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A revision and phylogenetic analysis of the spider genus *Coptoprepes* Simon (Araneae: Anyphaenidae, Amaurobioidinae)

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Abstract

We review the spider genus *Coptoprepes* Simon, endemic of the southern forests in Chile and Argentina, and present a phylogenetic analysis of the 10 known species of the genus together with other 91 representatives of the family Anyphaenidae. *Coptoprepes* is confirmed as a member of the tribe Amaurobioidini. The sister group of *Coptoptepes* is the genus *Negayan* Ramírez. Both genera are united by having contiguous spermathecae and a notch retrolateral to the cymbial conductor, where the median apophysis fits. The synapomorphies of *Coptoprepes* (the tegulum being displaced basally, the copulatory openings on or close to the epigastric furrow, and the lacking of some leg macrosetae) are homoplasious in the tribe Amaurobioidini. Most intergeneric branches within the tribe, as well as between species of *Coptoprepes* have low support values in the cladogram. This is probably related to *Coptoprepes* species being heterogeneous in characters usually constant in spider genera, such as the presence of retrolateral tibial apophysis in the male palp, the copulatory ducts being wrapped along an axis, or the spherical shape of spermathecae. We describe six new species: *Coptoprepes ecotono* **n. sp.**, *Coptoprepes bellavista* **n. sp.**, *Coptoprepes casablanca* **n. sp.**, *Coptoprepes contulmo* **n. sp.**, *Coptoprepes eden* **n. sp.**, and *Coptoprepes recinto* **n. sp.** We provide additional records, illustrations, and reviewed diagnosis of the four previously known species: *Coptoprepes flavopilosus* Simon, *Coptoprepes nahuelbuta* Ramírez, *Coptoprepes campanensis* Ramírez, and *Coptoprepes valdiviensis* Ramírez.

Key words: Cladistics, new species, South America, systematics

Introduction

The genus *Coptoprepes* was put forth by Simon (1884) from a collection of spiders brought from Tierra del Fuego by the Mission Scientifique du Cap Horn, commissioned by the French government between 1882 and 1883. He described one species, *Coptoprepes flavopilosus* Simon, distributed through the humid temperate forests in Chile and adjacent Argentina, from Osorno to Tierra del Fuego. Three additional species were recently described in Ramírez (2003), expanding the known distribution of the genus as far north as the coastal and mountain relict forests in the Coquimbo Region. As mentioned in that work, other species represented in collections remained to be described, which are the subject of this contribution.

Little is known of the biology of *Coptoprepes* species, beyond reports of being collected in silken cells under logs, or in leaf litter. Unlike most other Anyphaenidae, all *Coptoprepes* species were collected on the ground, instead of foliage. They are a frequent catch of pitfall and flight interception traps, all of them using containers with preserving fluid at ground level.

Coptoprepes is clearly placed in the tribe Amaurobioidini, as evidenced by the loop of the sperm duct in the apical part of the male copulatory bulb (SDAL, Fig. 23), a synapomorphy of the tribe (Ramírez 2003). The genus was diagnosed by a greatly developed median apophysis fitting in an apical-retrolateral notch in the male palpal cymbium. The relationships of *Coptoprepes* with the remaining genera of the tribe are, however, quite unstable. While in the analysis of Ramírez (2003) *Coptoprepes* was placed as the sister group of all other Amaurobioidini, the reinterpretation of the male palp morphology and the addition of a couple of species of *Aysenia* Tullgren and *Aysenoides* Ramírez (Ramírez 2007; Izquierdo & Ramírez 2008), produced some changes in the hypotheses of relationships among the genera of the tribe. This is hardly surprising, as most of the intergeneric branches in the tribe were poorly supported.

In this contribution we describe six new species of *Coptoprepes*, illustrate with comparable photographs the four previously know species, and provide reviewed diagnosis for all the species of the genus. We also present a phylogenetic analysis of the genus by scoring all *Coptoprepes* species along with all the species and characters studied in previous analyses.

Material and methods

After dissection, female genitalia were placed in clove oil, observed and illustrated with a camera lucida on a compound microscope Olympus BH-2. All remaining images were obtained with a digital camera Leica

DFC290 mounted on a stereoscopic microscope Leica M165 C, and the focal planes were composed with Helicon Focus 4.62 Pro (www.heliconsoft.com). Measurements are given in millimeters and the format of descriptions follows that of Ramírez (2003). Immature specimens of *Coptoprepes* are not reliably identified, and were listed between brackets when found in vials together with adults.

The scorings of the phylogenetic dataset were added to the most recent analysis by Izquierdo and Ramírez (2008). Only changes, whether additions or corrections, are reported here; the complete dataset and instructions to reproduce the analysis are available for download from http://aracnologia.macn.gov.ar/biblio/suppl/. The data matrix was analyzed under parsimony using implied weights (Goloboff 1993), following the same procedures as described in Izquierdo and Ramírez (2008), using TNT version 1.1-Feb.2009 (Goloboff *et al*. 2008a). As support measures we used Bremer support (Bremer 1994) and Jackknifing frequencies expressed as GC frequency differences (Goloboff *et al.* 2003). The constant of concavity for the weighting function was the same as determined in Ramírez (2003) (k = 6). Ramírez (2003) and Lopardo (2005) found that mild concavity values produced higher topological congruence indices, a result that was recently confirmed by Goloboff *et al.* (2008b) as a consistent trend for many morphological and molecular datasets.

Abbreviations

AB	accessory bulb (female genitalia)
ap	apical
bas	basal
C2	secondary conductor (male copulatory bulb)
CD	copulatory duct (female genitalia)
CO	copulatory opening (female genitalia)
d	dorsal
E	embolus (male copulatory bulb)
EBP	embolus basal process (male copulatory bulb)
FD	fertilization duct (female genitalia)
I, II, III, IV	first, second, third and fourth leg, respectively
LL	lateral lobe (female genitalia)
MA	median apophysis (male copulatory bulb)
MF	median field (female genitalia)
p	prolateral
PMA	paramedian apophysis (male copulatory bulb)
pPMA	prolateral cusp of paramedian apophysis (male copulatory bulb)
rPMA	retrolateral cusp(s) of the paramedian apophysis (male copulatory bulb)
RTA	retrolateral tibial apophysis (male palp)
r	retrolateral
S	spermatheca (female genitalia)
SDAL	apical loop of sperm duct (male copulatory bulb)
T	tegulum (male copulatory bulb)
v	ventral
x	some positions of individual spines in a generalized pattern are replaced by “x”: “v x-p1-x” means “ventral median prolateral spine (p1)”, regardless of whether the specimen bears v 2-2-2 or v 0-p1-2. A complete explanation of spination pattern is given in Ramírez (2003).

Depositories with curators

AMNH	American Museum of Natural History, New York (Norman I. Platnick)
IRSN	Institut Royal des Sciences Naturelles de Belgique, Brussels (Léon Baert)

MACN-Ar	Collection of Arachnids, Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires (Cristina Scioscia)
MCZ	Museum of Comparative Zoology, Cambridge, Massachusetts (Laura Leibensperger)
MHNP	Muséum National d'Histoire Naturelle, Paris (Christine Rollard)

Taxonomy

Coptoprepes Simon

Coptoprepes Simon, 1884: 130, 136 (type species by monotypy *Coptoprepes flavopilosus* Simon, 1884), 1887: E24, 1897: 93, 96, 102. Ramírez, 1995: 369; 1997: 178; 2003: 79.

Diagnosis: *Coptoprepes* are similar to *Negayan* species in having contiguous spermathecae and a notch just retrolateral to the male cymbial conductor where the median apophysis fits (see Ramírez 2003: fig. 42A, B; Fig. 16d, but can be distinguished by the lack of long, thick RTA with sinuous tip, characteristic of *Negayan* species (Ramírez 2003: fig. 48F, G, Lopardo 2005: fig. 9E, F). Several *Coptoprepes* species are unique in having a compressed, curved RTA with the tip pointing upwards (Fig. 10c).

Description: Color often dark, with or without abdominal pattern. Dorsal shield of prosoma (carapace) narrowed in front, posterior eye row procurved, ocular area not projecting. Chelicerae relatively small, unmodified, slightly smaller in males, three to five teeth on promargin, a series of small teeth (four to seven) on retromargin. Anterior legs with few spines, most often lacking prolateral spines on tibia II. Male palpal tibia short, RTA variable, even absent. Cymbium large, with retrolateral apical notch contiguous to cymbial conductor, where median apophysis fits. Tegulum displaced basally in ventral view, median apophysis apical, often large, sometimes bifid. Primary conductor with long canal. Secondary conductor of variable shape, separate or fused to anterior dorsal margin of tegulum. Paramedian apophysis with shallow cusps or absent. Embolus long, basal process flattened. Epigyne flattened, copulatory openings in or very close to epigastric fold. Copulatory ducts long in species with long embolus, with tortuous course, on occasion slightly coiled on oblique axes; fertilization ducts generally well separated from posterior epigynal margin. Spermathecae contiguous to each other.

Distribution: Southern forests of Chile and Argentina, from the relict forests in central Chile, Elqui province in the North, to humid forests in Tierra del Fuego.

Natural history: So far, all *Coptoprepes* species were collected on leaf litter, or in silken cells under logs (Ramírez 2003). They are usually collected in pitfall or flight interception traps.

Coptoprepes flavopilosus Simon

Fig. 1

Coptoprepes flavopilosus Simon, 1884: 137 (male holotype from Chile, Cabo de Hornos, in MHNP 6672, not reexamined); 1887: E25, 1897: 97, 102 (*fulvopilosus*, lapsus); 1902: 29. Tullgren, 1901: 245, 260. Merian, 1913: 12. Ramírez, 1995: 366, 369; 2003: 81; 2007: 597.

Diagnosis: Females are easily distinguished from those of other *Coptoprepes* by the lateral curved ridges on the epigyne (Fig. 1b; see Ramírez 2003: fig. 36D). Males resemble those of *C. casablanca* **n. sp.** by having a curved RTA and relatively short embolus, with the tegulum visible in ventral view, but differ by having a median apophysis with wide base and sinuous projection (see Ramírez 2003: fig. 37, Ramírez 2007: fig. 5).

Description: Male and female described in Ramírez (2003).

Distribution: Forests in southern Argentina and Chile, from Osorno to Tierra del Fuego.

New records: ARGENTINA: ***Río Negro:*** Cerro López, S41.09845º, W71.54952º, 1398 m, pitfall traps (cod. M1S7E06), January 2006, V. Werenkraut, 1 male [plus 1 immature] (MACN-Ar 19049); Cerro Challhuaco, S41.26946º, W71.31131º, 1906 m, pitfall traps (cod. M5S11E06), January 2006, V. Werenkraut, 1 female (MACN-Ar 19152).

Additional material examined: ARGENTINA: ***Chubut:*** Los Alerces Natl. Park, Río Arrayanes, February 1985, M. Ramírez, 1 female (MACN-Ar 20321; temporary preparation VIW-00015). **CHILE:** ***Región X (Los Lagos):*** Llanquihue: Lago Chapo, 13.5 km E Correntoso, 310 m, site 656, window trap, Valdivian rainforest, A. Newton & M. Thayer, 16–27 December 1982, 1 male (AMNH; temporary preparation MJR-01345).

Coptoprepes nahuelbuta Ramírez

Fig. 2

Coptoprepes nahuelbuta Ramírez, 2003: 85 (female holotype and male paratype from Chile, Malleco province, Nahuelbuta Natl. Park, in AMNH, not reexamined).

Diagnosis: Females are similar to *C. recinto* **n. sp.** by having the epigynal median field hidden in the epigastric furrow, but can be distinguished by the rounded, elevated posterior epigynal margin (Fig. 2b, c). Males are similar to those of *C. contulmo* **n. sp.** in having a long and curved RTA and a large, heavily sclerotized secondary conductor, but can be distinguished from this and other species by the long, slender median apophysis (Fig. 2d; Ramírez 2003: fig. 38A–D).

Description: Male and female described by Ramírez (2003).

Distribution: Forests in southern Chile, in Malleco and Aisén provinces, probably also in intermediate localities.

New records: CHILE: ***Región IX (Araucanía):*** Malleco: Purén, Monumento Natural Contulmo, 350 m, FIT, mixed evergreen forest, 11 December 1984–13 February 1985, S. & J. Peck, 1 female (AMNH).

Additional material examined: CHILE: ***Región IX (Araucanía):*** Malleco: Nahuelbuta Natl. Park, FITS, 1200–1500 m, *Nothofagus*/*Araucaria* forest, ca. 38°S, 73°W, 9 December 1984–17 February 1985, S. and J. Peck, 2 males and 2 females (AMNH; temporary preparations MJR-01009, MJR-01349, VIW-00018); Monumento Natural Contulmo, 350 m, FIT traps, 11 December 1984–13 February 1985, S. & J. Peck, 1 male, 1 female (AMNH; temporary preparations MJR-01340, VIW-00009).

Coptoprepes campanensis Ramírez

Fig. 3

Coptoprepes campanensis Ramírez, 2003: 87 (male holotype and female paratype from Chile, Quillota province, Palmas de Ocoa, La Campana Natl. Park, in AMNH, not reexamined).

Diagnosis: Females can be distinguished from other *Coptoprepes* species by the long, contorted female copulatory ducts (see Ramírez 2003: fig. 41D). Males are similar to those of *C. ecotono* **n. sp.** by lacking a RTA, but have a large, bifid, heavily sclerotized median apophysis (Fig. 3c, d; Ramírez 2003: fig. 39).

Description: Male and female described by Ramírez (2003).

Distribution: This species is rather densely sampled in relict forest in central Chile, from Elqui province in the North, to Región Metropolitana of Santiago. Here we report an isolated southern record about 350 km far from the known distribution.

FIGURE 1. *Coptoprepes flavopilosus* Simon. **a** female dorsal habitus; **b** epigyne, ventral view; **c** male left palp, ventral view; **d** male left palp, retrolateral view. Preparations, female VIW-00015, male MJR-01345.

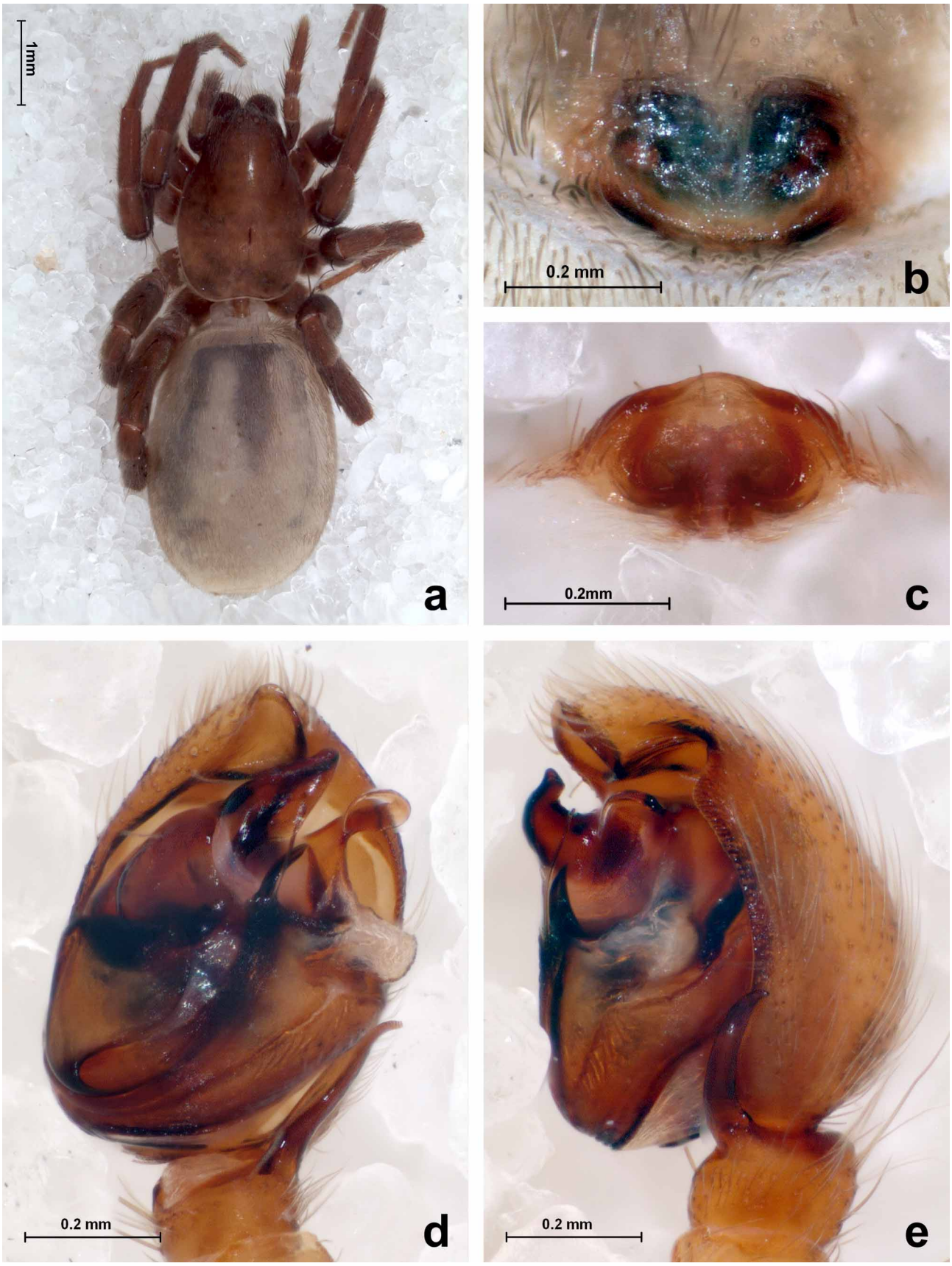

FIGURE 2. *Coptoprepes nahuelbuta* Ramírez. **a** female dorsal habitus; **b** epigyne, ventral view; **c** epigyne, posterior view; **d** male left palp, ventral view; **e** male left palp, retrolateral view. Preparations, female MJR-01340, VIW-00009, male MJR-01349.

