

A new genus of a new Austral family of paratanaoid tanaidacean (Crustacea: Peracarida: Tanaidacea), with two new species.

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Abstract

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During analysis of tanaidacean material collected from the Bass Strait, Victoria, Australia, in 1965 and 1974, seven specimens of a new species were found, quite distinct from but showing close affinities to the aberrant Antarctic paratanaoid species *Mirandotanais vorax*. More recent sampling in 2008 on Ningaloo Reef, Western Australia, discovered two specimens of a second new species, showing closer affinity to the Victoria species. Both new species are described herein, and the Australian taxa are separated into a distinct genus owing in particular to the morphology of their mouthparts, with features consistent between the two but quite distinct from Antarctic *M. vorax*. A new family is erected to include both genera.

Keywords

Tanaidacea, Australia, *Mirandotanais*, *Pooreotanais*, *Mirandotanainae*

Introduction

The tanaidacean tanaidomorph genus *Mirandotanais* was erected by Kusakin and Tzareva (1974) for their new and aberrant Antarctic species *M. vorax*, a paratanaoid with many similarities in appearance to *Collettea* Lang, 1973, but with an extravagantly swollen pleon in the adults (this inflation including posterior pereonites). While never common, this species has since been recorded a number of times (see below) in Antarctic and Subantarctic waters, but the genus has remained monotypic.

During examination of the extensive collection of tanaidacean material held in Museum Victoria, Melbourne, from surveys in the Bass Strait between the 1960s and 1990s, seven specimens of a distinct but similar species, with proportionately an even more inflated pleon, were discovered from samples taken in the shallow waters of Western Port, Victoria, including adults of both sexes.

Further, during a survey of Ningaloo Reef, Western Australia, in 2008, two female specimens of a second new species were discovered in coral rubble. This animal was distinct from the species from Victoria, but showing more affinity to that species than to *Mirandotanais vorax*.

These two new species are described herein. Owing to features of their mouthpart morphology, consistent between the two Australian species but quite distinct from the Antarctic one, the two new species are placed in a new genus. The two genera are (re)diagnosed, and assigned to a new family.

Methods

The Bass Strait collections were part of a long programme of sampling in this region, including the overall Bass Strait Survey, together with specific local benthic surveys in the bays and estuaries of Victoria (see Poore, 1986; Wilson and Poore, 1987). The material discussed here was collected during the Crib Point Benthic Survey (CPBS) and the Westernport Bay Environmental Study (WBES), using a Smith-McIntyre grab. Samples were washed in the field through a 1.0 mm mesh sieve, fixed in formalin and subsequently stored in 70% alcohol.

The material from Western Australia was collected during a CReefs (Australia) field-trip organized by the Australian Institute of Marine Science (AIMS) to Ningaloo (mid-western Australia). Pieces of coral rubble were collected by hand during SCUBA-diving, and were placed into buckets (20 l) with a few drops of formaldehyde for a while to encourage any animals to leave their microhabitats, such as tubes or crevices. The samples, with the animals still alive, were then washed over a 0.3 mm mesh, the residue sorted under the microscope and all tanaidacean specimens collected were preserved in 80% ethanol.

Series of specimens of type-genus, *Mirandotanais vorax* was collected during Polish Polar Expedition to *H. Arctowski* Station in 1984/85 (Błażewicz-Paszkowycz and SekulskaNalewajko, 2004).

Morphological terminology follows that of Błażewicz-Paszkowycz and Bamber (2007). Measurements are made

axially, dorsally on the body and antennae, laterally on other appendages. The new material is lodged in the collections of Museum Victoria, Melbourne (Bass Strait material), and the Western Australian Museum, Perth (Ningaloo material). The material of *Mirandotanais vorax* is deposited at the collection of University of Łódź.

Systematic Part

Order **Tanaidacea** Dana, 1849

Suborder **Tanaidomorpha** Sieg, 1980

Superfamily **Paratanaoidea** Lang, 1949

Family **Mirandotanaidae** fam. nov.

