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# The Haplogyne Spider Genus *Nopsides* (Araneae, Caponiidae), with Notes on *Amrishoonops*

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#### **ABSTRACT**

The caponiid spider genus *Nopsides* Chamberlin was established on the basis of juvenile specimens from Isla Cerralvo in the Gulf of California. Adult males and females of the type (and only known) species, *N. ceralbonus* Chamberlin, are described for the first time, and the species is newly recorded from the Mexican mainland as well as the Baja peninsula. These animals are nopines (i.e., have subsegmented tarsi), can easily be recognized by their unique eye pattern (with four eyes in two widely separated rows), and are notable for the modifications of the inferior claws. In both sexes, the inferior claw is greatly elongated on legs I and II, but is missing entirely on legs III and IV. A single juvenile specimen, reportedly taken in Peru, shares these somatic characters and suggests that the genus might be more widespread. In a supplement, the genus *Amrishoonops* Makhan and Ezzatpanah is placed as a junior synonym of the anapid genus *Pseudanapis* Simon.

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#### INTRODUCTION

The caponiid spider genus *Nopsides* is one of three nopine genera that were originally described by Chamberlin (1924) on the basis of specimens from Baja California and adjacent islands. The other two genera, *Orthonops* and *Tarsonops*, have been examined by later workers (e.g., Gertsch, 1935; Platnick, 1995), but *Nopsides* has remained unstudied. As indicated by Chamberlin (1924), specimens of *Nopsides* resemble other nopines in having subsegmented tarsi, but can be easily distinguished by their unique eye pattern, with four eyes in two widely separated rows (figs. 4, 12), and by the absence of the ventral translucent keel on the anterior metatarsi, and the translucent extension of the membrane between the anterior metatarsi and tarsi, that characterize the members of *Nops* MacLeay (1839) as well as *Orthonops* and *Tarsonops*.

Although Chamberlin's recognition of *Nopsides* as a separate genus was well justified, his specimens, including the holotype he thought to be an adult female, were actually all juveniles. In the present paper, the ninth in a series on caponiids, we present a detailed redescription of the type species, based for the first time on adult males and females.

Aside from their remarkable eye pattern and leg modifications, *Nopsides* specimens are notable for the modifications of the claws on the leg tarsi. In three-clawed spiders, the unpaired claw is typically much smaller than the paired claws, as well as more ventrally situated on the tarsal tip (and is hence often referred to as the inferior claw). In *Nopsides*, however, the third claw is sometimes enormously elongated, extending dorsally between the paired, superior claws, and sometimes even extends farther dorsally than do the superior claws (figs. 43, 46).

The only other spiders known to us that have such highly modified inferior claws are those belonging to *Nops* itself. Surprisingly, this highly distinctive feature does not seem to have been noticed by earlier students of that genus; the generic description provided, for example, by Chickering (1967: 2) says only "all tarsi with three claws each but third claw often hidden." Similarly, Chamberlin's (1924: 602) description of *Nopsides* omitted any mention of the elongated claws and noted only: "Unpaired claw absent or aborted...."

Nops, as presently delimited, is a large genus, containing 27 described (and many other undescribed) species found throughout the Neotropics (Platnick, 2011), and it remains to be seen whether all those species show the same pattern of tarsal claw morphology. Careful examination, ideally including scanning electron microscopy, is needed to obtain accurate results. In Nopsides, both males and females have the enormously elongated inferior claws on both legs I and II; the portion of the tarsal tip that would normally be occupied by the inferior claws instead bears a laterally compressed, translucent process (figs. 42–45, 68–71) that was called a pulvillus by Petrunkevitch (1939: 190). Interestingly, the pulvillus occurs also on legs III and IV, but in both sexes of Nopsides, the inferior claws have been lost entirely on those posterior legs (figs. 48, 49, 74, 75). At least some females of Nops, in contrast, have the elongated inferior claws on all their legs.

This dramatic modification of the inferior claws would seem to be an obvious synapomorphy, suggesting that *Nops* and *Nopsides* are sister taxa. However, that grouping is incongruent with the presence, in such genera as *Nops*, *Orthonops*, and *Tarsonops*, of two other equally dramatic leg modifications—the presence of the ventral translucent keel on the anterior meta-

tarsi, and the translucent extension of the membrane between the anterior metatarsi and tarsi that were mentioned above. Aside from Nopsides, the only described nopine that lacks these metatarsal and tarsal modifications is Nyetnops guarani Platnick and Lise (2007) from southern Brazil, suggesting instead that Nopsides and Nyetnops may be the most basal nopine genera, even though no pulvillus is found in Nyetnops.