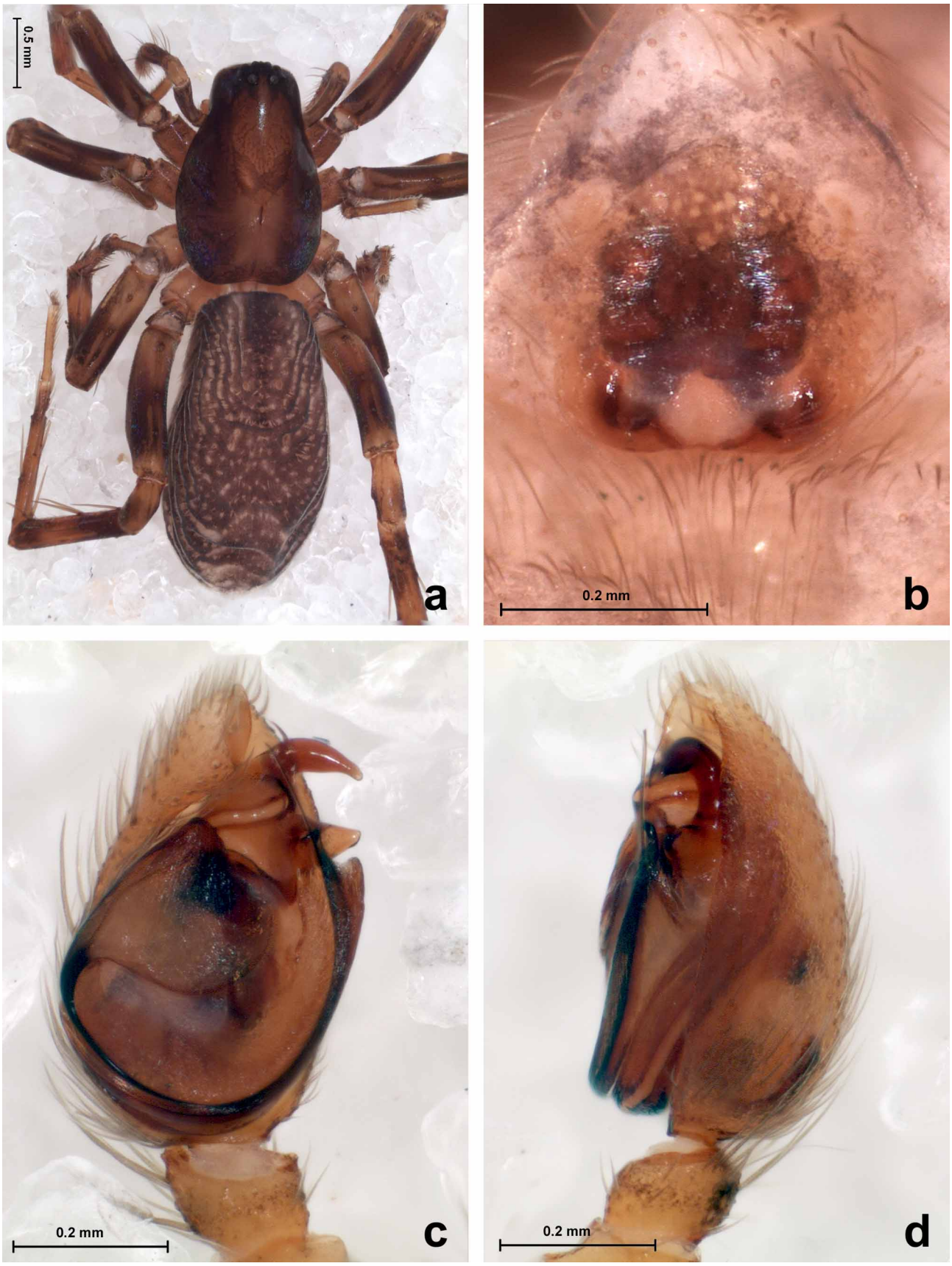

FIGURE 3. *Coptoprepes campanensis* Ramírez. **a** female dorsal habitus; **b** epigyne, ventral view; **c** male left palp, ventral view; **d** male left palp, retrolateral view. Preparations, female VIW-00016, male MJR-01346.

New records: CHILE: ***Región VIII (Biobío):*** Ñuble: 60 km SE Chillán, Termas Road, 1300 m, FIT, beech forest, 7 December 1984–19 February 1985, S. and J. Peck, 2 females (ANMH).

Additional material examined: CHILE: ***Región V (Valparaíso):*** Quillota: Palmas de Ocoa, La Campana Natl. Park, unburned site, pitfall trap 27, 29 September 1985, R. Calderón G., 1 male (AMNH; temporary preparation MJR-01346); same locality, 450 m, dry, rocky streamside, 5 February 1986, N. Platnick & R. T. Schuh, 1 female (AMNH; temporary preparation VIW-00016).

Coptoprepes valdiviensis Ramírez
Fig. 4

Coptoprepes valdiviensis Ramírez, 2003: 90 (male holotype and female paratype from Chile, Llanquihue province, Lago Chapo, in AMNH, not reexamined).

Diagnosis: Females are very similar to those of *C. ecotono* **n. sp.** by the rather flat epigyne with rectangular, unsclerotized median field, but can be distinguished by having a lower, transversally oriented profile of the anterior portion of the copulatory ducts (see Ramírez 2003: fig. 42E). Males are easily distinguished from those of other congeners by the sharp and slender RTA (Fig. 4d; Ramírez 2003: fig. 42B).

Description: Male and female described by Ramírez (2003).

Distribution: Forests of southern Chile and Argentina, in Cautín, Osorno, Llanquihue and Neuquén provinces, plus one isolated record in Ultima Esperanza province, Magallanes (Ramírez 2003).

New records: ARGENTINA: ***Neuquén:*** Nahuel Huapi Natl. Park, Cerro Bayo, S40.75934º W71.59516º, 1021 m, pitfall traps (cod. M3S2E05), January 2005, V. Werenkraut, 1 male (MACN-Ar 19028); Nahuel Huapi Natl. Park, Cerro Bayo, S40.75166º W71.59286º, 1096 m, pitfall traps (cod. M3S3E05), January 2005, V. Werenkraut, 1 male [plus 1 immature], (MACN-Ar 19039; temporary preparations MJR-01328, VIW-00001); Lanín Natl. Park, Lago Curilaufquen, 8 January 1985, M. Ramírez, 1 female (MACN-Ar). **CHILE:** ***Región IX (Araucanía):*** Cautín: 10 km S Pucón, Volcán Villarrica Natl. Park, 900 m, FIT, *Nothofagus* grove on ash, 15 December 1984–10 February 1985, S. & J. Peck, 6 males and 1 female (AMNH). ***Región X (Los Lagos):*** Llanquihue: Lago Chapo, 13.5 km E Correntoso, 310 m, site 656, window trap, Valdivian rainforest, 16–27 December 1982, A. Newton & M Thayer, 1 female [plus 1 immature] (AMNH). Chile, no specific locality, "loc. 96", 1 female (IRSN IG 25.934).

Other material examined: CHILE: ***Región IX (Araucanía):*** Cautín: Volcán Villarrica, window trap, *Nothofagus dombeyi* and *N. pumilio* forest with *Chusquea*, 15–29 December 1992, A. Newton & M. Thayer, 1 female (AMNH; temporary preparation MJR-01347, VIW-00017).

Coptoprepes ecotono new species
Figs. 5–7, 22a, 23a–c, 24a–c

Type material: Holotype: male from Argentina, Río Negro province, Bariloche, ca. 41º 00 S, 71º30' W, March 1947, A. G. Giai (MACN-Ar 2218; temporary preparations MJR-01341, VIW-00014). **Paratypes:** female from Argentina, Neuquén province, Nahuel Huapi Natl. Park, Lago Espejo, ca. 40º 30' S, 71º 30' W, 21 January 1985, M. J. Ramírez (MACN-Ar 20320; temporary preparations MJR-01342, VIW-00013).

Etymology: This new species is dedicated to V. Werenkraut's colleagues and friends from Laboratorio Ecotono, Bariloche, Argentina.

Diagnosis: Females are very similar to those of *C. valdiviensis* by the rather flat epigyne with rectangular, unsclerotized median field (Fig. 7g), but can be distinguished by having a longitudinally oriented profile of the anterior portion of the copulatory ducts (Fig. 24a–c). Males are similar to those of *C. campanensis* **n. sp.** by (virtually) lacking a RTA, but have a much smaller, not bifid median apophysis (Figs. 7a–f, 23a–c).

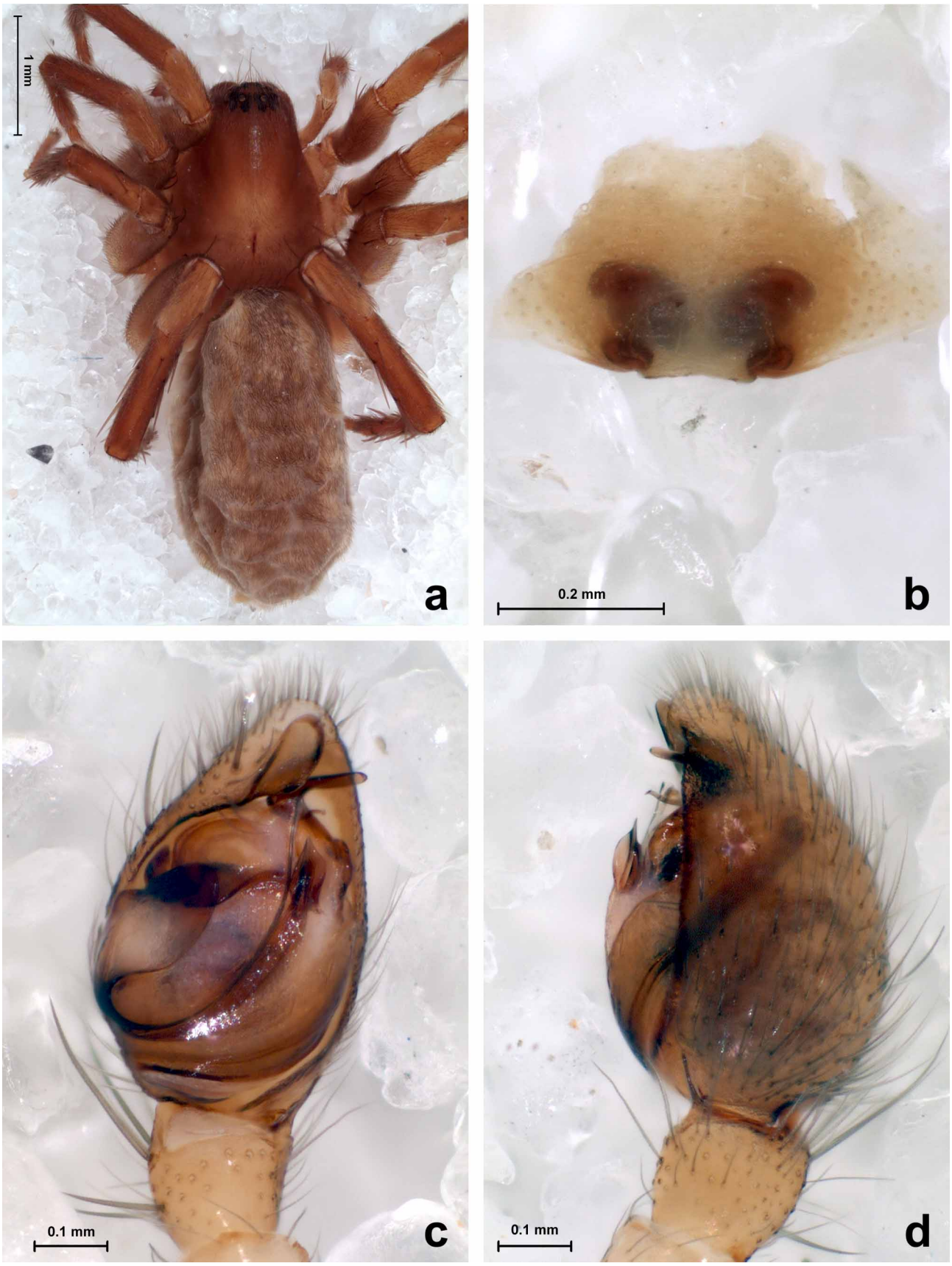

FIGURE 4. *Coptoprepes valdiviensis* Ramírez. **a** female dorsal habitus; **b** epigyne, ventral view; **c** male left palp, ventral view; **d** male left palp, retrolateral view. Preparations, female MJR-01347, male MJR-01328.

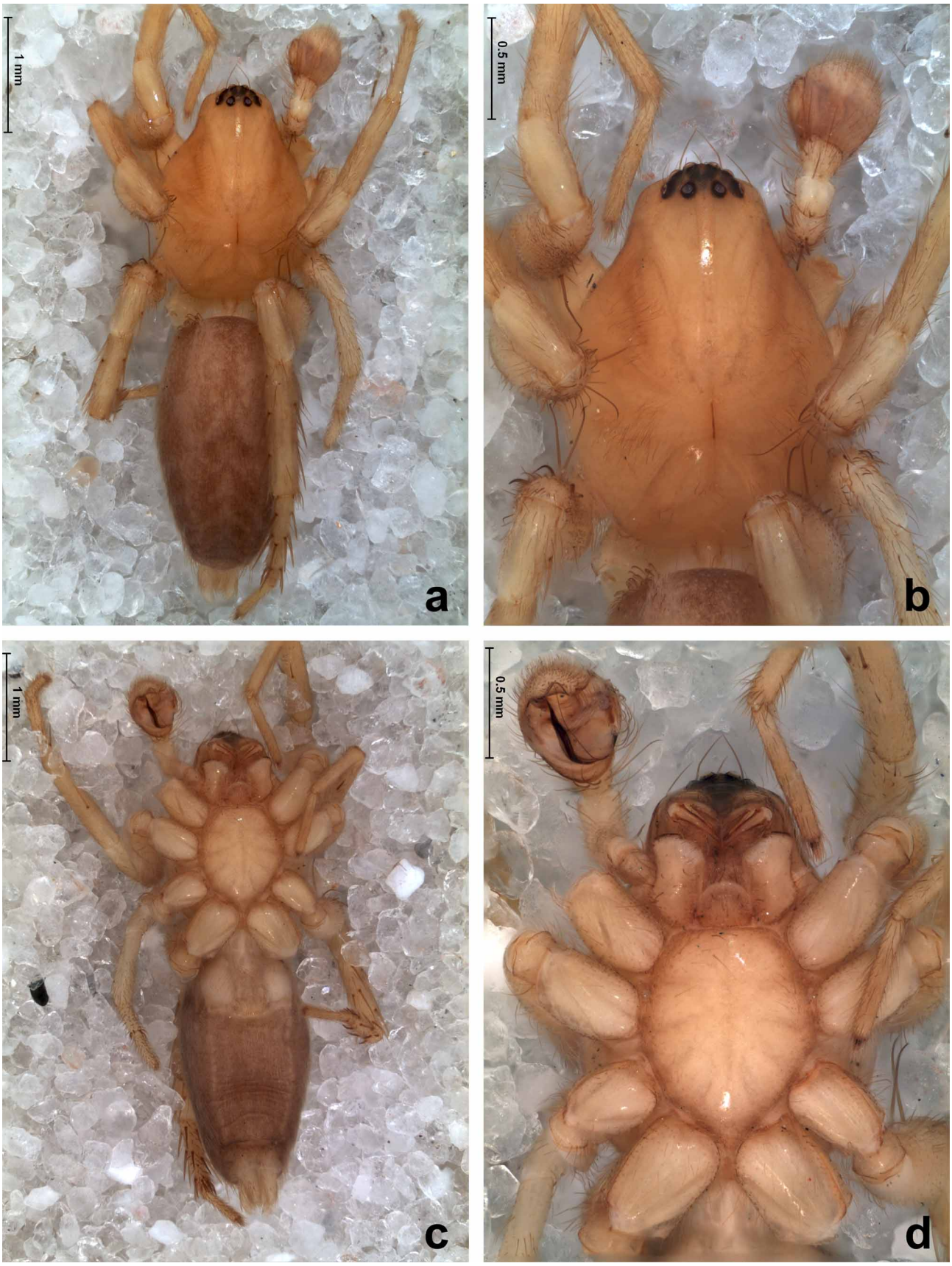

FIGURE 5. *Coptoprepes ecotono* new species. **a**–**d** male holotype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

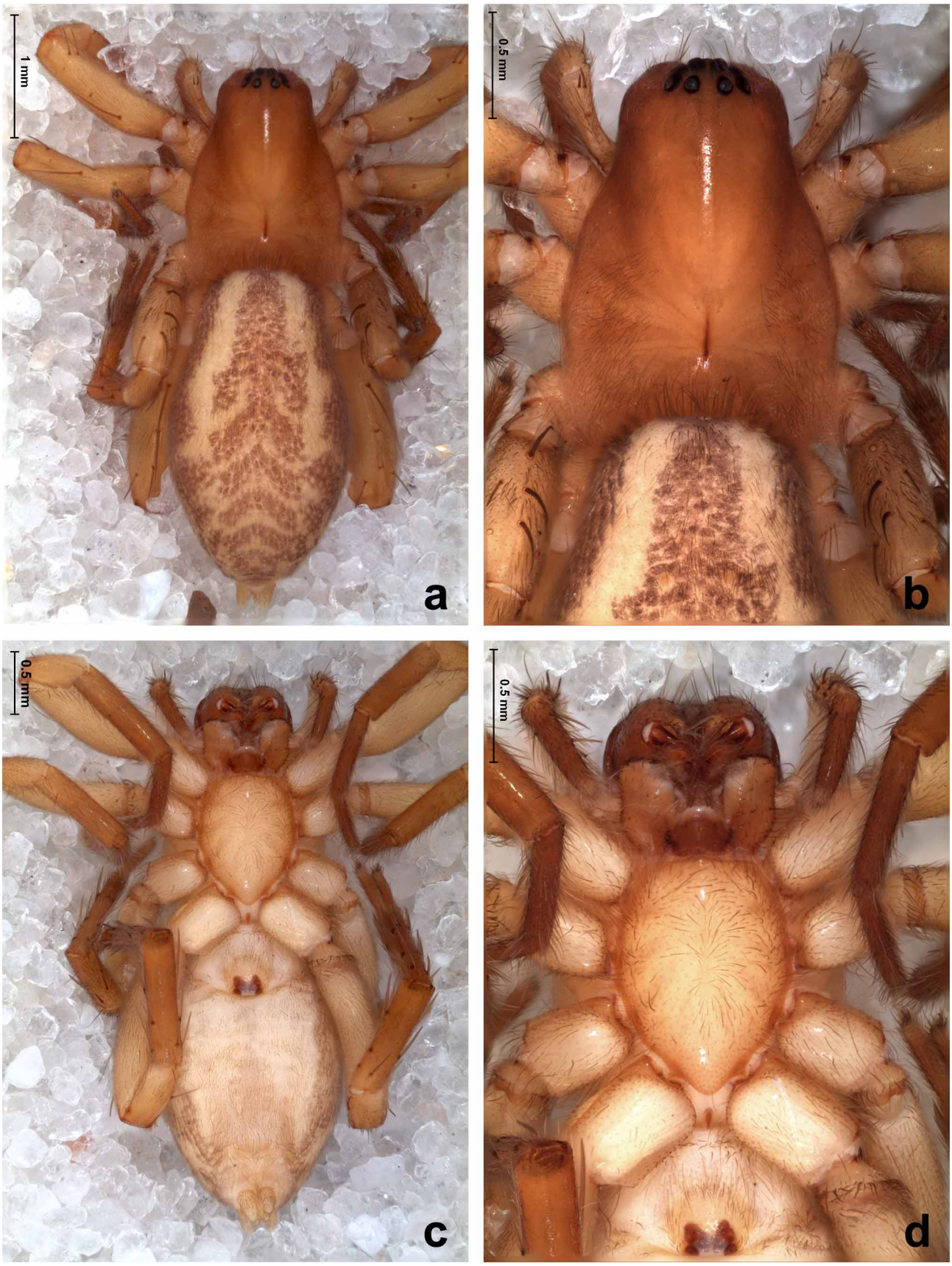

FIGURE 6. *Coptoprepes ecotono* new species. **a**–**d** female paratype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