Diagnosis. Mature adults with strongly-inflated posterior pereonites and pleon (“abdomen”) comprising half or more of the body length. Eyelobes prominent, eyes absent. Antennule of four articles, antenna of six articles. Labrum naked or with minute setules; mandible poorly calcified, with reduced *pars molaris*; labium naked; maxillule palp articles fused, with two distal setae; maxilliped basis fused medially. Cheliped basis attached by distinct triangular sclerite; dactylus strongly curved. Pereopods 1 to 3 with a separate coxa, merus naked, carpus and propodus with sparse setae only (no spines); pereopods 4 to 6 coxa not distinct, merus, carpus and propodus with slender spines; dactylus and unguis not fused, unguis of pereopods 4 to 6 distally bifurcate. Pleopods absent in female, biramous with simple, mainly distal, setae, in male. Uropods short, compact, exopod of one segment, endopod of two segments.

Etymology: from the type-genus, *Mirandotanais*.

Remarks. The most recent comprehensive classification of the Paratanaoidea was that of Guțu and Sieg (1999), which placed *Mirandotanais* in the Anarthruridae Lang, 1971. Since that time, a large number of new genera and species have been described, earlier taxa have been redescribed, and there is now a weight of evidence that their familial structure was too simplistic. Subsequent mathematical phylogenetic treatments of the Paratanaoidea by unweighted cladistic analysis have been attempted. Larsen and Wilson (2002) undertook a morphologically-based empirical parsimony analysis using eighty-one exemplar taxa, but failed to resolve a large number of genera into an overall classification. Their results suggested the inclusion of *Mirandotanais* in their new family Colletteidae, although their key would identify it with their other new family Tanaellidae, and some features of the genus were counter to their familial diagnosis for Colletteidae (but, curiously, not their diagnosis of Anarthruridae).

Błażewicz-Paszkowycz and Poore (2008) undertook a similar cladistic unweighted analysis of ninety-three paratanaoid taxa; they were unable to resolve Colletteidae *sensu* Larsen & Wilson (2002), indicating that this taxon is grossly polyphyletic, while *Mirandotanais* was isolated both from taxa associated with “Colletteidae” and from their clearly-resolved group of Anarthruridae; rather, the genus was weakly-associated with *Parafilitanais mexicanus* and *Pseudoleptognathia setosa*, albeit with very low bootstrap support. These taxa are incompatible

with such “colletteid” genera as *Subulella*, *Leptognathiella*, *Stenotanais*, *Leptognathiopsis* and *Filitanais* (which did cluster together in the analysis of Błażewicz-Paszkowycz and Poore, 2008) which are characterized by strong “spiniform setae” on pereopods 1 to 3, *inter alia*, while these are absent in *Mirandotanais* and in the new genus described below. The presence of weak setation on the anterior three pairs of pereopods is compatible with some species of *Collettea*, including the type-species *C. cylindrata* (Sars, 1882), but these setae are usually robust (cf. *C. arnaudi* (Shiino, 1979); *C. pegmata* Bamber, 2000).

All taxa in the Colletteidae *sensu* Larsen & Wilson (2002) other than *Mirandotanais* have well-developed mouthparts, with a functional mandible and fully-developed maxilliped, unlike the two genera discussed herein; conversely, reduction of the mouthparts is a characteristic feature of the Anarthruridae, together with weak setation of the anterior three pairs of pereopods. However, current understanding of the Anarthruridae includes only taxa without a uropod exopod (merely some form of apophysis on the uropod basis), unlike the two genera discussed in the present paper.

These characters (if deemed significant-enough to define families) exclude *Mirandotanais* and the new genus described below from either the Colletteidae or the Anarthruridae as presently diagnosed.

Until the familial classification within the Paratanaoidea is properly resolved, it is therefore necessary to assign *Mirandotanais* to a new family, the Mirandotanaidae.

Genus **Mirandotanais** Kusakin and Tzareva, 1974

Diagnosis. *Pars incisiva* of left mandible with low crenulations, *pars incisiva* of right mandible without crenulations; small (fused) *lacinia mobilis* present on both mandibles; *pars molaris* a stout, unornamented triangular lobe. Labrum finely setose. Maxillule with nine distal spines. Maxilliped palp article 3 longer than wide, with three inner setae; endite with distal seta. Ischium of pereopods 1 to 3 with ventral seta. Pereopods 4 to 6 with four spines on carpus.