Nor are the legs the only puzzling aspect of the morphology of Nopsides; in both sexes, the endites are distally widened (figs. 7, 19, 80), much as in the genera Tisentnops Platnick (1994b: fig. 26) from Chile and Diploglena Purcell (1904; see Platnick and Jäger, 2008: fig. 27) from southern Africa. Both of those genera are caponiines, however (i.e., they lack the subsegmented tarsi that are presumably synapomorphic for the subfamily Nopinae). The subfamilies Caponiinae and Nopinae were distinguished by Petrunkevitch (1939), but the former group is united by no known synapomorphies, merely by the lack of the tarsal subsegmentation that characterizes the nopines.

Equally puzzling is that, although adults of *Nopsides* are known only from Mexico, there is one specimen from Peru that shares the eye pattern, endite shape, and tarsal claw characteristics of the Mexican specimens, as well the enlarged palpal tarsus found in the Mexican females (figs. 56, 57). That specimen, in the collection of the California Academy of Sciences, was reportedly taken 43 miles east of Olmos, in Lambayeque province, on Jan. 18, 1955, by the experienced collectors Evert Schlinger and Ed Ross, so there is little reason to doubt its provenance. It is a fairly large specimen, and we had hoped that it would prove to be adult.

As with other nopines, the female genitalia of Nopsides are difficult to study (Sánchez-Ruiz et al., 2010), but our use of pancreatin digestion (Álvarez-Padilla and Hormiga, 2008) indicates that adult female Nopsides are characterized by a triangular receptaculum that is sclerotized only along its anterior margin, and is accompanied by a membranous structure that extends anteriorly of the sclerotized margin (figs. 83, 84). Juveniles, in contrast, show only a thickened margin of the epigastric furrow (fig. 81), and unfortunately the Peruvian female is clearly juvenile, despite its size (fig. 82).

#### **COLLECTIONS EXAMINED**

AMNH	American Museum of Natural History, New York
CAS	California Academy of Sciences, San Francisco CA
CIB	Centro de Investigaciones Biológicas del Noroeste, S.C., La Paz, Mexico
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge MA

#### SYSTEMATICS

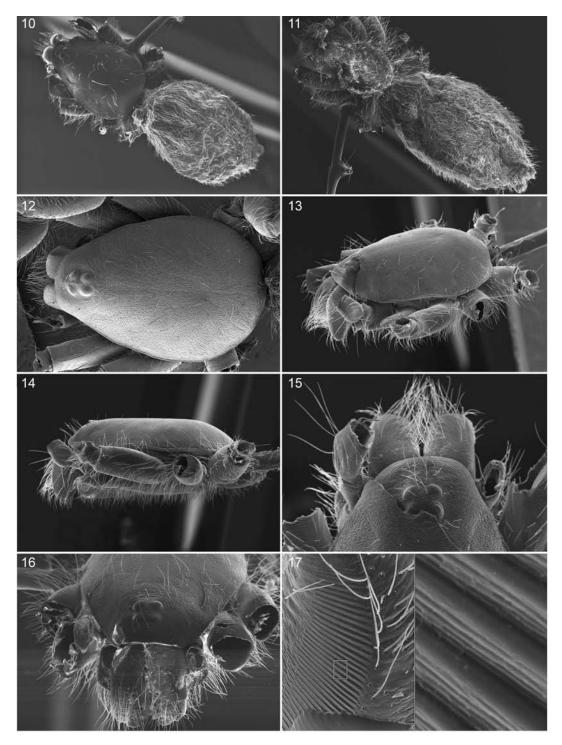
#### Nopsides Chamberlin

Nopsides Chamberlin, 1924: 601 (type species by original designation Nopsides ceralbonus Chamberlin).