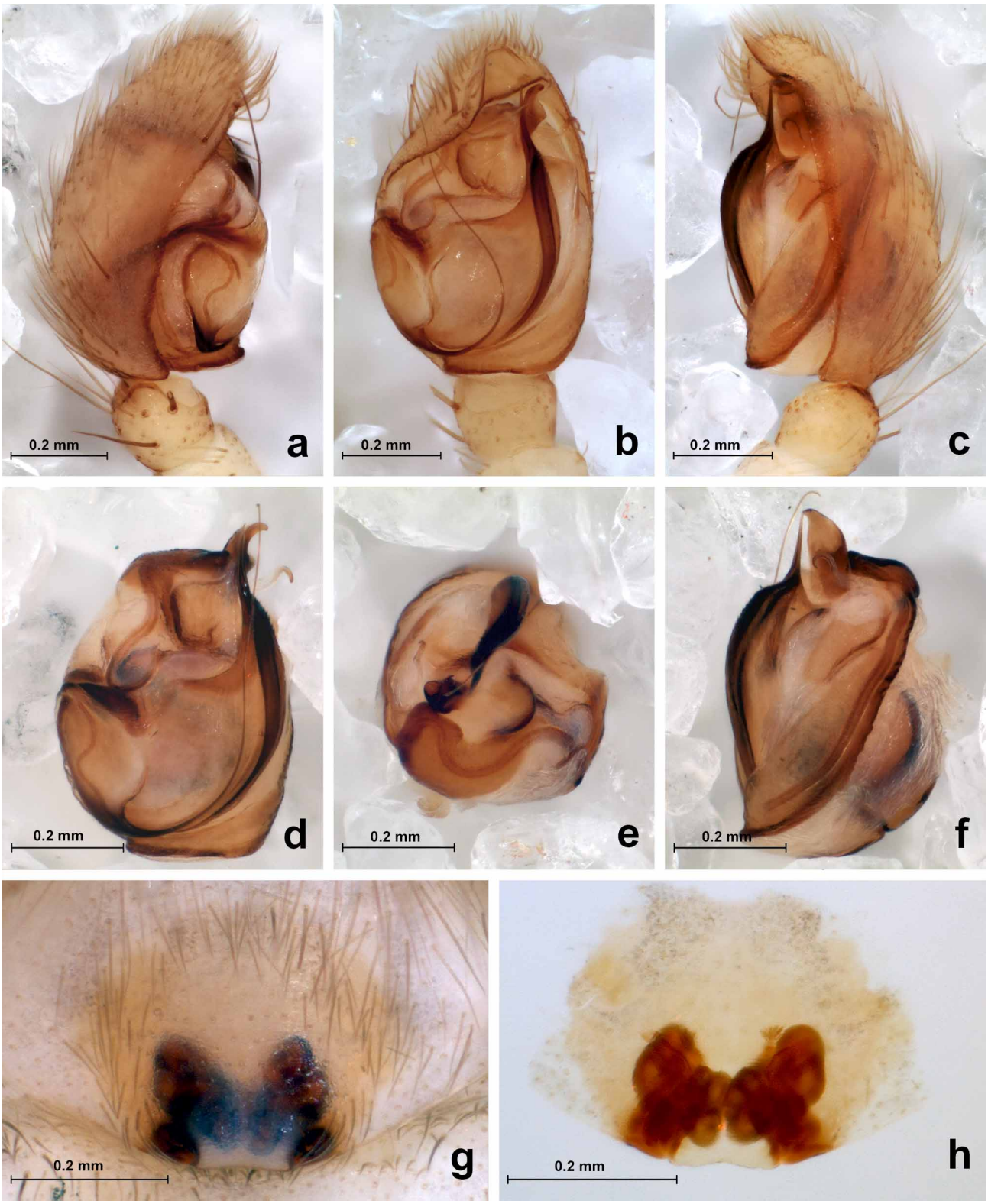

FIGURE 7. *Coptoprepes ecotono* new species. **a**–**f** male, **g**–**h** female paratype (**a** left palp, male holotype, prolateral view, **b** same, ventral view, **c** same, retrolateral view; **d** copulatory bulb, preparation MJR-01343, prolateral view, **e** same, apical view, **f** same, retrolateral view; **g** epigyne, ventral view; **h** vulva).

Description: *Male* (holotype): Prosoma length 1.86, width 1.36, narrower in front than in female. Tibia/metatarsus length: I, 1.06/0.91; II, 0.92/0.84; III, 0.64/0.68; IV, 1.17/1.27. Chelicerae slightly smaller than those of female, with four teeth on retromargin, three on promargin (promargin observed from MACN-Ar

2227). Sternum length 1.05, width 0.78. Spines: **I**, femur d 1-1-1, p 2ap; tibia v 0-2-p1; metatarsus v 2bas. **II**, femur d 1-1-1, p d1ap; tibia v 0-r1-p1; metatarsus v 2bas. **III**, femur d 1-1-1, p and r 0-d1-d1; patella r d1; tibia v p1-2-2, p 1-d1-1-0, r d1-1, d 0; metatarsus v 2-p1-2 plus apical comb, p and r d1-1-1, d 0-p1-2. **IV**, femur d 1-1-1, p 0-d1-d1, r d1ap; patella r d1; tibia v 2-2-2, p and r 1-d1-1-0, d 0; metatarsus v 2-2-2 plus apical comb, p and r d1-1-1, d 0-2-2. Opisthosoma length 2.20, spiracle–epigastrium 1.15, spiracle–spinnerets 0.18. Color in ethanol (Fig. 5): As in female, but paler, specimen faded (as well as male MACN-Ar 2227). Palp (Fig. 7): Tibia short, width/length 1.00, RTA reduced to short acute relict. Cymbial conductor wide. Tegulum only visible in retrolateral view. Sperm duct with conspicuous loop on anterior-dorsal margin. Embolus long, thin, basal process elongate, flat, transparent. Median apophysis thin, hook-shaped. Primary conductor with long canal, ventral border tiny, cuticular hair-like extensions, tip acute, elongate, directed forward. Secondary conductor well sclerotized, apical, without canal, contiguous to anterior-dorsal sperm duct loop. Paramedian apophysis absent, area only slightly sclerotized (Fig. 23a–c).

Female (paratype): Prosoma length 1.82, width 1.29. Tibia/metatarsus length: I, 0.93/0.80; II, 0.83/0.78; III, 0.72/0.86; IV, 1.11/131. Chelicerae with four teeth on retromargin, four on promargin. Sternum length 1.05, width 0.76. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v 2-2-2; metatarsus v 2bas. **II**, femur d 1-1-1, p d1ap; tibia v r1-r1-p1; metatarsus v 2bas. **III**, femur d 1-1-1, p and r 0-d1-d1; patella r d1; tibia v p1-p1-2, p 1-d1-1-0, r d1-1, d r1bas; metatarsus v 2-0-p1 plus apical comb, p and r d1-1-1, d 0-p1-2. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-2, p and r 1-d1-1-0, d r1bas; metatarsus v 2-2-p1 plus apical comb, p and r d1-1-1, d 0-p1-2. Color in ethanol (Fig. 6): Prosoma brown, legs brown, darker distally. Opisthosoma pale brown, dorsal pattern brown, including posterior chevrons. Opisthosoma length 2.55, epigastrium–spiracle 1.19, spiracle–spinnerets 0.15. Epigyne: Lateral lobes separate, median field not sclerotized (Fig. 7g). Copulatory openings very close to epigastric furrow. Copulatory ducts slightly wrapped. Ducts of accessory bulbs short. Spermathecae with convoluted chambers (Figs. 7h, 24a–c).

Variability: Spines in male: I, tibia v 0-p1-p1. II, tibia v 0-2-p1. III, metatarsus v 2-r1-2 or 2-2-2.

Distribution: Known from Neuquén and Río Negro provinces in Argentina.

Other material examined: ARGENTINA: same locality as holotype, 1 male (MACN-Ar 2227; temporary preparation MJR-01343); same data as paratype [1 immature] (MACN-Ar).

***Coptoprepes bellavista* new species**
Figs. 8–10, 22b, 23d–f, 24d–f

Type material: Holotype: male from Chile, Región IX (Araucanía), Cautín province, Bellavista, N shore Lago Villarrica, ca. 39º S, 72º W, 310 m, site 655, window trap, Valdivian rainforest, 15–30 December 1982, A. Newton & M. Thayer (AMNH; temporary preparations male: VIW-00002, VIW-00003, female: MJR-01337, VIW-00004). **Paratype:** female, same data as holotype.

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

Diagnosis: Females can be distinguished by their epigyne having an anterior trapezoidal sclerotized area, leaving the posterior margin of the epigyne mostly unsclerotized (Fig. 10c). Males are similar to several other *Coptoprepes* by having a RTA curved, longer than the tibia (Fig. 10c), but can be distinguished from them by the truncate tip of the primary conductor and from the similar *C. contulmo* **n. sp.** by having a ventrally concave secondary conductor (Figs. 10b–f, 23-d–f).

Description: *Male* (holotype): Prosoma length 2.07, width 1.55, narrower in front than in the female. Ttibia/metatarsus length: I, 1.43/1.33; II, 1.20/1.32; III, 0.92/1.17; IV, 1.28/1.70. Chelicerae slightly smaller than those of female, with six (right) or seven (left) teeth on retromargin, four on promargin. Sternum length 1.13, width 0.83. Spines: leg **I**, femur d 1-1-1, p d1ap; tibia v 2-2-2; metatarsus v 2 bas. **II**, femur d 1-1-1, p and r d1ap; tibia v r1-r1-2; metatarsus v 2 bas. **III**, femur d 1-1-1, p 0-d1-d1 or d1ap, r d1ap; patella r d1; tibia v p1-p1-2, p 1-d1-1-0, r d1-1, d r1bas; metatarsus v 2-0-comb, p and r d1-1-1, d 0-p1-2. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-2 or left 2-2-(p1-2), p 1-d1-1-0, r 1-d1-1-0 or left 1-d1-d1-1; metatarsus

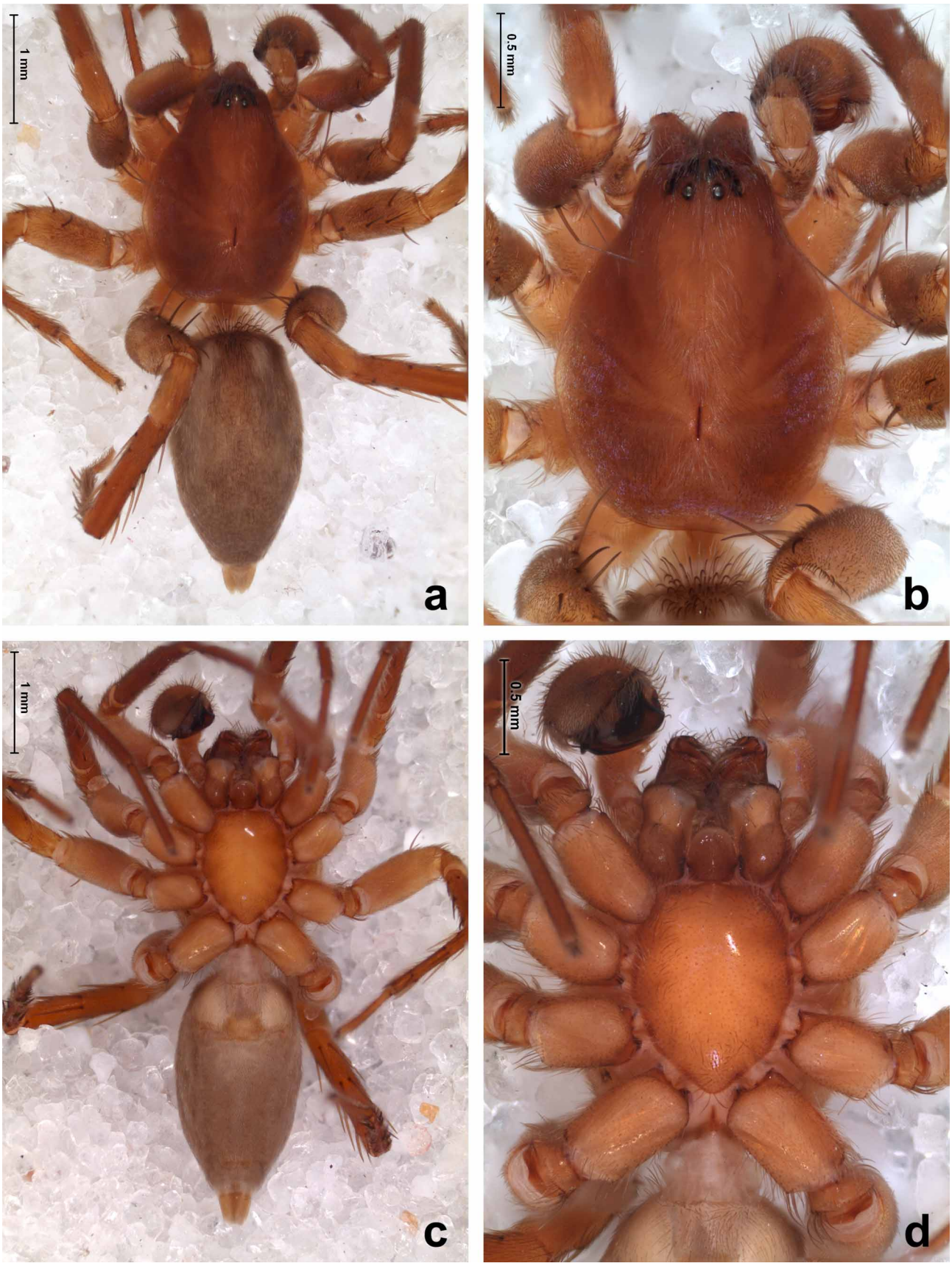

FIGURE 8. *Coptoprepes bellavista* new species. **a**–**d** male holotype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

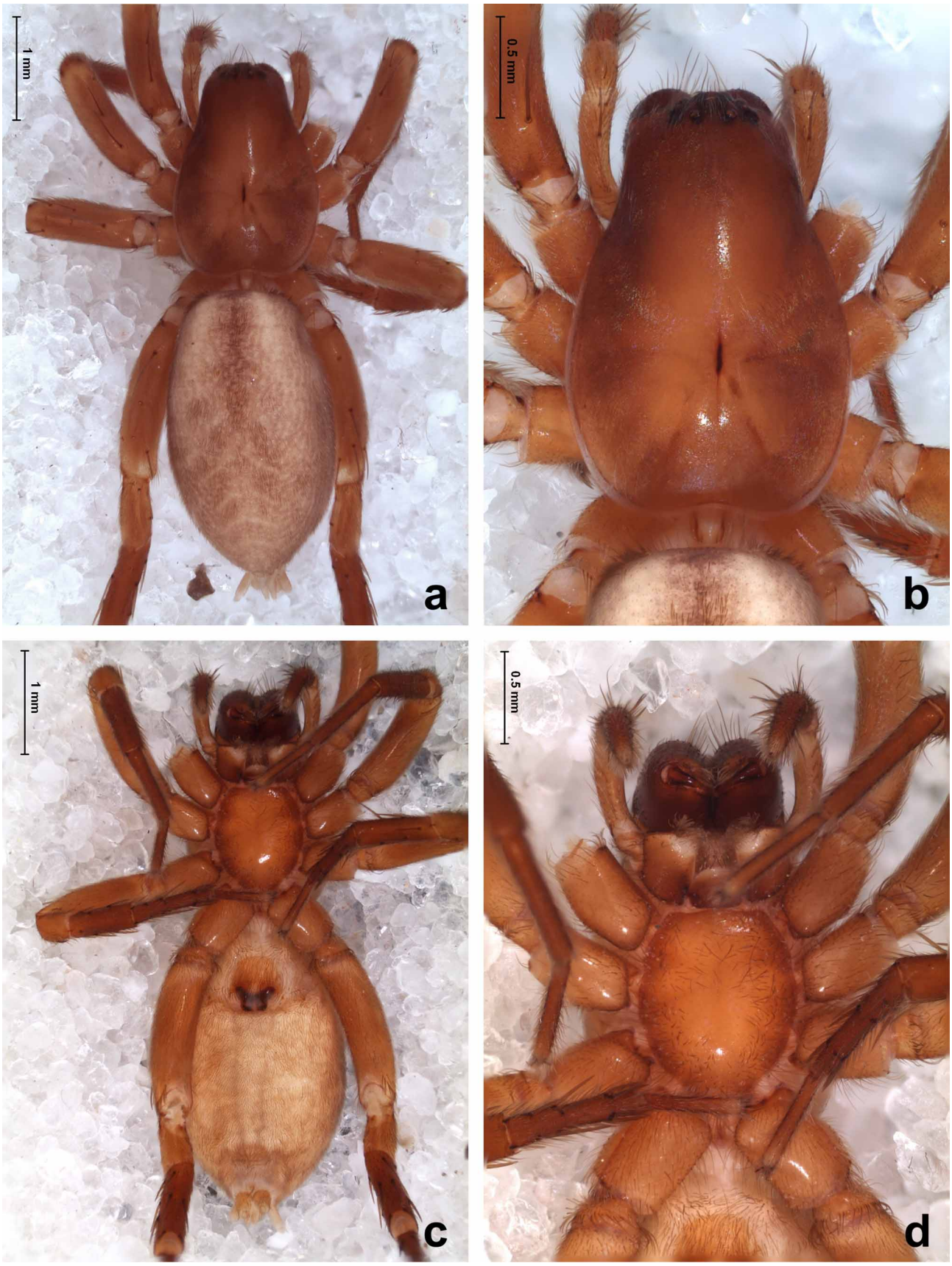

FIGURE 9. *Coptoprepes bellavista* new species. **a**–**d** female paratype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

