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ORIGINAL ARTICLE

Phoxocephalidae G.O. Sars, 1891 (Crustacea: Amphipoda) collected by the R/V Almirante Saldanha off the coast of Uruguay and Argentina

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ABSTRACT

Amphipods of the family Phoxocephalidae G.O. Sars, 1891 collected by the R/V Almirante Saldanha off the coast of Uruguay and Argentina in 1972 were examined. New records from the northern Argentine Sea and Uruguayan Sea include two species of the subfamily Harpiniinae Barnard and Drummond, 1978: *Pseudharpinia jonesyi* Andrade and Senna, 2020a, previously known from southeast/southern Brazil; and *Pseudharpinia tupinamba* Senna and Souza-Filho, 2011, recorded hitherto only from southeastern Brazil. Six species of the subfamily Phoxocephalinae G.O. Sars, 1891 were also recorded: *Fuegiphoxus abjectus* Barnard and Barnard, 1980, *Fuegiphoxus fuegiensis* (Schellenberg, 1931), *Metharpinia dentiurosoma* Alonso de Pina, 2003b, *Metharpinia grandirama* Alonso de Pina, 2003b, *Metharpinia protuberantis* Alonso de Pina, 2001, and *Parafoxiphalus longicarpus* Alonso de Pina, 2001. Redescriptions and discussion on distribution and morphological variations are presented.

KEYWORDS

Haustorioidea, Operação SUL II, South America, Southwestern Atlantic Ocean, taxonomy

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Introduction

The family Phoxocephalidae G.O. Sars, 1891 is benthic, distributed worldwide and very abundant and diverse in the southern hemisphere (Barnard and Drummond, 1978; Barnard and Karaman, 1991). Despite this diversity, only 16 species of the family are known from the Warm Temperate Southwestern Atlantic and Magellanic marine ecoregions (Gappa *et al.*, 2006; Alonso, 2012; Alonso and Chiesa, 2014).

This is a report regarding the phoxocephalid amphipods collected by the R/V Almirante Saldanha during the campaign "Operação Sul II" carried out off the coast of Uruguay and Argentina in 1972. The cited R/V was incorporated into the Brazilian Navy in 1934 and it conducted several important biological and oceanographical surveys along the South American coast until 1990 (Valente, 2019).

In total, eight phoxocephalid species were recorded, being *Pseudharpinia jonesyi* Andrade and Senna, 2020a and *Pseudharpinia tupinamba* Senna and Souza-Filho, 2011 belonging to the subfamily Harpiniinae Barnard and Drummond, 1978, and six species from the subfamily Phoxocephalinae G.O. Sars, 1891: *Fuegiphoxus abjectus* Barnard and Barnard, 1980; *Fuegiphoxus fuegiensis* (Schellenberg, 1931); *Metharpinia dentiurosoma* Alonso de Pina, 2003b; *Metharpinia grandirama* Alonso de Pina, 2003b; *Metharpinia protuberantis* Alonso de Pina, 2001; and *Parafoxiphalus longicarpus* Alonso de Pina, 2001. Two of them are new records from the Uruguay-Buenos Aires shelf: *Ps. jonesyi*, previously known only from the Brazilian states of Rio de Janeiro, São Paulo, Santa Catarina and Rio Grande do Sul; and *Ps. tupinamba*, recorded only from the states of Rio de Janeiro and São Paulo.

Redescriptions are provided for the material examined and morphological variations, plus extension of their geographical distributions and bathymetrical ranges, are discussed. The new taxonomic information and findings from this study may be significant since some species were not previously thoroughly described and/or diagnosed. Comparisons of species between the original descriptions and those collected at different sites are important as they shed some light on the morphological variation present within the family and are valuable for future systematic studies.

Materials and Methods

The material examined consists of five samples collected by the R/V Almirante Saldanha, off the coast of Uruguay and Argentina, in 1972, at depths ranging from 20 to 480 meters. The campaign was part of the "Operação SUL II", as a continuation of "Operação SUL I", charged with a systematic survey of oceanographic conditions of the Southwestern Atlantic coast (Valente, 2019).

The samples were collected with rectangular dredges, and all studied specimens were stored in 70 % ethanol and deposited in the Crustacea Collection of the Universidade do Estado do Rio de Janeiro (UERJ), Museu de Zoologia da Universidade de São Paulo (MZUSP), Museu Nacional, Universidade Federal do Rio de Janeiro (MNRJ), and the Biological Collection of "Prof. Edmundo F. Nonato", Instituto Oceanográfico da Universidade de São Paulo (ColBIO). For the taxonomic study, the appendages and mouthparts were dissected and mounted on glycerin gel slides, illustrated under an optical microscope with a camera lucida, Motic BA-310, and finally digitized with CorelDRAW® 2018. The setal/spine classification system adopted in this paper follows Garm and Watling (2013). Nomenclature of the gnathopod palm is based on Poore and Lowry (1997). The distribution map was made with QGIS 3.2.1 software.

To better address the taxonomic accuracy of the group, full diagnoses are proposed, and redescriptions presented, for *F. abjectus*, *F. fuegiensis*, *M. protuberantis,* and *Pa. longicarpus*. These species were treated with more attention because they were described a long time ago and generally lack proper discussion and an updated diagnosis.

Other species, such as *Ps. jonesyi* and *Ps. tupinamba,* only had pereopods 6–7 illustrated/described with some additional material, because they were recently described, and these appendages show interesting variation of characters that make the species easily recognizable. For the same reason, *M. dentiurosoma* and *M. grandirama* had a few other diagnostic characters illustrated, along with additional descriptions. The amended diagnoses of the genera *Fuegiphoxus* Barnard and Barnard, 1980 and *Parafoxiphalus* Alonso de Pina, 2001 was made through a literature review and observations of new characters available in this study.

The following abbreviations were used on the figures: Hb, habitus; Hd, head; A1–2, antennae 1–2; Md, mandible; Mx1–2, maxillae 1–2; LL, lower lip; Mp, maxilliped; G1–2, gnathopods 1–2; P3–7, pereopods 3–7; Ep1–3, epimeral plates 1–3; Ur1–3, urosomites 1–3; U1–3, uropods 1–3; T, telson; R, right; L, left.

Systematics

Order Amphipoda Latreille, 1816

Suborder Amphilochidea Boeck, 1871

Superfamily Haustorioidea Stebbing, 1906

Family Phoxocephalidae G.O. Sars, 1891

Subfamily Harpiniinae Barnard and Drummond, 1978

Genus *Pseudharpinia* Schellenberg, 1931

Type species. *Pseudharpinia dentata* Schellenberg, 1931.

Diagnosis. See Andrade and Senna (2020a)

Genus composition. The genus is composed of 22 species: *Pseudharpinia abyssalis* (Pirlot, 1932); *Ps. antarctica* Ren in Ren and Huang, 1991; *Ps. ayutlanta* (J.L. Barnard, 1964); *Ps. berardo* Senna, 2010; *Ps. birjulini* (Gurjanova, 1953); *Ps. bonhami* Andrade and Senna, 2020a; *Ps. brevirostris* Chevreux, 1920; *Ps. calcariaria* Bushueva, 1982; *Ps. cariniceps* (K.H. Barnard, 1932); *Ps. cinca* (J.L. Barnard, 1961); *Ps. dentata* (Schellenberg, 1931); *Ps. excavata* (Chevreux, 1887); *Ps. inexpectata* Jarret and Bousfield, 1994; *Ps. jonesyi*; *Ps. latipes* (Norman, 1900); *Ps. macrospinosa* Valério-Berardo and Piera, 2006; *Ps. obtusifrons* (Stebbing, 1888); *Ps. ovata* Senna, 2010; *Ps. pagei* Andrade and Senna, 2020a; *Ps. planti* Andrade and Senna, 2020a; *Ps. tupinamba*; *Ps. vallini* (Dahl, 1954).

Pseudharpinia jonesyi Andrade and Senna, 2020a

(Fig. 1)

Pseudharpinia jonesyi Andrade and Senna, 2020a: 509, figs. 6–12.

Material examined. 1 female, dissected and illustrated, st. 2865, 34°33'S 53°12'W, Uruguay, 55 m depth, February 1972 (UERJ 465); 1 female, in 70 % ethanol, same sampling data (UERJ 466); 2 females, in 70 % ethanol, same sampling data (MNRJ 29879); 1 female, in 70 % ethanol, same sampling data (MZUSP 41265); 1 female, in 70 % ethanol, same sampling data (ColBIO BT 656).

Diagnosis. See Andrade and Senna (2020a).

Additional description. Pereopod 6 basis strongly expanded posteriorly as acute spine proximally, anterior margin and anterodistal corner covered with plumose setae, posterior margin setulose, with 1 short seta proximally; ischium short and subrectangular, anterior margin with 3 setae; merus anterior margin with 11 stout setae, posterior margin with 4 plumose setae proximally and 2 stout distally; carpus anterior margin with 1 slender and 9 stout setae, posterior margin with 1 stout seta distally; propodus anterior margin covered with long setae; dactylus about half length of propodus. Pereopod 7 coxa subtriangular; basis about 1.3 × longer than wide, expanded posteroventrally, reaching half of ischium, anterior margin with 3 setae proximally, anterodistal corner with 6 medium to long setae, posterior margin serrate, ventrally with 4 plumose setae; ischium distofacial lobe produced, anterior margin with 2 stout setae, anterodistal corner with 4 long setae; merus anterodistal corner with 2 setae, posterior margin produced distally, with 1 stout seta; carpus anterior margin with 3 setae, posterior margin with 2 setae; propodus anterior margin with 2 setae, posterior margin with 1 seta; dactylus about 75 % length of propodus.

Type locality. Brazil: Santa Catarina State coast (26°34'S 47°59'W).

Remarks. This species was originally described with material from the Brazilian state of Santa Catarina (Andrade and Senna, 2020a) and this is its first record for Uruguayan waters (Fig. 25). Despite the strong similarity between the material studied

herein, when compared to the type material, some morphological differences are noteworthy, such as (characters of type material in parentheses): pereopod 6 ischium anterior margin with three setae (*vs* five setae), carpus anterior margin with one slender and nine stout setae (*vs* seven slender and eight stout setae), posterior margin with one stout seta distally (*vs* naked), dactylus about half the length of propodus (*vs* 65 % the length of propodus); pereopod 7 coxa subtriangular (*vs* rounded), basis about 1.3 × longer than wide (*vs* slightly longer than wide) and ventrally with four plumose setae (*vs* two plumose setae), dactylus about 75 % the length of propodus (*vs* 90 % the length of propodus).

Figure 1. *Pseudharpinia jonesyi* Andrade and Senna, 2020a, female (UERJ 465), Uruguay (34°33'S 53°12'W). P6, pereopod 6, lateral view; P7, pereopod 7, lateral view. Scale bars: 0.5 mm for P5; 1.0 mm for P6.

Pseudharpinia jonesyi can be easily distinguished from its congeners by the large acute spine on the posterior margin of the sixth pereopod.

Geographic distribution. Brazil: states of Rio de Janeiro, São Paulo, Santa Catarina, and Rio Grande do Sul. Uruguay: off Rocha Province (34°33'S 53°12'W).

Bathymetric range. 25–130 m.

Pseudharpinia tupinamba Senna and Souza-Filho, 2011

(Fig. 2)

Pseudharpinia dentata. — Wakabara *et al*., 1991: 74. — Wakabara and Serejo, 1998: 579. — Valério-Berardo *et al*., 2000: 63.

Pseudharpinia aff. *dentata*. — Senna, 2010: 2077.

Not *Pseudharpinia dentata* Schellenberg, 1931: 82, fig. 42. — J.L. Barnard, 1960: 342, pl. 75. — Barnard and Drummond, 1978: 534. — Alonso de Pina *et al*., 2008: 29.

Pseudharpinia tupinamba Senna and Souza-Filho, 2011: 9, figs. 1–3. — Andrade *et al*., 2015: 33. — Serejo and Siqueira, 2018: 39. — Andrade and Senna, 2020a: 532, fig. 25.

Material examined. 1 female, dissected and illustrated, st. 2886, 38°06'S 55°13'W, Argentina, 440–480 m depth, February 1972 (UERJ 467).

Diagnosis. See Andrade and Senna (2020a).

Additional description. Pereopod 6 coxa posterior margin with 2 setae; basis anterior margin with row of plumose setae extending facially, posterior margin with 12 plumose setae, setulose medially, with 3 blunt lobes proximally; ischium short and subrectangular, anterodistal corner with 5 setae extending facially; merus anterior margin with 1 slender and 7 stout setae, posterior margin with 3 stout setae distally; carpus anterior margin with 6 stout setae and 4 setae distally, posterior margin with 2 stout setae distally; propodus anterior margin covered with long setae, posterior margin with 2 setae distally; dactylus about 40 % length of propodus. Pereopod 7 coxa subtriangular; basis about 1.4 × longer than wide, expanded posteroventrally, reaching apex of merus, anterodistal corner with 2 stout setae and row of 9 long plumose setae, posterior margin serrate, with few plumose setae; ischium distofacial lobe produced, anterior margin with 3 setae, anterodistal corner with 6 plumose setae; merus anterior margin with 6 setae, posterior margin produced distally, with 1 stout seta; carpus anterior margin with 6 setae, posterodistal corner with 2 setae; propodus anterior margin with 3 setae, posterior margin with 1 seta; dactylus slightly longer than propodus.

Type locality. Brazil, São Paulo, estuarine complex of Santos (24°10'32"S 45°29'10"W).

Remarks. The species was previously known only from the Brazilian southeastern states of Rio de Janeiro and São Paulo (Andrade and Senna, 2020a), and here, we extend its distribution southwards to Argentina (Fig. 25). The material examined in this study is very similar to the type material; however, some subtle morphological differences are of particular interest such as (characters of type material in parentheses): pereopod 6 basis posterior margin with 12 plumose setae (*vs* four plumose setae), ischium anterodistal corner with five setae extending facially (*vs* anterodistal corner naked), merus anterior margin with one slender and seven stout setae (*vs* one slender and two stout setae), carpus anterior margin with six stout setae (*vs* three stout setae), posterior margin with two stout setae distally (*vs* two slender setae distally), dactylus about 40 % the length of propodus (*vs* about half long as propodus); pereopod 7 basis anterodistal corner with two stout setae and a row of nine long plumose setae (*vs* one stout seta and three long plumose setae), merus anterior margin with six setae (*vs* two setae).

The presence of three proximal blunt lobes on the basis of the sixth pereopod makes this species easily recognizable among its congeners.

Geographic distribution. Brazil: states of Rio de Janeiro and São Paulo. Argentina: off Buenos Aires Province (38°06'S 55°13'W).

Bathymetric range. The species was previously reported from 58–100 meters depth. In this study, *Ps. tupinamba* was collected at 440–480 meters depth, showing that this species inhabits a wide bathymetric range.

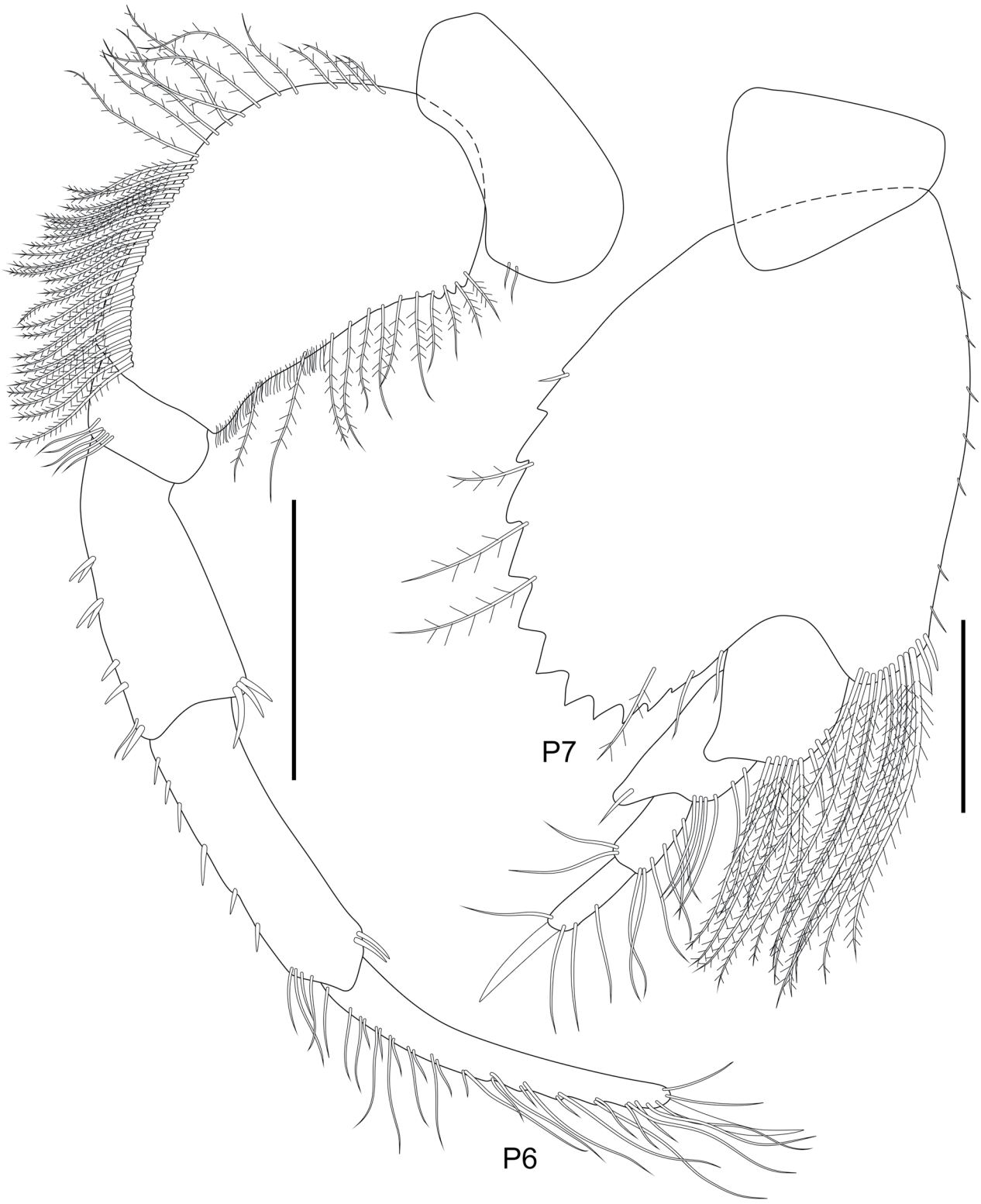

Figure 2. *Pseudharpinia tupinamba* Senna and Souza-Filho, 2011, female (UERJ 467), Argentina (38°06'S 55°13'W). P6, pereopod 6, lateral view; P7, pereopod 7, lateral view. Scale bars: 0.5 mm for P5; 1.0 mm for P6.

Subfamily Phoxocephalinae G.O. Sars, 1891

Genus *Fuegiphoxus* Barnard and Barnard, 1980

Type species. *Fuegiphoxus fuegiensis* (Schellenberg, 1931).

Amended diagnosis (after Chiesa and Alonso, 2011). Head with eyes present (absent in female *F. abjectus*), rostrum non-constricted and well developed. Antenna 1 peduncle article 2 short, ventral setae moderately spread. Antenna 2 peduncle article 1 not ensiform; article 4 with facial stout setae in 3 or more rows, with some thick and thin setae; article 5 shorter and narrower than article 4. Mandible right incisor with 3 or 4 teeth; right lacinia mobilis bifid or multicuspidate; left lacinia mobilis with 4 teeth; molar not triturative, small, bearing 3 stout setae, being one of those longer and serrate; palpar hump small, article 1 short to elongate, article 2 without lateral setae, article 3 apex oblique. Maxilla 1 inner plate with 4 setae; palp 2-articulate. Maxilliped inner plate with 1 or 2 stout setae apically; palp article 3 apex not strongly protuberant, article 4 elongate, apical nail distinct, short to medium length.

Gnathopods medium, dissimilar, with gnathopod 2 weakly enlarged. Gnathopods 1–2 propodus ovato-rectangular and elongate, weakly setose anteriorly; palms acute. Gnathopod 2 carpus short to elongate (only in *F. abjectus* is elongate) and subcryptic to cryptic. Pereopods 3–4 carpus without posteroproximal seta; propodus with thick and thin armaments, mid-apical setae absent. Pereopod 5 basis broad. Pereopods 5–6 basis not setose posteriorly; merus and carpus narrow to medium. Pereopod 7 basis naked ventrally, without facial setae.

Epimeral plates 1–2 (not described for *F. uncinatus* (Chevreux, 1912)) without long facial brushes or posterior setae. Epimeral plate 3 posteroventral corner rounded, subquadrate or with a hook, bearing 2 or more ventral setae. Urosomite 3 rounded posterodorsally. Uropod 1 peduncle elongate, without inter-ramal or major displaced stout seta, with dorsolateral setae confined apically or widely spread, medial setae widely spread. Uropod 2 peduncle strongly setose dorsally. Uropods 1–2 peduncle apico-lateral corners with faint comb (not described for *F. uncinatus*); rami not continuously setose to apex, without subapical nails, bearing embedded apical nails. Uropod 3 rami longer than peduncle; outer ramus article 2 bearing 2 medium to long setae apically. Telson lobes with 2 or 3 setae apically plus setule.

Genus composition. The genus is composed of four species: *Fuegiphoxus abjectus*; *F. fuegiensis*; *F. inutilus* Barnard and Barnard, 1980; *F. uncinatus*.

Fuegiphoxus abjectus Barnard and Barnard, 1980

(Figs. 3–7)

Parharpinia fuegiensis. — Schellenberg, 1931: 78.

Paraphoxus fuegiensis. — J.L. Barnard, 1960: 273.

Fuegiphoxus abjectus Barnard and Barnard, 1980: 862, figs. 5, 6. — Barnard and Barnard, 1990: 50. — Barnard and Karaman, 1991: 610. — González, 1991: 61. — De Broyer and Jażdżewski, 1993: 83. — Rothman, 1993: 751. — De Broyer and Rauschert, 1999: 286. — De Broyer *et al*., 2007: 187. — Chiesa and Alonso, 2007: 108. — Alonso de Pina *et al*., 2008: 8. — Chiesa and Alonso, 2011: 220, 221, 230, 231. — Andrade and Senna, 2020b: 156, 158.

Material examined. 1 female, dissected and illustrated, st. 2886, 38°06'S 55°13'W, Argentina, 440–480 m depth, February 1972 (UERJ 468); 1 female, in 70 % ethanol, same sampling data (MNRJ 29880).