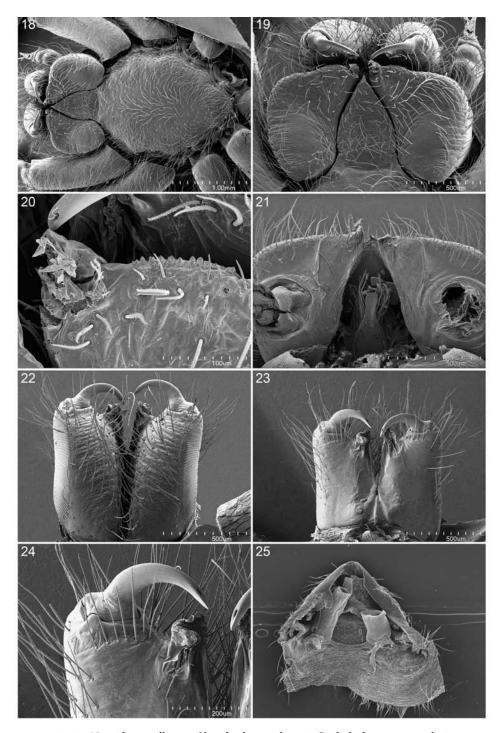
DIAGNOSIS: Members of the genus can be separated from species of the previously known caponiid genera as follows: from the caponiine genera Caponia Simon (1887), Caponina Simon



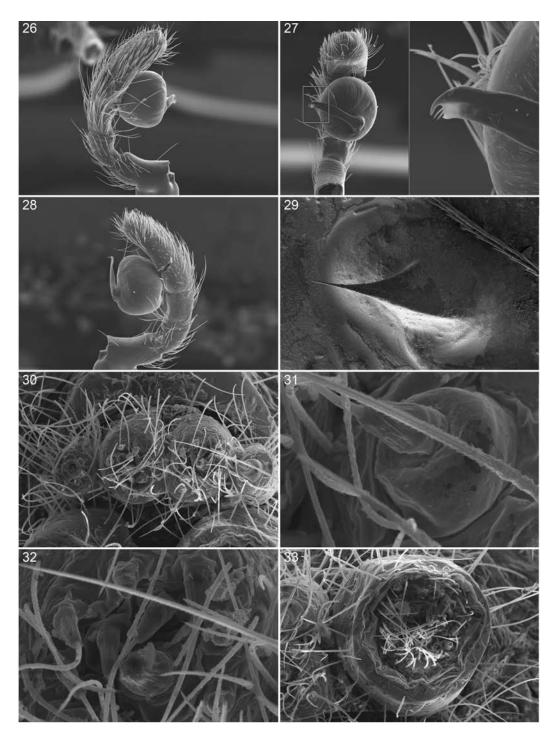
FIGS. 1–9. *Nopsides ceralbonus* Chamberlin, male. 1. Habitus, dorsal view. 2. Same, ventral view. 3. Palp, prolateral view. 4. Carapace, dorsal view. 5. Palp, ventral view. 6. Same, retrolateral view. 7. Cephalothorax, ventral view. 8. Embolus, prolateral view. 9. Same, retrolateral view.



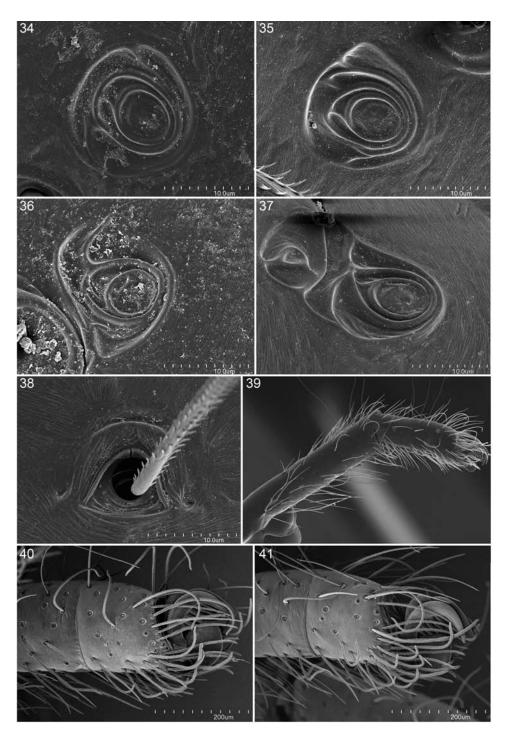
FIGS. 10–17. *Nopsides ceralbonus* Chamberlin, male. 10. Habitus, dorsal view. 11. Same, ventral view. 12. Carapace, dorsal view. 13. Same, oblique view. 14. Same, lateral view. 15. Ocular region, dorsal view. 16. Same, anterior view. 17. Cheliceral stridulatory file, lateral view.