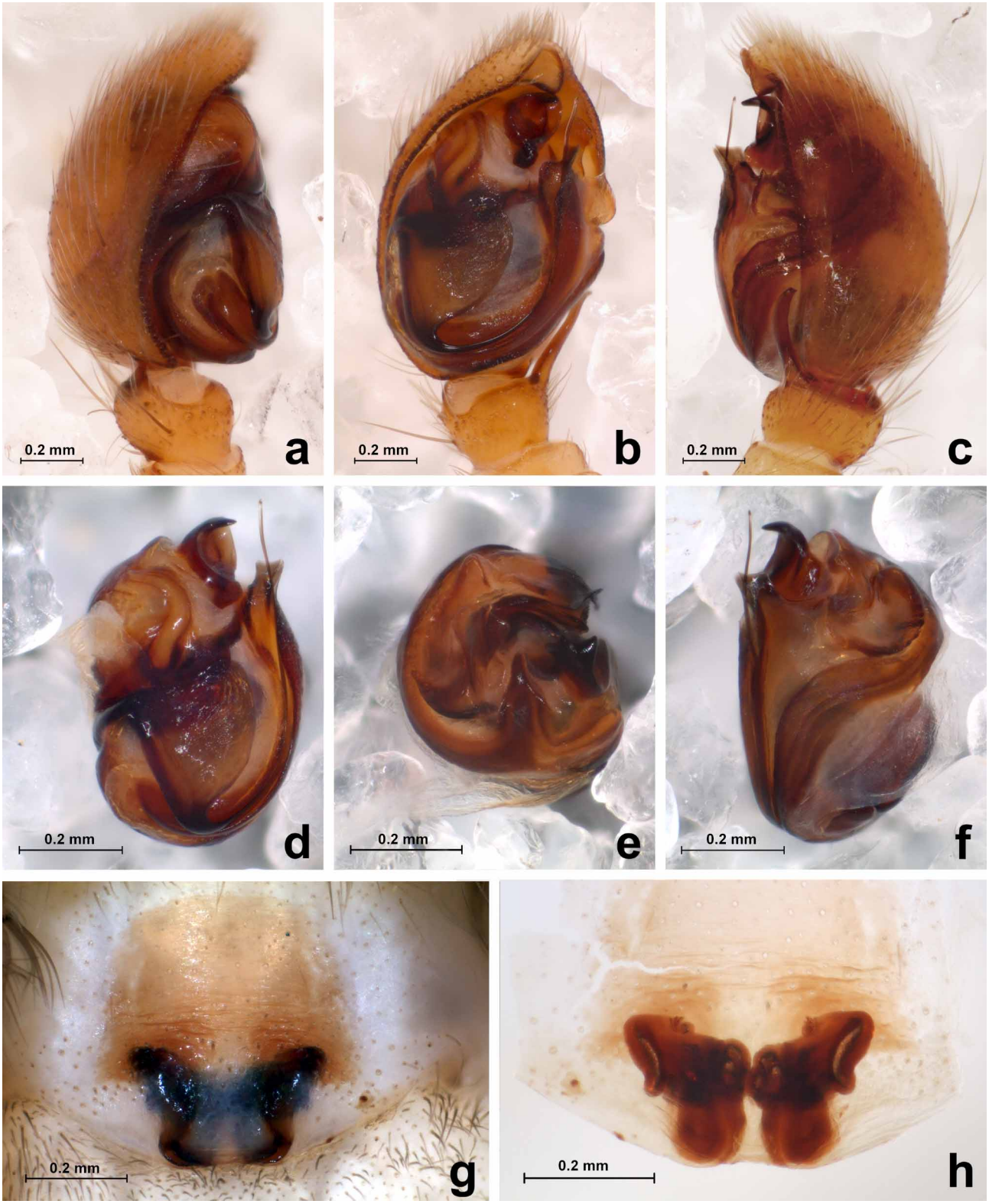

FIGURE 10. *Coptoprepes bellavista* new species. **a**–**f** male, **g**–**h** female paratype (**a** left palp, male holotype, prolateral view, **b** same, ventral view, **c** same, retrolateral view; **d** copulatory bulb, preparation MJR-01329, prolateral view, **e** same, apical view, **f** same, retrolateral view; **g** epigyne, ventral view; **h** vulva).

v 2-2-comb or left r1-2-p1-comb, p and r d1-1-1 or left p d1-1-1-0-1, d 0-p1-2 (left leg seemingly abnormal, not considered for scoring of dataset). Opisthosoma length 2.17, spiracle–epigastrium 1.21, spiracle–spinnerets 0.24. Color in ethanol (Fig. 8): As in female, but paler, specimen slightly faded. Palp (Fig. 10):

Tibia short, width/length 1.58, RTA longer than tibia, curved, compressed. Cymbial conductor wide. Tegulum displaced basally in ventral view, mostly visible in retrolateral view. Sperm duct with conspicuous loop on anterior-dorsal margin. Embolus long, with flat, rounded basal process. Median apophysis wide, truncate, translucent. Primary conductor with canal, ending in truncate sclerotized projection. Secondary conductor ventrally concave, well sclerotized, separated from anterior-dorsal sperm duct loop by a membranous stripe. Paramedian apophysis with prolateral-ventral cusp (pPMA, Fig. 23d–f) and a series of several short cusps (rPMA).

Female (paratype): Prosoma length 2.10, width 1.37. Length of tibia/metatarsus: I, 0.98/0.85; II, 0.88/0.82; III, 0.78/0.90; IV, 1.25/1.42. Chelicerae with five teeth on retromargin, four on promargin. Sternum length 1.05, width 0.83. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v 2-2-p1; metatarsus v 2 bas. **II**, femur d 1-1-1, p 1ap; tibia v r1-r1-p1; metatarsus v 2 bas. **III**, femur d 1-1-1, p and r 0-d1-d1; patella r d1; tibia v p1-p1-2, p 1-d1-1-0, r 1-d1-1-0 or 0-d1-1-0, d r1bas; metatarsus v 2-0-comb, p and r d1-1-1, d 0-p1-2. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-2, p and r 1-d1-1-0, d r1bas; metatarsus v 2-2-2 plus apical comb, p d1-1-1, r d1-0-1, d 0-2-2. Color in ethanol (Fig. 9): Prosoma brown, legs brown, darker distally. Opisthosoma pale brown with dorsal pattern brown, with weakly defined posterior chevrons. Opisthosoma length 2.70, epigastrium–spiracle 1.32, spiracle–spinnerets 0.18. Epigyne: Trapezoidal sclerotized patch, mostly anterior to internal ducts. Lateral lobes separate, posterior half not sclerotized except at the limits with the median field. Median field weakly sclerotized (Fig. 10g). Copulatory openings very close to epigastric furrow. Copulatory ducts not wrapped. Ducts of accessory bulbs short. Spermathecae with convoluted chambers, fertilization ducts well separated from posterior margin of epigyne (Figs. 10h, 24d–f).

Variability: Spines in females: I, tibia v 2-2-0. Spines in males: III, tibia v p1-2-2.

Distribution: Known for Cautín and Ranco provinces in Chile.

Other material examined: CHILE: ***Región IX (Araucanía):*** Cautín: same locality as holotype, 3 males, 2 females [plus 4 immatures] (AMNH); 15 km NE Villarrica, Flor del Lago, 300 m, 2 FITS, *Nothofagus* forest, 14 December 1984–10 February 1985, S. & J. Peck, 1 male and 1 female (AMNH), 1male (AMNH; temporary preparation MJR-01329), 1 female (AMNH), 28 males, 7 females [plus 2 males without palps] (AMNH); Monte Verde, Carahue, 600 m, 30 January 1993–2 February 1993, L. E. Peña, 1 male (AMNH; temporary preparation MJR-01348); 21 km NE Pucón, Lago Caburga, 600 m, FIT, mixed forest remnant, 15 December 1984–10 February 1985, S. & J. Peck, 1 male and 3 females (AMNH); 10 km S Pucón, Volcán Villarrica Natl. Park, 900 m, FIT, *Nothofagus* grove on ash, 15 December 1984–10 February 1985, S. & J. Peck, 3 males and 1 female (AMNH). ***Región XIV (Los Ríos):*** Ranco: 34 km WNW La Unión, 700m, FIT, mixed ever green forest, 17 December 1984–7 February 1985, S. & J. Peck, 7 males and 3 females (AMNH).

Coptoprepes casablanca **new species**
Figs. 11–14, 22c, 23g–i, 24g–i

Type material: Holotype: male from Chile, Región X (Los Lagos), Osorno province, Puyehue Natl. Park, Volcán Casablanca, ca. 40º30’ S, 72º00’ W, 1130–1180 m, site 665, pan traps above treeline, Valdivian rainforest, 20–25 December 1982, A. Newton & M. Thayer (AMNH; temporary preparations MJR-01330, VIW-00005). **Paratype:** female from Chile, Región X (Los Lagos), Puyehue Natl. Park, Antillanca rd., 1035 m, *Nothofagus* forest, 31 January 1985, N. I. Platnick & O. F. Francke (AMNH; temporary preparations MJR-01338, VIW-00006).

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

Diagnosis: Females are similar to that of *C. eden* **n. sp.** by having the lateral lobes of the epigyne posteriorly concave (Fig. 13c), continued in a pouch leading to the copulatory openings, but can be distinguished by the larger, almost spherical spermathecae (Fig. 24g–i). Males resemble those of *C. flavopilosus* by having a curved RTA and relatively short embolus, with the tegulum visible in ventral view (Fig. 13b–d), but differ by having simple, hook-shaped, slender median apophysis (Fig. 23g–i).

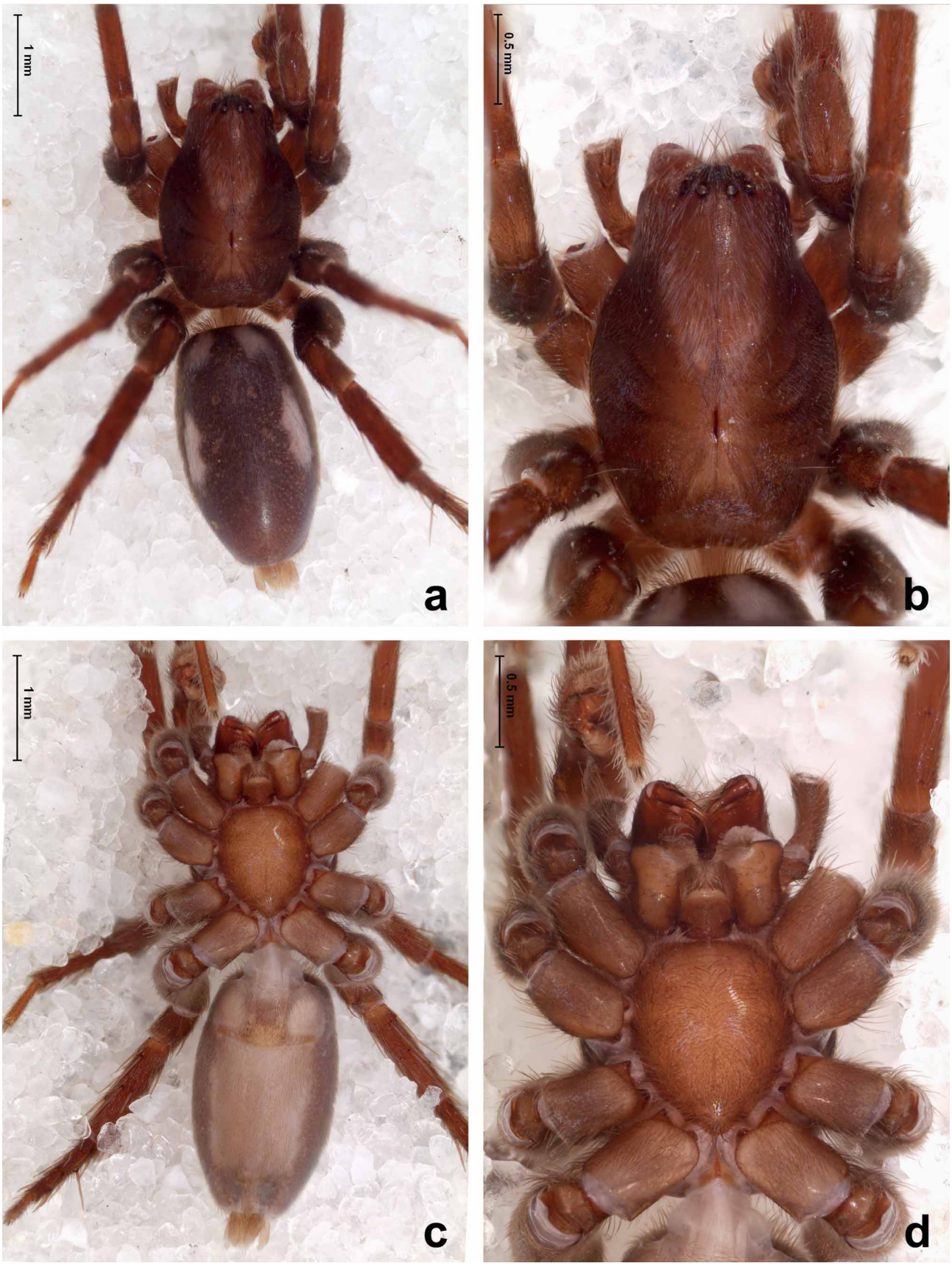

FIGURE 11. *Coptoprepes casablanca* new species. **a**–**d** male holotype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

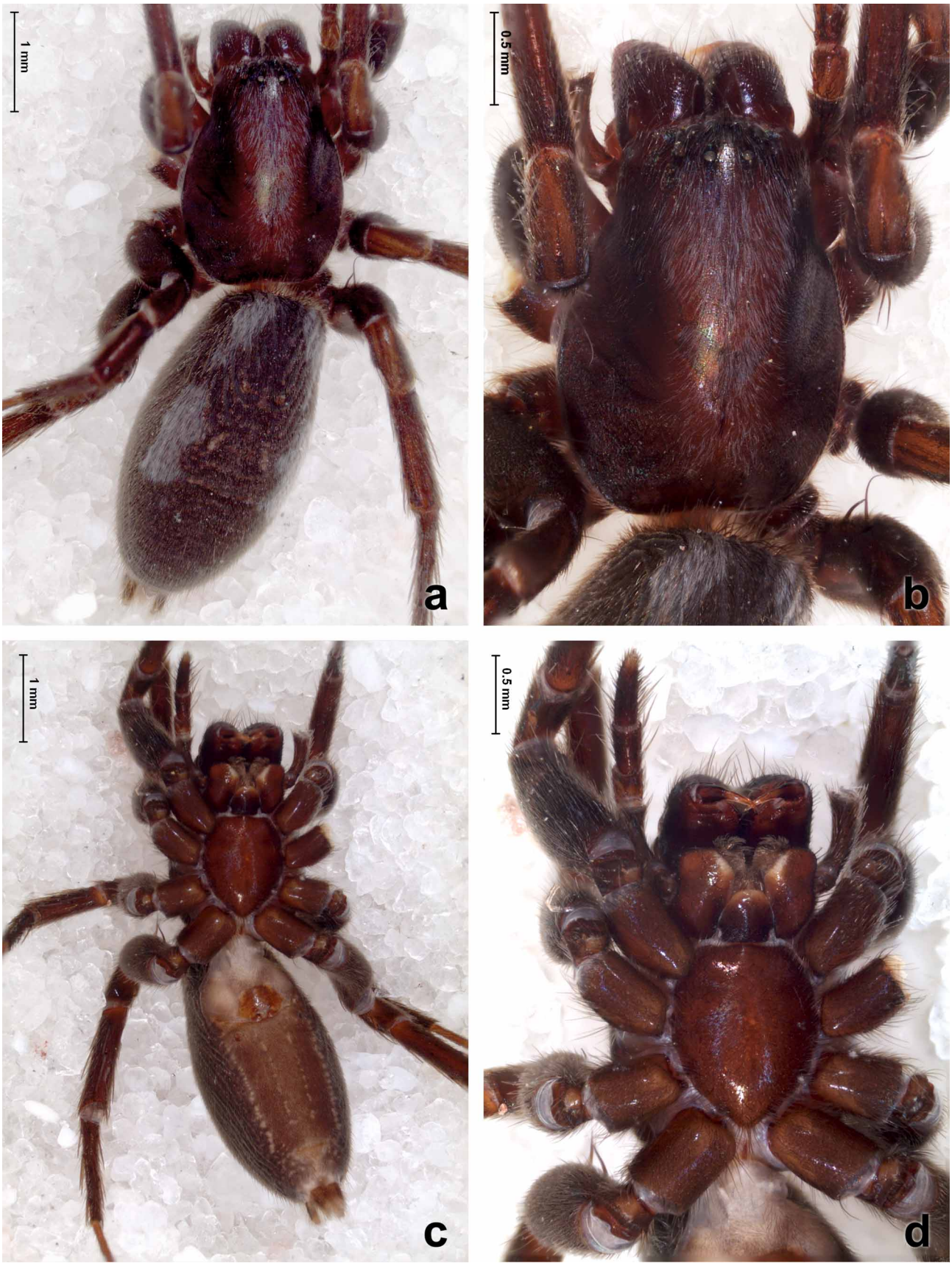

FIGURE 12. *Coptoprepes casablanca* new species. **a**–**d** female paratype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

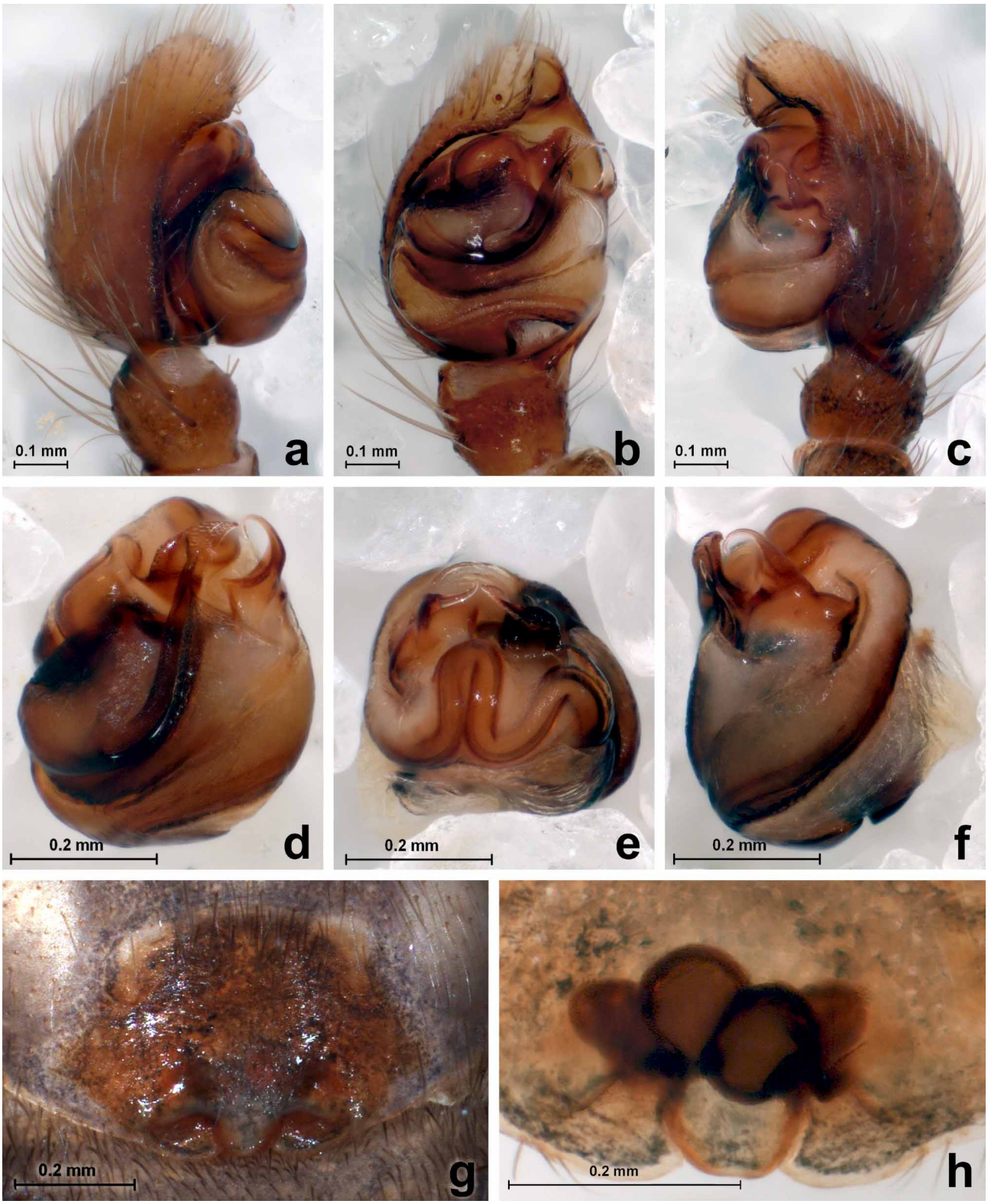

FIGURE 13. *Coptoprepes casablanca* new species. **a**–**f** male, **g**–**h** female paratype (**a** left palp, male holotype, prolateral view, **b** same, ventral view, **c** same, retrolateral view; **d** copulatory bulb, preparation MJR-01331, prolateral view, **e** same, apical view, **f** same, retrolateral view; **g** epigyne, ventral view; **h** vulva).