Distribution—Antarctic-Subantarctic.

Type-species. *Mirandotanais vorax* Kusakin and Tzareva, 1974 by monotypy.

Mirandotanais vorax Kusakin and Tzareva, 1974

Strongylura antarctica Hale, 1937; non-Vanhöffen, 1914.
Cryptocopoides rotundata Tzareva, 1982.

Material. All samples from the Admiralty Bay (King George Island, South Shetland Island), six females, OC-477, Section 1, 221 m depth, 11 May 1985; 6 females OC-485, Section 1, 232 m depth, 10 Aug 1985; 1 female, OC-479, Section 1, 240 m depth, 11 May, 1985; 1 female, OC 283, 258 m depth, 23 Jul 1985; 1 female, OC-275, 60 m depth, 10 Dec 1979.

Remarks. *Mirandotanais vorax* has been re-described by Sieg (1984: 299–305, figs. 1, 3–5), although with some apparent confusion over gender. In the light of the Australian material described below, it is apparent that the females of *Mirandotanais* are without pleopods, and the gender-attribution of Kusakin

and Tzareva (1974) was correct. Examination of recent material of this species has shown that the distal spines on the merus and carpus of the posterior three pairs of legs are simple, and rod-shaped, not sharp as figured by Sieg (*loc. cit.*).

Kusakin and Tzareva (*loc. cit.*) suggested that the “strongly dilated abdomen” and mandible structure were indicative of a parasitic mode of life, but there has been no further evidence to support this contention. Indeed, tubicolity has been inferred by Sieg (1986b), which would imply a non-parasitic mode of life.

M. vorax is a circum-Antarctic species, not common, but recorded frequently (Hale, 1937, as *Strongylura antarctica*; Kusakin and Tzareva, 1974; Tzareva, 1982, as *Cryptocopoides rotundata*; Sieg, 1984; 1986a [literature]; 1986b [distribution map]; Błażewicz and Jażdżewski, 1996; Schmidt, 1999; Błażewicz-Paszkowycz and Jażdżewski, 2000; Schmidt and Brandt, 2001; Błażewicz-Paszkowycz and Sekulska-Nalewajko, 2004) from a depth range of 10 to 580 m.

Genus *Pooreotanaeis* gen. nov.

Diagnosis. *Pars incisiva* of both mandibles with elaborate denticulation; *lacinia mobilis* absent on right mandible, very reduced (fused) on left mandible; *pars molaris* reduced to a small spike. Labrum naked. Maxillule with five to eight distal spines. Maxilliped palp article 3 as wide as or wider than long, with no or one inner seta; endite naked, weakly expanded distally. Ischium of pereopods 1 to 3 naked, carpus with one dorsodistal seta, merus and carpus of pereopods 4 to 6 with two subdistally-bifurcate distal setae.

Distribution—temperate-tropical Australia.

Etymology. Named in honour of Gary Poore of Museum Victoria, in recognition of his outstanding contribution to crustacean taxonomy and phylogeny.

Type species. *Pooreotanaeis gari* sp. nov. by original designation.

Other species. *Pooreotanaeis ningaloo* sp. nov.

Remarks. The two new species from Australian waters described herein as members of the new genus *Pooreotanaeis* show many affinities to the genus *Mirandotanaeis* in the grossly inflated, “maggot-like” appearance, the morphology of the antennules and antennae, and of the cheliped, pereopods (including their sparse setation and the bifurcate unguis on the posterior three pairs) and uropods. The morphology of the mouthparts, however, is remarkably distinct, particularly that of the mandibles with the long marginal teeth on the *pars incisiva*, the reduced *lacinia mobilis* and *pars molaris*; equally the labrum, maxilliped endite and basis are naked (finely setulose, and with single distal seta respectively in *M. vorax*), the maxilliped palp articles are stouter and more sparsely setose. Other differences in *Pooreotanaeis* include the cheliped setal row having three setae (four in *M. vorax*), the naked ischium of the anterior three pairs of pereopods, the presence of proximal setal tufts on the dactyli, and the unguis being shorter than the dactylus on the posterior three pairs of pereopods. There are also differences between the genera in the character of the spines on the merus and carpus of pereopods 4 to 6 (bifurcated in *Pooreotanaeis* and simple in *Mirandotanaeis*)

and their different number on the carpus (four in *Mirandotanaeis* and two in *Pooreotanaeis*). Additionally the expanded pleon is proportionately longer in *Pooreotanaeis* than in *Mirandotanaeis*.

