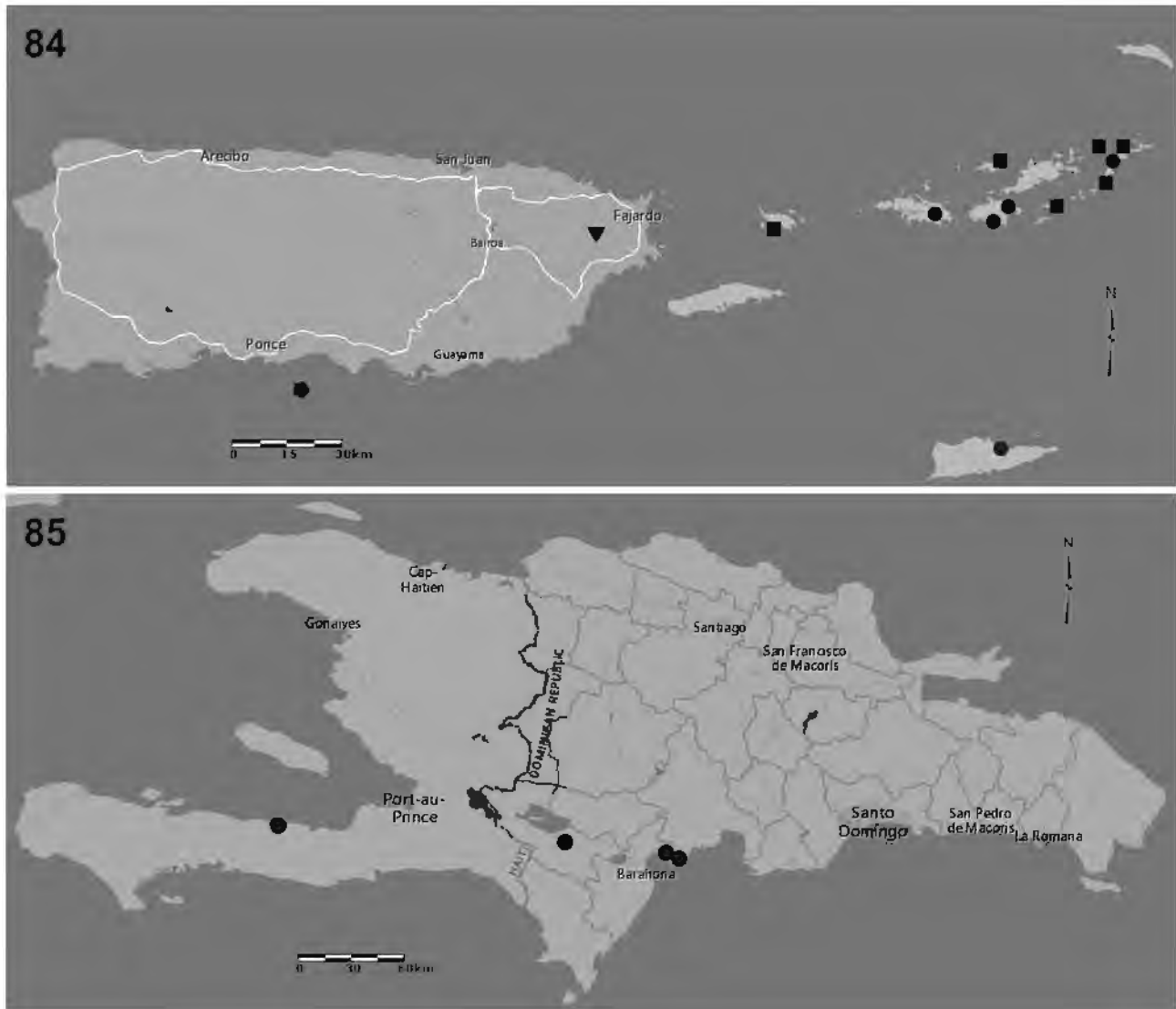
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FIGURES 81–83. Line drawings of internal female genitalia of *Nops* species. 81. *Nops blandus* (Bryant). 82. *Nops hispaniola* n. sp. 83. *Nops finisfurvus* n. sp. Scale line 0.5 nm. Abbreviations: anterior plate (ap), posterior plate (pp), lateral extensions of posterior plate (lep), external sclerotization around spiracles (ess), membranous sac (ms), anterior margin of receptaculum (amr), anterior spiracles (as) and posterior spiracles (ps).



FIGURES 84–85. Distribution maps. 84. Distribution in Puerto Rico and Virgin Island of *Nops blandus* (Bryant) (black circles), *Nops agnarssoni* n. sp. (black rhombus), *Nops finisfurvus* n. sp. (black squares) and *Cubanops luquillo* n. sp. (black triangle). 85. Distribution in Haiti and Dominican Republic of *Nops hispaniola* n. sp. (black circles).

Puerto Rico is the third largest island of the West Indies, but the only known caponiids are those males collected by Armas (2010) and described here as *N. agnarssoni* n. sp. Additionally, we describe a second caponiid spider from the East of Puerto Rico: *Cubanops luquillo* n. sp. We have placed this new species tentatively in the genus *Cubanops*, because specimens share several characteristics with the genus: widened labium (Fig. 76), endites distally rounded and medially narrowed (Fig. 76) and a bisegmented metatarsi IV (Figs. 13, 16). However, the carapace and abdomen of *C. luquillo* n. sp. are immaculate, lacking the distinct pattern characteristic of all other congeners. Furthermore, *C. luquillo* n. sp. present other unique characteristics as the short translucent ventral keel on the anterior metatarsi, occupying only about half the length of the metatarsus (Figs. 17, 20), and the large, exposed tarsal organ on dorsal tip of tarsus (Figs. 21, 22). Also, the conformation of bulb and embolus in the male (Figs. 70–72) differs slightly from other species of the genus. Thus, it is necessary to obtain new material, which may provide additional evidence for establishing the taxonomic placement of this species.

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