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A new species of Chaetiliidae (Crustacea: Isopoda: Valvifera) from the Río de la Plata estuary, Argentina-Uruguay, and reconsideration of *Macrochiridothea* and *Chiriscus*

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Abstract

A new species, *Macrochiridothea estuariae*, is described from the estuary of the Río de la Plata. It differs from other species of the genus in having weakly defined incisions on the side of the head. The genus *Chiriscus* Richardson, 1911, previously synonymised with *Macrochiridothea* Ohlin, 1901 is revived on the basis of a lobed article 4 on antenna 2 and a longer pereonite 7 to include the type species, *Chiriscus australis* Richardson, 1911, and *C. giambiagiae* (Torti & Bastida, 1972) transferred from *Macrochiridothea*. Nine other species of *Macrochiridothea* from southern South America and another from New Zealand are briefly diagnosed. A key is provided.

Key words: Chaetiliidae, *Chaetilia*, *Macrochiridothea*, new species, Argentina, Uruguay

Introduction

Macrochiridothea Ohlin, 1901, and its current synonym *Chiriscus* Richardson, 1911, genera of the isopod family Chaetiliidae Dana, 1849 (Poore, 2001) are represented in South America by ten described species (Carvacho, 1997; Moreira, 1973). These species are distributed south of 23ºS on the Atlantic coast of southern Brazil, Uruguay and Argentina and the Pacific coast of Chile. A subspecies of one has been recorded from the Falkland (Malvinas) Islands (Nordenstam 1933). Another species inhabits New Zealand (Hurley & Murray, 1968). A key to separate eight species was provided by Moreira (1973, in English) and another to all 11 species by Carvacho (1997, in Spanish).

A new species of *Macrochiridothea* was discovered from northern Argentinean coastal waters where other species apparently belonging to this genus are already known leading to a reappraisal of its composition. Since the revision of *Chiriscus* Richardson, 1911 by the first author (Poore, 1984), all publications have referred *Chiriscus australis* Richardson, 1911 to *Macrochiridothea*. In this contribution, *Chiriscus* is revived out of synonymy with *Macrochiridothea* and new generic diagnoses written to distinguish them from other members of Chaetiliidae, in particular *Chiridotea* Harger, 1878 (see King & Cawood, 2007) and *Chaetilia* Dana, 1853 (see Poore, 1985), two genera without mandibular molar processes and with lateral incisions on the head.

In addition, we describe the new species and review all published species descriptions and illustrations. To confirm enigmatic published observations, we examined the holotypes and paratypes of *Macrochiridothea robusta* Bastida & Torti, 1969 and *M. giambiagiae* Torti & Bastida, 1972 (MACN, MNHN). We also examined the holotype of *M. setifer* Menzies, 1962 (SMNH) and other specimens from central Chile. A paratype of *M. uncinata* Hurley & Murray, 1968 (NIWA) was reexamined for us (see below). In spite of the existence already of two keys, we present another that reflects the new classification, includes the new species, and uses more reliable characters.

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Specimens of the new species were collected on board RV *Capitán Cánepa* during a fishery research cruise by the Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP). They were fixed on board in buffered 4% formaldehyde-sea water solution. Type and other material for all species are lodged in museums abbreviated as follows: BMNH, Natural History Museum, London, England; IZUA, Instituto de Zoología, Universidad Austral, Valdivia, Chile; MACN, Museo Argentino de Ciencias Naturales 'Bernardino Rivadavia', Buenos Aires, Argentina; MNHN, Muséum national d'Histoire naturelle, Paris, France; MNHNS, Museo Nacional de Historia Natural, Santiago, Chile; MZUSP, Museu de Zoologia, Universidade de São Paulo, Brazil; NMV, Museum Victoria, Melbourne, Australia; NIWA, National Institute of Water and Atmosphere, Wellington, New Zealand; SMNH, Swedish Museum of Natural History, Stockholm; USNM, Museum of Natural History, Smithsonian Institution, Washington DC, USA; and ZMA, Zoologisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands.

Key to genera and species of *Chiriscus* and *Macrochiridothea*

1 Antenna 2 peduncle article 4 greatest width twice length of anterior margin, with a broad posterodistal lobe extending halfway alongside article 5; pereonite 7 tergite about 3 times as wide as long ..... *Chiriscus* … 2
– Antenna 2 peduncle article 4 quadrate or linear, without a posterodistal lobe overlapping article 5; pereonite 7 tergite about 6 times as wide as long ..... *Macrochiridothea* … 3
2 Head 3.5 times as wide as length in midline, laterally convex, without lateral incisions. ..... *C. australis*
– Head 2.4 times as wide as length in midline, laterally straight, with shallow lateral incisions..... *C. giambiagiae*
3 Antenna 2 peduncle articles 4 and 5 linear (article 4, 2.2–3.0 and article 5, 4–8 times as long as wide) 4
– Antenna 2 peduncle articles 4 and 5 quadrate (article 4, 1.0–1.7 and article 5, 2–3 times as long as wide) 8
4 Lateral incisions on head broad angles..... *M. estuariae*
– Lateral incisions on head deep slits 5
5 Posterior lateral lobe on head rounded; pleotelson with 3 parallel middorsal longitudinal ridges..... *M. marcusi*
– Posterior lateral lobe on head acute; pleotelson with single middorsal ridge at most..... 6
7 Coxa 6 reaching significantly beyond posterior margin of pleonite 3 in adults; pereon dorsally smooth; length to 10 mm ..... *M. setifer*
– Coxa 6 just reaching pleonite 3 in adults; pereon dorsally rugose; length to 15 mm..... *M. kruimeli*
8 Pereopod 5 ischium with prominent hook on anterior margin; head with lateral lobes equal and acute; New Zealand species ..... *M. uncinata*
– Pereopod 5 ischium without prominent hook on anterior margin; head with lateral lobes rounded-truncate, or if acute, anterior one smaller than posterior; South American species 9
9 Dorsal surface of pereon with 5 longitudinal rows of erect tubercles; pleotelson with a single strong median keel..... ..... *M. stebbingi*
– Body smooth dorsally 10
10 Head with posterior lobe more or less truncate, defined anteriorly and posteriorly by rounded corners..... 11
– Head with posterior lobe triangular (or rounded), with a single apex 12
11 Head (male) 2.5 times as wide as length in midline; coxa 6 just overlapping coxa 7 and pleonite 2 ..... *M. lilianae*
– Head (male) 3 times as wide as length in midline; coxa 6 reaching posteriorly to overlap pleonite 3 . *M.* aff. *lilianae*
12 Pereonite 1 with pair of lateral longitudinal rows of 3 tubercles in addition to transverse row; pereonites 1–4 with 5 longitudinal rows of tubercles with smaller ones interspersed; pleotelson with conspicuous median tubercle and pair of prominent lateral double tubercles anteriorly..... *M. multituberculata*
– Body smooth or with obscure middorsal tubercles only..... 13
13 Body widest at pereonite 1; pereonite 1 with posterolateral spines..... *M. robusta*
– Body widest at pereonite 3; pereonite 1 without posterolateral spines..... 14
14 Anterolateral lobe of head larger than posterolateral lobe; without eyes; coxa 6 just overlapping pleonite 1..... ..... *M. michaelseni*
– Anterolateral lobe of head smaller than posterolateral lobe; with eyes; coxa 6 reaching posteriorly to pleonite 3..... ..... *M. mehuinensis*

***Chiriscus* Richardson, 1911**

Chiriscus Richardson, 1911: 169–170. — Sheppard, 1957: 168–169. — Jones & Fenwick, 1978: 619.
Macrochiridothea (part). — Poore, 1984: 71–72.

Type species. *Chiriscus australis* Richardson, 1911, by original designation.