Diagnosis. Head with eyes present in males and absent in females. Antenna 1, peduncle article 1 dorsal apex weakly to moderately produced. Antenna 2, peduncle article 4 with 3 facial rows of stout setae. Mandible incisor with 3 or 4 teeth, molar as small hump with 3 serrate stout setae, being 1 longer and thicker, accessory setal row with stout multicuspidate setae and short plumose setules between them, palpar hump small; palp article 3 longer than article 2. Maxilliped inner plate with 1 stout seta apically; outer plate with 2 apical cusps; palp article 4 narrow, bearing partially embedded medium apical nail. Gnathopods 1–2 palmar hump small. Gnathopod 2 carpus elongate. Pereopod 6 basis stout, anterior margin convex and

produced, posterodistal lobe produced. Epimeral plate 1 anterior and posterior margins with row of setae, posteroventral corner quadrate to subquadrate. Epimeral plate 2 with facial row of setae, posteroventral corner subquadrate. Epimeral plate 3 ventral margin almost straight, posteroventral corner rounded, posterior margin weakly convex. Uropod 1 peduncle with basofacial and ventral setae. Uropods 1–2 rami bearing embedded apical nail. Telson apex rounded apically, with small acclivity with 1 plumose and 2 stout setae on each side.

Redescription (based on female, UERJ 468). Habitus as in Fig. 3. Head without eyes; ventrolateral line present. Antenna 1 peduncle article 1 with distal brush setae ventrally and facially, dorsal apex with two setae; article 2 ventral margin with six bipectinate long setae, facially with four brush and two long bipectinate setae; article 3 ventral and dorsal margins with two setae each; primary flagellum 12-articulate; accessory flagellum 9-articulate. Antenna 2 peduncle article 3 with one facial pectinate seta; article four facial stout setae formula: 3-4-4, ventral margin moderately setose; article 5 ventral margin moderately setose, facially with one stout and one plumose medial seta plus one stout seta distally; flagellum 11-articulate. Upper lip ordinary. Lower lip inner and outer lobes covered with setules apically. Mandible incisor with 3 (left) and 4 (right) teeth; lacinia mobilis flabellate with 4 teeth (left) and multicuspidate with large tooth (right); molar as hump with three serrate stout setae (left and right); accessory setal row with eight (left) and 10 (right) stout multicuspidate setae; palp article 2 medial margin with four (left) and five (right) setae, article 3 apex oblique, with seven (left) and eight (right) medium to long setae. Maxilla 1 inner plate with four setae, one being longer and plumose, lateral margin with setules; outer plate with 10 stout setae, nine being multicuspidate; palp article 2 setulose medially and facially, with five stout setae apically and four slender setae subapically. Maxilla 2 inner plate subequal to outer, medial margin densely setulose, with six plumose setae apically and seven slender setae subapically; outer plate setose apically, lateral margin covered with setules. Maxilliped inner plate with seven plumose setae, lateral margin with setules; outer plate medial margin with eight stout blunt setae bearing setules apically, apical margin with two stout blunt setae bearing setules apically, lateral margin setulose, with two apico-lateral pappose setae; palp article 1 with one seta apico-laterally, article 2 medial margin weakly setose, lateral margin with two setae apico-laterally, article 3 margins weakly setose, article 4 with one accessory seta.

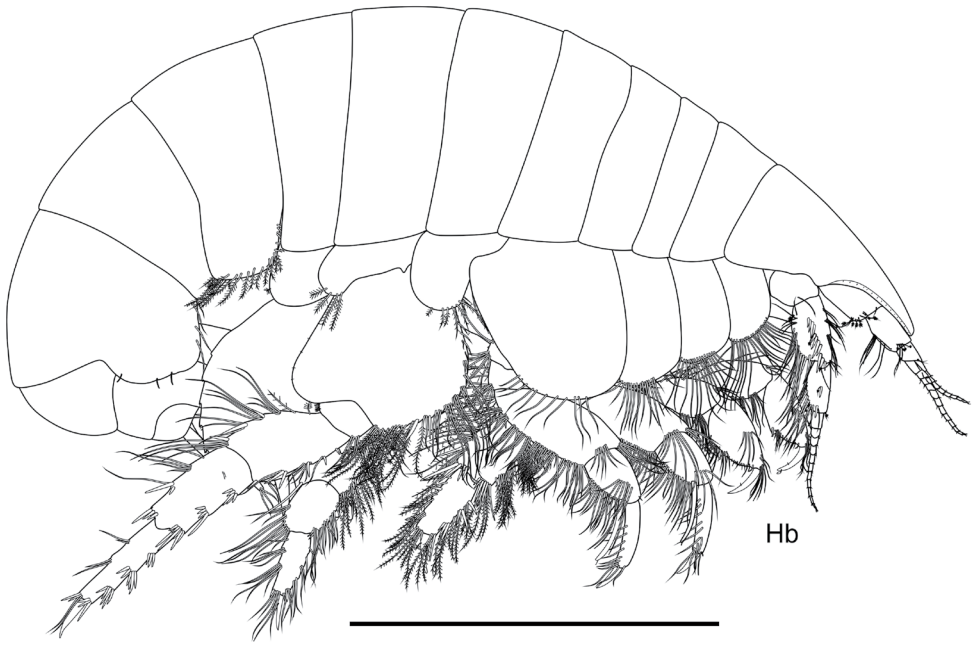

Figure 3. *Fuegiphoxus abjectus* Barnard and Barnard, 1980, female (UERJ 468), Argentina (38°06'S 55°13'W). Hb, habitus, lateral view. Scale bar: 3.0 mm.

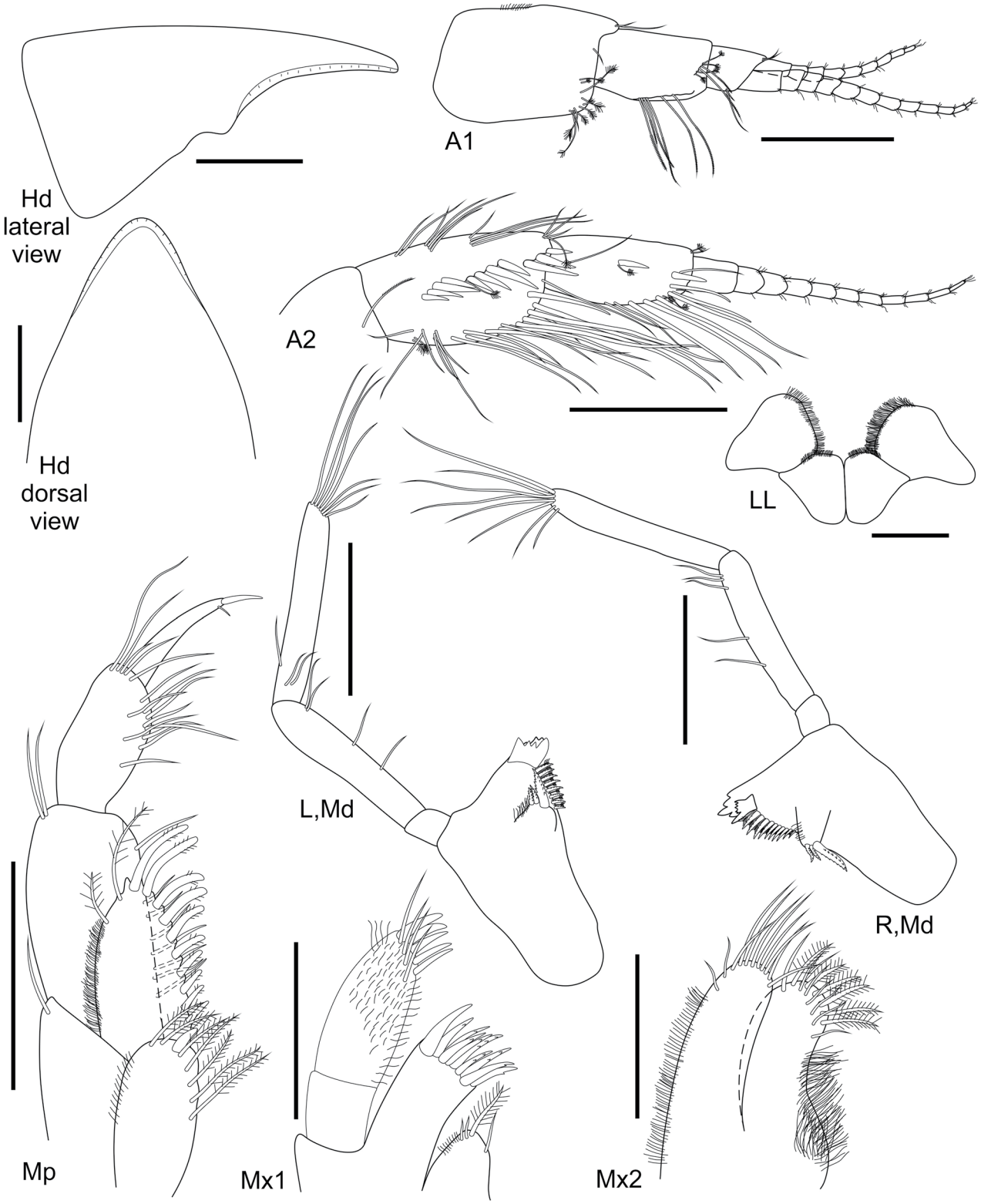

Figure 4. *Fuegiphoxus abjectus* Barnard and Barnard, 1980, female (UERJ 468), Argentina (38°06'S 55°13'W). Hd lateral view, head, lateral view; Hd dorsal view, head, dorsal view; A1, antenna 1, lateral view; A2, antenna 2, lateral view; LL, lower lip, dorsal view; L,Md, left mandible, mesial view; R,Md, right mandible, mesial view; Mp, left maxilliped, dorsal view; Mx1, left maxilla 1, dorsal view; Mx2, left maxilla 2, dorsal view. Scale bars: 0.2 mm for LL and Mx1–2; 0.3 mm for Mp, L,Md and R,Md; 0.5 mm for the remaining.

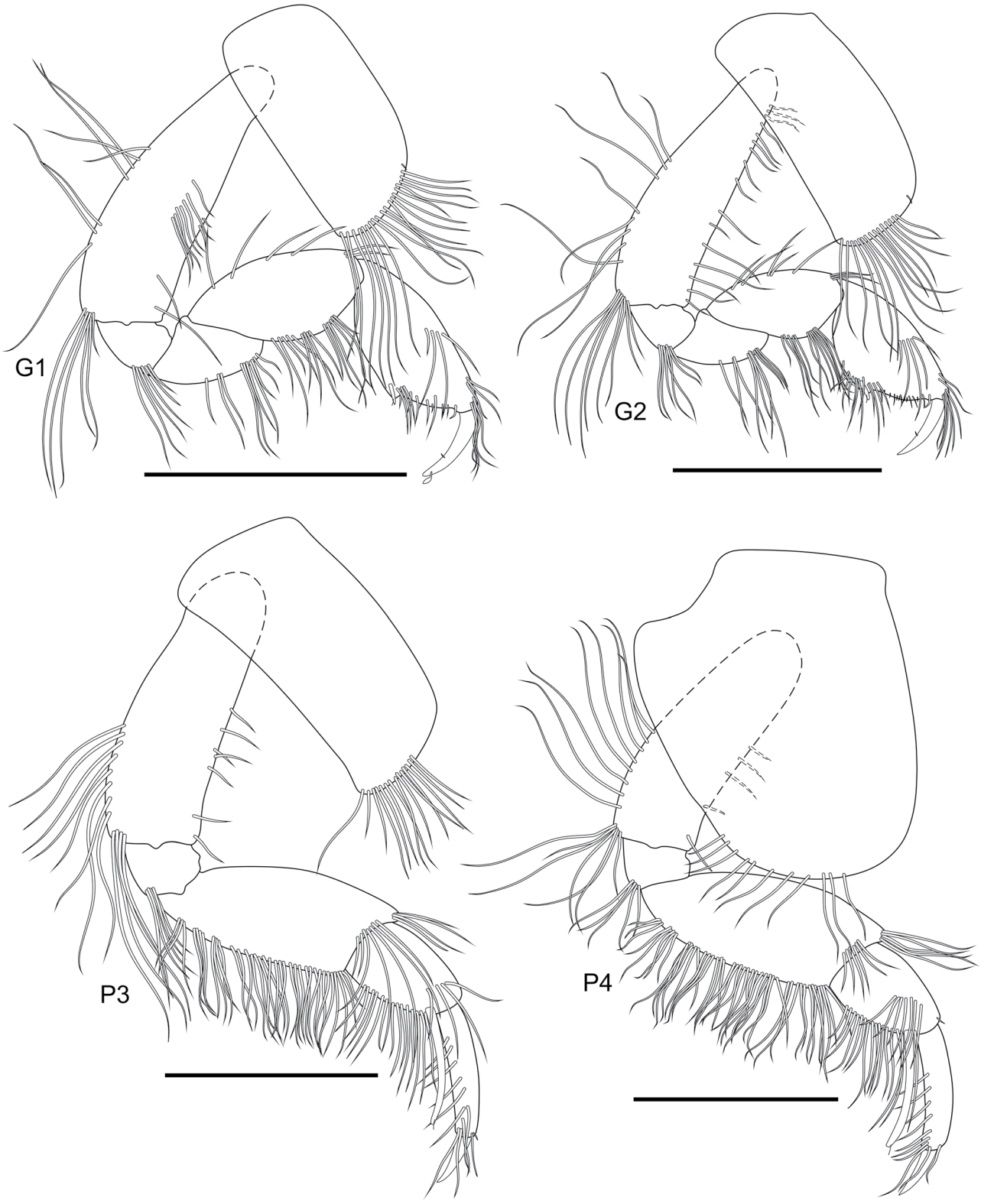

Figure 5. *Fuegiphoxus abjectus* Barnard and Barnard, 1980, female (UERJ 468), Argentina (38°06'S 55°13'W). G1, gnathopod 1, lateral view; G2, gnathopod 2, lateral view; P3, pereopod 3, lateral view; P4, pereopod 4, lateral view. Scale bars: 1.0 mm.

Figure 6. *Fuegiphoxus abjectus* Barnard and Barnard, 1980, female (UERJ 468), Argentina (38°06'S 55°13'W). P5, pereopod 5, lateral view; P6, pereopod 6, lateral view; P7, pereopod 7, lateral view. Scale bars: 1.0 mm.

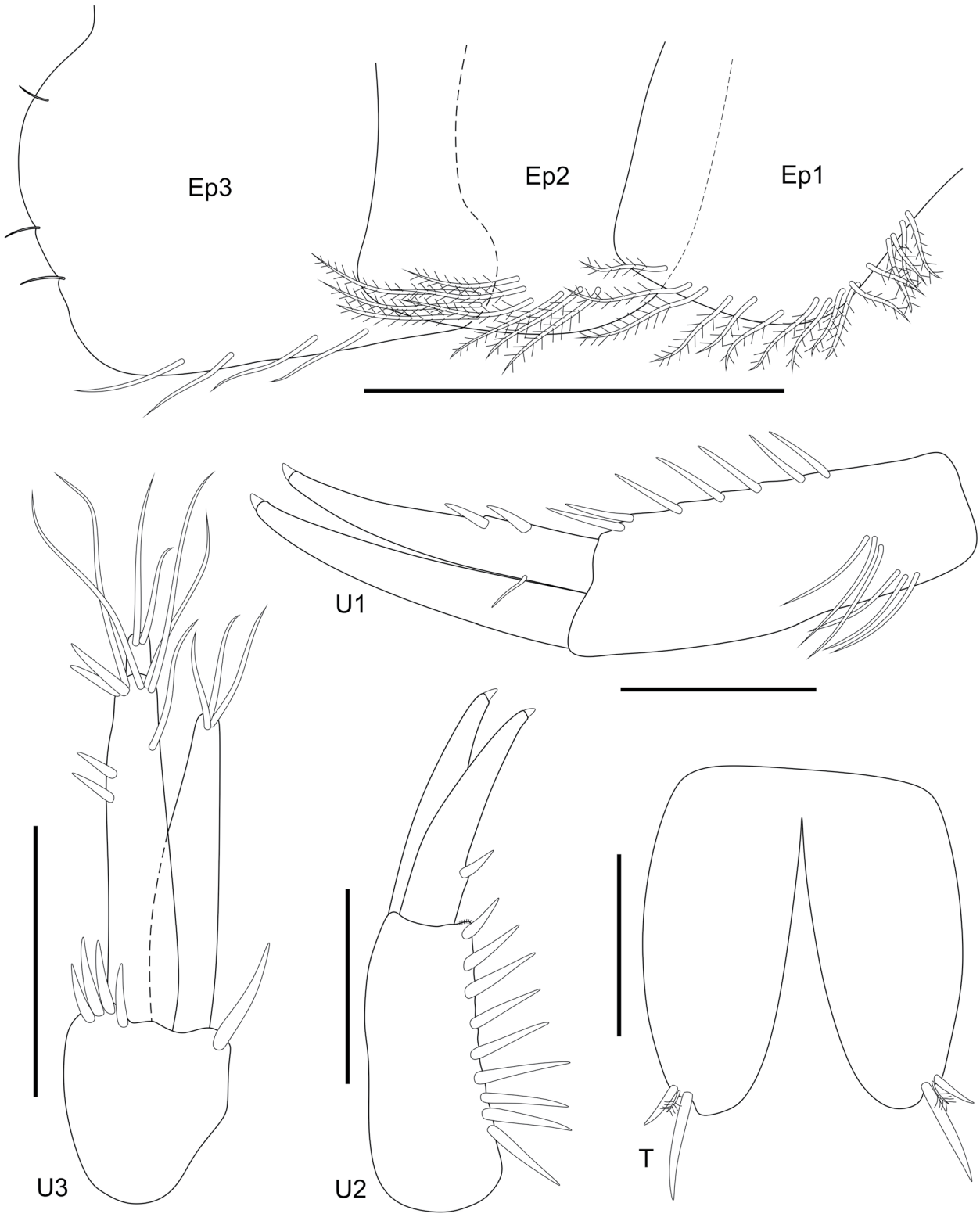

Figure 7. *Fuegiphoxus abjectus* Barnard and Barnard, 1980, female (UERJ 468), Argentina (38°06'S 55°13'W). Ep1, epimeral plate 1, lateral view; Ep2, epimeral plate 2, lateral view; Ep3, epimeral plate 3, lateral view; U1, uropod 1, lateral view; U2, uropod 2, lateral view; U3, uropod 3, lateral view; T, telson, dorsal view. Scale bars: 1.0 mm for Ep1–3; 0.3 mm for T; 0.5 mm for the remaining.

Gnathopod 1 weak to moderately setose; coxa subrectangular, ventral margin with 19 long setae; carpus subequal to propodus in length; propodus anterior margin with tuft of setae distally, posterior margin with 1 stout seta defining palm; dactylus slightly longer than palm, outer margin with 1 leaf-shaped seta distally. Gnathopod 2 weak to moderately setose; coxa subrectangular, ventral margin with 15 long setae; carpus about 0.8 × the length of propodus; propodus anterior margin with tuft of setae distally, with 1 stout seta defining palm; dactylus reaching the palmar corner. Pereopod 3 weak to moderately setose posteriorly; coxa subrectangular, ventral margin with 14 setae; carpus posterior margin setose, distally with 1 long stout seta with accessory setule almost reaching apex of propodus, with 4 facial setae; propodus posterior margin with 10 slender setae extending to facial apex; dactylus about 40 % length of propodus. Pereopod 4 similar to pereopod 3, weak to moderately setose posteriorly; coxa produced posteriorly, excavate posterodorsally, posteroventral margin with 11 setae. Pereopod 5 coxa bilobate, posteroventral margin with 6 pappose setae; basis 1.8 × longer than wide, anterior margin with 4 setae proximally and 3 medially, anterodistal corner with 8 setae; ischium short and subrectangular, anterodistal corner with row of 8 setae; merus, carpus and propodus setose, bearing plumose setae anteriorly and pappose setae posteriorly, with sets of distal stout setae; dactylus about 50 % length of propodus. Pereopod 6 coxa ovoid, anteroventral margin with 4 setae, ventral margin with small acute projection, posteroventral margin with 4 plumose setae; basis stout, slightly wider than long, anterior margin with short to long setae, medially and distally with 2 stout setae and row of long plumose setae; ischium anterodistal margin with 4 setae, posterior margin with setules; merus, carpus and propodus weak to moderately setose, bearing slender setae and sets of stout setae, mostly on anterior margin; dactylus about 40 % length of propodus. Pereopod 7 moderately setose anteriorly; coxa subtriangular, posterior margin with 1 short plumose seta; basis slightly longer than wide, expanded posteroventrally, reaching apex of merus, anterior margin with setae proximally and medially, anterodistal corner with row of 5 plumose setae, posterior margin weakly crenulate; ischium with distofacial lobe produced; merus anterior margin setose with plumose setae, posterior margin with 1 seta distally; carpus and propodus moderately setose; dactylus about half length of propodus, outer margin with 1 short plumose setae.

Epimeral plate 1 anterior and posterior margins with row of 16 plumose setae, posteroventral corner subquadrate. Epimeral plate 2 anteroventral corner rounded, with 9 facial plumose setae, posterior margin weakly concave. Epimeral plate 3 anterior margin concave, anteroventral corner rounded, ventral margin with 4 setae, posterior margin weakly convex, with 2 tiny notches bearing 1 setule each. Uropod 1 peduncle with 3 basofacial setae, dorsomedial margin with 7 stout setae, ventral margin with 3 setae proximally; outer ramus slightly longer than inner, naked; inner ramus dorsomedial margin with 2 stout setae, ventrolateral margin with 1 thin seta. Uropod 2 peduncle dorsolateral margin with 9 stout setae, with weak comb distally; outer ramus slightly shorter than inner, dorsal margin with 1 stout seta; inner ramus naked. Uropod 3 peduncle dorso-apical corner with 1 stout seta, ventro-apical corner with 4 stout setae; outer ramus 1.2 × longer than inner, article 1 ventrolateral margin with 1 thin and 4 stout setae, dorsolateral margin with 4 setae, article 2 with 2 setae apically; inner ramus with 3 setae apically. Telson about 85 % cleft, each lobe with 1 plumose and 2 stout setae.

Type locality. Chile, Bahía Inutil (53°30'S 69°45'W).