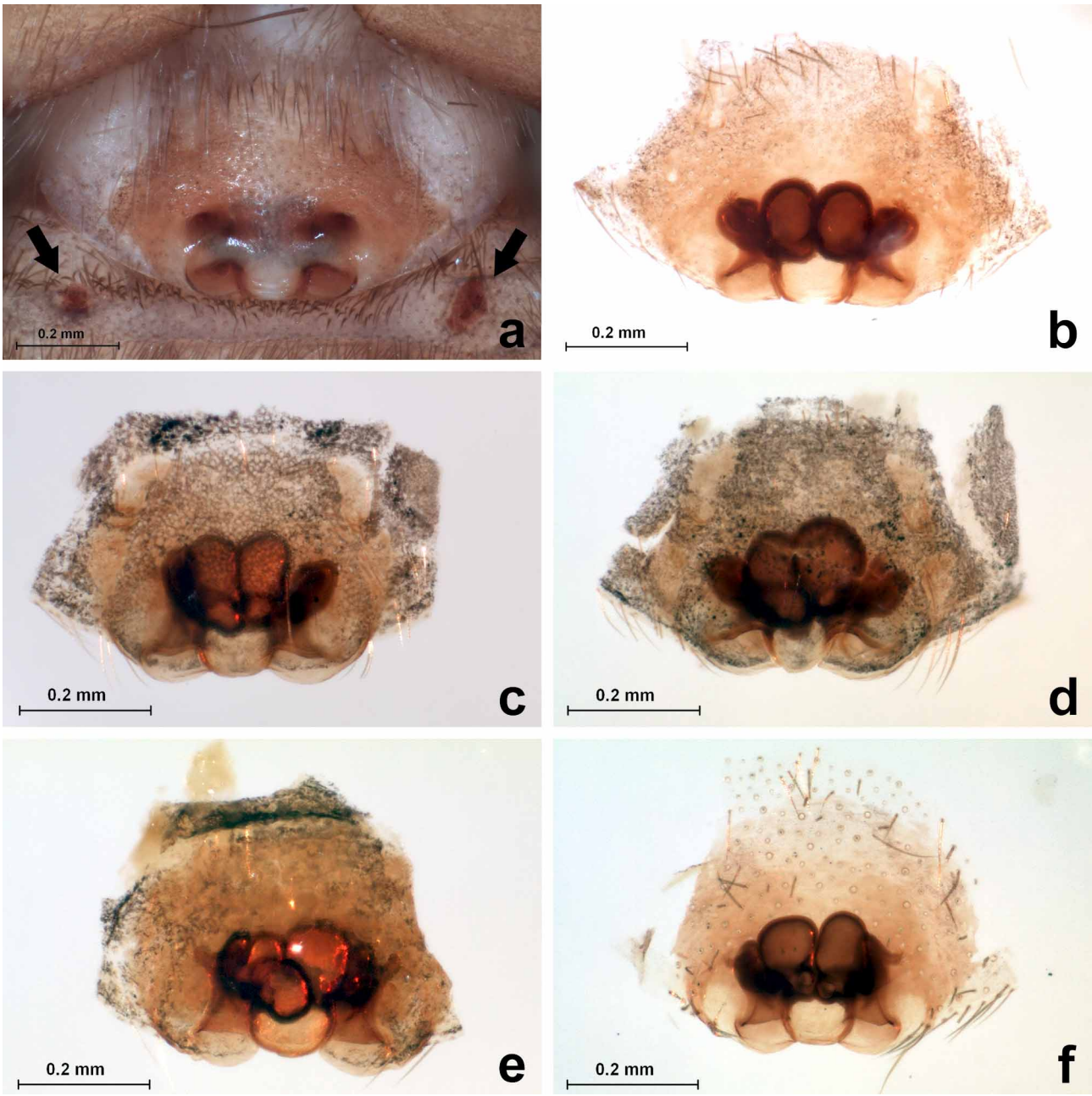

FIGURE 14. *Coptoprepes casablanca* new species. **a** epigyne in ventral view, **b**–**f** epigyne cleared in dorsal view (**a** preparation VIW-00019, arrows to scars on abdominal cuticle probably produced by endoparasitic flies; **b** same specimen as **a,** preparation MJR-01353; **c** preparation MJR-01354; **d** preparation MJR-01352; **e** preparation MJR-01355; **f** preparation MJR-01350)**.**

Description: *Male* (holotype): Prosoma length 2.10, width 1.37, narrower in front than in the female. Tibia/metatarsus length: I, 1.17/1.12; II, 1.02/0.97; III, 0.82/1.02; IV, 1.17/1.42. Chelicerae slightly smaller than those of female, with five teeth on retromargin, five on promargin. Sternum length 1.07, width 0.85. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v 2-2-2; metatarsus v 2bas. **II**, femur d 1-1-1, p d1ap; tibia r1-r1-p1 or r1-r1-2; metatarsus v 2bas. **III**, femur d 1-1-1, p 0-d1-d1, r d1ap; patella r d1; tibia v p1-2-2, p 1-d1-1-0, r d1-1, d r1bas; metatarsus v 2-p1-0 plus apical comb, p and r d1-1-1, d 0-p1-2. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-2, p 1-d1-1-0, r 1-d1-0-0, d r1bas; metatarsus v 2-2-0 plus apical comb, p and r d1-1-1, d 0-2-2. Opisthosoma length 2.43, spiracle–epigastrium 1.32, spiracle–spinnerets 0.20. Color in ethanol (Fig. 11): As in female but slightly decolorated, the patches of white setae on abdomen on pale cuticle. Palp

(Fig. 13): Tibia short, width/length 1.33, RTA shorter than tibia, compressed, curved. Cymbial conductor wide. Tegulum displaced basally in ventral view. Sperm duct with conspicuous loop on anterior-dorsal margin. Embolus thin, with flat rounded basal process. Median apophysis with large base and long, acute, hook-shaped tip. Primary conductor well sclerotized, with canal, ending in acute tip. Secondary conductor a broad concave ledge forming a canal, arising from sclerotized area continuous with anterior-dorsal margin of tegulum, dorsal side regularly covered with denticles not reaching the tip. Paramedian apophysis absent (Fig. 23g–i).

Female (paratype): Prosoma length 2.27, width 0.82. Length of tibia/metatarsus: I, 1.00/0.92; II, 0.98/0.87; III, 0.80/1.02, 1.20/1.50. Chelicerae with five (right) or six (left) teeth on retromargin, five on promargin. Sternum length 1.17, width 0.90. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v 2-2-p1 or 2-2-0; metatarsus v 2bas. **II**, femur d 1-1-1, p d1ap; tibia v r1-r1-p1; metatarsus v 2bas. **III**, femur d 1-1-1, p 0-d1-d1, r d1ap; patella r d1; tibia v p1-p1-2, p 1-d1-1-0, r d1-1, d r1bas; metatarsus v 2-2-0 plus apical comb, p and r d1-1-1, d 0-2-2. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-2, p and r 1-d1-1-0, d r1bas; metatarsus v 2-2-0 plus apical comb, p and r d1-1-1, d 0-2-2. Color in ethanol (Fig. 12): Prosoma and legs dark brown, femora with paler ventral distal spots, patellae and tibiae with longitudinal paler bands. Abdomen dark brown, with paler muscle insertions, two pairs of dorsal lateral patches of white hairs; venter paler, with four longitudinal lines of pale spots. Opisthosoma length 3.23, epigastrium–spiracle 1.55, spiracle–spinnerets 0.33. Epigyne: Lateral lobes separated from median field, concave, continued in pouch to copulatory openings, close to epigastric furrow. Median field weakly sclerotized, slightly elevated (Fig. 13g). Copulatory ducts not wrapped. Ducts of accessory bulbs short. Spermathecae near spherical, with ample lumen (Figs. 13h, 24g–i).

Variability: The female internal genitalia have been found to be quite variable, often asymmetric (Fig. 14). This may be related with being abnormally developed, as specimens often had scars on the abdominal cuticle compatible with those produced by nematode parasitoids (Fig. 14a). Spines in males: III, metatarsusus, d 0-2-2.

Distribution: Known for Río Negro province in Argentina, and for Cautín, Malleco, Osorno provinces, and one isolated record in Aisén province in Chile, which suggest that it may occur in intermediate localities in Palena province.

Other material examined: ARGENTINA: ***Río Negro:*** Cerro Chall-huaco, S41.25718º, W71.28316º, 1300 m, pitfall traps (cod. M5S5E06), January 2006, V. Werenkraut, 1 female (MACN-Ar 19161). **CHILE:** ***Región IX (Araucanía):*** Cautín: Volcán Villarrica, 1250 m, site 653, window trap, *Nothofagus dombeyi-pumilio* forest with *Chusquea*, 15–29 December 1982, A. Newton & M. Thayer, 5 males (AMNH); same data, baited pitfall traps, 3 males (AMNH); site 654, window trap, *Nothofagus dombeyi*/*Saxegothea* forest with *Drimys*, 15–29 December 1982, A. Newton & M. Thayer, 3 males [plus 1 immature male] (AMNH). Malleco: 14 km E Malalcahuello, 1570 m, site 649, window trap, *Nothofagus pumilio/Araucaria* forest, 13–31 December 1982, A. Newton & M. Thayer, 1 male (AMNH); 12 km E Malalcahuello, 1350 m, site 650, window trap, *Nothofagus dombeyi/Araucaria* forest, 13.31 December 1982, A. Newton & M. Thayer, 2 males (AMNH); 14 km E Malalcahuello, 1525 m, *Araucaria* forest, 25 January 1985, N. Platnick & O. Francke, 1 female (AMNH; temporary preparation MJR-01355). ***Región X (Los Lagos):*** Osorno: Puyehue Natl. Park, Volcán Casablanca, 1270 m, trap site 668, carrion trap (squid), just above tree line, 22–25 December 1982, A. Newton & M. Thayer, 1 male (AMNH; temporary preparation MJR-01331); 1130–1180 m, site 665, pan traps above treeline, Valdivian rainforest, 20–25 December 1982, A. Newton & M. Thayer, 4 males and 1 female (AMNH; temporary preparation MJR-01352); 1250 m, tree line, 31 January 1985, N. I. Platnick & O. F. Francke, 1 female (AMNH; temporary preparation MJR-01350), 2 females (AMNH; temporary preparations MJR-01351, MJR-01354). ***Región XI (Ibáñez del Campo):*** Aisén: Reserva Nac. Cerro Castillo, 500–600 m, dry forest, 7 February 1985, N. I. Platnick & O. F. Francke, 1 female (AMNH; temporary preparations MJR-01353, VIW-00019).

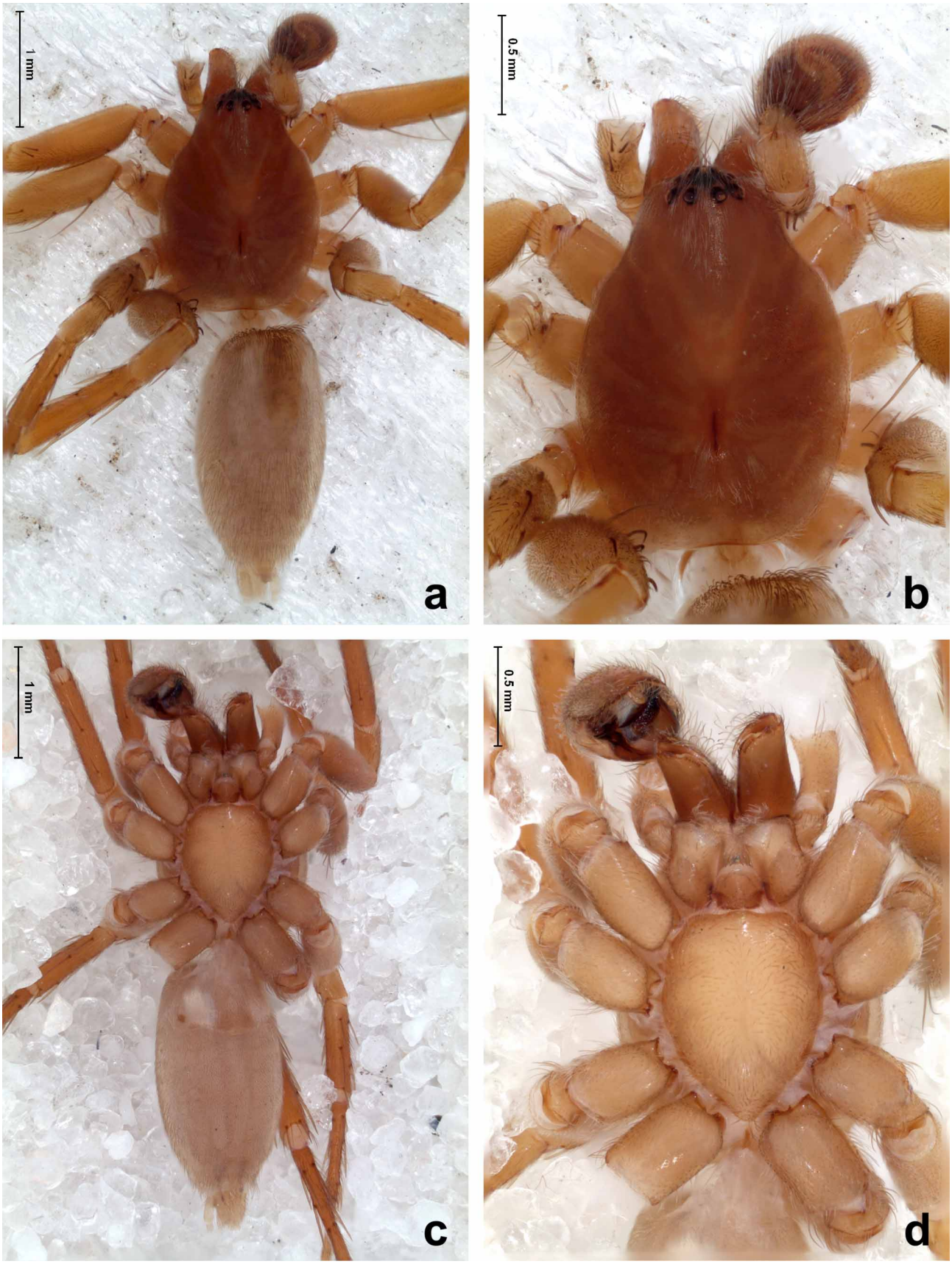

FIGURE 15. *Coptoprepes contulmo* new species. **a**–**d** male holotype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

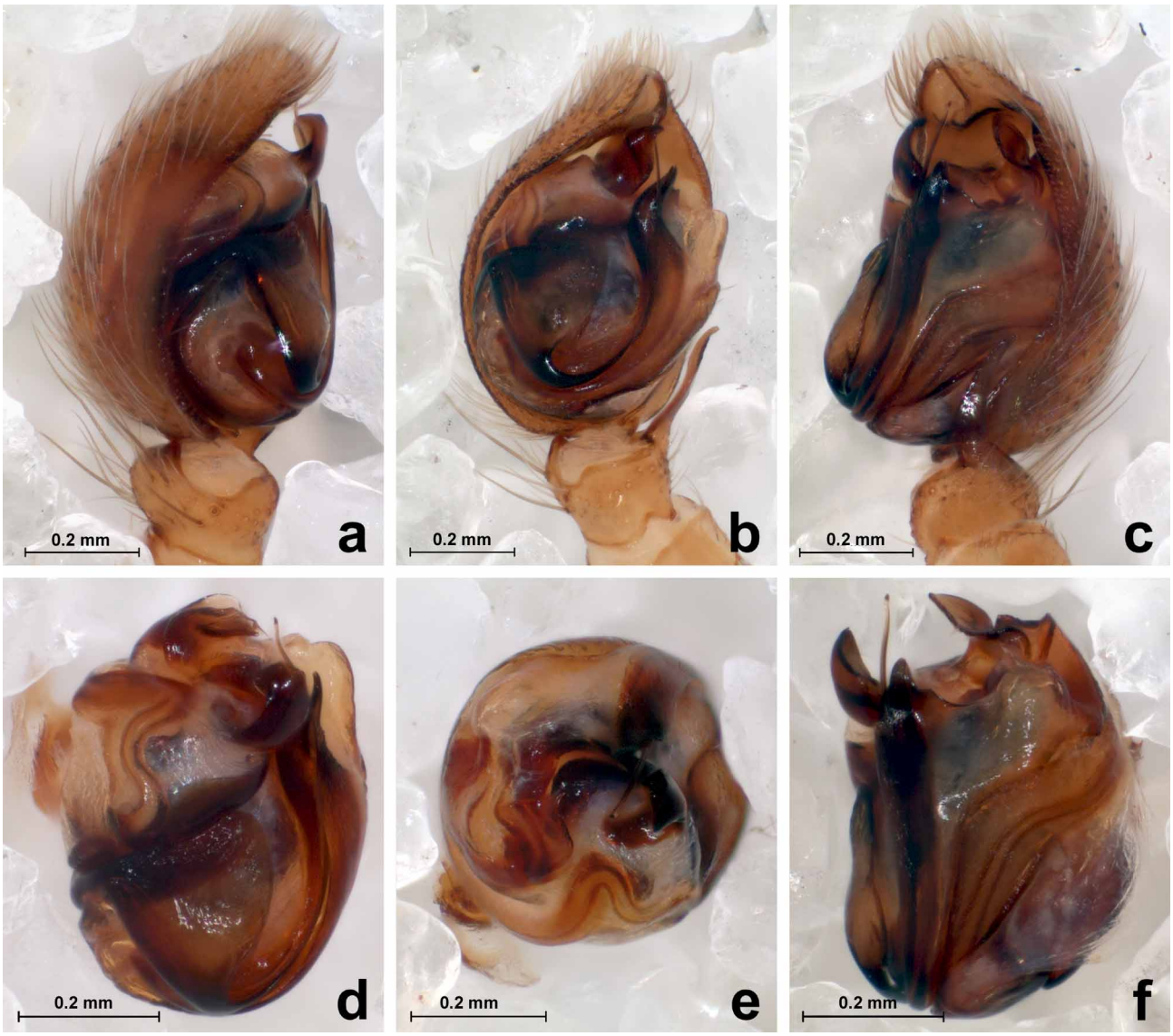

FIGURE 16. *Coptoprepes contulmo* new species. **a** left palp, male holotype, prolateral view, **b** same, ventral view, **c** same, retrolateral view; **d** copulatory bulb, preparation MJR-01334, prolateral view, **e** same, apical view, **f** same, retrolateral view.

***Coptoprepes contulmo* new species**
Figs. 15–16, 22d, 23j–l

Type material: Holotype: male from Chile, Región IX (Araucanía), Malleco province, Purén, Monumento Natural Contulmo, ca. 38º S, 73º W, 350 m, FIT, mixed evergreen forest, 11 December 1984–13 February 1985, S. & J. Peck (AMNH; temporary preparations MJR-01333, VIW-00008).

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

Diagnosis: Females are still unknown. Males are similar to those of *C. nahuelbuta* by having a long and curved RTA and a large, heavily sclerotized secondary conductor, but can be distinguished by the smaller secondary conductor and the wide, flat, truncate median apophysis (Figs 16, 23j–l).