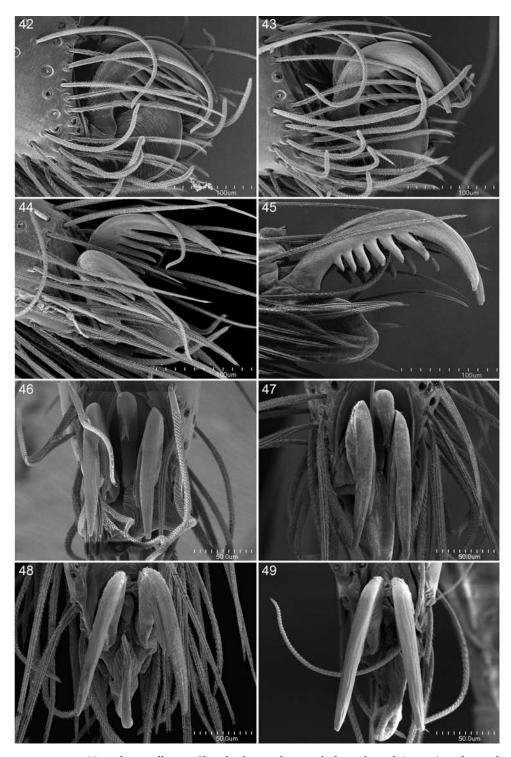
FIGS. 18–25. *Nopsides ceralbonus* Chamberlin, male. **18.** Cephalothorax, ventral view. **19.** Labium and endites, ventral view. **20.** Serrula, anterior view. **21.** Labrum and endites, dorsal view. **22.** Chelicerae, anterior view. **23.** Same, posterior view. **24.** Fang, posterior view. **25.** Bases of tracheae, dorsal view.



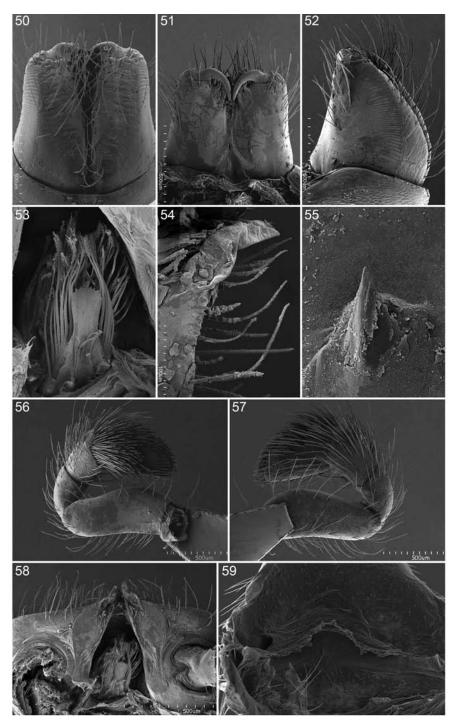
FIGS. 26–33. *Nopsides ceralbonus* Chamberlin, male. **26.** Palp, prolateral view. **27.** Same, ventral view. **28.** Same, retrolateral view. **29.** Stridulatory pick from palpal femur, prolateral view. **30.** Anterior spinnerets, apical view. **31.** Anterior lateral spinneret, apical view. **32.** Posterior median spinneret, apical view. **33.** Posterior lateral spinneret, apical view.



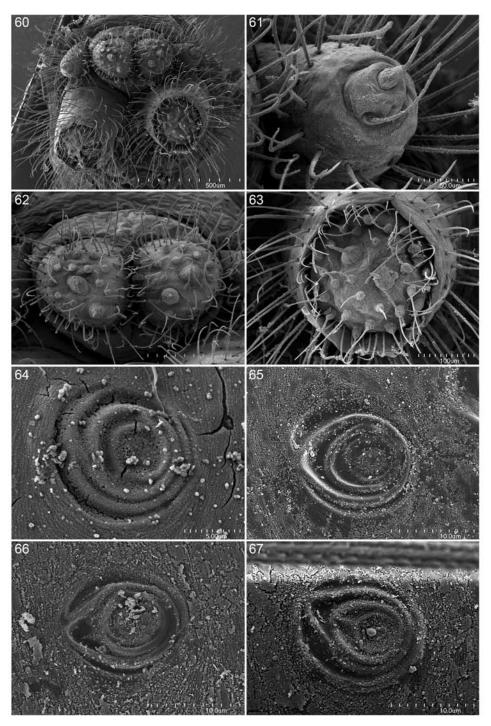
FIGS. 34–41. *Nopsides ceralbonus* Chamberlin, male. **34.** Tarsal organ from leg I, dorsal view. **35.** Same, leg II. **36.** Same, leg III. **37.** Same, leg IV. **38.** Trichobothrial base from tarsus I, dorsal view. **39.** Metatarsus and tarsus I, lateral view. **40.** Tip of tarsus I, lateral view. **41.** Same, leg II.