Remarks. The species was originally described by Schellenberg (1931) assigned to *Parharpinia* Stebbing, 1899 based on material collected at the Magellanic region and surroundings. J.L. Barnard (1960) re-examined the type material and defined one individual as a female of *Pa. fuegiensis*. After a thorough character analysis, Barnard and Barnard (1980) found that the *Pa. fuegiensis* original material was mixed with two undescribed species and between them, described *F. abjectus* based on a male specimen.

Barnard and Barnard (1980) state that the eyes of their specimen could be small, absent or diffuse. This character can be difficult to observe in some species due to the loss of pigmentation of the eyes after storage in collections. However, the presence of the male's eyes is clear on J.L. Barnard (1960);

also, he cites an aberrant female specimen found with no eyes and presenting a very stout and modified antennae, resembling a Lysianassidae Dana, 1849. The author's illustrations are not enough to make a detailed comparison with our samples, but the absence of eyes and shape of gnathopod 1 are confirmed, even if the stoutness of the first antenna is rejected. Although there are no more detailed descriptions of *F. abjectus* females, herein we present the first full description and illustrations of a female. Besides some common variations, such as number and length of setae on the appendages, a diagnosis for the species is provided in agreement with the literature.

The individuals studied here agree with the original description of *F. abjectus*, although they present some significant morphological differences, as follows (characters of type material in parentheses): antenna 2 article 4 facial stout setae formula as 3-4-4 (*vs* 3-3-3-1); pereopods 3–4 propodus without distal clump of setae (*vs* propodus with distal setal clump); pereopod 7 propodus distally smooth, without processes (*vs* combed, with nine digital processes); uropod 1 outer ramus naked (*vs* with three stout setae); uropod 2 inner ramus naked (*vs* with one stout seta).

Considering the newly observed characters, plus the ones pointed out by Barnard and Barnard (1980), *F. abjectus* can be distinguished from its congeners by the following: head without eyes in females; male antenna 1 with an unusual shape; facial stout setae arrangement on article 4 of antenna 2; mandible right incisor with four teeth; maxilliped outer plate with two apical cusps; gnathopod 2 weakly enlarged, carpus elongated; pereopod 5 with narrower basis; pereopod 6 basis anterior margin broadly convex, posterodistal lobe produced; epimeral plate 3 posterior margin weakly convex, with two notches bearing one setule each. In addition, characters observed in this study, such as the absence of eyes in females, the right mandible incisor with four teeth and a multicuspidate lacinia mobilis were significant to provide an amended diagnosis for the genus.

This is the first record of the species for Argentine waters (Fig. 25).

Geographic distribution. Chile: Bahía Inutil (53°30'S 69°45'W). Argentina: off northern Buenos Aires Province (38°06'S 55°13'W).

Bathymetric range. The species was previously reported from 36–55 meters depth. In the record presented herein, *F. abjectus* was collected at 440–480 meters depth, extending its distribution to a wider bathymetric range.

***Fuegiphoxus fuegiensis* (Schellenberg, 1931)**

(Figs. 8–12)

Parharpinia fuegiensis Schellenberg, 1931: 78–80, fig. 40. — Stephensen, 1949: 5–6.

Paraphoxus fuegiensis. — J.L. Barnard, 1958a: 146. — J.L. Barnard, 1958b: 118. — J.L. Barnard, 1960: 186, 195, 271–273, 282, 290, pl. 42, figs. A–R. — Sanderson, 1973: 43. — Thurston, 1974: app. C.

Paraphoxus feugiensis (sic). — Lowry and Bullock, 1976: 126.

Wildus? *fuegiensis*. — Barnard and Drummond, 1978: 18, 32, 134, 144–145.

Fuegiphoxus fuegiensis. — Barnard and Barnard, 1980: 853–858, figs. 1–3. — Barnard and Barnard, 1990: 50. — Barnard and Karaman, 1991: 610. — González, 1991: 61. — De Broyer and Jażdżewski, 1993: 83. — De Broyer and Rauschert, 1999: 286. — Alonso de Pina, 2003a: 1052–1054, figs. 13, 14. — Chiesa *et al*., 2005: 169–171, fig. 2C. — De Broyer *et al*., 2007: 187. — Chiesa and Alonso, 2007: 108. — Alonso de Pina *et al*., 2008: 9, 10, 33–35. — Alonso, 2012: 1883. — Alonso and Chiesa, 2014: 206, 207, 209, fig. 2F–J.

Material examined. 1 female, dissected and illustrated, st. 2886, 38°06'S 55°13'W, Argentina, 440–480 m depth, February 1972 (UERJ 470); 2 females, in 70 % ethanol, same sampling data (UERJ 471); 3 females, in 70 % ethanol, same sampling data (MNRJ 29881); 3 females, in 70 % ethanol, same sampling data (MZUSP 41266); 3 females, in 70 % ethanol, same sampling data (ColBIO BT 654).

Diagnosis. Head with ovoid eyes. Antenna 2 peduncle article 4 with 3 facial rows of stout setae; article 5 facially with 1 medial stout seta and 1 distal one. Mandible incisors with 3 teeth, molar as small hump with 3 serrate stout setae, 1 being longer and thicker, accessory setal row with stout multicuspidate setae and short plumose setules between them, palpar hump small; palp article 1 weakly elongate, article 3

slightly longer than article 2. Maxilliped inner plate with 1 stout seta apically; outer plate with 1 apical cusp; palp article 4 narrow, bearing partially embedded medium apical nail. Gnathopods 1–2 palmar hump small. Gnathopod 2 carpus short. Epimeral plate 1 posteroventral corner subquadrate. Epimeral plate 2 with horizontal facial row of setae. Epimeral plate 3 ventral margin almost straight, posteroventral corner rounded. Uropod 1 peduncle with baso-facial setae, apico-lateral corner weakly combed. Uropod 2 apico-lateral corner weakly combed. Uropods 1–2 rami bearing embedded apical nail. Uropod 3 outer ramus with short article 2, bearing 2 setae apically. Telson apex subtruncate, with 1 plumose and 2 stout setae on each lobe.

Redescription (based on female, UERJ 470). Habitus as in Fig. 8. Head with medium-sized and ovoid eyes, rostrum not constricted. Antenna 1 peduncle article 1 ventral margin with long and brush setae distally, dorsal margin with setules proximally, dorsal apex produced with 2 setae; article 2 ventral margin with 7 long setae; article 3 ventral margin with 2 setae distally, with 4 facial brush setae; primary flagellum 9-articulate, with aesthetascs on articles 4–8; accessory flagellum 7-articulate. Antenna 2 peduncle article 3 with 1 distal seta each dorsally and facially; article 4 facial stout setae formula: 3-4-2, ventral margin with 5 long pectinate setae and 2 plumose setae proximally, dorsal margin with 2 sets of short to long setae, dorsal margin with 2 sets of setae (proximal, with two short simple and two long pectinate; distal, with one short simple, one short plumose and one long simple); article 5 ventral margin with 3 long pectinate and 3 brush setae distally; flagellum 8-articulate.

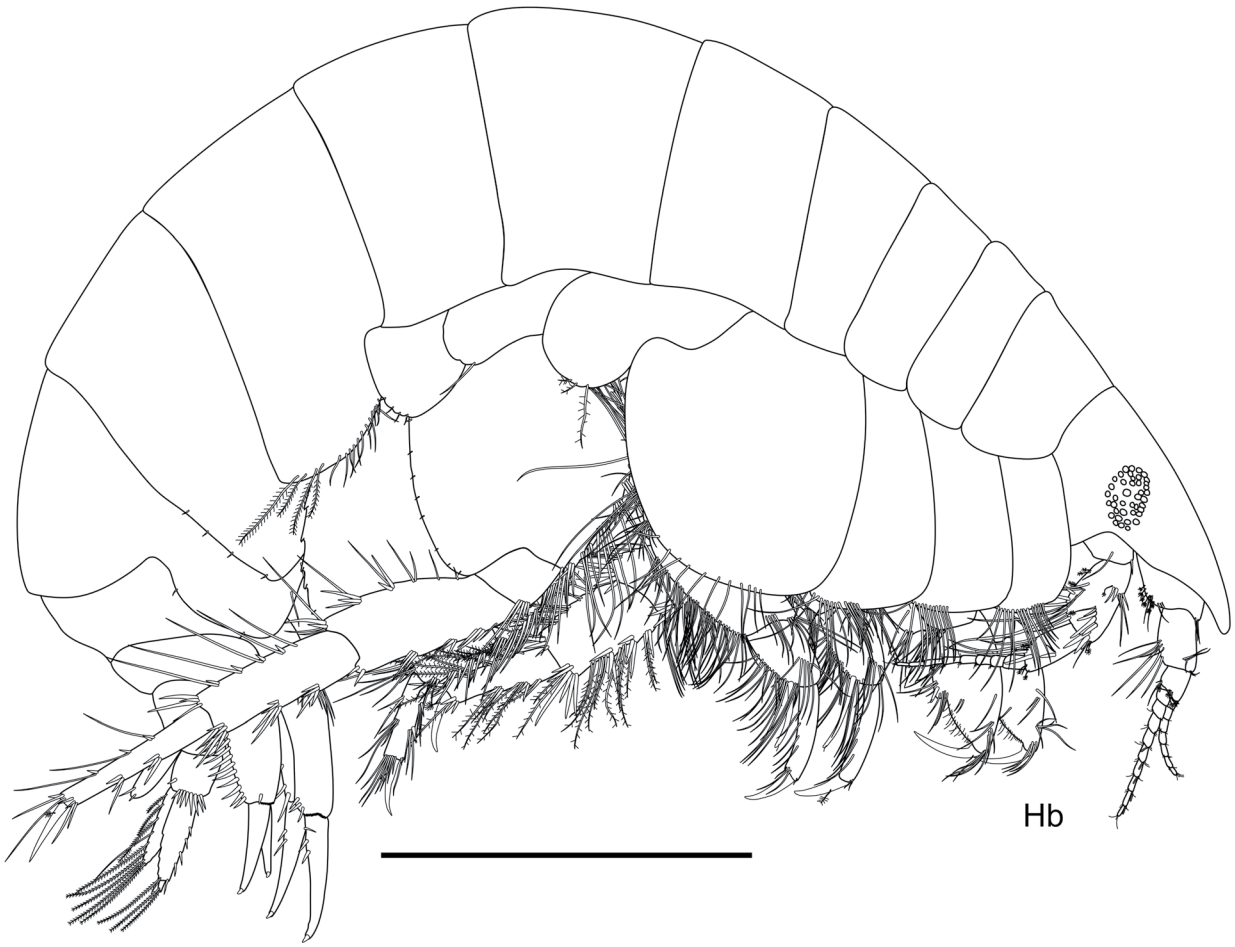

Figure 8. *Fuegiphoxus fuegiensis* (Schellenberg, 1931), female (UERJ 470), Argentina (38°06'S 55°13'W). Hb, habitus, lateral view. Scale bar: 2.0 mm.

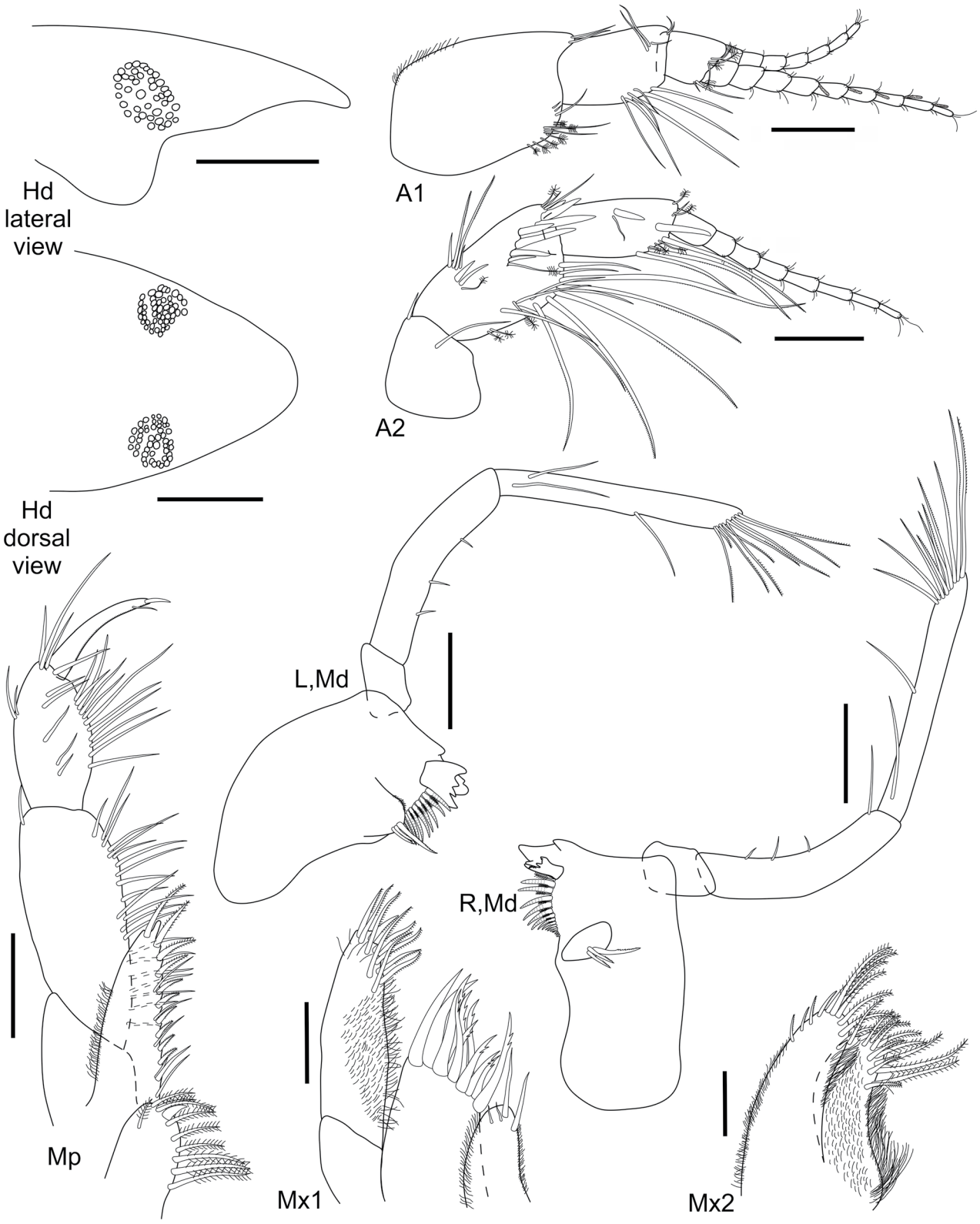

Figure 9. *Fuegiphoxus fuegiensis* (Schellenberg, 1931), female (UERJ 470), Argentina (38°06'S 55°13'W). Hd lateral view, head, lateral view; Hd dorsal view, head, dorsal view; A1, antenna 1, lateral view; A2, antenna 2, lateral view; L,Md, left mandible, mesial view; R,Md, right mandible, mesial view; Mp, left maxilliped, dorsal view; Mx1, left maxilla 1, dorsal view; Mx2, left maxilla 2, dorsal view. Scale bars: 0.1 mm for Mx1–2; 0.5 mm for Hd; 0.2 mm for the remaining.

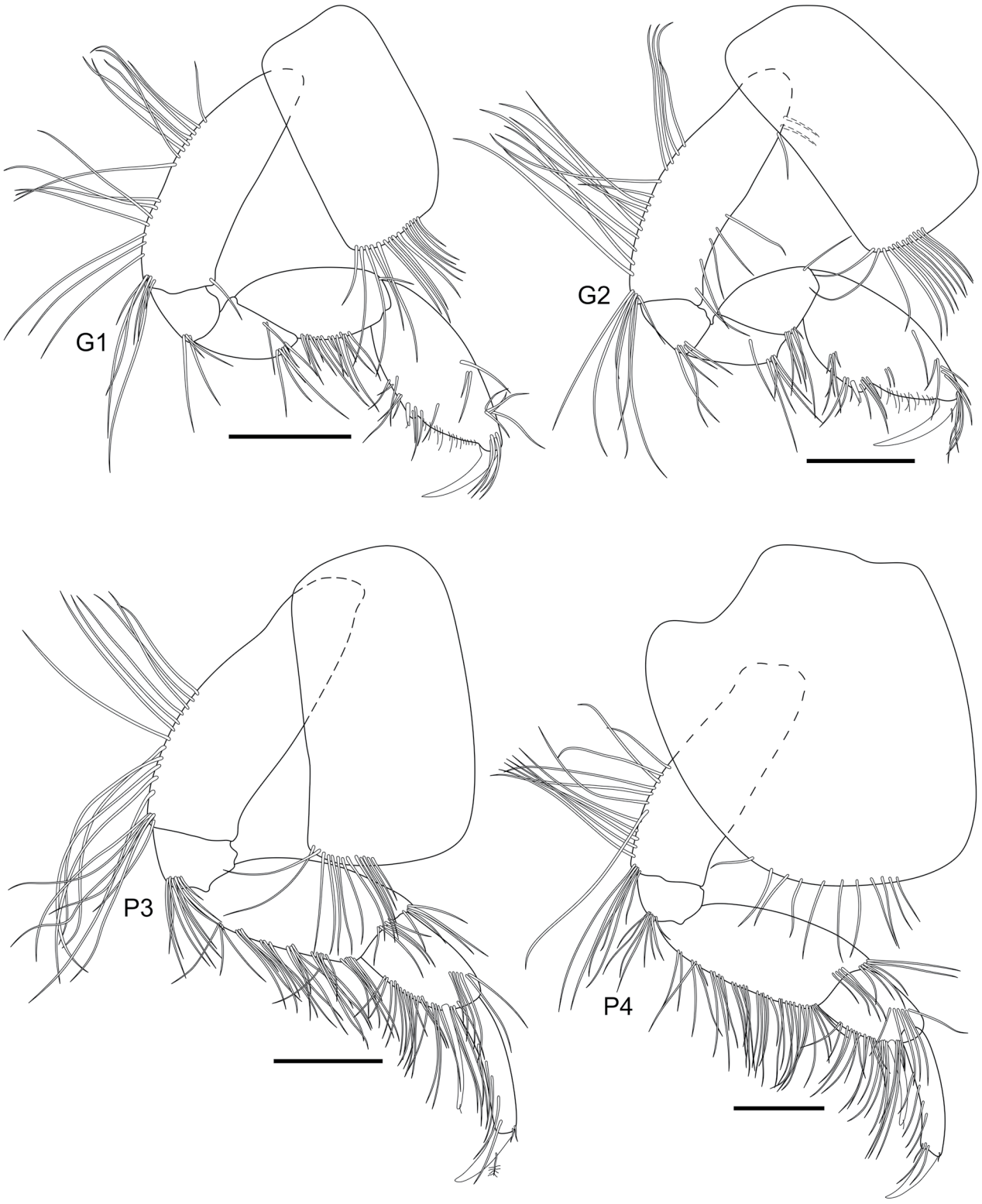

Figure 10. *Fuegiphoxus fuegiensis* (Schellenberg, 1931), female (UERJ 470), Argentina (38°06'S 55°13'W). G1, gnathopod 1, lateral view; G2, gnathopod 2, lateral view; P3, pereopod 3, lateral view; P4, pereopod 4, lateral view. Scale bars: 0.5 mm.

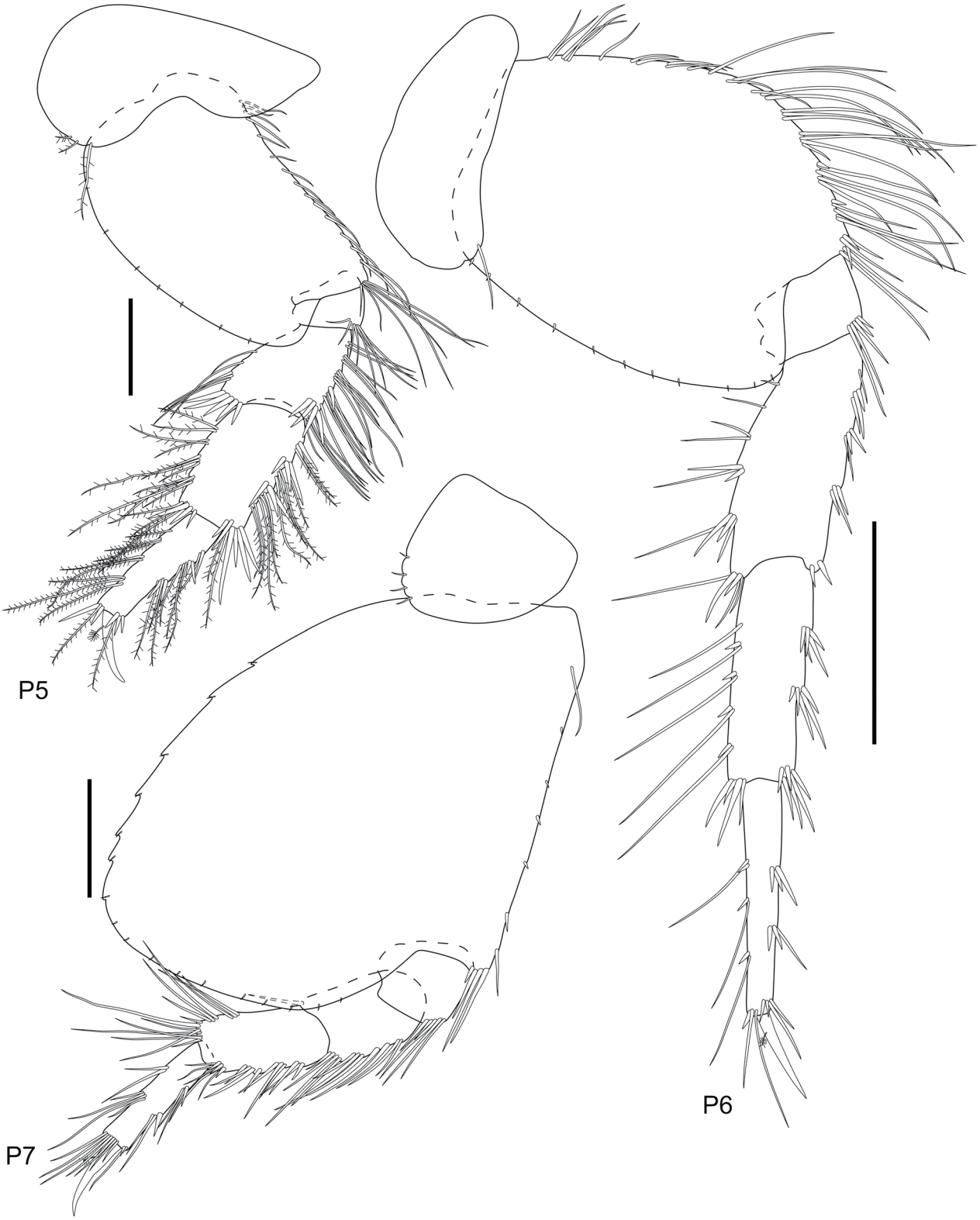

Figure 11. *Fuegiphoxus fuegiensis* (Schellenberg, 1931), female (UERJ 470), Argentina (38°06'S 55°13'W). P5, pereopod 5, lateral view; P6, pereopod 6, lateral view; P7, pereopod 7, lateral view. Scale bars: 1.0 mm for P6; 0.5 mm for the remaining.