Diagnosis. Body smooth. Head with or without lateral incisions (very short if present). Eyes present. Pereonites with dorsal coxal plates visible dorsally on 5–7 only. Pereonite 7 tergite about 3 times as wide as long; pleonites 1–3 free. Coxa 7 significantly smaller than coxa 6. Antenna 1 peduncle article 2 without anterodistal prolongation; article 3, 1.2 times as long as article 2. Antenna 2 peduncle article 4 greatest width twice length of anterior margin, with a broad posterodistal lobe extending halfway alongside article 5. Mandibles without molar; incisor with 4 acute teeth on left, of 5 uneven teeth on right; lacinia mobilis with concave, denticulate margin on left, of 4 blunt teeth on right; spine row of denticulate spines. Maxillipedal palp of 4 articles, articles 4 and 5 free. Pereopod 1 with grossly widened propodus, about as wide as long, much wider than propodus of pereopods 2 and 3. Pereopods 2 and 3 basis anterior margin with setae only on proximal half; carpus posterodistal corner grossly produced as a lobe (about half as long as and dominating propodus), bearing long distal setae; dactyli absent. Pereopod 4 dactylus vestigial, dome-like, with a minute terminal seta. Pereopod 5 dactylus short, cylindrical, with a long terminal seta; pereopod 6, 1.3 times as long as pereopod 5. Pereopod 7 dactylus minute, dome-like, with a short apical seta. Pleopod 2, appendix masculina straight, with lobulate apex. Uropod endopod half length of exopod. Oostegites 1 broad overlapping plates, longer than broad; oostegites 2–4 almost circular, overlapping; oostegites 5 linguiform, reaching midline.

Remarks. In reviving *Chiriscus* we recognise distinctive character states in the two species we now assign to this genus that differentiate them from *Macrochiridothea* s.s. The absence of pereopodal dactyli on pereopods 2–5 and 7 that inspired Richardson to erect her genus proved to be true only for pereopods 2 and 3 (Poore, 1984) but the shape of antenna 2 (wide article 4 and with a broad posterodistal lobe) and long pereonite 7 are distinctive. All species of *Macrochiridothea* possess dactyli on pereopods 2 and 3. Males of only one species are known but its appendix masculina is of a characteristic form different from those of other chaetiliid genera.

Poore (1984) transferred *Chiriscus australis* to the larger genus *Macrochiridothea* on the basis of numerous shared features. At the time, the differences were treated as unique features. He overlooked the similar species, *Macrochiridothea giambiagiae* Bastida & Torti, 1972 now placed with *C. australis* in the revived *Chiriscus*.

Chiriscus australis Richardson, 1911

Chiriscus australis Richardson, 1911: 170–171, figs 1–5.
Macrochiridothea australis. — Poore, 1984: 72–76, figs 1a, 2. — Carvacho, 1997: 48 (list).

Material. *Holotype*: Off Río de la Plata, Argentina, 21 m, 36°S, 56°W, USNM 42092 (ovigerous female, 7.9 mm).

Distribution. Off Río de la Plata, Argentina (38°S); 21 m depth.

Remarks. *Chiriscus australis* is known only from the type specimen partly reillustrated by Poore (1984). The female is larger than that of *C. giambiagiae*. The absence of lateral incisions is a unique feature.

Chiriscus giambiagiae (Torti & Bastida, 1972) new combination

Macrochiridothea giambiagiae Torti & Bastida, 1972: 16–22, figs 1, 2. — Harrison-Nelson & Bowman, 1990: 127–129, fig. 1. — Carvacho, 1997: 51 (list).

Material. *Holotype*: Mar del Plata (Playa Peralta Ramos), Buenos Aires, Argentina, 0–2 m, 38°03´S, 57°32´W, MACN 27514 (male, 4.3 mm, examined by AS).

Paratypes: collected with holotype, MACN (4 females), MNHN Is3849 (female, examined by GCBP).

Distribution. Rio de Janeiro, Brazil (23°S), to Mar del Plata, Argentina (38°S); 2–7 m depth.

Remarks. As pointed out by Harrison-Nelson & Bowman (1990) the species was overlooked by Poore (1984) and other authors who dealt with *Macrochiridothea*. The limbs of *M. giambiagiae* are almost indistinguishable from those of *Chiriscus australis* and Carvacho (1997) thought it very possible that the two species were synonymous. The most significant differences are in the shape of the head (more angled in *C. giambiagiae*) and the presence (in female and male *C. giambiagiae*) and absence (in female *C. australis*) of a lateral incision in the head. Harrison-Nelson & Bowman (1990) noted only small differences between their material from Copacabana Beach, Rio de Janeiro, Brazil, and that from the more southern type locality.

Macrochiridothea Ohlin, 1901

Macrochiridothea Ohlin, 1901: 286. — Stebbing, 1914: 353-354. — Nordenstam, 1933: 105. — Sheppard, 1957: 168–173. — Menzies, 1962: 98. — Hurley & Murray, 1968: 244. — Moreira, 1973: 12 (key). — Jones & Fenwick, 1978: 619. — Poore, 1984: 71–72 (part). — Harrison-Nelson & Bowman, 1990: 127 (list of species). — Carvacho, 1997: 46–47 (key).

Type species. *Macrochiridothea michaelseni* Ohlin, 1901, subsequent designation by Menzies, 1962: 98.

Diagnosis. Body smooth, or ornamented with tubercles, spines or ridges. Head with lateral incisions. Eyes present or absent. Pereonites with dorsal coxal plates visible dorsally on 5–7 only. Pereonite 7 tergite about 6 times as wide as long. Pleonites 1–3 free. Coxa 7 significantly smaller than coxa 6. Antenna 1 peduncle article 2 with or without anterodistal prolongation; article 3, 0.4–0.7 times as long as article 2. Antenna 2 peduncle, article 4 quadrate or linear, without a posterodistal lobe overlapping article 5; article 4, 1–3 times as long as greatest width; article 5, 2–8 times as long as greatest width. Mandibles without molar; incisor with 4 acute teeth on left, 5 uneven teeth on right; lacinia mobilis with concave, denticulate margin on left, about as broad as incisor and with 4 blunt teeth on right; spine row of denticulate spines. Maxillipedal palp of 4 articles, articles 4 and 5 free. Pereopod 1 with grossly widened propodus, about as wide as long, much wider than propodus of pereopods 2 and 3. Pereopods 2 and 3 basis anterior margin with setae along most of length, or with setae only on proximal half (*lilianae* only); carpus posterodistal corner angular, not dominating propodus, or grossly produced as a lobe (about half as long as and dominating propodus), bearing long distal setae (*marcusi* only); dactyli subchelate, half as long as propodus, or subchelate (closing on truncate palm), or a minute terminal hook. Pereopod 4 dactylus short, cylindrical, with a minute terminal seta, or vestigial, dome-like, with a minute terminal seta, or present as a short seta only. Pereopod 5 dactylus short, cylindrical, with a long terminal seta. Pereopod 6, 1.3 times as long as pereopod 5. Pereopod 7 dactylus short, cylindrical, with long terminal seta. Pleopod 2, appendix masculina straight, apex laterally denticulate (with 20 saw-like teeth) or strongly curved, laterally with minute setae. Uropod endopod half length of exopod. Oostegites 1 broad, overlapping, longer than broad; oostegites 2–4 almost circular, overlapping; oostegites 5 linguiform, reaching midline.

Remarks. *Macrochiridothea* is differentiated from *Chiriscus* by the quadrate or linear article 4 of the antenna 2 peduncle that lacks a posterodistal lobe, the presence of dactyli on pereopods 2 and 3, and the short pereonite 7.

Macrochiridothea estuariae new species
(Figs 1–3)

Material. *Holotype*: Río de la Plata estuary (34°49' to 36º10'S, 55°50' to 57º5'E), Argentina, oblique plankton tows from bottom to surface (nets of 330 and 550 µm mesh aperture) from RV *Capitán Cánepa*, 5–16 m depth, March 1998, MACN-In 37496 (adult female, 9.4 mm).