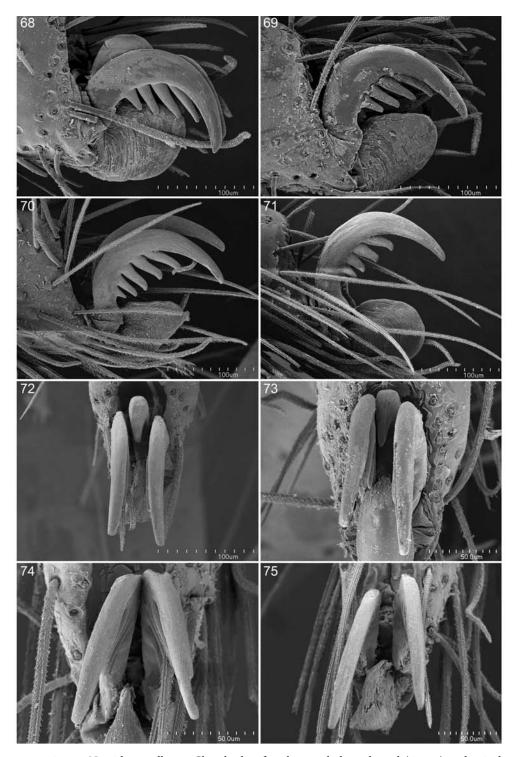
FIGS. 42–49. *Nopsides ceralbonus* Chamberlin, male, tarsal claws, lateral (42–45) and apical (46–49) views. **42**, **46**. Leg I. **43**, **47**. Leg II. **44**, **48**. Leg III. **45**, **49**. Leg IV.



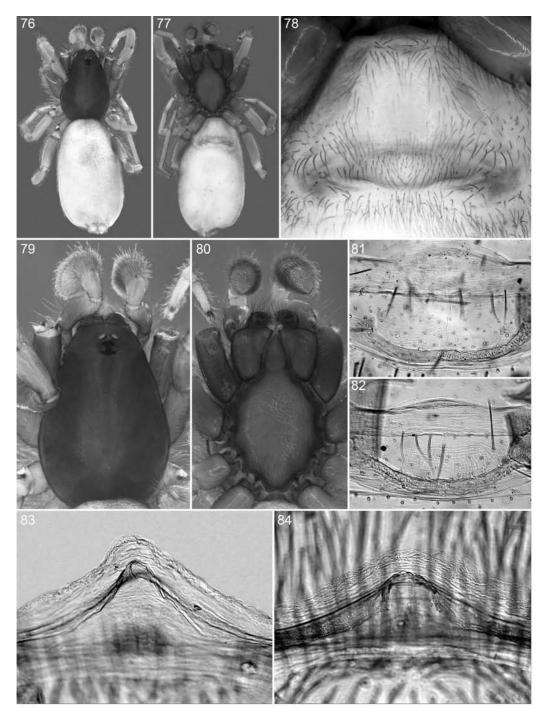
FIGS. 50–59. *Nopsides ceralbonus* Chamberlin, female. **50.** Chelicerae, anterior view. **51.** Same, posterior view. **52.** Same, lateral view. **53.** Labrum, dorsal view. **54.** Serrula, dorsal view. **55.** Stridulatory pick from palpal femur, prolateral view. **56.** Palp, prolateral view. **57.** Same, retrolateral view. **58.** Labrum and endites, dorsal view. **59.** Genitalia, dorsal view.



FIGS. 60–67. *Nopsides ceralbonus* Chamberlin, female. **60.** Spinnerets, apical view. **61.** Anterior lateral spinneret, apical view. **62.** Posterior median spinneret, apical view. **63.** Posterior lateral spinneret, apical view. **64.** Tarsal organ from leg I, dorsal view. **65.** Same, leg II. **66.** Same, leg III. **67.** Same, leg IV.



FIGS. 68–75. *Nopsides ceralbonus* Chamberlin, female, tarsal claws, lateral (68–71) and apical (72–75) views. **68**, **72**. Leg I. **69**, **73**. Leg II. **70**, **74**. Leg III. **71**, **75**. Leg IV.



