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Tanaidaceans (Crustacea: Peracarida: Tanaidacea) from Moreton Bay, Queensland

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ABSTRACT

Sampling of the littoral and sublittoral benthos around Moreton Bay, Queensland, Australia, undertaken in February 2005, revealed, *inter alia*, 1175 specimens of tanaidacean, representing 29 species in 20 genera. Four of these species in the Parapseudidae, including three new species and one new genus, have been treated elsewhere. All of the material is discussed herein, including 17 further new species, comprising one kalliapseudid, one synapseudid, and one pagurapseudid, one tanaid, two anarthrurids, one typhlotanaid, two paratanais and seven leptocheliids, and three further new genera, one in the Anarthruridae, one in the Typhlotanaidae and one in the Leptocheliidae. Range extensions of a number of species are reported, including taxa recorded previously from Western Australia, New South Wales and New Caledonia. *Heterotanais crassicornis* is transferred to *Konarus*. The diversity and niche specificity of these taxa in the Moreton Bay region is discussed. Existing samples held in the Queensland Museum were also examined, and contributed a further new species as well as additional taxa, and further records of the new taxa found in 2005. A complete listing is given of the known Australian species of Tanaidacea (not including those from Subantarctic waters). □ Crustacea, Tanaidacea, Apseudomorpha, Tanaidomorpha, Queensland, Australia, Antiplotanais, Bathytanais, Bunakenia, Curtipleon, Gollumudes, Kalliapseudes, Konarus, Leptochelia, Longiflagrum, Pagurotanais, Pakistanapseudes, Paratanais, Pseudoleptochelia, Catenarius, Remexudes, Sinelobus, Tanaopsis, Tangalooma, Teleotanais, Whiteleggia, Zeuxo.

Sampling of the littoral and sublittoral benthos around Moreton Bay, Queensland, was undertaken in February 2005 in order to characterise the smaller marine arthropod fauna of this region, including tanaidaceans. In the event, 1175 specimens of tanaidacean were collected, representing 29 species in 20 genera, of which 20 species and 4 genera were new to science. Range extensions of a number of known species were discovered, including taxa recorded previously from Western Australia, New South Wales and New Caledonia. Four of these species, including three new species and one new genus in the Parapseudidae, have been treated elsewhere (Błażewicz-Paszkowycz & Bamber, 2007a). Existing samples held in the Queensland Museum were also examined, and included further material of the

new taxa found in 2005, and an additional new species of the Tanaidae. All this material is described or discussed below.

Listings of tanaidaceans from all Australian waters were given by Poore (2002, 2005). The previous records of Tanaidacea from Australia (not including Antarctica) were reviewed by Bamber (2005), who listed 28 known species, and added two new genera and 24 new species from Western Australia. To that list should be added *Bathytanais bathybrotus* (Beddard 1886), as some of Beddard's material came from Port Jackson, New South Wales. While the early records are sparse, studies since the end of the 1990s (Larsen 1999, 2000, 2001; Larsen & Heard 2001; Larsen & Hansknecht 2002; Guțu & Heard

2002; Bamber 2005; Guţu, 2006; Drumm & Heard 2006b; Błażewicz-Paszkowycz & Bamber, 2007a, b; Edgar, 2008) have demonstrated an unusually high density and diversity of tanaidaceans in Australian waters; most surprisingly, Larsen & Hansknecht (2004) described as new *Pseudohalmyrapseudes aquadulcis* from a freshwater spring in Northern Territory. Of particular relevance here, Boesch (1973) recorded three new species from Moreton Bay. Also, Guţu (2006) described 13 new species of apseudomorph tanaidacean from Australian waters; six of these were collected from Moreton Bay in 1976. Four of these six were not collected in 2005, including, perhaps surprisingly, the apseudid *Muramurina splendida* (Guţu, 2006) (Apseudinae), which was recorded as an estimated 1500 specimens from Middle Banks, to the west of Moreton Island, in 1976. Most recently, Edgar (2008) described 12 new species of the family Tanaidae from Australian waters.

A complete listing of the 113 known Australian species of Tanaidacea (not including those from Subantarctic waters), including the species described below, is given as Appendix 1.

METHODS

Collecting methods were by hand (diving) and by various sampling gears, notably long-arm and standard 0.1 m² van Veen grabs and a spanner-crab dredge. Other sampling was opportunistic and non-quantitative. Sample depths ranged from the littoral zone to 41.3 m. Position fixing was by GPS. All specimens were collected under Queensland Marine Parks Permit No. QS2005/CVL1057.

Specimens were sorted live, colour noted, then fixed in 100% ethanol or 75% methanol. Drawings were all done using a camera lucida. Measurements are axial, dorsally on the trunk and laterally on the appendages. Voucher and type-material has been lodged in the collections of The Queensland Museum (QM) and The Natural History Museum, London (NHM).

Station details for grab samples collected by Peter Davie from his intensive survey of Moreton Bay south of Peel Island during the 2005 workshop are given in Table 1; these samples are referred to in the text as 'MBWS Stn #'. Abbreviations for collectors listed: Roger

Bamber (RNB); Peter Davie (PJFD); Anne-Nina Lörz (A-NL).

The higher taxonomy of the suborder Tanaidomorpha is largely based on Sieg (1980) for the Tanaoidea and on Guţu & Sieg (1999) for the Paratanaoidea. Recently Larsen & Wilson (2002) produced a re-interpretation of the higher taxonomy of the Paratanaoidea derived from cladistic analysis; while potentially a positive step in sorting out the complexity of the superfamily, it left a large number of genera unclassified (*incertae sedis*). Until the remaining taxa are brought into the higher taxonomy, and the somewhat arbitrary divisions based on cluster analysis are given sound taxonomic justification, this analysis must be regarded as only preliminary.

Morphological terminology follows Bamber & Shearer (2005). Serially repetitive body-parts, such as the subdivisions of the antennal flagella and of the uropod rami are segments, while those with independent musculature (such as the parts of the pereopods) are articles. The term 'spines' is used in the traditional (and etymologically correct) sense of rigid 'thorn-like' structures (avoiding the contextual oxymoron 'spiniform setae' *sensu* Watling 1989) to distinguish them from the flexible 'hair-like' setae; non-articulating spine-shaped extensions of the cuticle are mainly considered to be apophyses.

Table 1. Station details for the MBWS survey of February 2005, south of Peel Island, Moreton Bay, Queensland.

| Stn | Latitude | Longitude | Depth (m) | Date |
|-----|------------|-------------|-----------|------------|
| 1 | 27° 31.25' | 153° 22.00' | 5.7 | 17/02/2005 |
| 2 | 27° 31.25' | 153° 21.85' | 5.8 | 17/02/2005 |
| 3 | 27° 31.25' | 153° 21.65' | 5.6 | 18/02/2005 |
| 4 | 27° 31.53' | 153° 21.44' | 5.1 | 20/02/2005 |
| 5 | 27° 31.53' | 153° 21.70' | 5.7 | 20/02/2005 |
| 6 | 27° 31.55' | 153° 20.80' | 7.7 | 18/02/2005 |
| 7 | 27° 31.48' | 153° 20.72' | 8.2 | 18/02/2005 |
| 8 | 27° 31.48' | 153° 20.48' | 8.4 | 18/02/2005 |
| 10 | 27° 31.68' | 153° 20.54' | 7.6 | 18/02/2005 |
| 13 | 27° 31.98' | 153° 20.62' | 6.2 | 20/02/2005 |

SYSTEMATICS

Suborder APSEUDOMORPHA Sieg, 1980
 Superfamily APSEUDOIDEA Leach 1814
 Family APSEUDIDAE Leach, 1814

Bunakenia Guțu, 1995

Bunakenia (Extensibasella) anomala

Guțu, 2006

(Fig. 1)

Bunakenia (Extensibasella) anomala, Guțu, 2006: 105–109, figs 130–142.

Material Examined. QM-W28072, subadult ♂, ♀ without oostegites, dissected, topotypes, medium muddy sand with shell, NE of Banana Bank, Moreton Bay, 27°32.53'S, 153°20.99'E, 4.2 m, 35‰, 28.8°C, 11.02.2005, van Veen grab, RNB. QM-W28452, 5 ♀♀ (3 brooding), Stn. 2; QM-W28453, brooding ♀, MBWS Stn. 3; both van Veen grab, PJFD.

Supplementary Description. Pleotelson rectangular, elongate, just less than half length of pleon, 1.3 times as long as wide. Labrum rounded, simple, naked. Maxilla moveable endite virtually fused, fixed endite with two bifurcate and one bilaterally denticulate distal spines, other spines and setae simple, rostral row of 15 setae. Maxilliped first palp article with longer, inner distal seta and shorter outer seta; second palp article with inner margin bearing about 13 setae largely in two rows, and long outer distal seta reaching tip of fourth article; third palp article with six recurved setae on blunt inner-distal apophysis; fourth palp article with five longer recurved setae and one shorter, straight distal seta.

Cheliped of subadult male (Fig. 1A) slender, basis twice as long as wide, ventrally with stout central spine and paired subdistal setae; three-articled exopodite present, distal article with four plumose setae. Merus subrectangular, with single inner and four ventral subdistal setae; carpus slender, 3.7 times as long as wide, not as compact as that of adult male; chela as that of female.

Pereopod 1 (Fig. 1B) as type. Pereopod 2 (Fig. 1C) basis 2.5 times as long as wide, with single fine elongate dorsal and ventral proximal setae and ventrodistal seta longer than basis width; ischium longer than wide with two ventrodistal setae; merus shorter than carpus, with simple ventral and distal setae, one short and one

longer ventral slender blunt spines and dorso-distal slender blunt spine longer than merus; carpus dorsally with four distal setae and subdistal spine, and single ventrodistal blunt spine, smaller adjacent blunt spine, and smaller proximal ventral spine; propodus slender, sparsely setose, with three ventral spines becoming progressively longer distally, single dorsodistal spine and two smaller spines on posterior face; dactylus slender with small dorsal seta, unguis distinct. Pereopod 3 (Fig. 1D) similar to pereopod 2, but basis three times as long as wide with two midventral setae longer than basis width, ischium with small dorso-distal spine and single seta, carpus with single ventrodistal spine but no dorsal spine, propodus with two dorsodistal spines.

Pereopod 4 (Fig. 1E) basis stouter, 2.3 times as long as wide, with short ventral setae apart from long ventrodistal seta; ischium with single short dorsal and longer ventrodistal setae; merus with two ventral blunt spines; carpus nearly twice as long as merus, ventrally with two proximal spines, distally with row of five slender, blunt spines increasing in length from ventral to dorsal margins; propodus with dorso-distal group of four spines and one seta, most longer than dactylus; dactylus plus unguis shorter than propodus. Pereopod 5 (Fig. 1F) similar to pereopod 4, carpus proportionately longer and with spines arranged ventrally, propodus with distal, subdistal and proximal ventral spines, dactylus plus unguis longer than propodus. Pereopod 6 (Fig. 1G) with two long plumose setae dorsally on merus, four on carpus; propodus ventral margin with row of some 13 small leaf-like spines not extending to proximal margin, dorsodistal group of two blunt spines and single seta, dactylus plus unguis longer than propodus.

Remarks. Guțu (2006) described this species from five females and two males collected from Middle Banks, Moreton Bay in Autumn 1976. The present male is much smaller than the male holotype (2.2 mm compared with 4 mm), and the cheliped has not developed the full dimorphic structure shown by the holotype; a penial tubercle is present midventrally on pereonite 6.

The present material has allowed the foregoing additional description to complement that

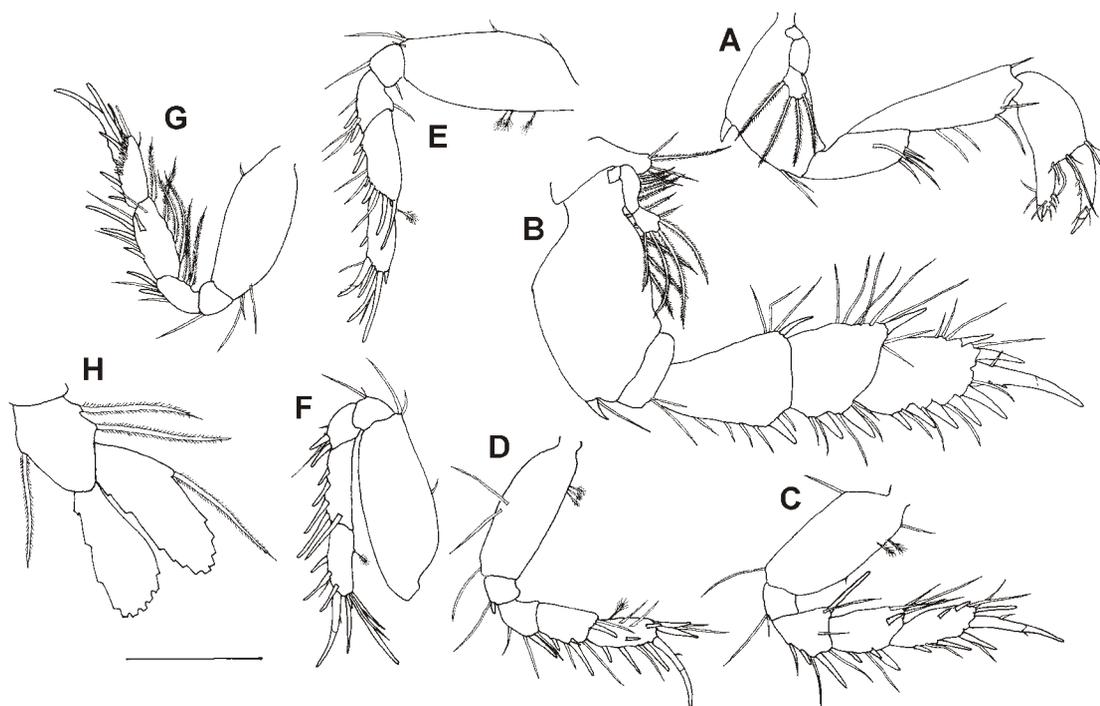


FIG. 1. *Bunakenia (Extensibasella) anomala*, subadult male, A, cheliped; B–G, pereopods 1–6 respectively; H, second pleopod (most setae omitted). Scale bar = 0.2 mm for A–G; 0.1 mm for H.

of Guțu (*loc. cit.*). In particular, he described the distal article of the mandibular palp as having three long and two very small distal setae; in fact the paired small setae are denticulate spines. In addition, pereopods 2–6 were not originally described.

The diet, judging from the gut contents of fine sediment particles, was detritus.

Gollumudes Bamber, 2000

Gollumudes larakia (Edgar, 1997)

Apseudes larakia Edgar, 1997: 279–286, figs 1–3.

Gollumudes larakia – Guțu, 2001: 85–86, 92 (synonymy). Błażewicz-Paszkowycz & Bamber, 2007b: 127–131.

Material Examined. QM-W28073, ♂ (dissected), manca, coarse sand with pebbles and gorgonians, southeast of Bribie I., 27°02.46'S, 153°11.49'E, 8.3 m, 35‰, 28.8°C, 23.02. 2005, van Veen grab, RNB.

Remarks. Guțu (2001) corrected the type-description of this species, pointing out that, contrary to that description, both cheliped and pereopod 1 have an exopodite. Edgar (1997)

recorded large numbers of this species in shallow water (1–8 m depth) around Darwin, Northern Australia, in association with algae and coral rubble. Guțu (2006) recorded five females from Middle Banks, Moreton Bay, collected in 1976, and Błażewicz-Paszkowycz & Bamber (2007b) recorded numerous specimens from the Bass Strait, and to depths of over 60 m, extending its distribution much further south. The present Moreton Bay male differs slightly from the type in having only five articles in the main flagellum of the antennule.

Family Whiteleggiidae Guțu, 1972

Whiteleggia Lang, 1970

Whiteleggia stephensoni Boesch, 1973

Whiteleggia stephensoni Boesch, 1973: 181–187, figs 7–9.

Whiteleggia incerta Guțu, 2006: 297–301, figs 590–600 (new synonymy).

Material Examined. QM-W28074, 26 mature ♂♂, 17 subadult ♂♂, 56 ♀♀ (9 brooding), 12 juvs, 3 further

♂♂, 3 further brooding ♀♀, muddy sand with spatangoids, Moreton Bay, 27°20.91'S, 153°19.96'E, 16.6 m, 33l, 29.1°C, 10.02.2005, van Veen grab, RNB. NHM 2006.1520–1529, in ethanol, 3 mature ♂♂, subadult ♂, 13 ♀♀ (4 brooding), 5 juvs, sandy mud, Moreton Bay, 27°22.72'S, 153°19.43'E, 15 m, 35‰, 29.4°C, 10.02.2005, van Veen grab, RNB. QM-W28075, topotypic ♂, mud with shell breccia, north of Peel I., Moreton Bay, 27°29.39'S, 153°19.92'E, 8.7 m, 35‰, 29.2°C, 11.02.2005, van Veen grab, RNB. QM-W28076, ♀, sandy mud with seagrass, Banana Bank, Moreton Bay, 27°32.46'S, 153°20.74'E, 3.1 m, 33‰, 28°C, 17.02.2005, van Veen grab, RNB. QM-W28454, 24 ♀♀, 11 ♂♂, MBWS Stn. 2; QM-W28455, 4 ♀♀, 3 ♂♂, subadult, MBWS Stn. 3; QM-W28456, ♂, ♀, MBWS Stn. 4; QM-W28457, 10 ♀♀ (1 brooding), 9 ♂♂, MBWS Stn. 5; QM-W28458, 5 ♀♀, ♂, MBWS Stn. 6; QM-W28459, 2 ♂♂, MBWS Stn. 7; QM-W28460, 4 ♀♀, 3 ♂♂, MBWS Stn. 8; QM-W28461, ♂, MBWS Stn. 9; QM-W28462, ♂, MBWS Stn. 13; all van Veen grab, PJFD.

Remarks. The type locality for *Whiteleggia stephensoni* is near Peel Island, Moreton Bay, at 5–6 m depth, in silts and fine sands. It is reassuring to find the species still present, and in large numbers. The present material, all from inside Moreton Bay and from similar substrata as the type-collection, extends the depth range to 3–17 m. Guțu (2006) described a new species, *W. incerta*, from the mouth of the Brisbane River (coll. March, 1976), based on a single female without oostegites; its morphology is quite within the variation of the present material, and compatible with its being an immature *W. stephensoni*.

Family Kalliapseudidae Lang, 1956

Subfamily Kalliapseudinae Lang, 1956

Transkalliapseudes Drumm & Heard, 2006

Transkalliapseudes banana sp. nov.

(Figs 2–4)

Material Examined. HOLOTYPE: QM-W28077, ♂, medium muddy sand with shell, NE of Banana Bank, Moreton Bay, 27°32.53'S, 153°20.99'E, 4.2 m, 35‰, 28.8°C, 11.02.2005. PARATYPES: QM-W28078, brooding ♀ (head missing), 2 mancae, ♂ (dissected), sandy mud with some seagrass, NE of Banana Bank, Moreton Bay, 27°32.46'S, 153°20.74'E, 3.1 m, 33‰, 28°C, 17.02.2005, both van Veen grab, RNB. QM-W28169, ♀ allotype, QM-W28170, ♂, MBWS Stn. 10, van Veen grab, PJFD.

OTHER MATERIAL. QM-W28463, 2 ♂♂ MBWS Stn. 11; QM-W28464, ♂ MBWS Stn. 12; all van Veen grab, PJFD.

Description of Male. Body (Fig. 2A) dorsoventrally flattened, small, holotype 4 mm long, 5 times as long as wide, unpigmented. Cephalothorax subrectangular, just wider than long, with pronounced indented rostrum; eyelobes clearly distinguished, eyes absent. Six free pereonites; pereonites 1–3 subequal, about one third as long as cephalothorax; pereonites 4 and 5 subequal, longer, 1.3 times as long as pereonite 2, pereonite 6 shortest (pereonites respectively 3.3, 3.1, 3.0, 2.1, 2.4 and 3.3 times as wide as long). Pleon of five free subequal pleonites bearing pleopods, each pleonite with eight posterolateral setae, otherwise naked. Pleotelson pentagonal, stepped at point of attachment of uropods, longer than last three pleonites together, 1.1 times as wide as long; marginally with three lateral setae and five posterior setae on each side. Penial tubercle present midventrally on pereonite 6, small pointed hyposphenium present midventrally on pleonite 1.

Antennule (Fig. 2B) proximal peduncle article 3.8 times as long as wide, with inner and outer lateral setae longer in the distal half; second article 1.5 times as long as wide, about one quarter length of first, with 2 outer and 1 inner laterodistal setae longer than article length, two outer and 12 inner distal plumose sensory setae; third article half length of second, 1.3 times as long as wide with inner and outer distal setae longer than article length; fourth peduncle article two-thirds as long as third. Main flagellum of eight segments with sparse setation, segments 1–7 with 3, 3, 1, 1, 1, 0 and 1 aesthetascs respectively, distal segment with four distal setae; accessory flagellum of four segments, distal segment with three longer and one tiny distal setae.

Antenna (Fig. 2C) with inner process on proximal peduncle article bearing three plumose distal setae, inner margin of process denticulate. Second article with outer extension surpassing distal margin of third peduncle article, elongate squama with two outer marginal and two distal simple setae, inner margin denticulate. Third peduncle article short, probably representing fusion of third and fourth articles, with two plumose inner setae. Fourth article 3.7 times as long as wide, with inner marginal row of six shorter plumose filtering setae, and midventral row of 20 longer plumose filtering setae,

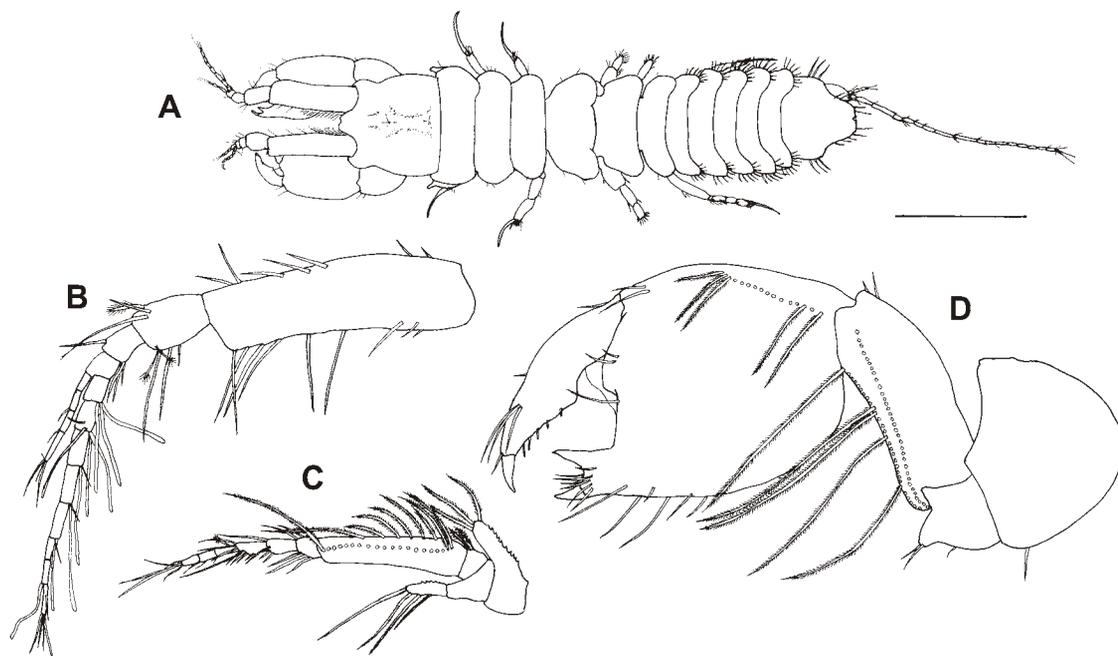


FIG. 2. *Transkalliapseudes banana* sp. nov.: A, male holotype, dorsal; B, male antennule; C, antenna; D, male right cheliped. Scale bar =1 mm for A; 0.3 mm for B–D.

longest of these as long as first four segments of flagellum together. Flagellum of six segments, first three with outer expansion bearing three shorter setae, third with single longer outer distal seta as long as three distal segments together.

Mouthparts closely similar to those of *T. spinulata*, but labrum naked; single-articled mandibular palp bearing 28 plumose filtering setae, distal spine 3.2 times as long as its maximum width; labial palp with pronounced, acuminate inner distal apophysis but no mesial or proximal setae; maxillule inner endite with three 1 simple and three setulate spines; second, third and fourth articles of maxilliped palp respectively with 30, 56 and 38 plumose filtering setae in two parallel rows; maxilliped endite with short, simple distal spines, inner caudal spine similar.

Cheliped (Fig. 2D) with stout basis 1.2 times as long as wide, without exopodite or midventral seta, with single simple ventrodistal seta; merus quadrangular with one shorter mid-ventral and two longer ventrodistal setae; carpus elongate, 2.6 times as long as wide, with two parallel rows of 34 (inner) and 29 (marginal) plumose

filtering setae, increasing in length distally along carpus until equal to carpus length. Propodus stout, robust, as long as wide, with 16 inner plumose filtering setae on dorsal margin, decreasing in length distally along propodus and all shorter than half propodal width; fixed finger with large tooth-like apophysis on cutting edge and smaller sharp apophysis adjacent to dactylus; dactylus (moveable finger) with ventral stout setae but no serrations.

Pereopod 1 (Fig. 3A) with stout basis 2.1 times as long as wide, dorsal margin smooth, with dorsoproximal apophysis visible dorsally on whole animal (Fig. 2A), without exopodite; short ventrodistal spine and fine adjacent seta. Ischium with single seta. Merus shorter than basis with short ventral setae in proximal half, with single ventrodistal and dorsodistal spines, the former with marginal denticulation. Carpus compact, with single dorsodistal blunt simple spine, two ventrodistal marginally-denticulate spines, outer face with diagonal row of crenulation. Propodus with four ventral denticulate blunt spines, two dorsodistal denticulate spines; outer face with diagonal row of crenulation,

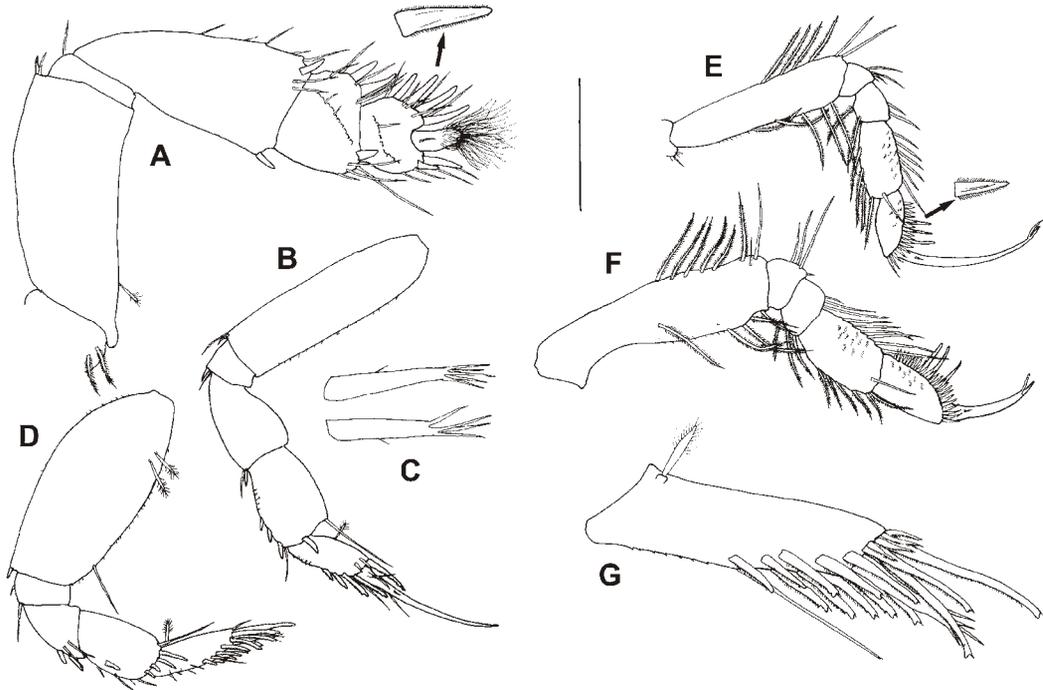


FIG. 3. *Transkalliapseudes banana* sp. nov.: A, pereopod 1, with detail of denticulate spine; B, pereopod 2; C, dactyli of pereopods 4 and 5; D, pereopod 4; E, male pereopod 6, with detail of denticulate leaf-like spine; F, female pereopod 6; G, distal articles of pereopod 5. Scale bar = 0.3 mm for A, B, D-F; 0.1 mm for C, G.

inner face with row of six denticulate setae at base of dactylus. Dactylus stout, with proximal seta and distal brush of numerous sensory setae typical of the subfamily.

Pereopod 2 (Fig. 3B) basis 3.6 times as long as wide with sparse fine spinules on dorsal margin, ischium and merus with slender spine and fine seta ventrodistally; carpus as long as merus with sparse comb-rows of spinules proximoventrally, three ventral denticulate spines in distal half, one inner distal denticulate spines, dorso-distal seta 1.3 times as long as propodus; propodus 0.8 times as long as merus, with sparse comb-rows of spinules proximoventrally, row of four ventrodistal and one dorsodistal finely denticulate spines; dactylus and unguis fused, slender, twice as long as propodus, with proximal sensory lobe bearing two setae and single simple seta distal to this lobe. Pereopod 3 similar to pereopod 2 but with three inner distal spines on carpus

Pereopods 4 and 5 (Fig. 3D, G) similar to each other; basis 2.15 times as long as wide, with

sparse fine spinules on dorsal proximoventral margins, ventrodistal spine, two dorsoproximal plumose sensory setae and subdistal dorsal seta; merus with two ventrodistal denticulate spines; carpus twice as long as merus, with graded row of four denticulate distal spines as well as mid-ventral small spine; propodus with dorso-proximal plumose sensory seta, four dorsodistal short denticulate spines and distal crown of 15 longer denticulate spines (shorter proximally) each with distal seta; dactylus terminating in four (pereopod 4) or five (pereopod 5) filaments but not a 'brush' of setae (Fig. 3C).

Pereopod 6 (Fig. 3E) smaller and more slender than preceding; basis 4.5 times as long as wide, with sparse fine spinules on dorsal margin, dorsally with five plumose setae in distal half, ventrally with four plumose setae in distal half and two ventrodistal simple setae; ischium shorter than merus with simple ventrodistal setae; merus with two dorsal plumose setae, two ventral simple setae; carpus with four dorsal plumose setae, six ventral simple setae and

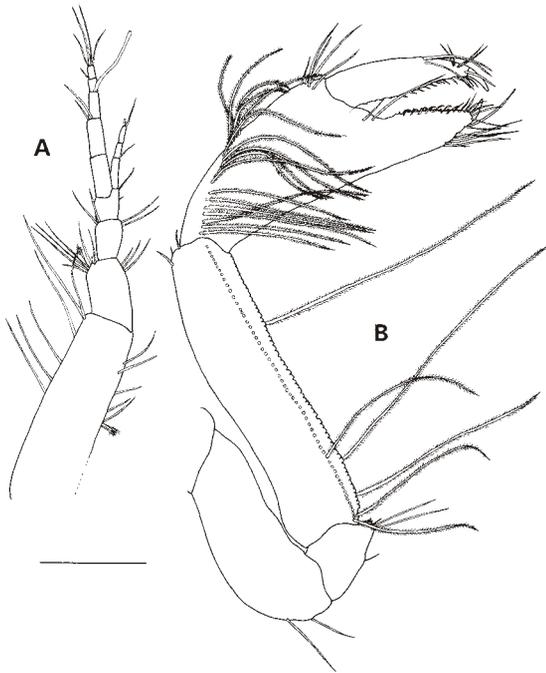


FIG. 4. *Transkalliapseudes banana* sp. nov., female allotype: **A**, antennule (drawn *in situ*); **B**, left cheliped (most carpal filtering setae shown only by their bases). Scale bar = 0.3 mm.

sparse comb-rows of spinules mesially; propodus with sparse comb-rows of spinules mesially, dorsodistal denticulate spine, ventral marginal row of 16 denticulate leaf-like spines and four longer adjacent simple blunt spines; dactylus and unguis fused, twice as long as carpus, distally bifurcate.

Pleopods all alike, typical for the subfamily, basis with three inner plumose setae, exopod smaller than endopod, respectively with 14 and 15 plumose setae.

Uropod biramous, basis with two simple distal setae, exopod shorter than basis and of three segments, endopod elongate, filiform, multi-segmented, 2.8 times as long as pleon (Fig. 2A).

Description of Female. (Only one female specimen, the allotype, had an undamaged anterior). Similar to, but larger than, the male, with sexual dimorphism shown in the antennule, antenna, cheliped and pereopod 6. Length of allotype 5.9 mm. Rostrum truncate rather than concave. Antennule (Fig. 4A) with fewer pinnate sensory

setae than male, accessory flagellum of 3 segments, main flagellum of 5 segments with single aesthetasc on segment 3. Antenna with longer setae than that of male, squama with 6 marginal setae. Cheliped (Fig. 4B) basis more elongate, twice as long as wide; carpus elongate, 4.25 times as long as wide, with two parallel ventral rows each of 59 long, plumose setae; palm of chela (propodus) nearly twice as long as wide, longer than fingers, with dorsodistal tuft of 5 simple setae and, in proximal half, dorsal marginal row of 18 plumose filtering setae, most longer than width of propodus; fixed finger with nine ventrodistal setae in two rows, cutting edge with short spines interspersed with fine denticles and parallel row of short setae; dactylus with dorsal group of four simple setae in distal half and subdistal group of 5 finer setae adjacent to unguis. Sixth leg (Fig. 3F) similar to that of male, with few additional setae as figured commensurate with its larger size; dactylus and unguis as long as carpus.

Etymology. Named after Banana Bank, a submerged bank in Moreton Bay near which all the specimens were collected. Used as a noun in apposition.

Remarks. *Transkalliapseudes* was recently erected by Drumm & Heard (2006b) for their species *T. spinulata* from the shelf off northwestern Western Australia, at 44–82 m depth. It is distinguished from the other genera in the Kalliapseudinae by a combination of characters including the absence of exopodites on both the cheliped and the first pereopod, the presence of vestigial sensory organs (digitiform lobe) on the dactyli of pereopods 2 and 3, the dactyli of pereopods 4 and 5 not reduced to a blunt setose brush and the presence of plumose filtering setae on the distal peduncle article of the antenna.

Transkalliapseudes banana sp. nov. is generally similar to the generotype *T. spinulata* (known only from males), but can be distinguished on a number of characters, notably the distinctly bilobed, or concave, rostrum in the male (not found in any other member of the subfamily), also in the lack of dorsal setae on the pleonites (two pairs on each in *T. spinulata*), in having four segments in the accessory flagellum of the male antennule (three in *T. spinulata*), only three plumose setae on the inner process on proximal

peduncle article of the antenna (four), a naked labrum and mesial face of labial palp, the short plumose filtering setae on the male cheliped propodus (as long as propodal width in *T. spinulata*), far sparser spinulation on the bases of the pereopods, a conspicuous proximal apophysis on the basis of pereopod 1, the presence of only two setae on the sensory lobe of the dactyli of pereopods 2 and 3 (three), the shorter dactylus plus unguis on pereopod 2 (twice as long as propodus, compared with 2.75 times as long in *T. spinulata*), and in having three plumose setae on the pleopod basis (2 in *T. spinulata*).

The only species of *Kalliapseudes sensu* Guțu (2006) described previously from Australia are *K. struthi* Bamber, 2005, from Esperance, Western Australia, *K. multiarticulus* Guțu, 2006, from Darwin, Northern Territory, *K. langi* Guțu, 2006, from Middle Banks, Moreton Bay, and *K. obtusifrons* (Haswell 1882), from Port Jackson, New South Wales (valuably redescribed by Drumm & Heard, 2006a, who gave an identification key to the Australian species of *Kalliapseudes*). The antenna of *K. multiarticulus* was not described, but the species is quite distinct from *T. banana* sp. nov. in having stout, brush-like, sensory dactyli on pereopods 4 and 5, and in having 12 segments in the main flagellum and seven in the accessory flagellum of the antennule. *K. obtusifrons* also has stout, brush-like, sensory (penicillate *sensu* Haswell 1882) dactyli on pereopods 4 and 5 and three segments in the uropod exopod.

Both *Kalliapseudes struthi* and *K. langi* are as small as *T. banana* (all other species being larger at maturity), but they have exopodites on both cheliped and pereopod 1, and a simply convex rostrum (distinctly bilobed [male] or truncate [female], in *T. banana*). Unlike the other two, *K. struthi* does not show fusion of the third and fourth peduncle articles of the antenna (having two short articles after that bearing the squama). The merus of pereopods 2 and 3 is shorter than the carpus in *K. langi* (subequal in length in *K. banana*), and the plumose dorsal setae on the articles of pereopod 6 of *T. banana* are absent in *K. langi*.

The lack of exopodites on both cheliped and pereopod 1 is characteristic of the genus *Mesokalliapseudes*, but those species have a distinct

cheliped morphology with an elongate, slender propodus and unequal fingers of the chela, as well as dactyli of pereopods 4 and 5 reduced to a bunt, setose brush. *Cristapseudes* Băcescu, 1980 is also without exopodites, but the other characters which distinguish *Cristapseudes* (complex epignath, no vestigial sensory organs on the dactyli of pereopods 2 or 3, enlarged coxa and reduced dorsodistal spines on the carpus and propodus of pereopod 1) are not found in *Transkalliapseudes*. A key to the current genera of the Kalliapseudinae is given by Drumm & Heard (2006b).

Family Metapseudidae Lang, 1970

Subfamily Synapseudinae Guțu, 1972

Curtipleon Băcescu, 1976(b)

Curtipleon loerzæ sp. nov.

(Figs 5–7)

Material Examined. HOLOTYPE: QM-W28079, brooding ♀, PARATYPES: NHM 2006.1530–1533, ♂, 3 ♀♀ (1 brooding), among the algae *Amphiroa fragilissima*, with *Asparagopsis taxiformis* and *Zonaria diesingiana*, Flat Rock, north of North Stradbroke I., 27°23.5'S, 153°33.0'E, 8–15 m, 17.02.2005. QM-W28080, ♂ (allotype), 2 ♂♂, subadult ♂, 2 ♀♀, 3 juvs. QM-W28081, ♀ with oostegites, dissected, in *Phoronis* tube mat, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. QM-W28082, 3 ♀♀, sponge and bryozoan epifauna, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. QM-W28083, ♀, amongst sponge, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. All diver collected, A-NL.