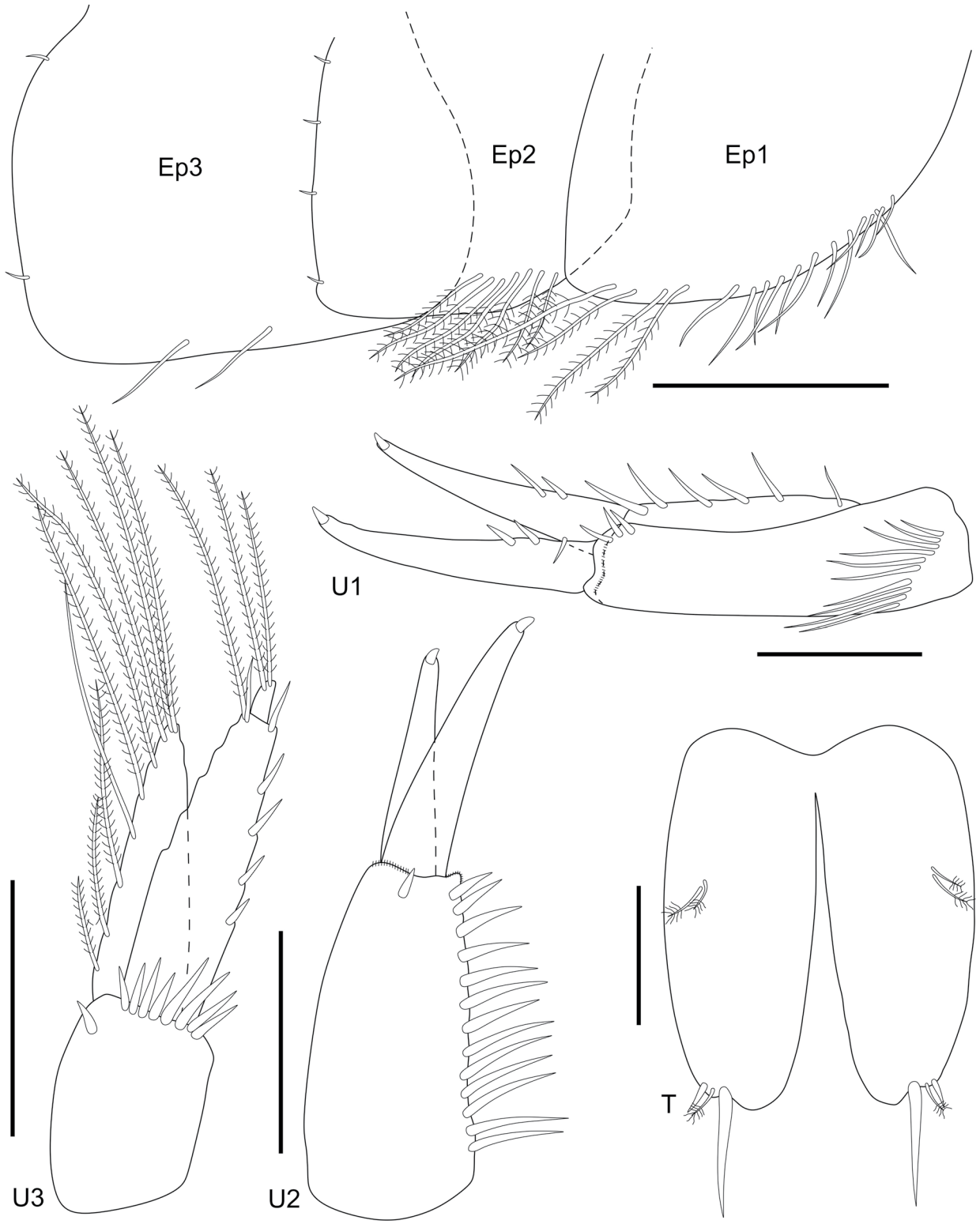

Figure 12. *Fuegiphoxus fuegiensis* (Schellenberg, 1931), female (UERJ 470), Argentina (38°06'S 55°13'W). Ep1, epimeral plate 1, lateral view; Ep2, epimeral plate 2, lateral view; Ep3, epimeral plate 3, lateral view; U1, uropod 1, lateral view; U2, uropod 2, lateral view; U3, uropod 3, lateral view; T, telson, dorsal view. Scale bars: 0.1 mm for T; 0.5 mm for the remaining.

Upper lip and lower lip ordinary. Mandible incisor with 3 teeth (left and right); lacinia mobilis with 4 teeth (left) and multicupidate (right); molar as hump with 3 weakly serrate stout setae (left and right); accessory setal row with 10 (left) and 8 (right) multicuspidate stout setae; palp article 2 medial margin with 3 (left) and 4 (right) setae, article 3 apex oblique, with 9 (left) and 10 (right) medium to long pectinate setae. Maxilla 1 inner plate with 2 long and 2 short setae, medial and lateral margins setulose; outer plate with 11 stout setae, being 9 multicuspidate; palp article 2 medial margin setulose, with row of 6 pectinate setae extending to apical margin and 4 pectinate setae subapically, setulose facially. Maxilla 2 inner plate subequal to outer, densely setulose medially and facially, apical, and subapical margins setose with medium to long plumose setae; outer plate medial margin setulose, apically with 6 long plumose setae, lateral margin setulose, with 4 stout pectinate setae distally. Maxilliped inner plate with 10 plumose setae; outer plate medial margin with 8 stout bipectinate setae and 6 setae, apical margin with 2 stout bipectinate setae, lateral margin with row of setules; palp article 2 medial margin moderately setose, lateral margin with 1 seta distally, article 3 medial margin moderately setose, with 5 facial setae, lateral margin with 2 setae medially and 3 distally, article 4 elongate, medial margin minutely combed, bearing 1 accessory seta.

Gnathopod 1 weak to moderately setose; coxa subrectangular, ventral margin with 14 setae; carpus about 0.7 × the length of propodus; propodus anterior margin with tuft of setae distally, posterior margin with 1 stout seta defining palm; dactylus reaching the palmar corner. Gnathopod 2 weak to moderately setose; coxa subrectangular, ventral margin with 12 setae; carpus anterior margin with 1 seta distally, posterior margin with 6 setae; propodus anterior margin with 3 setae and tuft of setae distally, posterior margin weakly setose, with 1 stout seta defining palm; dactylus reaching palmar corner, outer margin with 1 setule proximally. Pereopod 3 weak to moderately setose posteriorly; coxa subrectangular, ventral margin with 13 setae; carpus posterior margin moderately setose, distally with 1 long stout seta with accessory setule extending about 75 % length of propodus, with facial row of 6 setae; propodus posterior margin with 5 slender setae extending to apex; dactylus about 55 % length of propodus, outer margin with 1 short plumose seta. Pereopod 4 similar to pereopod 3, weak to moderately setose posteriorly; coxa produced posteriorly, excavate posterodorsally, posteroventral margin with 11 setae; merus longer and less stout than in pereopod 3. Pereopod 5 coxa bilobate, posteroventral margin with 3 pappose setae; basis 2.5 × longer than wide, anterior margin moderately setose, anterodistal corner with 6 setae; merus moderately setose, with stout setae distally; carpus and propodus moderately setose, with stout setae medially and distally, bearing pappose setae anteriorly and plumose setae posteriorly; dactylus about 50 % length of propodus, outer margin with 1 plumose seta. Pereopod 6 coxa posteroventral margin with 1 seta; basis 1.2 × longer than wide, anterior margin moderately setose; merus, carpus, propodus weakly setose, with sparse sets of stout setae mainly on anterior margin; dactylus about 40 % length of propodus, outer margin with 1 plumose seta proximally. Pereopod 7 coxa subtriangular, posterior margin with 4 setae; basis 1.3 × longer than wide, expanded posteroventrally, reaching half of carpus, anterodistal corner with 4 setae, posterior margin crenulate; merus, carpus, and propodus weak to moderately setose, with slender and sparse stout setae; dactylus about 60 % length of propodus, outer margin with 1 plumose seta proximally.

Epimeral plate 1 anterior margin with row of setae extending to anteroventral corner, ventral margin with 4 long plumose setae. Epimeral plate 2 anterior margin weakly concave, with 7 facial plumose setae, posterior margin weakly concave, with 4 short setae. Epimeral plate 3 anterior margin convex, ventral margin with 2 setae, posterior margin with 2 short setae. Uropod 1 peduncle with 10 basofacial setae, dorsomedial margin with 6 stout setae, dorsolateral margin with 3 setae distally, apico-lateral corner weakly combed; outer ramus slightly longer than inner, dorsal margin with 2 stout setae; inner ramus dorsal margin with 2 stout setae, ventrolateral margin with 1 thin seta. Uropod 2 peduncle dorsomedial margin with 13 stout setae, margins dorso-apical and ventro-apical weakly combed; rami naked; outer ramus 1.2 × longer than inner. Uropod 3 peduncle dorsomedial margin with 1 stout seta, apically with row of 8 stout setae; outer

ramus 1.2 × longer than inner, article 1 ventrolateral margin with 5 stout setae, dorsolateral margin with 2 plumose setae distally, article 2 short, with 2 long plumose setae apically; inner ramus dorsomedial margin with 7 long plumose setae, apically with 2 long plumose setae. Telson about 80 % cleft, each lobe with 1 plumose and 2 stout setae.

Type locality. Chile, Magellanic region (54°08'S 71°01'W).

Remarks. Over time, *F. fuegiensis* has been allocated in three distinct genera; however, the species was not fully diagnosed, as we do here, and the appendages were lacking full illustrations and descriptions. Alonso de Pina (2003a) reported the possibility to observe certain variations among individuals of this species, mainly regarding the number of thin and stout setae on mouthparts and appendages. These variations were also found in the analyzed material, especially on the formula of facial setae present on the article 4 of antenna 2. They appear to be lower in number in smaller specimens and more numerous in larger ones, which can be related to the maturity of each individual. The material analyzed here shows 3-4-2 as the most common facial stout setal formula on the fourth article of antenna 2, while the original work by Barnard and Barnard (1980) shows 3-3-2. Additionally, Alonso de Pina (2003a) reported three different patterns in Argentina: 3-4-3 and 3-4-1 for specimens collected at Golfo Nuevo; and 3-3-3 for individuals from Golfo San José.

Chiesa and Alonso (2011) proposed an identification key to world species of *Fuegiphoxus* using a variable character as a diagnostic one (facial setal formula on article of antenna 2). Thus, we recommend disregarding this character in the third step of the key, and still consider the other ones, and the key will work properly for future identifications.

Geographic distribution. The species is well represented in southern South America, ranging from southern Uruguay (Atlantic coast), through the Beagle Channel, to Valparaiso, Chile (Pacific coast) (Alonso, 2012). Also, there are records of *F. fuegiensis* from South Shetland Islands (Antarctica), Tristan da Cunha and South Georgia Islands (Alonso de Pina *et al*., 2008).

Bathymetric range. 0–1,031 meters depth.

Genus *Metharpinia* Schellenberg, 1931

Type species. *Metharpinia longirostris* Schellenberg, 1931

Diagnosis. See Andrade and Senna (2020c).

Genus composition. The genus is composed of 10 species: *Metharpinia coronadoi* J.L. Barnard, 1980; *M. dentiurosoma*; *M. floridana* (Shoemaker, 1933); *M. grandirama*; *M. iado* Alonso de Pina, 2003; *M. jonesi* (J.L. Barnard, 1963); *M. longirostris* Schellenberg, 1931; *M. oripacifica* J.L. Barnard, 1980; *M. protuberantis*; *M. taylorae* Andrade, Johnsson and Senna, 2015.

Metharpinia dentiurosoma Alonso de Pina, 2003b

(Fig. 13)

Metharpinia dentiurosoma Alonso de Pina, 2003b: 2523, figs. 1–7. — López-Gappa *et al*., 2006: 16, 52. — Alonso and Chiesa, 2014: 206, 207, 209, fig. 3C, E–I. — Andrade *et al*., 2015: 39. — Andrade and Senna, 2020c: 2, figs. 1–6.

Material examined. 1 female, dissected and illustrated, st. 2861, 36°29'S 55°57'W, Argentina, 20 m depth, February 1972 (UERJ 461); 4 females, in 70 % ethanol, st. 2868, 36°23'S 53°32'W, Argentina, 51 m depth, February 1972 (UERJ 462); 4 females, in 70 % ethanol, st. 2868, 36°23'S 53°32'W, Argentina, 51 m depth, February 1972 (MNRJ 29882); 4 females, in 70 % ethanol, st. 2868, 36°23'S 53°32'W, Argentina, 51 m depth, February 1972 (MZUSP 41267); 4 females, in 70 % ethanol, st. 2868, 36°23'S 53°32'W, Argentina, 51 m depth, February 1972 (ColBIO BT 655); 1 female, in 70 % ethanol, st. 2888, 37°56'S 57°07'W, Argentina, 31 m depth, February 1972 (UERJ 463).

Diagnosis. See Andrade and Senna (2020c).

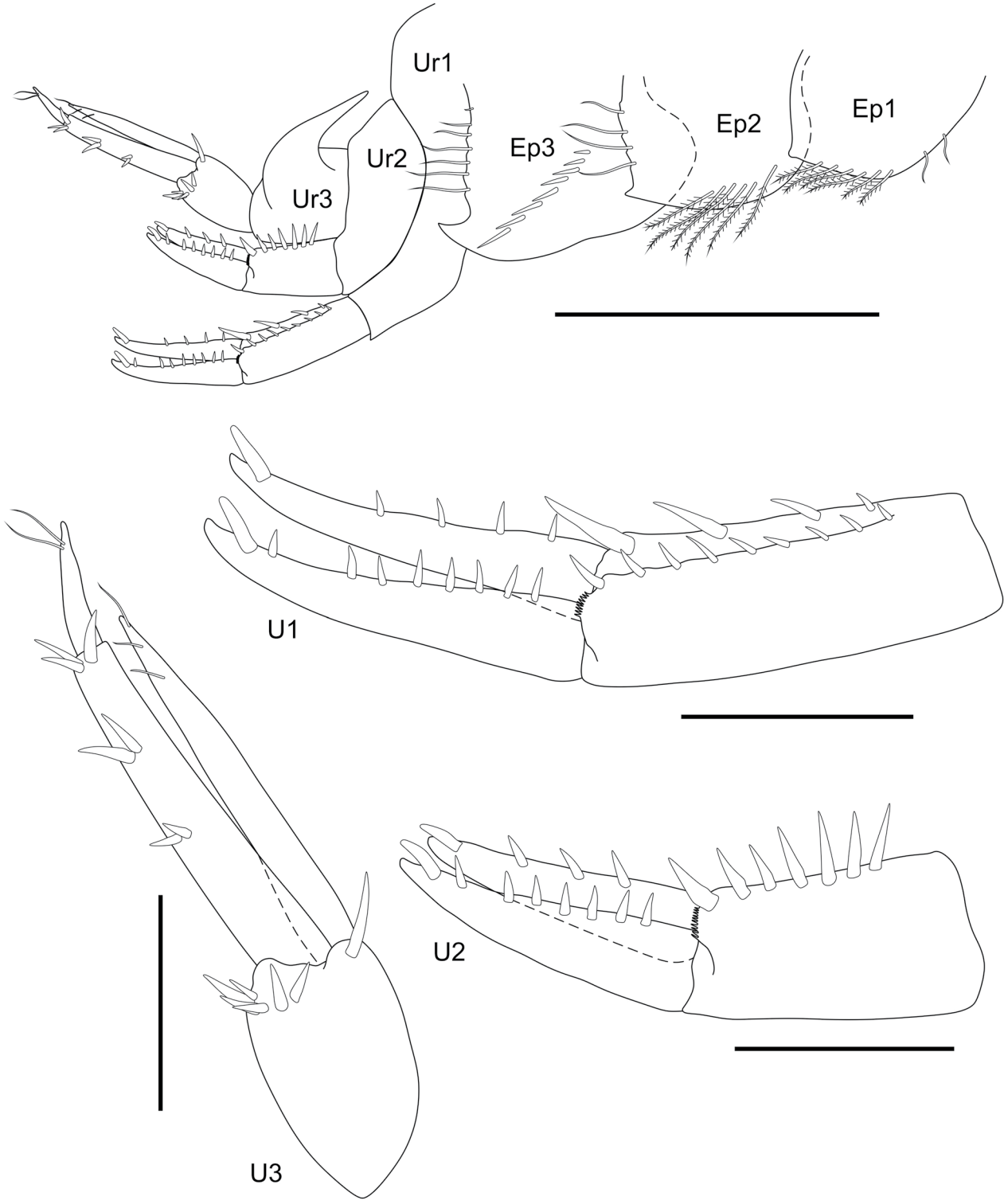

Figure 13. *Metharpinia dentiurosoma* Alonso de Pina, 2003b, female (UERJ 461), Argentina (36°29'S 55°57'W). Ep1, epimeral plate 1, lateral view; Ep2, epimeral plate 2, lateral view; Ep3, epimeral plate 3, lateral view; Ur1, urosomite 1, lateral view; Ur2, urosomite 2, lateral view; Ur3, urosomite 3, lateral view; U1, uropod 1, lateral view; U2, uropod 2, lateral view; U3, uropod 3, lateral view. Scale bars: 1.0 mm for Ep1–3; 0.3 mm for the remaining.

Additional description. Epimeral plate 1 anterior margin rounded, with 2 setae, ventral margin with 7 plumose setae, posteroventral corner with small, rounded hump, posterior margin convex. Epimeral plate 2 anterior margin weakly concave, with 6 facial plumose setae, posteroventral corner with small subacute hump, posterior margin weakly crenulate, with 4 setae. Epimeral plate 3 anterior margin concave, anteroventral corner rounded, posteroventral corner strongly produced into large spine, posterior margin weakly crenulate, with 6 setae and 1 setule, with oblique facial row of 8 stout setae extending from posteroventral margin to middle of plate, decreasing in length. Urosomite 3 produced as large acute hook dorsally. Uropod 1 peduncle dorsomedial margin with 4 stout setae, dorsolateral margin with 9 stout setae; outer ramus slightly longer than inner, dorsal margin with 7 stout setae, bearing 2 subapical nails; inner ramus dorsal margin with 4 stout setae, bearing 1 subapical nail. Uropod 2 peduncle dorsomedial margin with 7 stout setae; outer ramus slightly longer than inner, dorsal margin with 6 stout setae, bearing 2 subapical nails; inner ramus dorsal margin with 3 stout setae, bearing 1 subapical nail. Uropod 3 peduncle dorsomedial margin with 1 stout seta distally, ventrolateral margin with 6 stout setae; outer ramus 1.2 × longer than inner, article 1 ventrolateral margin with 3 sets of stout setae: 2-2-3, article 2 elongate, with 2 setae subapically; inner ramus ventrolateral margin with 2 setae, subapically with 1 seta.

Type locality. Argentina, Buenos Aires, El Rincón (39°49'58"S 61°35'02"W).

Remarks. This species was described from type material from southern Buenos Aires Province (Argentina) and was recently recorded from southeastern and southern Brazil (Andrade and Senna, 2020c). Some morphological differences are clear when comparing the drawings of the type material (Alonso de Pina, 2003b) plus the Brazilian records (Andrade and Senna, 2020c) with the ones belonging to this study. For example, while the epimeral plate 1 ventral margin presents five to six plumose setae here, and in Alonso de Pina (2003b), the plates from Andrade and Senna (2020c) show only two slender setae on the antero- and posteroventral corners. The posterior margin of epimeral plate 2 is weakly crenulate in the present material, whereas it is smooth in the other works. The facial row of setae of the epimeral plate 3 is composed of eight and nine setae in this study and in the type material respectively; however, the Brazilian material shows 10 setae.

Although it is possible to observe some other subtle differences regarding number of stout setae on the uropods, the species can be easily recognized by the produced spine on third epimeral plate and urosomite 3, and distal combs on peduncle of uropods 1–2.

Geographic distribution. Argentina: El Rincón (39°49'58"S 61°35'02"W), off Buenos Aires Province (36°29'S 55°57'W; 36°23'S 53°32'W; 37°56'S 57°07'W) (Fig. 25). Brazil: states of Rio de Janeiro, São Paulo, and Santa Catarina.

Bathymetric range. 9–72 meters depth.

Metharpinia grandirama **Alonso de Pina, 2003b** (Fig. 14)

Metharpinia grandirama Alonso de Pina, 2003b: 2533, figs. 8–15. — López-Gappa *et al*., 2006: 16, 52. — Alonso and Chiesa, 2014: 206, 207, 209, fig. 3J–N. — Andrade *et al*., 2015: 39. — Andrade and Senna, 2020c: 9, figs. 7–11.

Material examined. 1 female, dissected and illustrated, st. 2888, 37°56'S 57°07'W, Argentina, 31 m depth, February 1972 (UERJ 464).

Diagnosis. See Andrade and Senna (2020c).

Additional description. Antenna 2 peduncle article 3 with 1 facial seta distally, article 4 facial stout setae formula: 1-3-6-6, ventral margin weakly setose, with 1 stout and long seta distally, dorsal margin with 1 long and two stout setae; article 5 ventral margin weakly setose, dorsal margin with 2 setae distally, with facial row of 4 stout setae and 1 stout and 2 long setae distally.