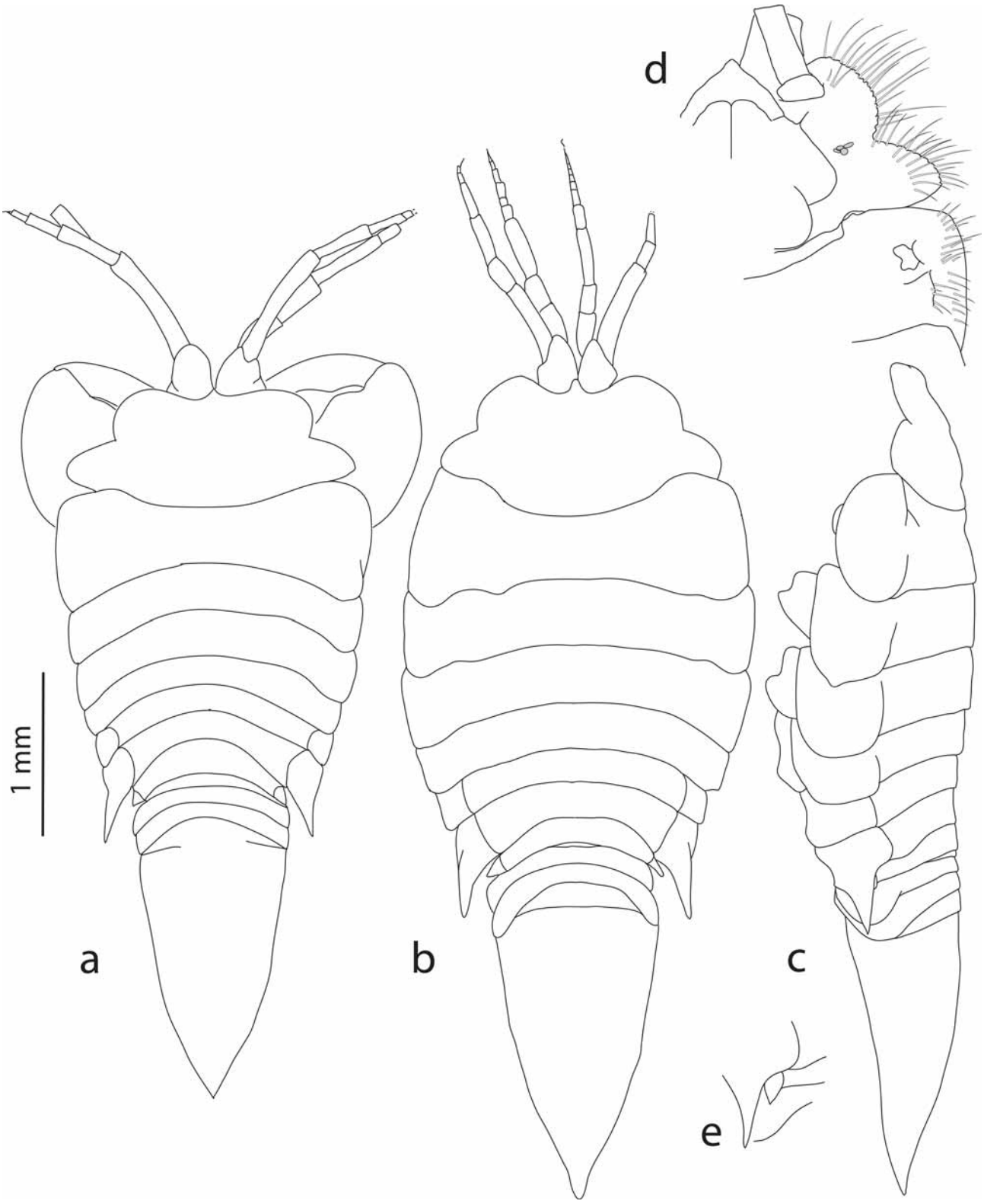

FIGURE 1. *Macrochiridothea estuariae* **n. sp.** a, dorsal habitus of male; b, c, dorsal and lateral habitus of female; d, ventral view of left head and pereonite 1; e, oblique view of coxae 6 and 7 of male. a, d, e from paratype, adult male, 4.5 mm, NMV J55675. b, c from paratype, ovigerous female, 5.2 mm, NMV J55676. Scale bar applies to a–c.

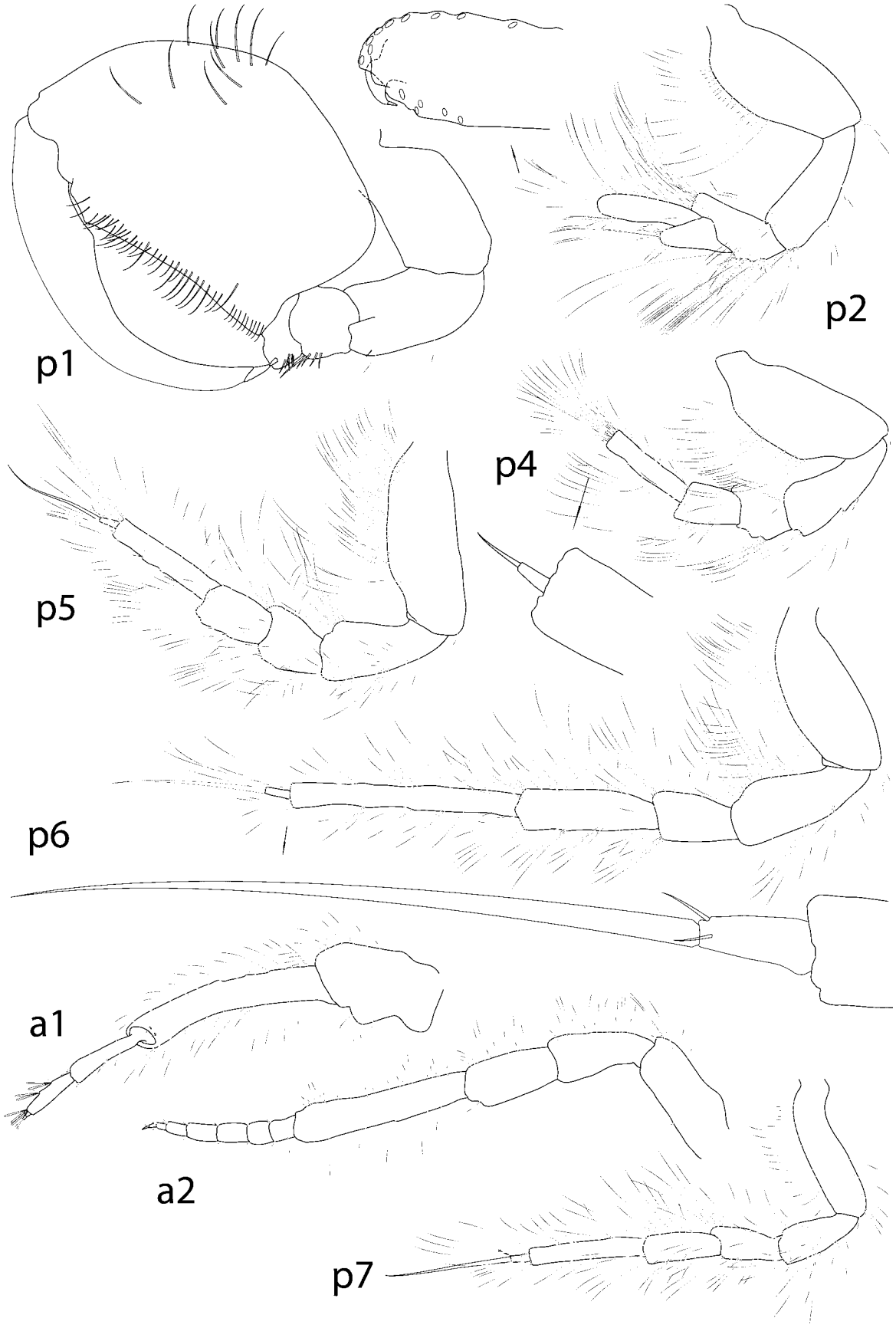

FIGURE 2. *Macrochiridothea estuariae* **n. sp.** a1, a2, antennae 1 and 2; p1, p2, p4–p7, pereopods 1, 2, 4–7 (with ends of propodi and dactyli of pereopods 2, 4, 6, without propodal setae) from paratype, adult male, 4.5 mm, NMV J55675.