Description of Female. Body (Fig. 5A) strongly calcified, typical of the genus, tapering from anterior to posterior; small, holotype 2.28 mm long. Cephalothorax rectangular, naked, sculptured, as long as wide, with concave anterior margin without rostrum; small tubercle either side of anteromedian groove, mid- to postero-medial ridge; eyelobes present, eyes with dark pigment. Six free pereonites; pereonites 1 and 2 shorter than wide with convex lateral margins, swollen laterally and with median ridge; pereonite 3 as pereonite 2 but longer and without ridge, with small anterolateral spine-like apophyses; pereonite 4 longest (1.5 times as long as pereonite 1) with small anterolateral spine-like apophyses, narrower anteriorly, median round tubercle and posterior square tubercle;

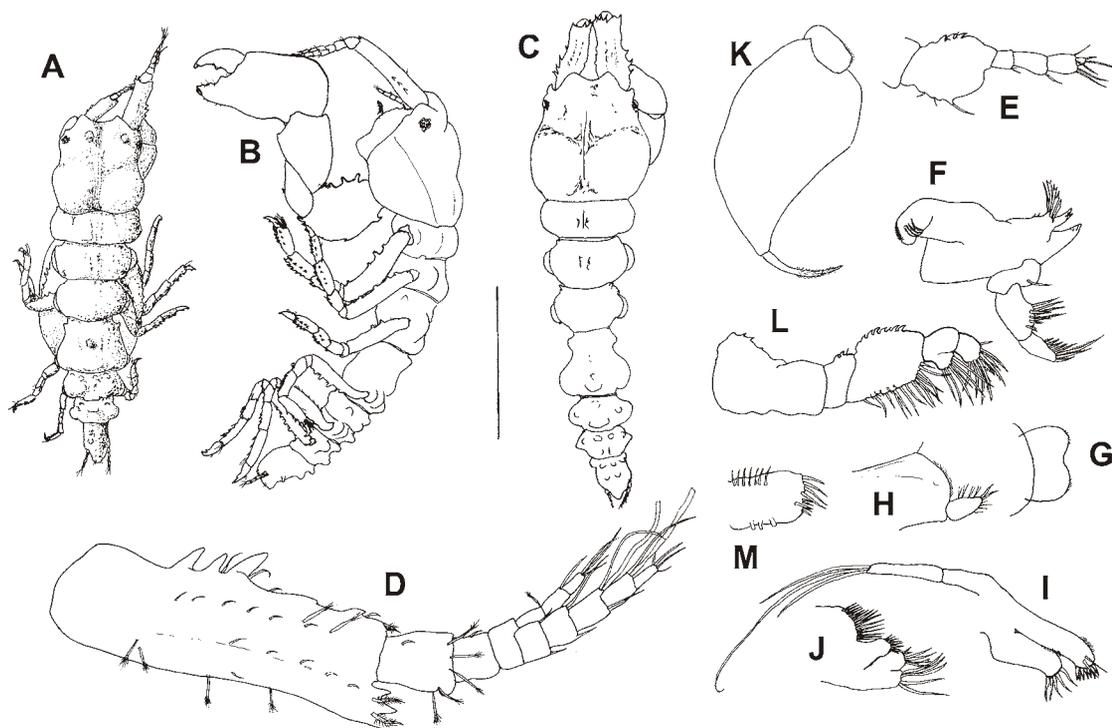


FIG. 5. *Curtipteleon loerzæ* sp. nov.: **A**, holotype female, dorsal; **B**, allotype male, lateral; **C**, allotype male, dorsal; **D**, antennule; **E**, antenna; **F**, right mandible; **G**, labrum; **H**, labium; **I**, maxillule; **J**, maxilla; **K**, epignath; **L**, maxilliped palp; **M**, maxilliped endite. **D–M**, paratype female with oostegites. Scale bar = 1 mm for A, B, C; 0.2 mm for D–M.

pereonite 5 0.75 times as long as pereonite 1, with four small, round anterior tubercles and midposterior squared tubercle; pereonite 6 shorter than pereonite 5 with midlateral rounded tubercles and posterior squared tubercle. Pleon of five pleonites and pleotelson all fused, 0.6 times as wide as long with four dorsal rounded tubercles. Live colour mainly grey, cephalon pink, antennae olive-green.

Antennule (Fig. 5D) proximal peduncle article robust, 3.2 times as long as wide, with three outer spine-like apophyses in proximal half; inner distal corner extended into trifold spine-like apophysis; simple, shorter, curled setae and sensory plumose setae numerous, as figured. second article 0.2 times as long as first with distal crown of five plumose sensory setae; third article half as long as second, fourth article one-third length of second. Main flagellum of five segments subequal in length, distal segments narrower than proximal, fourth and fifth

segments with single aesthetasc, distal segment with four short distal setae; accessory flagellum of three segments.

Antenna (Fig. 5E) with five-articled peduncle; proximal article short, naked; second article expanded, as wide as long, with inner spine-like apophyses and outer setae on small tubercles; squama absent. Third article one-quarter as long as second with single outer seta, fourth article twice as long as third with single outer seta; fifth article just shorter than fourth with three outer and single inner distal setae. Flagellum of one tiny segment with two distal setae.

Labrum (Fig. 5G) bilobed, rounded, laterally setulose. Mandible (Fig. 5F) with tricuspid pars incisiva, bicuspid lacinia mobilis, setiferous lobe with five setae, pars molaris slender, blunt but with finely denticulate margin; palp of three articles, proximal article with simple seta, second article articulating anaxially on first, as long as first with two rows each of four denticulate

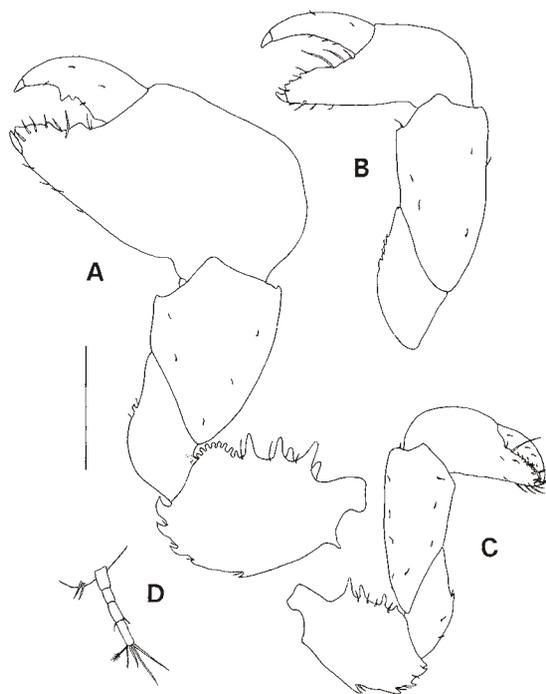


FIG. 6. *Curtiptleon loerzæ* sp. nov.: **A**, left cheliped of allotype male; **B**, distal articles of right cheliped of allotype male; **C**, right cheliped of paratype female; **D**, right uropod. Scale bar = 0.3 mm.

inner setae, dorsal setae shorter, third article shorter than second, with graduated row of eight denticulate setae in distal half.

Labium (Fig. 5H) with smooth outer margin, palp with two distal setae. Maxilla (Fig. 5J) with rostral row of 15 setae; endites with simple setae. Maxillule (Fig. 5I) inner endite with five simple distal setae and slight inner apophysis, outer endite with two subdistal setae and seven distal spines, inner mesial and outer distal margins sparsely setose; palp of two articles, distally with three simple, long setae. Maxilliped (Fig. 5L) basis naked; palp proximal article with paired outer spine-like apophyses; second article outer margin coarsely denticulate, inner margin with outer row of 14 simple setae and inner row of five or six fine setules; third article with distinct inner apophysis bearing six simple setae; distal article with eleven setae in two rows, proximal setae finely denticulate; endite (Fig. 5M) with simple four longer outer and four shorter inner distal simple setae, subdistal seta slender, elon-

gate, simple. Epignath (Fig. 5K) large, cup-shaped, with setulose distal seta.

Cheliped (Fig. 6C) basis 1.6 times as long as wide, dorsal margin with four spine-like apophyses interspersed with setae; ventral margin with small proximal apophysis, single median and three distal spine-like apophyses each with adjacent fine seta; exopodite absent. Merus quadrangular, with single ventromedian spine-like apophysis, few setae; carpus slender, 2.2 times as long as wide, with sparse, fine setae as figured; propodus rounded, 1.5 times as long as wide, fixed finger half length of body of propodus, with finely crenulate cutting edge, three ventral setae; dactylus robust with fine cigar-shaped setae along cutting edge. Finger tips opposed.

Pereopods all broadly similar to each other. Pereopod 1 (Fig. 7A) coxa with slight setose apophysis; basis slender, 4 times as long as wide, without exopodite; dorsal margin with three mesial and one subdistal rounded linguiform apophyses interspersed with fine, simple setae; ischium stout, naked; merus 0.3 times as long as basis, with paired subdistal, ventral spines with finely denticulate proximal margin; carpus and propodus subequal, 1.3 times as long as merus, each bearing two ventral rows of triangular finely-denticulate spines and sparse simple setae as figured; propodus with ventrodiscal plumose seta, dorsodistally with spine and cluster of five setae, three being simple, two with comb-like denticulation. Dactylus stout, ventrally with proximal curved and distal pointed apophyses and three fine inner setae, dorsally with paired fine setae; unguis distinct, stout.

Pereopod 2 (Fig. 7B) as pereopod 1 but smaller, with single simple distal seta on propodus and dorsal plumose sensory seta; merus 0.8 times as long as propodus. Pereopod 3 (Fig. 7C) shortest pereopod, particularly basis, otherwise as pereopod 2. Pereopod 4 (Fig. 7D) as pereopod 2 but merus and propodus subequal, spines on propodus reduced to a single row, propodus with dorsodistal pair of spines and one simple and two comb-like setae; pereopod 5 (Fig. 7E) as pereopod 2 but with single spine row on carpus, denticulate spines more slender; pereopod 6 (Fig. 7F) as pereopod 5 but with fewer ventral denticulate spines.

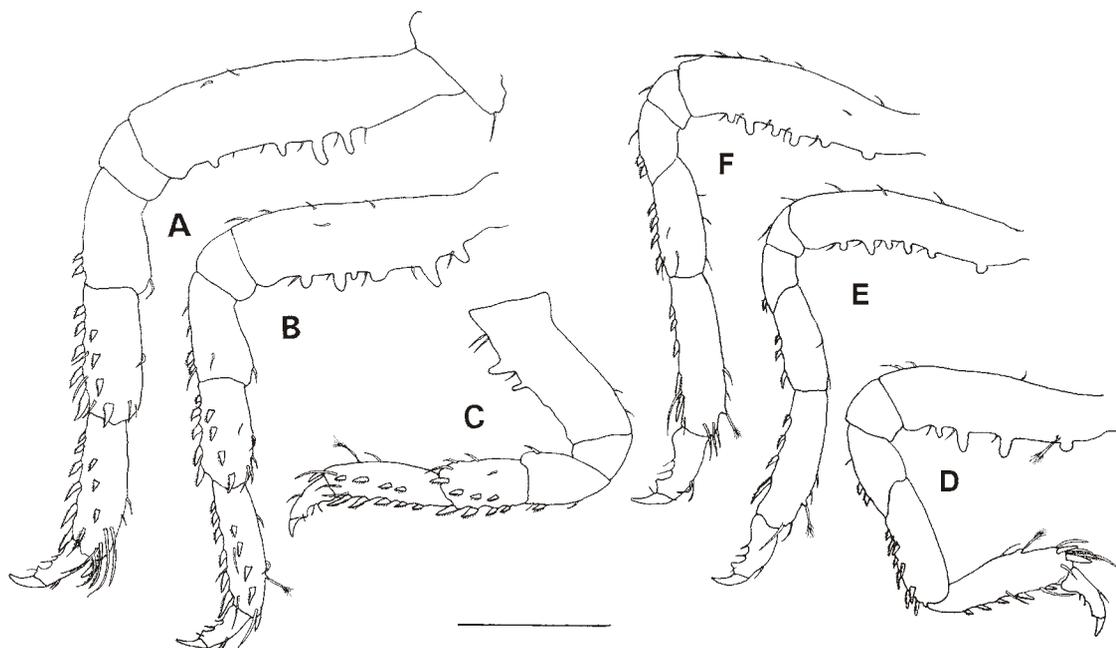


FIG. 7. *Curtipteleon loerzae* sp. nov.: A–F, pereopods 1–6 respectively. Scale bar = 0.2 mm.

Pleopods absent.

Uropods (Fig. 6D) short, uniramous, basis simple, endopod of three segments, distal segment with four simple and one plumose sensory setae.

Holotype with eight embryos in brood pouch.

Description of Male. Broadly similar to, but larger than, female, allotype (Fig. 5B, C) 2.8 mm long. Lateral carina on carapace conspicuous. Antennule similar, but main flagellum segments 1–4 with 1, 1, 2 and 1 aesthetascs respectively. Major dimorphism shown by chelipeds, both of which are more robust in the male. Left cheliped of allotype (Fig. 6A) larger than right. Basis dorsally with two parallel rows of spine-like apophyses and rounded group of linguiform apophyses distally; ventral proximal apophysis spine-like. Carpus stout, 1.2 times as long as wide; propodus massive, as long as merus and carpus together, stout dactylus with tooth-like apophyses on cutting edge. Right cheliped of allotype (Fig. 6B) smaller than left, more similar to that of female, although larger and more robust; dactylus without tooth-like apophyses.

Etymology. Named for Dr Anne-Nina Lörz, who collected all the *Curtipteleon* material as well as so many other specimens reported herein.

Remarks. Three species of the distinctive genus *Curtipteleon* had been described, and they were reviewed by Larsen (2002). *C. carinata* (Makaveeva, 1971) was recorded from the Gulf of Aden at 50 m depth, *C. carinatoides* (Băcescu, 1976) from Tanzania at 25–40 m depth, and *C. heterochelatum* Larsen, 2002, from the Andaman Sea at 18–26 m depth. The last is best-described, the first the worst. Including the present species, the distribution of the genus is in keeping with the zoogeographic trends described by Bamber (1998).

All the previous species have denticulation along the anterior margin of the cephalic depression, *C. carinatoides* having large lateral and central spine-like apophyses, the other two having smaller crenulation. There are no spine-like apophyses indicated by Makaveeva for *C. carinatus*; conversely, the spination of the antennular peduncle is far greater than that of *C. loerzae* sp. nov. *C. heterochelatum* is distinct in having a large spine-like apophysis dorsodistally on the cheliped carpus of the male. *C. loerzae* has a smooth anterior to the cephalon, cheliped basis apophyses reminiscent of those of *C. carinatoides*, and no dorsodistal apophysis on the cheli-

ped carpus; the antennal structure appears also to be unique, although all the previous descriptions and figures of antennae are unclear.

All species show the sexual dimorphism in the chelipeds, those of the male being larger and more robust. Both Băcescu (1976a: 'hundreds' of specimens) and Larsen (2002: one male) note that the left cheliped of the male is larger and more massive than its right cheliped. The male specimen of *C. loerzæ* from Flat Rock and one of the non-allotype males from the Point Lookout *Phoronis* tube-mat have their right chela larger than the left; in all other males, including the allotype, the left cheliped is larger than the right.

All the present specimens were found in epifaunal communities, at between 8 and 15 m depth off the north of North Stradbroke Island (and always sympatric with *Konarus cheiris*, q.v.).

Family Parapseudidae Guțu, 1981

Longiflagrum Guțu, 1995

Longiflagrum caeruleus (Boesch, 1973)

Aapseudes caeruleus Boesch, 1973: 168–174, figs 1–3.

Material Examined. QM-W28084, 2 ♂♂, 14 ♀, 11 juvs, NHM 2006.1534–1539, 2 ♂♂, 2 ♀, 2 juvs, sandy mud (40:55) with *Caulerpa taxifolia*, Moreton Bay, 27°31.58'S, 153°24.18'E, 3.9 m, 35‰, 28.8°C, 11.02.2005, van Veen grab, RNB. QM-W28085, topotypic juv., littoral sand with *Halophila ovalis*, Bradbury Beach, Dunwich, North Stradbroke I., Moreton Bay, 27°29.6'S, 153°23.8'E, +0.4 m, 13.02.2005, trowel sample, RNB. QM-W28086, ♀, Zosteretum inside sand bar, Amity Point, North Stradbroke I., Moreton Bay, 27°24.7'S, 153°26.15'E, depth 0 m, 35.5‰, 14.02.2005, spade sample, RNB. QM-W7409, ♂, 3 ♀♀, Woogoompah I., southern Moreton Bay, amongst *Zostera* 'below low water', 11.04.1976, Australian Littoral Society.

Remarks. The type locality for *Longiflagrum caeruleus* is Dunwich, Moreton Bay, from intertidal sediments with eelgrass. It is thus reassuring to find the species still present in large numbers. Live adult specimens are a pronounced cerulean blue (hence the name) while the manca is white.

Longiflagrum estuarius (Boesch, 1973)

Aapseudes estuarius Boesch, 1973: 174–181, figs 4–6.

Material Examined. QM-W7124, over 100 specimens, including ♂ and ♀, 3.2 km from the mouth of the

Serpentine Creek, Brisbane, 20.08.1974, T.P. Tebble & PJFD.

Remarks. *L. estuarius* was originally described from the estuaries of the Brisbane (type locality) and Fitzroy Rivers. Although not collected during the 2005 surveys, which concentrated on fully marine habitats, it continues to be common in the mainland estuaries feeding into Moreton Bay (P. Davie pers. comm.). As well as their habitat differences, the morphological differences listed by Boesch (1973) (*L. estuarius* having a much shorter uropod, fewer ventral spines on the propodus of pereopod 1, and no ventral hyposphenia on the pereonites) allow easy distinction of the two Australian species of *Longiflagrum*.

Remexudes toompani Błażewicz-Paszkwycz & Bamber, 2007

Remexudes toompani Błażewicz-Paszkwycz & Bamber, 2007a: 19–25, figs 10–12.

Material Examined. All of this material formed part of the type series and is described in Błażewicz-Paszkwycz & Bamber (2007a); it is listed here for completeness of the Moreton Bay material. PARATYPES: QM-W28150, 3 ♀♀ without oostegites, 2 ♀♀ with oostegites, 2 ♂♂, clean medium sand with some shell and ophiuroids, off South Passage East of Moreton I., 27°17.65'S, 153°26.95'E, 19.4 m. QM-W28151, 2 ♂♂, 5 ♀♀, clean medium sand WNW of Flat Rock, off South Passage East of Moreton I., 27°24.10'S, 153°29.18'E, 10.7 m. NHM 2006.15078–1514, 4 ♂♂, 4 ♀♀ without oostegites, clean medium sand WNW of Flat Rock, off South Passage East of Moreton I., 27°23.46'S, 153°30.08'E, 20 m. QM-W28152, ♂, brooding ♀, ♀ with oostegites, ♀ without oostegites, slightly muddy medium sand with holothurians, WNW of Flat Rock, off South Passage East of Moreton I., 27°22.95'S, 153°30.79'E, 26.6 m. All 19.02.2005, van Veen grab, RNB. QM-W28153, 2 ♂♂, 5 ♀♀ (4 of these with oostegites), clean medium sand East of Moreton I., 27°18.19'S, 153°27.56'E, 20.6 m; ♀ without oostegites, clean medium sand East of Moreton I., 27°18.37'S, 153°26.77'E, 9.9 m; both 22.02.2005, van Veen grab, RNB.

Remarks. This taxon shows affinities with *Pakistanapseudes* (see below) and, *Saltipedis* Guțu, 1995, but is distinguished principally in having a swimming morphology to the second pereopod, with merus, carpus and propodus wide and flattened in the same manner as pereopod 1 of most parapseudids; additionally, the propodus of pereopod 1 is twice as long as wide. All the present material was collected from east of the

South Passage, either north of North Stradbroke Island or east of the southern tip of Moreton Island, on clean medium sand substrata from depths of 10–27 m. The other material in the type series, held in the Museum Victoria, Melbourne, was collected from the Bass Strait.

Pakistanapseudes Băcescu, 1978

Pakistanapseudes australianus Guțu, 2006

Pakistanapseudes australianus Guțu, 2006: 260–264, figs 511–525; Błażewicz-Paszkowycz & Bamber, 2007a: 12–14, fig. 6.

Material Examined. QM-W28154, ♀ with oostegites, sandy mud, Moreton Bay, 27°22.72'S, 153°19.43'E, 15 m, 35‰, 29.4°C. QM-W28155, ♀?, no legs muddy sand with spatangoids, Moreton Bay, 27°20.91'S, 153°19.96'E, 16.6 m, 33‰, 29.1°C. 1 damaged specimen, amongst *Halophila decipiens* on sand with some shell, west side of Moreton I., Moreton Bay, 27°16.90'S, 153°123.20'E, 4.7 m, 35‰, 28.6°C. All 10.02.2005, van Veen grab, RNB. QM-W28465, 3 ♀♀, 1 brooding, MBWS Stn. 2. QM-W28466, ♀, MBWS Stn. 5. QM-W28467, 3 ♀♀?, 1 brooding, MBWS Stn. 6. QM-W28468, ♀, MBWS Stn. 7. QM-W28469, ♂, MBWS Stn. 8. QM-W28470, ♀ with empty brood pouch, MBWS Stn. 12. QM-W28471, brooding ♀, MBWS Stn. 13. All van Veen grab, PJFD. QM-W28167, ♀, Middle Banks, northern Moreton Bay, 17.09.1983/13.01.1984, P. Saenger & S. Cook (there are two dates on the label, in material containing a number of species).

Remarks. *P. australianus* is one of five described species of the *Pakistanapseudes*-group (*sensu* Błażewicz-Paszkowycz & Bamber, 2007a) with a pointed rostrum and pigmented eyes and a simple dactylus and unguis to pereopod 2. However the other four species — *P. hodgsoni* Bamber, 2000, from Hong Kong, *P. shiinoi* Băcescu, 1978, from the Gulf of Aden, *Biropalostoma spiniferum* Guțu & Angsupanich, 2004, and *P. pectinis* (Bamber, 1998)(see below) from Brunei — all have a rostrum with rounded 'shoulders' either side of a terminal point, unlike the present species. Other differences between these taxa are discussed in Błażewicz-Paszkowycz & Bamber (2007a). *P. australianus* was taken from muddier substrata than the following species. Moreton Bay is the type locality for this species (Guțu 2006).

Guțu (2006) moved *P. pectinis* from *Pakistanapseudes* to his new genus *Platylicoa*, together with his new species *Platylicoa setosa*. The problems with the genus *Platylicoa* are discussed by Błażewicz-Paszkowycz & Bamber (2007a).

Pakistanapseudes perulpa

Błażewicz-Paszkowycz & Bamber, 2007

Pakistanapseudes perulpa Błażewicz-Paszkowycz & Bamber, 2007a: 3–8, figs 1–3.

Material Examined. all of this material formed the type series and is described in Błażewicz-Paszkowycz & Bamber (2007a). HOLOTYPE: QM-W28156, ♀ with oostegites and antennulae, clean medium sand with shell breccia, N. of Moreton I., Moreton Bay, 26°56.62'S, 153°24.35'E, 27.9 m, 16.02.2005. QM-W28157, allotype ♂, clean medium sand with some shell and ophiuroids, off South Passage East of Moreton I., 27°17.65'S, 153°26.95'E, 19.4 m. NHM 2006.1515, ♂, clean medium sand East of Moreton I., 27°13.70'S, 153°26.84'E, 25.2 m. QM-W28158, brooding ♀, clean medium sand with holothurians, east of Moreton I., 27°18.19'S, 153°27.56'E, 20.6 m. QM-W28159, 2 ♀♀, (1 brooding) fine sand with shell and *Nephtys* sp., west of the northern end of Moreton I., 27°12.37'S, 153°21.42'E, 16.8 m, 23.02.2005. QM-W28160, 3 ♀♀ (2 brooding, 1 dissected) clean sand with polychaetes, west of Moreton I., 27°04.41'S, 153°17.36'E, 7.2 m, 23.02.2005. NHM 2006.1516-1519, 4 ♀♀ (1 brooding) medium sand with shell, west of Moreton I., 27°04.10'S, 153°16.95'E, 8.5 m, 23.02.2005. QM-W28161, ♀ with empty brood pouch medium sand with coarse shell breccia, callianassids and ophiuroids, southeast of Bribie I., 27°03.17'S, 153°13.17'E, 10.2 m, 23.02.2005. All van Veen grab, RNB.

Remarks. The only other *Pakistanapseudes*-group species with a rounded rostrum, pigmented eyes and simple (not bifurcate) claw on pereopods 2 and 3 are the generotype, *P. leptochelatus* Băcescu, 1978 from the Gulf of Oman, *P. bassi* Błażewicz-Paszkowycz & Bamber (2007a) from Bass Strait, Australia, and *Thaicungella lideeiensis* Guțu & Angsupanich, 2004 from Thailand. *T. lideeiensis* is the only species in the group to have multiple setae on the dactylus of all pereopods other than the fourth; unlike *P. perulpa*, it has a compound dactylus and claw on pereopod 4. *P. perulpa* is distinct from *P. leptochelatus* in having far more setae on the antennal squama, far more aesthetascs on the male antenna, five distal setae on the maxillule palp, marginal spines on the articles of the pereopods, more distal setae the exopodites of the cheliped and pereopod, and more segments in the uropod exopod. *P. perulpa* is distinguished from the only other Australian species of a similar morphology, *P. bassi* by having setae on both margins of the pleopod bases (dorsal only in *P. bassi*), pereonites 5 and 6 wider than long (longer than wide in *P. bassi*), and distally blunt marginal

spines on pereopod 1 propodus (distally pointed in *P. bassi*).

The present material was collected from outside Moreton Bay itself around Moreton Island (east, north and west), from clean sand substrata, usually containing shell breccia, and at depths from 7–28 m.

Pakistanapseudes turkoroa

Błażewicz-Paszkowycz & Bamber, 2007

Błażewicz-Paszkowycz & Bamber, 2007a: 8–12, figs 4,5.

Material Examined. This material is described in Błażewicz-Paszkowycz & Bamber (2007a). HOLOTYPE: QM-W28162, ♂, muddy sand with fine shell breccia, Moreton Bay, 27°28.66'S, 153°21.34'E, 7.2 m, 35‰, 29°C, 11.02.2005, van Veen grab, RNB.

Remarks. This species, known only from the holotype male, is distinct in the genus in having a truncate, flattened rostrum. The first pereopod bears unique fleshy dendritic structures on the ventral margins of the merus, carpus and propodus and distally on the dactylus; they are assumed to have some sensory function, and may be absent in the female. It is further distinguished from the other Australian species of this genus by having a much more robust cheliped, that of those other species being extremely slender. The specimen is from shallow muddy sand just north of Peel Island ('Turkrooa', from which its specific epithet derives). An identification key to the Australian species of *Pakistanapseudes* is given by Błażewicz-Paszkowycz & Bamber (2007a).

Family Pagurapseudidae Lang, 1970

Subfamily Pagurapseudinae Lang, 1970

Pagurotanais Bouvier, 1918

Remarks. Guțu (1996) erected *Pagurolangis* for those pagurapseudid species from the Gulf of Mexico and off the Pacific coast of Mexico, which are distinguished by having an exopodite on the cheliped but not on pereopod 1, these being respectively absent and present in species of the other two genera of the Pagurapseudinae, *Macrolabrum* Băcescu, 1976 and *Pagurapseudes* Whitelegge, 1901, although McSweeney (1982) interprets a structure on the cheliped of *Pagurapseudes spinipes* as a rudimentary exopodite. The type species of *Pagurolangis* was designa-

ted as *Pagurotanais bouryi* Bouvier, 1918 — a species for which Bouvier (1918) erected *Pagurotanais* as a new genus. Despite the possibility of 'serious confusion' which Guțu (*loc. cit.*) thought could arise from the suffix 'tanais' alluding to tanaidomorph rather than apseudomorph tanaidaceans, Bouvier's generic name has nomenclatural priority, and *Pagurolangis* Guțu, 1996, is a junior synonym of *Pagurotanais* Bouvier, 1918.

If the rudimentary process on the cheliped of *Pagurapseudes spinipes* is a rudimentary exopodite, this would introduce problems for the generic distinction, as *P. spinipes* is the generotype of *Pagurapseudes*. A further distinction suggested by Guțu (1996) is the width of the basis of pereopod 1, being wider than merus, carpus or propodus in *Pagurapseudes*, but of a similar width in *Pagurotanais*. Unfortunately, again the figures of Whitelegge (1901) indicate a basis little if any wider than the merus for *Pagurapseudes spinipes*.

Pagurotanais koonungai sp. nov.

(Figs 8, 9)

Material Examined. HOLOTYPE: QM-W28087, ♂, amongst algae, Flat Rock, north of North Stradbroke I., 27°23.5'S, 153°33.0'E, 8–15 m, 17.02.2005, A-NL.

Description of Male. Body (Fig. 8A) typical of a pagurapseudid, pleon skewed to the right and curved under pereon; small, holotype about 2.1 mm long. Cephalothorax subrectangular, as long as wide, with smooth, slightly convex anterior margin; on each side one single, simple subocular seta and paired, plumose midlateral and posterolateral setae. Eyelobes distinguished, eyes present, darkly pigmented. Epistome inconspicuous. Six free pereonites, all with anterolateral and posterolateral plumose setae and paired median anterodorsal simple setae; pereonite 1 shortest, 0.75 times as long as pereonite 2 and 2.8 times as wide as long; pereonites 2–6 subequal, pereonites 4 and 5 just longest. Pleon of five free subequal pleonites, without pleopods, each pleonite about 4.4 times as wide as long, with single plumose midlateral seta and sparse row of simple posterodorsal setae (plumose setae on pleonite 6). Pleotelson (Fig. 8B) subrectangular, longer than last two pleonites together, 1.3 times as wide as long, with mid-lateral and

posterolateral plumose setae and paired simple distal setae.

Antennule (Fig. 8C), proximal peduncle article three times as long as wide, with inner and outer plumose setae but no apophyses; second article one-third as long as first with group of distal plumose sensory setae; third article 0.75 times as long as second, fourth peduncle article 0.4 times as long as third. Main flagellum of three segments, the first two wider than long, with 3, 3 and 2 aesthetascs respectively; accessory flagellum of one segment, distally reaching past second segment of main flagellum.

Antenna (Fig. 8D) with wide proximal peduncle article bearing longer plumose and shorter simple setae distally; second article as long as wide, naked; third article twice as long as second, with plumose sensory seta; fourth peduncle article three times as long as second with two shorter and one longer distal setae. Flagellum of two compact segments, penultimate segment with single seta as long as first three peduncle articles together, distal segment with three distal setae.

Mouthparts generally typical for the subfamily. Labrum rounded, sparsely setose. Left mandible (Fig. 8E) with denticulate pars incisiva, lacinia mobilis conspicuous with four unequal 'teeth', setiferous lobe with four simple or bifid setae; palp of three articles, proximal article with long, plumose distal seta; second article longest, 1.5 times as long as proximal article, with seven small spines in distal half; third article as long as first, with seven progressively longer setae in distal half, distal seta much longer than article. Right mandible as left but without lacinia mobilis. Labial palp with two distal setae. Maxillule (Fig. 8F) inner endite with four simple distal setae, outer endite with 10 distal spines, outer margins sparsely denticulate; palp of two articles with indistinct articulation, distally with three setae (damaged in preparation). Maxilliped (Fig. 8G) endite with slender outer distal setae, blunt inner distal and inner caudodistal spines. Maxilliped basis with paired plumose setae; proximal palp article with simple outer margin with one seta; second article with three long plumose and two shorter simple setae on inner margin, one

shorter and one longer simple setae distally on outer margin; third article with six inner marginal simple setae; distal article with thirteen simple inner-marginal and distal setae. Epignath with robust, setulose distal seta.

Chelipeds (Fig. 9A) showing no conspicuous dimorphism. Compact basis just longer than wide, with mid-ventral and ventrodiscal spines and single ventrodiscal plumose seta; square apophysis ('sidepiece') at point of attachment but exopodite absent. Merus triangular, ventral margin with two stout plumose setae. Carpus elongate, more than twice as long as wide, widening distally, ventral margin with five simple setae and single, longer plumose seta. Propodus relatively compact, 1.1 times as long as wide, with two proximal ventral setae and one mid-distal and two dorsodistal setae a base of dactylus; fixed finger with row of small teeth distally on cutting edge and three distal ventral setae; moveable finger curved with two minute spines on cutting edge.

Pereopod 1 (Fig. 9B) longest pereopod, with relatively slender basis 2.5 times as long as wide, dorsal margin bearing nine plumose setae, ventral margin with two curved proximal spines and two distal plumose setae; exopodite absent. Ischium longer than wide with single ventrodiscal plumose seta. Merus shorter than basis, ventral margin with four plumose setae, finer simple setae submarginally and proximally and paired spines distally. Carpus as long as merus, with three ventral spines and simple setae, single spine, simple seta and plumose seta dorsodistally. Propodus longer than basis, with four ventral spines and simple setae. Dactylus curved, as long as propodus, with fine ventral setae, unguis slender, 0.5 times as long as dactylus.

Pereopods 2–6 (Fig. 9) similar to each other, progressively shorter, pereopod 2 one-half as long as pereopod 1; bases 1.5 times (pereopod 2) to 1.3 times (pereopod 6) as long as wide, with subdistal, ventral plumose seta on pereopod 2, paired dorsal plumose setae on pereopods 5 and 6; ischium with two (pereopod 2) one (pereopods 3 and 4) or no simple ventrodiscal setae. Pereopods 2–4, merus with three rows, carpus with two rows and propodus one row of 'sucker-like' spines; and plumose setae

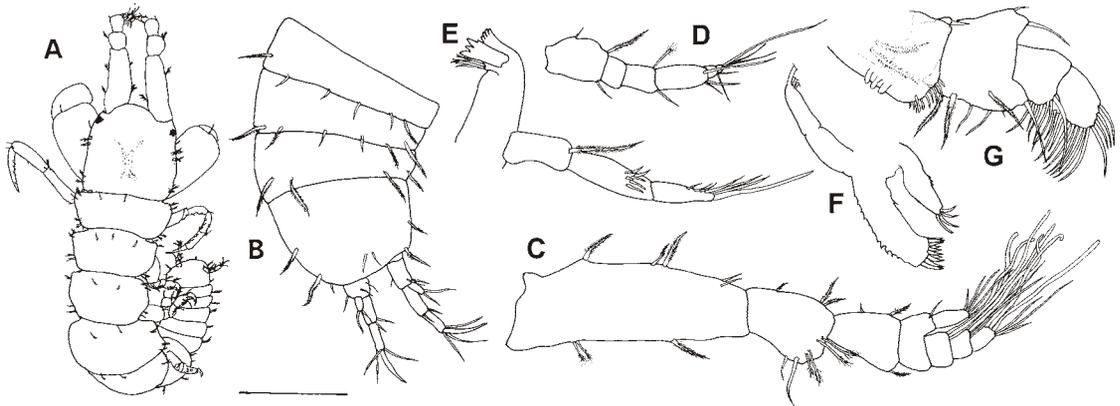


FIG. 8. *Pagurotanais koonungai* sp. nov., male holotype: A, habitus; B, pleonites 3–5 and pleotelson, dorsal; C, antennule; D, antenna; E, left mandible; F, maxillule; G, maxilliped. Scale bar = 0.5 mm for A; 0.2 mm for B; 0.15 mm for C; 0.1 mm for D–G.

as figured; merus with dorsodistal plumose seta, ventrodiscal plumose setae on pereopods 3 and 4; carpus with dorsodistal plumose seta on pereopod 2, ventrodiscal plumose setae on pereopods 3 and 4; propodus with long distal plumose seta on pereopod 2 only. Pereopods 5 and 6, merus short, with two ventrodiscal 'sucker-like' spines; carpus and propodus as pereopods 2–4 except carpus with ventrodiscal simple spine, propodus of pereopod 6 with denticulate spine adjacent to dactylus (Fig. 9F). Merus about as long as carpus on pereopods 2–4; on pereopods 5 and 6 carpus four times as long as merus. Propodus of pereopod 2 with simple distal seta; propodus of pereopod 6 with distal denticulate spine and adjacent simple spine. Dactylus and unguis fused into claw, with minute inner seta.

Pleopods absent. Uropod (Fig. 8B) biramous, basis with three small distal setae; endopod twice as long as basis, of two subequal segments, second segment distally with three simple setae and one stout distal spine-like seta; exopod of one segment, half as long as proximal endopod segment, with two slender distal setae.

Female unknown.

Etymology. *Koonungai* is a local Australian Aboriginal name for North Stradbroke Island, just off the north coast of which is the type locality of this species.

Remarks. *Pagurotanais koonungai* sp. nov. adds a little confusion to the distinction of the genera

Pagurotanais and *Pagurapseudes*, in having no exopodite on either the cheliped or pereopod 1. The basis of pereopod 1 is of similar width to the merus, carpus and propodus. The lack of a significant epistome excludes the present species from *Macrolabrum*. With the main and accessory flagella of the antennule having two and one segments respectively, the uropod endopod and exopod having two and one segments respectively, the narrow basis of pereopod 1, and the extreme reduction of the pleopods, the present species is perhaps closest to *Pagurotanais bouryi*. Many of these features are also found in *Pagurapseudes spinipes*, but this genotype and all other species of *Pagurapseudes* have a large, plumose exopodite on pereopod 1, and on that feature alone the distinction of the genus *Pagurotanais* is maintained, and includes the present species.

Pagurotanais koonungai is distinguished from all other species of the genus by the absence of an exopodite on the cheliped, the absence of pleopods, the truncated segments on the main flagellum of the antennule and in the lack of a distinct rostrum.

Suborder TANAIIDOMORPHA Sieg, 1980

Superfamily Tanaiodea Dana, 1849

Family Tanaidae Dana, 1849

Subfamily Sinelobinae Sieg, 1980

Sinelobus Sieg, 1980

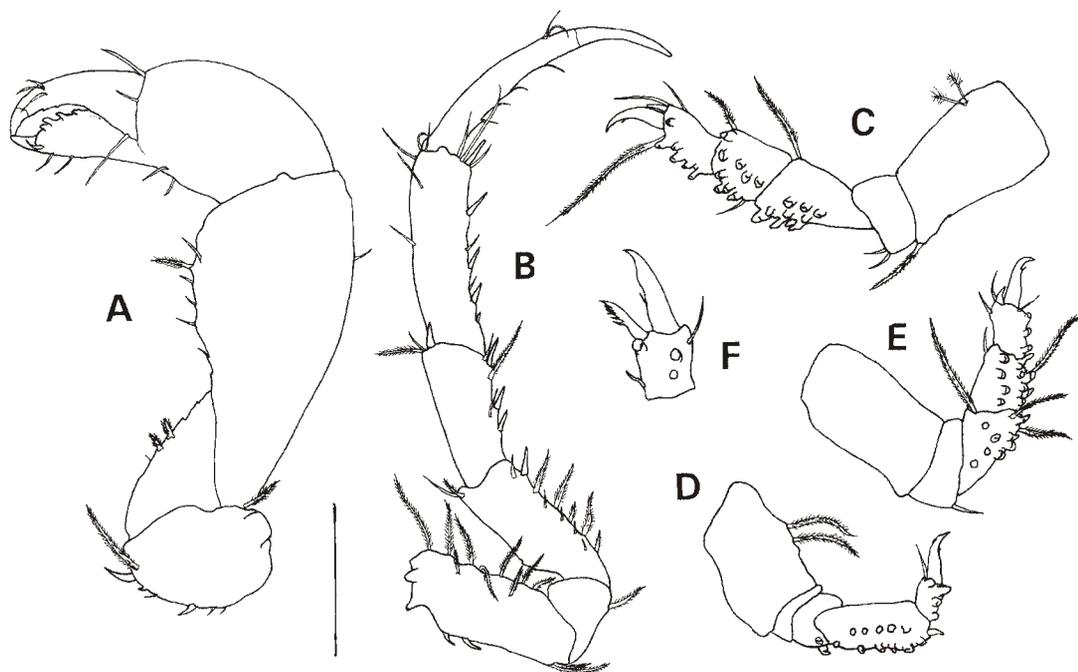


FIG. 9. *Pagurotanais koonungai* sp. nov., male holotype: A, right cheliped; B–E, pereopods 1, 2, 3 and 5 respectively; F, distal articles of pereopod 6. Scale bar = 0.2 mm for A, B; 0.15 mm for C, D, E; 0.1 mm for F.

***Sinelobus pinkenba* sp. nov.**

(Figs 10, 11)

?*Sinelobus stanfordi* sensu Sieg, 1980 (*partim*: Queensland specimens), non *Tanais stanfordi* Richardson, 1901.

Material Examined. HOLOTYPE. QM-W28657, brooding ♀; PARATYPES QM-W15572, 5 ♀♀, 2 ♂♂, all Bulwer I., Brisbane River, in rotting timber near low-tide mark on boat ramp, 12.07.1988. J. Short, J. Johnson & P. Lawless.

Description of female: typical *Sinelobus*, body (Fig. 10A) 3.6 times as long as wide, dorsally with black mottling on cephalon only (in preserved material); length of holotype 4.1 mm. Cephalothorax subrectangular, tapering towards anterior, 1.1 times as wide as long, with slight rounded frons but no rostrum, eyes present, pigmented. Cephalothorax shorter than pereonites 1–3 together. Six free pereonites, rounded laterally, with one small lateral seta on each side, four small dorsal setae on pereonites 1 and 6 towards anterior of pereonite, and paired dorsolateral setae on remaining pereonites; pereonite 1 shortest, half as long as pereonite 3, pereonite 3 1.2 times as long as pereonite 2, pereonites 4 and 5 longest,

1.4 times as long as pereonite 2, pereonite 6 as long as pereonite 3 (all pereonites respectively 3.4, 2.1, 1.7, 1.4, 1.4 and 1.6 times as wide as long). Pleon of four free pleonites with lateral seta on each side and paired dorsolateral setae; pleonites 1 and 2 with transverse latero-dorsal rows of setae not reaching centre of pereonite; pleonites 1 to 3 bearing pleopods; pleonite 4 shorter and narrower, without pleopods. Pleotelson (Fig. 11J) semicircular, 1.6 times as wide as long, with paired lateral and three latero-distal setae on each side and paired distal setae.