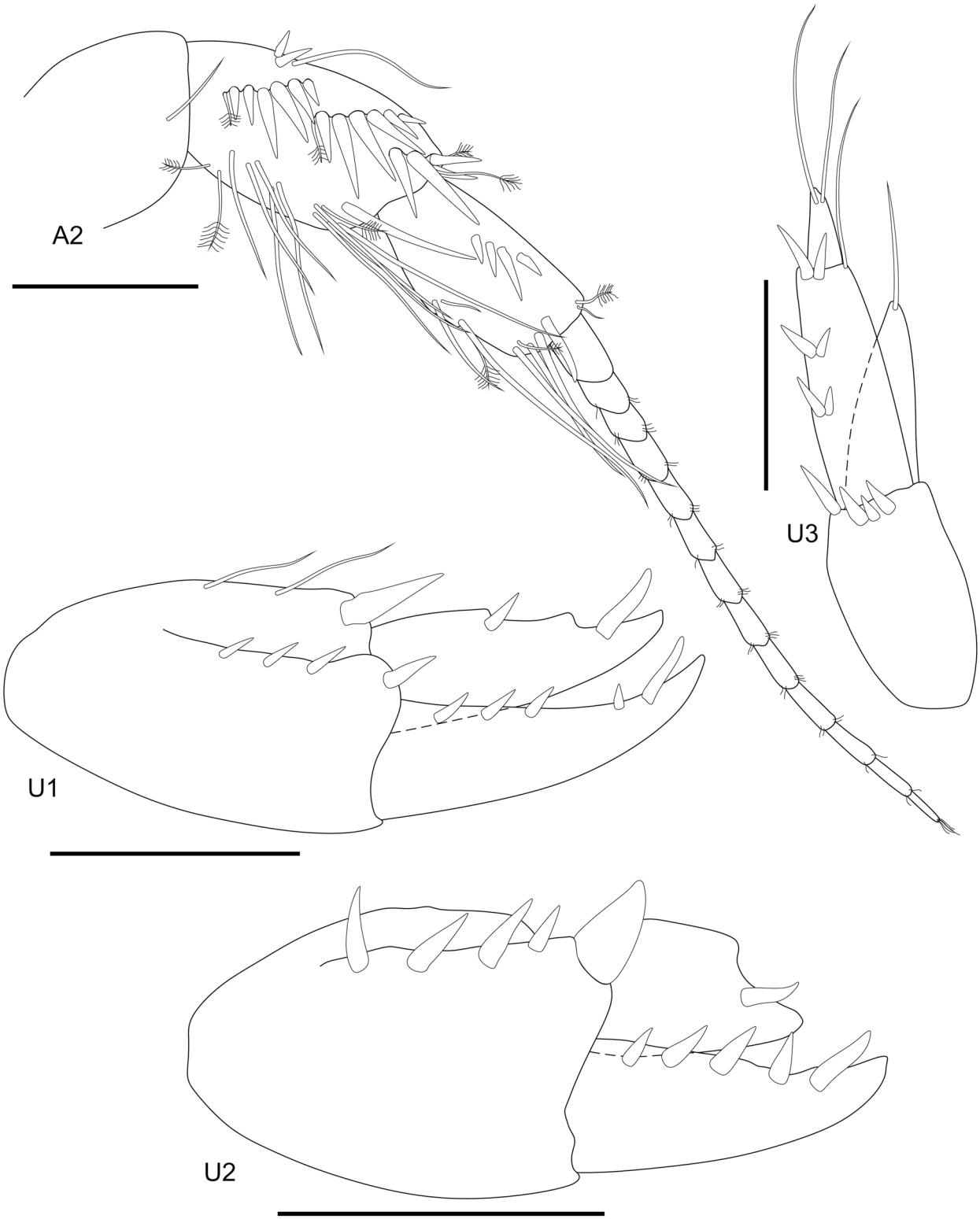

Figure 14. *Metharpinia grandirama* Alonso de Pina, 2003b, female (UERJ 464), Argentina (37°56'S 57°07'W). A2, antenna 2, lateral view; U1, uropod 1, lateral view; U2, uropod 2, lateral view; U3, uropod 3, lateral view. Scale bars: 0.3 mm.

Uropod 1 peduncle 1.6 × longer than wide, dorsomedial margin with 2 long setae, dorsomedial corner with 1 stout seta, dorsolateral margin with 3 stout setae, dorsolateral corner with 1 stout seta; outer ramus slightly longer than inner, dorsal margin with 3 stout setae, bearing 2 subapical nails; inner ramus dorsal margin with 1 stout seta, bearing 1 subapical nail. Uropod 2 short and stout, peduncle 1.4 × longer than wide, dorsolateral margin with 4 stout setae and 1 seta much more robust distally; outer ramus 1.5 × longer than inner, dorsal margin with 3 stout setae, bearing 2 apical nails; inner ramus bearing 1 subapical nail.

Type locality. Argentina, El Rincón (39°05'36"S 61°20'11"W).

Remarks. This species was described from type material from off Buenos Aires Province (Argentina) and was recently recorded from southeastern Brazilian waters (Andrade and Senna, 2020c). The studied specimen here, presents a different pattern of stout setae on the fourth article of antenna 2, differing from both previous records. While the specimens described from Argentina and Brazil present the facial stout setae formula as 1-2-6-6 and 1-3-5-5 respectively, the analyzed individual from this study show a formula of 1-3-6-6. Although it is possible to observe other differences regarding number of stout setae on appendages, *M. grandirama* can be distinguished from its congeners by the stout and shortened uropods 1–2.

Geographic distribution. Argentina: El Rincón (39°05'36"S 61°20'11"W), northern Argentine Sea (37°56'S 57°07'W) (Fig. 25). Brazil: states of Rio de Janeiro and São Paulo.

Bathymetric range. 9–72 meters depth.

***Metharpinia protuberantis* Alonso de Pina, 2001**
(Figs. 15–19)

Metharpinia protuberantis Alonso de Pina, 2001: 527, figs. 7–11. — Alonso de Pina, 2003a: 1044. — Alonso de Pina, 2003b: 2521. — De Broyer *et al.*, 2007: 190. — Alonso de Pina *et al.*, 2008: 17–19, 33, 34. — Storero and González, 2008: 1056. — Alonso and Chiesa, 2014: 206, 207, 209, fig. 3D. — Andrade *et al.*, 2015: 34, 39. — Andrade and Senna, 2020c: 2, 22.

Material examined. 1 female, dissected and illustrated, st. 2886, 38°06'S 55°13'W, Argentina, 440–480 m depth, February 1972 (UERJ 460).

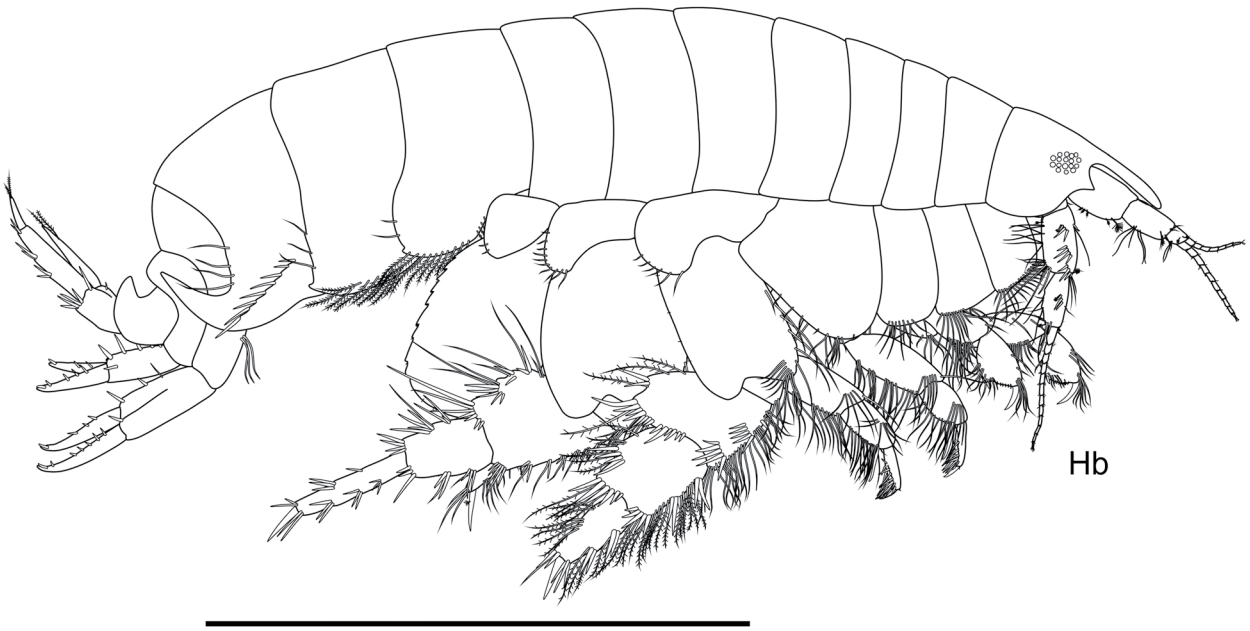

Figure 15. *Metharpinia protuberantis* Alonso de Pina, 2001, female (UERJ 460), Argentina (38°06'S 55°13'W). Hb, habitus, lateral view. Scale bar: 3.0 mm.

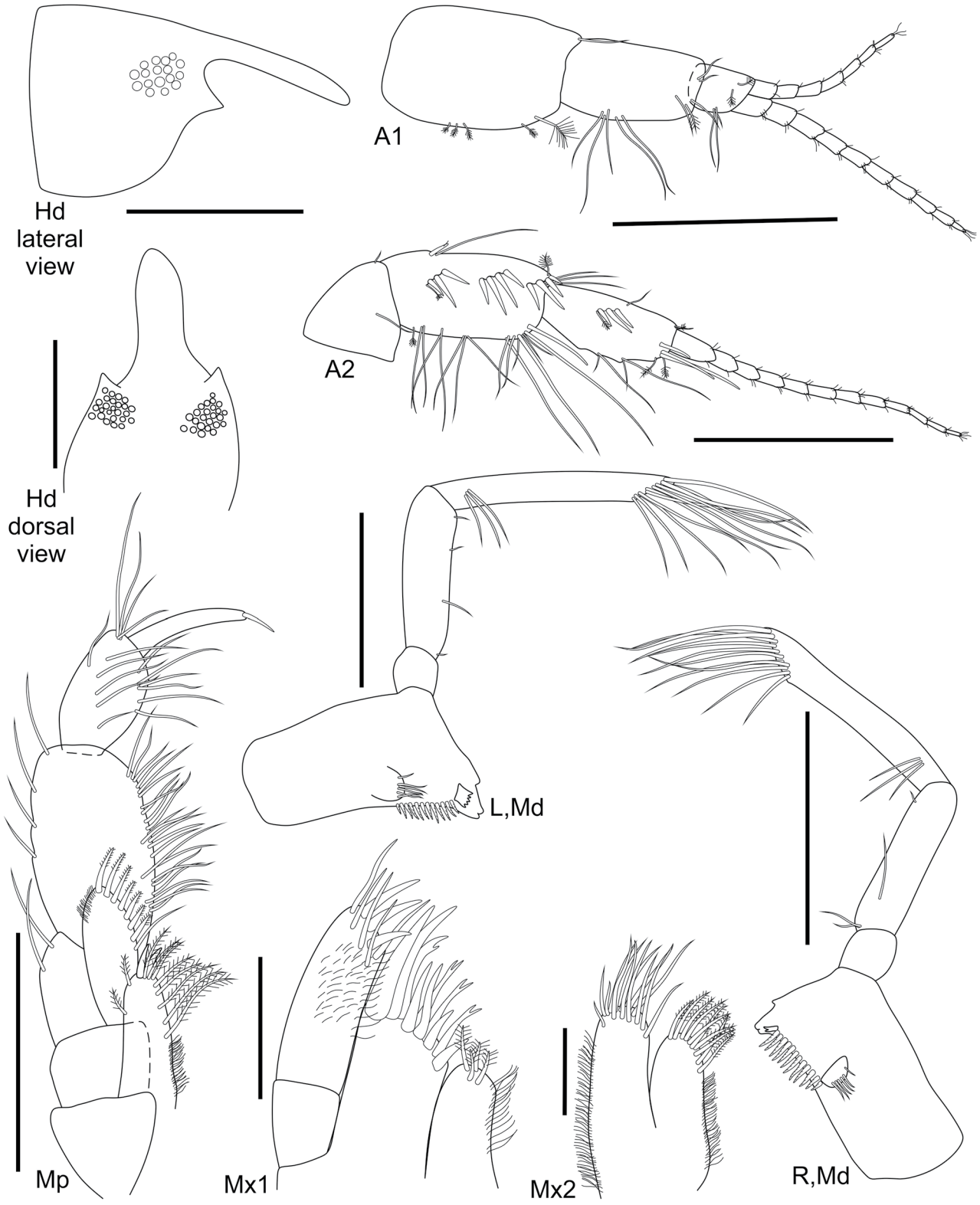

Figure 16. *Metharpinia protuberantis* Alonso de Pina, 2001, female (UERJ 460), Argentina (38°06'S 55°13'W). Hd lateral view, head, lateral view; Hd dorsal view, head, dorsal view; A1, antenna 1, lateral view; A2, antenna 2, lateral view; L,Md, left mandible, mesial view; R,Md, right mandible, mesial view; Mp, left maxilliped, dorsal view; Mx1, left maxilla 1, dorsal view; Mx2, left maxilla 2, dorsal view. Scale bars: 0.1 mm for Mx1–2; 0.3 mm for L,Md, R,Md and Mp; 0.5 mm for the remaining.

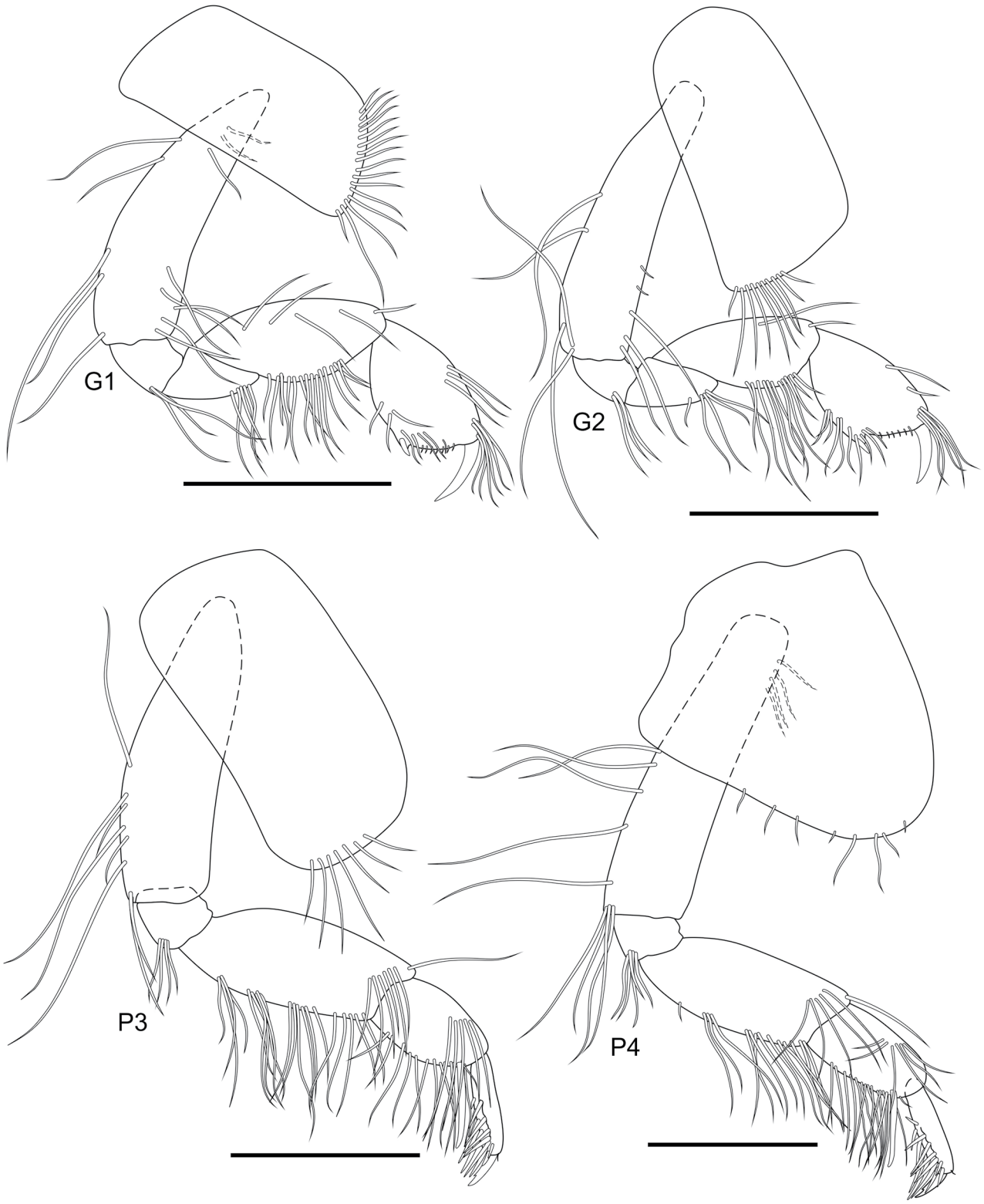

Figure 17. *Metharpinia protuberantis* Alonso de Pina, 2001, female (UERJ 460), Argentina (38°06'S 55°13'W). G1, gnathopod 1, lateral view; G2, gnathopod 2, lateral view; P3, pereopod 3, lateral view; P4, pereopod 4, lateral view. Scale bars: 0.5 mm.

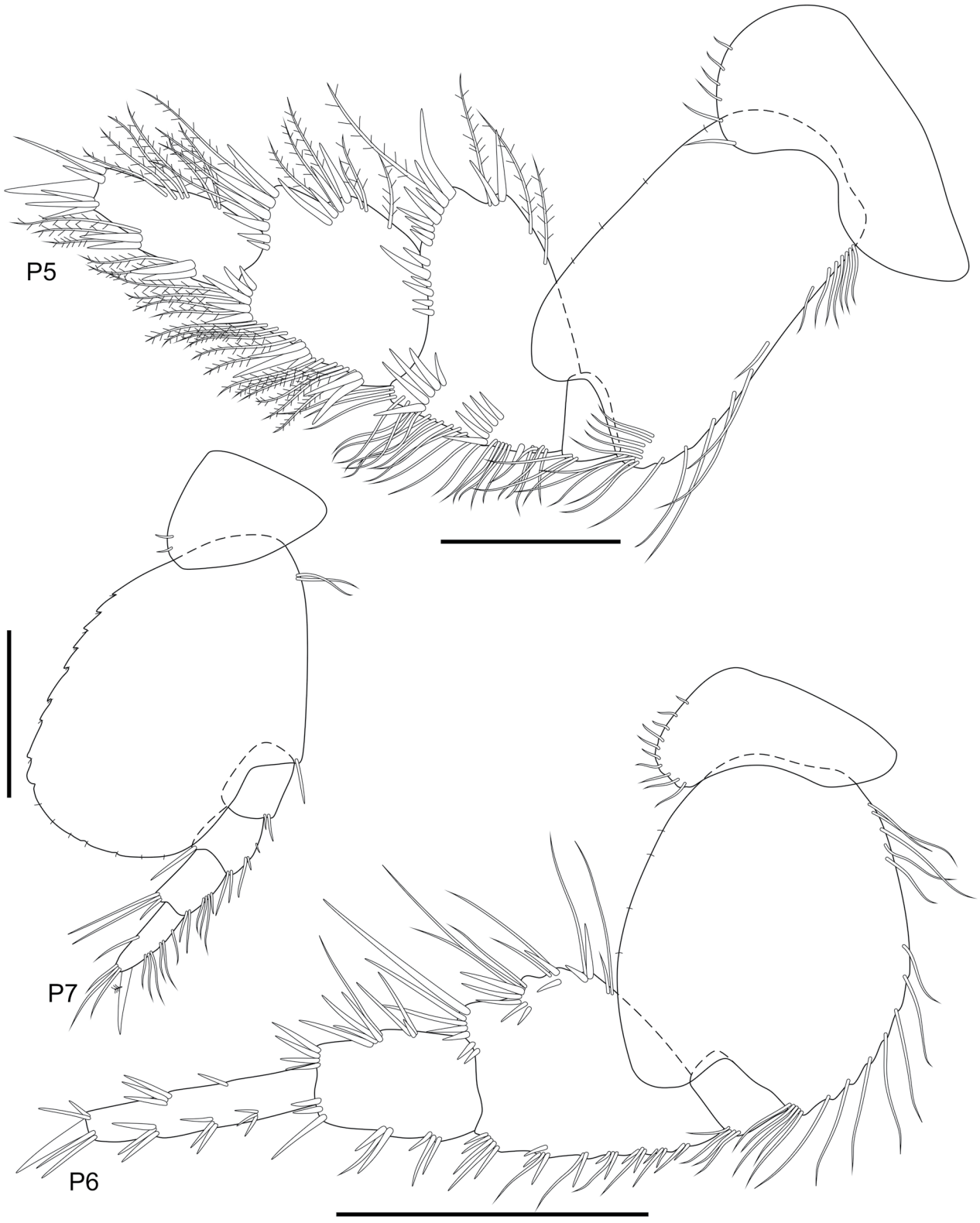

Figure 18. *Metharpinia protuberantis* Alonso de Pina, 2001, female (UERJ 460), Argentina (38°06'S 55°13'W). P5, pereopod 5, lateral view; P6, pereopod 6, lateral view; P7, pereopod 7, lateral view. Scale bars: 0.3 mm for P7; 0.5 mm for the remaining.