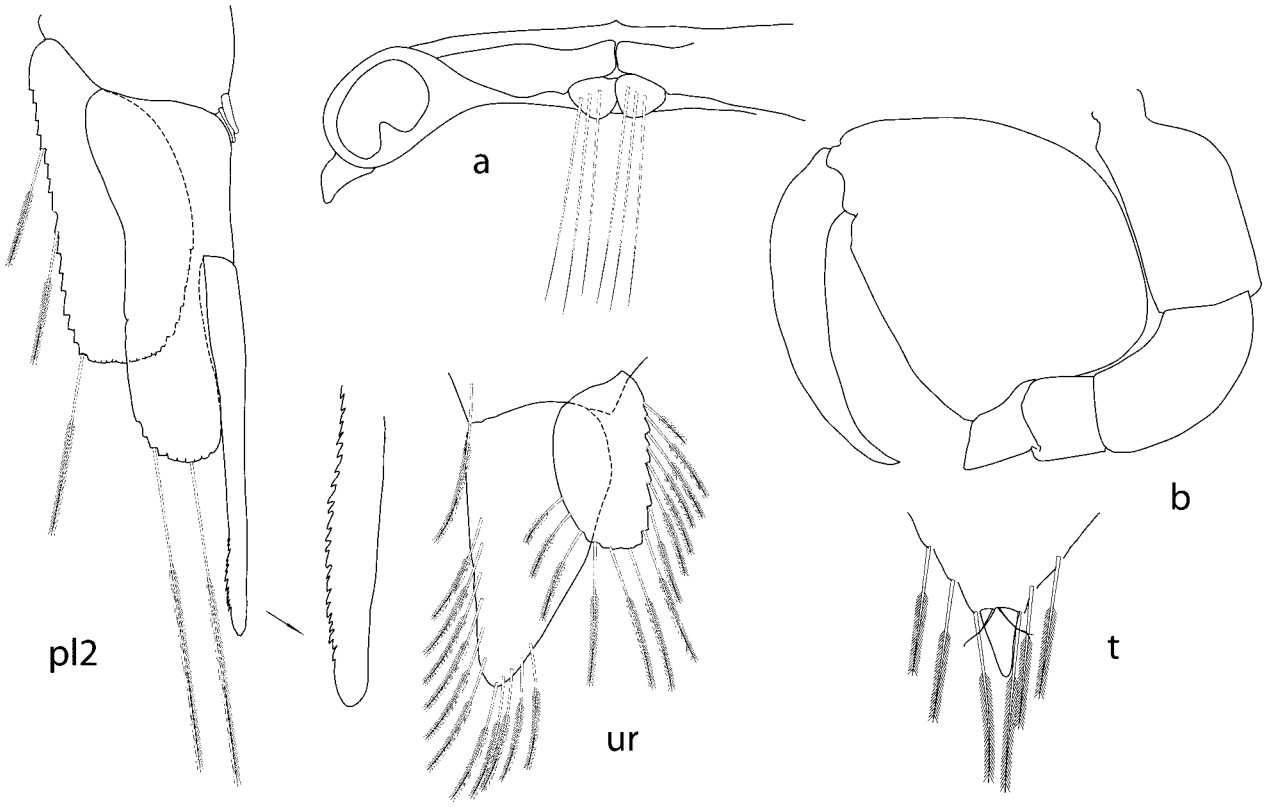

FIGURE 3. *Macrochiridothea estuariae* **n. sp.** a, sternite and coxae of pereonite 7 and penes; pl2, pleopod 2 with detail of appendix masculina; ur, uropodal rami; t, telson apex from paratype, adult male, 4.5 mm, NMV J55675. b, pereopod 1 from paratype, ovigerous female, 5.2 mm, NMV J55676.

***Paratypes*:** collected with holotype, MACN-In 37497 (adult male, 6.0 mm, adult male, 7.0 mm, 2 adult females, 6.0, 7.5 mm), NMV J55675 (adult male, 4.5 mm), NMV J55676 (ovigerous female, 5.2 mm), NMV J55677 (male, 4.5 mm), NMV J55678 (male, 3.7 mm, and juvenile male, 2.5 mm).

Diagnosis. Total body length of male 7 mm; female 9.4 mm. Dorsal surface of head, pereon and pleotelson smooth. Lateral lobes on head rounded, separated by broad angles. Coxa 6 reaching posteriorly to pleonite 3. Antenna 1 peduncle, article 2 without anterodistal prolongation. Antenna 2 peduncle, article 4, twice as long as greatest width; article 5, 5 times as long as greatest width. Pereopods 2 and 3 dactyli minute, hook-like. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina straight, apex laterally denticulate.

Description. Total body length of male 7 mm, of female 9.4 mm. Body of male 2.2 times as long as greatest width, of female 2.4 times as long as greatest width. Body smooth.

Head of male 2.6 times as wide as length in midline, of female 2.2 times as wide as length in midline; with lateral incisions, depth 3% of greatest head width; anterolateral lobe broadly rounded, separated by almost right-angled notch from linguiform, subacute posterolateral lobe, both lobes less pronounced in female than male; lateral lobes with minutely crenulate margin, anterolateral lobe with 16 marginal setae, alternating long and short, and group of 3 ventral setae near anterior margin; posterolateral lobe with 11 marginal setae, 1 ventral seta near notch, and submarginal row of 7 ventral setae. Eye of about 4 ommatidia.

Pereon of male widest at pereonite 1, tapering posteriorly; pereonite 1 with strong ‘shoulders’; each pereonite with more or less vertical lateral plates defined by obtuse longitudinal ridge; coxa 1 small but evident laterally; coxae 2–4 visible only in lateral view; coxa 5 with a free dorsal plate, subrectangular in lateral view; coxa 6 thorn-like, posteriorly directed to reach beyond posterior margin of pleonite 2; coxa 7 with small triangular dorsal plate. Pereon of female widest at pereonite 3, pereonite 1 without obvious ‘shoulders’; otherwise pereonites and coxae as in male.

Pleon 2.1 times as long as width of pleonite 2; pleonite 1 extremely short and almost concealed by adjacent segments; pleonites 2 and 3 similar, with rounded epimera; pleonite 4 defined posteriorly by complete transverse suture (female) or defined posteriorly as partial lateral sutures, not present middorsally (male); pleotelson without any sculpture.

Antenna 1 of male and female similar; peduncle article 1 with triangular dorsolateral lobe bearing 4 setae; article 2 without anterodistal prolongation, setose along anterior and posterior margins; article 3 half as long as article 2, with few setae; flagellum with major article plus 2 minute articles, 0.8 length of peduncle article 3, with 2 pairs of aesthetascs and setae on anterior margin, 3 aesthetascs at tip of major article. Antenna 2 peduncle with linear articles; article 4 twice as long as greatest width, setose along anterior margin especially; article 5, 5 times as long as greatest width, marginally setose; flagellum of 8 articles, 0.9 times length of peduncle article 5.