Description: *Male* (holotype): Prosoma length 1.97, width 1.33. Tibia/metatarsus length: I, 1.37/1.25; II, 1.08/1.07; III, 0.85/1.07; IV, 1.25/1.52. Chelicerae with six teeth on retromargin, five on promargin. Sternum length 1.08, width 0.82. Spines: leg **I**, femur d 1-1-1, p 2 ap; tibia v 2-2-2, p 1bas or 0; metatarsus v 2 bas. **II**,

femur d 1-1-1, p d1ap; tibia v r1-2-2; metatarsus v 2 bas. **III**, femur d 1-1-1, p and r 0-d1-d1; patella r d1; tibia v p1-p1-2, d r1bas, p and r 1-d1-1-0; metatarsus v 2bas plus apical comb, p and r d1-1-1, d 0-p1-2. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-2, d r1bas, p and r 1-d1-1-0; metatarsus v 2-2-0 plus apical comb, p and r d1-1-1, d 0-2-2. Opisthosoma length 2.07, spiracle–epigastrium 1.16, spiracle–spinnerets 0.19, with weak dorsal anterior scutum. Color in ethanol brown uniform, opisthosoma slightly paler (Fig. 15). Palp (Fig. 16): Tibia short, width/length 1.64, RTA longer than tibia, curved, compressed. Cymbial conductor wide. Tegulum basal in ventral view, mostly visible in retrolateral view. Sperm duct with conspicuous loop on anterior-dorsal margin. Embolus long, thin, basal process flat, rounded. Median apophysis wide, transparent, truncate. Primary conductor well sclerotized, with wide canal, apex short, moderately acute. Secondary conductor ventrally convex, well sclerotized, separated from anterior-dorsal sperm duct loop by membranous stripe. Paramedian apophysis with prolateral cusp globose, two retrolateral projections near median apophysis (Fig. 23j–l).

Female: Unknown.

Variability: Spines in males: IV, metatarsus, d 0-p1-2.

Distribution: Known from Malleco province in Chile.

Other material examined: CHILE: same data as holotype, 1 male (AMNH; temporary preparation MJR-01334); Chile, no specific locality, "loc. 59", 1 male (IRSN IG 25.765).

***Coptoprepes eden* new species**
Figs. 17–18, 22e, 24j–l

Type material: Holotype: female from Chile, Región XII (Magallanes y Antártica), Ultima Esperanza province, Puerto Eden, Isla Wellington, ca. 49° S 74° W, 7–9 December 1962, P. J. Darlington (MCZ; temporary preparation MJR-01344, VIW-00012).

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

Diagnosis: Females are similar to that of *C. casablanca* **n. sp.** by having the lateral lobes of the epigyne posteriorly concave, continued in a pouch leading to the copulatory openings (Fig. 23), but can be distinguished by the smaller, irregularly shaped spermathecae (Fig. 24j–l). Males are still unknown.

Female (holotype): Prosoma length 3.03, width 1.93. Tibia/metatarsus length: I, 1.49/1.34; II, 1.41/1.31; III, 1.24/1.57; IV, 1.80/2.26. Chelicerae with five or six teeth on retromargin, four or five on promargin (right side with more teeth). Sternum length 1.51, width 1.21. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v p1-2-p1; metatarsus v 2 bas. **II**, femur d 1-1-1, p d1ap; tibia v 0-r1-p1, p 0-1 or 0; metatarsus v 2 bas. **III**, femur d 1-1-1, p and r 0-d1-d1; patella r d1; tibia v p1-2-2 (median pair not well paired), d r1 bas, p and r 1-d1-1-0; metatarsus v 2-2-comb, d 0-p1-2, p and r d1-1-1. **IV**, femur d 1-1-1, p 0-d1-d1, r d1 ap; patella r d1; tibia v p1-2-2, d 2 bas, p and r 1-d1-1-0; metatarsus v 2-2-p1 plus apical comb, d 0-2-2, p and r d1-1-1. Color in ethanol (Fig. 17): Brown uniform, venter of opisthosoma paler. Opisthosoma length 3.79, epigastrium–spiracle 1.54, spiracle–spinnerets 0.39. Epigyne: Central area anterior to median field not sclerotized. Lateral lobes separated from median field, concave, continued in pouch to copulatory openings, close to epigastric furrow. Median field posteriorly sclerotized, slightly elevated (Fig. 18a). Copulatory ducts slightly wrapped on transversal-oblique axes. Ducts of accessory bulbs well defined. Spermathecae irregular, connate, with ample lumen (Figs. 18b, 24j–l).

Distribution: Only known from the type locality.

Other material examined: None.

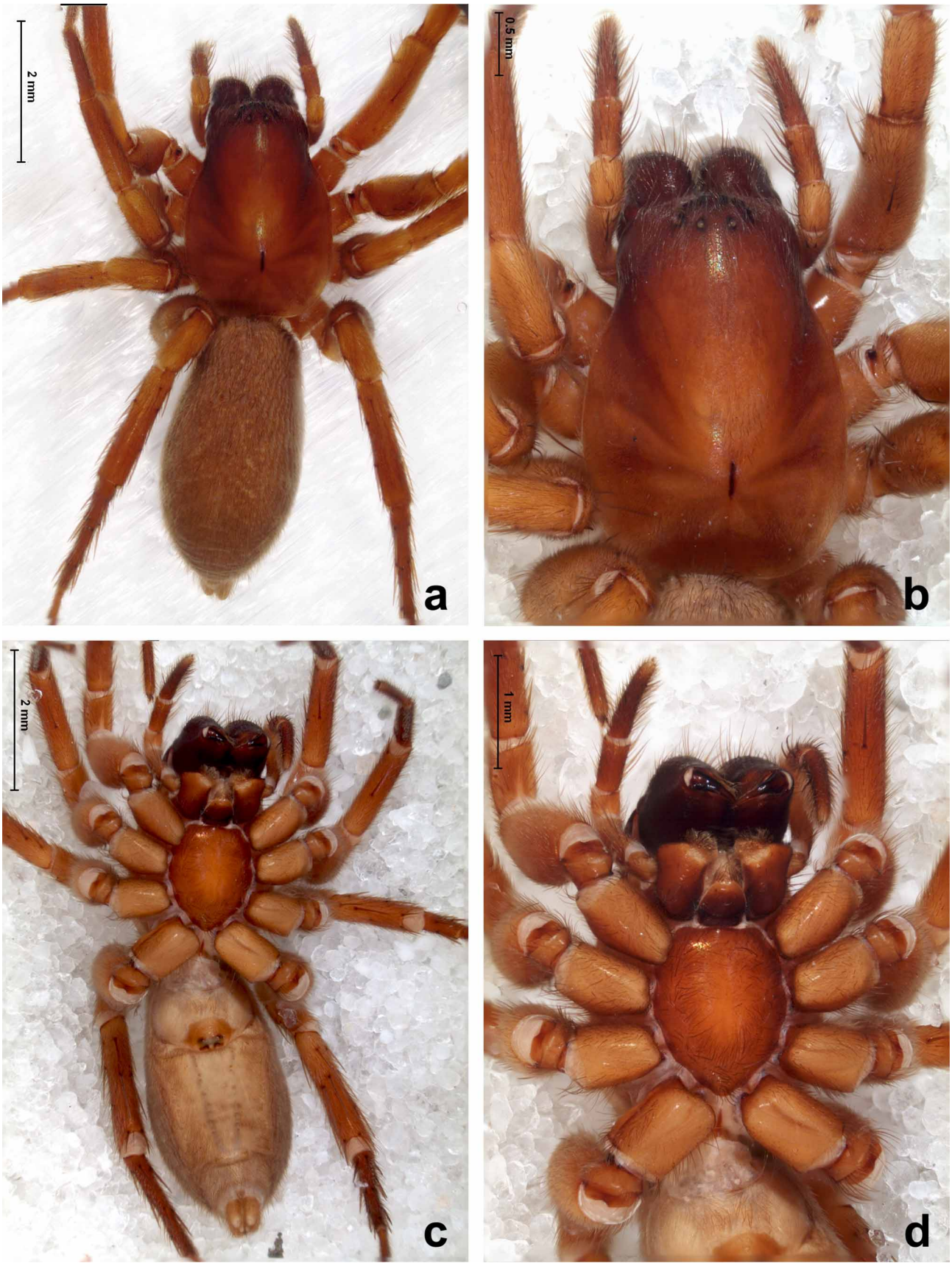

FIGURE 17. *Coptoprepes eden* new species. **a**–**d** female holotype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

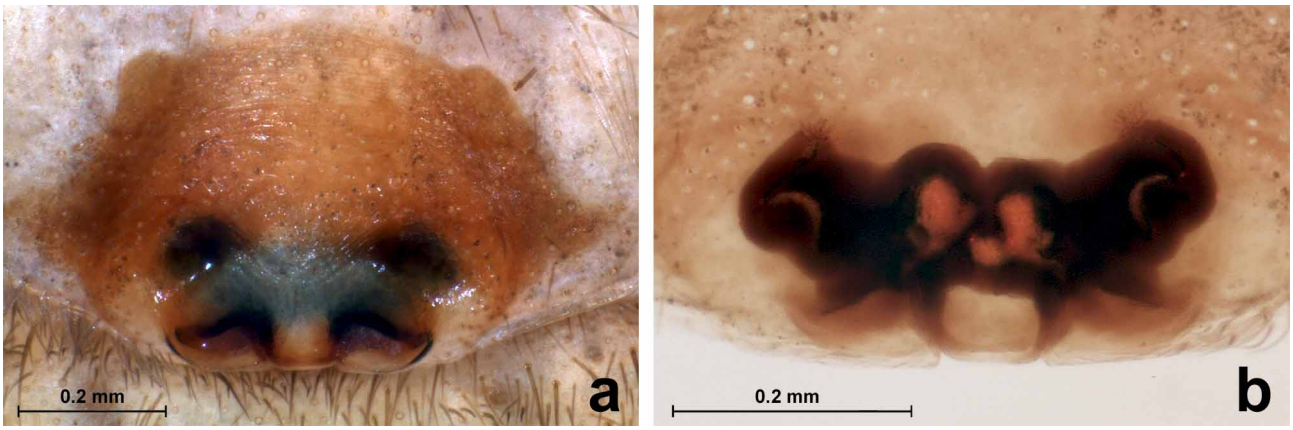

FIGURE 18. *Coptoprepes eden* new species. **a**–**b** female holotype (**a** epigyne, ventral view; **b** vulva).

***Coptoprepes recinto* new species**
Figs. 19–21, 22f, 23m–o, 24m–o

Type material: Holotype: male and female paratype from Chile, Región VIII (Biobío), Ñuble province, 19.5 km ESE Recinto, ca. 37º00' S, 71º30' W, 1250 m, site 647, window trap, *Nothofagus* forest, 10 December 1982–3 January 1983, A. Newton & M. Thayer (AMNH; temporary preparations, male: MJR-01335, VIW-00011, female: MJR-01339, VIW-00010).

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

Diagnosis: Females are similar to *C. nahuelbuta* by having the epigynal median field hidden in the epigastric furrow, but can be distinguished by the notched posterior epigynal margin (Figs. 21g–h, 24m–n). Males are distinguished by the long and curved RTA, about twice as long as the palpal tibia, and the flat, rounded and projecting median apophysis (Figs. 21c–f, 23m–o).

Description: *Male* (holotype)**:** Prosoma length 1.92, width 1.34, anteriorly slightly narrower than in female. Length of tibia/metatarsus: I, 1.24/1.14; II, 1.05/1.02; III, 0.81/0.99; IV, 1.18/1.45. Chelicerae less robust than in female, with five teeth on retromargin, four on promargin. Sternum length 1.08, width 0.84. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v 2-2-p1; metatarsus v 2bas. **II**, femur d 1-1-1, p d1ap; tibia v r1-r1-p1, p 0-1 or 0; metatarsus v 2bas. **III**, femur d 1-1-1, p 0-d1-d1, r d1ap; patella r d1; tibia v p1-p1-2, d r1bas, p 1-d1-1-0, r d1-1; metatarsus v 2bas plus apical comb, d 0-2-2, p and r d1-1-1. **IV**, femur d 1-1-1, p and r d1ap; patella r d1; tibia v p1-2-p1 or p1-2-2, d r1bas, p and r 1-d1-1-0; metatarsus v 2-2-0 plus apical comb, d 0-2-2, p and r d1-1-1. Opisthosoma length 2.22, spiracle–epigastrium 1.29, spiracle–spinnerets 0.11. Color in ethanol (Fig. 19): Prosoma and legs dark brown, almost uniform, except coxae pale brown, and a pale apical patch ventrally on leg femora III and IV. Opisthosoma dark brown with paler pattern, dorsum with anterior lateral bands of white setae and posterior chevrons. Palp (Fig. 21): Tibia width/length 1.42, RTA long, about twice as long as tibia, curved, compressed. Cymbial conductor wide, conspicuous. Tegulum basal/retrolateral in ventral view. Sperm duct with two conspicuous loops on anterior-dorsal margin, small apical tegular sclerite with conical shape arising between both loops. Embolus long, thin, basal process ample, flattened, slightly projecting with rounded border. Median apophysis flat, concave, projecting anteriorly, with prolateral-dorsal acute projection. Primary conductor with canal, ending in acute sclerotized projection. Secondary conductor a small sclerotized cone, separated from anterior-dorsal sperm duct loop by membranous stripe. Paramedian apophysis reduced to sclerotized stripe connecting with base of median apophysis, with two rounded flat cusps (Fig. 23m–o).

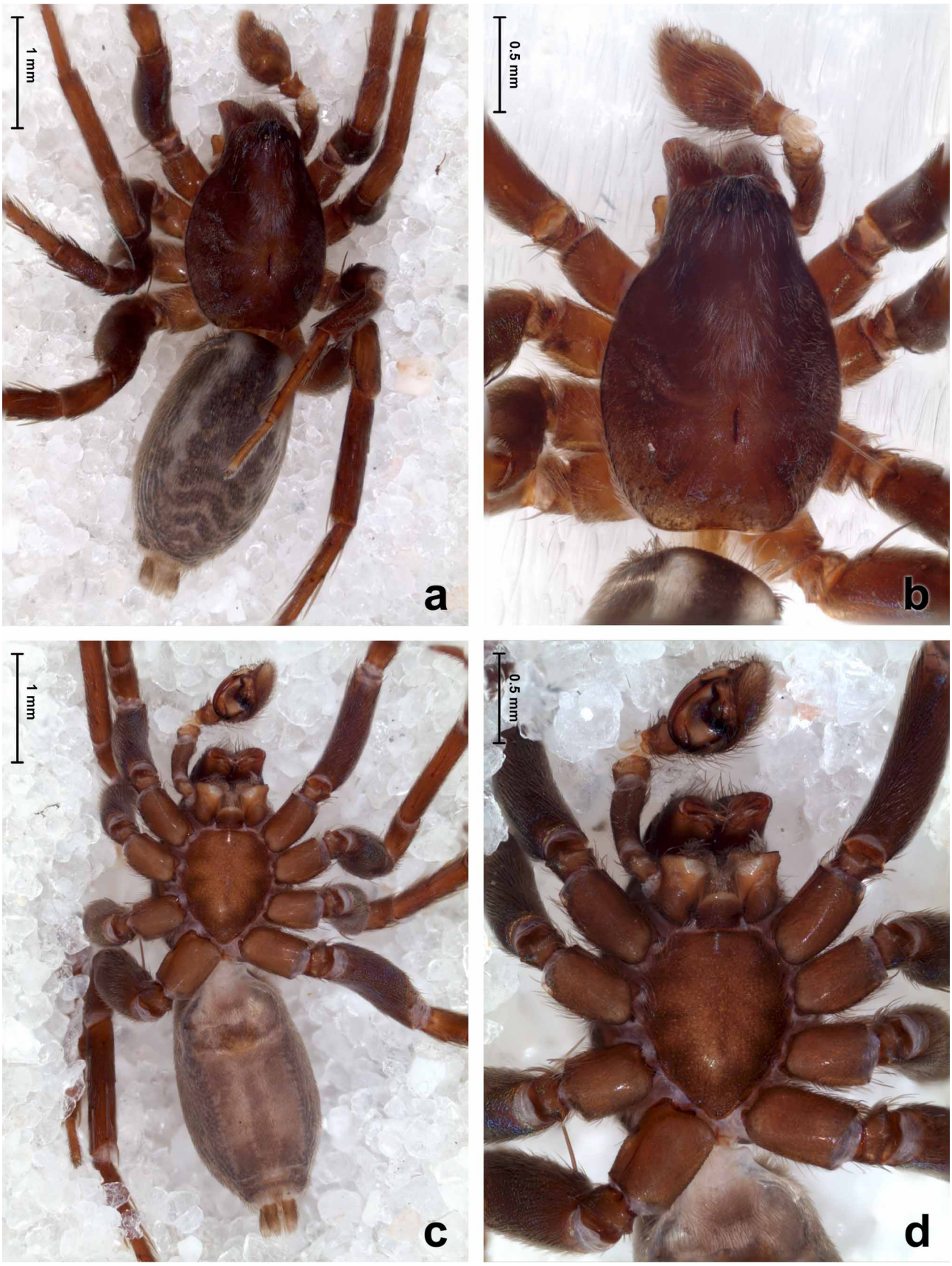

FIGURE 19. *Coptoprepes recinto* new species. **a**–**d** male holotype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

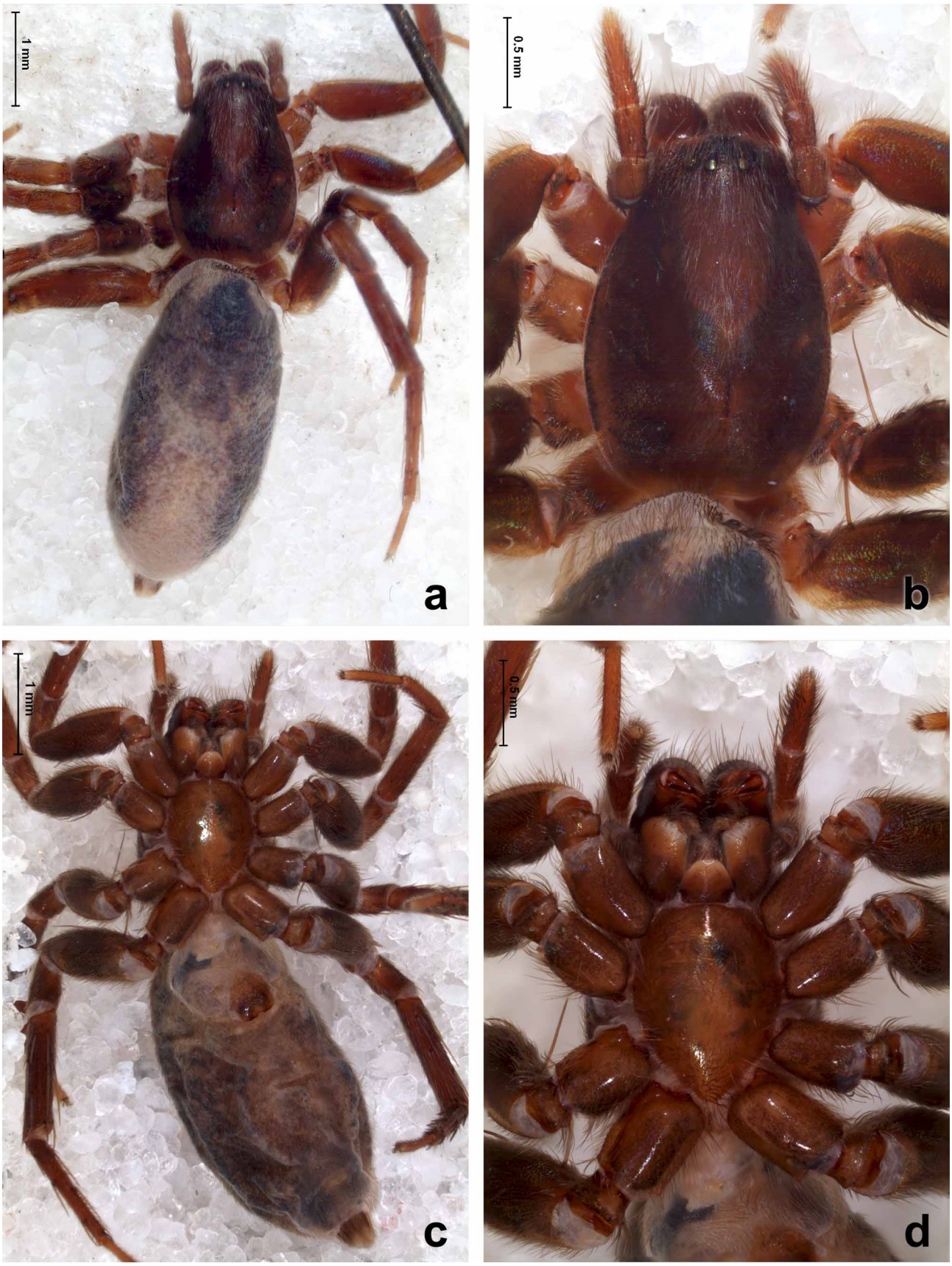

FIGURE 20. *Coptoprepes recinto* new species. **a**–**d** female paratype (**a** dorsal habitus; **b** prosoma, dorsal view; **c** ventral habitus, ventral view; **d** prosoma, ventral view).