It is in particular the distinct mouthpart morphology which is considered justification for separating the following two species into a distinct genus.

Pooreotanaeis gari sp. nov.

Figs. 1–3

Material. Holotype female (J56252), stn CPBS 33S, Western Port, Victoria, 38°22.06'S 145°14.10'E, 13 m depth, on reef with sponge, 5 Mar 1965. Paratypes and allotype: 2 large females, 2 small specimens (J58851), same locality as holotype; 1 large female (J56254), WBES stn 1747, Western Port, Victoria, 38°27.53'S 145°08.59'E, 18 m depth, sand, 25 Nov 1974; 1 large female dissected on slides (J56253); 1 allotype male dissected on slides (J60423), stn CPBS 41N, Western Port, Victoria, 38°20.81'S 145°13.85'E, 13 m depth, gravel and sand, 30 Mar 1965.

Description of female. Body (fig. 1B–D) up to 3.5 mm long, glabrous, generally cylindrical, with cephalothorax and pereonites 1 to 3 slender, pereonites 4 and 5 progressively expanding, pereonite 6 and pleon (“abdomen”) grossly inflated; holotype 2.1 mm long, pleon 1.4 mm long. Cephalothorax subrectangular, wider than long, with slight rostrum, eyelobes prominent and eyes absent (fig. 1C–D). Pereonites 1 and 2 shortest, 0.25 times as long as cephalothorax; succeeding pereonites progressively longer, pereonites 3, 4 and 5 respectively 1.4, 2.0 and 3.5 times as long as pereonite 1, pereonite 6 massive, 6.5 times as long as pereonite 1. Pleon of five free subequal pleonites plus pleotelson; each pleonite about 7 times as long as pereonite 1 except pleonite 5 about 5.5 times as long as pereonite 1; pleotelson stout, rounded, 0.7 times as long as last pleonite.

Antennule (fig. 2A) of four articles; proximal article stout, twice as long as wide, 1.2 times as long as distal three articles together, with one simple and five penicillate outer setae in distal half; article 2 just wider than long, 0.3 times as long as article 1, with simple distal outer seta; article 3 about half length of article 2, with simple inner-distal seta; article 4 comparatively slender, 3 times as long as wide and 1.2 times as long as article 2, with three long and one short distal setae and one aesthetasc.

Antenna (fig. 2B) of six articles, proximal article compact, naked; article 2 as long as wide, naked; article 3 as long as wide, with dorsodistal seta; article 4 longest, more than twice as long as article 3, 2.6 times as long as wide, with two inner penicillate setae and two simple distal setae; article 5 0.35 times as long as article 4 with one distal seta; article 6 comparatively minute, one-third length of article 5, with one subdistal and three distal strong setae.

Labrum (fig. 2C) rounded, naked. Left mandible (figs. 2D, D') with eleven elongate teeth distally on *pars incisiva*; *lacinia mobilis* a slight, fused tooth; *pars molaris* a short spike without rugosity; right mandible (figs. 2E, E') with nine distal elongate teeth, without *lacinia mobilis*. Labium (not figured) naked, without palp. Maxillule (fig. 2F) with six distal and two subdistal spines, and sparse microtrichia on inner distal face; palp distinct, unsegmented, with two distal setae. Maxilla (not figured) small, ovoid, naked. Maxilliped (figs. 2G, G') palp article 1 wide, naked; article 2 almost triangular, no outer