Pereopod 1 basis twice as long as wide; ischium twice as long as wide; carpus bluntly quadrate, with apical spiniform seta and 5 finer short setae (both sexes); propodus of male 1.5 times as long as broad, palm barely concave, with obtuse angle subdistally, with submarginal setae; propodus of female 1.2 times as long as broad, palm convex; dactylus clearly falcate (male) or almost straight, curved only at tip (female). Pereopod 2 basis about twice as long as greatest width, with about 35 long setae along proximal two-thirds of anterior margin; ischium with groups of 8 and 6 setae distally; merus with abundant setae along posterior margin, anterolateral angle produced to overlap base of propodus, with about 12 long setae; carpus without free anterior margin, posterodistal angle produced to freely overlap propodus by about 0.2 its length, with abundant long setae; propodus about 4 times as long as greatest width, with 7 setae along anterior margin and numerous setae around rounded apex; dactylus minute, hook-like. Pereopod 3 essentially similar to pereopod 2. Pereopod 4 basis 2.4 times as long as wide, with about 30 long setae along proximal two-thirds of anterior margin; ischium with groups of 8 and 6 setae distally; merus with abundant setae along posterior margin, anterolateral angle barely overlapping carpus, with about 6 long setae; carpus subrectangular, distal margin almost square, with submarginal row of 5 long setae on lateral face; propodus half width of carpus, 5 times as long as wide, with few marginal setae, 16 setae distally; dactylus short, cylindrical, with a short terminal seta. Pereopod 5 basis 2.3 times as long as wide, with about 30 long setae along proximal two-thirds of anterior margin; ischium with 2 oblique rows of 10 and 6 setae on inner face, in addition to marginal and distal setae; ischium without a prominent hook on upper margin; merus expanding distally, with setae concentrated distally; carpus 1.7 times as long as wide, with abundant setae along distal margin; propodus 5 times as long as wide, with 6 setae along anterior margin, clusters posteriorly, and circlet of 10 setae distally; dactylus tapered, with single apical seta as long as propodus. Pereopod 6, 1.4 times as long as pereopod 5; basis 2.7 times as long as wide with about 26 long setae along most of anterior margin; ischium and merus with clusters of setae on lower margin and row on upper margin; carpus 3.5 times as long as wide, with clusters of setae on lower margin and row on upper margin, with about 15 setae along distal margin; propodus 10 times as long as wide, marginally setose, with circlet of 8 long setae distally; dactylus narrow, cylindrical, with distal seta, together 0.7 length of propodus. Pereopod 7 about as long as pereopod 5; basis 3.6 times as long as wide; carpus 2.8 times as long as wide; propodus 6 times as long as wide; dactylus short, cylindrical, with a terminal seta, together 1.3 length of propodus; setation much as in pereopods 5 and 6.

Pleopods 1–3 similar, rami with setose margins; pleopod 4 exopod 2-articled, with apical seta; pleopod 5 exopod 2-articled, without setae. Pleopod 2 of male, endopod extending beyond exopod, with 10 plumose setae along distal margin; exopod with 34 plumose setae along all margins; appendix masculina exceeding end of endopod by half its total length, straight, apex laterally denticulate (with 20 saw-like teeth).

Uropodal exopod oval, half length of exopod, with 16 marginal plumose setae; exopod triangular, with 11 marginal setae concentrated distally.

Penes contiguous, subtriangular lobes posterior to margin of ventral coxal plate 7, each with 3 long setae.

Oostegites 1 broad, overlapping, longer than broad; oostegites 2–4 almost circular, overlapping; oostegites 5 linguiform, reaching midline.

Distribution. Río de la Plata estuary, Argentina.

Remarks. The overall body shape (dorsal view) of the new species is sexually dimorphic. In males, pereonite 1 is clearly the widest with strong 'shoulders' laterally. The female is more oval, widest at pereonite 3. Neither sex has strong lateral incisions on the head but in males the head is shorter and the incisions between the anterior and posterior lobes more pronounced. In six other described species the illustrated specimen is a female and in five a male (one not stated). We are able to confirm that *M. setifer* is sexually dimorphic in the same way. Moreira (1973) noted sexual dimorphism in body shape (and pereopod 1) for *M. marcusi* but not in a way seen in the new species. Sexual dimorphism in other species is unknown. Males of *M. lilianae, M. marcusi* and *M. setifer* are similar to that of the new species but so too is the female holotype of *M. kruimeli*. The female of the new species is oval like most females.

Macrochiridothea estuariae has much less developed incisions on the head than any other species of the genus. It shares a fine toothed appendix masculina with *M. lilianae, M. marcusi, M. stebbingi, M. kruimeli* and *M. setifer* but differs from these in many features. The new species shares linear distal articles on antenna 2 with *M. marcusi, M. setifer* and *M. kruimeli* and minute dactlyi on pereopods 2 and 3 with *M. marcusi, M. setifer, M. lilianae* and *M. robusta*.

We report for the first time the nature of the oostegites in *Macrochiridothea*. We confirmed the same arrangement in *M. setifer* (NMV material) and *M. uncinata* (S. Ahyong, NIWA, pers. comm.). The penes of *M. setifer* are similar to those of *M. estuariae* but those of *M. uncinata* appear more separate and with a single shorter seta (S. Ahyong, NIWA, pers. comm.).

All specimens of the new species were collected in the Río de la Plata estuary using plankton samplers (at 5–16 m depth). Species of *Macrochiridothea* and *Chiriscus* are typically benthic animals from subtidal sand to depths over 300 metres.

Macrochiridothea kruimeli Nierstrasz, 1918

Macrochiridothea kruimeli Nierstrasz, 1918: 130–132, figs 13, 54–64. — Nordenstam, 1933: — Nierstrasz, 1941: 279. — Sheppard, 1957, 172–173, fig. 13. — Menzies, 1962: 101, fig. 51J. — Moreira, 1973: figs 7–8. — Carvacho, 1997: 51 (list).

Material. *Holotype*: Punta Arenas, 53°09'S, 70°55'W, Chile, ZMA (female, 15 mm).

Diagnosis. Total body length of male 8 mm; female 15 mm. Dorsal surface rugose, posterior pereonites and pleonites with median ridge; pleotelson smooth. Lateral lobes on head acute. Coxa 6 reaching posteriorly to pleonite 3. Antenna 1 peduncle article 2 without anterodistal prolongation. Antenna 2 peduncle, article 4, 2.2 times as long as greatest width; article 5, 8 times as long as greatest width. Pereopods 2 and 3 dactyli subchelate, closing on truncate palm. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina straight, apex laterally denticulate.

Distribution. Southern Chile and off southern Argentina; to 107 m depth.

Remarks. Nierstrasz's (1918) drawings are small and his photograph difficult to interpret. Sheppard (1957) added details of antennae and mouthparts from a male taken east of southern Argentina (49°29´S, 66°21´W, 104–107 m depth; *Discovery* stn WS809). The species is characterised its large size and a rugose dorsum but is otherwise similar to *M. setifer.*

Macrochiridothea lilianae Moreira, 1972

Macrochiridothea lilianae Moreira, 1972: 395–399, fig. 1A. — Moreira, 1973: 22–25, 32–39, figs 48–76. — Carvacho, 1997: 51 (list).

Material. *Lectotype*: Pota do Catimbau, Ilha Anchieta, São Paulo, Brazil, 21 m, 23°35´S, 45°05´W, MZUSP (male, 5.0 mm, designated as "holotype" by Moreira, 1973). Southern Brazil, 23°12´S–29°13´S, 12–33 m depth.

Paralectotypes: collected with holotype, MZUSP (59 specimens).

Diagnosis. Total body length of male 5 mm; female 6 mm. Dorsal surface of head, pereon and pleotelson smooth. Lateral lobes on head rounded. Coxa 6 just overlapping pleonite 2. Antenna 1 peduncle article 2 without anterodistal prolongation. Antenna 2 peduncle, article 4, 1.7 times as long as greatest width; article 5, 3 times as long as greatest width. Pereopods 2 and 3 dactyli minute, hook-like. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina straight, apex laterally denticulate.