Antennule (Fig. 10C) of four articles; proximal article 1.8 times as long as wide with outer distal tuft of setae; second article 0.6 times as long as first with outer distal tuft of setae; third article just shorter than second; distal article very small, with eight distal setae and three aesthetascs.

Antenna (Fig. 10E) of six articles, first article naked, one-quarter length of second; second article with slight dorsal flange-like expansion and ventrodiscal tuft of three setae; third article half length of second, with smaller dorsal flange-

like expansion; fourth article longest, 1.5 times as long as second article; fifth article 0.6 times as long as fourth; sixth article very small with eight distal setae.

Labrum (Fig. 10G) extended centrally, rounded, setose. Left mandible (Fig. 10H) with wide, robust, distally denticulate lacinia mobilis, right mandible (Fig. 10I) with narrower, distally crenulate lacinia mobilis; pars molaris of each mandible robust, rugose. Labium (Fig. 10J) wide, all lobes finely setose distally, labial palp absent. Maxillule (Fig. 10K) with seven distal spines, finely setose outer margin, palp with two distal setae. Maxilliped (Fig. 10L) typical of genus, basis with single seta reaching proximal margin of palp article 2; proximal palp article naked, second palp article with outer seta four simple

inner setae; third article with five plumose and three simple inner setae in two rows; fourth article with one inner, three distal and two outer subdistal simple setae. Maxilliped endites (Fig. 10M) with one simple and one longer coarsely-plumose setae, the latter reaching proximal margin of fourth palp article. Epignath (Fig. 10N) typical of genus, elongate with distal spine and finely setose distal margin.

Cheliped (Fig. 11A) comparatively stout, basis 1.16 times as long as wide with ventrodiscal seta; merus ventrally with single subdistal seta; carpus as long as wide, with single dorsodistal paired midventral setae; propodus with single ventral seta, fixed finger with outer distal tubercle bearing four setae, two inner distal setae, cutting edge distally expanded into squared

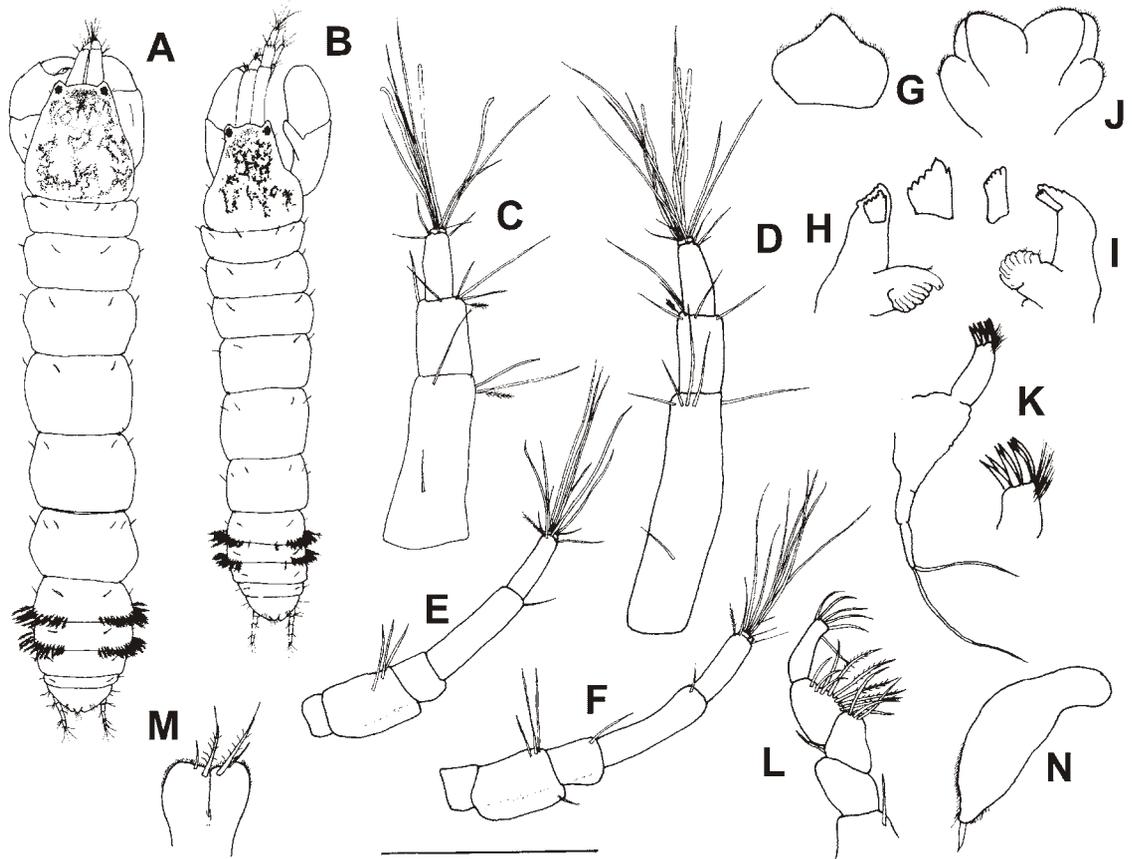


FIG. 10. *Sinelobus pinkenba* sp. nov., A, female holotype, dorsal; B, male, dorsal; C, female antennule; D, male antennule; E, female antenna; F, male antenna; G, labrum; H, left mandible; I, right mandible; J, labium; K, maxillule; L, maxilliped; M, maxilliped endites; N, epignath; Scale bar = 1.5 mm for A, B; 0.4 mm for C–N.

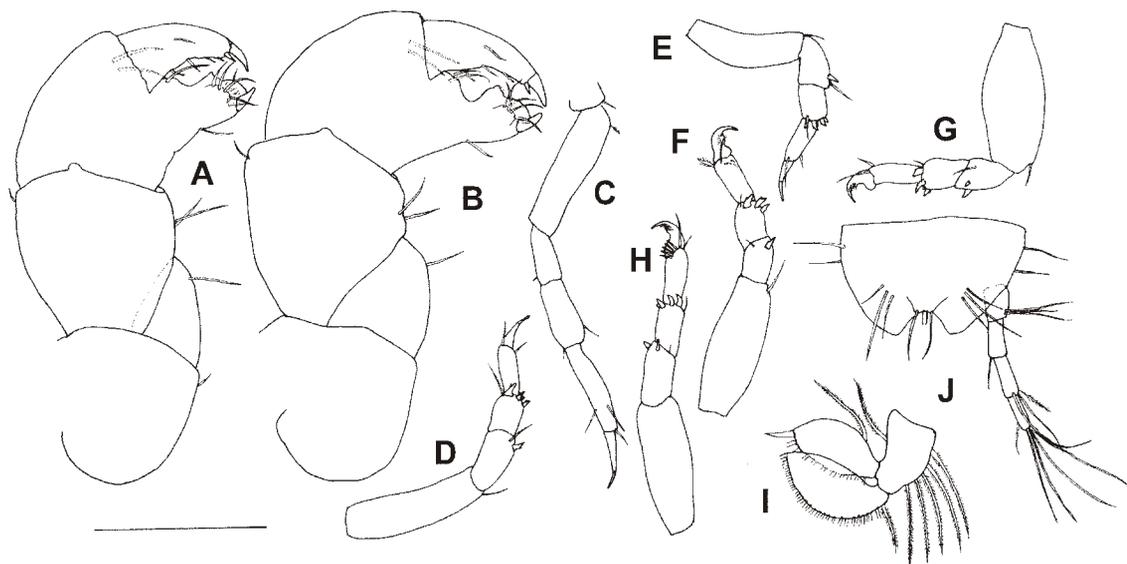


FIG. 11. *Sinelobus pinkenba* sp. nov., A, female cheliped; B, male cheliped; C-H, pereopods 1-6; I, pleopod (most setae shown only by their bases); J, pleotelson and right uropod. Scale bar = 0.4 mm for A-H, 0.3 mm for I, J.

lamella; dactylus with four fine setae submarginally along cutting edge and simple spine adjacent to claw.

Pereopod 1 (Fig. 11C) longer than others, with sparse simple setae as figured; coxa with seta but no apophysis; basis slender, 3.8 times as long as wide; ischium fused; merus 0.4 times length of basis; carpus one-third longer than merus; propodus 1.5 times as long as carpus; dactylus with distinct, slender, shorter claw, both together 0.6 times as long as propodus. Pereopod 2 (Fig. 11D) basis 3.7 times as long as wide with ventrodistal seta; merus half length of basis with ventrodistal seta and short tooth-like spine; carpus compact, shorter than merus, with dorsal seta, three anteroventral and two posteroventral short tooth-like spines; propodus 1.3 times as long as carpus; dactylus plus claw as long as carpus. Pereopod 3 (Fig. 11E) similar to pereopod 2 but smaller.

Pereopod 4 (Fig. 11F) basis 2.25 times as long as wide, with single ventrodistal seta; merus 1.1 times as long as carpus, with paired subdistal ventral short spines, carpus with crown three anteroventral and two posteroventral short tooth-like spines, each spine with subdistal seta; propodus 1.2 times as long as merus; dactylus and

unguis fused into a claw, curved, with lateral comb of six or seven spinules. Pereopod 5 (Fig. 11G) as pereopod 4. Pereopod 6 (Fig. 11H) as pereopod 4, but propodus with distal row of five leaf-like spines.

Pleopod (Fig. 11I) basis with single inner plumose seta and five outer plumose setae; exopod with numerous plumose setae along outer edge; endopod with one inner proximal and ten outer plumose setae, distally with shorter, stout, articulate seta.

Uropod (Fig. 11J) uniramous, of three segments plus basis, segments 2-3 times as long as wide, subequal in length; basis with conspicuous outer-distal tuft of three setae.

Distinctions of male: body (Fig. 10B) similar to but smaller than female (figured specimen 3.3 mm long), cephalothorax with concave anterior lateral margins. Pereonites comparatively shorter, pereonites 2 and 3 being 1.2 times as long as pereonite 1.

Antennule (Fig. 10D) proportionately longer, proximal article 3.9 times as long as wide. Antenna (Fig. 10F) slightly more slender, article 2 and 3 with more pronounced dorsal flange-like expansions.

Cheliped (Fig. 11B) proportionately larger and more robust, although ornamentation of chela identical.

Etymology. Pinkenba is the district of Brisbane in which lies Bulwer Island, where the type material was found.

Remarks. *Sinelobus stanfordi* (Richardson, 1901) is a brackish water species which has been regarded as cosmopolitan in the tropics and subtropics in lagoons and estuaries since Lang (1956) and subsequently Sieg (1980) synonymised all described species of the genus. Previous Australian records of this species are from Queensland, from the Ross River near Townsville and the Mowbray River near Hockley (Sieg 1980). Edgar (2008), while describing as new *S. barretti*, the first distinguished species of *Sinelobus* from Australian waters, quite rightly pointed out the unlikelihood of all the known records, from a global distribution and a range of habitats, being of a single species. Those previous records from Queensland may in fact be of the present species.

In distinction from *Sinelobus stanfordi sens. auctt.*, *S. pinkenba* sp. nov. shows similarities only to the Tasmanian *S. barretti* in a reduced sexual dimorphism of the cheliped (carpus without ventral tubercles; chela fingers shorter), in having seven distal spines on the maxillule (also found in '*S. stanfordi*' sensu Shiino, 1965) and a less-slender proximal antennule article. The present species differs from *S. barretti* in the proportions of the uropod segments, in the distal position of the seta-bearing tubercle on the chela fixed finger (proximal in *S. barretti*), in the setation of the mouthparts, and from this and all other described forms of *Sinelobus* in the flange-like expansions on the second and third articles of the antenna.

It is possible that the low degree of sexual dimorphism shown by the present species is because the males are not fully mature.

Subfamily Pancolinae Sieg, 1980

Tribe Anatanaini Sieg, 1980

Zeuxo Templeton, 1840

Zeuxo (Parazeuxo) amiti sp. nov.

(Figs 12, 13)

Material Examined. HOLOTYPE: QM-W28088, ♀, amongst *Cladophoropsis vaucheriaeformis*, Amity Point, North Stradbroke I., 27°23.9'S, 153°26.2'E, 0.5 m, 20.02.2005. PARATYPE: QM-W28089, ♀ with oostegites, dissected amongst sponges, Shag Rock, north of North Stradbroke I., 27°24.8'S, 153°31.5'E, 15 m, 15.02.2005, both A-NL.

Description. Female typical *Zeuxo*, body (Fig. 12A) slender, dorsally with black mottling on cephalon, pereonites and pleonites, darkest as bar between eyes; length of holotype 1.75 mm. Cephalothorax subrectangular, 1.1 times as wide as long, with slight rounded frons but no rostrum, eyes present, pigmented. Cephalothorax shorter than pereonites 1–3 together. Six free pereonites, rounded laterally, with one or two small lateral setae on each side and paired dorso-lateral setae towards anterior of pereonite; pereonite 1 shortest, two-thirds as long as pereonite 2, pereonite 3 longer than pereonite 2, pereonite 4 1.7 times as long as pereonite 1, pereonite 5 longest, 2.6 times as long as pereonite 1, pereonite 6 twice as long as pereonite 1 (all pereonites respectively 3.6, 2.4, 2.1, 1.6, 1.4 and 1.8 times as wide as long). Pleon of five free pleonites with lateral seta on each side, paired dorsolateral setae on pleonites 1–4 only; pleonite 1 three times as wide as long, pereonites 2 and 3 subequal, shorter, 4.5 times as wide as long, without transverse dorsal rows of setae, bearing pleopods; pleonites 4 and 5 shorter and narrower, 6 times as wide as long, without pleopods. Pleotelson subpentangular, 1.6 times as wide as long, distally bifurcate, with single lateral and dorso-lateral setae on each side and paired distal setae.

Antennule (Fig. 12B) of four articles, proximal article twice as long as wide, with two longer distal simple setae and one plumose sensory seta; second article half as long as first with distal crown of four setae; third article two-thirds as long as second with two distal setae; distal article very small, with four distal setae and four aesthetascs.

Antenna (Fig. 12C) of seven articles, first and third articles subequal, naked, half length of second; second, fourth and fifth articles subequal, setose as figured; sixth and seventh articles very small with five and four distal setae respectively.

Labrum rounded, setose. Left mandible (Fig. 12D) with small, rounded lacinia mobilis, right

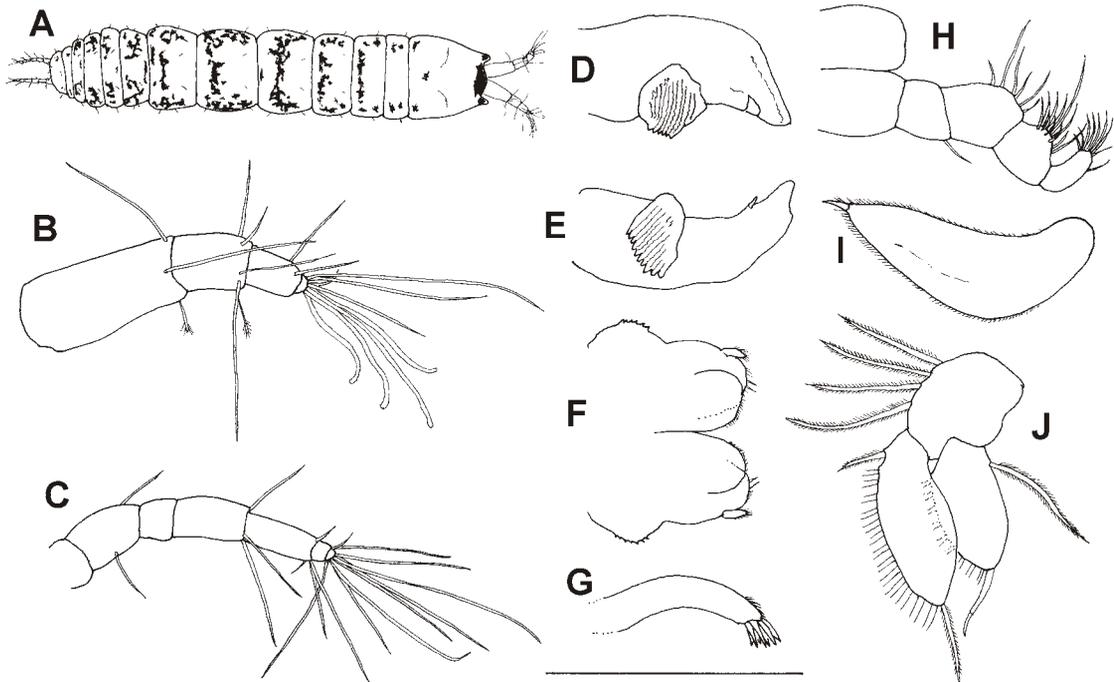


FIG. 12. *Zeuxo amiti* sp. nov., A, holotype, dorsal; B, antennule; C, antenna; D, left mandible; E, right mandible; F, labium; G, maxillule endite; H, maxilliped; I, epignath; J, pleopod (most setae shown only by their bases). Scale bar = 1 mm for A; 0.2 mm for B–J.

mandible (Fig. 12E) with minute, scale-like lacinia mobilis; pars molaris of each mandible robust, rugose. Labium (Fig. 12F) inner lobe finely setose distally, outer lobe with midlateral denticulations, labial palp present, finely setose. Maxillule (Fig. 12G) with eight distal spines, finely setose outer margin, palp not seen. Maxilliped typical of genus, proximal palp article only with outer seta (Fig. 12H). Epignath (Fig. 12I) typical of genus, elongate with distal spine and finely setose margin.

Cheliped (Fig. 13A) comparatively stout, basis 1.45 times as long as wide with ventrodistal seta; merus ventrally with paired subdistal setae; carpus 1.6 times as long as wide, dorsally with single proximal and two distal setae, ventrally with three subdistal setae; propodus with three ventral setae, fixed finger with crown of six setae, cutting edge smooth; dactylus with row of fine setae submarginally along cutting edge.

Pereopod 1 (Fig. 13B) longer than others, with sparse simple setae as figured; coxa with seta but no apophysis; basis slender, 4.7 times as

long as wide; ischium fused; merus one-third length of basis; carpus one-third longer than merus; propodus 1.5 times as long as carpus; dactylus with distinct, slender, longer claw, both together 0.85 times as long as propodus. Pereopod 2 (Fig. 13C) basis 3.6 times as long as wide; merus half length of basis with paired ventrodistal short spines; carpus compact, shorter than merus, with two dorsal, two anteroventral and two posteroventral spines; propodus 1.6 times as long as carpus; dactylus plus claw just longer than carpus. Pereopod 3 (Fig. 13D) similar to pereopod 2, but basis shorter, no ventrodistal seta on carpus.

Pereopod 4 (Fig. 13E) basis 2.3 times as long as wide, with two distal setae and single ventral plumose sensory seta; merus 1.3 times as long as carpus, with paired subdistal ventral spines, carpus with crown of six distal spines, each spine with subdistal seta; propodus just longer than merus; dactylus and unguis fused into a claw, curved, with lateral comb of 4 spinules. Pereopod 5 (Fig. 13F) as pereopod 4. Pereopod

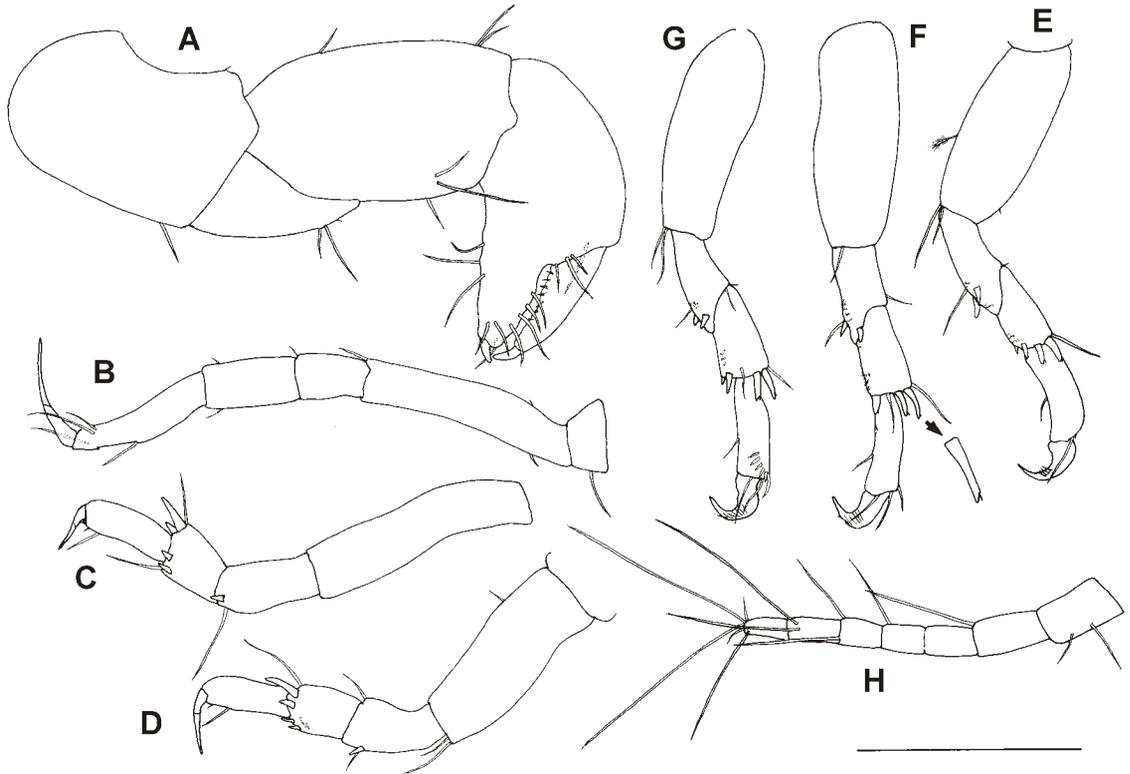


FIG. 13. *Zeuxo amiti* sp. nov., A, cheliped; B–G, pereopods 1–6; H, uropod. Scale bar = 0.2 mm.

6 (Fig. 13G) as pereopod 4, but propodus with distal row of five leaf-like spines.

Pleopod (Fig. 12J) basis with naked inner margin and four outer plumose setae; exopod with 15 plumose setae along outer edge; endopod with one inner and ten outer plumose setae, distally with shorter, stout, articulate seta.

Uropod (Fig. 13H) uniramous, of six segments plus basis, segments 2–3 times as long as wide, subequal in length.

Male unknown.

Etymology. From *Amity* Point, on the north-west coast of South Stradbroke I., where the holotype was found.

Remarks. The genera within the Anataini, *Anatanais* Nordenstam, 1930, *Zeuxo*, and *Zeuxoides* Sieg 1980, are poorly distinguished, Sieg (1980), for example, relying on the proportions of the proximal antennular article as a major distinction, even though this does show intraspecific variation in some of the taxa (G. Bird, pers.

comm.). The short antennular peduncle article of *Zeuxo amiti* sp. nov. would imply its being a species of *Anatanais*, yet the total lack of a coxal apophysis on pereopod 1, the reduction of the lacinia mobilis on both mandibles, the sparse setation of the pleopod bases, and the proportionate length of the uropod articles all preclude it from that genus. Despite the antennular proportions, the present species is consistent with the subgeneric diagnosis of Stock (1980) for *Parazeuxo*, a taxon which does include species with underdeveloped coxal apophyses on pereopod 1, a reduced mandibular lacinia mobilis, four antennular aesthetascs in the female and reduced pleopod setation (notably only a single seta on the inner margin of the pleopod endopod).

Edgar (2008) described six new species of *Zeuxo* from Australian waters, three of which, *Z. belli*, *Z. mooneyi* and *Z. russi*, are attributable to the subgenus *Parazeuxo*. *Z. mooneyi* has a compact four-segmented uropod and a broad, crenulated lacinia mobilis on the left mandible.

Both of the other species have seven-segmented uropods in the adult and a relatively compact antennule, but, unlike *Z. amiti*, they have a distinct coxal apophysis on pereopod 1, more numerous ventral setae on the cheliped fixed finger, better-developed rows of leaf-like spines on the propodus of pereopod 6, and a distinct dorsal pigmentation. All three of these species have a single seta on the inner margin and more than four setae on the outer margin of the pleopod basis, unlike *Z. amiti*.

Zeuxo amiti is distinct from all other described members of the subgenus in its compact antennule. The only other described species of *Zeuxo* (*Parazeuxo*) with a single seta on the inner margin of the pleopod endopod and more than five articles in the uropod (>4 segments plus basis) are *Z. (P.) seurati* (Nobili, 1906) from Tuamotu and Hawaii (incl. *Anatanais insularis* Miller, 1940), and *Z. (P.) cloacarattus* Bamber, 2006, from New Caledonia. Those species also have a reduced lacinia mobilis on each mandible, but their antennular proximal peduncle articles are 2.6 and 3 times as long as wide respectively, their chelipeds are more compact (carpus respectively 1.5 and 1.4 times as long as wide), and they both have a coxal apophysis on pereopod 1 (Sieg 1980; Bamber 2006).

Superfamily Paratanaoidea Lang, 1949

Family Anarthruridae Lang, 1971

Subfamily Leptognathiinae Sieg, 1976

Tanaopsis Sars, 1896

Tanaopsis canaipa sp. nov.

(Figs 14, 15)

Material Examined. HOLOTYPE: QM-W28165, ♀, without oostegites, ♀, dissected, MBWS Stn. 15E, Moreton Bay. P. JFD. PARATYPE: QM-W28166, ♀ without oostegites, Middle Banks, northern Moreton Bay, 17.09.1983/13.01.1984, P. Saenger & S. Cook (there are two dates on the label, in material that contained a number of species).

Description. Female body (Fig. 14A) attenuate, length of holotype 4 mm, 8.75 times as long as wide. Cephalothorax subrectangular, 1.33 times as wide as long, with slight rostrum; single midlateral setae. Eyelobes and eyes absent.

Six free rectangular pereonites with single midlateral setae. Pereonite 1 shortest, one third

as long as cephalon and 2.2 times as wide as long; pereonites 2 and 3 subequal, 1.5 times as long as pereonite 1, 1.4 times as wide as long; pereonites 4 and 5 longest, subequal, 2.5 times as long as pereonite 1, 1.1 times as long as wide; pereonite 6 shorter, twice as long as pereonite 1, 1.2 times as wide as long. Pleon wide than pereon, of five free pleonites, subequal but progressively shorter posteriorly, each about 3.2 times as wide as long; pleopods on all pleonites. Pleotelson semicircular, 1.75 times as wide as long, distally extended, with two distal setae.

Antennule (Fig. 14B) of four articles, proximal peduncle article twice as long as wide, distally with one longer outer and one shorter inner setae and two pinnate sensory setae on outer margin; second article 0.43 times as long as first with long outer subdistal seta, 1.5 times as long as article; third article 0.43 times as long as second with single inner and outer simple distal setae; distal article (flagellum) as long as proximal peduncle article, with one longer and four shorter distal setae and single aesthetasc.

Antenna (Fig. 14C) of six articles, setose as figured, first three articles compact, fourth article longest, three times as long as second and 3.8 times as long as wide, fifth article as long as second, sixth article tiny with six distal setae.

Labrum rounded, naked. Right mandible (Fig. 14E) relatively simple, pars incisiva with crenulated edge, pars molaris a simple process; left mandible (Fig. 14F) similar but with delicate pars incisiva. Labium (Fig. 14D) of two wide, naked lobes without palp. Maxillule (Fig. 14G) with six shorter and one more robust distal spines, outer margin with tufts of fine setules; palp of two articles with two distal setae. Maxilla and epignath not seen. Maxilliped (Fig. 14H) endites distally with rounded lateral lobes, single inner distal seta; maxilliped basis fused medially, with single long distal seta not reaching distal margin of epignath; palp first article naked, second and third articles each with two inner simple setae; fourth article with five distal simple setae.

Cheliped (Fig. 15A) basis 1.8 times as long as wide, naked; merus triangular, with single ventral seta; carpus 1.5 times as long as wide with two ventral marginal setae and one middorsal and one dorsodistal setae; chela as long as carpus;

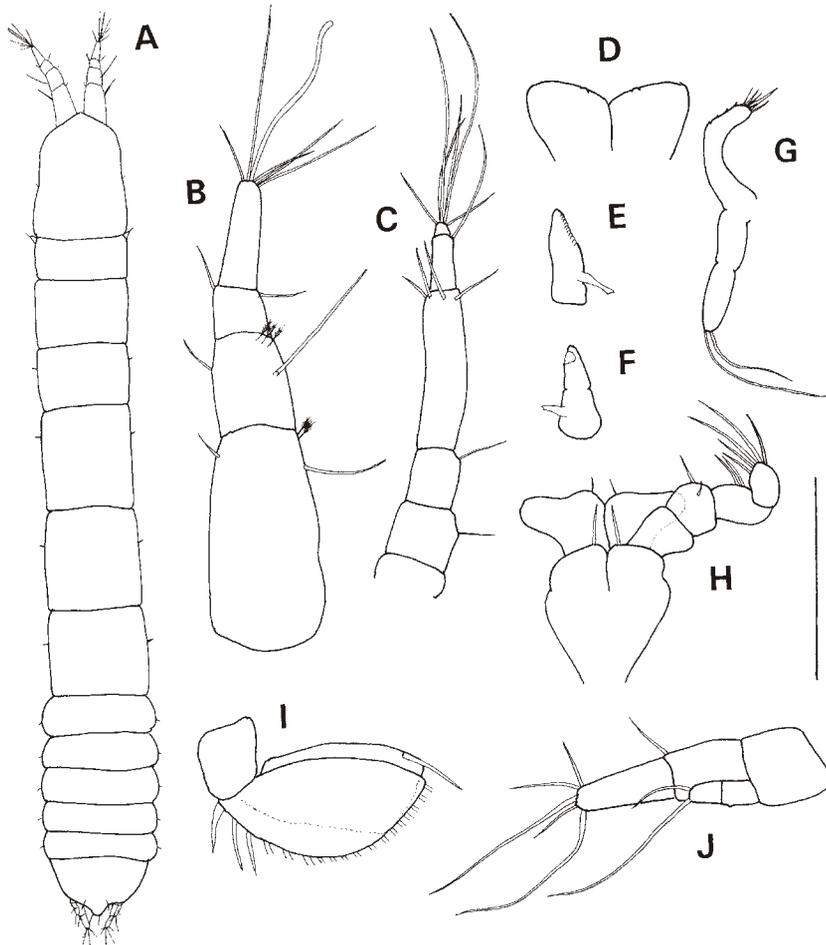


FIG. 14. *Tanaopsis canaipa* sp. nov., A, holotype female, dorsal; B, antennule; C, antenna; D, labium; E, right mandible; F, left mandible; G, maxillule; H, maxilliped; I, pleopod (most setae shown only by their bases); J, uropod. Scale bar = 0.5 mm for A; 0.1 mm for B–J.

propodus with distal comb of three shorter and one longer setae at base of dactylus, fixed finger with two ventral setae, one distal seta and two setae distally on cutting edge, distally with inner bifurcate claw and outer trifurcate claw between which claw of dactylus sits; fingers of chela shorter than palm; dactylus with simple cutting edge but corrugated dorsal margin typical for genus.

Pereopod 1 (Fig. 15B) much longer than others; coxa with triangular apophysis bearing simple seta; basis slender, four times as long as wide, naked; ischium with single ventral seta; merus and carpus subequal, 0.3 times as long as basis; merus naked, carpus with small, single ventro-

distal and dorsodistal setae; propodus longer than merus and carpus together, tapering, dorsally with subdistal group of three setae, single ventrodorsal seta and longer distal seta exceeding tip of dactylus; dactylus with small distal seta, slender unguis twice length of dactylus, both together 1.34 times as long as propodus. Pereopod 2 (Fig. 15C) similar to but smaller than pereopod 1, coxa with simple seta but without apophysis, merus shorter than carpus, propodus not tapering with ventrodorsal seta longer than dactylus. Pereopod 3 (Fig. 15D) similar to pereopod 2, but propodus with two subdistal dorsal setae, dactylus and unguis together just as long as propodus.

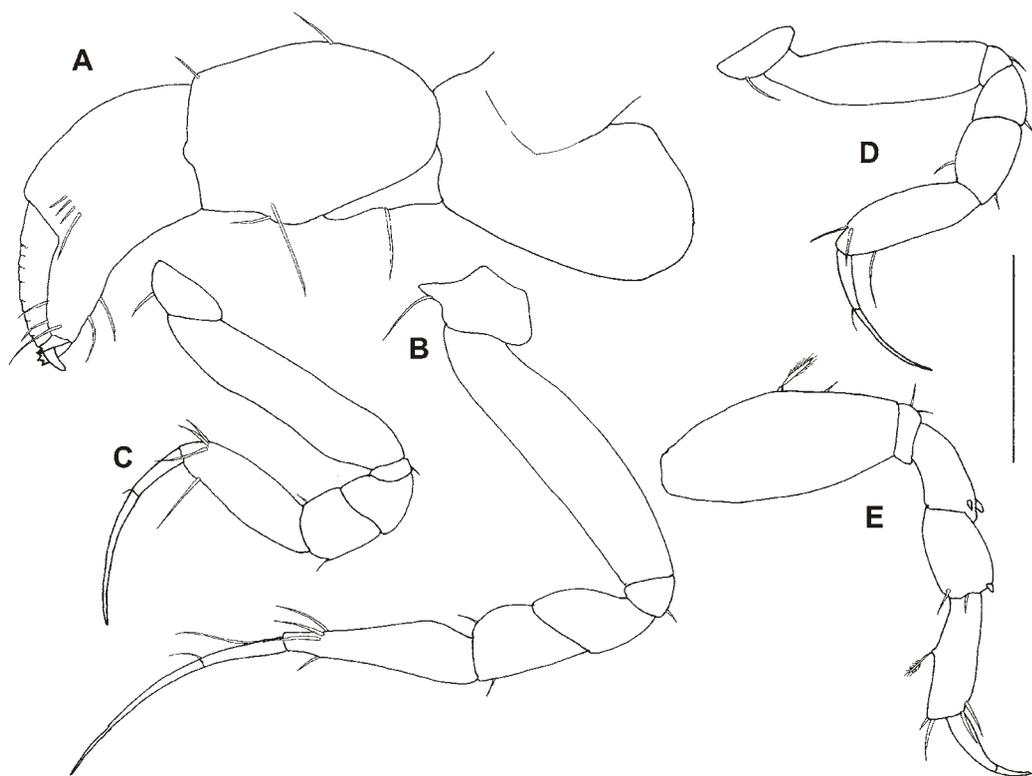


FIG. 15. *Tanaopsis canaipa* sp. nov., A, cheliped; B–E, pereopods 1, 2, 3 and 5 respectively. Scale bar = 0.13 mm for A; 0.1 mm for B–E.

Pereopods 4, 5 (Fig. 15E) and 6, similar to each other; basis stouter, twice as long as wide, with midventral pinnate sensory seta; ischium with two ventral setae; merus shorter than carpus, merus with two and carpus with one ventrodistal tooth-like spines, carpus with two simple dorsodistal setae; propodus with three distal setae (four on pereopod 6); dactylus and unguis not fused but forming curved claw shorter than propodus.

Pleopod (Fig. 14I) basis naked; exopod with 18 plumose setae along outer edge; endopod with one distomedial plumose seta and nine plumose setae around distal margin.

Uropod (Fig. 14J) biramous, basis naked, exopod just shorter than proximal segment of endopod, of two segments, proximal segment with outer distal seta, distal segment with two distal setae of which outer is far longer; endopod of two segments, proximal segment with shorter

inner and longer outer distal setae, second segment with five distal setae.

Male unknown.

Etymology. 'Canaipa' is a local Aboriginal name for a passage along the southwest of North Stradbroke Island in Moreton Bay.

Remarks. Sieg & Dojiri (1991) presented a key to the species of *Tanaopsis* as then known. To these must be added *Tanaopsis gallardoi* (Shiino, 1970) (moved from *Leptognathia* by Bird & Bamber, 2000) and *T. chotkarakde* Bird & Bamber, 2000. *T. canaipa* sp. nov. is remarkably attenuate for the genus, with pereonites 4 and 5 longer than wide. The only other species so attenuate is *T. antarctica* Lang, 1967, which is distinct from the present species in a number of features, including having the distal seta on the maxilliped basis exceeding the tip of the endites, more numerous setae on the maxilliped palp articles, a shorter proximal antennule article, a cheliped

with a more compact basis and carpus (1.3 times as long as wide), no distal setae on the dactyli of the pereopods, and more setae on the pleopods.

Subfamily Akanthophoreinae Sieg, 1986

Tangalooma gen. nov.

Diagnosis. Small, compact tanaidomorph, dorso-ventrally flattened; cephalon with rostrum, eyelobes and eyes; antennule of four articles in the female, that of the male of eight articles (including minute distal article) bearing numerous aesthetascs; antenna of six articles without dorsal or ventral spines on articles 2 and 3. In female, mandible with robust pars molaris, lacinia mobilis absent; maxillule with six distal spines; mouthparts of male atrophied. Chelipeds highly dimorphic, that of male more robust, the chela almost subchelate. Pereopods 1 and 2 ambulatory, dactylus and unguis not fused; pereopod 3 of female reduced, ambulatory; pereopods 4–6 of female with fused and compound claw; all pereopods of male ambulatory, although carpus endowed with distal tooth-like spines. Five free pleonites without plumose lateral setae, all bearing biramous pleopods. Uropods biramous, exopod of one segment, endopod of two segments.

Type species: *Tangalooma rous* sp. nov., by original designation.

Etymology. ‘Tangalooma’ is the local Ngugi Aboriginal name of a settlement on Moreton Island.

Tangalooma rous sp. nov.

(Figs 16, 17)

Material Examined. HOLOTYPE: QM-W28090, ♀ without oostegites, QM-W28091, ♂, allotype, on the bryozoan *Orthoscuticella ventricosa* aggregate, Henderson’s Pinnacles, east side of Moreton I., 27°07.901’S, 153°28.712’E, 22–26m, 22.02.2005, A-NL.

Description of female (based on anatomy examined *in situ*): body (Fig. 16A) compact, small, length of holotype 0.75 mm. Cephalothorax subrectangular, 1.1 times as wide as long, with prominent, rounded rostrum; single lateral seta behind eyelobe and paired lateral setae in posterior half. Eyelobes present, eyes with black ocelli.

Six free pereonites, anterior three pointed laterally with one or two simple lateral setae, posterior three rounded laterally, naked. Pereonites

1 and 2 shortest, 7–8 times as wide as long; pereonite 3 1.4 times as long as pereonite 2, four times as wide as long; pereonites 4 and 6 subequal, twice as long as pereonite 1, about three times as wide as long; pereonite 5 longest, three times as long as pereonite 2, twice as wide as long. Pleon of five free pleonites, subequal but progressively shorter posteriorly, about seven times as wide as long; pleopods on all pleonites. Pleotelson semicircular, twice as wide as long, distally entire, with two distal setae.

Antennule (Fig. 16C) of four articles, proximal peduncle article 1.5 times as long as wide, distally with one longer simple seta and two pinnate sensory setae on outer margin; second article 0.6 times as long as first with two outer distal setae, the longer exceeding distal tip of antennule; third article 0.7 times as long as second with single inner and outer simple distal setae; distal article (flagellum) as long as second peduncle article, with one longer and three shorter distal setae and single aesthetasc.

Antenna (Fig. 16E) of six articles, setose as figured, first three articles compact, fourth article longest, three times as long as third and three times as long as wide, fifth article half as long as fourth, sixth article tiny with four distal setae.

Labrum (Fig. 16G) rounded, hood-like, marginally finely setose. Left mandible (Fig. 16K) relatively simple, with slender, bifurcate pars incisiva and stout pars molaris with one slender and numerous rounded marginal teeth; right mandible (Fig. 16J) much as left mandible but pars incisiva wider. Labium (Fig. 16H) of two simple, naked lobes without palp. Maxillule (Fig. 16I) with six distal spines and single outer distal seta. Maxilla and epignath not seen. Maxilliped endites apparently distally simple, naked; maxilliped basis not fused, with single long distal seta; palp (Fig. 16L) first article naked, second with four distal simple setae and possibly one fine outer seta; third article with inner group of four longer simple setae and shorter adjacent dorsal seta; fourth article with six distal simple setae.