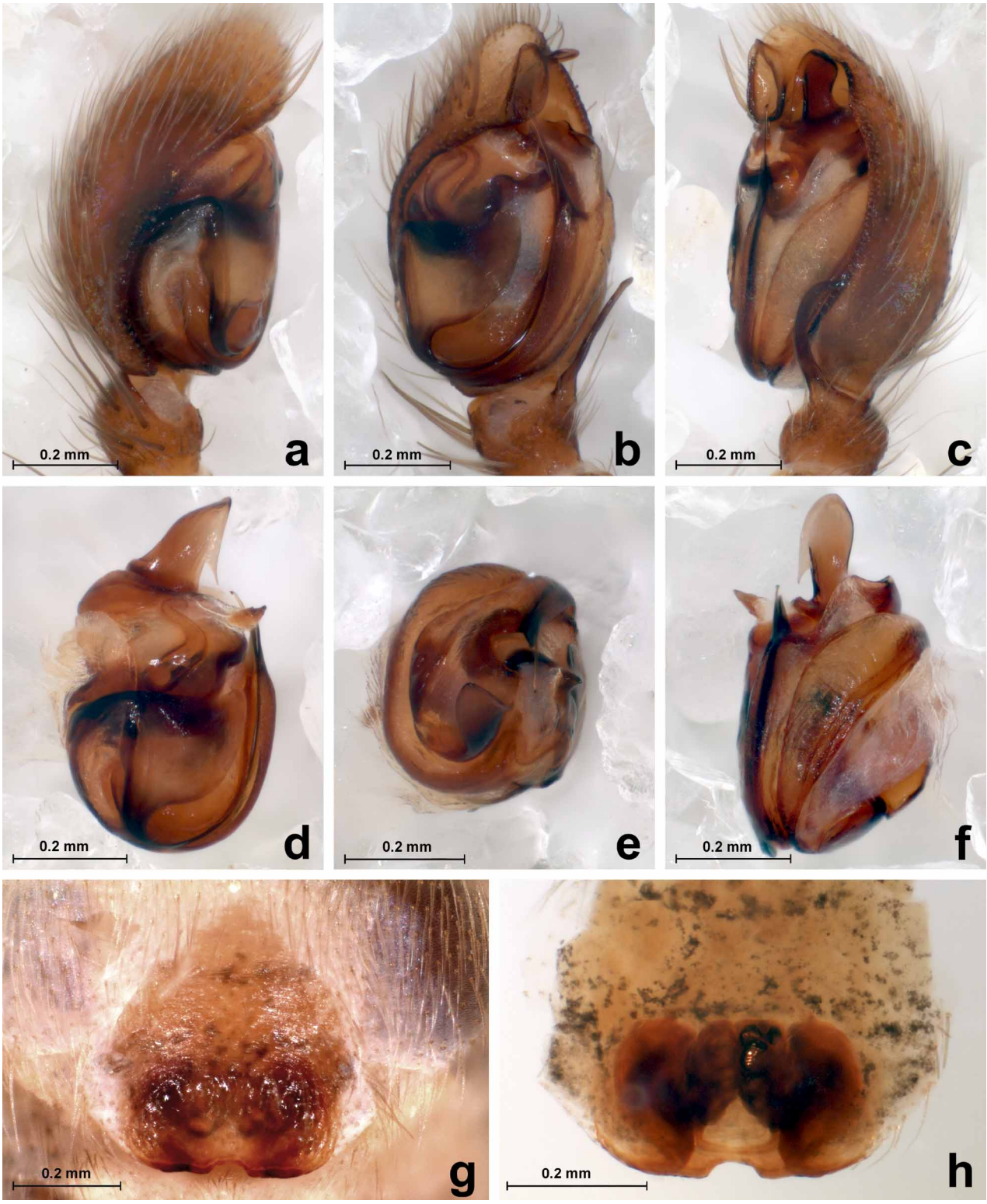

FIGURE 21. *Coptoprepes recinto* new species. **a**–**f** male, **g**–**h** female paratype (**a** left palp, male holotype, prolateral view, **b** same, ventral view, **c** same, retrolateral view; **d** copulatory bulb, preparation MJR-01332, prolateral view, **e** same, apical view, **f** same, retrolateral view; **g** epigyne, ventral view; **h** vulva).

Female (paratype): Prosoma length 2.05, width 1.37, wider between legs II–III. Tibia/metatarsus length: I, 1.65/0.89; II, 0.93/0.89; III, 0.8/0.97; IV, 1.22/1.47. Chelicerae with four teeth on promargin, six on retromargin. Sternum length 1.15, width 0.89. Spines: leg **I**, femur d 1-1-1, p 2ap; tibia v 2-2-0 or r1-2-0; metatarsus v 2bas. **II**, femur d 1-1-1, p d1ap; tibia v r1-r1-p1; metatarsus v 2bas. **III**, femur d 1-1-1, p 0-d1-d1,

r d1 ap; patella r d1; tibia v 0-p1-2 or p1-p1-2, d r1bas, p 1-d1-1-0, r d1-1; metatarsus v 2-0-0 plus apical comb, d 0-2-2, p and r d1-1-1. **IV**, femur d 1-1-1, p d1ap, r d1ap; patella r d1; tibia v p1-2-2, d r1bas, p and r 1-d1-1-0; metatarsus v 2-2-0 plus apical comb, d 0-2-2, p and r d1-1-1. Color in ethanol (Fig. 20): As in male, but in poor condition. Opisthosoma length 3.40, epigastrium–spiracle approximately 1.60, spiracle–spinnerets 0.33, in poor condition. Epigyne (Fig. 21g): Ventrally a single plate with a posterior notch, lateral lobes well separated in posterior-dorsal view, their limits with median field parallel. Copulatory ducts running in ectal arcs. Ducts of accessory bulbs short. Spermathecae with convoluted chambers (Fig. 21h).

Variability: Spines in males: III, tibia v p1-2-2. Spines in females: I, tibia v 2-2-p1.

Distribution: Known for Ñuble and Malleco provinces in Chile.

Other material examined: CHILE: ***Región VIII (Biobío):*** Ñuble: same locality as holotype, 12 males, 4 females [plus 2 immature males and 2 immatures]; 22.7 km ESE Recinto, 1330 m, site 646, window trap, *Nothofagus* forest, 10 December 1982–3 January 1983, A. Newton & M. Thayer, 1 male (AMNH; temporary preparation MJR-01332), 3 males (AMNH); 72 km SE Chillán, Trancas, nr. Termas, 1700 m, FIT, *Nothofagus* forest, 6 December 1984–19 February 1985, S. & J. Peck, 3 males and 1 female (AMNH). ***Región IX (Araucanía):*** Malleco province: 12 km E Malalcahuello, 1350 m, site 650, window trap, *Nothofagus dombeyi/ Araucaria* forest, 13–31 December1982, A. Newton & M. Thayer, 3 males (AMNH); 14 km E Malalcahuello, 1570 m, site 649, window trap, *Nothofagus pumilio-Araucaria* forest, 13–31 December 1982, A. Newton & M. Thayer, 1 female (AMNH).

Cladistic analysis and discussion

We have added four characters to the previous dataset of Izquierdo and Ramírez (2008), to account for new variation found after the addition of the newly described species. These characters are sufficiently evident for easy scoring from the descriptions in the mentioned previous analyses of the group. The following characters have been added, and the scorings for the terminals not in Table 1 are here summarized:

440. Spine on metatarsus III d x-r1-x: (0) absent, (1) present. Scorings: [01]: *C. casablanca*, *Negayan paduana* (Karsch), *Josa riveti* (Berland), *J. nigrifrons* (Simon). 0: all the rest.

441. Spine on metatarsus IV d x-r1-x: (0) absent, (1) present. Scorings: 1: *Negayan paduana*, *Josa. riveti*. [01]: *Josa nigrifrons*. 0: all the rest.

442. Median apophysis: (0) single; (1) bifid. Scorings: 1: *Josa calilegua* Ramírez, *J. nigrifrons*. Inapplicable: *Malenella nana* Ramírez, *Italaman santamaria* Brescovit, *Negayan coccinea* (Mello-Leitão). Missing: *Aysenia elongata* Tullgren, *Josa personata* (Simon), *J. lutea* (Keyserling), *Philisca doilu* (Ramírez). 0: all the rest.

443. RTA curvature: (0) straight; (1) curved, with tip upwards. This character was considered applicable only for terminals with simple RTA (all Amaurobioidinae, and the anyphaenine *Italaman santamaria* Brescovit). Some outgroups have a complex RTA, and were scored as inapplicable. Scorings: Inapplicable: *Malenella nana*, *Aysha prospera* Keyseling, *Otoniela adisi* Brescovit, *Xiruana hirsuta* (Mello-Leitão), *Anyphaena accentuata* (Walckenaer), *Wulfila albus* (Mello-Leitão), all *Josa* and Gayennini, *Gamakia hirsuta* Ramírez. Missing: Same as previous character. 0: all the rest.

After reexamination of all species of *Coptoprepes*, we have corrected the following scorings:

19. Male chelicerae, (1) smaller than in female (all *Coptoprepes* species). Missing: *Coptoprepes eden*, *C. contulmo*.

316. Teeth on C2 apex, regularly disposed, pointing backward: (1) present (*C. flavopilosus*, *Ferrieria echinata* Tullgren).

Table 1 shows the complete vectors of character scorings for the new species described here. The heuristic search strategies using ratchet parsimony and implied weighting (constant of concavity $k = 6$) produced three optimal trees of 1056 steps long in 84% of the replicates (TNT commands: *piwe = 6; ratchet: iter 50; collapse*

3; mult = ratchet repl 100 tbr hold 10; bb = fillonly;). With such a high percentage of hits for the same best trees, it is likely that the optimal trees were found.

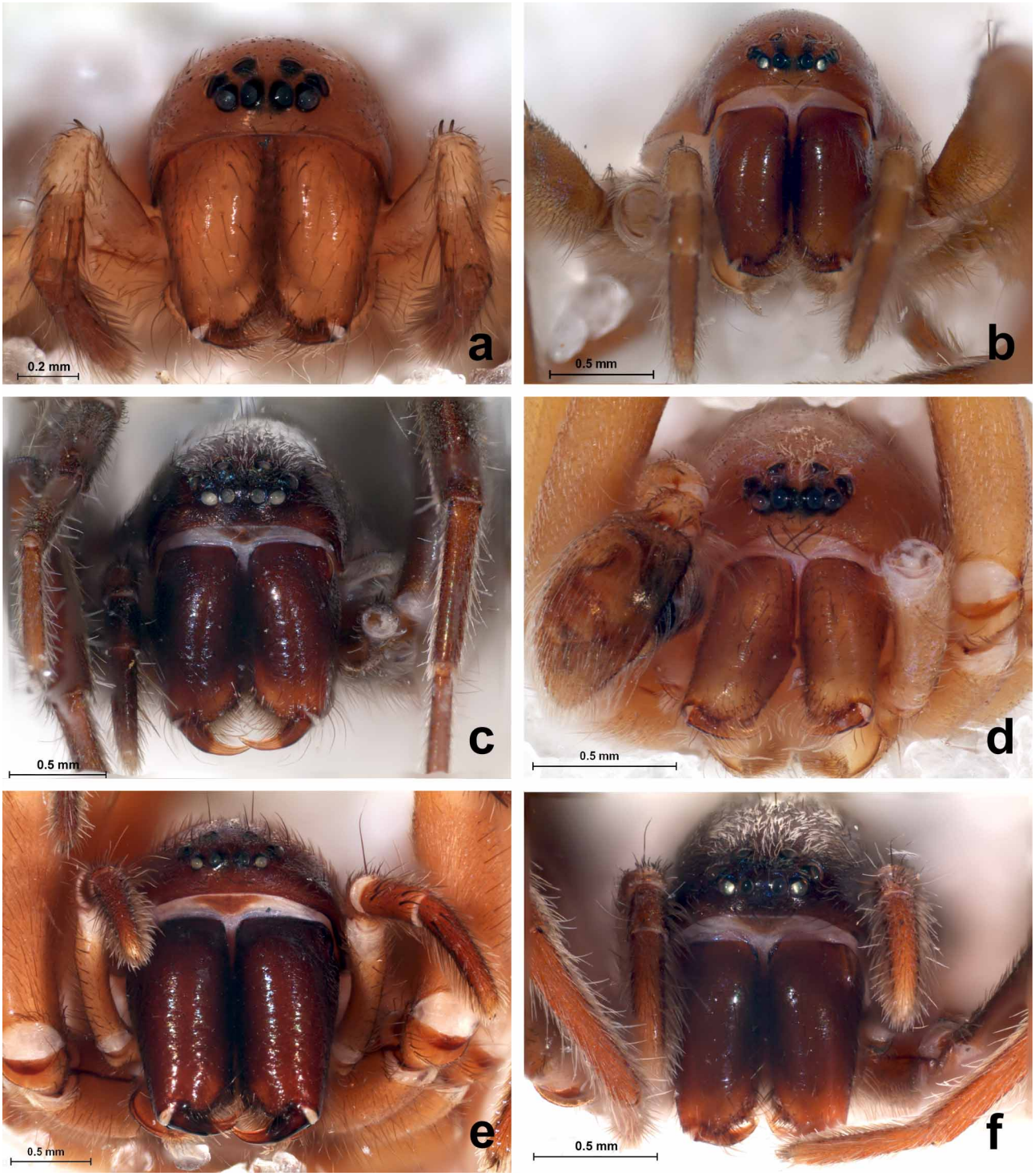

FIGURE 22. Prosoma, anterior view: **a** *Coptoprepes ecotono*, female paratype; **b** *C. bellavista*, female paratype; **c** *C. casablanca*, female paratype; **d** *C. contulmo*, male holotype; **e** *C. eden*, female paratype; **f** *C. recinto*, female paratype.

The strict consensus tree and support values for the tribe Amaurobioidini and internal branches of *Coptoprepes* are shown in the Figure 25a. This study reproduced the same cladogram for all the representatives of the tribe Amaurobioidini as obtained by Izquierdo and Ramírez (2008), except for the relationships between species of *Coptoprepes*. We obtained a similar configuration of support values, with most intergeneric branches poorly supported, except for the clade *Aysenia* + *Aysenoides*. Support values for *Coptoprepes* and internal groups are relatively low, compared with the rest of the tree, especially for several

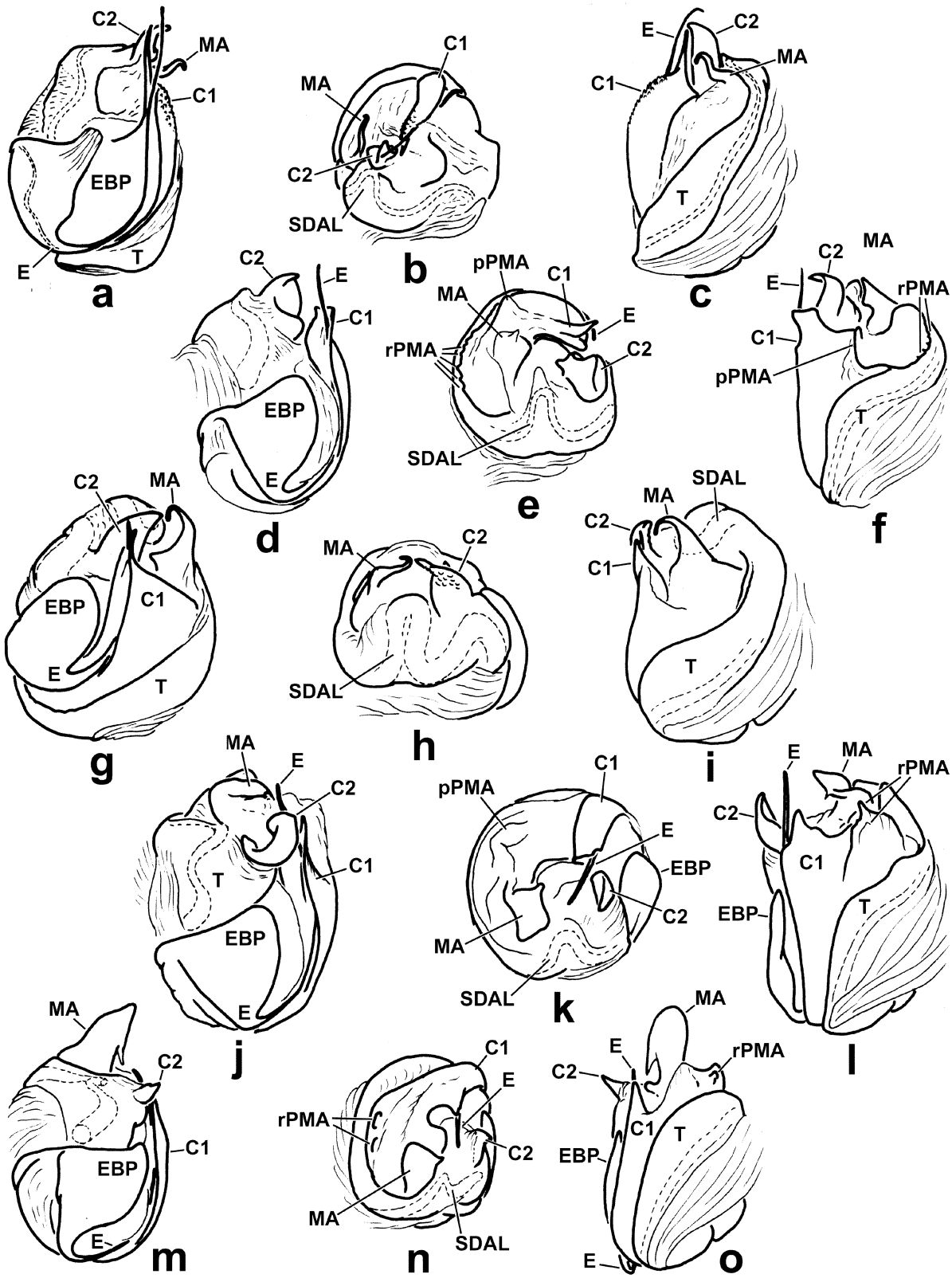

FIGURE 23. Male copulatory bulbs, schematic. **a**–**c** *C. ecotono* (**a** preparation MJR-01343, prolateral view, **b** same, apical view, **c** same, retrolateral view); **d**–**f** *C. bellavista* (**d** preparation MJR-01329, prolateral view, **e** same, apical view, **f** same, retrolateral view); **g**–**i** *C. casablanca* (**g** preparation MJR-01331, prolateral view, **h** same, apical view, **i** same, retrolateral view); **j**–**l** *C. contulmo* (**j** preparation MJR-01334, prolateral view, **k** same, apical view, **l** same, retrolateral view). **m**–**o** *C. recinto* (**m** preparation MJR-01332, prolateral view, **n** same, apical view, **o** same, retrolateral view). Abbreviations: (C2) secondary conductor, (E) embolus, (EBP) embolus basal process, (MA) median apophysis, (PMA) paramedian apophysis, (SDAL) apical loop of sperm duct, (T) tegulum.