FIGS. 76–84. *Nopsides ceralbonus* Chamberlin, female. **76.** Habitus, dorsal view. **77.** Same, ventral view. **78.** Epigastric region, ventral view. **79.** Carapace, dorsal view. **80.** Cephalothorax, ventral view. **81.** Epigastric region, juvenile from Mexico, dorsal view. **82.** Same, juvenile reportedly from Peru. **83.** Genitalia, dorsal view, specimen from San Isidro, Baja California Sur. **84.** Same, specimen from La Quebrada, Durango.

(1891, see Platnick, 1994a), *Diploglena* Purcell (1904), *Calponia* Platnick (1993), *Notnops* Platnick (1994b), *Taintnops* Platnick (1994b), *Taintnops* Platnick (1994b), *Laoponia* Platnick and Jäger (2008), and *Iraponia* Kranz-Baltensperger et al. (2009) by the presence of subsegmented tarsi (figs. 39–41), and from the nopine genera *Nops* MacLeay (1839), *Orthonops* Chamberlin (1924), *Tarsonops* Chamberlin (1924), *Nyetnops* Platnick and Lise (2007), and *Cubanops* (Sánchez-Ruiz et al., 2010) by having four, rather than only two, eyes (figs. 4, 12), as well as by the distally expanded endites (figs. 7, 19). Moreover, they differ from specimens of *Nops*, *Orthonops*, *Tarsonops*, and *Cubanops* in lacking a translucent ventral keel on the anterior metatarsi and a translucent extension of the membrane separating the anterior metatarsi and tarsi IV, and from those of *Nyetnops* and *Cubanops* in having an unpatterned carapace.

DESCRIPTION: Medium-sized caponiids with four eyes (figs. 1, 2, 10, 11, 76, 77). Carapace uniformly orange, elongate oval, widest at rear of coxa II (fig. 12), gradually narrowed anteriorly, pars cephalica not elevated, with slightly elevated ocular tubercle; pars thoracica slightly elevated near middle, gradually sloping posteriorly (fig. 13); surface reticulate, with hexagonal cells, with few long dark setae in ocular area and around midline of pars thoracica (fig. 14). Thoracic groove obsolete; clypeus over three times as high as anterior lateral eyes. Four eyes in two widely separated rows (figs. 4, 12, 15, 16, 79), anterior laterals in front of smaller, darker anterior medians, that pair united by oval ring of black pigment, separated by less half their diameter; anterior laterals translucent, separated by their diameter, by less than their radius from anterior medians. Chelicerae orange, with median internal lamina and white conspicuous membranous lobe near base of fang (figs. 22, 23, 50, 51); fang thickened at base (figs. 22-24), lateral surface of paturon with long series of stridulatory ridges in both sexes (figs. 22, 50, 52), spaces between ridges occupied by smaller ridges (fig. 17); stridulatory pick sharply pointed, situated at base of prolateral side of palpal femur (figs. 29, 55). Endites anteriorly widened, truncated (figs. 7, 80), orange except for white anterior tip, almost meeting at midline (figs. 19, 58), anterior surface with distal serrula consisting of single long tooth row (figs. 20, 54), distally with strong setae. Labium orange, triangular, fused to sternum along posterior groove; labrum long, narrow (figs. 21, 53). Sternum orange, oval, sculptured with circular cells, with numerous stiff setae (fig. 18); three epimeric sclerites above coxae I, II, and III plus IV articulating each other, intercoxal triangular extensions of sternum not fused with epimera. Plagula articulating with sternum, dorsal extensions not fused with epimera. Female palpal tarsus expanded (figs. 56, 57), without claw, covered with conspicuous prolateral brush of dense, thick setae, with dorsoapical pad of shortened setae. Leg formula 4-1-2-3; legs orange, setose but without spines; femora I, II enlarged, metatarsi without region of narrow membranous sutures. Metatarsi I, II without translucent ventral, longitudinal keel (but males with row of ventral denticles) or distal translucent extension, tarsi with two segments (figs. 39-41), proximal segment longer than distal one; tarsi I, II with three claws (figs. 42, 43, 68, 69), inferior claw without teeth but with long basal portion long and erect distal, hooked portion reaching at least to top of superior claws (figs. 46, 47, 72, 73); all tarsi with apical, laterally compressed, translucent pulvillus; paired claws of all legs with six teeth, distal teeth largest; legs III, IV without median claw (figs. 44, 45, 48, 49, 70, 71, 74, 75) but with ventral pad of setae. Tarsus and tibia of all legs with several rows of very long, pilose trichobothria, their bases with semicircular rim bearing slight longitudinal ridges (fig. 38). Tarsal organ exposed, with pronounced marginal ridges (figs. 34-37, 64-67). Abdomen setose, pale gray dorsally, lighter ventrally, without dark markings, with slightly sclerotized epigastric region in males; epigastric region with two pairs of respiratory spiracles clustered around epigastric groove, anterior spiracles leading to numerous tracheoles, posterior spiracles each leading to two large tracheal trunks (sometimes fused at base) extending anteriorly into cephalothorax, single, much narrower trunk extending posteriorly for most of abdominal length, and few small tracheoles extending posteriorly (fig. 25). Six spinnerets, in typical caponiid arrangement (figs. 30, 60; Platnick et al., 1991: 56), anterior laterals with single major ampullate gland spigot (figs. 31, 61); posterior medians with several aciniform gland spigots (fig. 32), those of females with two large minor ampullate gland spigots with flat bases (fig. 62); posterior laterals longest, with numerous aciniform gland spigots (fig. 33), those of female with two minor ampullate gland spigots with flat bases (fig. 63). Male palp (figs. 3, 5, 6) with short patella, tibia short, excavated ventrally, cymbium elongated, not swollen (fig. 28), prolateral surface densely covered with strong setae (fig. 26); embolus long, erect, depressed, membranous prolaterally near curved tip (figs. 8, 9, 27). Female epigastric area with wide sclerite occupying most of space between spiracles (fig. 78), internal genitalia (figs. 83, 84) with sclerotized anterior ridge with small denticles (fig. 59), median duct leading to membranous sac.