Cheliped (Fig. 17A) with comparatively stout basis just longer than wide, naked; merus triangular, with single ventral seta; carpus twice as long as wide with three ventral marginal setae and one dorsodistal seta; chela as long as carpus;

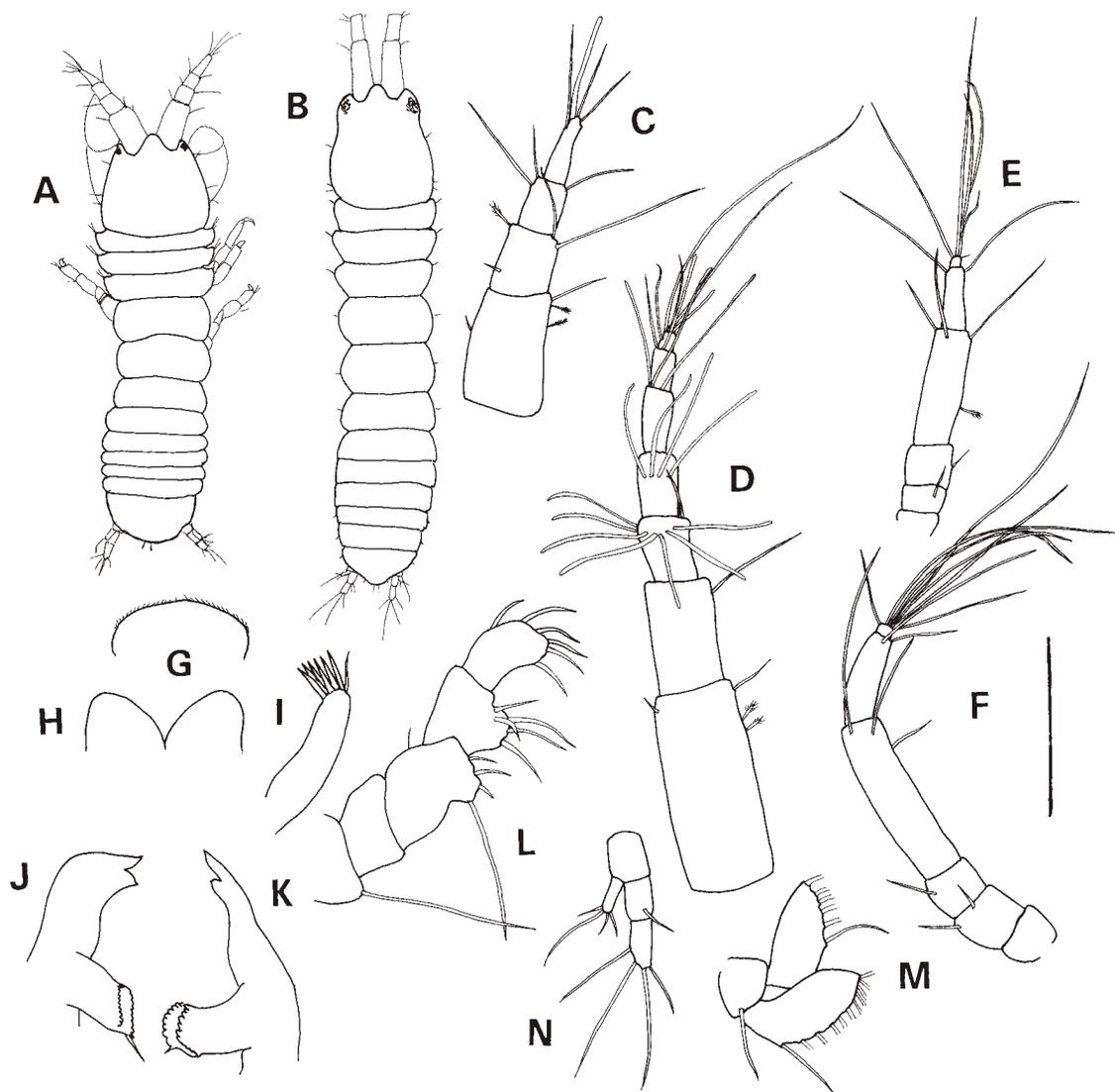


FIG. 16. *Tangalooma rous* gen. et sp. nov., A, female holotype; B, male allotype; C, female antennule; D, male antennule; E, female antenna; F, male antenna; G, labrum; H, labium; I, maxillule; J, right mandible; K, left mandible; L, maxilliped; M, third pleopod; N, uropod. Scale bar = 0.3 mm for A, B; 0.1 mm for C–N.

propodus twice as long as wide with one mid-ventral, one inner and paired dorsal setae on fixed finger; fingers of chela shorter than palm (propodus); dactylus with simple cutting edge and simple proximal inner seta.

Pereopod 1 (Fig. 17D) longer than others; coxa without apophysis; basis slender, five times as long as wide; ischium naked; merus and carpus subequal, twice as long as wide and 0.4 times as

long as basis; merus with paired ventrodistal setae, carpus with single ventrodistal seta and longer dorsodistal seta longer than article; propodus twice as long as carpus with subdistal crown of four simple setae; dactylus naked, shorter than distinct, slender unguis, both together two-thirds as long as propodus. Pereopod 2 (Fig. 17E) similar to pereopod 1, coxa with long simple seta, ischium with ventrodistal seta, merus

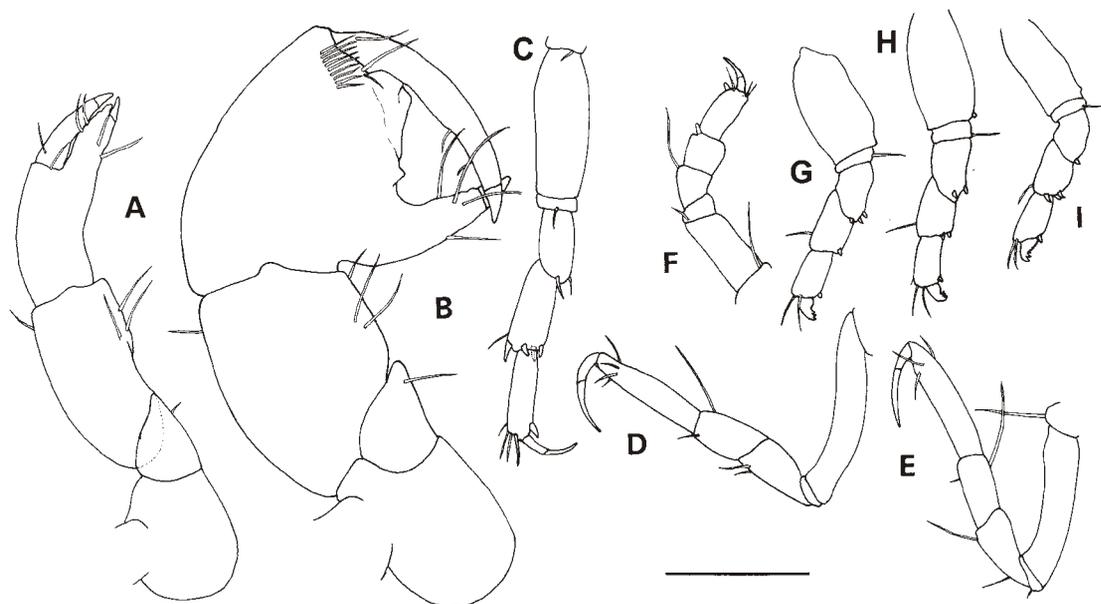


FIG. 17. *Tangalooma rous* gen. et sp. nov., A, cheliped of female; B, cheliped of male; C, pereopod 5 of male; D-I, pereopods 1-6 of female. Scale bar = 0.1 mm.

with single, longer ventrodistal seta. Pereopod 3 (Fig. 17F) more compact than pereopod 2, basis about twice as long as wide, merus and carpus as long as wide; merus with slender ventrodistal seta, carpus small, stout ventrodistal spine; propodus twice as long as wide, with small, stout ventrodistal spine; dactylus and unguis distinct, together 0.7 times as long as propodus.

Pereopod 4 (Fig. 17G) basis stout, twice as long as wide, naked; ischium short with ventrodistal seta; merus, carpus and propodus subequal; merus and carpus each with two ventrodistal tooth-like spines, carpus with simple dorsodistal seta; propodus with single ventrodistal tooth-like spine and two dorsodistal setae; dactylus and unguis fused into short claw, curved, with three ventral denticulations. Pereopod 5 (Fig. 17H) as pereopod 4. Pereopod 6 (Fig. 17I) as pereopod 4, but carpus with three tooth-like spines, claw with four denticulations.

Pleopod (Fig. 16M) basis with single ventrodistal plumose seta; exopod with ten plumose setae along outer edge; endopod with six plumose setae around distal margin.

Uropod (Fig. 16N) biramous, basis naked, exopod of one segment with three short and

one longer distal setae, endopod of two segments (articulation obscure), first segment with single mesial and distal inner setae, second segment with one subdistal and three distal setae.

Description of male: generally similar to but larger than female, showing dimorphism of antennule, mouthparts, cheliped and posterior pereopods. Body (Fig. 16B) more elongate; length of allotype 0.92 mm. Cephalothorax 1.1 times as long as wide. Pereonites 1-3 longer than in female (five, three and three times as wide as long respectively). Pleonites longer than in female, about four times as wide as long.

Antennule (Fig. 16D) of eight articles, proximal peduncle article 2.5 times as long as wide; second article 0.6 times as long as first; distal articles progressively thinner, third to seventh articles with seven, four, three, one and one distal aesthetascs respectively; distal article tiny, anaxial. Antenna (Fig. 16F) similar to that of female, distal article with six distal setae.

Mouthparts entirely atrophied.

Cheliped (Fig. 17B) robust, carpus 1.25 times as long as wide; propodus slightly wider than long, almost triangular, fixed finger originating from entire ventral margin, distal margin with outer membranous extension and row of nine

setae at base of dactylus; dactylus plus unguis twice as long as fixed finger.

Pereopods 1 and 2 similar to those of female, but carpus longer than merus. Pereopod 3 similar to pereopod 2. Pereopods 4–6 (e.g. Fig. 17C) more slender than those of female, with paired ventrodistal setae on ischium and merus; carpus with single dorsodistal and three ventrodistal tooth-like spines; dactylus and unguis not fused, two-thirds as long as propodus.

Pleopods and uropods as those of female.

Etymology. ‘Rous’ is a local Australian Aboriginal name of a channel next to Chain Banks in Moreton Bay.

Remarks. The unique combination of extreme sexual dimorphism in the cheliped, modified pereopod 3 in the female, compound claw on the posterior pereopods in the female, short uropod and atrophied male mouthparts justify erection of a new genus for this species, but make the attribution of this species to a supra-generic taxon somewhat difficult. While there are some similarities with *Armaturatana* Larsen, 2005 (*q.v.*) in terms of the gross morphology, the antennular, antennal and mouthpart morphology, any such association is precluded by the fused claws of the posterior pereopods and the high degree of sexual dimorphism. The four-articled female antennule, distal aesthetascs, short uropod, lack of plumose lateral setae on the pleonites and modified female posterior pereopods are variously inappropriate to Leptocheliidae, Pseudotanaidae, Paratanaidae, Typhlotanaidae, Pseudozeuxidae and Nototanaidae. Within the Anarthruridae, the robust molar process of the mandible is characteristic of the Akanthophorinae, wherein there are already a few ‘aberrant’ genera, *Cristatotana* Kudinova-Pasternak, 1990, for example, showing fusion of the dactylus and unguis of the posterior pereopods.

The dimorphism of the posterior pereopods is attributed to the female showing adaptation to tubicolity, while the male is a mobile (ambulatory) mating form.

Family Typhlotanaidae Sieg, 1984

Antiplotanais gen. nov.

Diagnosis. Typhlotanaid with large, acuminate apophyses on coxae of pereopods 1–3, each bear-

ing a seta; chela fingers less than half length of cheliped propodus; cheliped carpus with sparse dorsal setae and rounded proximodorsal apophysis; carpus of pereopods 4–6 with ventral ring of setules but no evident spines; antennule of 3 articles, antenna of six articles; mandibular molar process distally with robust tubercles but no setae; maxillule with nine distal spines; uropod rami one-articled.

Type species: *Antiplotanais coochimudlo*, by original designation. Other included species: *Typhlotanais lutze* Bamber, 2005.

Etymology. A hybrid of ‘Antip-’ from Antipodean, species having been found only in Australia to date, and ‘Typhlotanais’, the genus (*sensu lato*) to which the new genus appears closest.

Remarks. The cumbersome genus *Typhlotanais* Sars, 1882 *sensu lato* contained perhaps seventy described species, of global distribution and occurring in all depths from the littoral to over 6000 m; numerous further taxa are presently being resolved from, for example, the north-east Atlantic (G. J. Bird, pers. comm.). Recently, Błażewicz-Paszkowycz (2004, 2005), while redefining *Peraeospinosus* Sieg, 1986 (comprising species originally attributed to *Typhlotanais* as well as new taxa), pointed out the presence of a number of ‘morpho-groups’ within *Typhlotanais sensu lato* which warrant distinction as separate genera; subsequently, Błażewicz-Paszkowycz (2007) valuably rationalised 66 species of the Typhlotanidae into nine genera and a further seven morphogroups.

Both the species newly described below and the similar *Typhlotanais lutze* Bamber, 2005, also from Australia (Western Australia), show consistent features which in combination are distinct from other described taxa within *Typhlotanais*, notably the short chela fingers, the large coxal apophyses on pereopods 1–3 and the cuticular ornamentation of the posterior pereopods. These features are considered sufficient to warrant the separation of these two species into a new genus. The distinctive coxal spur on the anterior pereopods accords with the *greenwichensis*-group of Błażewicz-Paszkowycz (2007), although the body, legs and uropods are more compact than those of *Typhlotanais greenwichensis* and *T. messinensis*; the chela fingers of *T. greenwichensis* are not less-than-half of the length of the chela,

while the uropod rami of *T. messinensis* are both two-segmented. Nevertheless, should the coxal spur be regarded as the defining character, then these taxa may also eventually be included in *Antiplotanais* gen. nov.

Antiplotanais coochimudlo sp. nov.

(Figs 18, 19)

Material Examined. HOLOTYPE: QM-W28092, ♀, muddy medium sand with shell breccia and holothurians, N. of Moreton I., Moreton Bay, 26°56.38'S, 153°23.73'E, 41.3 m, 35‰, 28.8°C, van Veen grab, 16.02.2005, RNB. PARATYPES: QM-W28093, 2 ♀, 2 ♀♀, dissected, data as for holotype. QM-W28094, ♀, coarse sand and shell with *Branchiostoma*, Moreton Bay, 27°27.0'S, 153°18.8'E, 8.4–9.9 m, 10.02.2005, spanner-crab dredge, RNB. NHM 2006. 1540–1541, 2 ♀, sand, north of Banana Bank, Moreton Bay, 27°32.02'S, 153°20.67'E, 4.9m, 11.02.2005, van Veen grab, RNB. QM-W28095, ♀, sandy mud with seagrass, Banana Bank, Moreton Bay, 27°32.46'S, 153°20.74'E, 3.1 m, 17.02.2005, van Veen grab, RNB. OTHER MATERIAL. QM-W28440, ♀, MBWS Stn. 3; QM-W28441, 2 ♀♀, MBWS Stn. 5; QM-W28442, ♀, MBWS Stn. 10; QM-W28443, 4 ♀♀, MBWS Stn. 13, all van Veen grab, PJFD.

Description. Body (Fig. 18A) compact, small (holotype 1.73 mm long, 4.8 times as long as wide). Cephalothorax subrectangular, 1.2 times as long as wide, longer than pereonites 1, 2 and 3 together, naked, eyes absent. Six free pereonites; pereonites 1 and 2 shortest, pereonites 3 and 6 subequal, 1.2 times as long as pereonite 1, pereonites 4 and 5 subequal, 1.5 times as long as pereonite 1 (all pereonites respectively 2.8, 2.8, 2.4, 1.9, 2 and 2.6 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite 6 times as wide as long. Pleotelson semicircular, as long as last three pleonites, with one midlateral and one posterolateral seta on each side and two distal setae.

Antennule (Fig. 18B) of three articles, proximal article three times as long as wide, 1.6 times as long as distal two articles together; second article as long as wide, 0.3 times as long as third article; third article tapering, with eight distal setae, one of these twice as wide as the others.

Antenna (Fig. 18C) of six articles, proximal three articles compact, subequal, second article with ventrodiscal seta; fourth article longest, 3.8 times as long as wide, with one distal seta; fifth article half as long as fourth, with one long and

one short distal seta; sixth article smallest with four distal setae.

Labrum (Fig. 18E) rounded, setose. Left mandible (Fig. 18G) with wide, crenulate lacinia mobilis, right mandible (Fig. 18F) without lacinia mobilis; pars molaris of both mandibles with strong, rounded tooth-like protrusions. Labium simple, finely setose, without palp. Maxillule (Fig. 18D) with nine distal spines, palp with two distal setae; maxilla (Fig. 18D) simple, kidney-shaped. Maxilliped palp (Fig. 18H) first article naked, second article with three inner setae, third and fourth articles with filtering rows of four and six setae respectively; basis with single, long seta not reaching distal margin of endites; endites distally with single outer seta and oval membranous structure.

Cheliped (Fig. 19A) with rounded basis 1.8 times as long as wide, merus subtriangular with single ventral seta; carpus with rounded dorso-proximal extension, elongate, 2.6 times as long as wide, with three midventral setae and sparse, short setae on dorsal margin; propodus slender 0.85 times as long as carpus, fixed finger with two ventral and one inner setae, three setae on cutting edge; dactylus with fine dorsal seta; chela fingers 0.4 times as long as whole propodus.

Pereopod 1 (Fig. 19B) longer than others, coxal apophysis large, pointed, with seta; basis slender, 2.8 times as long as wide; ischium compact; merus 0.75 times as long as carpus, with single ventrodiscal seta; carpus with two distal setae; propodus 1.4 times as long as carpus, with three distal setae; dactylus with distinct, longer, slender claw, both together 0.8 times as long as propodus. Pereopod 2 (Fig. 19C), coxa and basis similar to pereopod 1; ischium with single seta; merus and carpus subequal, merus with single ventral seta, carpus with paired ventrodiscal setae and rows of fine setules; propodus 1.4 times as long as carpus, with paired ventrodiscal stout spines, one laterodistal and two dorsodistal setae; dactylus with slender, subequal claw 0.6 times as long as propodus. Pereopod 3 compact (Fig. 19D), similar to pereopod 2.

Pereopod 4 (Fig. 19E) basis longer, 2.4 times as long as wide with ventrodiscal plumose sensory seta; otherwise as pereopod 5. Pereopod 5 (Fig. 19F, G) coxa simple; basis stout, 1.6 times as long as wide; ischium with single ventrodiscal

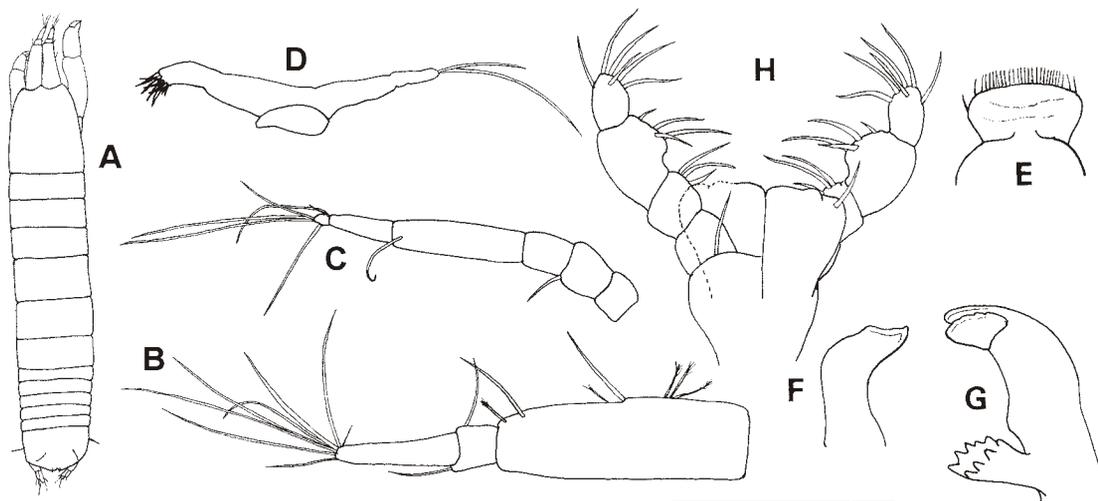


FIG. 18. *Antiplotanais coochimudlo* sp. nov., A, holotype female, dorsal; B, antennule; C, antenna; D, maxillule and maxilla; E, labrum; F, right mandible; G, left mandible; H, maxilliped. Scale bar = 1 mm for A; 0.15 mm for B–D; 0.1 mm for E–H.

seta; merus with paired ventrodistal stout spines and ventral rows of fine setules; carpus as long as merus, with dorsodistal seta and ventral prickly tubercles *sensu* Błażewicz-Paszkowycz (2007); propodus longer than carpus, with paired ventrodistal stout spines, ventral rows of fine setules, and one short and one long dorsodistal setae; dactylus and unguis appearing to be fused into claw, curved. Pereopod 6 (Fig. 19H) as pereopod 5, but propodus with three distal setae.

Pleopods (Fig. 19I) all alike, with naked basis; endopod with inner distal seta, exopod without setae on inner margin, outer margins with respectively 8 and 12 plumose setae, most proximal seta separated from the remainder.

Uropod (Fig. 19J) biramous, both exopod and endopod of one segment; exopod 0.8 times as long as endopod, with two distal and one subdistal setae; endopod with four distal setae.

Male unknown.

Etymology. Coochiamudlo is the Goenpul Aboriginal name for an island south of Banana Bank, Moreton Bay.

Remarks. With its combination of a short chela and pronounced, seta-bearing apophyses on the anterior coxae, the present species is closest to *Antiplotanais lutze* (Bamber 2005) comb. nov. Close examination of paratypic material of *A. lutze* has discerned the presence of fields of fine

setules and prickly tubercles on the ventral margins of merus, carpus and propodus of pereopods 4–6 in that species also, as described above for *A. coochimudlo* sp. nov. Equally, both species show a similar paucity of the pereopod setation/spination, and otherwise consistent morphology of mouthparts, pleopods, uropods, etc.

Antiplotanais coochimudlo can be distinguished from *A. lutze* (from southwestern Australia) in having much more slender antennule articles, more compact bases to the anterior pereopods, one longer and one shorter setae dorsodistally on the propodus of pereopods 4–6 (two longer setae in *A. lutze*), three setae on the uropod exopod (two setae in *A. lutze*), and in the proportions of the cheliped articles (e.g. carpus longer than propodus, and merus extending to midpoint of ventral margin of carpus in *A. coochimudlo*, carpus and propodus of equal length, and merus hardly reaching one-third the length along the ventral margin of the carpus in *A. lutze*). Both are distinguished from the species of the *greenwichensis*-group as described above under the generic Remarks.

Family Paratanaidae Lang, 1949

Subfamily Bathytanaidinae
Larsen & Heard, 2001

Bathytanais Beddard, 1886

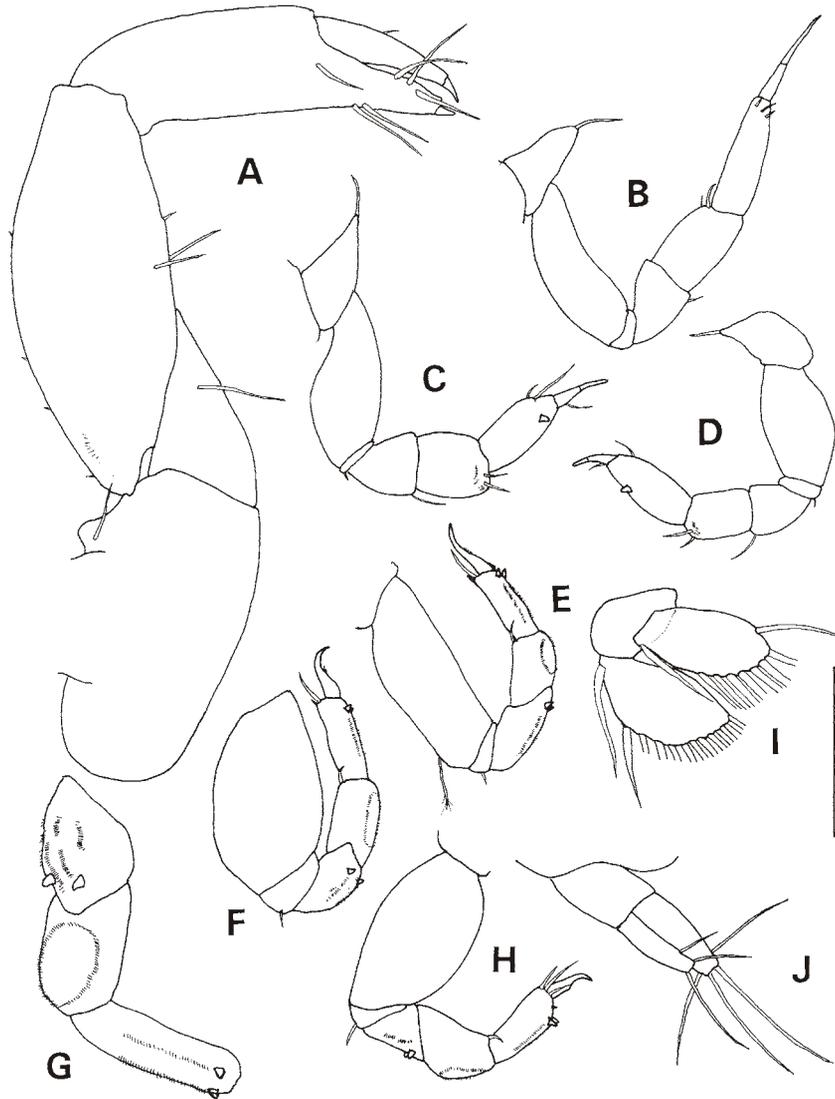


FIG. 19. *Antiplotanais coochimudlo* sp. nov., A, cheliped; B-F, pereopods 1-5 respectively; G, merus, carpus and propodus of pereopod 5, ventrolateral detail; H, pereopod 6; I, pleopod; J, uropod. Scale bar = 0.1 mm for A-F, H-J; 0.05 mm for G.

***Bathytanais bathybrotos* (Beddard, 1886)**

Paratanais bathybrotos Beddard, 1886a: 119.

Bathytanais bathybrotos — Beddard, 1886b: 133-134, plate 17; Lang, 1972: 221-229, figs 1-5; Larsen & Wilson, 1998: 347-348, fig. 9 (literature).

Material Examined. QM-W28096, brooding ♀, 2 ♀♀ without oostegites, 2 juvs, brooding ♀, dissected, clean medium sand with some shell, dense holothurians, off South Passage East of Moreton I., 27°

17.54'S, 153°28.26'E, 29 m, 35‰, 28.1°C, 19.02.2005, van Veen grab, RNB. QM-W28097, 3 ♀♀ without oostegites, muddy medium sand with shell breccia and holothurians, N. of Moreton I., Moreton Bay, 26°56.38'S, 153°23.73'E, 41.3 m, 35‰, 28.8°C, 16.02.2005, van Veen grab, RNB. NHM 2006.1542-1543, 2 ♀♀ without oostegites, clean medium sand with shell breccia, N. of Moreton I., Moreton Bay, 26°56.89'S, 153°24.19'E, 23.6 m, 35‰, 28.3°C, 16.02.2005, van Veen grab, RNB. NHM 2006.1544, ♀ without ooste-

gites, slightly muddy medium sand with holothurians, NW of Flat Rock, East of South Passage, 27°22.95'S, 153°30.79'E, 26.6 m, 35‰, 28°C, 19.02.2005, van Veen grab, RNB. QM-W28098, ♀, 1 juv, slightly muddy medium sand with holothurians, NW of Flat Rock, East of South Passage, 27°22.10'S, 153°31.91'E, 35.5 m, 35‰, 27.9°C, 19.02.2005, van Veen grab, RNB. 3 ♀♀, NHM 2006.1545–1549, 2 juvs, coarse sand with shell and holothurians, East of Moreton I., 27°13.07'S, 153°28.29'E, 35.6 m, 35‰, 22.02.2005, van Veen grab, RNB. QM-W28099, ♀, medium sand with shell, west of Moreton I., 27°04.10'S, 153°16.95'E, 8.5 m, 35‰, 23.02.2005, van Veen grab, RNB.

Remarks. *Bathytanais bathybrotes* was first described by Beddard (1886a) on the basis of a single female reportedly taken from 3,752 m from the North Pacific (north-east of Midway I.). In his more detailed *Challenger Report* (Beddard 1886b) he reported a further 14 individuals from Port Jackson, New South Wales, Australia at 6–18 m depth. Subsequently, Lang (1972) recorded a specimen from 50 m off Grafton, New South Wales (*Galathea* Stn 544), and gave a comprehensive redescription. The present material accords with the surviving Port Jackson specimens of Beddard (1886b) (NHM.1967:11:12.1–9) and with the description of Lang (1972; but note Larsen & Wilson's (1972) comments on the cheliped basis) other than the articulation of the uropod rami, with the exopod here showing no apparent articulation, and the endopod showing marked fusion of two articles (see also Larsen & Wilson 1998). It also accords with a southeastern Australian distribution, and adds further doubt to the location (and unlikely depth) of Beddard's holotype (now lost).

While largely characterised by the conformation of the lobes on the antennal peduncle articles 2 and 3, a notable feature of this species is the ventral 'flange' on the basal peduncle article of the antennule (Beddard, 1886b, Pl. 17, Fig. 12; Lang, 1972, Fig. 1d), present even in juveniles. Unlike the comments of Larsen & Wilson (1998) the present material, as that of Lang (loc. cit.) has seven distal spines on the maxillule endite.

Other than the holotype of doubtful provenance, all specimens have been found on clean sand at depths between 6–50 m; the twenty specimens in the present material were all taken outside Moreton Bay, off the major sand banks of Moreton and North Stradbroke Islands.

Bathytanais culteriformis Larsen & Heard, 2001

Bathytanais culteriformis Larsen & Heard, 2001: 3–7, figs 1, 2.

Material Examined. QM-W28100, ♀ without oostegites, muddy sand with spatangoids, Moreton Bay, 27°20.91'S, 153°19.96'E, 16.6 m, 33‰, 29.1°C, 10.02.2005, van Veen grab, RNB. QM-W28101, ♀ without oostegites sand, north of Banana Bank, Moreton Bay, 27°32.02'S, 153°20.67'E, 4.9 m, 11.02.2005, van Veen grab, RNB. QM-W28444, subadult ♀, dissected, coarse sand and shell with *Branchiostoma*, Moreton Bay, 27°27.0'S, 153°18.8'E, 8.4–9.9 m, 10.02.2005, spanner-crab dredge, RNB, ♀, MBWS Stn. 4; QM-W28445, 2 ♀♀, MBWS Stn. 10; QM-W28446, ♀, MBWS Stn. 13; QM-W28447, ♀, MBWS Stn. 15; all van Veen grab, PJFD. QM-W12582, 22 ♀♀, one in a mucus tube, Middle Banks, northern Moreton Bay, 17.09.1983/13.01.1984, P. Saenger & S. Cook (there are two dates on the label, in material containing a number of species).

Remarks. These specimens, all collected from sandy substrata within Moreton Bay at depths from 4.9–16.6 m, are almost identical to the figures and type-descriptions of *B. culteriformis* (see Larsen & Heard 2001), although that material was collected from north-west Australian waters (again on sand, at 38–88 m depth). In particular, the antennal morphology is typical for that species. The chela dactylus has two fusiform setae on the cutting edge, and there is a distinct row of eight denticulate setae along the propodal distal margin at the insertion of the dactylus (about three indicated by Larsen & Heard 2001, for their dissected paratype).

Bathytanais juergeni Larsen & Wilson, 1998

Bathytanais juergeni Larsen & Wilson, 1998: 348–357, figs 1–9.

Material Examined. QM-W28102, ♀ without oostegites in *Phoronis* tube mat, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005, A-NL. QM-W28103, 1 manca sponge and bryozoan epifauna, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005, A-NL. 1 manca, dissected on *Sertularella diaphana* with ectozoic *Hebella* sp., Amity Point, 27°23.9'S, 153°26.2'E, 5–10 m depth (dive), 14.02.2005, A-NL.

Remarks. *Bathytanais juergeni* was originally described from Bute Bay, New South Wales at depths of 45–50 m, living in tubes on a sandy substratum. The present material was collected in epifaunal habitats, at 5–10 m depth, all off the northern coast of North Stradbroke Island. The dorsal spine on article 3 of the antennal peduncle

shows an articulation with the article, and the antennal peduncle articles are somewhat more slender (length of article 1 2.9 times the width in the adult female, twice as long in the type-description). Otherwise, the Moreton Bay material is consistent with the figures and descriptions of the types.

While the presence of three sympatric species of *Bathytanais* in the Moreton Bay area was at first surprising, they in fact occur in separate habitats (at least here), with *B. culteriformis* in the sheltered sands of Moreton bay, *B. bathybrotes* in sands in the open Pacific waters offshore of the islands to the east of the Bay, and *B. juergeni* in epifaunal habitats. As well as by habitat, they are all distinguishable by the morphology of the antenna (other morphology being generally conservative in this genus). A key to the species of *Bathytanais* was given by Larsen & Heard (2001), since when the only new species described has been *B. greebo* Bamber, 2005, taken in medium to coarse sands at 29–33 m depth off Esperance, Western Australia; this last is distinct as being the only species without a dorsodistal apophysis on the third peduncle article of the antenna, although a ventrodistal apophysis is present (Bamber 2005). Disregarding the suspect type-locality of *B. bathybrotes* (see above), all species are from Australian waters except for *B. bipennifer* Bird & Bamber, 2000 (*q.v.*), recorded from Hong Kong.

Subfamily **Teleotanaidinae nom. nov.**

Teleotanais Lang, 1956

Revised diagnosis. Female small, elongate paratanaid with mottled dorsal pigmentation, dorso-ventrally flattened, cephalon with slight rostrum, eyelobes and pigmented eyes. Six free pereonites, five free pleonites, the first four bearing articulated plumose midlateral setae. Antennule of four articles, antenna of six articles without dorsodistal spine on third article, distal setae simple. Maxillule with palp bearing one or two distal setae; maxilliped endite not expanded, distally with single seta and two or three fine pointed spines. Anterior pereopods setose, with slender dactylus plus unguis; posterior pereopods with distal spines on merus, carpus and propodus; dactylus plus unguis slender, not fused into a claw; pleopods biramous, basis

with single dorsal plumose seta; uropods short, biramous; exopod of two segments, endopod of one or two segments.

Type Species: *Teleotanais gerlachi* Lang, 1956. Other included species: *Teleotanais warragamba* sp. nov.; *Teleotanais 'gerlachei'* Sieg & Heard, 1983 (Nigerian material)

Remarks. *Teleotanais* has the immediate overall appearance of a paratanaid, and the pleonites bear the articulated midlateral plumose setae characteristic of that family, although not recognised as such by Lang (1956), while Sieg (1976) and Sieg & Heard (1983) make no mention of pleonite setae. However, the maxilliped endites are not expanded, as they are in all other paratanaid genera, and the sharp distal spines are unusual, other paratanoids having flat, rounded distal endite spines. Further, the unguis of the posterior pereopods are less reduced than in any other paratanaid genus. Although Lang (*loc. cit.*) attributed his new genus to the Paratanaidae, Sieg & Heard (1983) attributed the genus to the Nototanaidae (and then went on to compare it only with *Paratanais!*) on the basis of its having fused maxilliped bases; owing to the conformation of the maxilliped endites and the lack of knowledge of the articulated plumose pleonite setae subsequent researchers have put the genus in the Nototanaidae (e.g. Guțu & Sieg 1999; Larsen & Wilson 2002; Anderson *et al.* 2007). From the additional information from the present, second species of the genus, it is clearly a member of the Paratanaidae.

Teleotanais warragamba sp. nov.

(Figs 20, 21)

Material Examined. HOLOTYPE: QM-W28104, brooding ♀, 14 ♀♀ (11 brooding), 4 mancae. PARATYPES: QM-W28105, 3 brooding ♀♀, NHM 2006.1550–1552, amongst algae on low-tide wreck, Bradbury Beach, Dunwich, North Stradbroke I., 27°29'S, 153°24'E, littoral, 21.02.2005, D. Jones.

Description. Female body (Fig. 20A) slender, small, holotype 2.2 mm long, 7 times as long as wide. Cephalothorax subrectangular, 1.3 times as long as wide, as long as pereonites 1, 2 and 3 together, tapering to anterior with slight rostrum, eyelobes with eyes present and black. Six free pereonites; pereonite 1 shortest, pereonite 2 slightly longer, pereonites 3, 4 and 6 subequal, pereonite 5 longest and 2.7 times as long as

pereonite 1 (all pereonites respectively 3.0, 2.4, 1.8, 1.5, 1.1 and 1.6 times as wide as long). Pleon of five free pleonites progressively shorter posteriorly, each bearing pleopods; each pleonite about 4 times as wide as long, with single articulating, plumose midlateral setae. Pleotelson semi-circular, as long as last two pleonites together, 1.5 times as wide as long, with on each side single lateral setae anterior of uropod insertion, three posterior of uropod insertion and two mid-distal setae. Black mottled pigmentation (reminiscent of that of a *Tanais*) present over the whole dorsum, also on chelae and slight pigment spots on antennules.

Antennule (Fig. 20B) of four tapering articles, proximal article 2.15 times as long as wide, 0.9 times as long as distal three articles together, with long outer distal seta; second article just longer than wide, distal outer seta as long as article; third article two-thirds length of second; fourth article just longer than second, with three distal setae, four subdistal setae and two subdistal aesthetascs implying fusion of a small fifth article.

Antenna (Fig. 20C) of six articles, proximal article compact, naked; second article as long as wide, naked; third article longest, three times as long as first and 2.2 times as long as wide, with dorsal row of three strong setae; fourth article 0.75 times as long as third with long ventrodistal seta; fifth article 0.8 times as long as fourth; sixth article minute.

Labrum (Fig. 20D) rounded, setose. Left mandible (Fig. 20F) with crenulate lacinia mobilis not wider than crenulate pars incisiva, pars molaris stout with strong rugosity; right mandible (Fig. 20E) similar but without lacinia mobilis. Labium (Fig. 20G) wide, bilobed, distally finely setose, without palp. Maxillule (Fig. 20H) with nine distal spines; palp distinct, with single distal seta; maxillule rounded, simple. Maxilliped (Fig. 20I) palp first article naked, second article with one outer and three inner simple setae; third and fourth articles with filtering rows of six and eight setae respectively, third article with two further inner distal setae, fourth article with outer seta; basis with single long seta extending to third palp article; endites (Fig. 20J) narrower than bases, distally with single seta and two short, sharp spines. Epignath not seen.

Cheliped (Fig. 21A) with rounded, compact basis 1.25 times as long as wide; merus sub-triangular with two ventral setae; carpus 1.74 times as long as wide, with two ventrodistal setae; propodus robust, fixed finger with three ventral and three inner setae, cutting edge expanded into blade along distal two-thirds; setal row at base of dactylus of four setae; dactylus with proximal seta, small spine proximally on cutting edge.

Pereopod 1 (Fig. 21B) longer than other pereopods, coxa with seta; basis slender, 3.9 times as long as wide; ischium with one seta; merus 1.4 times as long as carpus, with single ventrodistal seta; carpus with three distal setae; propodus just longer than carpus, with five distal setae; dactylus slender, extending into subequal slender unguis, the two together 1.25 times as long as propodus. Pereopods 2 and 3 (Fig. 21C) similar to each other, more compact than pereopod 1; basis 3.2 times as long as wide; ischium with one seta; merus just shorter than carpus, merus with two ventrodistal spine, carpus with dorso-distal and ventrodistal seta; dactylus and subequal unguis together 1.2 times as long as propodus.

Pereopods 4 and 5 (Fig. 21D) similar to each other, basis stouter, 2.34 times as long as wide; ischium with one seta; merus longer than carpus, with two ventrodistal spines, carpus with outer, ventral and inner distal spines; propodus as long as merus, with two ventrodistal spines, three distal setae as long as dactylus; dactylus and unguis partially fused into a claw, curved, shorter than propodus. Pereopod 6 (Fig. 21E) as pereopod 4, but distal propodal spines more slender, propodus with four distal setae.

Pleopods (Fig. 20K) all alike, with single inner plumose seta on basis; endopod with two inner setae.

Uropod (Fig. 21F) biramous, basis naked; exopod of two subequal segments, outer distal seta longer than inner distal seta; endopod of one segment, 1.25 times as long as exopod.