Distribution. Southern Brazil, 23°12´S–29°13´S, 12–33 m depth.

Remarks. Moreira clearly expected his extended species description (submitted 17 August 1971, published 1973) to have priority over his 1972 paper on distribution of *Macrochiridothea*. This was not to be and his 1972 figures and short diagnoses are sufficient to qualify as published names for this and the following species. The 60 specimens he mentioned in 1972 are syntypes and the "holotype" designated in 1973 is in fact a lectotype (ICZN Article 74.6).

The female is larger and more vaulted than the male. *Macrochiridothea lilianae* is the only species for which a sexually dimorphic pereopod 2 (and possibly 3) is described. Pereopods 2 and 3 of the female have a prolonged setose posterodistal lobe on the carpus and simple setae on distal margins of the propodus. In the male the carpal posterodistal corner is not produced but the posterior margins of the carpus and propodus carry a dense field of fine setae. Jaramillo (1982) reported a similar species from Chile (see *M*. aff. *lilianae* below).

Macrochiridothea marcusi Moreira, 1972

Macrochiridothea marcusi Moreira, 1972: 395–399, fig. 1B. — Moreira, 1973: 19–22, 32–39, figs 17–47. — Carvacho, 1997: 51 (list).

Material. *Lectotype*: SE of Ilha Anchieta, São Paulo, Brazil, 12–21 m, 23°35´S, 45°05´W, MZUSP (male, 5.0 mm, designated as "holotype" by Moreira, 1973).

Paralectotypes: Southern Brazil, 21°15´S–32°05´S, 8–65 m depth, MZUSP (257 specimens).

Diagnosis. Total body length of male 6.6 mm; female 7 mm. Dorsal surface with transverse rows of small tubercles along posterior margins of head, pereonites and pleonites; pleotelson with median and submedian keels near anterior margin. Lateral lobes on head rounded. Coxa 6 just overlapping pleonite 2. Antenna 1 peduncle, article 2 without anterodistal prolongation. Antenna 2 peduncle, article 4, 3 times as long as greatest width; article 5, 7 times as long as greatest width. Pereopods 2 and 3 dactyli minute, hook-like. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina straight, apex laterally denticulate.

Distribution. Southern Brazil, 21°15´S–32°05´S, 8–65 m depth.

Remarks. See the previous species for an explanation of the date of publication and type designation. Moreira (1973) illustrated differences between the setation of pereopod 1 of males (with dense strong setae along the margin of the carpus and propodal palm enveloping the dactylus) and females (mostly short setae and few longer setae). The female is larger and more vaulted, and the tubercles sharper. The pattern of ridges on the pleotelson is diagnostic.

Macrochiridothea mehuinensis Jaramillo, 1977

Macrochiridothea mehuinensis Jaramillo, 1977: 72–79, figs 1–3. — Jaramillo, 1982: 183–184, fig. 6. — Carvacho, 1997: 51 (list).

Material. *Holotype*: Mehuín (Playa Grande), Valdivia, Chile 39°26'S, 73°13'W, IZUA-IC.1 (female, 14.3 mm).

Paratypes: collected with holotype, IZUA-IC.2–11 (10 males, females, juveniles).

Diagnosis. Total body length of male 14.3 mm; female 15 mm. Dorsal surface of head, pereon and pleotelson smooth. Lateral lobes on head acute. Coxa 6 reaching posteriorly to pleonite 3. Antenna 1 peduncle, article 2 with anterodistal prolongation. Antenna 2 peduncle, article 4, as long as greatest width; article 5, 2.2 times as long as greatest width. Pereopods 2 and 3 dactyli subchelate, half as long as propodus. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina strongly curved, laterally with minute setae.

Distribution. Valdivia to Llanquique, Chile, 39°S–43°S; lower tidal levels on sandy beaches.

Remarks. *Macrochiridothea mehuinensis* is distinguished from others by the combination of lack of sculpture and strong anterodistal process on the second article of antenna 2. Jaramillo (1982) found the species commonly on sandy beaches over a 450 km range in southern Chile.

Macrochiridothea michaelseni Ohlin, 1901

Macrochiridothea michaelseni Ohlin, 1901: 287–289, pls 11, 12, fig. 8. — Menzies, 1962: 98, fig. 32. — Hurley & Murray, 1968: 247–248, fig. 9 (head). — Moreira, 1973: figs 4–6. — Carvacho, 1997: 51 (list).

Material. *Syntypes*: Brackish pools of delta of Río de las Minas; and Magellan Strait, 22 m [12 fm], Punta Arenas, 53°09'S, 70°55'W, Chile, SMNH (15 specimens).

Diagnosis. Total body length of male 11.5 mm; female smaller than male. Dorsal surface of head, pereon and pleotelson smooth. Lateral lobes on head rounded. Coxa 6 just overlapping pleonite 2. Antenna 1 peduncle, article 2 with anterodistal prolongation. Antenna 2 peduncle, article 4, 1.3 times as long as greatest width; article 5, 2.5 times as long as greatest width. Pereopods 2 and 3 dactyli subchelate, half as long as propodus. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina strongly curved, laterally with minute setae.

Distribution. Punta Arenas, Chile (53°09'S, 70°55'W); 0–22 m depth.

Remarks. *Macrochiridothea michaelseni* is the type species and distinguished from others by the combination of lack of sculpture, small posterolateral lobe on the head, short coxa 6 and strong anterodistal process on the second article of antenna 2. Menzies (1962) recorded the species north of Punta Arenas, close to the type locality.

Macrochiridothea multituberculata Nordenstam, 1933

Macrochiridothea stebbingi. — Stebbing, 1914: 354. — Moreira, 1972: 395–399, fig. 1C. — Moreira, 1973: 13–15, fig. 1 (only).

Macrochiridothea stebbingi var. *multituberculata* Nordenstam, 1933: 110–112, pl. 1 fig. 7, fig 26. — Sheppard, 1957: 170–172. — Menzies, 1962: 101.

Material. *Holotype*: Rocks at Port William, Falkland (Malvinas) Islands, 51°40'S, 57°47'W, SMNH (ovigerous female, 13 mm).

Diagnosis. Total body length of female 13 mm. Dorsal surface tuberculate (pereonite 1 with pair of lateral longitudinal rows of 3 tubercles and transverse row of 9 tubercles; pereonites 1–4 with 5 longitudinal rows of tubercles: median, 2 sublaterals and 2 laterals, plus smaller intermediate tubercles between them; pereonite 5 with 7 tubercles; pereonite 7 with 3 tubercles; pleonite 1 with 3 tubercles); pleotelson with a single strong median keel. Lateral lobes on head rounded. Pereopods 2 and 3 dactyli subchelate, closing on truncate palm. Pereopod 5 ischium without a prominent hook on upper margin.

Distribution. Falkland (Malvinas) Islands (51°40'S, 57°47'W), Rio Grande do Sul, Brazil (34°S); 65 m.

Remarks. Stebbing (1914) reported on two females of *M. stebbingi* collected from the Falkland Islands in

1898. Both are about twice as long as the female holotype of the nominal species. Nordenstam's (1933) subspecies was based on another ovigerous female of similar length and judging on his detailed description of the sculpture and photograph a separate species is justified. Menzies (1962) agreed. Two features clearly distinguish the species: *M. multituberculata* has wide acute lateral lobes on the head (more rounded in *M. stebbingi*) and a double lateral tubercle anteriorly on the pleotelson (not evident in *M. stebbingi*). Moreira's (1972; 1973) figures of an adult male from off Arroio Chuí, Rio Grande do Sul, Brazil, that he attributed to *M. stebbingi* has more but much smaller tubercles than *M. stebbingi*. It lacks eyes and has acute head lobes. The pattern of tubercles, notably the lateral longitudinal rows of three tubercles on pereonite 1 and the pattern of median tubercle plus double lateral tubercles on the pleotelson, match the description of *M. stebbingi multituberculata*.