DISTRIBUTION: Mexico (and possibly Peru).

### Nopsides ceralbonus Chamberlin Figures 1–84

Nopsides ceralbona Chamberlin, 1924: 602, figs. 38–41 (juvenile holotype from Isla Cerralvo, Baja California Sur, Mexico, in CAS; examined, and determined to be juvenile, by R. Schick; juvenile paratypes from the same locality, in MCZ; examined).

Nopsides ceralbonus: Bonnet, 1958: 3115 (emendation, to match the gender of the generic name).

DIAGNOSIS: With the characters of the genus, male palps with a large, rounded bulb and a ventrally situated embolus with a curved tip (figs. 3, 5, 6, 8, 9), and female genitalia sclerotized only along the anterior margin of the receptaculum (figs. 83, 84).

MALE (figs. 1–49): Total length 7.1–8.9 (n = 10). Carapace 3.0–3.5 long, 2.0–2.7 wide. Femur I 1.7–2.8 long, 0.7–0.9 wide. Bulb large, relative to size of cymbium; embolus long, narrow, membranous prolaterally near apex; in ventral view broad throughout length.

Female (figs. 50-84): Total length 7.1-9.5 (n = 10). Carapace 2.8-3.2 long, 2.2-3.0 wide. Femur I 0.9-2.3 long, 0.6-0.8 wide. Internal genitalia with sclerotized anterior margin, sclerotization strongest near midline.

MATERIAL EXAMINED: MEXICO: **Baja California:** 12.7 km E El Rosario,  $30^{\circ}04'15''$ N, 115°37′10″W, Feb. 7, 1984–Apr. 2, 1984, pitfall, elev. 180 m (W. Clark, P. Blom, MCZ),  $1 \, \mathring{\sigma}$ . **Baja California Sur:** Carambuche,  $26^{\circ}14'13.2''$ N,  $112^{\circ}00'06''$ W, Nov. 2, 2009 (C. Palacios, CIB),  $3 \, \mathring{\sigma}$ , Nov. 2, 2009, elev. 119 m (C. Palacios, CIB),  $1 \, \mathring{\varphi}$ , Mar. 18, 2010 (C. Palacios, CIB),  $1 \, \mathring{\varphi}$ , Mar.