Male unknown.

Etymology. *Warragamba* is the name of a sand bank in Moreton Bay.

Remarks. *Teleotanis warragamba* sp. nov. differs from the only previously described species, *T. gerlachei*, in its more compact third antennule

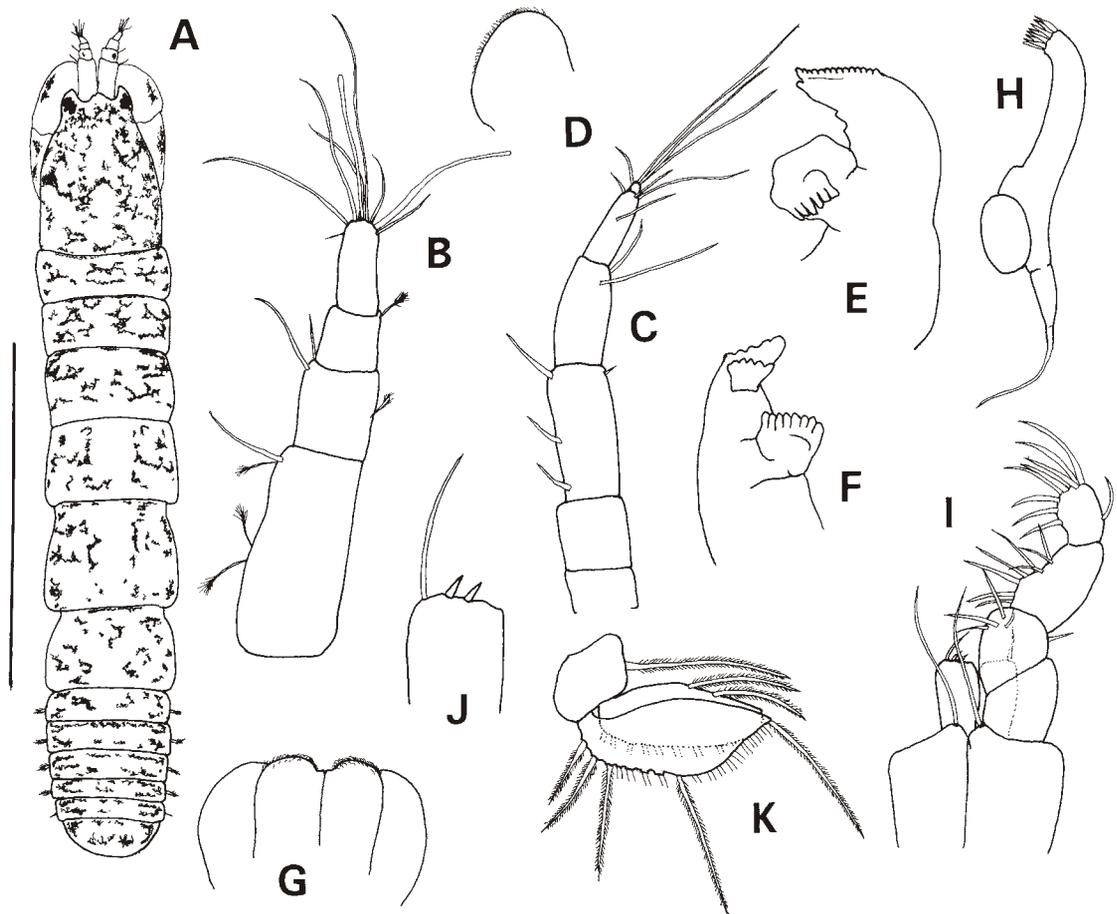


FIG. 20. *Teleotanaeis warragamba* gen. et sp. nov., A, holotype, dorsal; B, antennule; C, antenna; D, labrum, lateral; E, right mandible; F, left mandible; G, labium; H, maxillule and maxilla; I, maxilliped; J, detail of maxilliped endite; K, pleopod. Scale bar = 1 mm for A; 0.2 mm for B–I, K; 0.1 mm for J.

article, in having only two (rather than three) sharp distal spines on each maxilliped endite, a comparatively longer dactylus and unguis on pereopod 1, and only one segment in the uropod endopod (two in *T. gerlachei*).

Sieg & Heard (1983) include in their analysis of *T. gerlachei* from Florida some 200 specimens from Port Hartcourt, Nigeria, but their redescription and stylised figures (copied from Sieg 1976) are based on specimens from El Salvador. It seems inconceivable that the Nigerian material is conspecific with Lang's South American-Caribbean species, unless its presence in Africa is a result of anthropogenic transport, e.g. in fouling on the hull of a ship. A more

critical examination of that material is warranted in the light of the discovery of *T. warragamba*. Similarly, while the records of Sieg (1976) from Panama were mis-identifications (Sieg & Heard 1983), his material from Pacific El Salvador attributed to *T. gerlachei* needs critical re-examination.

The midlateral pleonite setae of *Teleotanaeis* are diagnostic of the Paratanaidae, while none of the 'non-paratanaid' features of narrow maxilliped endites with small, sharp distal spines, the slender posterior unguis are diagnostic of any other genus. As these features appear to be plesiomorphic in comparison to their counterparts in described paratanoids, *Teleotanaeis*

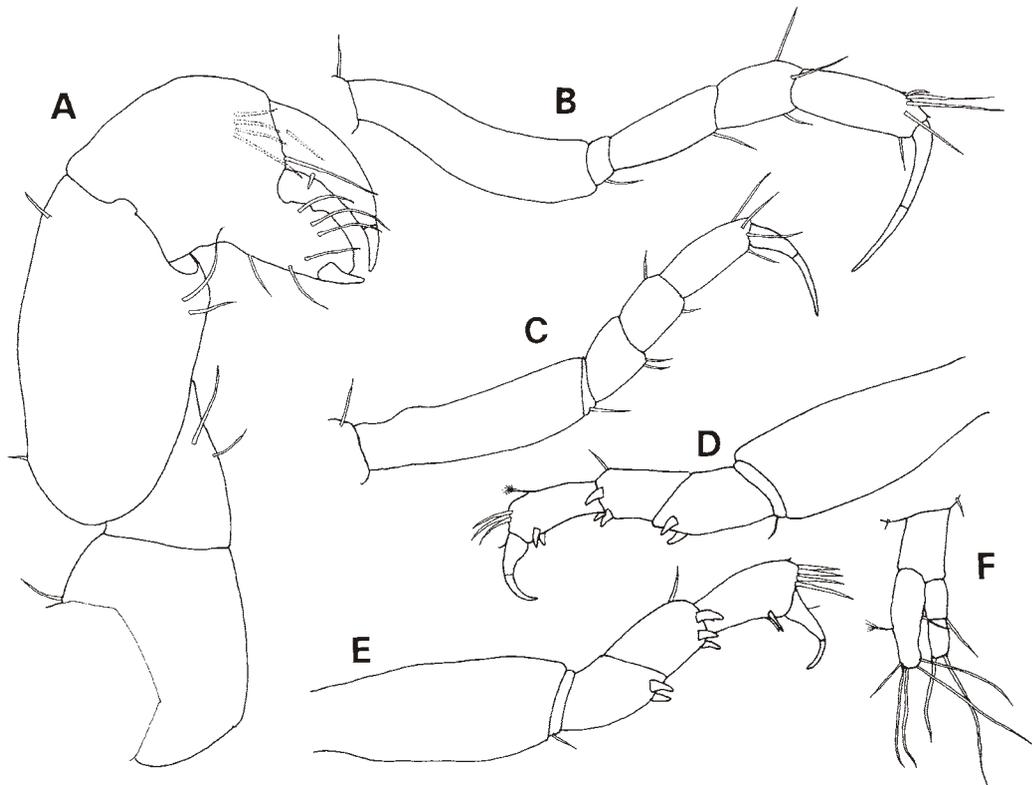


FIG. 21. *Teleotanaeis warragamba* gen. et sp. nov., A. Cheliped; B, pereopod 1; C, pereopod 3; D, pereopod 5; E, pereopod 6; F, uropod. Scale bar = 0.1 mm.

appears to be a primitive member of the family, with less specialised maxilliped endites, anterior pereopod setation and posterior ungues. In the context of the subfamily divisions of Larsen & Heard (2001), *Teleotanaeis* is herein placed in its own subfamily, the Teleotanaidinae, with the characters of the genus. Equally, these are the only littoral species of the family (*T. gerlachei* was recorded from the low littoral and near mangroves at a number of sites in Brazil, and from reduced salinity mangrove habitat in El Salvador and Florida), which may account for the unusual (for a paratanaid) pigmentation; Lang does not describe the colouration of the types of *T. gerlachei*, but Sieg & Heard (1983) figure the colouration of their material, although without specifying whether it is from Florida or from Nigeria; no other paratanaid is described as bearing mottled dorsal pigmentation.

Subfamily Paratanaidinae Lang, 1949

Paratanaeis wanga sp. nov.

(Figs 22–24)

Material Examined. HOLOTYPE: QM-W28106, ♀, QM-W28107, ♂ allotype, ♀, 2 juvs. PARATYPES: QM-W28108, ♀, dissected, in filamentous red algae, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. NHM 222006.1553, ♀ in *Phoronis* tube mat, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. QM-W28109, 2 ♀♀ amongst barnacle-sponge epifaunal on tyres, off Amity Point, North Stradbroke I., 27°23.9'S, 153°26.2'E, 8–10 m, 35‰, 14.02.2005. NHM 2006.1554–1559, 5 ♀♀, 1 manca, (amongst sponges (*Niphatis*), Amity Point, 27°12.9'S, 153°126.22'E, 4–9 m, 15.02.2005. QM-W28110, subadult ♀? on the bryozoan *Orthoscuticella ventricosa* agg, Henderson's Pinnacles, east side of Moreton I., 27°07.901'S, 153°28.712'E, 22–26 m, 22.02.2005, all A-NL.

Description of female. Body (Fig. 22A) slender, holotype 3.4 mm long, 6.4 times as long as wide. Cephalothorax tapering towards the rostrum, 1.1 times as long as wide, 1.3 times as long as pereonites 1 and 2 together, with slight rostrum,

eyelobes and eyes present and black, single setae at posterior of eyelobes and midlaterally. Six free pereonites; pereonite 1 shortest, pereonites 2 and 3 subequal and 1.5 times as long as pereonite 1, pereonites 4–6 subequal and 1.3 times as long as pereonite 2 (all pereonites respectively 3.1, 2.1, 2.1, 1.7, 1.65 and 1.7 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite about 6.7 times as wide as long, pleonites 1–4 with plumose mid-lateral seta on each side, pleonite 5 with simple midlateral seta. Pleotelson semi-circular, just longer than last two pleonites together, 2.3 times as wide as long, with single lateral setae on each side above uropod attachment and two distal setae.

Antennule (Fig. 22C) of four articles, proximal article 1.6 times as long as wide, with single median blunt seta and adjacent plumose seta; second article one third as long as first, longer distal outer seta blunt; third article 0.75 times as long as second, with blunt distal seta; fourth article longer than second and third together, with four distal setae and one aesthetasc.

Antenna (Fig. 22D) of six articles, proximal article compact, naked; second article 1.4 times as long as wide, with single dorsodistal spine and setulose dorsal margin; third article 0.6 times as long as wide, with stout dorsodistal spine; fourth article twice as long as third, with longer distal seta blunt and exceeding antenna tip; fifth article half as long as fourth with blunt distal seta more than twice length of article; sixth article minute with five distal setae.

Labrum rounded, setose, typical of genus. Left mandible (Fig. 22E) with crenulate lacinia mobilis, little crenulation on pars incisiva, pars molaris robust with marginal rugosity; right mandible (Fig. 22F) similar but without lacinia mobilis, pars molaris simpler. Labium simple with rows of fine setules, without palp. Maxillule (Fig. 22J) with eight distal spines of which inner pair are shortest, setose outer margin; palp distinct, with two distal setae. Maxilliped (Fig. 22I) palp first article naked, second article with one simple outer and three finely-denticulate inner setae; third article with five finely-denticulate inner setae; fourth article with three inner finely-denticulate inner setae, distal and outer setae simple; basis with one simple seta extending past tip of first palp article;

endites (Fig. 22H) with serrated and setulose laterodistal margins, each with two linguiform distal spines but no distal seta. Epignath (Fig. 22G) elongate with setose distal margins.

Cheliped (Fig. 23A) with rounded, compact basis 1.25 times as long as wide; merus subtriangular with single blunt ventral seta; carpus 1.5 times as long as wide, with two blunt ventrodistal setae; propodus typical for the genus, fixed finger with two ventral and three inner blunt setae, cutting edge slightly crenulate, setal row at base of dactylus of three setae; dactylus with proximal seta and two leaf-like spines on proximal half of cutting edge.

Pereopod 1 (Fig. 23B) longer than other pereopods, coxa naked; basis slender, 5.5 times as long as wide with short, blunt dorsal seta in proximal half; ischium compact with one blunt seta; merus 1.3 times as long as carpus, naked; carpus with two distal setae; propodus 1.5 times as long as carpus, with three distal setae; dactylus slender, extending into longer slender unguis, the two together 1.3 times as long as propodus; single distal seta on dactylus. Pereopods 2 and 3 (Fig. 23C) similar to each other, more compact than pereopod 1; basis 2.6 times as long as wide; ischium with 2 setae; merus almost as long as carpus and with paired dorsoventral spines; carpus with curved outer and inner distal spines with finely crenulate ventral margins, and paired, shorter ventrodistal spines; propodus 1.7 times as long as carpus, with ventrodistal blunt seta; dactylus and longer unguis slender, together 1.15 times as long as propodus.

Pereopod 4 (Fig. 23D) basis stout, 1.3 times as long as wide with ventral plumose sensory seta; ischium with two setae; merus and carpus subequal, merus with paired ventrodistal spines each with outer setule; carpus with outer, ventral and inner distal spines each with fine outer setule; propodus nearly twice as long as carpus, with distal seta, ventrodistal simple spine and mid-dorsal plumose sensory seta; dactylus and shorter unguis not fused but forming a claw, curved, together half as long as propodus. Pereopod 5 as pereopod 4, but without sensory plumose seta on propodus. Pereopod 6 (Fig. 23E) as pereopod 4, but distal carpal and propodal spines larger, propodus with three pectinate distal setae.

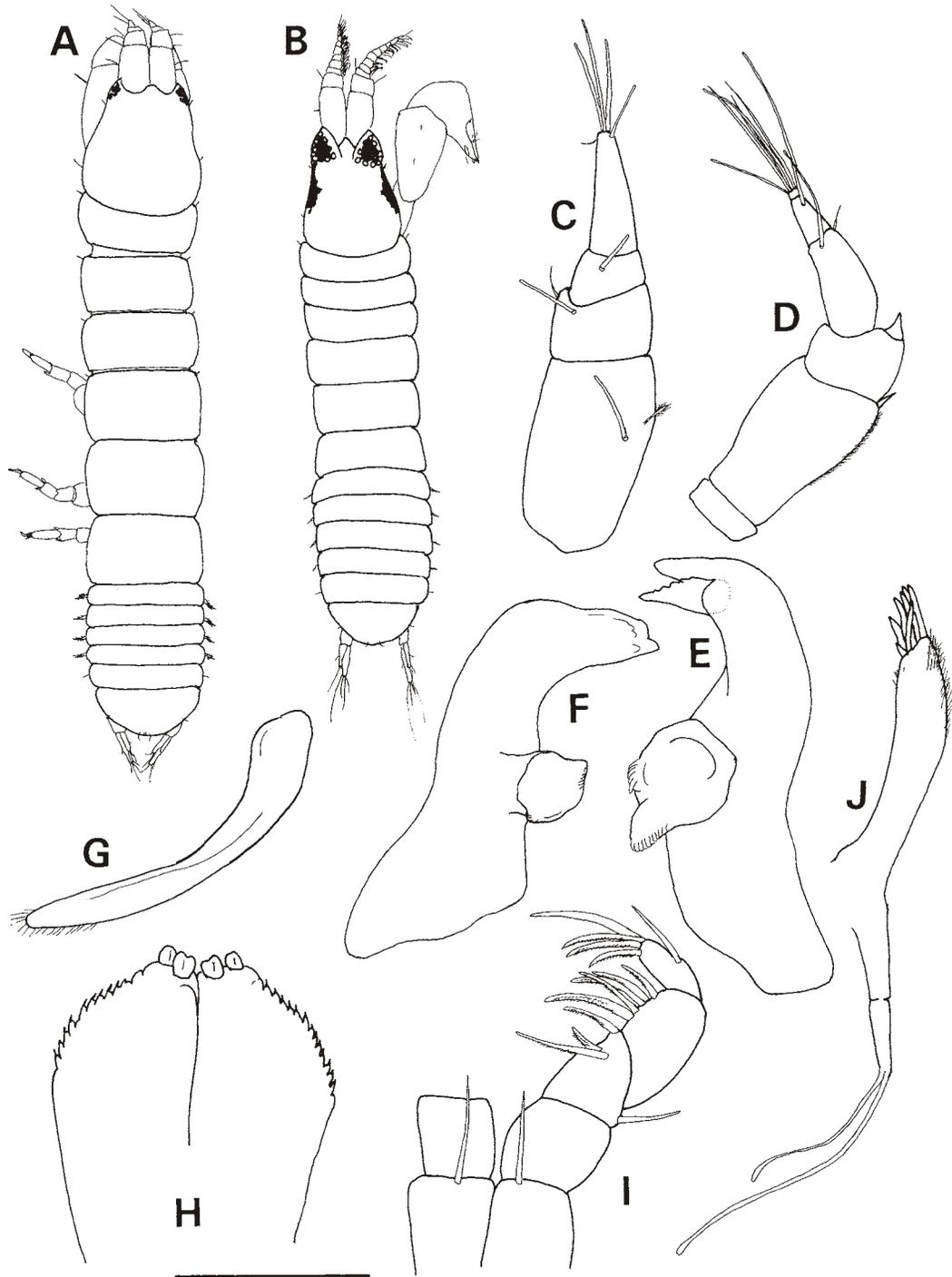


FIG. 22. *Paratanais wanga* sp. nov., A, holotype female, dorsal; B, allotype male, dorsal; C-J, female paratype: C, antennule; D, antenna; E, left mandible; F, right mandible; G, epignath; H, maxilliped endite; I, maxilliped; J, maxillule. Scale bar = 1 mm for A, B; 0.3 mm for C, D; 0.15 mm for E-J.

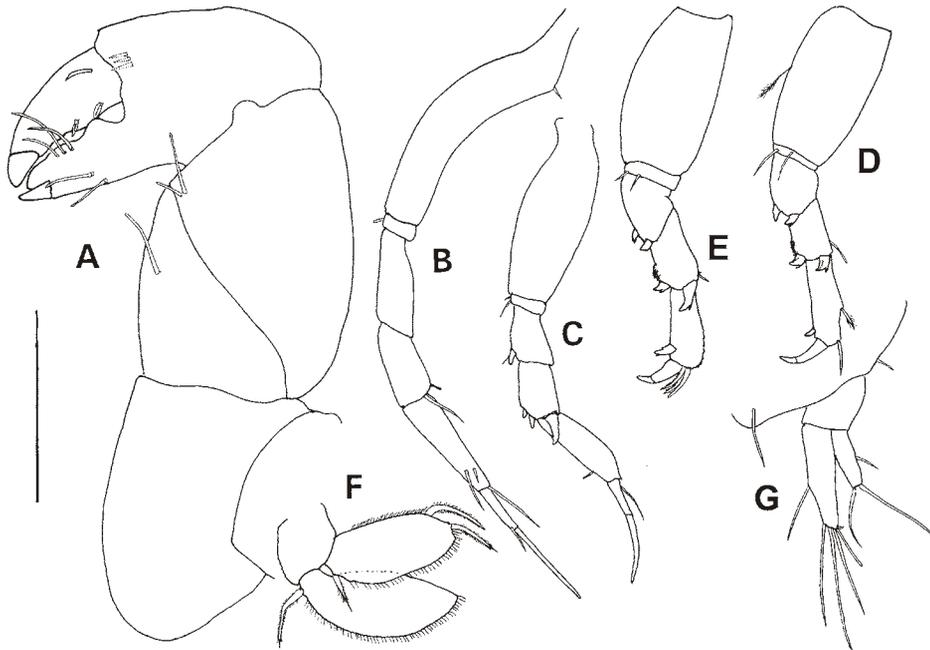


FIG. 23. *Paratanais wanga* sp. nov., A, cheliped; B, pereopod 1; C, pereopod 3; D, pereopod 4; E, pereopod 6; F, pleopod (most setae shown only by their bases); G, uropod. Scale bar = 0.3 mm.

Pleopods (Fig. 23F) all alike, typical for the genus, basis naked, endopod with single inner distal plumose seta and 20 outer plumose setae, exopod with 30 outer plumose setae.

Uropod (Fig. 23G) biramous, basis naked; exopod of one segment, 0.6 times as long as endopod, with mid-length outer seta and outer distal seta longer than inner distal seta; endopod of one segment, with mid-length inner seta and four distal setae.

Description of male. Smaller than female (allotype length 2.63 mm), body (Fig. 22B) more compact, cephalon nearly as long as pereonites 1–4 together, with large eyelobes bearing large black eyes, midlateral black pigment patches; pereonites 1–3 subequal (pereonite 1 shortest), pereonites 4–6 subequal (pereonite 5 longest), 1.7 times as long as pereonite 1. Five free pleonites, subequal in length, each 0.9 times as long as pereonite 1, pleotelson twice as long as pleonite 5. Sexual dimorphism as follows.

Antennule (Fig. 24A) elongate, first peduncle article twice as long as wide with single dorsodistal seta; second article one third as long as first with single ventrodistal blunt seta; third

article compact, with dorsodistal blunt seta; flagellum of 7 segments, bearing ventrodistal rows of 20, 18, 16, 8, 4, 4 and 1 aesthetascs respectively, distal article also with three shorter, two longer and one blunt setae.

Antenna (Fig. 24B) more slender than that of female, dorsodistal seta rather than spine on article 3, distal setae elongate.

Mouthparts largely atrophied, maxilliped (Fig. 24C) with fewer but much longer and more slender setae.

Cheliped (Fig. 24D) slightly more robust than that of female; carpus 1.13 times as long as wide; propodus distal setal; row of 17 setae; dactylus with slender setae on cutting edge. Pereopods similar to those of female; pereopods 1 (Fig. 24E) 2 and 3 (Fig. 24F) dactylus plus unguis shorter than propodus, pereopods 2–6 with more slender bases, distal spines on carpus more slender than on female, and unguis finely crenulate ventrally; pereopod 6 (Fig. 24G) without ventrodistal spine on propodus.

Pleopods more setose than those of female. Distal setae of uropod rami proportionately longer.

Etymology. Named for Wanga Wallen Bank, a sand-spit just south of Amity Point.

Remarks. There are five recognised species of *Paratanais* which have been described from Australia (see Larsen 2001; Bamber 2005), all of which, unlike the present species, have a two-segmented uropod endopod. *P. wanga* sp. nov. shares the lack of an 'anteriomedial' seta on the maxilliped endite only with *P. malignus* Larsen, 2001, from New South Wales. What appears to be unique to the present species is the number of blunt setae on the antennules, cheliped, etc. – while some of these may represent damage, they were a recognisable feature on all the female specimens.

Males of this genus are rare. The present male shares the body form and huge eyes noted in other species (e.g. *P. maleficus* Larsen, 2001, from New South Wales), but the flagellum segments are more numerous than in any other described male.

All of the material collected was from epifauna of algal habitats in 4–29 m depth.

Family Leptocheliidae Lang 1973

Konarus Bamber, 2006

Konarus cheiris Bamber, 2006

Konarus cheiris Bamber, 2006: 7–12, figs 3–5.

Material Examined. QM-W2228111, 4 ♀♀ without oostegites sponge and bryozoan epifauna, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. QM-W28112, 3 ♀♀, two within tubes in filamentous red algae, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005; NHM 2006.1560–1569 in ethanol, 11 ♀♀, eight within tubes amongst sponge, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. QM-W28113, 2 ♀♀, 1 juv in *Phoronis* tube mat, Point Lookout, 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005. QM-W28114, 2 ♀♀ among the alga *Melanamansia glomerata*, Flat Rock, north of North Stradbroke I., 27°23.5'S, 153°33.0'E, 8–15 m, 17.02.2005. QM-W28115, 8 ♀♀ among the algae *Amphiroa fragilissima*, with *Asparagopsis taxiformis* and *Zonaria diesingiana*, Flat Rock, north of North Stradbroke I., 27°23.5'S, 153°33.0'E, 8–15 m, 17.02.2005. QM-W28116, ♀ on the bryozoan *Orthoscuticella ventricosa* agg., Henderson's Pinnacles, East side of Moreton I., 27°07.901'S, 153°28.712'E, 22–26 m, 22.02.2005. All from diving, A-NL. QM-W28472, brooding ♀, 1 manca, on medium sand with detritus and holothurians, East of Moreton I., 27°17.26'S, 153°29.141'E, 40 m, 22.02.2005, long-arm van Veen grab, RNB. QM-W28473, ♀, MBWS Stn. 9; QM-W28476, 12 ♀♀, MBWS Stn. 10; van Veen grab, PJFD.

Remarks. *K. cheiris* was described originally from New Caledonia and the Loyalty Islands at 12–20 m, also on algae. These specimens are from the other side of the Coral Sea, and from 8–40 m depth. While basically white in colour, there are scarlet lines on the cheliped propodus and on the cephalon, marking the second thoracomere demarcation dorsally on the carapace (by which the genus can be easily recognised). The antennule peduncle article 1 is very robust, and the proximal end of the chela is somewhat covered by a cuff-like extension of the carpus. Some of the present material was collected in tubes of mucopolysaccharide, fibres and adherent sand grains and shell fragments.

A second species which should be transferred to this genus is *Heterotanais crassicornis* Stebbing, 1905, which was originally collected in shallow waters from the Gulf of Manaar (Stebbing 1905); this species also has the junction between the cephalon and the first thoracomere delineated on the carapace, as well as the distal cuff on the carpus of the cheliped enclosing the proximal part of the chela, and the compact antennule, after which the species was named. It seems unlikely that *H. crassicornis* Nierstrasz, 1913 is the same species, as it was collected in Pacific Indonesia at 30 m depth. Nierstrasz (1913) listed a few slight differences in size and shape which he attributed to intraspecific variation, but, as descriptions and figures for both records of *Konarus crassicornis* comb. nov. are lacking in detail, their distinction or otherwise remains inconclusive. Both forms of *K. crassicornis* have one, not two, distal setae on the maxillule palp, and less than 2 ventral setae on the fixed finger of the chela, unlike *K. cheiris*.

Leptochelia Dana, 1849

Leptochelia 'savignyi' (Krøyer, 1842) complex

Remarks. The history of the *Leptochelia savignyi* (Krøyer, 1842) complex, which has included the synonymy of numerous world-wide taxa by Lang (1973), has made the distinction of the probably numerous species difficult, not least because there are very few detailed descriptions of morphology, and many taxa were described largely from the highly dimorphic males. The sex-ratio in this genus is always heavily biased towards females; for example, Bird &

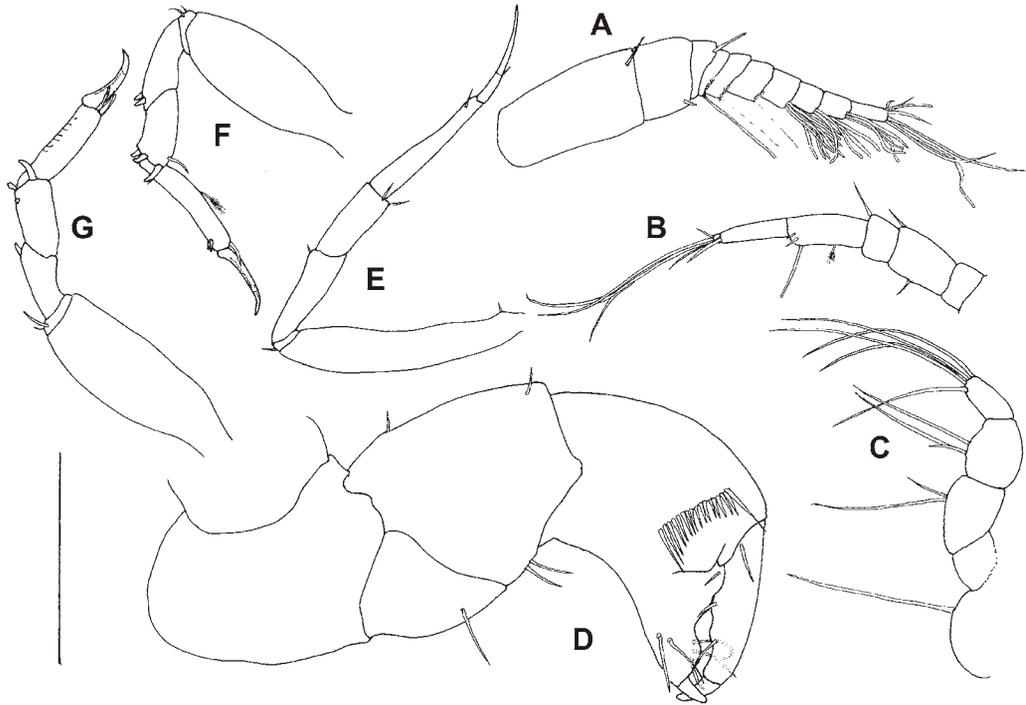


FIG. 24. *Paratanais wanga* sp. nov., male allotype, **A**, antennule (most proximal aesthetascs only indicated by their bases); **B**, antenna; **C**, maxilliped in situ; **D**, cheliped; **E**, pereopod 1; **F**, pereopod 3; **G**, pereopod 6. Scale bar = 0.4 mm for A, B, D-G; 0.2 mm for C.

Bamber (2000) recorded three males in 104 specimens of their *L. aff. savignyi* (non Krøyer 1842), and Ishimaru (1985) found two males in 6,500 individuals of *L. itoi* Ishimaru, 1985. Species of this group are often locally common or abundant, and it is thus necessary where possible not only to distinguish the individual taxa but also to base this distinction where possible on females. Sieg (1980) demonstrated the value of examining such detail as the spination/setation of the pereopods, *inter alia*, in the specific distinctions within the Tanaidaceae: such an approach has been neglected in the Leptocheiliidae. A detailed redescription of *L. savignyi* s. str. from the northeastern Atlantic would be invaluable (type locality is Madeira); however, the interpretation of Sars (1886) that that species has a five-articled antennule (including the minute distal article) appears valid.

The first approach to comprehensive description was by Shiino (1965) who described '*Leptocheilia savignyi*' from the Bismarck Archipelago, Melanesia. Ishimaru (1985) gave a

detailed analysis of both genders of *L. itoi* and a Japanese species attributed to *L. savignyi*. Subsequently, Bird & Bamber (2000) gave a detailed analysis of distinctions between their *L. aff. savignyi* and *L. lusei* Bamber & Bird, 1997. Larsen & Rayment (2002) described two species of '*Leptocheilia*' from the Andaman Sea, although their *L. elongata* may be inappropriate to this genus as the distal three antennule articles are subequal in length (in all other species of the genus, the distal article is minute, about 0.05 times the length of the subdistal article). Bamber (2005) described the first two Australian species attributable to *Leptocheilia*, *L. nobbi* Bamber, 2005, and *L. daggi* Bamber, 2005, and presented a table comparing a range of morphological features for most species for which adequate descriptions of the females were available.

It is now apparent that, in a taxon with minimal dispersive capability, there is a large number of species of the *Leptocheilia savignyi*-complex in shallow waters around the world. Indeed, Larsen & Rayment (2002) considered

Leptocheilia as 'probably the most numerically abundant shallow-water genus worldwide', with co-occurrence of cryptic species. There are known sibling species sharing sympatric distributions (Ishimaru 1985; Bird & Bamber 2000; Bamber 2005), that show niche specificity through exploitation of distinct habitats.

Characters which have so far been found to offer consistent distinctions between females of the species include the dimensions of the antennule proximal article; setation of the pereopod 1 carpus, the antennules and antennae; the proportions of the pereopod articles (particularly merus:carpus ratios of pereopods 2 and 3); the spination of the pereopod 2/3 merus; the maxilliped basis setae and endite spines; the proportions of the cheliped basis and carpus; the uropod exopod and possibly the lacinia mobilis of the left mandible. Observation of live material has also found colour differences between species, but many of the taxa *in litt.* are known only from preserved material, which has lost its pigmentation. Male morphology (when available) often offers early indication of specific differences.

A number of species of *Leptocheilia* were collected in the range of habitats around Moreton Bay. They have been analysed in comparison with the data presented by Bamber (2005, Table 1) covering the eight taxa listed therein, plus *L. dubia* Sars, 1886, *L. neapolitana* Sars, 1886, *L. nobbi*, *L. daggi*, and *L. tarda* Larsen & Rayment, 2002. The Brazilian taxon *L. dubia* (Krøyer, 1842) (non *L. dubia* Dojiri & Sieg, 1977) cannot be included as the description of that species is inadequate; similarly, insufficient detail is available for *L. savignyi sensu* Krøyer, 1842, and that species appears to have a five-articled antennule, as does *L. savignyi sensu* Sars, 1886, making them quite distinct from the remaining taxa (see *Catenarius* gen. nov., below).

Leptocheilia myora sp. nov.

(Figs 25, 26)

Material Examined. HOLOTYPE: QM-W28117, ♀ with oostegites, QM-W28118, 11 ♀♀. PARATYPES: QM-W28119, ♂, allotype, ♂ with oostegites, dissected, *Zostera capricorni* bed on soft sand, beach off Myora Spring, North Stradbroke I., 27°28.2'S, 153°25.45'E, mid-littoral (trowel sample), 32%, 9.02.2005, RNB.

Description of Female. Body (Fig. 25A) slender, holotype 2 mm long, 7.3 times as long as wide.

Cephalothorax subrectangular, 1.6 times as long as wide, longer than pereonites 1 and 2 together, with slight rostrum, eyelobes prominent, eyes present and black. Six free pereonites; pereonites 1, 2, 3, 5 and 6 subequal in length, pereonite 4 longest, 1.3 times as long as pereonite 1 (all pereonites respectively 1.6, 1.4, 1.5, 1.1, 1.3 and 1.6 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; pleon just longer than cephalon, each pleonite about 3.6 times as wide as long. Pleotelson semicircular, longer than last two pleonites together, twice as wide as long, with one posterolateral seta on each side and two distal setae. Body live colour generally brown with scattered white patches.

Antennule (Fig. 25C) of four tapering articles, proximal article 2.64 times as long as wide, 1.25 times as long as distal three articles together, with two long outer and single long inner setae; second article 1.8 times as long as wide, 0.4 times as long as first, distal setae half length of article; third article just shorter than second, with one aesthetasc; fourth article minute, eccentric, with four distal setae.

Antenna (Fig. 25E) of six articles, proximal article compact, naked; second article as long as wide, with single ventrodorsal and dorsodorsal slender spines; third article as long as wide, with dorsodorsal spine; fourth article longest, 2.9 times as long as wide; fifth article 0.6 times as long as fourth; sixth article minute.

Labrum (not figured) rounded, setose, typical of genus. Left mandible (Fig. 25G) with crenulate lacinia mobilis tapering towards distal end of mandible, coarse crenulation on pars incisiva, pars molaris stout; right mandible (Fig. 25F) with long crenulate margin, without lacinia mobilis. Labium (not figured) wide, distally finely setose, without palp. Maxillule (Fig. 25J) with ten distal spines and setose margins; palp distinct, with two distal setae. Maxilliped (Fig. 25H) palp first article naked, second article with finely setose inner margin, and with one outer and four inner setae, distal-most inner seta almost reaching distal margin of third palp article; third and fourth articles with filtering rows of ten and eight setae respectively, third article with three further outer setae, fourth article with outer seta; basis (Fig. 25I) with four long setae extending to third palp article; endites

distally with single seta and two robust spatulate and one rounded spines. Maxilla (not figured) oval, naked; epignath (not figured) elongate with setose margin distally and proximally.

Cheliped (Fig. 25K) with rounded, compact basis 1.3 times as long as wide; merus subtriangular with three ventral setae; carpus twice as long as wide, with three midventral and one subdistal dorsal setae; propodus typical for the genus, fixed finger with three ventral and three inner setae, cutting edge hardly crenulate, setal row at base of dactylus of three setae; dactylus with dorsoproximal seta.

Pereopod 1 (Fig. 26B) longer than other pereopods, coxa with seta; basis slender, 2.6 times as long as wide; ischium compact with one seta; merus as long as carpus, naked; carpus with three short distal setae, longest of which is 0.17 times length of propodus; propodus longer than carpus and merus together, with three longer dorsodistal setae on distinct raised pad; dactylus slender, extending into shorter slender unguis, the two together some 1.26 times as long as propodus.

Pereopod 2 (Fig. 26C) more compact than pereopod 1; ischium with one seta; merus just shorter than carpus, merus with strong ventrodorsal spine and dorsodistal seta, carpus with single dorsodistal and ventrodorsal setae; propodus shorter than carpus and merus together, with three longer dorsodistal setae on distinct raised pad; dactylus and shorter unguis together as long as propodus.

Pereopod 3 (Fig. 26D) similar to pereopod 2, but merus without dorsodistal seta, carpus with short outer distal spine, dactylus plus unguis 0.75 times as long as propodus.

Pereopod 4 (Fig. 26E) basis stout, twice as long as wide; ischium with one seta; merus and carpus subequal; merus with one outer and one inner short, ventrodorsal tooth-like spine; carpus with two outer and one inner distal tooth-like spines and fine dorsodistal seta; propodus longer than carpus, with two dorsodistal setae longer than dactylus, one shorter subdistal dorsal seta, one ventral subdistal tooth-like spine and one outer distal tooth-like spine; dactylus and unguis partially fused, curved. Pereopod 5 as pereopod 4. Pereopod 6 (Fig. 26F) as pereopod 4, but propodus with paired ventral subdistal spines

and no outer distal spine, dorsodistally with two pectinate and three simple setae.

Pleopods all alike, typical for the genus, basis naked.

Uropod (Fig. 26G) biramous, basis naked; exopod of one segment, 0.5 times as long as proximal endopod segment, outer distal seta longer than inner distal seta; endopod of four segments, distal segments slender.

Description of Male. Highly dimorphic primary male, smaller than female (allotype length 1.5 mm), body more compact; cephalon (Fig. 25B) elongate, nearly twice as long as wide, tapering towards rostrum, longer than pereonites 1–3 together, with distinct eyelobes bearing black eyes; pereonite 1 shortest, most pereonites subequal, pereonite 5 longest, 1.4 times as long as pereonite 1. Five free pleonites, subequal in length, entire pleon twice as long as pereonite 1. Sexual dimorphism as follows.

Antennule (Fig. 25D) elongate, slender, of 6 articles; first peduncle article 4 times as long as wide with one shorter and one longer distal setae, the latter almost as long as second article; second article half as long as first; third to sixth articles bearing 3, 3, 5 and 7 distal aesthetascs respectively. Mouthparts atrophied.

Cheliped (Fig. 26A) highly modified, more robust than that of female; basis as long as wide; carpus with convex dorsal edge and ventral flange, the whole thus being almost as wide as long; propodus with setal row at base of dactylus of 14 setae. Fixed finger set at right-angles to axis of propodus, 1.25 times as long as propodus, with large tooth-like apophysis on cutting edge bearing three setae; dactylus as long as fixed finger, but tips not opposing, cutting edge with four small spines.

Pleopods more setose than those of female.

Female to male sex ratio of the type material is 13:1.

Etymology. Named after the mangrove spring at the type locality.