Macrochiridothea robusta Bastida & Torti, 1969

Macrochiridothea robusta Bastida & Torti, 1969: 65–72, figs 1, 2. — Moreira, 1973: fig. 15. — Carvacho, 1997: 51 (list).

Material. *Holotype*: Buenos Aires Province, Argentina (37°57'S, 57°28'W), 16 m, MACN 27.327 (ovigerous female, 8.9 mm, examined by AS).

Paratypes: MNHN Is.3848 (female, examined by GCBP); "colección particular" (adult male).

Diagnosis. Total body length of female 9 mm. Dorsal surface smooth except for posterolateral spines on pereonite 1 and small middorsal tubercles on pereonites 6 and 7; pleotelson with obsolete median carina on pleonite 4. Lateral lobes on head acute. Coxa 6 reaching posteriorly to pleonite 3. Antenna 1 peduncle, article 2 with anterodistal prolongation. Antenna 2 peduncle, article 4, as long as greatest width; article 5, 3 times as long as greatest width. Pereopods 2 and 3 dactyli minute, hook-like. Pereopod 5 ischium without a prominent hook on upper margin.

Distribution. Buenos Aires Province, Argentina (38°S); 16–22 m depth.

Remarks. In Bastida & Torti's (1969) figure of the holotype, pereonite 6 is longer than in other species, an observation confirmed by examination of the holotype in MACN and of the paratype in MNHN. The carina on pleonite 4, referred to as "espina mediana anterior" by Bastida & Torti (1969) is not evident in the somewhat distorted paratype.

Macrochiridothea setifer Menzies, 1962

Macrochiridothea setifer Menzies, 1962: 101–102, fig. 34. — Moreira, 1973: figs 9–10. — Epelde-Aguirre & Lopez, 1975: 161. — Jaramillo, 1977: 79. — Jaramillo, 1982: 184–185, fig. 7. — Carvacho, 1997: 45–48, 52, figs 1–20.
Macrochiridothea sp. — Carvacho & Saavedra, 1994.

Material. *Holotype*: Isla de Guafo, near Punta Weather, Chile, 25 m, 43°37'S, 74°49'W, SMNH Type-3103 (male, 4.2 mm, examined by GCBP).

Other material: Playa Totoralillo, Coquimbo, Chile, NMV J58383, J58384 (>100 specimens, 4–6 mm, examined by GCBP); Mehuín and Muicolpué, Chile, IZUA (17 specimens, 4.5–10 mm, Jaramillo, 1982); unspecified localities, Chile (Carvacho, 1997).

Diagnosis. Total body length of male 7.8 mm; female 10.1 mm. Dorsal surface smooth; pleotelson with a weak median keel along whole length. Lateral lobes on head acute. Coxa 6 reaching posteriorly well beyond pleonite 3. Antenna 1 peduncle, article 2 without anterodistal prolongation. Antenna 2 peduncle, article 4, 2.5 times as long as greatest width; article 5, 4 times as long as greatest width. Pereopods 2 and 3 dactyli minute, hook-like. Pereopod 5 ischium without a prominent hook on upper margin. Pleopod 2, appendix masculina straight, apex laterally denticulate.

Distribution. Coquimbo to Isla de Guafo, Chile (30°S–44°S); sandy beaches to 25 m depth.

Remarks. Menzies (1962) illustrated only the dorsal view, end of antenna 1 and apex of the pleotelson of the holotype. His diagnosis was short and not informative; he reported that the pereopods were similar to those of *M. stebbingi.* The holotype was examined by one of us (GCBP) and found to be a male (not female as stated by Menzies – his figure shows a typical male pereonite 1) and to lack the "pair of flattened elevations at margin of maxillipedal somite groove" reported and illustrated by Menzies. Jaramillo's (1982) illustrations of a 10.1 mm female and others by Carvacho (1997) of a 7.8 mm male do not figure these elevations. Numerous specimens from Playa Totoralillo, Chile, examined by GCBP lack any ornamentation. It appears Menzies misinterpreted the shape of the head-pereonite suture.

Jaramillo (1977, 1982) reported *M. setifer* over a wide geographic range throughout Chile based in part on the beach surveys of Epelde-Aguirre & Lopez (1975).

Macrochiridothea stebbingi Ohlin, 1901

Macrochiridothea stebbingi Ohlin, 1901: 289–291, pl.12, fig. 9. — Carvacho, 1997: 52 (list).
Probably not *Macrochiridothea stebbingi*. — Sheppard, 1957: 170–172, fig. 12.
Probably not *Macrochiridothea stebbingi*. — Menzies, 1962: 98–101, fig. 33.
Probably not *Macrochiridothea stebbingi*. — Moreira, 1972: fig. 1A. — Moreira, 1973: fig. 1. (= *M. multituberculata*).

Material. *Holotype*: Between Isla Nueva and Isla Navarino, 55°15'S, 66°25'W, Chile, 54 m [30 fm], SMNH (female, 7 mm).

Diagnosis. Total body length of female 7 mm. Dorsal surface generally tuberculate (5 longitudinal rows: median from head to pleotelson, 2 sublaterals and laterals from pereonite 1 converging on pereonite 6); pleotelson with a single strong median keel. Lateral lobes on head rounded. Coxa 6 just overlapping pleonite 2. Antenna 1 peduncle, article 2 without anterodistal prolongation. Antenna 2 peduncle, article 4, 1.1 times as long as greatest width; article 5, 3 times as long as greatest width. Pereopods 2 and 3 dactyli subchelate, closing on truncate palm. Pereopod 5 ischium without a prominent hook on upper margin.

Distribution. Tierra del Fuego, Chile-Argentina, 55°15'S, 66°25'W; 54 m depth; other localities doubtful.

Remarks. *Macrochiridothea stebbingi* is a problematic species. Ohlin's (1901) holotype from western Tierra de Fuego is a female with prominent tubercles, especially evident in his illustration of the lateral view. He illustrated many limbs. Sheppard (1957) commented on additional material collected east of southern Argentina at 118–309 m depth. Her illustrations of antennae and pereopod 2 show narrower limbs than in Ohlin's figure 9. Menzies' (1962) figure 33a of a specimen collected at Seno Reloncaví, Chile, at 20–25 m depth, considerably north of the type locality, differs from Ohlin's in tuberculation and apparent head shape. Notably, Menzies' figure shows fewer tubercles on pereonites 5 and 6. His figure of pereopod 2 does not resemble Sheppard's. The identity of Sheppard's and Menzies' specimens remains uncertain.

Moreira's (1972, 1973) figures of a male from Rio Grande do Sul, Brazil, even further from the type locality, show a head with more prominent acute lateral lobes and more tubercles than in other illustrations (see *M. multituberculata*).

If the subspecies from the Falkland Islands were treated as a distinct species and subsequent records are not of this species, the geographical range of *M. stebbingi* would not be as extensive as summarised by Moreira (1973) and Carvacho (1997).

Macrochiridothea uncinata Hurley & Murray, 1968

Macrochiridothea uncinata Hurley & Murray, 1968: 244–248, figs 1–4. — Moreira, 1973: figs 11–15. — Carvacho, 1997: 52 (list).

Material. *Holotype*: Muriwai Beach, New Zealand (36°49'S, 174°27'E), lower intertidal, NIWA (male, 4 mm).

Paratypes: collected with holotype, NIWA (4 females, 3.0–3.8 mm).