20, 2010 (C. Palacios, CIB),  $1\,^{\circ}$ ; El Chorro, Santiago,  $23^{\circ}26'20$ "N,  $109^{\circ}48'15$ "W, Sept. 1, 2005, elev. 185 m (M. Correa, M. Jiménez, C. Palacios, CIB),  $6\,^{\circ}$ , Oct. 28, 2005 (C. Palacios, CIB),  $2\,^{\circ}$ ; Presa La Buena Mujer,  $24^{\circ}05'13$ "N,  $110^{\circ}11'19$ "W, Aug. 25, 2004 (C. Palacios, CIB),  $2\,^{\circ}$ ; San Isidro-La Purísima,  $26^{\circ}12'23$ "N,  $112^{\circ}02'54$ "W, June 15, 2003, elev. 300 m (M. Correa, CIB),  $1\,^{\circ}$ , June 16–17, 2003 (C. Palacios, CIB),  $2\,^{\circ}$ , Sept. 20, 2003, pitfall, elev. 300 m (I. Posada, CIB),  $1\,^{\circ}$ , Sept. 20, 2003 (M. Correa, G. Nieto, CIB),  $2\,^{\circ}$ , San José de Comondú,  $26^{\circ}23'34$ "N,  $112^{\circ}49'13$ "W, Oct. 28, 2002 (M. Correa, CIB),  $1\,^{\circ}$ , Oct. 28, 2002 (C. Palacios, CIB),  $1\,^{\circ}$ , Nov. 25, 2002 (C. Palacios, CIB),  $1\,^{\circ}$ , Oct. 11, 2003 (M. Correa, CIB),  $1\,^{\circ}$ . Coahuila: Delicias, Aug. 18–19, 1946 (C. Bogert, AMNH),  $1\,^{\circ}$ . Colima: 10 mi S Colima, Aug. 1, 1954 (W. Gertsch, AMNH),  $1\,^{\circ}$ . Durango: La Quebrada, July 30, 1947 (W. Gertsch, AMNH),  $1\,^{\circ}$ . San Luis Potosí: 2 mi E Santo Domingo, June 6, 1941 (A., L. Davis, AMNH),  $1\,^{\circ}$ . Tamaulipas: Route 101, km 15, Mar. 18, 1972 (J. Cooke, AMNH),  $1\,^{\circ}$ .

DISTRIBUTION: Northern and central Mexico.

NATURAL HISTORY: During the day, these spiders hide under large stones in xeric shrubland; they apparently become active at night, as most specimens have been taken in pitfall traps. Adult males have been taken from April through November, females from March through November.

#### ACKNOWLEDGMENTS

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#### SUPPLEMENT (by Norman I. Platnick)

In what may be the most preposterous "paper" ever produced in spider taxonomy, Dewanand Makhan and Somayeh Ezzatpanah recently attempted to establish "A new spider family, Hawkeswoodidae fam. nov. and *Amrishoonops amrishi* gen. et sp. nov. (Araneae) from Suriname." This contribution was "published" in a "journal" called *Calodema* (136: 1–5, 2011, available online at http://www.calodema.com/product\_info.php?products\_id=548&osCsid=53 a785e97c5159f0410c86cc92daa5b9).

Luckily, the family name those authors attempted to establish was stillborn (i.e., is a nomen nudum), because it lacks a type genus with "Hawkeswood-" as the root of its name, as required by Article 29.1 of the International Code of Zoological Nomenclature. The description provided for the family occupies 3.5 lines of type, and is identical with the description provided for the designated type genus, *Amrishoonops*, save for a typographical error in the body length measurement. Ironically, much more space is devoted to a laudatory etymology for "Hawkes-

woodidae," which was named for the "editor" of *Calodema*, apparently in recognition of the total absence of competent peer review that seems to characterize that outlet.

Those authors considered their taxon to be "closely related to the family Oonopidae." This hypothesis was reflected also in their choice of the generic name. No evidence for that hypothesis was presented; they indicated merely that "This is the first Neotropical genus with teeth-shaped palps." From their limited descriptions, one can determine little that is relevant to this hypothesis, but they do say "Last segment of palp small with inclosing sclerites," implying that the male palp is entelegyne in form, rather than haplogyne (as in oonopids and their actual relatives, the other dysderoid families).

The descriptions are accompanied by seven low-quality photographs; surprisingly, the two photographs supplied of the male palp are sufficient to show that their species belongs to the well-known anapid genus *Pseudanapis* Simon, 1905. That genus is characterized by the presence of two apophyses on the male palpal femur and at least one on the male palpal patella (these apophyses are what Makhan and Ezzatpanah referred to as the "teeth-like segments" on the palp). *Amrishoonops* is therefore here placed as a junior synonym of *Pseudanapis* (NEW SYNONYMY); the type species, *Amrishoonops amrishi*, may well be a junior synonym of *Pseudanapis gertschi* (Forster), but their photographs are inadequate for species-level identification.

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