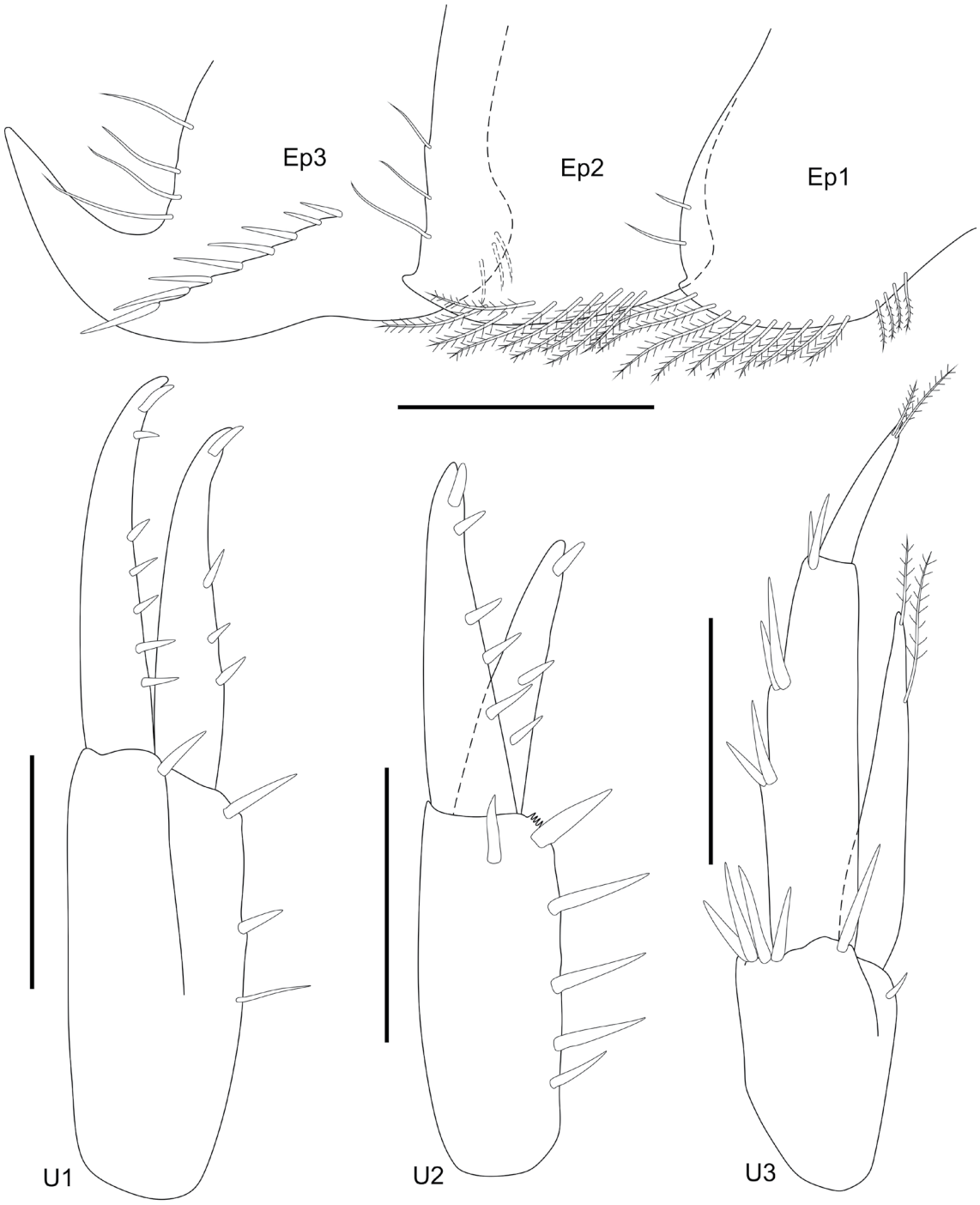

Figure 19. *Metharpinia protuberantis* Alonso de Pina, 2001, female (UERJ 460), Argentina (38°06'S 55°13'W). Ep1, epimeral plate 1, lateral view; Ep2, epimeral plate 2, lateral view; Ep3, epimeral plate 3, lateral view; U1, uropod 1, lateral view; U2, uropod 2, lateral view; U3, uropod 3, lateral view. Scale bars: 0.5 mm for Ep1–3; 0.3 mm for the remaining.

Diagnosis. Head with medium-sized and rounded eyes, rostrum constricted, narrow, elongate and spatulate, reaching half of article 2 of antenna 1. Antenna 2 article 4 with 4 rows of facial stout setae. Mandible molar as hump with 5 stout setae plus 1 displaced, incisor with 3 teeth, left lacinia mobilis with 5 teeth, right lacinia mobilis bifid. Maxilliped inner plate with 2 stout setae apically. Gnathopods 1–2 propodus elongate, palm acute and almost transverse. Epimeral plate 3 posteroventral corner strongly produced as acute spine, with oblique facial row of stout setae. Urosomite 3 produced dorsally into acute, triangular process.

Redescription (based on female, UERJ 460). Habitus as in Fig. 15. Antenna 1 peduncle article 1 with 5 brush setae, dorsal apex with 1 seta; article 2 ventral margin with 5 setae; article 3 ventral margin with 2 setae, with 2 facial brush setae; primary flagellum 10-articulate; accessory flagellum 7-articulate. Antenna 2 article 3 dorsally and facially with 1 short and 1 long seta respectively; article 4 facial stout setae formula: 1-3-4-3, ventral margin with medium to long setae, dorsal margin with 1 stout and 1 long seta medially; article 5 facially with 1 plumose and 3 stout setae, plus 1 stout seta distally, ventral margin with short to long setae and 2 stout setae distally; flagellum 12-articulate. Mandible incisor with 3 teeth (left and right); lacinia mobilis with 5 teeth (left) and bifid (right); molar as hump with 6 slender setae (left and right); accessory setal row with 12 multicuspidate stout setae (left and right); palp 3-articulate, article 2 medial margin with 4 setae (left and right), article 3 about 1.3 × longer than article 2, medial margin with 3 setae proximally, apex oblique, with 11 medium to long setae (left and right). Maxilla 1 inner plate with 4 plumose setae apically, medial margin with row of setules; outer plate with 10 stout setae, 4 bifid; palp 2-articulate, article 2 facial and medial margins setulose, apical and subapical margins with row of 3 stout and 5 slender setae. Maxilla 2, inner plate about 0.8 × length of outer, medial margin setulose, with row of 10 plumose setae extending to apex; outer plate lateral margin setulose, apical margin with 12 short to long setae. Maxilliped inner plate medial margin with row of setules, medial margin with 5 plumose setae, apical margin with 2 stout and 3 plumose setae, lateral margin with 2 short plumose setae; outer plate medial margin with 1 long and 5 bipectinate stout setae, apical margin with 2 bipectinate stout setae, lateral margin with row of setules distally; palp article 1 lateral margin with 2 long setae, article 2 medial margin moderately setose, lateral margin with 4 setae, article 3 medial margin with 6 setae, with 5 facial setae, lateral margin with 1 seta medially and 4 distally, article 4 elongate, bearing 1 medium apical nail, partially immersed.

Gnathopod 1 weakly setose; coxa subrectangular, ventral margin with 16 setae; carpus about 1.2 × longer than propodus; propodus anterior margin with 6 setae distally, posterior margin weakly setose, with 1 stout seta defining palm; palm acute, with setules, palmar hump small; dactylus reaching palmar corner. Gnathopod 2 weakly setose, coxa subrectangular, ventral margin with 10 setae; carpus slightly longer than propodus; propodus posterior margin weakly setose, with 1 stout seta defining palm; palm acute with setules, palmar hump medium; dactylus reaching palmar corner. Pereopod 3 weakly setose; coxa subrectangular, ventral margin with 7 setae; carpus posterior margin weakly setose, distally with 1 long stout seta extending about 85 % length of propodus, with facial row of 5 setae; propodus with 6 posterior and facial stout setae; dactylus about 40 % length of propodus, with acute spine distally. Pereopod 4 similar to pereopod 3, weakly setose; coxa produced posteriorly, weakly excavate posterodorsally, posteroventral margin with 8 setae; merus less stout than in pereopod 3; carpus posterior margin weakly setose, distally with 1 long stout seta extending to 75 % length of propodus. Pereopod 5 coxa bilobate, posteroventral margin with 6 setae; basis about 1.7 × longer than wide, anterior margin with 13 setae; merus anterior margin moderately setose, posterior margin with 3 pappose setae, with 5 facial rows of stout setae: 5-2-5-6-8; carpus anterior margin setose, with 2 stout setae proximally and 3 medially, posterior margin with 5 pappose setae, with 3 facial rows of stout setae: 4-5-6; propodus anterior margin with 5 pappose and 7 stout setae, posterior margin with 6 pappose setae; dactylus about 50 % length of propodus. Pereopod 6 coxa posteroventral margin with 10 setae; basis about 1.2 × longer than wide, anterior margin with medium to long setae; merus anterior and posterior margins with medium to long slender and stout setae, with 4 facial rows of stout setae: 2-2-5-7; carpus anterior margin with 3 sets of 3 stout setae, posterior margin with 3 sets of stout setae: 3-5-4; propodus anterior and posterior margins with distal 2 stout setae each, with 5 facial sets of stout setae: 3-1-3-3-3; dactylus about 35 % length of propodus. Pereopod 7 weakly setose; coxa subtriangular, posteroventral margin with 2 setae; basis about 1.4 × longer than wide, expanded posteroventrally, reaching the apex of carpus, posterior margin weakly crenulate; ischium, merus, carpus and propodus with sparse setae on margins; dactylus about 80 % length of propodus, with 1 plumose seta.

Epimeral plate 1 anterior margin with 4 plumose setae, ventral margin convex, with 10 plumose setae,

posteroventral corner produced into short subacute spine, posterior margin convex, with 2 setae. Epimeral plate 2 anterior margin concave, ventral margin convex, with 9 plumose setae, posteroventral corner produced into short subacute spine, posterior margin weakly crenulate, with 3 setae. Epimeral plate 3 anterior margin concave, anteroventral corner produced, with 3 setae, ventral margin with concavity, posteroventral corner strongly produced as acute spine, posterior margin with 4 setae, with oblique facial row of 8 stout setae. Urosomite 1 with ventral tuft of setae. Uropod 1 peduncle dorsomedial margin with 1 slender and 2 stout setae, dorsolateral margin with 1 seta distally; outer ramus slightly longer than inner, dorsal margin with 5 stout setae, bearing 2 subapical nails; inner ramus dorsal margin with 3 stout setae, bearing 1 subapical nail. Uropod 2 peduncle dorsomedial margin with 5 stout setae, dorsodistal corner combed, dorsolateral margin with 1 stout seta; outer ramus 1.2 × longer than inner, dorsal margin with 4 stout setae, bearing 1 subapical nail; inner ramus dorsal margin with 2 stout setae, bearing 1 subapical nail. Uropod 3 peduncle 1 dorsomedial and dorsolateral margins with 1 stout seta each, ventrodistal corner with 4 stout setae; outer ramus 1.5 × longer than inner, article 1 ventrolateral margin with 3 sets of 2 stout setae, article 2 elongate, with 2 plumose setae apically; inner ramus dorsal margin with 1 plumose seta medially and subapically.

Type locality. Argentina, Península Valdés, Punta Pardelas (42°37'S 64°16'W).

Remarks. *Metharpinia protuberantis* was described with material from Chubut, Argentinean Patagonia (Alonso de Pina, 2001). The species is considered intermediate between *Metharpinia* Schellenberg, 1931 and *Microphoxus* Barnard, 1960, being easily distinguished by presenting epimeral plate 3 posteroventral corner with a strong spine pointing upwards. It is relevant to highlight that a very variable character such as the facial stout setae formula (1-3-4-3) present on the fourth article of antenna 2 is the same for both the type material and the one examined here. Besides some subtle differences, such as the setation on mouthparts and appendages, there are some distinctions when compared to the type material (characters of type material in parentheses): pereopod 7 propodus distally smooth, without processes (*vs* combed, with five digital processes); epimeral plate 3 posterior margin smooth (*vs* weakly crenulate); uropod 1 dorsodistal corner not combed (*vs* coarsely combed).

In this study, we propose a diagnosis of the species for the first time. This new record represents the northernmost for the species (Fig. 25), previously known from the northern Magellanic region, on the Atlantic coast of Patagonia.

Geographic distribution. Argentina: Punta Pardelas, Peninsula Valdés (42°31'S 64°16'W), Punta Verde and Banco Reparo, Patagonia (40°42'S – 40°50'S / 64°43'W – 65°07'W), and off Buenos Aires Province (38°06'S 55°13'W).

Bathymetric range. The species was previously reported from 2–10 meters depth. In this study, *M. protuberantis* was collected at 440–480 meters depth, demonstrating that this species is not restricted to shallow waters and presents a wide bathymetric range.

Genus *Parafoxiphalus* Alonso de Pina, 2001

Type species. *Parafoxiphalus longicarpus* Alonso de Pina, 2001.

Amended diagnosis (after Alonso de Pina, 2001). Female: head with eyes medium-sized and subovate, occluded with pigment. Antenna 1 peduncle article 2 shorter than article 1, ventral setae sparse. Antenna 2 peduncle article 1 without any process; article 4 with facial stout setae in 4 rows; article 5 shorter than 4, with facial stout setae in 1 row. Mandible molars as hump with 6 setae, right incisor with 3 teeth, palp article 2 shorter than article 3. Maxilla 1 palp 2-articulate; inner plate with 4 setae. Maxilla 2 outer plate broader than inner. Maxilliped inner plate with 2 stout setae apically; palp article 4 elongate, narrow, with long apical nail. Gnathopods 1–2 similar, small; carpus elongate; propodus weakly setose; palms slightly acute, almost transverse. Gnathopod 2 carpus shorter than in gnathopod 1. Pereopod 5 basis broad. Pereopods 5–6 merus and carpus of medium width. Pereopod 7 basis posterior margin weakly serrate. Pereopods 5–7

dactylus with short acute spine distally. Gills present on coxae 2–7. Oostegites on coxae 2–5. Epimeral plates 1–2 posterior margin without long setae. Urosomite 1 with ventral tuft of setae. Urosomite 3 without special process. Uropod 1 peduncle shorter than rami, with basofacial setae and displaced apicomedial stout setae. Uropod 2 peduncle with stout setae dorsally. Uropods 1–2 peduncle apices not combed distally; rami with stout setae. Uropod 3 elongate; rami with plumose setae; outer ramus article 2 with 2 setae apically; inner ramus shorter than outer ramus article 1. Telson with dorsolateral and apical stout setae on each lobe.

Male: head with large and ovate eyes. Antenna 1 peduncle article 1 with brush setae; primary flagellum elongate, longer than peduncle, with calceoli (bulb-like sensorial structure). Antenna 2 peduncle articles 3–4 with brush setae dorsomedially; article 5 longer than article 4, bearing numerous calceoli; flagellum very long, exceeding body length, calceolate. Pereopod 7, carpus with two slender, long and straight copulating spines. Epimeral plates 1–2 posterior margin without long setae. Uropod 3 rami subequal in length, strongly setose with plumose setae. Telson elongate.

Genus composition. The genus is composed of one species: *Parafoxiphalus longicarpus*.

Parafoxiphalus longicarpus Alonso de Pina, 2001

(Figs. 20–24)

Parafoxiphalus longicarpus Alonso de Pina, 2001: 517, figs. 1–6. — Chiesa *et al.*, 2005: 171, 172. — Chiesa and Alonso, 2007: 108. — De Broyer *et al.*, 2007: 191. — Alonso de Pina *et al.*, 2008: 20, 21, 33, 34. — Calgagno *et al.*, 2012: 941. — Alonso and Chiesa, 2014: 206–209, fig. 2L–N.

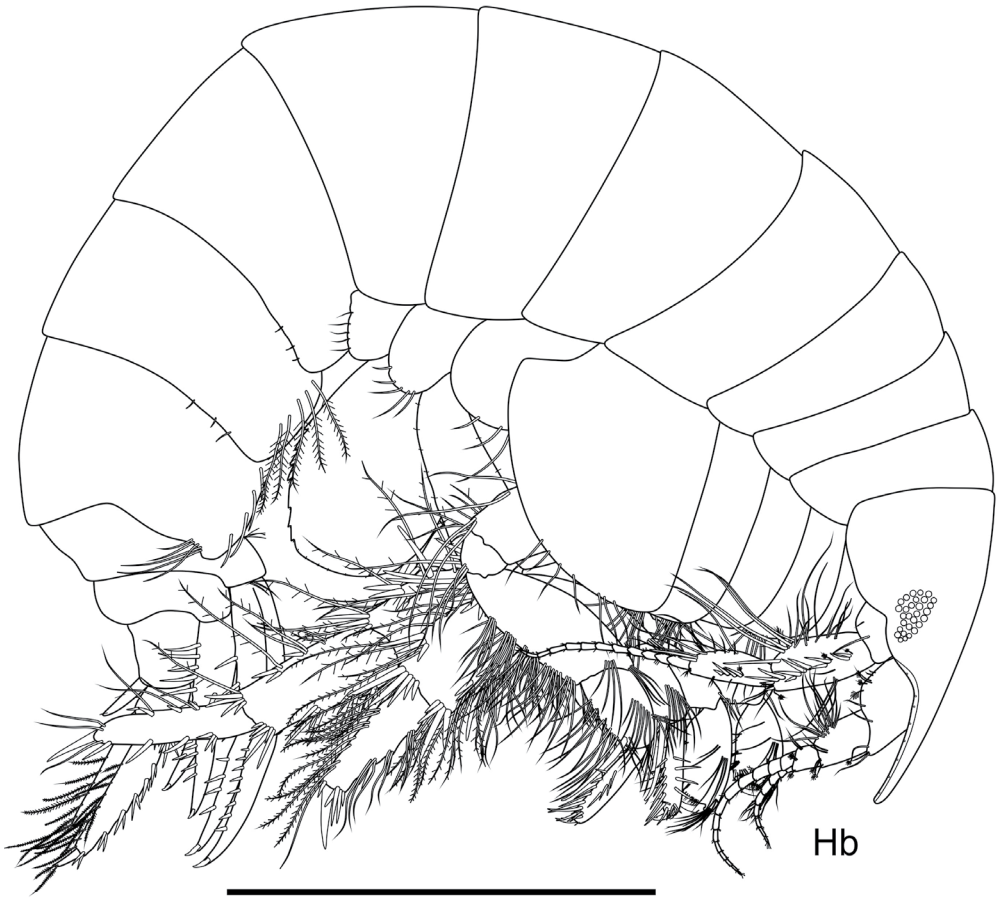

Figure 20. *Parafoxiphalus longicarpus* Alonso de Pina, 2001, female (UERJ 472), Argentina (38°06'S 55°13'W). Hb, habitus, lateral view. Scale bar: 2.0 mm.

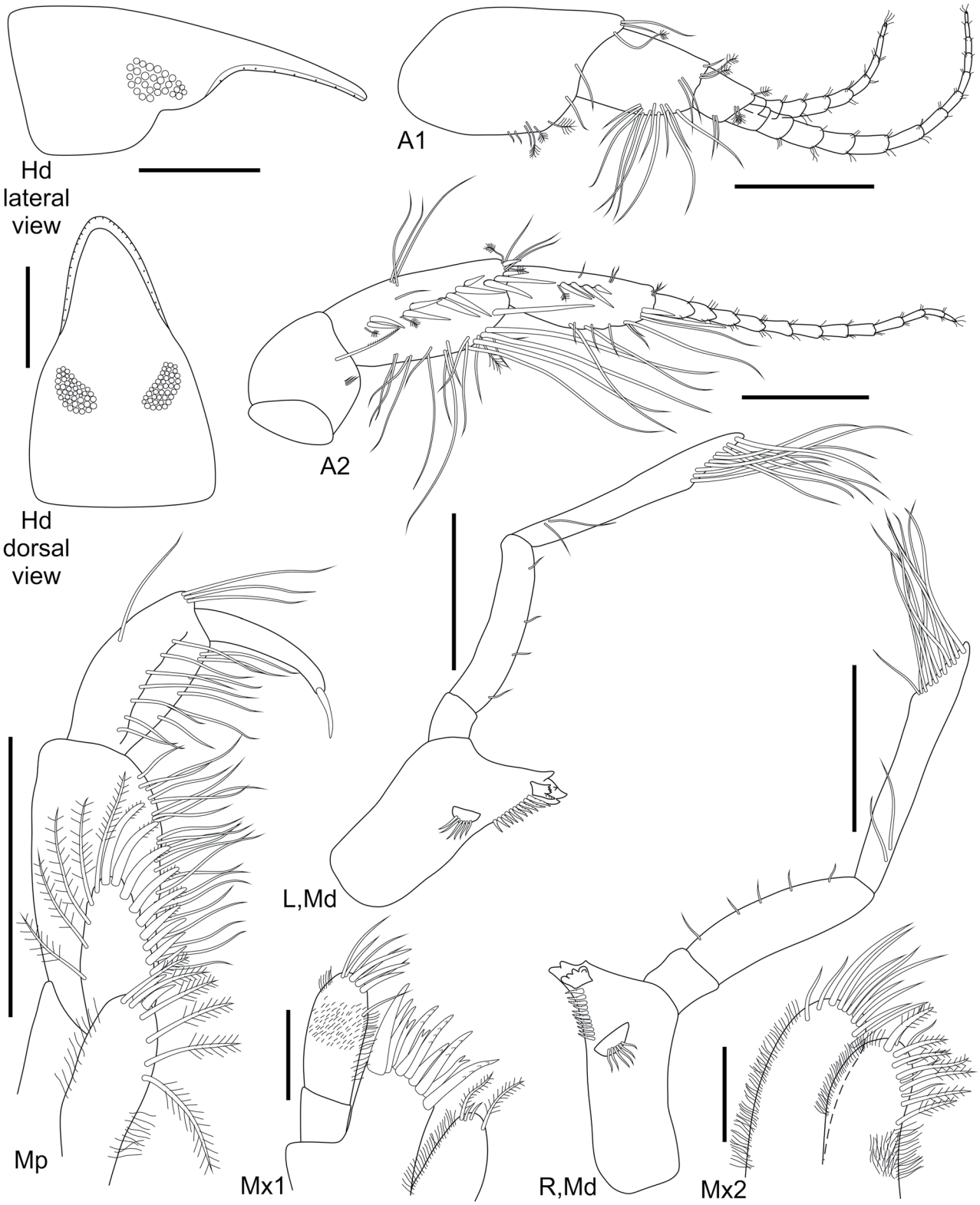

Figure 21. *Parafoxiphalus longicarpus* Alonso de Pina, 2001, female (UERJ 472), Argentina (38°06'S 55°13'W). Hd lateral view, head, lateral view; Hd dorsal view, head, dorsal view; A1, antenna 1, lateral view; A2, antenna 2, lateral view; L,Md, left mandible, mesial view; R,Md, right mandible, mesial view; Mp, left maxilliped, dorsal view; Mx1, left maxilla 1, dorsal view; Mx2, left maxilla 2, dorsal view. Scale bars: 0.1 mm for Mx1–2; 0.5 mm for Hd; 0.3 mm for the remaining.