Diagnosis. Total body length of male 4 mm; female 5.5 mm. Dorsal surface of head, pereon and pleotelson smooth. Lateral lobes on head acute. Coxa 6 just overlapping pleonite 2. Antenna 1 peduncle, article 2 with anterodistal prolongation. Antenna 2 peduncle, article 4, as long as greatest width; article 5, 2.5 times as long as greatest width. Pereopods 2 and 3 dactyli subchelate, half as long as propodus. Pereopod 5 ischium with a prominent hook on upper margin. Pleopod 2, appendix masculina strongly curved, laterally with minute setae.

Distribution. North Island, New Zealand, 35°S–41°S.

Remarks. The penes, examined for us by Shane Ahyong, NIWA, are a pair of simple short papillae with a distal seta. Hurley & Murray (1968) noted sexual differences only in the shape of the hook on pereopod 5, a feature unique to this species. The species is the only one outside South America.

Macrochiridothea aff. *lilianae* Moreira, 1972

Macrochiridothea aff. *lilianae*. — Jaramillo, 1982: 185, fig. 8.

Material. Mehuín and Muicolpué, Chile, IZUA (11 specimens, 9.3–11.7 mm).

Diagnosis. Total body length of male 11.7 mm. Dorsal surface of head, pereon and pleotelson smooth. Lateral lobes on head rounded. Coxa 6 reaching posteriorly to pleonite 3. Antenna 1 peduncle, article 2 without anterodistal prolongation.

Distribution. Mehuín and Muicolpué, Chile, 39°S–41°S.

Remarks. Jaramillo (1982) briefly diagnosed a Chilean species similar to the Brazilian species, *M. lilianae*. He did not specify what he saw as the differences from *M. lilianae.* The male was illustrated in dorsal and lateral view, plus the antenna 1, pereopod 1 and appendix masculina. The male of this Chilean species is twice as long as the Brazilian *M.lilianae,* the head is relatively broader and it possesses a longer coxa 6.

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References

Bastida, R. & Torti, M.R. (1969) Un nuevo isopódo del género *Macrochiridothea* de las costas Argentinas (Valvifera, Idoteidae). *Neotropica*, 15, 65–72.

Carvacho, A. (1997) Redescripción de *Macrochiridothea setifer* Menzies, 1962 y revisión del género *Macrochiridothea* Ohlin, 1901 (Isopoda: Valvifera: Idoteidae). *Boletin Museo Nacional de Historia Natural, Chile*, 46, 45–54.

Carvacho, A. & Saavedra, M. (1994) Sobre una colección de Crustáceos de Chiloé Occidental. *Gayana (Instituto Central de Biologia, Universidad de Conceptión) Zoologia*, 58, 169–179.

Dana, J.D. (1849) Conspectus crustaceorum quae in orbis terrarum circumnavigatione, Carolo Wilkes e classe Reipublicae, Foederate Duce, lexit et descripsit (continued.). *American Journal of Sciences and Arts*, 8, 424–428.

Dana, J.D. (1853) Crustacea. Part II. *United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842 under the command of Charles Wilkes, U.S.N.*, 13, 691–1618, with a folio atlas of 96 plates (published 1855).

Epelde-Aguirre, A. & Lopez, M.T. (1975) Zonación en el sustrato arenoso de playa Blanca, Bahía de Coronel y observaciones sobre crustáceos poco recuentes. *Boletín de la Sociedad de Biología de Concepción*, 49, 161–170 [English summary].

Harger, O. (1878) Report on the marine Isopoda of New England and adjacent waters. *Report of the United States Commission of Fish and Fisheries*, 6, 297–462, pls 1–13.

Harrison-Nelson, E. & Bowman, T.E. (1990) A range extension to the north for *Macrochiridotea* [sic] *giambiagiae* Torti and Bastida (Crustacea: Isopoda: Valvifera). *Proceedings of the Biological Society of Washington*, 103, 127–130.

Hurley, D.E. & Murray, R.H. (1968) A new species of *Macrochiridothea* from New Zealand, with notes on the idotheid subfamily Chaetilinae (Crustacea Isopoda: Valvifera). *Transactions of the Royal Society of New Zealand (Zoology)*, 10, 241–249.

Jaramillo, E. (1982) Taxonomy, natural history and zoogeography of sand beach Isopoda from the coast of Southern Chile. *Studies on the Neotropical Fauna and the Environment*, 17, 175–194.

Jones, M.B. & Fenwick, G.D. (1978) *Maoridotea naylori*, a new genus and species of isopod (Valvifera, Idoteidae, Chaetilinae) from the Kaikoura Peninsula, New Zealand. *Journal of Natural History*, 12, 617–625.

King, R.A. & Cawood, A.M. (2007) A revision of the genus *Chiridotea* (Isopoda: Chaetiliidae) with species redescriptions and a key. *Journal of Crustacean Biology*, 27, 121–139.

Menzies, R.J. (1962) Reports of the Lund University Chile Expedition 1948-49. 42. The zoogeography, ecology, and systematics of the Chilean marine isopods. *Lunds Universitets Årsskrift*, 2, 1–162.

Moreira, P.S. (1972) On the distribution of species of *Macrochiridothea* Ohlin, 1901 in southern Brazil (Crustacea, Isopoda, Valvifera). *Revista Brasileira de Biologia*, 32, 395–399.

Moreira, P.S. (1973) Species of *Macrochiridothea* Ohlin, 1901 (Isopoda, Valvifera) from Southern Brazil, with notes on remaining species of the genus. *Boletim do Instituto Oceanográfico, Sao Paulo*, 22, 11–47.

Nierstrasz, H.F. (1918) Alte und neue Isopoden. *Zoologische Mededelingen, Leiden*, 4, 103–142, pls 9, 10.

Nierstrasz, H.F. (1941) Die Isopoden der Siboga-Expedition. IV. Isopoda Genuina. III. Gnathiidea, Anthuridea, Valvifera, Asellota, Phreatocoidea. *Siboga Expéditie*, 19, 235–308.

Nordenstam, A. (1933) Marine Isopoda of the families Serolidae, Idotheidae, Pseudidotheidae, Arcturidae, Parasellidae and Stenetriidae mainly from the South Atlantic. *Further Zoological Results of the Swedish Antarctic Expedition, 1901–1903*, 3, 1–284, 2 pls, errata.

Poore, G.C.B. (1984) Clarification of the monotypic genera *Chiriscus* and *Symmius* (Crustacea: Isopoda: Idoteidae). *Proceedings of the Biological Society of Washington*, 97, 71–77.

Poore, G.C.B. (1985) Australian chaetiliids (Crustacea: Isopoda: Valvifera): a new genus, new species and remarks on the family. *Memoirs of the Museum of Victoria*, 46, 153–172, pl 34.

Poore, G.C.B. (2001) Isopoda Valvifera: diagnoses and relationships of the families. *Journal of Crustacean Biology*, 21, 213–238.

Richardson, H. (1911) Descriptions of a new genus and species of isopod crustacean of the family Idotheidae from the mouth of the Río de la Plata, Argentina, South America. *Proceedings of the United States National Museum*, 40, 169–171.

Sheppard, E.M. (1957) Isopod Crustacea Part II. The sub-order Valvifera. Families: Idoteidae, Pseudidotheidae and Xenarcturidae fam. n. With a supplement to isopod Crustacea, Part 1. The family Serolidae. *Discovery Reports*, 29, 141–197, pls 8, 9.

Stebbing, T.R.R. (1914) Crustacea from Falkland islands collected by Mr. Rupert Valletin, F.L.S. Part II. *Proceedings of the Zoological Society of London*, 341–378, 9 pls.

Torti, M.R. & Bastida, R. (1972) Presencia del género *Macrochiridothea* Ohlin, 1901 en Uruguay y Brasil: *M. giambiagiae* sp. nov. (Crustacea, Isopoda). *Neotropica*, 18, 16–22.