Remarks. With the uropod exopod only half the length of the first endopod segment, *L. myora* sp. nov. compares only with *L. neapolitana* Sars, 1886, from the Mediterranean, *L. nobbi* from southwestern Australia, and *L. lusei* Bamber & Bird, 1997 (0.6 times); the latter two species

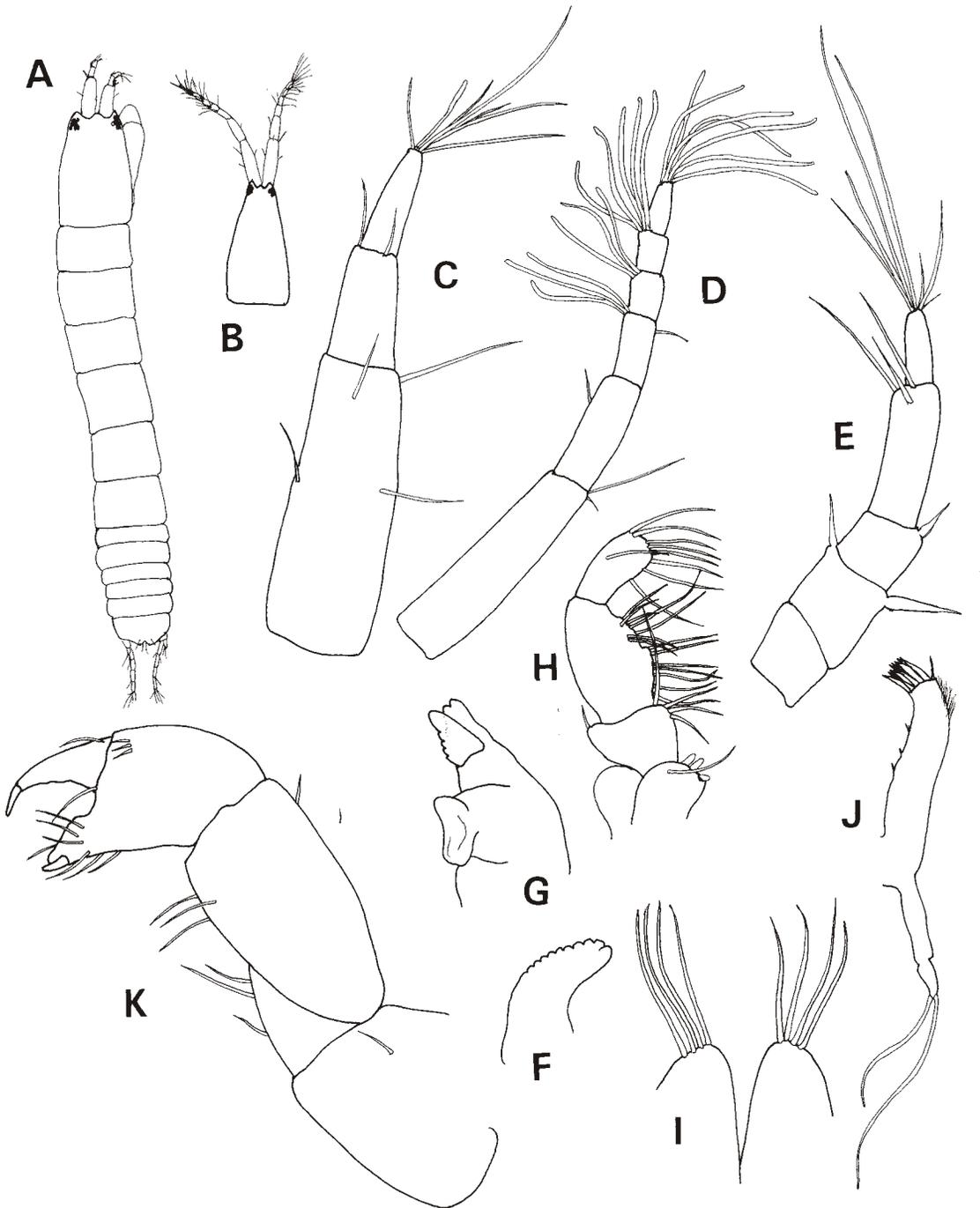


FIG. 25. *Leptocheilia myora* sp. nov., A, female holotype, dorsal; B, cephalon and antennules of male allotype, dorsal; C, female antennule; D, male antennule; E, antenna; F, right mandible, distal; G, left mandible; H, maxilliped palp and endite; I, maxilliped bases; J, maxillule; K, female cheliped. Scale bar = 1 mm for A, B; 0.25 mm for C, D, E; 0.2 mm for F–J; 0.35 mm for K.

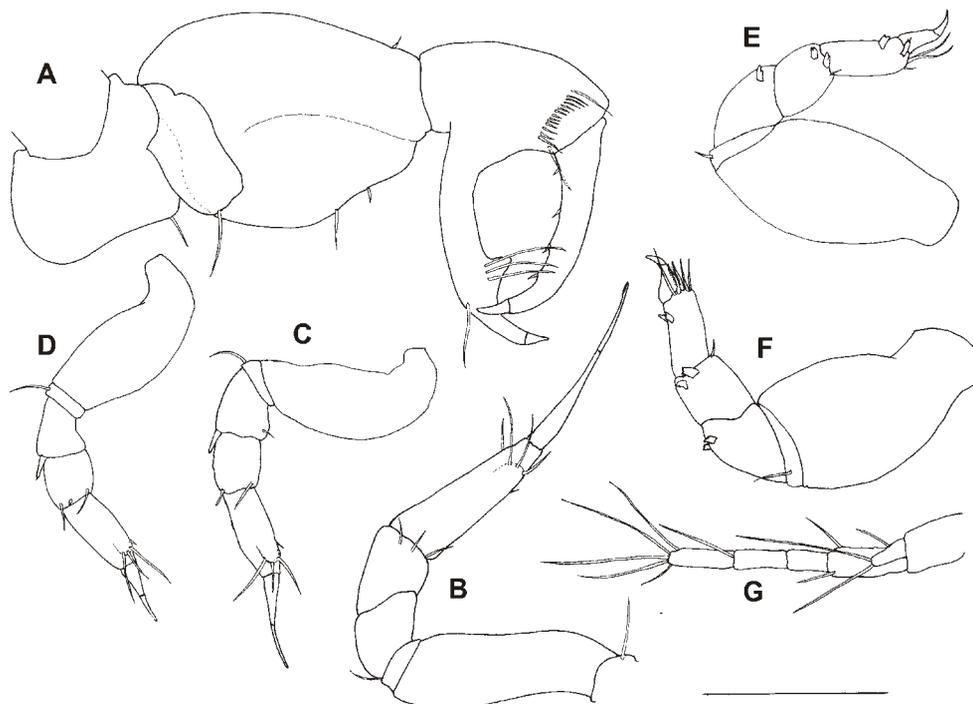


FIG. 26. *Leptochelia myora* sp. nov., A, male cheliped; B–F, pereopods 1, 2, 3, 4 and 6 respectively; G, uropod. Scale bar = 0.2 mm.

have only three distal setae on the maxilliped basis, compared with four in *L. myora*; *L. neapolitana* has five. The cephalon of *L. myora* is proportionately longer (1.6 times as long as wide) than *L. neapolitana* (1.3 times) *L. nobbi* (1.15 times) or *L. lusei* (1.4 times). The basis of pereopod 1 in the present species is proportionately shorter (2.6 times its own width) than in any other species of this group, all of which have the basis at least 3 times as long as its own width. The longest distal seta on the carpus of pereopod 1 (0.17 times the length of the propodus) is shorter than in any other species (at least 0.3 times the length of the propodus), and the longest distal seta on article 2 of the antennule (0.6 times as long as the article) is also shortest in this species (0.64 in *L. aff. savignyi* Bird & Bamber, 2000; >0.8 times in all other species). *L. myora* is further distinct from the two previously described Australian species in having two spatulate and one low rounded distal spines on the maxilliped endite, both *L. nobbi* and *L. daggi* Bamber, 2005 having three spatulate spines.

The raised dorsodistal pad bearing setae on the propodus of pereopods 1–3 of the present species, while probably present in all other species of *Leptochelia*, is most conspicuous in *L. myora*.

The male of the present species is distinct from those of the other species in the *Leptochelia savignyi* aggregate. In particular, the elaborate carpus is unique.

Leptochelia dijonesae sp. nov.

(Figs 27–29)

Material Examined. HOLOTYPE: QM-W28120, ♀ with oostegites. QM-W28121, mature ♂, allotype, 3 ♂♂, 45 ♀♀, 5 manca. PARATYPES: QM-W28122, 2 ♂♂, 4 ♀♀, NHM 2006.1570–1575, 4 ♀♀ in ethanol, collected on pneumatophores of *Avicennia marina* with *Cladophora*, Adams Beach, North Stradbroke I., 27°30.25'S, 153°24.43'E, mid-littoral, 16.02.2005, D. Jones. QM-W28123, 6 ♀♀ (2 brooding), in *Cladophora coelothrix* on mangroves, Myora Spring, North Stradbroke I., 27°28.2'S, 153°24.45'E, mid-littoral, 10‰, 11.02.2005, A-N.L. QM-W28124, ♀ with oostegites, *Zostera capricorni* bed on soft sand, beach off Myora Spring, North Stradbroke I., 27°28.2'S, 153°25.45'E, mid-littoral (trowel sample), 32‰, 9.02.2005, RNB.

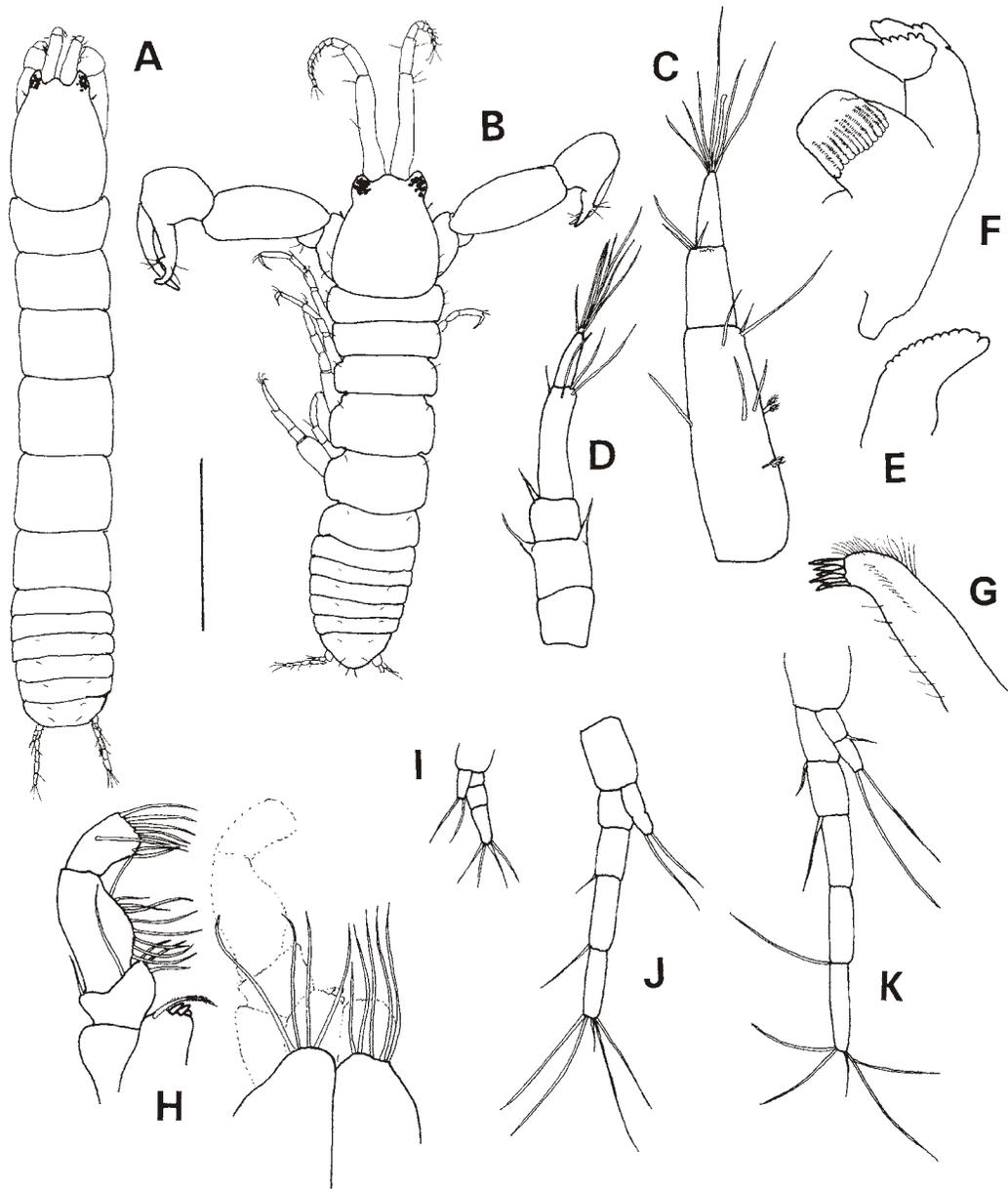


FIG. 27. *Leptochelia dijonesae* sp. nov., **A**, holotype female, dorsal; **B**, allotype male, dorsal; **C**, antennules; **D**, antenna; **E**, pars incisiva of right mandible; **F**, left mandible; **G**, maxillule endite; **H**, maxilliped; **I**, uropod of 1.14 mm manca; **J**, uropod of 2.13 mm female; **K**, uropod of 3.9 mm female with oostegites. Scale bar = 1 mm for **A**, **B**; 0.3 mm for **C**, **D**; 0.2 mm for **E**-**H**; 0.15 mm for **I**-**K**.

Description of Female. Body (Fig. 27A) slender, holotype 3.9 mm long, 7 times as long as wide. Cephalothorax subrectangular, 1.3 times as long as wide, 1.3 times as long as pereonites 1

and 2 together, with blunt rostrum, eyelobes conspicuous, eyes present and black, single setae at posterior of eyelobes. Six free pereonites; pereonite 1 shortest, pereonites 2, 3 and 4 progres-

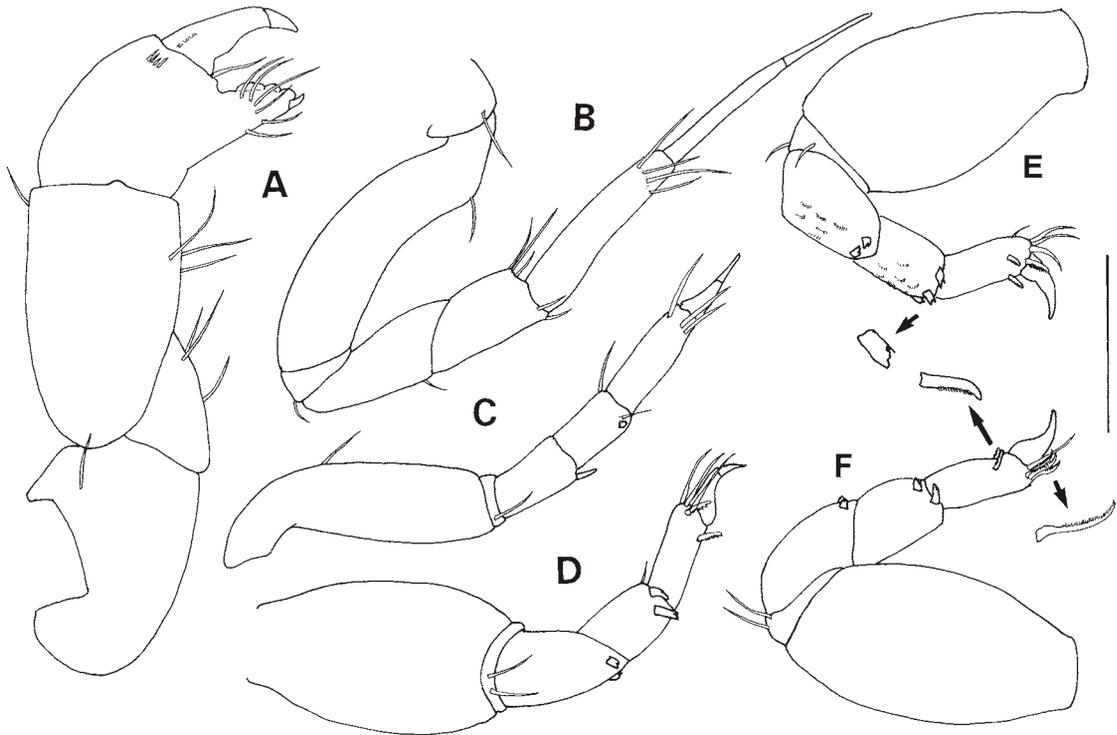


FIG. 28. *Leptochelia dijonesae* sp. nov., female paratype, A, cheliped; B–F, pereopods 1, 2, 4, 5 and 6 respectively. Scale bar = 0.3 mm for A; 0.2 mm for B–F.

sively longer, pereonite 5 just shorter than pereonite 4, pereonite 6 as long as pereonite 2 (all pereonites respectively 2.6, 1.7, 1.4, 1.2, 1.3 and 1.8 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite about 4.5 times as wide as long, with dorsal setal pair on last three pleonites. Pleotelson semi-circular, as long as last two pleonites together, twice as wide as long, with one anterodorsal and one posterolateral setae on each side and two distal setae. Body live colouration olive green.

Antennule (Fig. 27C) of four tapering articles, proximal article 2.9 times as long as wide, 1.5 times as long as distal three articles together, with two outer setae at midlength, three outer distal setae (longest of these 1.5 times length of article 2), and single inner seta at midlength; second article 1.5 times as long as wide, one third length of proximal article, longest distal seta 0.8 times length of article; third article just shorter than second, with one aesthetasc; fourth article minute, with three distal setae.

Antenna (Fig. 27D) of six articles, proximal article compact, naked; second article as long as wide, with single ventrodorsal and dorsodorsal slender spines; third article as long as wide, with dorsodorsal slender spine; fourth article longest, 4 times as long as wide; fifth article 0.5 times as long as fourth; sixth article minute.

Labrum rounded, setose, typical of genus. Left mandible (Fig. 27F) with crenulate lacinia mobilis longer than distal end of mandible, proximal crenulation on pars incisiva, pars molaris with strong rugosity; right mandible (Fig. 27E) similar but without lacinia mobilis, pars incisiva with more crenulations. Labium (not figured) wide, distally finely setose, without palp. Maxillule (Fig. 27G) with ten distal spines and setose margins, single row of setules on inner distal face, sparser single setae along ventral margin; palp (not figured) distinct, with two distal setae. Maxilliped (Fig. 27H) palp first article naked, second article with one outer and three inner setae, single distal seta almost reaching distal margin of third palp article; third and fourth

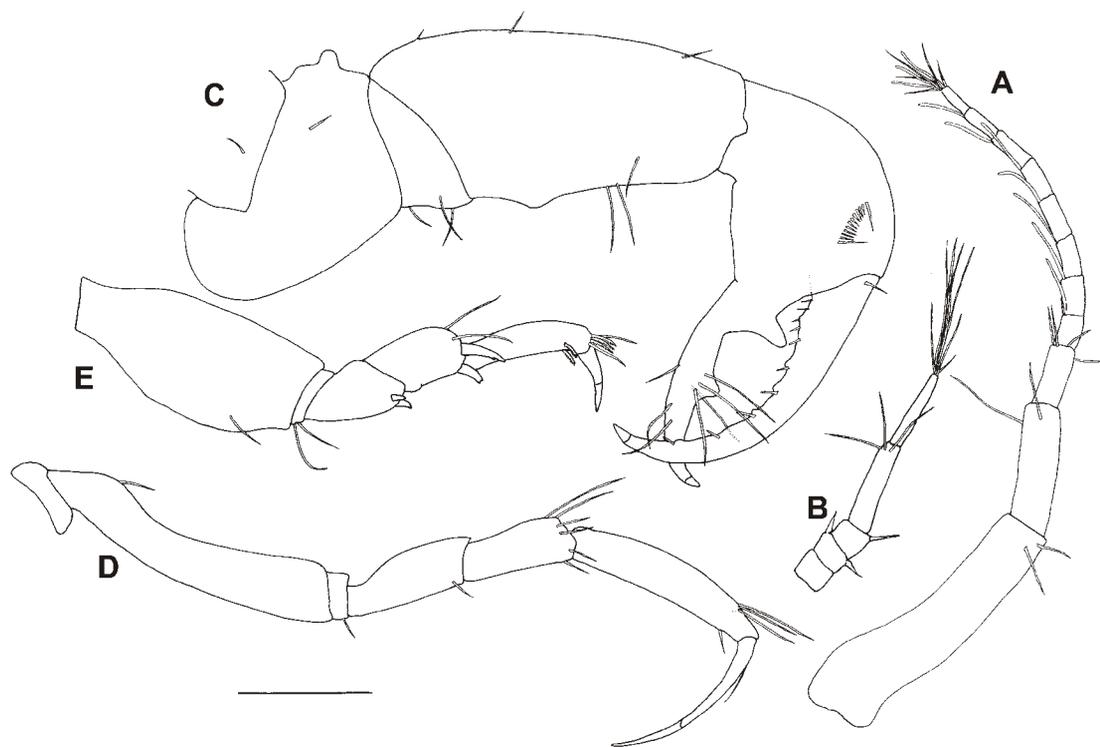


FIG. 29. *Leptocheilia dijonesae* sp. nov., male paratype, A, antennule; B, antenna; C, cheliped; D, pereopod 1; E, pereopod 6. Scale bar = 0.3 mm for A, B, C; 0.2 mm for D, E.

articles with filtering rows of nine and seven setae respectively, fourth article with additional outer seta; basis with four or five long setae (including in same specimen) extending to mid-length of third palp article; endites distally with single finely setulose seta and two spatulate and one inner rounded blunt spines. Maxilla (not figured) oval, naked; epignath (not figured) elongate with setose margins.

Cheliped (Fig. 28A) with rounded, compact basis 1.35 times as long as wide; merus subtriangular with three ventral setae; carpus 1.73 times as long as wide, with three midventral setae; propodus typical for the genus, fixed finger with two ventral, one lateral and three inner setae, cutting edge with three plate-like teeth, setal row at base of dactylus of four setae; dactylus with proximal outer seta.

Pereopod 1 (Fig. 28B) longer than other pereopods, coxa with seta; basis slender, 3.73 times as long as wide; ischium compact with one seta; merus just longer than carpus, with single ventro-

distal seta; carpus with three dorsodistal and two ventrodistal setae, longest of which is 0.4 times length of propodus; propodus nearly twice as long as carpus, with four distal setae on slight raised pad; dactylus slender, extending into shorter slender unguis, the two together some 1.28 times as long as propodus.

Pereopod 2 (Fig. 28C) more compact than pereopod 1; basis 3 times as long as wide; ischium with one ventrodistal seta; merus longer than carpus, merus with strong ventrodistal spine, carpus with dorsodistal seta; dactylus and short unguis together 0.75 times as long as propodus. Pereopod 3 (not figured) similar to pereopod 2, carpus shorter than merus, but ischium with two ventrodistal setae.

Pereopod 4 (Fig. 28D) basis stout, 1.6 times as long as wide; ischium with two setae; merus 1.5 times as long as carpus; merus with paired short, ventrodistal tooth-like spines; carpus with one outer, one ventral and one inner distal spines each with fine outer setule; propodus longer

than carpus, with three distal slender simple setae as long as dactylus plus unguis, single inner-distal and ventrodiscal denticulate spines; dactylus and unguis shaped but not fused into an unguis, curved. Pereopod 5 (Fig. 28E) as pereopod 4, but with dorsal subdistal fine seta and additional inner subdistal denticulate spine. Pereopod 6 (Fig. 28F) as pereopod 4, but propodus with paired ventrodiscal denticulate spines and four pectinate and one simple dorso-distal setae.

Pleopods all alike, typical for the genus, with single pleopods 1–3) or no (4 and 5) dorsal plumose seta on basis.

Uropod (Fig. 27K) biramous, basis naked; exopod of two segments, 1.4 times as long as proximal endopod segment, outer distal seta shorter than inner distal seta, proximal segment with short outer seta; endopod of five slender segments, distal three segments longer than proximal pair. Uropod of manca (Fig. 27I) exopod 1-segmented, endopod 3-segmented; uropod of subadult female (Fig. 27J) exopod 1-segmented, endopod 4-segmented.

Description of Male. Typical secondary male, shorter than female (allotype length 3.0 mm), body (Fig. 27B) more compact, 4.2 times as long as wide, cephalon longer than pereonites 1–3 together, with large eyelobes bearing large black eyes; pereonite 1 shortest, pereonites 2, 3 and 4 progressively longer, pereonite 5 just shorter than pereonite 4, pereonite 6 as long as pereonite 2. Five free pleonites, subequal in length, pleon in total as long as cephalon, pleotelson just longer than pleonites 4 and 5 together. Sexual dimorphism as follows.

Antennule (Fig. 29A) elongate, first peduncle article 3.7 times as long as wide with 2 dorso-distal setae; second article 0.46 times as long as first with long ventrodiscal setae; third article half length of second; flagellum of 8 segments, distal article with three aesthetascs, all others with single distal aesthetasc. Antennule (Fig. 29B) more slender, fifth article almost as long as fourth. Mouthparts atrophied.

Cheliped (Fig. 29C) more robust than that of female; basis 1.2 times as long as wide with dorsodistal rounded apophysis; carpus 1.8 times as long as wide with sparse dorsal marginal setae; propodus fixed finger longer than palm,

with two inner tooth-like apophyses on cutting edge, distal apophysis with three long adjacent setae; moveable finger recurved with series of short setae along cutting edge; setal row at base of dactylus with twelve setae.

Pereopods more slender than those of female; pereopod 1 (Fig. 29D) basis five times as long as wide, dactylus plus unguis shorter than propodus. Posterior pereopods (e.g. Fig. 29E) with larger distal spines on carpus,

Pleopods more setose than those of female. Uropods similar to those of female but basis with six distal setae.

Female to male sex ratio over all the material is 9.5:1

Etymology. Named for Dr Diana Jones of the Western Australia Museum, Perth, who collected the type series.

Remarks. *Leptochelia dijonesae* sp. nov. is the only species of the *L. savignyi*-complex to have a 2-segmented uropod exopod (some species of the sibling genera *Pseudoleptochelia* Lang, 1973, *Pseudonototanaia* Lang, 1973, and *Catenarius*, newly erected below, also have a two-articled exopod). The exopod is also far longer in proportion to the proximal endopod article (1.4 times as long) than any other taxon (1.1 times as long in *L. daggi*, otherwise shorter). With *L. daggi* only it shares the character of the carpus of pereopods 2 and 3 being shorter than the merus. However, the cheliped carpus is shorter in proportion to its width (1.73 times as long) than in any other species (*L. savignyi sensu* Ishimaru, 1985, 1.85 times as long; all others >1.9 times as long). The secondary male of the present species bears many similarities to that of the West Australian species *L. daggi*, but again is distinguished by the 2-segmented uropod endopod.

Leptochelia opteros sp. nov.

(Figs 30–32)

Material Examined. HOLOTYPE: QM-W28125, brooding ♀, QM-W28126, ♂ allotype. PARATYPES: QM-W28127, 5 ♂♂, 22 ♀♀ (5 brooding), 6 juvs/mancae. NHM 2006.1576–1581, 2 ♂♂, 2 ♀♀, 2 mancae, amongst filamentous red algae, Point Lookout, North Stradbroke I., 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005, diver A-NL. QM-W28128, 2 ♂♂, 27 ♀♀ (5 brooding), 3 juvs/mancae. NHM 2006.1582–1620, 6 ♂♂, 29 ♀♀ (8 brooding), 4 juvs/mancae, amongst *Cladophoropsis vaucheriaeformis*, low shore at Amity Point, North

Stradbroke I., 27°23.9'S, 153°26.2'E, +0.5 m CD, 20.02.2005, A-NL. QM-W28129, 5 ♂♂, 78 ♀♀ (14 brooding), 13 juvs/mancae, amongst sponges, Shag Rock, north of North Stradbroke I., 27°24.8'S, 153°31.5'E, 15 m, 15.02.2005, A-NL. QM-W28130, 3 ♀♀ (1 brooding), 1 manca, amongst haplosclerid sponges, Shag Rock, north of North Stradbroke I., 27°24.8'S, 153°31.5'E, 18 m, 15.02.2005, J. Carini. QM-W28131, 2 ♀♀, 1 manca, amongst haplosclerid sponge, Flat Rock, north of North Stradbroke I., 27°23.5'S, 153°33.0'E, 8 m, 17.02.2005, J. Carini. 1 subadult, sandy mud with some seagrass, NE of Banana Bank, Moreton Bay, 27°32.46'S, 153°20.74'E, 3.1 m, 33‰, 28°C, 17.02.2005, both van Veen grab, RNB. QM-W28132, 2 ♀♀, 1 manca, amongst algae (*Amphiroa fragilissima*, *Asparagopsis taxiformis* and *Zonaria diesingiana*), Flat Rock, north of North Stradbroke I., 27°23.5'S, 153°33.0'E, 8–15 m, 17.02.2005, A-NL. QM-W28133, 3 ♀♀ (2 brooding), 3 juvs/mancae, amongst *Cladophoropsis vaucheriaeformis*, Amity Point, North Stradbroke I., 27°23.9'S, 153°26.2'E, 5–10 m, 14.02.2005, A-NL. QM-W28134, 2 ♀♀ (1 brooding), 1 manca, amongst sponges with ascidians, Amity Point, North Stradbroke I., 27°23.9'S, 153°26.2'E, 5–10 m, 14.02.2005, A-NL. QM-W28135, ♂ (red), 12 ♀♀, 3 juvs/mancae, amongst barnacle-sponge epifaunal on tyres, off Amity Point, North Stradbroke I., 27°23.9'S, 153°26.2'E, 8–10 m, 35‰, 14.02.2005, A-NL. NHM 2006.1621–1629, ♂, 7 ♀♀ (2 brooding), 1 juv. amongst empty *Phoronis* tubes, Point Lookout, North Stradbroke I., 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005, A-NL. NHM 2006.1630–1648, ♂, 11 ♀♀ (2 brooding), 7 juvs/mancae, amongst sponge and bryozoan epifauna, Point Lookout, North Stradbroke I., 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005, A-NL. QM-W28136, 3 ♂♂, 3 ♀♀, 13 juvs/mancae, littoral open sand, Bradbury Beach, Dunwich, North Stradbroke I., 27°29.6'S, 153°23.8'E, 13.02.2005, RNB. QM-W28137, 2 ♀♀, amongst zosteretum with *Halophila ovalis*, inside Amity Point sand bar, North Stradbroke I., 27°24.7'S, 153°26.15'E, ELWM, 35.5‰, 14.02.2005, RNB. QM-W28448, ♀, MBWS Stn. 9; QM-W28449, ♀, MBWS Stn. 13; QM-W28450, ♀, MBWS Stn. 15, all van Veen grab, PJFD. OTHER MATERIAL. QM-W28168, 9 ♀♀, Middle Banks, northern Moreton Bay, 17.09.1983/ 13.01.1984, P. Saenger & S. Cook (there are two dates on the label, in material containing a number of species). QM-W12543, 3 ♂♂, Middle Banks, northern Moreton Bay, 09.1983/1984, P. Saenger & S. Cook (there are two dates on the label). QM-W12011, 2 ♀♀, Serpentine Creek, Cribb I., Nudgee Beach, intertidal, I. Stejskal, 1984.

Description of Female. Body (Fig. 30A) slender, holotype 3.4 mm long, 6.3 times as long as wide. Cephalothorax subrectangular, laterally slightly convex, 1.3 times as long as wide, 1.3 times as long as pereonites 1 and 2 together, with slight rostrum, eyelobes and black eyes present, single setae at posterior of eyelobes. Six free pereonites;

pereonite 1 shortest, pereonites 2 and 6 subequal and 1.5 times as long as pereonite 1, pereonites 3, 4 and 5 subequal and twice as long as pereonite 1 (all pereonites respectively 2.7, 1.9, 1.4, 1.3, 1.2 and 1.6 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite about 5 times as wide as long. Pleotelson semicircular, as long as last two pleonites together, almost twice as wide as long, with two posterolateral setae and two distal setae on each side.

Antennule (Fig. 30C) of four tapering articles, proximal article 2.6 times as long as wide, 1.35 times as long as distal three articles together, with two long outer and two shorter inner/dorsal setae, outer distal seta much longer than second article; second article 1.5 times as long as wide, distal outer seta as long as article; third article just shorter than second, with four distal setae and one aesthetasc; fourth article minute, eccentric, with three distal setae.

Antenna (Fig. 30D) of six articles, proximal article compact with ventrodorsal seta; second article as long as wide, with single inner distal and dorsodistal slender spines; third article as long as wide, with dorsodistal slender spine; fourth article longest, 3.7 times as long as wide; fifth article 0.4 times as long as fourth; sixth article minute.

Labrum rounded, setose, typical of genus. Left mandible (Fig. 30G) with crenulate lacinia mobilis as wide as distal end of mandible, proximal crenulation on pars incisiva, pars molaris with strong rugosity and marginal spines; right mandible similar but without lacinia mobilis. Labium (not figured) wide, distally finely setose, without palp. Maxillule (Fig. 30E) with ten distal spines and setose margins, sparse row of setules on inner distal face, sparser and paired setae along ventral margin; palp distinct, with two distal setae. Maxilliped palp (Fig. 30F) first article naked, second article with one outer and four inner setae, distal-most inner seta reaching distal margin of third palp article; third and fourth articles with filtering rows of seven and nine setae respectively, third article with two further inner distal setae, fourth article with outer seta; basis with four long setae extending to third palp article; endites distally with single seta and two robust spatulate and one rounded spines. Maxilla (not figured) oval, naked; epignath

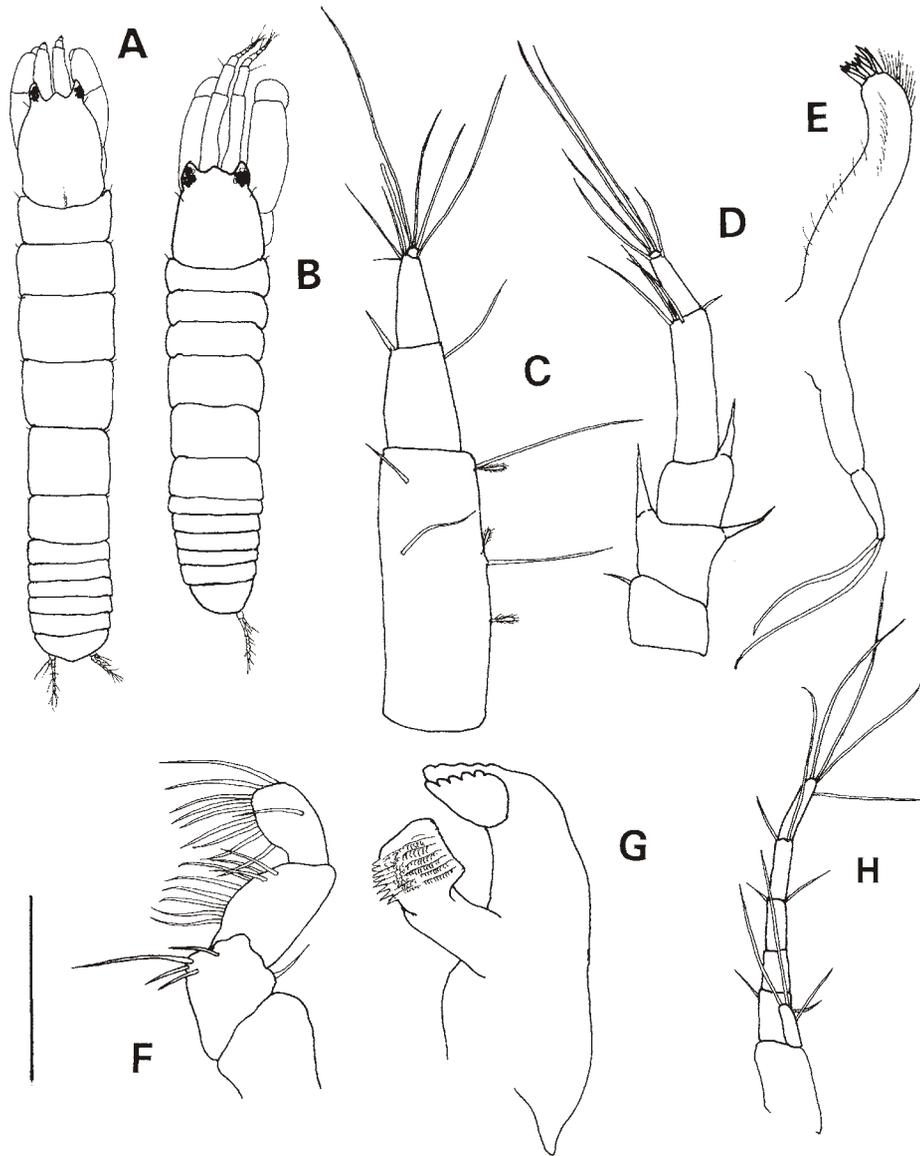


FIG. 30. *Leptochelia opteros* sp. nov., **A**, holotype female, dorsal; **B**, allotype male, dorsal; **C**, female antennule; **D**, female antenna; **E**, maxillule; **F**, maxillipedal palp; **G**, left mandible; **H**, uropod. Scale bar = 1 mm for **A**, **B**; 0.2 mm for **C**, **D**, **H**; 0.1 mm for **E**, **F**, **G**.

(not figured) elongate with setose margin distally and proximally.

Cheliped (Fig. 31A) with rounded, compact basis 1.2 times as long as wide; merus subtriangular with three ventral setae; carpus 1.6 times as long as wide, with three ventrodistal setae; propodus typical for the genus,

fixed finger with three ventral, one outer and three inner setae, cutting edge with three plate-like teeth, setal row at base of dactylus of six setae; dactylus naked.

Pereopod 1 (Fig. 31B) longer than other pereopods, coxa with seta; basis slender, 4.5 times as long as wide; ischium compact with one seta;

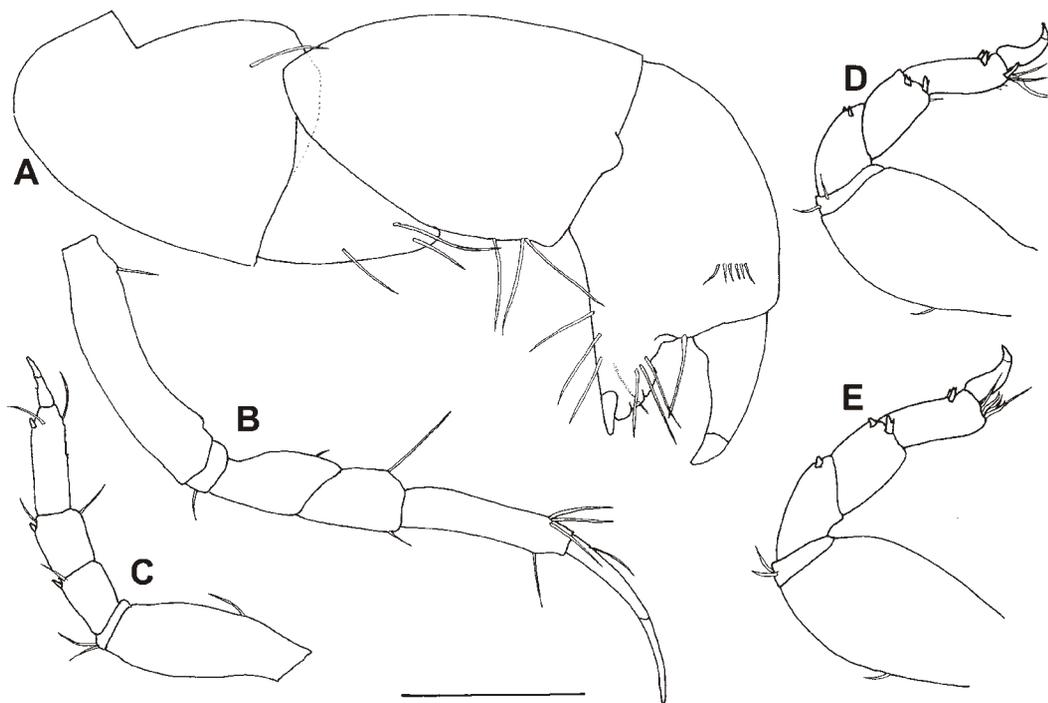


FIG. 31. *Leptochelia opteros* sp. nov., female, A, cheliped; B, pereopod 1; C, pereopod 3; D, pereopod 4; E, pereopod 6. Scale bar = 0.2 mm.

merus just longer than carpus, with single dorsodistal seta; carpus with one long subdistal dorsal seta half length of propodus and one short ventrodistal seta; propodus as long as carpus and merus together, with ventral subdistal seta and three dorsodistal setae; dactylus slender, extending into shorter slender unguis, the two together some 1.1 times as long as propodus; single proximal seta on dactylus. Pereopods 2 and 3 (Fig. 31C) similar to each other, more compact than pereopod 1; ischium with 2 setae; merus as long as carpus, merus with short ventrodistal spine and adjacent seta, carpus with ventrodistal spine and adjacent seta and dorsodistal seta; propodus 1.8 times as long as carpus with ventrodistal spine; dactylus and short unguis together 0.5 times as long as propodus.