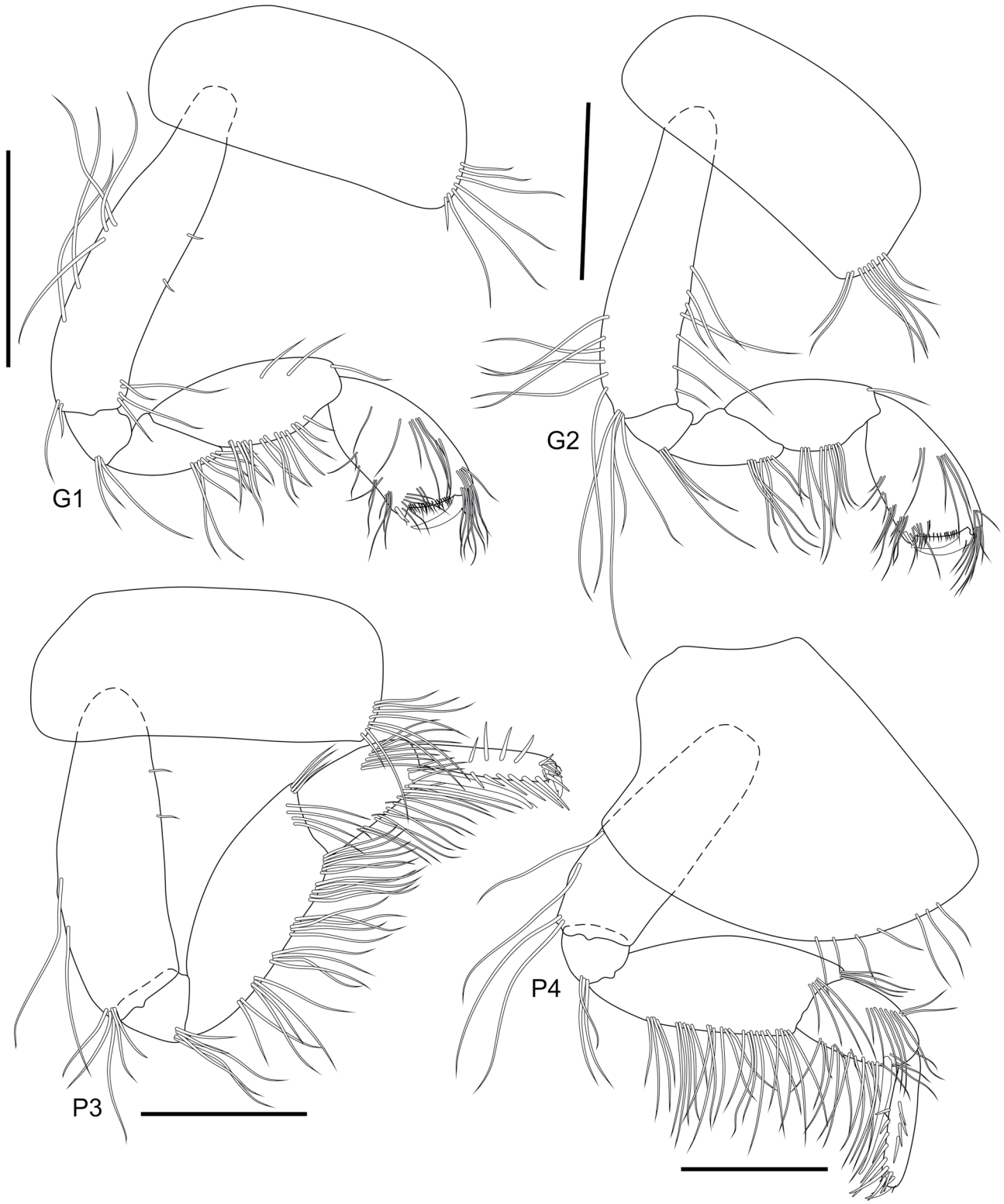

Figure 22. *Parafoxiphalus longicarpus* Alonso de Pina, 2001, female (UERJ 472), Argentina (38°06'S 55°13'W). G1, gnathopod 1, lateral view; G2, gnathopod 2, lateral view; P3, pereopod 3, lateral view; P4, pereopod 4, lateral view. Scale bars: 0.5 mm.

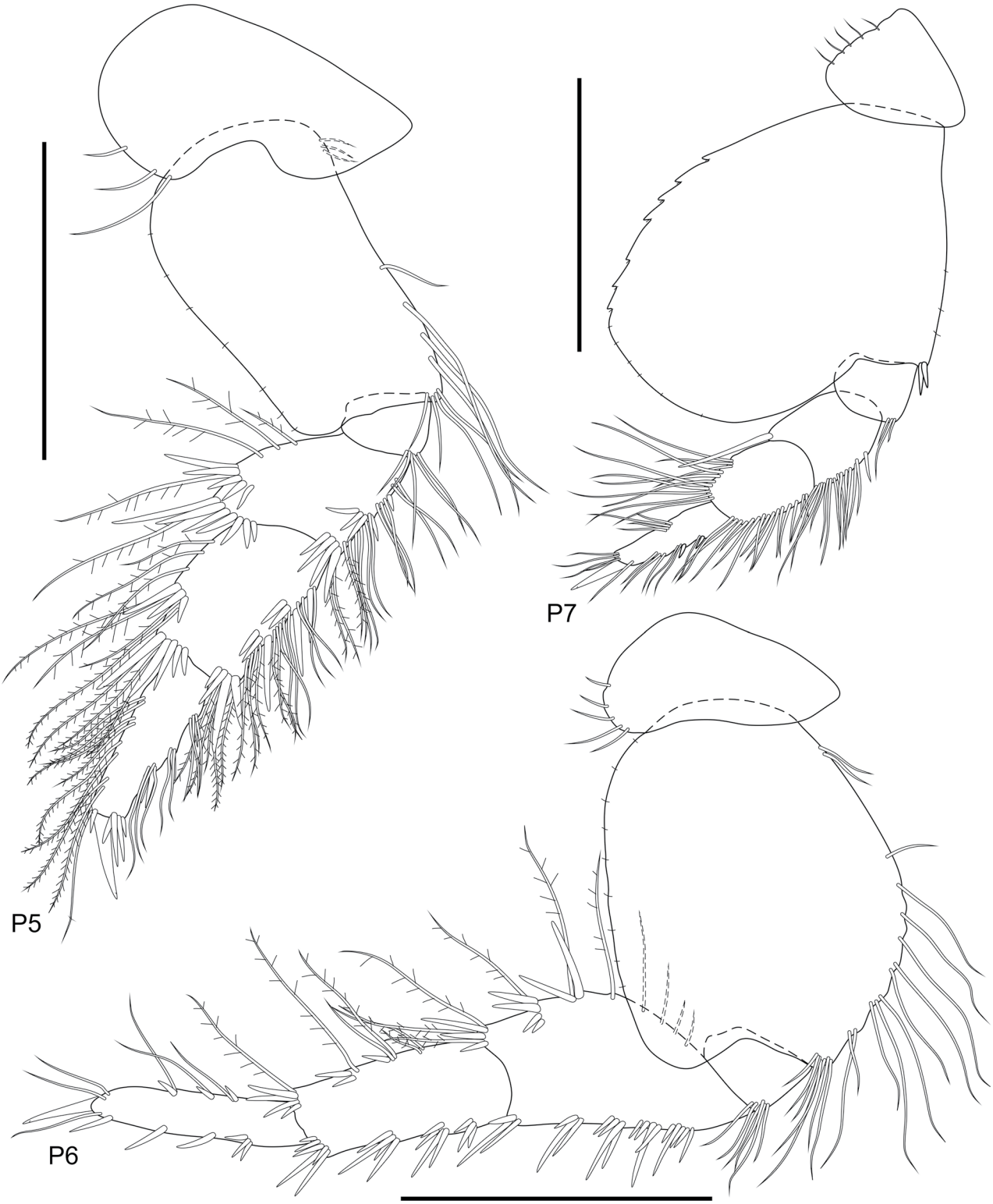

Figure 23. *Parafoxiphalus longicarpus* Alonso de Pina, 2001, female (UERJ 472), Argentina (38°06'S 55°13'W). P5, pereopod 5, lateral view; P6, pereopod 6, lateral view; P7, pereopod 7, lateral view. Scale bars: 1.0 mm.

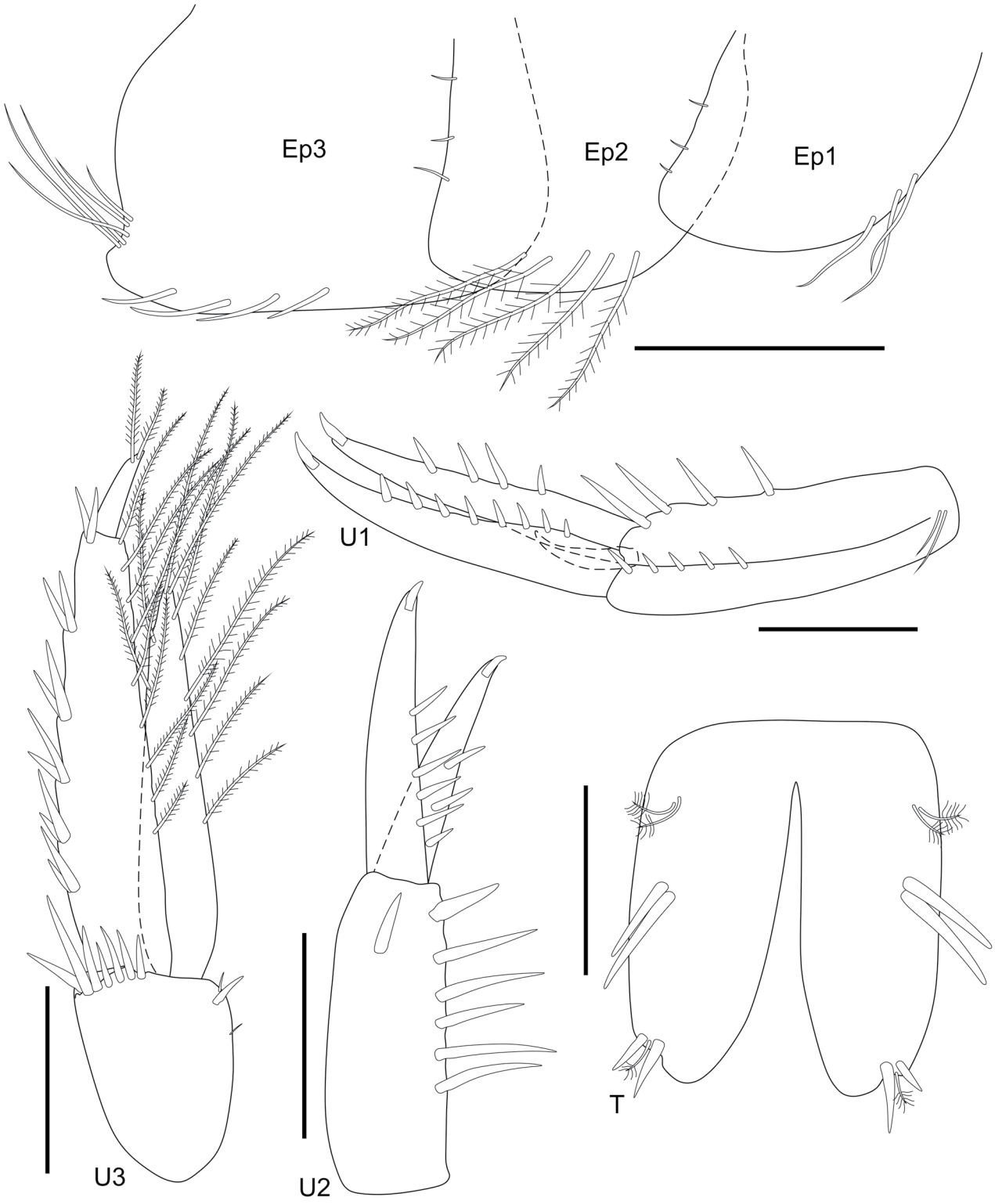

Figure 24. *Parafoxiphalus longicarpus* Alonso de Pina, 2001, female (UERJ 472), Argentina (38°06'S 55°13'W). Ep1, epimeral plate 1, lateral view; Ep2, epimeral plate 2, lateral view; Ep3, epimeral plate 3, lateral view; U1, uropod 1, lateral view; U2, uropod 2, lateral view; U3, uropod 3, lateral view; T, telson, dorsal view. Scale bars: 0.5 mm for Ep1–3; 0.2 mm for T; 0.5 mm for the remaining.

Material examined. 1 female, dissected and illustrated, st. 2886, 38°06'S 55°13'W, Argentina, 440–480 m depth, February 1972 (UERJ 472); 1 female, in 70 % ethanol, same sampling data (MNRJ 29883).

Diagnosis. Head with rostrum developed, not constricted. Mandible left lacinia mobilis with 5 teeth, right with 4 teeth; palp article 1 short, article 2 weakly setose, article 3 strongly oblique and setose. Maxilla 1 outer plate with 11 stout setae apically. Maxilliped outer plate slender and short. Coxae 1–3 progressively increasing in size. Coxa 4 large, margins divergent. Pereopods 3–4 propodus with medium stout setae widely spread in distal two-thirds of article and bearing mid-apical shorter seta. Uropod 1 peduncle dorsolateral margin with stout setae confined medially and distally. Uropods 1–2 rami with articulate apical nail. Telson with pair of dorsal plumose setules on each lobe.

Redescription (based on female, UERJ 472). Habitus as in Fig. 20. Head with ventrolateral line present. Antenna 1 peduncle article 1 ventral margin with simple and brush setae; article 2 ventral margin with 12 setae, facially with 2 slender and 2 brush setae; article 3 ventral margin with 2 setae, dorsal apex with 1 brush seta, with 2 facial brush setae distally; primary flagellum 13-articulate; accessory flagellum 9-articulate. Antenna 2 peduncle article 2 short; article 3 with 1 pectinate and 3 short setae facially; article 4 facial stout setae formula: 4-4-2-2, ventral margin with medium to long setae, dorsal margin with 3 long setae medially and tuft of setae distally; article 5 ventral and dorsal margins weakly setose, with 4 facial stout setae medially and 2 distally; flagellum 12-articulate. Mandible incisor with 4 (left) and 3 (right) teeth; lacinia mobilis with 5 (left) and 4 (right) teeth; molar as hump with 6 setae (left and right); accessory setal row with 10 (left) and 11 (right) multicuspidate stout setae; palp article 2 medial margin with 4 (left) and 5 (right) setae, article 3 about 1.4 × longer than article 2, apex oblique, with 10 (left) and 11 (right) medium to long setae. Maxilla 1 inner plate with 2 short and 2 plumose setae apically, lateral margin setulose; outer plate with 11 stout setae (5 multicuspidate, 3 bifid); palp article 2 setulose medially and facially, apical margin with 3 stout and 5 slender setae, lateral margin with setules distally. Maxilla 2 inner plate setulose proximally, medial margin with 7 plumose and 5 slender setae extending to apical margin, lateral margin setulose; outer plate setose apically, lateral margin setulose. Maxilliped inner plate with 6 plumose setae and 2 stout setae, medial and lateral margins with setules; outer plate medial margin with 7 stout setae, apical margin with 2 stout setae, lateral margin with 5 plumose setae; palp article 2 medial margin moderately setose, article 3 weakly setose, lateral margin with 1 long seta medially, weakly produced distally, article 4 elongate, bearing 1 long apical nail.

Gnathopod 1 weakly setose; coxa subrectangular, ventral margin with 7 setae; basis elongate, about 4.2 × longer than wide; carpus slightly longer than propodus; propodus anterior margin with 2 tufts of setae distally, posterior margin with 1 stout seta defining palm; palm acute, palmar hump medium; dactylus reaching palmar angle, proximally with 1 short seta. Gnathopod 2 weakly setose; coxa subrectangular, ventral margin with 8 setae; carpus posterior margin with 9 setae; propodus slightly longer than carpus, anterior margin with tuft of setae distally, posterior margin with 1 stout seta defining palm; palm acute, palmar hump medium; dactylus reaching the palmar angle, proximally with 1 short seta. Pereopod 3 weak to moderately setose; coxa subrectangular, ventral margin with 8 setae; carpus posterior margin moderately setose, distally with 1 long stout seta extending to apex of propodus, with facial row of 7 setae; propodus with medium posterior and facial stout setae extending to apex; dactylus about 20 % length of propodus, with acute spine distally. Pereopod 4 similar to pereopod 3; coxa produced posteriorly, posterodorsal margin excavate, ventral margin with 7 setae; carpus posterior margin moderately setose, distally with 1 long stout seta extending to apex of propodus, with facial row of 7 setae; propodus anterior margin with 1 short seta distally, posterior margin with 7 stout setae, with 8 facial stout setae extending to apex; dactylus about 20 % length of propodus, with acute spine distally. Pereopod 5 coxa bilobate, posteroventral margin with 3 setae; basis about 1.5 × longer than wide, anterior margin with 7 setae, anterodistal corner with 4 setae; merus anterior margin moderately setose, posterior

margin with 5 pappose setae, with 4 facial rows of stout setae: 4-5-4-7; carpus anterior margin with slender and plumose setae, posterior margin with 10 pappose setae, with 5 facial rows of stout setae: 3-3-3-4-5; propodus anterior margin with slender setae medially and 4 stout setae distally, posterior margin with 8 plumose setae medially and 1 stout and 1 slender seta distally; dactylus about 50 % length of propodus, with minute acute spine distally. Pereopod 6 coxa posterior margin with 5 setae; basis about 1.2 × longer than wide, anterior margin with 13 setae, anterodistal corner with 7 setae; ischium short and subrectangular, anterodistal corner with 6 setae; merus anterior margin with 5 sets of stout setae: 5-4-4-3-3, posterior margin with 6 pappose setae and 3 sets of stout setae: 2-3-3; carpus anterior margin with 4 sets of stout setae: 3-4-4-6; propodus anterior margin with sparse stout setae, posterior margin with 3 stout and 5 long setae; dactylus about 35 % length of propodus, with minute acute spine distally. Pereopod 7 weak to moderately setose; coxa subtriangular, posterior margin with 5 setae; basis about 1.2 × longer than wide, expanded posteroventrally, slightly exceeding apex of merus, anterodistal corner with 2 stout setae, posterior margin weakly crenulate, ventral margin smooth; ischium, merus, carpus and propodus moderately setose anteriorly and weakly posteriorly; dactylus about 50 % length of propodus, with 1 short projection distally.

Epimeral plate 1 anterior margin with 3 setae, ventral margin and posteroventral corner convex, posterior margin weakly concave, with 3 setae. Epimeral plate 2 with 5 facial plumose setae, posterior margin weakly concave, with 3 setae. Epimeral plate 3 anterior margin convex, ventral margin almost straight, with 4 setae, posteroventral corner produced, posterior margin convex, with 5 setae. Urosomite 1 with ventral tuft of setae. Uropod 1 peduncle with 2 basofacial setae, distally with 1 displaced stout seta, dorsomedial margin with 4 stout setae, dorsolateral margin with 5 setae; outer ramus dorsal margin with 8 stout setae, bearing 1 subapical nail; inner ramus subequal to outer, dorsal margin with 4 stout setae, bearing 1 subapical nail. Uropod 2 peduncle dorsomedial margin with 6 stout setae, dorsolateral margin with 1 stout seta; outer ramus about 1.2 × longer than inner, dorsal margin with 5 stout setae, bearing 1 subapical nail; inner ramus dorsal margin with 3 stout setae, bearing 1 subapical nail. Uropod 3 peduncle dorsolateral margin with 1 stout and 2 short setae, ventro-apical margin with row of 7 stout setae; outer ramus about 1.3 × longer than inner, article 1 ventral margin with 6 sets of 2 stout setae each, dorsal margin with 9 long plumose setae, article 2 with 2 plumose setae apically; inner ramus dorsal margin with 6 plumose setae, apically with 2 plumose setae. Telson about 85 % cleft, each lobe with 2 stout setae and 1 short plumose seta apically, apex weakly excavate, dorsal margin with 2 long stout setae medially and 2 short plumose setae proximally.

Type locality. Argentina, Punta Pardelas, Golfo Nuevo (42°37'S 64°16'W).

Remarks: This species was originally described with type material from off Chubut Province in Argentina (Alonso de Pina, 2001). *Parafoxiphalus* is a monotypic genus and resembles *Foxiphalus* J.L. Barnard, 1979 in the general aspect of the body, the unconstricted rostrum, and the shape of the appendages; however, Alonso de Pina (2001) presented many remarkable characters to justify the erection of this genus. Besides some expected variation, such as the number of stout setae on appendages, the specimens examined here show some noteworthy differences distinguishing them from the original diagnosis established by Alonso de Pina. The author has stated that the propodus is longer than carpus on both gnathopods 1–2; however, in our specimens this is true only for the gnathopod 2, whilst the propodus of gnathopod 1 is about 80–85 % the length of carpus. Another variation can be observed in uropod 2, while in the original diagnosis the peduncle is longer than both rami, in our specimens the peduncle is shorter than rami. Due to these differences, we provide an amended diagnosis for the species, including two new important characters: mandible palp article 2 shorter than article 3 and carpus of gnathopod 2 shorter than in gnathopod 1.

Previously, the species has only been recorded in southern South America around the Magellanic region and Tierra del Fuego, but herein, we report *Pa. longicarpus* in the north of Buenos Aires Province in Argentina (Fig. 25); extending its distribution limit further north.