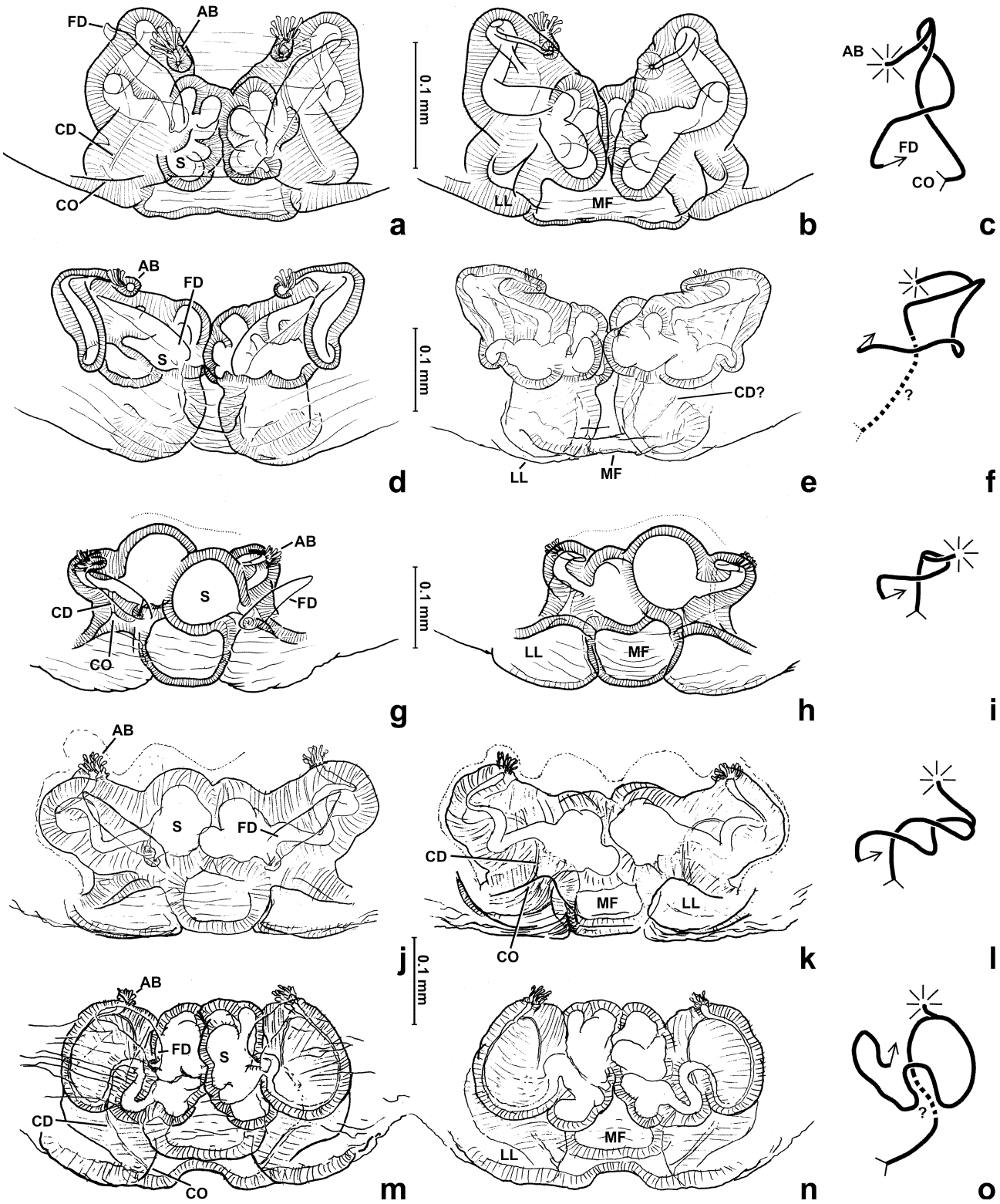

FIGURE 24. Female vulvae. **a**–**c** *C. ecotono* (**a** female paratype, dorsal view, **b** same, ventral view, **c** trajectory in ventral view, schematic); **d**–**f** *C. bellavista* (**d** female paratype, dorsal view, **e** same, ventral view, **f** trajectory in ventral view, schematic); **g**–**i** *C. casablanca* (**g** female paratype, dorsal view, **h** same, ventral view, **i** trajectory in ventral view, schematic); **j**–**l** *C. eden* (**j** female paratype, dorsal view, **k** same, ventral view, **l** trajectory in ventral view, schematic); **m**–**o** *C. recinto* (**m** female paratype, dorsal view, **n** same, ventral view, **o** trajectory in ventral view, schematic). Abbreviations: (AB) accessory bulb, (CD) copulatory duct, (CO) copulatory opening, (FD) fertilization duct, (LL) lateral lobe, (MF) median field, (S) spermathecae.

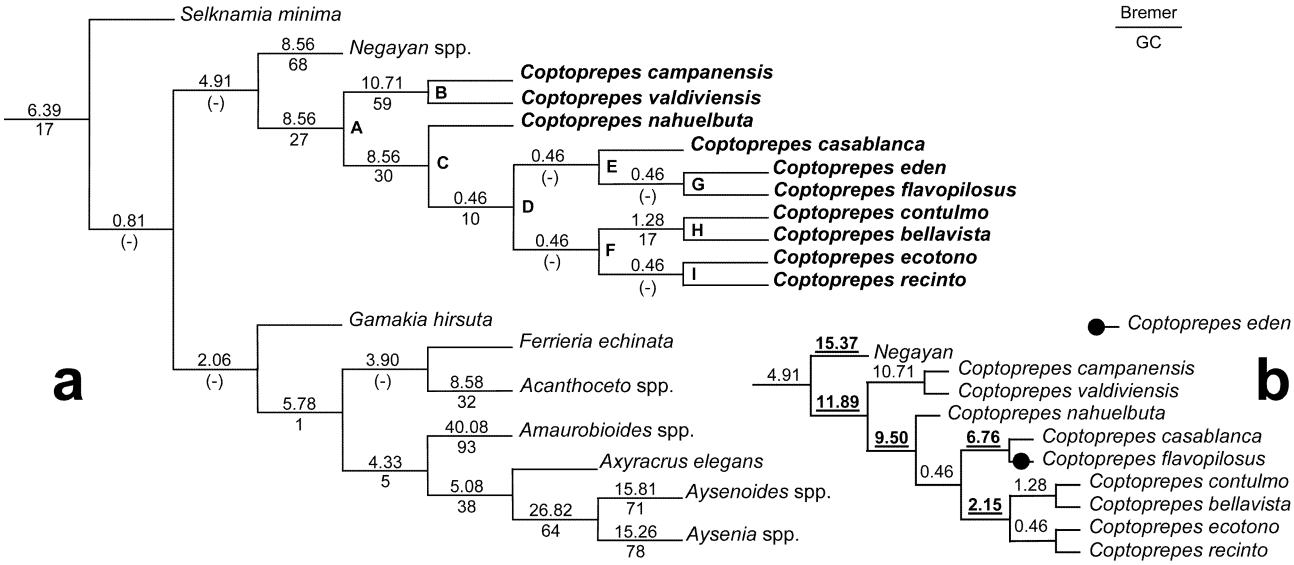

FIGURE 25. **a** Phylogenetic hypothesis of *Coptoprepes* species and outgroups. Support values for groups expressed as Bremer support in units of fit x 100 (BS, top left) and GC frequency differences (bottom) for the tribe Amaurobioidini. Groups without values do not appear in the majority frequency differences tree. Only the basal branch is shown for outgroup genera with more than one species (indicated by "spp."). Constant of concavity K = 6, Fit: 75.82551, length: 1056. b Detail of the tree, showing Bremer support values after the pruning of *Coptoprepes eden*, known by the female only; increased support values are underlined.

groups with Bremer support = 0.46. Because much of the phylogenetic structure comes from characters of the male copulatory bulb, we investigated whether the instability was caused by *Coptoprepes eden*, known only from the female. We recalculated Bremer and GC support values pruning *C. eden* from the trees after the searches (TNT commands: *bsupport/<excluded terminal>;* and *resample/<excluded terminal>;*). As shown in Figure 25b (underlined figures), only two groups within *Coptoprepes* increase their support after the pruning of *C. eden*. Further pruning *C. contulmo*, known only from the male, did not improve Bremer values. This means that while some of the lowest Bremer support values are due to the missing entries introduced by *C. eden*, there is still character conflict coming from the observations. We expect that the discovery of the males of *C. eden* will help resolve not only its placement in the skeleton tree of Fig. 25b, but also the relationships between all *Coptoprepes* species in Clade C (Fig. 25a).

Table 3 lists the synapomorphies of *Coptoprepes* and internal clades. *Coptoprepes* is remarkably variable in characters that are usually quite constant in genera of entelegyne spiders. For example, *Coptoprepes* shows intrageneric variation in the presence of RTA (char 44), the wrapping of the copulatory ducts (char. 123), and the spermathecae being spherical (char. 130). Because those characters are potential synapomorphies of other clades within the tribe Amaurobioidini, it seems that the variation found in *Coptoprepes* is one of the causes of the low support of all neighboring branches of the tree. For example, *C. valdiviensis* has a long and thin RTA, otherwise synapomorphic of a clade including *Ferrieria*, *Acanthoceto*, *Amaurobioides*, *Axyracrus*, *Aysenia* and *Aysenoides*.

TABLE 1. Vectors of character scorings for *Coptoprepes* species, following character numbers as in Ramírez (2007) and Izquierdo and Ramírez (2008). Polymorphic terminals are coded as follows: [01] = a, [12] = b, [13] = c, [03] = d, [2345] = e, [012] = f.

	0		10		20		30		40		50		60	
	|	|	|	|	|	|	|	|	|	|	|	|	|	|
C. valdiviensis	..100	0	10000	201	300	0	1	10000	0??01	10001	1100	10?00	1100	1
C. campanensis	..100	0	10000	101	300	0	1	10000	0??00	??001	1100	10?00	1100	0
C. flavopilosus	..000	0	10000	201	300	20000	1	0	1	1	1100	10?00	1100	1

	0		10		20		30		40		50		60	
	|	|	|	|	|	|	|	|	|	|	|	|	|	|
C. nahuel	..100	0	10000	201	300	20000	1	10000	0??01	1	1100	10?00	1100	0000?
C. recinto	..100	0	10000	101	300	10000	1	10000	0??01	1	1100	10?00	1100	1
C. eden	..000	0	10000	0020?	??30?	a??00	1	100?0	0????	?????	?????	?????	?????	?????
C. bellavista	..000	0	10000	201	300	10000	1	0	0??01	1	1100	10000	1100	1
C. ecotono	..100	0	10000	101	300	10000	1	10000	0??01	?0001	1100	10000	1100	100
C. contulmo	..000	0	10000	0020?	300	20000	00??1	0	0??01	1	1100	10000	1100	1
C. casablanca	..100	0	10000	101	300	20000	1	0	0??01	1	1100	10000	1100	0

	70		100		110		120		130		140		150	
	|	|	|	|	|	|	|	|	|	|	|	|	|	|
C. valdiviensis	00?0?	0	10100	0	0???0	0	1000	10	1010	1	11011	10000	111	11100
C. campanensis	?????	??	11100	0	0???0	0	1000	10	1010	1	11012	10000	111	11100
C. flavopilosus	00?0?	0	10100	0	0???0	0	1000	10	1000	1	1011	10000	111	11100
C. nahuel	?????	??	10100	0	0???0	0	1000	10	1010	1	11010	10000	111	11100
C. recinto	10?0?	0	1110a	0	0???1	0	1000	10	1010	0000a	1101b	10000	10	110a0
C. eden	?????	??	?????	?0000	0???0	0	1010	10	0100?	1	1011	10000	0	110a0
C. bellavista	10?00	0	11100	0	0???0	0	1000	10	1000	1	1101a	10000	10	11a00
C. ecotono	?????	??	1110	0	0???0	0	1010	10	1000	0000a	a10aa	10000	000a0	11000
C. contulmo	10?00	0	11100	0????	?????	?????	?????	?????	?????	1	11010	10000	11	11100
C. casablanca	?????	??	10100	0	0???0	0	1000	10	11000	1	1101f	10000	10	11a00

	160		170		180		190		200		370	
	|	|	|	|	|	|	|	|	|	|	|	|
C. valdiviensis	a0001	0101a	11100	31111	11111	11101	11111	11111	11111	1	?????	?????
C. campanensis	?0001	1010	11100	21111	11111	1a101	11111	11111	11111	1	?????	?????
C. flavopilosus	?0001	0101a	1a111	31111	11111	111a1	11111	11111	11111	1	1001	0
C. nahuel	?0001	01a1a	11100	31111	11111	11101	11111	11111	11111	1	0100a	?0000
C. recinto	1	0a01a	11100	31111	11111	11101	11a11	11111	11111	1	1000	?0000
C. eden	1	1011	11111	c1111	11111	11101	11111	11111	11111	1	?????	?????
C. bellavista	1	0101a	11100	d1111	11111	11101	11111	11111	1a111	1	0100a	a0000
C. ecotono	1	0101a	111a0	a1111	11111	111a1	11111	11111	11111	1	1000	?0000
C. contulmo	1	1010	11100	31111	11111	11101	11111	11111	11111	1	1000	?0000
C. casablanca	1	0101a	1111a	31111	11111	11101	11111	11111	11111	1	11001	0

	380		390		400		410		420		430		440
	|	|	|	|	|	|	|	|	|	|	|	|	|
C. valdiviensis	?????	?????	??100	11	0	0010?	0000?	00???	?????	?????	?????	?????	10
C. campanensis	?????	?????	??100	11	0	0010?	0000?	00???	?????	?????	?????	?????	001-
C. flavopilosus	0	?0010	?0100	11	0	0010?	0000?	1000	110?0	0	110?0	000?0	01a1
C. nahuel	0	?0000	?0100	00?11	0	0010?	0000?	1000	110?0	0	110?0	000?0	0a01
C. recinto	0	?0000	?0100	11	0	0010?	0000?	1000	110?0	0	110?0	000?0	1101
C. eden	?????	?????	?????	?????	?????	?????	?????	?????	?????	?????	?????	?????	01??
C. bellavista	0	?0000	?0100	111	0	0010?	0000?	1000	110?0	0	110?0	000?0	0a01
C. ecotono	0	?0000	?0100	00?11	0	0010?	0000?	00???	?????	?????	?????	?????	0a0-
C. contulmo	0	?0000	?0100	11	0	0010?	0000?	1000	110?0	0	110?0	000?0	0a01
C. casablanca	0	?0010	?0100	00?11	0	0010?	0000?	00???	?????	?????	?????	?????	a101

TABLE 2. Internal steps added to characters according to intraspecific variability (C = character, IS = internal steps).

C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS	C	IS
3	1	40	2	140	3	148	18	153	5	158	8	163	8	169	30	175	3	181	5	188	23	193	1	198	8	203	1
19	1	41	2	143	3	149	7	154	3	159	10	164	3	170	5	177	12	182	2	189	1	194	2	199	1	204	6
22	5	65	1	144	10	150	5	155	2	160	20	166	15	171	2	178	5	183	3	190	15	195	5	200	11	205	1
23	4	116	2	146	4	151	4	156	5	161	2	167	26	173	27	179	3	186	2	191	2	196	20	201	6	440	4
25	2	139	5	147	4	152	12	157	8	162	7	168	4	174	21	180	7	187	6	192	2	197	10	202	2	441	5

TABLE 3. Synapomorphies of *Coptoprepes* and internal clades, as referred in Fig. 25.

Coptoprepes (clade A)	tegulum displaced basally (61): absent → present CO on epigastric furrow (121): absent → present spine tibia II p-x-1 (158): present → absent spines metat III and IV v ap (175): 2 → 0
Clade B	pPMA (416): present → absent MA bifid (442): single → bifid
Clade C	number prom teeth (25): three → five or more C2 (368): absent or just ridge → present well defined RTA curvature (443): straight → curved with tip upwards
Clade D	spine tibia II v p1-x-x (152): present → absent spine tibia II v x-p1-x (154): present → absent
Clade E	spine metat III v x-p1-x (173): absent → present C2 apex regular teeth (388): absent → present
Clade F	PMA cusps additional to pPMA-rPMA (three or more total) (70): absent → present embolus very long (101): normal → very long
Clade G	body pattern (2): present → absent spine tibia I v r1-x-x (140): present → absent
Clade H	body pattern (2): present → absent
Clade I	spine tibia II v x-x r1 (157): present → absent
C. valdiviensis	No autapomorphies
C. campanensis	RTA (44): present → absent rPMA (69): present → absent embolus very long (101): normal → very long spines tibia I v ap (144): p1ap → 0ap spines metat III and IV v ap (175): 0 → 1
C. flavopilosus	spine tibia II v p1-x x (152): absent → present spine tibia II v x-p1-x (154): absent → present
C. nahuelbuta	No autapomorphies
C. recinto	median depression on epigynum (114): absent → present FD advanced (133): absent → present spine metat III d x-r1-x (440): absent → present
C. eden	number promarginal teeth (25): five or more → three, or four CD wrapped (123): absent → present spine tibia II v r1-x-x (153): present → absent spine tibia II v x-x-r1 (157): present → absent
C. bellavista	C1 connected to rPMA (397): unconnected → connected

C. ecotono	shape of MA (67): thick → slender rPMA (69): present → absent articulation of embolus (100): movable → fixed shape embolar process (103): flattened → thin hyaline CD wrapped (123): absent → present spines metat III and IV v ap (175): 0 → 2, or p1 pPMA (416): present → absent
C. contulmo	spine tibia II v x-p1-x (154): absent → present
C. casablanca	rPMA (69): present → absent spermathecae spherical (130): absent → present C2 fusion to dorsodistal tegulum (370): free → fused pPMA (416): present → absent

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