Pereopods 4 (Fig. 31D) and 5 similar to each other, basis stout, less than twice as long as wide with single midventral seta; ischium with two setae; merus and carpus subequal, merus with two short, opposing ventrodistal spines, carpus with two anterior and one posterior distal spines each with fine outer setule; propodus

longer than carpus, with one dorsodistal finely serrated spine and two ventrodistal spines with fine outer setule, three dorsodistal setae almost as long as dactylus; dactylus and unguis partially fused into claw, curved. Pereopod 6 (Fig. 31E) as pereopod 4, but propodus without dorsodistal spine, with three pectinate and two simple distal setae.

Pleopods all alike, typical for the genus, with single dorsal plumose seta on basis.

Uropod (Fig. 30H) biramous, basis naked; exopod of one segment, 0.8 times as long as proximal endopod segment, with median outer seta and outer distal seta longer than inner distal seta; endopod of five segments, distal segments slender.

Description of Male. Smaller than female (allotype length 2.6 mm), body (Fig. 30B) more compact, cephalon longer than pereonites 1–3, with large eyelobes bearing large black eyes; pereonite 1 shortest, pereonites 2, 3 and 6 subequal, 1.5 times as long as pereonite 1; pereonites 4 and 5 longest, twice as long as pereonite

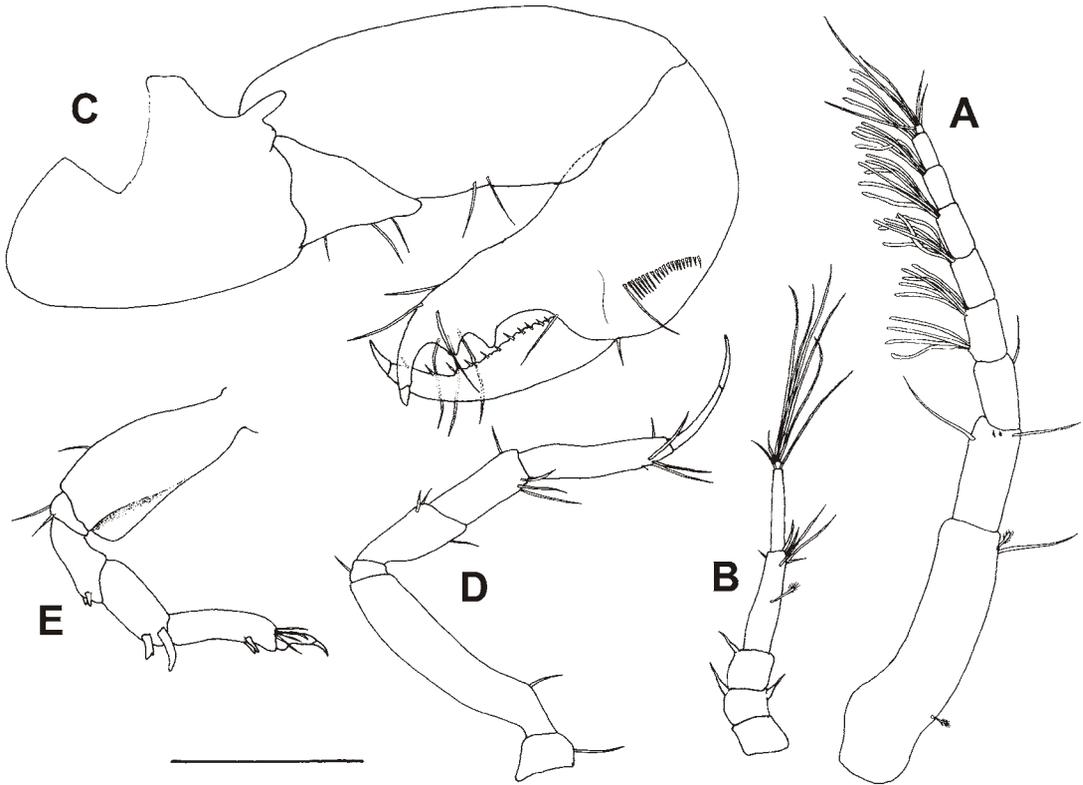


FIG. 32. *Leptochelia opteros* sp. nov., male: A, antennule; B, antenna; C, cheliped; D, pereopod 1; E, pereopod 6. Scale bar = 0.3 mm.

1. Five free pleonites, subequal in length, 0.6 times as long as pereonite 1, pleotelson twice as long as pleonite 5. Males on red algae and amongst epifauna red, those on *Cladophoropsis* or open littoral sand blue (colour lost on preservation). Sexual dimorphism as follows.

Antennule (Fig. 32A) elongate, first peduncle article 4 times as long as wide with dorsodistal seta longer than article width; second article 0.36 times as long as first with ventrodorsal and dorsodistal seta longer than article width; third article 0.75 times as long as second; flagellum of 6 segments, first segment with proximal tuft of 4 and distal tuft of 5 aesthetascs; second to sixth articles with distal tufts of 6, 6, 4 and 3 aesthetascs respectively; distal article with single aesthetasc and 5 setae. Antenna (Fig. 32B) more slender than that of female, fifth article 0.8 times as long as fourth. Mouthparts atrophied.

Cheliped (Fig. 32C) more robust than that of female; basis nearly twice as long as wide with

dorsodistal rounded apophysis projecting past carpus base; carpus with ventrodorsal invagination to accommodate propodus on reflexion; propodus setal row at base of dactylus of twenty setae; fixed finger shorter than palm, with two inner tooth-like apophyses on cutting edge; dactylus (moveable finger) with short setae and crenulations along whole of cutting edge.

Pereopods more slender than those of female, pereopod 1 (Fig. 32D) dactylus plus unguis shorter than propodus. Anterior distal spines on carpus of pereopods 4–6 (e.g. Fig. 32E) much longer than those of female; pereopod 6 (Fig. 32E) basis with conspicuous posterodorsal flange widening distally (rarely also present on pereopod 5).

Pleopod rami more setose than those of female. Uropods similar to those of female.

Female to male sex ratio over all the material is 8.7:1.

Etymology. Named for Point Lookout, the type locality (from the Greek, *opteros*, a scout or spy). Used as a noun in apposition.

Remarks. The female of *Leptochelia opteros* sp. nov. is less distinguished morphologically than the previous two species. It is distinct from *L. dijonesae* owing to its one-articled uropod exopod, and from *L. myora* (and most other described taxa) owing to the more slender pereopod 1 basis (4.5 times as long as wide compared with 2.5 times in *L. myora*), the less slender cheliped articles and the proportionately shorter dactylus plus claw on pereopod 1. The males of *L. myora* and *L. opteros* are markedly different. Of the remaining described taxa with four distal setae on the maxilliped basis, it is closest to the southwestern Australian species *L. daggi* (pereopod 1 basis 4.6 times as long as wide) with which species only it shares the longest distal seta on the carpus of pereopod 1 being half or more the length of the propodus (less than 0.45 times in the other taxa; half as long in *L. lusei*, but that species has only three maxilliped basis setae). However, the uropod exopod of *L. daggi* is longer than the proximal endopod segment (shorter in the present species), the cheliped carpus is more slender (twice as long as wide, only 1.6 times as long as wide in the present species), and the dactylus plus claw on pereopod 1 is much longer than the propodus (1.25 times as long in *L. daggi*; 1.1 times as long in *L. opteros*). None of these other species has a seta on the proximal article of the antenna, although *L. dubia sensu* Sars, 1886 and *L. neapolitana* do.

The males of *L. daggi* and *L. opteros* are also similar, but the posterodorsal flange on the basis of the rear pereopods is unique to *L. opteros* (allowing easy identification of populations where males are present). The setation of the fixed finger of the chela is less in *L. daggi*, although that species shares the distal invagination on the cheliped carpus into which the chela fits on reflexion.

Leptochelia opteros was collected from sublittoral algae and epifaunal communities where it constructed tubes of sand, and in low littoral sand flats. Males taken amongst red algae and sessile epifauna were normally red, but those collected amongst *Cladophoropsis vaucheriaeformis* or from open littoral sand were blue; addition-

ally, females within the zosteretum at Amity Point sand bar were also blue. Although this difference in the males was consistent, no other morphological differences were evident. If they were taking on the colour of their surroundings through diet (despite their not being known to be algivorous), then all of the females should also have shown this colouration; if the colour difference were selected for (camouflage), then the two colour morphs must be reproductively isolated, and other distinctions are likely to have co-evolved. The possibility of undistinguished cryptic species cannot be ruled out.

Leptochelia karragarra sp. nov.

(Figs 33–35)

Material Examined. HOLOTYPE: QM-W28138, ♀, sand, north of Banana Bank, Moreton Bay, 27°32.02'S, 153°20.67'E, 4.9 m, 35‰, 28.8°C, 11.02.2005. van Veen grab, RNB. PARATYPES: QM-W28139, ♂ allotype, ♀, dissected, data as for holotype.

Description of Female. Body (Fig. 33A) slender, small, holotype 1.6 mm long, 6.8 times as long as wide. Cephalothorax subrectangular, 1.5 times as long as wide, 1.4 times as long as pereonites 1 and 2 together, with slight rostrum, eyelobes present, eyes black, single setae at posterior of eyelobes and midlaterally. Six free pereonites; pereonites 1 and 2 shortest, pereonites 3 and 6 subequal, slightly longer, pereonites 4 and 5 longest and 1.75 times as long as pereonite 1 (all pereonites respectively 2, 2, 1.5, 1.1, 1.2 and 1.8 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite about 4.2 times as wide as long, with dorsal setal pair on pereonite 5. Pleotelson (Fig. 33B) semicircular, 2.9 times as wide as long, with two posterolateral setae on each side and two distal setae.

Antennule (Fig. 33D) of four tapering articles, proximal article 2.23 times as long as wide, 1.1 times as long as distal three articles together, with two longer outer and single shorter inner setae; second article 1.25 times as long as wide, distal outer seta 0.58 times as long as article; third article just longer than second with two distal setae and one aesthetasc; fourth article minute, with four distal setae.

Antenna (Fig. 33E) of six articles, proximal article compact, naked; second article as long as

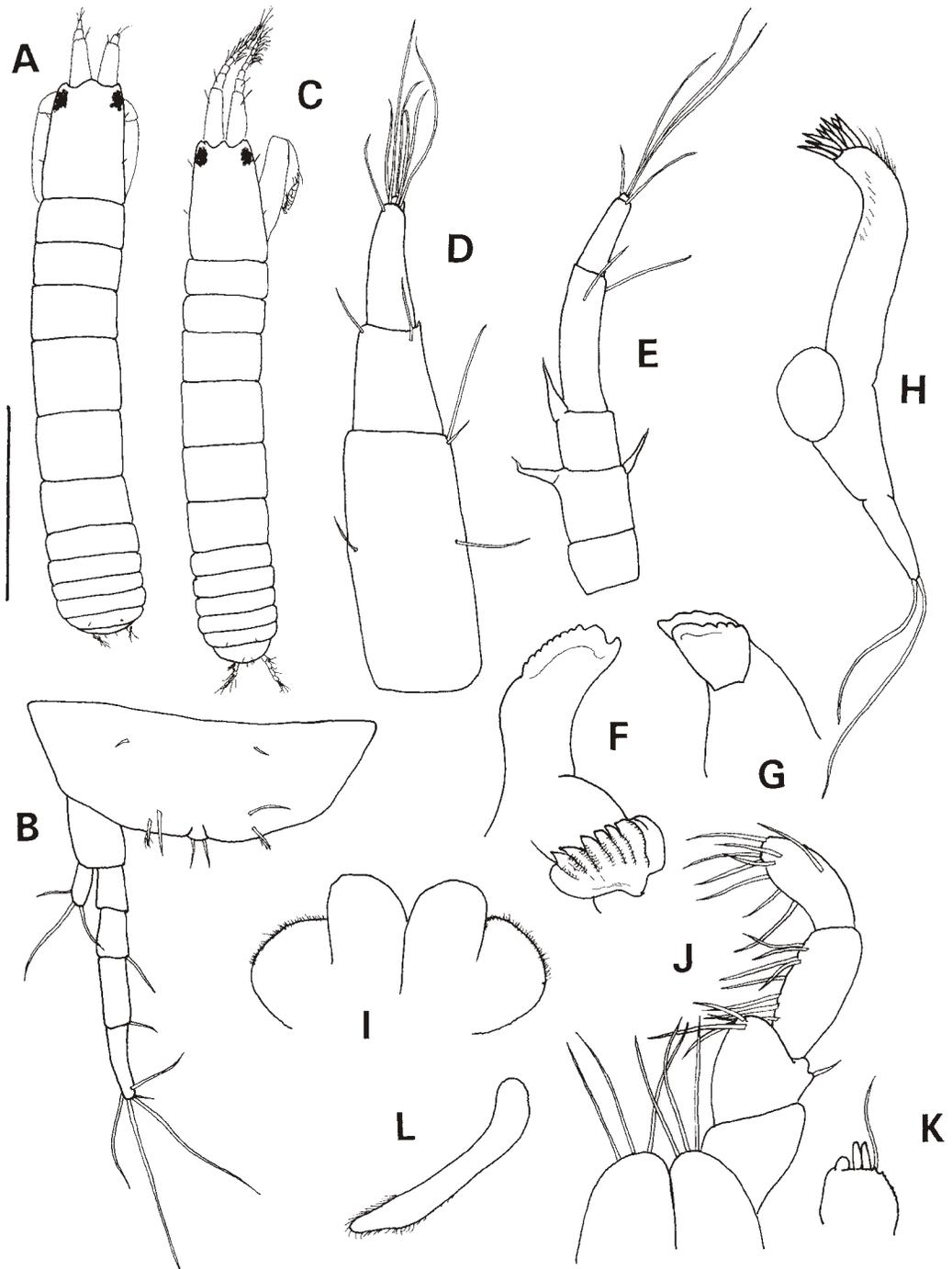


FIG. 33. *Leptocheilia karragarra* sp. nov., A, holotype female, dorsal; B, pleotelson and left uropod; C, allotype male, dorsal. D-L, paratype female: D, antennule; E, antenna; F, right mandible; G, left mandible, distal; H, maxillule and maxilla; I, labium; J, maxilliped; K, maxilliped endite; L, epignath. Scale bar = 0.5 mm for A, C; 0.1 mm for B, D, E; 0.07 mm for F-L.

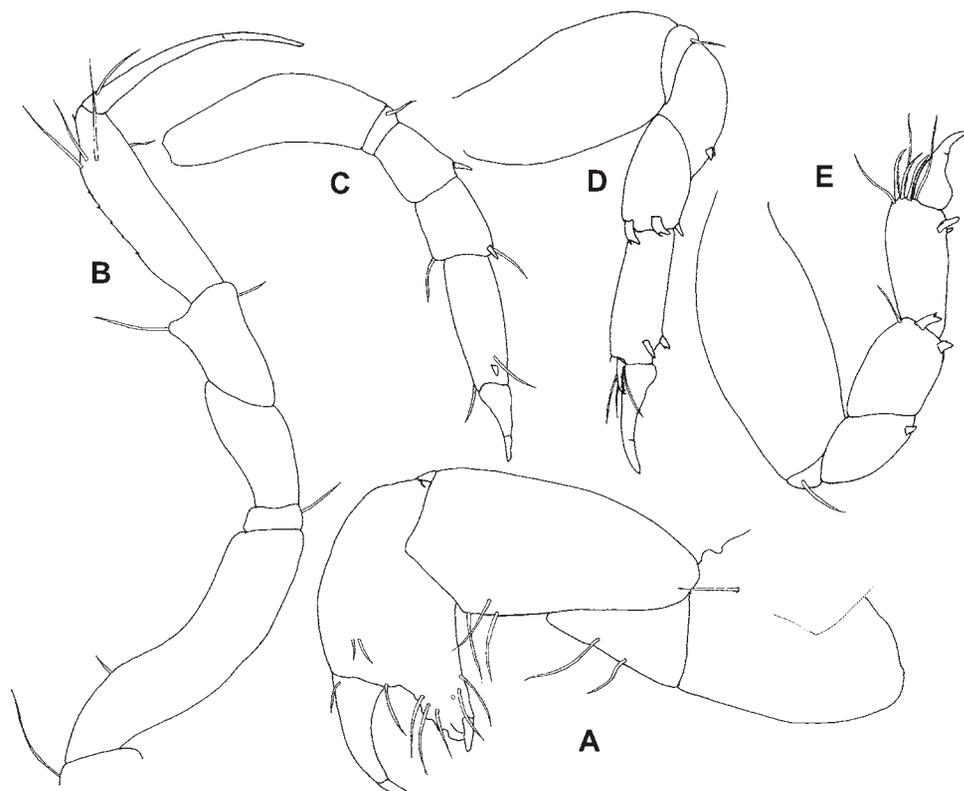


FIG. 34. *Leptochelia karragarra* sp. nov., female paratype, **A**, cheliped; **B** pereopod 1; **C**, pereopod 2; **D**, pereopod 4; **E**, pereopod 6. Scale bar = 0.15 mm for A; 0.1 mm for B–E.

wide, with single inner distal and dorsodistal slender spines; third article as long as wide, with dorsodistal slender spine; fourth article longest, 3.7 times as long as wide, with two distal setae; fifth article 0.6 times as long as fourth; sixth article minute.

Labrum rounded, setose, typical of genus. Right mandible (Fig. 33F) without lacinia mobilis, with crenulation on pars incisiva, pars molaris with strong rugosity; left mandible (Fig. 33G) similar but with crenulate lacinia mobilis wider than distal end of mandible. Labium (Fig. 33I) wide, laterodistally finely setose, without palp. Maxillule (Fig. 33H) with ten distal spines and setose margins, rows of setules sparse on inner distal face; palp distinct, with two distal setae. Maxilliped (Fig. 33J) palp first article naked, second article with one outer and three inner setae, longest inner seta not reaching distal margin of third palp article; third and fourth

articles with filtering rows of six setae and two further inner distal setae, fourth article with outer seta; basis with three long distal setae distal margin of second palp article; endites (Fig. 33K) distally with single seta, one rounded and two robust spatulate spines. Maxilla (Fig. 33H) oval, naked; epignath (Fig. 33L) elongate with setose margin distally.

Cheliped (Fig. 34A) with rounded, compact basis 1.5 times as long as wide; merus subtriangular with two ventral setae; carpus 2.1 times as long as wide, with three midventral setae; propodus typical for the genus, fixed finger with three ventral and three inner setae, cutting edge crenulate, setal row at base of dactylus of two setae; dactylus with proximal seta.

Pereopod 1 (Fig. 34B) longer than other pereopods, coxa with seta; basis slender, 4.1 times as long as wide; ischium compact with one seta; merus and carpus subequal, merus naked; carpus

with one longer dorsodistal seta one third length of propodus, and one shorter ventrodial seta; propodus almost as long as carpus and merus together, with four distal setae; dactylus slender, extending into shorter slender unguis, the two together as long as propodus; single proximal seta on dactylus.

Pereopods 2 (Fig. 34C) and 3 similar to each other, more compact than pereopod 1, basis 3.1 times as long as wide; ischium with 1 seta; merus as long as carpus, merus with strong ventrodial spine, carpus with ventrodial spine and adjacent seta, and dorsodial seta; propodus 1.8 times as long as carpus, with ventrodial spine and adjacent seta, and dorsodial seta; dactylus and short unguis together 0.6 times as long as propodus.

Pereopods 4 (Fig. 34D) and 5 similar to each other, basis stout, 1.8 times as long as wide; ischium with one seta; merus shorter than carpus, merus with two short, ventrodial spines, carpus with outer, ventral and inner distal spines each with fine outer setule; propodus 1.4 times as long as carpus, with two distal slender spines, three distal setae half as long as dactylus plus unguis, and distal serrated spine; dactylus and unguis partially fused into a claw, curved, 0.8 times as long as propodus.

Pereopod 6 (Fig. 34E) similar to pereopod 4, but propodus more compact, without distal serrated spine but with three pectinate and three simple distal setae.

Pleopods all alike, typical for the genus, with naked basis.

Uropod (Fig. 33B) biramous, basis naked; exopod of one segment, as long as proximal endopod segment, with median outer seta and with outer distal seta longer than inner distal seta; endopod of four segments, distal segments slender.

Description of Male. Just smaller than female (allotype length 1.4 mm), body (Fig. 33C) of similar proportion, cephalon as long as pereonites 1–3 together. Sexual dimorphism as follows.

Antennule (Fig. 35A) elongate, first peduncle article 4 times as long as wide with single distal seta; second article half as long as first with single outer-distal seta and three ventrodial setae; third article 0.6 times as long as second, with single dorsodial seta; flagellum of 7 seg-

ments, distal two minute; proximal flagellum segment with tufts of 7 proximal and 6 distal aesthetascs, subsequent segments each bearing distal tufts of 6, 6, 5, 5, 4 and 0 aesthetascs respectively. Antenna (Fig. 35B) more slender than that of female, articles 4 and 5 subequal in length. Mouthparts atrophied.

Cheliped (Fig. 35C) more slender than that of female; carpus 3 times as long as wide, with small ventrodial invagination to accommodate propodus on reflexion; propodus with setal row at base of dactylus of 12 setae, fixed finger shorter than palm, with single inner tooth-like apophyses on cutting edge; moveable finger with stout setae along cutting edge.

Pereopod 1 (Fig. 35D) carpus with longest distal seta as long as carpus; dactylus plus unguis shorter than propodus. Spines on merus and carpus of pereopods 2–6 (e.g. Figs 32E, F) longer and more slender than those of female, pereopods 4 (Fig. 35F) and 5 without distal serrated spine on propodus.

Etymology. *Karragarra* is the Goenpul Aboriginal name for an island in the south of Moreton Bay.

Remarks. All of the three previously described species of *Leptocheilia* with only three distal maxilliped basis setae (*L. nobbi*, *L. itoi* and *L. lusei*) have their uropod exopod much shorter than the proximal endopod article, whereas in *L. karragarra* sp. nov. these articles are equal in length. In most respects (other than number of maxilliped basis setae), the present species is closest to *L. daggi* from southwest Australia, but differs in having the longest distal seta on antennule peduncle article 2 much shorter than article length (1.4 times as long in *L. daggi*), the dactylus plus claw on pereopod 1 as long as propodus (1.25 times as long in *L. daggi*), and the cheliped basis 1.5 times as long as wide (only as long as wide in *L. daggi*). The antennule peduncle basal article, at 2.23 times as long as wide, is much more compact in *L. karragarra* than in all of the species mentioned above (at least 2.5 times as long as wide). The male is typical of a primary male for the genus, but with a shorter chela with only a single tooth-like apophysis on the fixed finger (perhaps related to its small size), and no elaborations on the cheliped carpus or pereopod 6 basis. *L. karragarra* is the smallest species of the genus yet described.

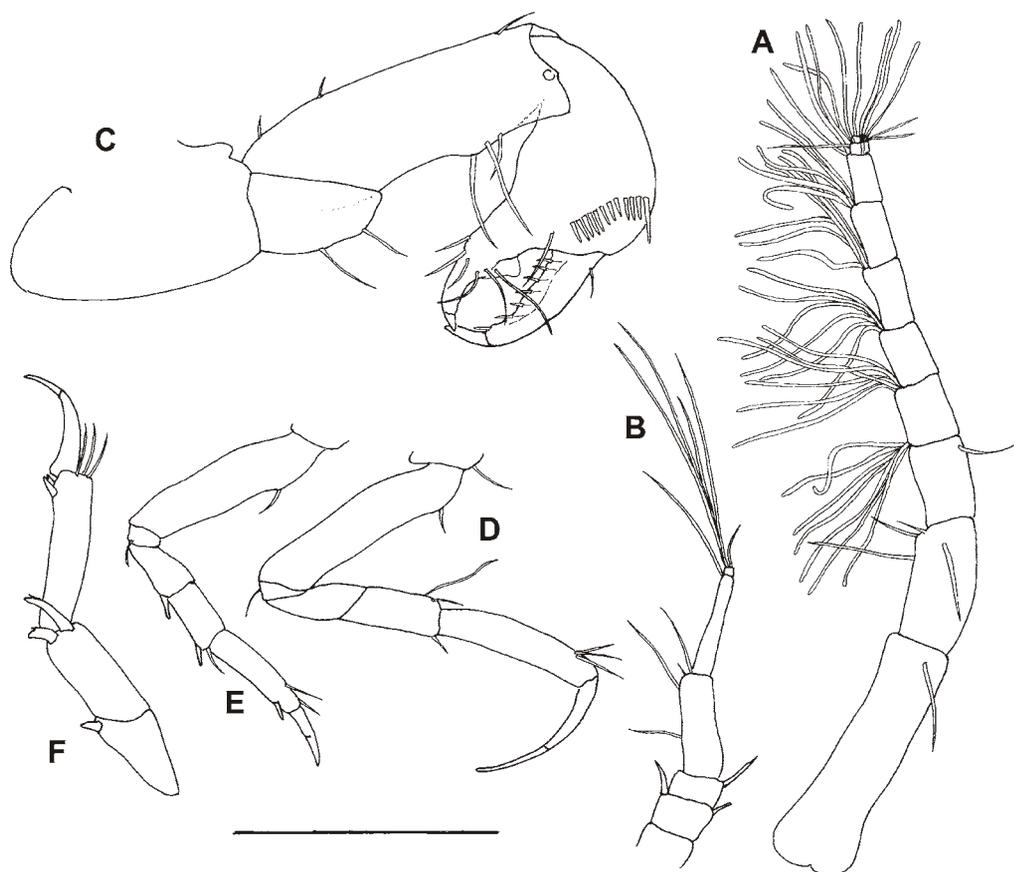


FIG. 35. *Leptochelia karragarra* sp. nov., allotype male, **A**, antennule; **B**, antenna; **C**, cheliped; **D**, pereopod 1; **E**, pereopod 3; **F**, distal articles of pereopod 4. Scale bar = 0.2 mm for A-E; 0.15 mm for F.

The present species occurred towards the southern end of Moreton Bay, sublittorally in sedimentary infauna in clean sand, probably interstitially.

Leptochelia guduroo sp. nov.

(Figs 36, 37)

Material Examined. HOLOTYPE: QM-W28140, ♀, medium sand with coarse shell breccia and ophiuroids, southeast of Bribie I., northwest of Moreton Bay, 27°03.17'S, 153°13.17'E, 10.2 m, 35‰, 28.5 °C, 22.02.2005, long-arm van Veen grab, RNB. PARATYPES: QM-W28141, ♀, 3 juvs, NHM 2006.1649, ♀ with oostegites, dissected, data as for holotype.

Description. Female body (Fig. 36A) slender, holotype 4 mm long, 7.2 times as long as wide. Cephalothorax subrectangular, 1.35 times as long as wide, as long as pereonites 1 and 2 together,

with slight rostrum, eyelobes and black eyes present, single setae midlaterally. Six free pereonites; pereonite 1 shortest, pereonites 2, 3 and 5 subequal, pereonite 6 slightly shorter, pereonite 4 longest and 1.7 times as long as pereonite 1 (all pereonites respectively 1.9, 1.4, 1.3, 1.1, 1.4 and 1.7 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite about 4.5 times as wide as long, naked. Pleotelson (Fig. 36B) semicircular, shorter than last two pleonites together, nearly three times as wide as long, with single posterolateral setae on each side and two distal setae.

Antennule (Fig. 36C) of four tapering articles, proximal article 2.8 times as long as wide, 1.3 times as long as distal three articles together, with two long outer distal and inner and ventral setae at midlength; second article 1.5 times as

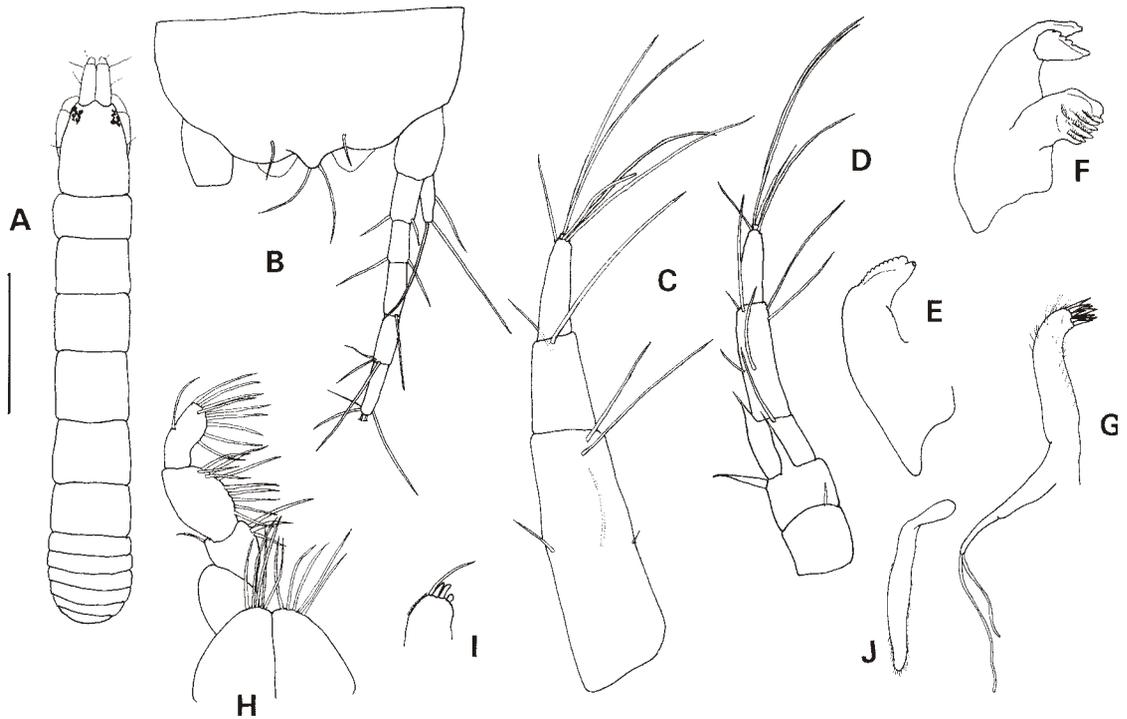


FIG. 36. *Leptochelia guduroo* sp. nov., A, holotype female, dorsal; B, pleotelson and right uropod; C, antennule; D, antenna; E, right mandible (pars molaris detached); F, left mandible; G, maxillule; H, maxilliped; I, maxilliped endite; J, epignath. Scale bar = 1 mm for A; 0.2 mm for B–J.

long as wide, distal outer seta twice as long as article; third article as long as second, with three distal setae and one aesthetasc; fourth article minute, with two distal setae.

Antenna (Fig. 36D) of six articles, proximal article compact, as long as wide, with single distal seta; second article shorter than first, with single outer distal and dorsodistal slender spines; third article as long as wide, with dorsodistal slender spine and outer seta longer than article; fourth article longest, 3.5 times as long as wide and twice as long as third article, with median and distal setae longer than fifth article; fifth article 0.65 times as long as fourth; sixth article minute.

Labrum rounded, setose, typical of genus. Left mandible (Fig. 36F) with crenulate lacinia mobilis not wider than distal end of mandible, slight crenulation on pars incisiva, pars molaris with strong rugosity; right mandible (Fig. 36E) similar but without lacinia mobilis. Labium (not figured)

wide, distally finely setose, without palp. Maxillule (Fig. 36G) with ten distal spines and setose dorsal margin, rows of setules on inner face towards ventral margin; palp distinct, with two distal setae. Maxilliped (Fig. 36H) palp first article naked, second article with one outer and three inner setae, distal-most inner seta shorter than third palp article; third and fourth articles each with filtering rows of eight setae, third article with two further inner distal setae, fourth article with outer seta and submarginal inner distal seta; basis with five long setae extending to distal margin of second palp article; endites (Fig. 36I) distally with single seta, one inner rounded and two robust spatulate spines. Maxilla (not figured) oval, naked; epignath (Fig. 36J) elongate with setose margin distally.

Cheliped (Fig. 37A) with rounded, compact basis 1.4 times as long as wide; merus subtriangular with two shorter and one longer ventral setae; carpus 1.8 times as long as wide, with

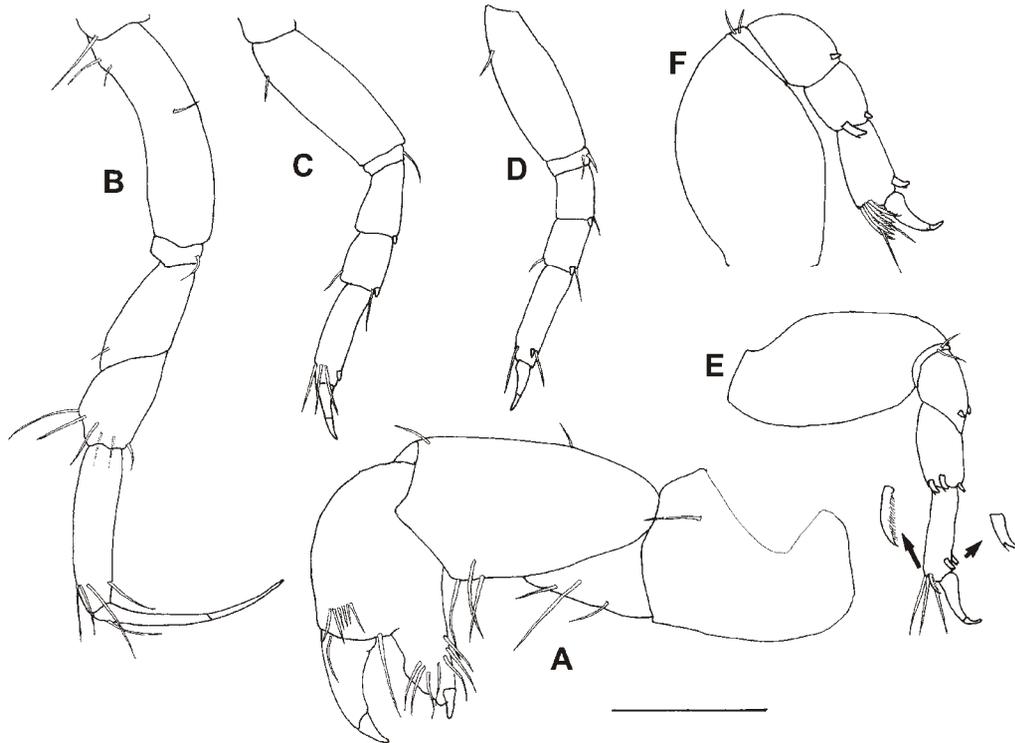


FIG. 37. *Leptocheilia guduroo* sp. nov., A, cheliped; B-E, pereopods 1-4 respectively; F, pereopod 6. Scale bar = 0.15 mm for A; 0.2 mm for B-F.

three ventrodiscal setae; propodus typical for the genus, fixed finger with three ventral and four inner setae, cutting edge raised distally; setal row at base of dactylus of six setae; dactylus with proximal seta.

Pereopod 1 (Fig. 37B) longer than other pereopods, coxa with seta; basis 3.8 times as long as wide; ischium compact, naked; merus just longer than carpus, with single dorsodistal seta; carpus with one ventrodiscal, two inner distal and three dorsodistal setae, longest of which is half length of propodus; propodus 0.9 times as long as carpus and merus together, with four distal setae; dactylus slender, extending into shorter slender unguis, the two together 1.14 times as long as propodus; single proximal seta on dactylus. Pereopod 2 (Fig. 37C) more compact than pereopod 1; ischium with one seta; merus 1.25 times as long as carpus, merus with small ventrodiscal spine, carpus with ventrodiscal spine and adjacent seta and dorsodistal seta; propodus nearly twice as long as carpus, with three dorso-

distal setae and single ventrodiscal spine; dactylus and short unguis together 0.55 times as long as propodus. Pereopod 3 (Fig. 37D) similar to pereopod 2, but ischium with two setae, carpus and merus of equal length, and propodus with two distal setae.

Pereopod 4 (Fig. 37E) basis stout, 1.6 times as long as wide; ischium with two setae; merus shorter than carpus, with two short, ventrodiscal spines, carpus with outer, ventral and inner distal spines each with fine outer setule; propodus 1.2 times as long as carpus, with two ventrodiscal stout spines with fine outer setule and one mid-distal pectinate spine, three distal setae as long as dactylus plus unguis; dactylus and unguis partially fused into a claw, curved. Pereopod 5 as pereopod 4. Pereopod 6 (Fig. 37F) as pereopod 4, but single distal carpal spine larger, propodus with five pectinate and two simple distal setae, and no mid-distal spine.

Pleopods all alike, typical for the genus, with single dorsal plumose seta on basis.

Uropod (Fig. 36B) biramous, basis naked; exopod of one segment as long as proximal endopod segment, with mid-outer short seta and outer distal seta longer than inner distal seta; endopod of five segments, distal segments slender.

Male unknown.

Etymology. After *Nguduroo*, a local Aboriginal name for an island in the south of Moreton Bay.

Remarks. *Leptochelia guduroo* sp. nov. is distinguished from all other described species of *Leptochelia* by the long setae on the antenna and antennule; the longest distal seta on article two of the antennule peduncle is twice as long as the article itself, while the distal setae on peduncle article four of the antenna are longer than article five. Of the other taxa with five distal setae on the maxilliped basis, only *L. dijonesae* and *L. savignyi sensu* Shiino, 1965 have the carpus of pereopod two shorter than the merus; the former species is distinguished by having a two segmented uropod exopod (see above), while the latter has a more slender cheliped, a uropod exopod shorter than the first endopod segment, the dactylus plus unguis of pereopod 1 shorter than the propodus, and the longest distal seta on the antennule article two less than the length of the article. Neither of these species (nor any other) has the long distal seta on antenna article three or at midlength on antenna article four.

Leptochelia guduroo was only found in sublittoral coarse sand at 10.2 m depth at the north-west corner of Moreton Bay.

Pseudoleptochelia Lang, 1973

Pseudoleptochelia fairgo Bamber, 2005

Pseudoleptochelia fairgo Bamber, 2005: 699–705, figs 44–46.

Material Examined. QM-W28142, 219 ♀♀ (5 brooding), coarse sand and shell with *Branchiostoma*, Moreton Bay, 27°27.0'S, 153°18.8'E, 8.4–9.9 m, 35‰, 29.4°C, 10.02.2005, spanner-crab dredge. QM-W28143, 7 ♀♀ (1 brooding), amongst *Halophila decipiens* on slightly anoxic sand, NE of Chain Banks, Moreton Bay, 27°24.59'S, 153°21.68'E, 7.7 m, 35‰, 29.4°C, 10.02.2005, van Veen grab. QM-W28144, 2 ♀♀ with oostegites, amongst *Halophila decipiens* on slightly anoxic sand, NE of Chain Banks, Moreton Bay, 27°24.58'S, 153°21.75'E, 7.7–8.5 m, 35‰, 28.8°C, 11.02.2005, spanner-crab dredge. 1 damaged ♀ without oostegites, amongst *Halophila decipiens* on sand with some shell, west side

of Moreton I., Moreton Bay, 27°16.90'S, 153°23.20'E, 4.7 m, 35‰, 28.6°C, 10.02.2005, van Veen grab. QM-W28145, 32 ♀♀ (2 brooding) muddy sand with fine shell breccia, Moreton Bay, 27°28.66'S, 153°21.34'E, 7.2 m, 35‰, 29°C, 1.02.2005; van Veen grab. NHM 2006.1650–1651, 2 ♀♀ (in ethanol), sand, north of Banana Bank, Moreton Bay, 27°32.02'S, 153°20.67'E, 4.9m, 35‰, 28.8°C, 11.02.2005; van Veen grab. QM-W28146, 2 ♀♀ (1 brooding), medium muddy sand with shell, NE of Banana Bank, Moreton Bay, 27°32.53'S, 153°20.99'E, 4.2 m, 35‰, 28.8°C, 11.02.2005; van Veen grab. QM-W28147, 2 ♀♀, sandy mud with seagrass, Banana Bank, Moreton Bay, 27°32.46'S, 153°20.74'E, 3.1 m, 33‰, 28°C, 17.02.2005, van Veen grab, all RNB. QM-W28451, 6 ♀♀, MBWS Stn. 10; van Veen grab, PJFD.