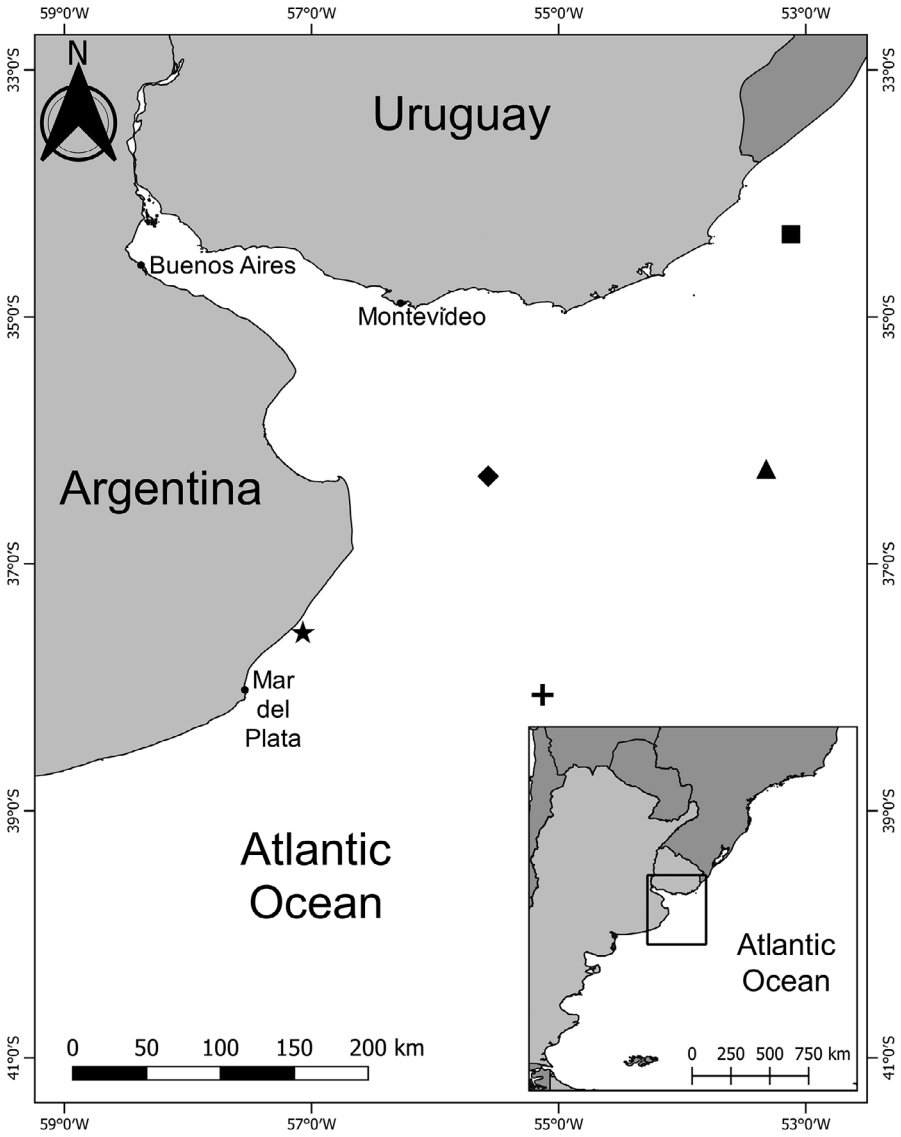

Figure 25. Distribution of the phoxocephalids collected by the R/V Almirante Saldanha. Square: record for *Pseudharpinia jonesyi* (st. 2865). Triangle: record for *Metharpinia dentiurosoma* (st. 2868). Diamond: record for *M. dentiurosoma* (st. 2861). Star: records for *M. dentiurosoma* and *Metharpinia grandirama* (st. 2888). Plus sign: records for *Pseudharpinia tupinamba, Fuegiphoxus abjectus, Fuegiphoxus fuegiensis, Metharpinia protuberantis,* and *Parafoxiphalus longicarpus* (st. 2886).

Geographic distribution. Argentina: off Buenos Aires Province (38°06'S 55°13'W); Rio Grande, Tierra del Fuego; Magellanic region (see Alonso de Pina *et al*., 2008).

Bathymetric range. The species was previously reported from 2–35 meters depth. In this study, *Pa. longicarpus* was collected at 440–480 meters depth.

Discussion

The results of this study provide new insight into the phoxocephalid fauna of southern South America. Species previously known only to Brazilian waters, such as *Ps. jonesyi* and *Ps. tupinamba,* are now reported from Uruguay and Argentina, respectively. *Fuegiphoxus abjectus, F. fuegiensis, M. protuberantis*

and *Pa. longicarpus* were previously recorded from the Magellanic region and/or off Buenos Aires Province. Here, we extend the distribution of these species northwards (except *F. fuegiensis*), recording them from the northern Argentine Sea. Species such as *M. dentiurosoma* and *M. grandirama* were already known from southeastern and southern Brazil, and El Rincón (southern Buenos Aires Province, Argentina), thus here we extend their distribution southwards into Argentine waters. In addition, some species only known from shallow waters, are now recorded from the deep sea (440–480 m depth): *Ps. tupinamba*, *F. abjectus*, *M. protuberantis*, and *Pa. longicarpus*.

Extensions of bathymetrical ranges are common and have been reported for amphipods (Takeuchi *et al*., 2016; Brix *et al*., 2018), other crustaceans (Alves-Júnior *et al*., 2017; 2019), and further groups such as polychaetes (Capa *et al*., 2013), molluscs (Schwabe *et al*., 2007), and even fishes (Valdez-Holguín *et al*., 2017) and may be a reflection of inadequate knowledge of neglected or rare species. Given the wide depth range of the species in this paper, it is possible to assume that they present significant tolerance for temperature, pressure, and salinity. Although there are remarkable physical differences between the southernmost parts of South America and the study area, it seems that some phoxocephalid species are adaptable, being found across broader geographical and bathymetrical ranges.

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References

Alonso, G.M. 2012. Amphipod crustaceans (Corophiidea and Gammaridea) associated with holdfasts of *Macrocystis pyrifera* from the Beagle Channel (Argentina) and additional records from the Southwestern Atlantic. *Journal of Natural History*, 46: 1799–1894.

Alonso, G.M. and Chiesa, I.L. 2014. Phoxocephalidae. p. 205–213. In: S. Roig-Juñent; L.E. Claps and J.J. Morrone (eds), Biodiversidad de Artrópodos Argentinos – Volumen 3. San Miguel de Tucumán, Argentina, INSUE - UNT.

Alonso de Pina, G.M. 2001. Two new phoxocephalids (Crustacea: Amphipoda: Phoxocephalidae) from the south-west Atlantic. *Journal of Natural History*, 35: 515–537.

Alonso de Pina, G.M. 2003a. A new species of Phoxocephalidae and some other records of sand-burrowing Amphipoda (Crustacea) from Argentina. *Journal of Natural History*, 37: 1029–1057.

Alonso de Pina, G.M. 2003b. Two new species of *Metharpinia* Schellenberg (Amphipoda: Phoxocephalidae) from the south-west Atlantic. *Journal of Natural History*, 37: 2521–2545.

Alonso de Pina, G.M.; Rauschert, M. and De Broyer, C. 2008. A catalogue of the Antarctic and sub-Antarctic Phoxocephalidae (Crustacea: Amphipoda: Gammaridea) with taxonomic, distribution and ecological data. *Zootaxa*, 1752: 1–40.

Alves-Júnior, F.A.; Araújo, M.S.L.C. and Souza-Filho, J.F. 2017. New records and bathymetric distribution of deep-sea shrimps of the family Glyphocrangonidae (Decapoda: Caridea) from the Potiguar Basin, northeastern Brazil. *Nauplius*, 25: e2017002.

Alves-Júnior, F.A.; Araújo, M.S.L.C.; Cardoso, I.A.; Bertrand, A. and Souza-Filho, J.F. 2019. Meso- and bathypelagic prawns of the superfamilies Penaeoidea Rafinesque, 1815 and Sergestoidea Dana, 1852 (Crustacea: Decapoda: Dendrobranchiata) from Southwestern Atlantic: new records and bathymetric distribution. *Thalassas: An International Journal of Marine Sciences*, 35: 465–484.

Andrade, L.F. and Senna, A.R. 2020a. Four new species of *Pseudharpinia* Schellenberg, 1931 (Crustacea: Amphipoda: Phoxocephalidae) from southwestern Atlantic and new records of *P. tupinamba* Senna and Souza-Filho, 2011. *Zootaxa*, 4763: 501–537.

Andrade, L.F. and Senna, A.R. 2020b. *Atlantiphoxus wajapi* n. gen., n. sp. (Crustacea: Amphipoda: Phoxocephalidae), a new deep-sea amphipod from the southwestern Atlantic. *Scientia Marina*, 84: 155–166.

Andrade, L.F. and Senna, A.R. 2020c. New and additional records of *Metharpinia* Schellenberg, 1931 and *Microphoxus* Barnard, 1960 (Crustacea: Amphipoda: Phoxocephalidae) from Brazilian waters. *Papéis Avulsos de Zoologia,* 60: e20206022.

Andrade, L.F.; Johnsson, R. and Senna, A.R. 2015. Description of the first species of *Metharpinia* (Crustacea: Amphipoda: Phoxocephalidae) from Brazil. *Zoologia*, 32: 33–40.

Barnard, J.L. 1958a. Revisionary notes on the Phoxocephalidae (Amphipoda), with a key to the genera. *Pacific Science*, 12: 146–151.

Barnard, J.L. 1958b. Index to the families, genera and species of gammaridean Amphipoda (Crustacea). *Occasional Paper of the Allan Hancock Foundation Publications*, 19: 1–145.

Barnard, J.L. 1960. The amphipod family Phoxocephalidae in the Eastern Pacific Ocean, with analyses of other species and notes for a revision of the family. *Allan Hancock Pacific Expedition*, 18: 175–368.

Barnard, J.L. 1961. Gammaridean Amphipoda from depths of 400 to 6000 meters. *Galathea Report*, 5: 23–128.

Barnard, J.L. 1963. Relationship of benthic Amphipoda to invertebrate communities of inshore sublittoral sands of southern California. *Pacific Naturalist*, 3: 439–467.

Barnard, J.L. 1964. Deep-sea Amphipoda (Crustacea) collected by the R/V "Vema" in the eastern Pacific Ocean and the Caribbean and Mediterranean seas. *Bulletin of the American Museum of Natural History*, 127: 3–46.

Barnard, J.L. 1979. Revision of American species of the marine amphipod genus *Paraphoxus* (Gammaridea: Phoxocephalidae). *Proceedings of the Biological Society of Washington*, 92: 368–379.

Barnard, J.L. 1980. Revision of *Metharpinia* and *Microphoxus* (Marine Phoxocephalid Amphipoda from the Americas). *Proceedings of the Biological Society of Washington*, 93: 104–135.

Barnard, J.L. and Barnard, C.M. 1980. Two new phoxocephalid genera, *Fuegiphoxus* and *Phoxorgia*, from Magellanic South America (Amphipoda: Crustacea). *Proceedings of the Biological Society of Washington*, 93: 849–874.

Barnard, J.L. and Barnard, C.M. 1990. Geographic index to marine Gammaridea (Amphipoda). Washington D.C., National Museum of Natural History, Department of Invertebrate Zoology, Division of Crustacea, 139p.

Barnard, J.L. and Drummond, M.M. 1978. Gammaridean Amphipoda of Australia, Part III: The Phoxocephalidae. *Smithsonian Contributions to Zoology*, 245: 1–551.

Barnard, J.L. and Karaman, G.S. 1991. The families and genera of marine gammaridean Amphipoda (except marine Gammaroidea). Parts 1 and 2. *Records of the Australian Museum*, 13: 1–866.

Barnard, K.H. 1932. Amphipoda. *Discovery Reports*, 5: 1–326.

Boeck, A. 1871. Crustacea Amphipoda borealia et arctica. *Forhandlinger i Videnskabs-Selskabet i Christiania*, 1870: 83–280.

Brix, S.; Lörz, A.N.; Jażdżewska, A.M.; Hughes, L.; Tandberg, A.H.S.; Pabis, K.; Stransky, B.; Krapp-Schickel, T.; Sorbe, J.C.; Hendrycks, E.; Vader, W.; Frutos, I.; Horton, T.; Jażdżewski, K.; Peart, R.; Beerman, J.; Coleman, C.O.; Buhl-Mortensen, L.; Corbari, L.; Havermans, C.; Tato, R. and Campean, A.J. 2018. Amphipod family distributions around Iceland. *ZooKeys*, 731: 1–53.

Bushueva, I.V. 1982. Novyy vid roda *Pseudharpinia* (Amphipoda) iz moria Deyvisa (Antarktika). *Zoologicheskij Zhurnal*, 61: 1262–1265.

Calgagno, J.A.; Curelovich, J.N.; Fernandez, V.V.; Thatje, S. and Lovrich, G.A. 2012. Effects of physical disturbance on a sub-Antarctic middle intertidal bivalve assemblage. *Marine Biology Research*, 8: 937–953.

Capa, M.; Nishi, E.; Tanaka, K. and Fujikura, K. 2013. First record of a *Bispira* species (Sabellidae: Polychaeta) from a hydrothermal vent. *Marine Biodiversity Records*, 6: 1–12.

Chevreux, E. 1887. Crustaces amphipodes nouveaux dragues par l'Hirondelle, pendant sa campagne de 1886. *Bulletin de la Société Zoologique de France*, 12: 566–580.

Chevreux, E. 1912. Deuxième Expédition dans l'Antarctique, Dirigée par le Dr Charcot, 1908-1910. Diagnoses d'amphipodes nouveaux. *Bulletin du Muséum national d'Histoire naturelle*, 18: 208–218.

Chevreux, M.E. 1920. Note préliminaire sur les Amphipodes recueillis par les expédition du Travailleur et du Talisman (1880–1883). *Extrait du Bulletin du Muséum d'Histoire Naturelle*, 7: 1–13.

Chiesa, I.L. and Alonso, G.M. 2007. Biodiversity of the Gammaridea and Corophiidea (Crustacea: Amphipoda) from the Beagle Channel and the Straits of Magellan: a preliminary comparison between their faunas. *Revista de Biología Tropical*, 55: 103–112.

Chiesa, I.L. and Alonso, G.M. 2011. Redescription and generic assignment of *Fuegiphoxus uncinatus* (Chevreux, 1912) (Crustacea, Amphipoda, Phoxocephalidae). *Zoosystema*, 33: 219–233.

Chiesa, I.L.; Alonso, G.M. and Zelaya, D.G. 2005. Species richness and faunistic affinities of the Gammaridea and Corophiidea (Amphipoda) from shallow waters of southern Tierra del Fuego, Argentina: preliminary results. *Scientia Marina*, 69: 167–174.

Dahl, E. 1954. A collection of Amphipoda from the Ross Sea. *Arkiv för Zoologi, Serie 2*, 7(19): 281–293.

Dana, J.D. 1849. Synopsis of the Genera of *Gammaracea*. *The American Journal of Science and Arts*, 8: 135–140.

De Broyer, C. and Jażdżewski, K. 1993. Contributions to the marine biodiversity inventory. A checklist of the Amphipoda (Crustacea) of the Southern Ocean. *Documents de Travail de l'Institut Royal des Sciences Naturelles de Belgique*, 73: 1–154.

De Broyer, C. and Rauschert, M. 1999. Faunal diversity of the benthic amphipods (Crustacea) of the Magellan region as compared to the Antarctic (preliminary results). *Scientia Marina*, 63: 281–293.

De Broyer, C.; Lowry, J.K.; Jażdżewski, K. and Robert, H. 2007. Census of Antarctic Marine Life. Synopsis of the Amphipoda of the Southern Ocean. Part. 1. Catalogue of the Gammaridean and Corophiidean Amphipoda (Crustacea) of the Southern Ocean with distribution and ecological data. *Bulletin de L'institut Royal Des Sciences Naturelles de Belgique*, 77: 1–325.

Gappa, J.L.; Alonso, G.M. and Landoni, N.A. 2006. Biodiversity of benthic Amphipoda (Crustacea: Peracarida) in the Southwest Atlantic between 35°S and 56°S. *Zootaxa*, 1342: 1–66.

Garm, A. and Watling, L. 2013. The crustacean integument: setae, setules, and other ornamentation. p. 167–198. In: T. Watling and M. Thiel (eds). The Natural History of the Crustacea. Functional Morphology and Diversity. Oxford, Oxford University Press.

González, E. 1991. Actual state of gammaridean Amphipoda taxonomy and catalogue of species from Chile. *Hydrobiologia*, 223: 47–68.

Gurjanova, E.F. 1953. Novye dopolnenija k dal'nevostochnoi faune morskik bokoplavov. *Akademiia Nauk SSSR, Trudy Zoologicheskogo Institute*, 13: 216–241.

Jarret, N.E. and Bousfield, E.L. 1994. The amphipod superfamily Phoxocephaloidea on the pacific coast of North America.

Family Phoxocephalidae. Part II. Subfamilies Pontharpiniinae, Parharpiniinae, Brolginae, Phoxocephalinae, and Harpiniinae. Systematics and distributional ecology. *Amphipacifica*, 3: 71–150.

Latreille, P.A. 1816. Amphipoda. p. 467–469. In: Nouveau Dictionaire d'histoire naturelle, appliquée aux Arts, à l'Agriculture, à l'Économie rurale et domestique, à la Médecine, etc. Par une société de Naturalistes et d'Agriculteurs. Vol. 1. 2nd Edition. Paris, Deterville.

López-Gappa, J.; Alonso, G.M. and Landoni, N.A. 2006. Biodiversity of benthic Amphipoda (Crustacea: Peracarida) in the Southwestern Atlantic between 35°S and 56°S. *Zootaxa*, 1342: 1–66.

Lowry, J.K. and Bullock, S. 1976. Catalogue of the marine gammaridean Amphipoda of the Southern Ocean. *Bulletin of the Royal Society of New Zealand*, 16: 1–187.

Norman, A.M. 1900. British Amphipoda: families Pontoporeidae to Ampeliscidae. *Annals and Magazine of Natural History*, 7: 326–346.

Pirlot, J.M. 1932. Les amphipodes de l'expédition du Siboga. Deuxième partie: Les amphipodes gammarides I. Les amphipodes fouisseurs. Phoxocephalidae, Oedicerotidae. *Siboga Expeditie, Monographie*, 33 (b): 57–113.

Poore, A.G.B. and Lowry, J.K. 1997. New ampithoid amphipods from Port Jackson, New South Wales, Australia (Crustacea: Amphipoda: Ampithoidae). *Invertebrate Taxonomy*, 11: 897–941.

Ren, X. and Huang, L. 1991. Studies on Gammaridea and Caprellidea (Crustacea: Amphipoda) from the northwest waters off the Antarctic Peninsula. *Studia Marina Sinica*, 32: 185–323.

Rothman, P.L. 1993. New families, genera and species of amphipod crustaceans described by J. Laurens Barnard (1928–1991). *Journal of Natural History*, 27: 743–780.

Sanderson, J.M. 1973. A catalogue of the Amphipoda (Crustacea) in the collection of the late D.H. Reid, now in the Royal Scottish Museum, Edinburgh. *Royal Scottish Museum Information Series, Natural History*, 1: 1–78.

Sars, G.O. 1891. An account of the Crustacea of Norway, with short descriptions and figures of all the species. Vol. I. Amphipoda. Parts 4–5 Lysianassidae (continued); Part 6 Phoxocephalidae; Part 7 Pontoporeiidae Part 8 Ampeliscidae; Part 9 Ampeliscidae (concluded), Stegocephalidae. Cammermeyers, Christiania and Copenhagen, 144p.

Schellenberg, A. 1931. Gammariden und Caprelliden des Magellangebietes, Sudgeorgiens und der Westantarkis. *Further Zoological Results of the Swedish Antarctic Expedition 1901-1903*, 2(6): 1–290.

Schwabe, E.; Bohn, J.M.; Engl, W.; Linse, K. and Schrödl, M. 2007. Rich and rare—First insights into species diversity and abundance of Antarctic abyssal Gastropoda (Mollusca). *Deep-Sea Research Part II*, 54: 1831–1847.

Senna, A.R. 2010. A new genus and five new species of Phoxocephalidae (Crustacea: Amphipoda) from the south-east Brazilian deep sea. *Journal of Natural History*, 4: 2075–2118.

Senna, A.R. and Souza-Filho, J.F. 2011. A new species of *Pseudharpinia* (Amphipoda: Haustorioidea: Phoxocephalidae) from Southeastern Brazilian continental shelf. *Nauplius*, 19: 7–16.

Serejo, C.S. and Siqueira, S.G.L. 2018. Catalogue of the Order Amphipoda from Brazil (Crustacea, Peracarida): Suborders Amphilochidea, Senticaudata and Order Ingolfiellida. *Zootaxa*, 4431: 1–139.

Shoemaker, C.R. 1933. Amphipoda from Florida and the West Indies. *American Museum Novitates*, 598: 1–24.

Stebbing, T.R.R. 1888. Report on the Amphipoda collected by H.M.S. Challenger during the years 1873–76. *Report on the Scientific Results of the Voyage of H.M.S. Challenger during the Years 1873–1876. Zoology*, 29: 1–1737, pls. 1–212.

Stebbing, T.R.R. 1899. Revision of Amphipoda (continued). *Annals and Magazine of Natural History*, series 7, 4: 205–211.

Stebbing, T.R.R. 1906. Amphipoda I. Gammaridae. *Das Tierreich*, 21: 1–146.

Stephensen, K. 1949. The Amphipoda of Tristan da Cunha. *Results of the Norwegian Scientific Expedition to Tristan da Cunha 1937–1938*, 3(19): 1–61.

Storero, L.P. and González, R.A. 2008. Feeding habits of the seahorse *Hippocampus patagonicus* in San Antonio Bay (Patagonia, Argentina). *Journal of the Marine Biological Association of the United Kingdom*, 88: 1503–1508.

Takeuchi, I.; Tomikawa, K. and Lindsay, D. 2016. A new genus and species of Phtisicidae (Crustacea: Amphipoda) from abyssal depths in the Japan trench, with special reference to similarities with Southern Ocean genera. *Journal of Crustacean Biology*, 36: 495–506.

Thurston, M.H. 1974. The Crustacea Amphipoda of Signy Island, South Orkney Islands. *British Antarctic Survey Scientific Reports*, 71: 1–133.

Valdez-Huguín, J.E.; López-Martinez, J. and Rábago-Quiroz, C.H. 2017. Bathymetric range extension of the Peruvian flounder *Etropus peruvianus* Hildebrand, 1946 in the Gulf of California, Mexico. *Latin American Journal of Aquatic Research*, 45: 837–839.

Valente, M.H.M. (Org.) 2019. 60 Anos da Oceanografia na Marinha: 260 Comissões Oceanográficas. Rio de Janeiro, Centro de Hidrografia da Marinha, 332p.

Valério-Berardo, M.T.; Flynn, M.N. and Wakabara, Y. 2000. Structure and dynamic of the shelf amphipod taxocoenosis in Southeastern Brazil. *Bulletin of Marine Science*, 66: 59–72.

Valério-Berardo, M.T. and Piera, F.E. 2006. Description of a new species of *Pseudharpinia* (Amphipoda: Phoxocephalidae: Harpiniinae) from Admiralty Bay, King George, Antarctic Peninsula. *Nauplius*, 14: 75–82.

Wakabara, Y. and Serejo, C.S. 1998. Malacostraca - Peracarida. Amphipoda. Gammaridea and Caprellidea. p. 561–594. In: P.S. Young (ed), Catalogue of Crustacean of Brazil. Museu Nacional, Rio de Janeiro. (Série Livros, 6)

Wakabara, Y.; Tararam, A.S.; Valério-Berardo, M.T.; Duleba, W. and Leite, F.P.P. 1991 Gammaridean and Caprellidean fauna from Brazil. *Hydrobiologia*, 223: 69–77.