Remarks. *Pseudoleptochelia fairgo* was previously known from the type collection at Esperance Bay, southwestern Australia, where it was the commonest tanaidomorph, living in sandy substrata at depths between 23–40 m. The present material is from similar substrata, although from shallower depths (3–10 m). The antennule of this species is relatively compact (although less so than that of *Konarus cheiris*), the dactylus plus unguis on the first pereopod is longer than the propodus, and the uropod exopod is much longer than the proximal endopod article, with incipient separation into two segments. It is recognisable from other Australian leptocheliids by the lack of strong spines on the antenna, the group of elongate distal setae on the cheliped merus (the longest as long as the merus, and pointing proximally in life) and its unique possession of setose tubercles on pereopods 4–6.

Pseudoleptochelia straddi sp. nov.

(Fig. 38)

Material Examined. HOLOTYPE: QM-W28148, ♂ amongst empty *Phoronis* tubes, Point Lookout, North Stradbroke I., 27°26.31'S, 153°32.52'E, 10 m, 12.02.2005, A-NL.

Description. Male body (Fig. 38A) compact, holotype 2.6 mm long, 4.5 times as long as wide. Cephalothorax subpentangular, 1.3 times as long as wide, as long as first four pereonites together, with pronounced rostrum, large eyelobes and eyes present, eyes black. Six free pereonites; pereonite 1 shortest, pereonites 2, 3 and 6 subequal, pereonites 4 and 5 subequal, longest and nearly twice as long as pereonite 1 (all pereonites respectively 4.8, 4.0, 3.8, 2.4, 2.3 and 3.1 times as wide as long). Pleon of five free sub-

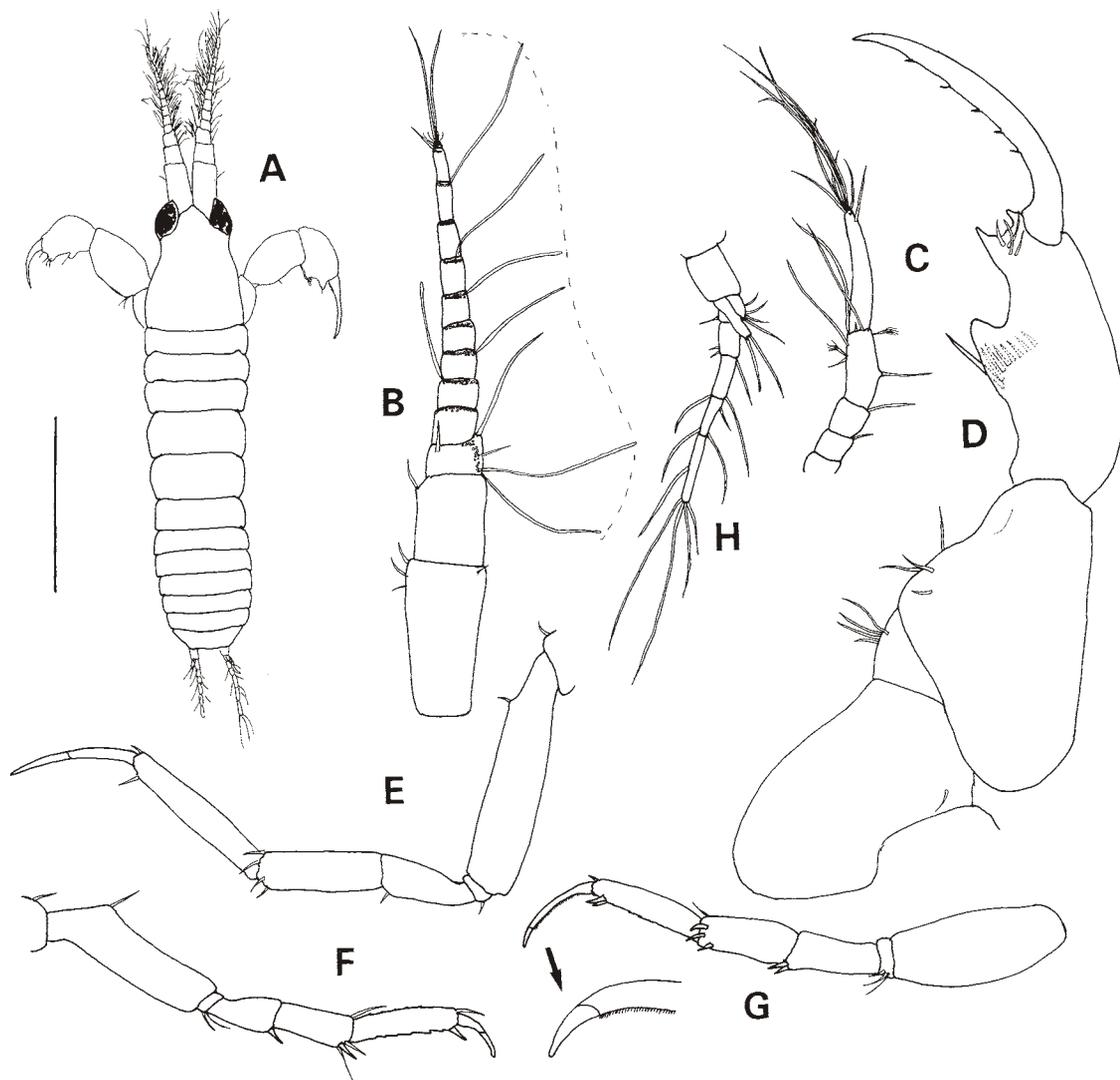


FIG. 38. *Pseudoleptochelia straddi* sp. nov., holotype male: A, holotype, dorsal; B, antennule; C, antenna; D, cheliped; E, pereopod 1; F, pereopod 3; G, pereopod 5; H, uropod. Scale bar = 1 mm for A; 0.3 mm for B-H.

equal pleonites bearing pleopods; each pleonite about 4.5 times as wide as long. Pleotelson trapezoid, as long as last pleonite, 4 times as wide as long, with two posterodistal setae on each side and two mid-distal setae.

Antennule (Fig. 38B) peduncle of three articles, proximal article twice as long as wide, with three short outer distal setae; second article 0.6 times as long as first; third article one-third length of second, with inner distal seta 4 times as long as article. Flagellum of 11 articles; first

segment hidden beneath distal peduncle article, segments 2–6 wider than long, segments 7–10 longer than wide, distal segment minute and bearing 4 short curved and two long distal setae. Segments 1–10 bearing 18, 16, 15, 14, 13, 13, 10, 6, 5 and 5 distal aesthetascs respectively.

Antenna (Fig. 38C) of six articles, proximal article compact, naked; second and third articles with single dorsodistal setae; fourth article as long as first three together, twice as long as wide, with single mid-dorsal seta longer than

article width, three distal setae longer than article length, small mid-ventral seta, and two sensory setae; fifth article longest, 1.5 times as long as fourth; sixth article minute.

Mouthparts atrophied.

Cheliped (Fig. 38D) subchelate, with rounded, compact basis 1.6 times as long as wide; merus subtriangular with four ventral setae; carpus with curved proximal expansion overlapping basis, 1.7 times as long as wide, with four mid-ventral setae; propodus with mid-ventral rounded apophysis and adjacent setal row, ventrodorsal apophysis ('fixed finger') pointed and with four short setae; dactylus just longer than propodus, with short, stout setae along cutting edge.

Pereopod 1 (Fig. 38E) longer than other pereopods, coxa with seta; basis slender, 4.2 times as long as wide; ischium compact with one seta; merus half length of basis, with single short ventrodorsal seta; carpus 1.3 times as long as merus, with 4 short distal setae; propodus 1.3 times as long as carpus; dactylus slender, extending into subequal slender unguis, the two together 0.8 times as long as propodus. Pereopods 2 and 3 (Fig. 38F) similar to each other, more compact than pereopod 1; basis 3.7 times as long as wide; ischium with 2 setae; merus 0.8 times as long as carpus, with slender ventrodorsal spine; carpus with slender ventrodorsal spine and two ventrodorsal and single dorsodorsal setae; propodus with slender ventrodorsal spine and dorsodorsal seta; dactylus and unguis curved, together half as long as propodus.

Pereopods 4, 5 (Fig. 38G) and 6 similar to each other; basis stouter than on anterior pereopods, 2.5 times as long as wide; ischium with three setae; merus with two slender ventrodorsal spines; carpus just longer than merus, with outer, ventral and inner distal spines; propodus longer than carpus, with two ventrodorsal slender simple spines; dactylus and short unguis slender, curved, dactylus finely serrate along ventral margin.

Pleopods all alike, typical for the genus, with single dorsal plumose seta on basis.

Uropod (Fig. 38H) biramous, basis naked; exopod of one segment, 1.8 times as long as proximal endopod segment, with outer mid-length seta and two distal setae, outer distal seta longer than inner distal seta; endopod of five, pro-

gressively longer segments, with distal segments slender.

Etymology. 'Straddy' is the colloquial name for North Stradbroke Island.

Remarks. The only other species of *Pseudoleptochelia* described from Australia is *P. fairgo* (see above). The large number of female *Pseudoleptochelia* collected from Moreton Bay showed a morphology not significantly distinguishable from that south-western-Australian species, although there are slightly more setae on the cheliped merus. The male of *P. fairgo* is immediately distinct from the present species in its cheliped morphology, *P. fairgo* being without the mid-ventral, rounded apophysis on the propodus present in *P. straddi* sp. nov., and having a carpus expanded into a rounded apophysis mid-ventrally, rather than extended proximodorsally as in *P. straddi*. Antennal and pereopod morphology of the two is similar.

If the Moreton Bay *P. fairgo* material represents a sibling species distinguishable only by the males, this can only be resolved by molecular analysis. However, no females of this genus were collected in the epizoic habitats at Point Lookout in which the present male was taken; rather, *P. fairgo* is a denizen of open soft-sediment habitats.

Catenarius gen. nov.

Diagnosis. Typical tanaidomorph of the Leptocheliidae, dorsoventrally flattened; cephalon with a slight, rounded rostrum, eyelobes and pigmented eyes; antennule of five articles in the female, articles two to four subequal in length; antenna of six articles with dorsal and ventral distal spines on article 2 and dorsodorsal spine on article 3. Mandibles, maxillule, labrum, labium typical of *Leptochelia*. Maxilliped basis with three distal setae; endite with two distal pointed spines, inner distal square apophysis, outer distal setulose seta. Cheliped slender. Pereopods generally typical of *Leptochelia*: pereopod 1 dactylus and unguis together longer than propodus; pereopods 2 and 3 with small ventrodorsal spine; pereopods 4–6 with sparse setation and simple spines. Five free pleonites without plumose lateral setae, all bearing biramous pleopods, pleopod basis naked. Uropods biramous, exopod of two segments, endopod of five segments.

Type Species: *Catenarius daviei* sp. nov., by original designation.

Etymology. *Catenarius* is from the Latin 'of a chain', referring to Chain Banks, the type locality.

Remarks. The new genus is distinguished from the majority of species described in *Leptocheilia* by its five-articled antennule in the female, and from all of them by the sharp distal spines on the maxilliped endite. Three other species attributed to *Leptocheilia* exhibit a five-articled antennule (presuming that they have a minute distal article), viz. *Leptocheilia savignyi sensu* Sars, 1886, from the Mediterranean (Italy), *Leptocheilia elongata* Larsen & Rayment, 2002, from the Andaman Sea (Thailand), and *Leptocheilia savignyi* (Krøyer, 1842) *sensu stricto*, which Smith (1906) considered to represent an immature male stage (the present specimen is a mature female). All of these species have a one-segmented uropod exopod. The only one of these species for which the maxilliped endite ornamentation is known is *L. elongata*, and that species has a 'normal' distal set of two spatulate and one rounded spines. If these two features of uropod exopod and maxilliped endite spination are diagnostic of the new genus, then it remains difficult to attribute these other species thereto. Conversely, it may be useful to separate those taxa with five-articled antennules from the remaining species of *Leptocheilia*.

***Catenarius daviei* sp. nov.**

(Figs 39, 40)

Material Examined. HOLOTYPE: QM-W28149, ♀ with empty brood pouch, amongst *Halophila decipiens* on slightly anoxic sand, NE of Chain Banks, Moreton Bay, 27°24.59'S, 153°21.68'E, 7.7 m, 35‰, 29.4°C, 10.02.2005, van Veen grab, RNB.

Description. Female body (Fig. 39A) slender, holotype 2.75 mm long, 6.5 times as long as wide. Cephalothorax subrectangular, just longer than wide, shorter than pereonites 1 and 2 together, with slight rostrum, eyelobes and black eyes present. Six free pereonites, pleonites 1–3 with single anterolateral setae; pereonite 1 shortest, pereonites 2, 3 and 5 subequal, pereonite 6 shorter, pereonite 4 longest and twice as long as pereonite 1 (all pereonites respectively 2.13, 1.4, 1.4, 1.1, 1.4 and 1.6 times as wide as long). Pleon of five free subequal pleonites bearing pleopods; each pleonite about 5 times as wide as long,

with single midlateral setae. Pleotelson semi-circular, as long as last two pleonites together, twice as wide as long, with two posterolateral setae on each side and two distal setae.

Antennule (Fig. 39B) of five tapering articles, proximal article 3 times as long as wide, 1.3 times as long as distal four articles together, with two long outer and single long dorsal setae; second article 1.5 times as long as wide, 0.3 times as long as proximal article, distal outer seta shorter than article; third and fourth articles subequal, just shorter than second, fourth article with three distal setae and single aesthetasc; fifth article minute, eccentric, with two distal setae.

Antenna (Fig. 39C) of six articles, proximal article compact, with distal seta; second article longer than wide, with ventrodorsal and dorso-distal slender spines; third article longer than wide, as long as second article, with dorsodistal slender spine; fourth article 1.6 times as long as third, 3.6 times as long as wide; fifth article just longer than fourth; sixth article minute.

Labrum (Fig. 39E) rounded, setose. Left mandible (Fig. 39F) with crenulate lacinia mobilis narrower than distal end of mandible, proximal crenulation on pars incisiva, pars molaris with strong rugosity; right mandible similar but without lacinia mobilis. Labium (not figured) wide, distally finely setose, without palp. Maxillule (Fig. 39D) with ten distal spines and setose margins, rows of setules on inner distal face; palp distinct, with two distal setae. Maxilla not seen. Maxilliped (Fig. 39G) palp first article naked, second article with one outer and three inner setae, distal-most inner seta almost reaching distal margin of third palp article; third and fourth articles with filtering rows of six and five setae respectively, third article with two further inner distal setae, fourth article with two mesial setae; basis with three long setae extending to third palp article; endites (Fig. 39H) distally with single outer setulose seta, two pointed spines and slight inner square apophysis. Epignath not seen.

Cheliped (Fig. 40A) with rounded, slender basis 1.5 times as long as wide; merus subtriangular with one longer and one small ventral setae; carpus 2.3 times as long as wide, with three ventrodorsal setae, sparse small dorsal setae;

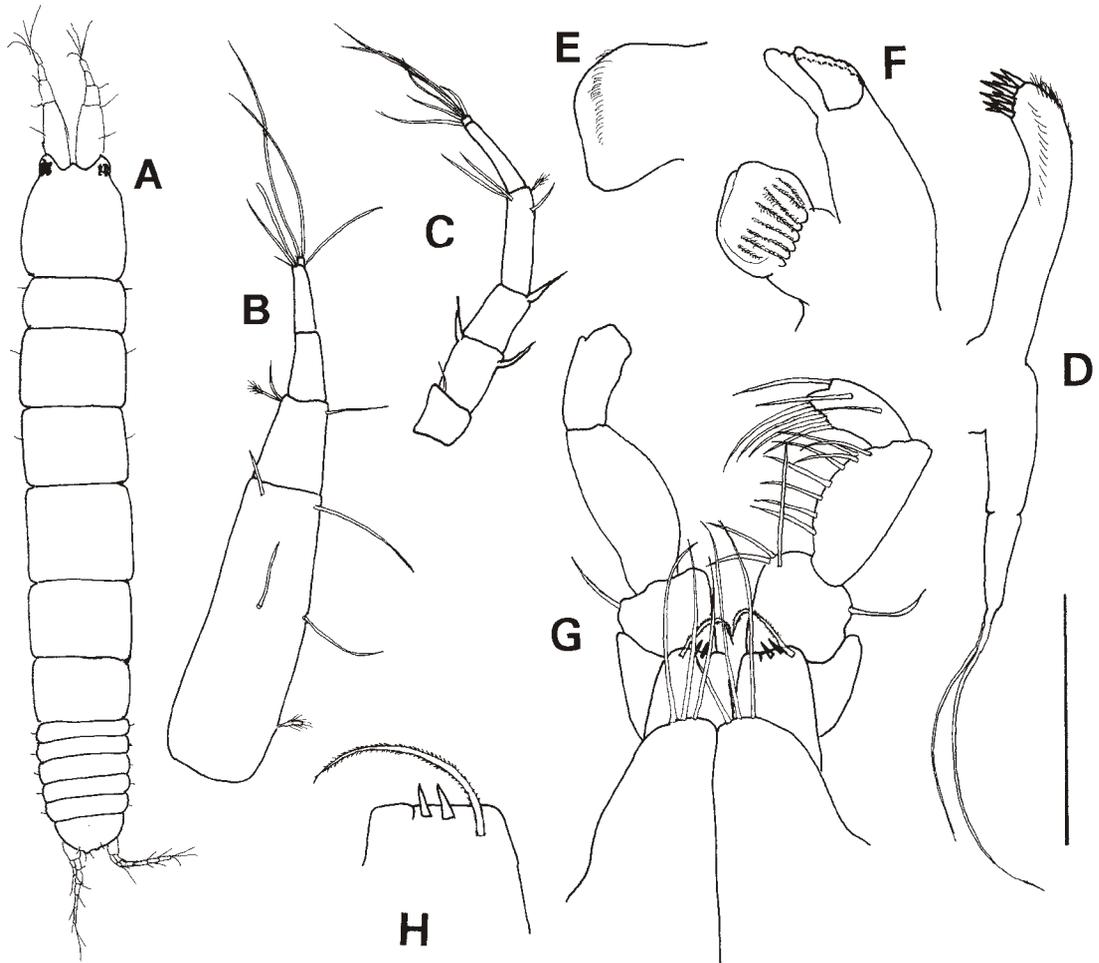


FIG. 39. *Catenarius daviei* gen. et sp. nov., female holotype, **A**, body, dorsal; **B**, antennule; **C**, antenna; **D**, maxillule; **E**, labrum, lateral; **F**, left mandible; **G**, maxilliped (inner setae of right palp not shown); **H**, detail of maxilliped endite. Scale bar = 1 mm for **A**; 0.2 mm for **B**, **C**; 0.1 mm for **D**–**H**.

propodus palm longer than fingers of chela, fixed finger with two ventral and three inner setae, cutting edge hardly crenulate, setal row at base of dactylus of two setae; dactylus with proximal seta.

Pereopod 1 (Fig. 40B) longer than other pereopods, coxa with seta; basis slender, 3.6 times as long as wide, with proximal seta; ischium compact with one ventral seta; merus axially as long as carpus, naked; carpus with long dorsodistal seta 0.4 times length of propodus; propodus as long as carpus and merus together, with three dorsal and one ventral distal setae; dactylus slender, extending into shorter slender unguis, the two

together some 1.2 times as long as propodus; single proximal seta on dactylus. Pereopod 2 (Fig. 40C) more compact than pereopod 1; basis 2.7 times as long as wide, ischium with 2 setae; merus as long as carpus, merus with small dorsodistal spine, carpus with short ventrodistal spine and adjacent seta, single dorsodistal seta; propodus 1.5 times as long as carpus, with short ventrodistal spine and two dorsodistal setae; dactylus and unguis together 0.6 times as long as propodus. Pereopod 3 similar to pereopod 2.

Pereopods 4 and 5 (Fig. 40D) similar to each other, basis stout, twice as long as wide; ischium with two setae; merus 0.6 times as long

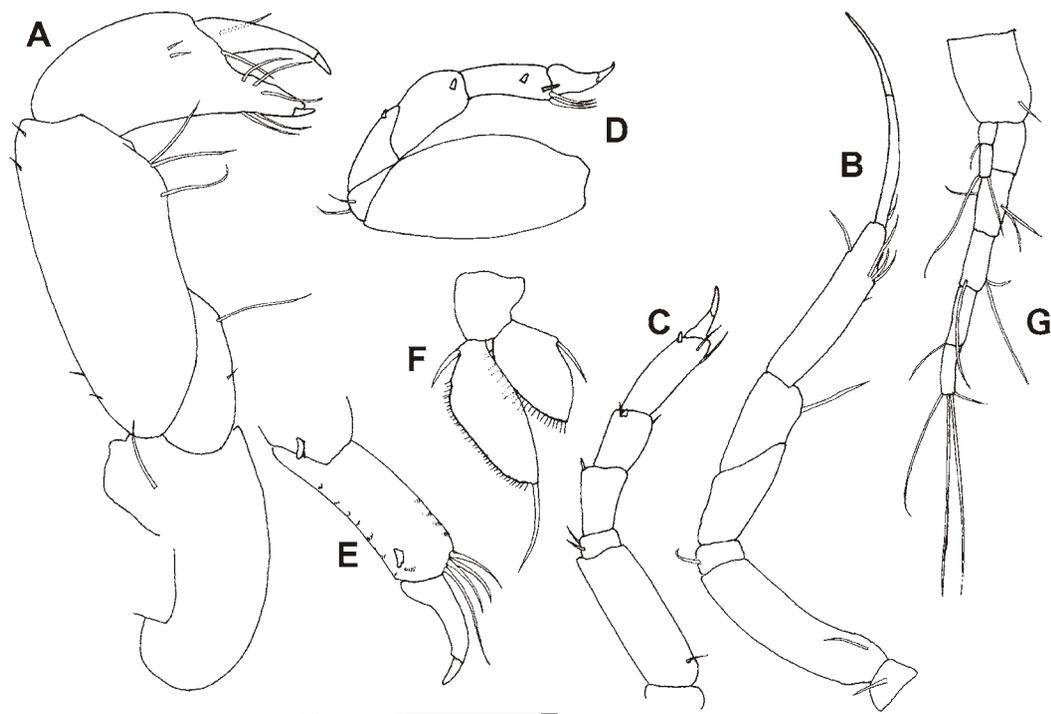


FIG. 40. *Catenarius daviei* gen. et sp. nov., female holotype, **A**, cheliped; **B**, pereopod 1; **C**, pereopod 2; **D**, pereopod 5; **E**, distal articles of pereopod 6; **F**, pleopod; **G**, uropod. Scale bar = 0.2 mm for A–D, F, G; 0.1 mm for E.

as carpus, with two short, ventrodiscal spines, carpus with single outer and inner simple distal spines; propodus as long as carpus, with one subdistal and one distal simple spines, three dorsodistal setae more than half as long as dactylus plus unguis; dactylus and unguis partially fused into a claw, curved. Pereopod 6 (Fig. 40E) as pereopod 5, but propodus with single subdistal spine and three shorter and one longer simple distal setae.

Pleopods (Fig. 40F) all alike, with naked basis.

Uropod (Fig. 40G) biramous, basis with inner distal seta; exopod of two segments, 1.1 times as long as proximal endopod segment, outer distal seta longer than inner distal seta; endopod of five segments, distal segments slender.

Male unknown.

Etymology. In gratitude to Peter Davie for his organisation of the 2005 Moreton Bay Workshop and his assistance with this paper.

Remarks. The five-articled antennule is rare amongst the Leptocheiliidae, and the pointed

distal spines on the maxilliped endite unique (see above under generic remarks), on which basis the species is placed in a new genus. In comparison with *Leptocheilia* species, only *L. dijonesae* has a two-segmented uropod exopod, but that species has four or five maxilliped basis setae. All of the three species with three distal maxilliped basis setae (*L. itoi*, *L. lusei* Bamber & Bird 1997, and *L. nobbi*) have single-segmented uropod exopods shorter than the proximal uropod endopod segment, and have a proportionately shorter cheliped carpus, a proportionately longer cheliped basis, a proportionately shorter merus and longer propodus on pereopods 2 and 3, and generally more substantial spines and setation on the pereopods.

DISCUSSION

The directed collecting in Moreton Bay has confirmed the unusually high diversity of tanaidaceans in Australian inshore waters, as found in Western Australia by Bamber (2005), and more locally by Larsen (2001) in New South Wales

within *Paratanais*. These results indicate that the Australian tanaidacean fauna is severely under-recorded. That will, in part, account for the fact that, of the thirty species recorded herein, only six are known from elsewhere in Australia, one from Victoria (*Remexudes toompani*), two from New South Wales (*Bathytanais bathybrotus*, *B. juergeni*), two from Western Australia (*B. culteriformis*, *Pseudoleptochelia fairgo*) and one from Northern Territory (*Gollumudes larakia*). One other, *Konarus cheiris*, is known from the other side of the Coral Sea in New Caledonia.

Equally, there is increasing evidence that species of tanaidacean are not normally widespread, hardly surprising for taxa with no active dispersal phase in their life-history. Rather, they demonstrate localised diversity via niche specificity, as was found in 'sympatric' *Leptochelia* species in Hong Kong by Bird & Bamber (2000).

The habitat specificity of apparently sympatric *Bathytanais* species in Moreton Bay is discussed above. Equally, the two species of *Pakistanapseudes* which were collected more than once showed different habitat preferences, *P. australianus* occurring in muddy sands in the middle of Moreton Bay (Middle Banks of Guṭu 2006), while *P. perulpa* was taken in clean medium to fine sands around and to the north of Moreton Island. *P. turkoroa* was only found once, in muddy sand in the south of Moreton Bay. None of these species co-occurred in samples.

Similar and consistent ecological separation is present for the five species of *Leptochelia* in Moreton Bay. Thus *L. myora* and *L. dijonesae* are littoral species, the former occurring amongst seagrasses, the latter amongst algae epiphytic on mangroves. Of the three sublittoral species, the abundant *L. opteros* (which does extend into the low littoral) inhabited epifaunal and algal habitats. The other two species were each only collected once, and associated with soft sediments: *L. karragarra* occurred in sandy sediments in the south of Moreton Bay, while *L. guduroo* was collected from sand with shell breccia at the northern end of Moreton Bay.

With the diversity and sympatricity of leptocheliid species present in Australian waters (see Appendix 1), it is deemed useful to offer an identification key to those species of the family described so far from Australia.

Key to adults of known Leptocheliidae of Australia

1. Antennule of four longer articles plus minute distal article. *Catenarius daviei* *
- Antennule of three longer articles plus minute distal article. 2
- Antennule of more than six articles (males)* 10
2. Carapace with posterior demarcation of second thoracomere; cheliped carpus distally extending into a cuff in which the propodus sits; antennule peduncle article 1 less than twice as long as wide; white with red markings in life. *Konarus cheiris* *
- Carapace without posterior demarcation of second thoracomere; cheliped carpus distally normal; antennule peduncle article 1 at least 2.5 times as long as wide; without red markings in life. 3
3. Elongate distal setae on the cheliped merus pointing proximally in life, the longest as long as the merus; setose tubercles on pereopods 4–6. *Pseudoleptochelia fairgo*
- Less than four setae on cheliped merus, mostly shorter than article; no setose tubercles on pereopods 4–6. 4
4. Uropod exopod of two segments; body olive green in life. *Leptochelia dijonesae*
- Uropod exopod of one segment; body colour other than green. 5
5. Uropod exopod only half length of proximal endopod segment. 6
- Uropod exopod at least 0.8 times as long as proximal endopod segment. 7
6. Cephalon at least 1.5 times as long as wide; pereopod 1 basis <2.7 times as long as wide; antennule peduncle article 1 less than three times as long as wide. *Leptochelia myora*
- Cephalon less than 1.25 times as long as wide; pereopod 1 basis 3 times as long as wide; antennule peduncle article 1 more than three times as long as wide. *Leptochelia nobbi*
7. Longest distal seta on antennule peduncle article two twice as long as article; antenna peduncle with distal seta on article 3 longer than article, mid-length seta on article 4 exceeding distal tip of article. *Leptochelia guduroo* *
- Longest distal seta on antennule peduncle article two less than 1.5 times as long as

- article; antenna peduncle without distal seta on article 3, mid-length seta on article 4 as long as article width or absent. 8.
8. Uropod exopod as long as or longer than proximal endopod segment; cheliped carpus twice as long as wide; proximal article of antenna naked. 9
- Uropod exopod shorter than proximal endopod segment; cheliped carpus 1.6 times as long as wide; proximal article of antenna with small distal seta. *Leptocheilia opteros*
9. Uropod exopod as long as proximal endopod segment; dactylus plus claw on first pereopod as long as propodus; antennule peduncle article 2 longest distal seta much shorter than article length. *Leptocheilia karragarra*
- Uropod exopod longer than proximal endopod segment; dactylus plus claw on first pereopod 1.25 times as long as propodus; antennule peduncle article 2 longest distal seta much longer than article length. *Leptocheilia daggi*
10. Cheliped subchelate (*Pseudoleptocheilia*).. 17
- Cheliped chelate. 11
11. Cheliped longer than body, merus rectangular; proximal antennule article longer than cephalon plus pereonite 1. *Leptocheilia vimesi**
- Cheliped less than half body length; proximal antennule article about as long as cephalon. 12
12. Pereopod 6 basis with distinct posterodorsal flange. *Leptocheilia opteros*
- Pereopod 6 basis without flange, normal. 13
13. Cheliped carpus with convex dorsal edge and ventral flange, the whole thus being almost as wide as long; chela fixed finger set at right-angles to axis of propodus. *Leptocheilia myora*
- Cheliped carpus at least 1.5 times as long as wide, without ventral flange; chela fixed finger generally set along same axis as propodus. 14
14. Uropod exopod of two segments. *Leptocheilia dijonesae*
- Uropod exopod of one segment. 15
15. Chela fixed finger stout, shorter than body of propodus, without tooth-like apophyses on cutting edge; antennule flagellum articulating anaxially on peduncle, proximal two articles much shorter than wide. *Leptocheilia nobbi*
- Chela fixed finger elongate, slender, with one or two tooth-like apophyses on cutting edge; antennule flagellum proximal articles as long as or longer than wide, articulating axially on peduncle. 16
16. Chela fixed finger shorter than body of propodus, with single tooth-like apophysis on cutting edge; uropod exopod as long as proximal segment of endopod, endopod of four segments; body length < 2 mm. *Leptocheilia karragarra*
- Chela fixed finger longer than body of propodus, with two tooth-like apophyses on cutting edge; uropod exopod shorter than proximal segment of endopod, endopod of five segments; body length > 3 mm. *Leptocheilia daggi*
17. Cheliped propodus ventrally with single, distal, rounded apophysis; carpus with mid-ventral rounded apophysis. *Pseudoleptocheilia fairgo*
- Cheliped propodus with mid-ventral rounded apophysis as well as ventrodistal, pointed apophysis; carpus without ventral apophysis. *Pseudoleptocheilia straddi**
- * males of *Catenarius daviei*, *Konarus cheiris* and *Leptocheilia guduroo* unknown. Females of *Leptocheilia vimesi* and *Pseudoleptocheilia straddi* unknown.

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APPENDIX 1

List of the species of Tanaidacea recorded from the waters of continental Australia, with their Australian provenance.

Order TANAIACEA Dana, 1849

Suborder APSEUDOMORPHA Sieg, 1980
Superfamily Apseudoidea Leach 1814

Family Apseudidae Leach, 1814

Annexos abditospina Błażewicz-Paszkowycz & Bamber, 2007 — Vic, Tas*Apseudes atuini* Bamber, 2005 — WA*Apseudes bucospinosus* Guțu, 2006 — Qld*Apseudes poorei* Błażewicz-Paszkowycz & Bamber, 2007 — Vic, Tas*Apseudes tuski* Błażewicz-Paszkowycz & Bamber, 2007 — Vic*Bilobatus gallardoi* — Shiino, 1963) — NT, WA*Bilobatus rostridentatus* Guțu, 2006 — Qld*Androgynella fecunda* Guțu, 2006 — NT*Muramura* *splendida* (Guțu, 2006) — Qld*Bunakenia* (B.) *salzella* Bamber, 2005 — WA*Bunakenia* (*Extensibasella*) *anomala* Guțu, 2006 — Qld*Gollumudes larakia* (Edgar, 1997) — NT, Qld, Vic, Tas*Gutuapseudes manda* Edgar, 1997 (? = *Apseudes*) — NT*Hainanius* (?) *imaculatus* Guțu, 2006 — Qld*Pugiodactylus daicovicii* Guțu, 2006 — Qld*Pugiodactylus syntomos* Błażewicz-Paszkowycz & Bamber, 2007 — Vic, Tas*Spinosaapseudes colobus* Błażewicz-Paszkowycz & Bamber, 2007 — Vic, Tas

Family **Whiteleggiidae** Guțu, 1972

Pseudowhiteleggia typica Lang, 1970 – NSW, Vic, Tas

Whiteleggia multicarinata (Whitelegge, 1901) – NSW, Vic, Tas

Whiteleggia stephensoni Boesch, 1973 – Qld

Family **Kalliapseudidae** Lang, 1956

Kalliapseudes langi Guțu, 2006 – Qld

Kalliapseudes multiarticulus Guțu, 2006 – NT

Kalliapseudes struthi Bamber, 2005 – WA

Kalliapseudes obtusifrons (Haswell, 1882) – NSW

Cristapseudes unicus Guțu, 2006 – Qld

Transkalliapseudes banana sp. nov. – Qld

Transkalliapseudes spinulata Drumm & Heard, 2006 – WA

Family **Metapseudidae** Lang, 1970

Subfamily Metapseudinae Guțu, 1972

Labraxeudes heliodiscus Błażewicz-Paszkowycz & Bamber, 2007 – Vic

Metapseudes wilsoni Błażewicz-Paszkowycz & Bamber, 2007 – Vic

Pseudapseudomorpha wagait (Edgar, 1997) – NT

Subfamily Synapseudinae Guțu, 1972

Curtipleon loerzae sp. nov. – Qld

Synapseudes australianus Băcescu, 1981 – Qld

Family **Numbakullidae** Guțu & Heard, 2002

Numbakulla pygmaeus Guțu & Heard, 2002 – WA

Family **Parapseudidae** Guțu, 1981

Longiflagrum caeruleus (Boesch, 1973) – Qld

Longiflagrum aestuarius (Boesch, 1973) – Qld

Pakistanapseudes australianus Guțu, 2006 – Qld

Pakistanapseudes bassi Błażewicz-Paszkowycz & Bamber, 2007 – Vic

Pakistanapseudes perulpa Błażewicz-Paszkowycz & Bamber, 2007 – Qld

Pakistanapseudes ridculli Bamber, 2005 – WA

Pakistanapseudes turkoroa Błażewicz-Paszkowycz & Bamber, 2007 – Qld

Parapseudes latifrons agg. (Grube, 1864) – WA

Platylicoa setosa Guțu, 2006 – Qld

Pseudohalmyrapseudes aquadulcis Larsen & Hansknecht, 2004 – NT

Remexudes toompani Błażewicz-Paszkowycz & Bamber, 2007 – Qld, Vic

Saltipedis forex Bamber, 2005 – WA

Saltipedis incognita Bamber, 2005 – WA

Saltipedis nugoris Błażewicz-Paszkowycz & Bamber, 2007 – Vic

Family **Pagurapseudidae** Lang 1970

Subfamily Pagurapseudinae Lang, 1970

Pagurapseudes abrucei Băcescu, 1981 – Qld

Pagurapseudes spinipes Whitelegge, 1901 – NSW

Macrolabrum boeri Băcescu, 1981 – Qld

Macrolabrum impedimenta Bamber, 2005 – WA

Pagurotanais koonungai sp. nov. – Qld

Subfamily Hodometricinae Guțu, 1981

Hodometrica australis (Haswell, 1882) – NSW

Indoapseudes macabre Bamber, 2005 – WA

Similipedia diarris Błażewicz-Paszkowycz & Bamber, 2007 – Vic

Suborder NEOTANAIDOMORPHA
Sieg, 1980Family **Neotanaidae** Lang, 1956

Neotanais noelitaiti Larsen & Hansknecht, 2002 – Vic

Suborder TANAIDOMORPHA Sieg, 1980

Superfamily Tanaiodea Dana, 1849

Family **Tanaidae** Dana, 1849

Subfamily Sinelobinae Sieg, 1980

Sinelobus barretti Edgar, 2008

Sinelobus pinkenba sp. nov. – Qld

? *Sinelobus stanfordi* (Richardson, 1905) – Qld

Subfamily Pancolinae Sieg, 1980

Zeuxo (Zeuxo) angua Bamber, 2005 – WA

Zeuxo (Zeuxo) kirkmani Edgar, 2008 – WA

Zeuxo (Zeuxo) nannioiggae Bamber, 2005 – WA

Zeuxo (Zeuxo) normani (Richardson, 1905) – NSW, Tas

Zeuxo (Zeuxo) odohertyae Edgar, 2008 – Tas

Zeuxo (Zeuxo) shepherdii Edgar, 2008 – SA

Zeuxo (Parazeuxo) amiti sp. nov. – Qld

Zeuxo (Parazeuxo) belli Edgar, 2008 – Qld

Zeuxo (Parazeuxo) mooneyi Edgar, 2008 – NSW

Zeuxo (Parazeuxo) russi Edgar, 2008 – Qld

Zeuxoides casanunda Bamber, 2005 – WA

Zeuxoides lasti Edgar, 2008 – Tas

Zeuxoides lauriebourqueae Edgar, 2008 – WA

Zeuxoides mawbeyi Edgar, 2008 – Tas

Aviatanais tempestacera Bamber, 2005 – WA

Hexapleomera cf. *robusta* (Moore, 1894) – Qld

Pancoloides moverleyi Edgar, 2008 – Tas

- Subfamily Tanainae Dana, 1849
Austrotanais rileyi Edgar, 2008 – WA, Tas
Tanais cf. dulongii (Audouin, 1826) – WA
Tanais pongo Bamber, 2005 – WA
- Superfamily Paratanaoidea Lang, 1949
 Family **Anarthruridae** Lang 1971
 Subfamily Anarthrurinae Lang, 1971
Agathotanaeis spinipoda Larsen, 1999 – Vic
- Subfamily Leptognathiinae Sieg, 1976
Tanaopsis canaipa sp. nov. – Qld
- Subfamily Akanthophoreinae Sieg, 1986
Araphura io Bamber, 2005 – WA
Collettea cylindratoides Larsen, 2000 – Vic
Tanaella dongo Bamber, 2005 – WA
Tangalooma rous gen. et sp. nov. – Qld
- Family **Typhlotanaidae** Sieg, 1984
Antiplotanais coochimudlo gen. et sp. nov. – Qld
Antiplotanais lutze (Bamber, 2005) – WA
- Family **Paratanaidae** Lang, 1949
 Subfamily Bathytanaidinae Larsen & Heard, 2001
Bathytanais bathybrotos (Beddard, 1886) – Qld, NSW
Bathytanais arenamans Larsen & Heard, 2001 – WA
Bathytanais culteriformis Larsen & Heard, 2001 – Qld, WA
Bathytanais fragilis Larsen & Heard, 2001 – Vic
Bathytanais greebo Bamber, 2005 – WA
Bathytanais juergeni Larsen & Wilson, 1998 – Qld, NSW
- Pseudobathytanais gibberosus* Larsen & Heard, 2001 – Vic
- Subfamily Teleotanaidinae nom. nov.
Teleotanais warragamba sp. nov. – Qld
- Subfamily Paratanaidinae Lang, 1949
Paratanais gaspodei Bamber, 2005 – WA
Paratanais maleficus Larsen, 2001 – NSW
Paratanais malignus Larsen, 2001 – NSW
Paratanais perturbatius Larsen, 2001 – NSW
Paratanais vetinari Bamber, 2005 – WA
Paratanais wanga sp. nov. – Qld
Xeplenois anemos Bamber, 2005 – WA
- Family **Leptocheliidae** Lang 1973
Leptochelia daggi Bamber, 2005 – WA
Leptochelia dijonesae sp. nov. – Qld
Leptochelia guduroo sp. nov. – Qld
Leptochelia karragarra sp. nov. – Qld
Leptochelia myora sp. nov. – Qld
Leptochelia nobbi Bamber, 2005 – WA
Leptochelia opteros sp. nov. – Qld
Leptochelia vimesi Bamber, 2005 – WA
Catenarius daviei gen. et sp. nov. – Qld
Pseudoleptochelia fairgo Bamber, 2005 – WA, Qld
Pseudoleptochelia straddi sp. nov. – Qld
Konarus cheiris Bamber, 2006 – Qld
- Family **Pseudotanaidae** Sieg, 1973
 Subfamily Pseudotanainae Sieg, 1973
Pseudotanais (Akanthinotanais) scrappi Bamber, 2005 – WA