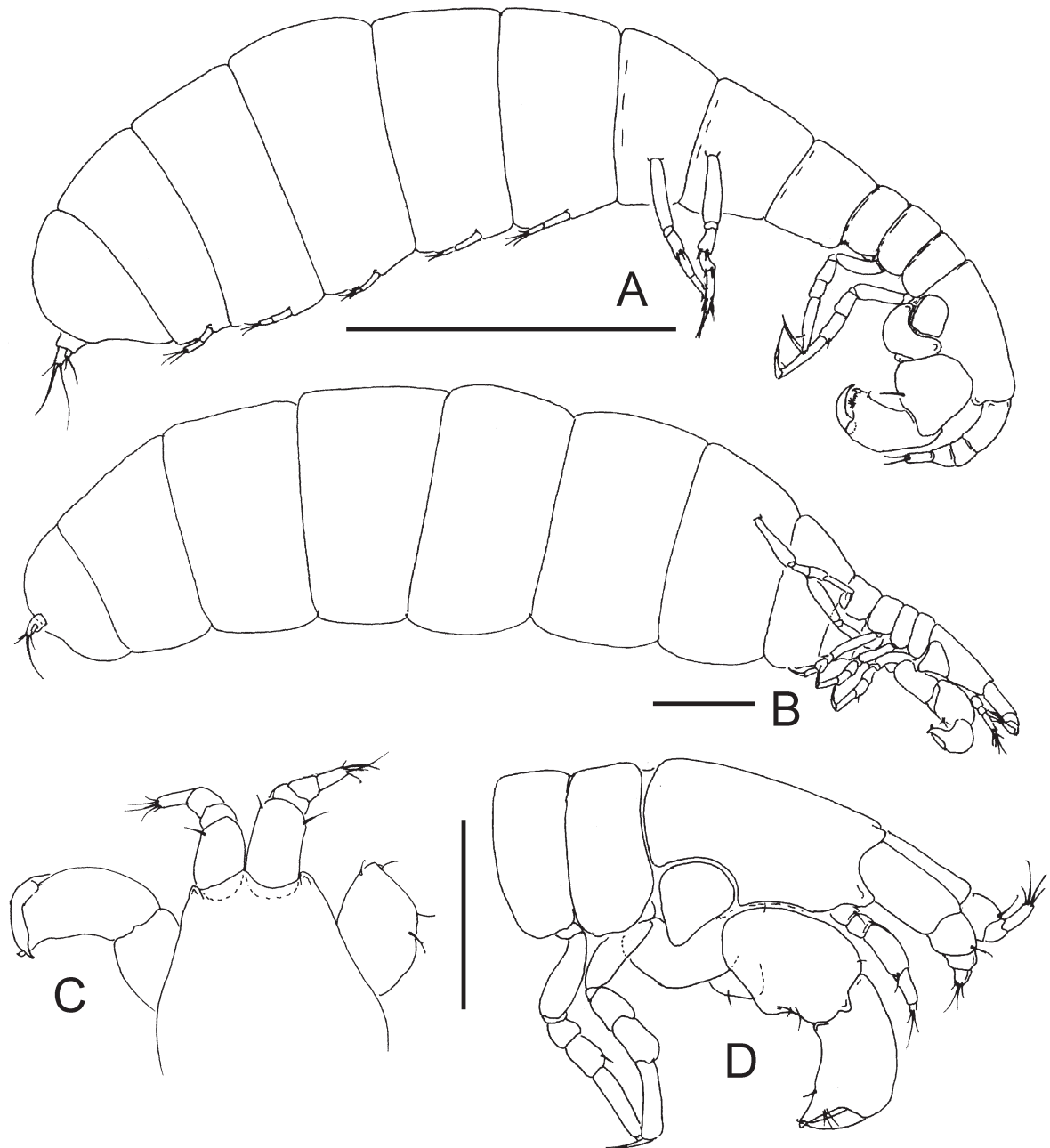


Figure 1. *Pooreotanaïs gari* gen. et sp. nov., : A, body lateral, male; B, body lateral, female; C, details of anterior part of body in female; D, details of cheliped attachment. Scale line = 0.5 mm for A, 0.2 mm for B, 0.1 mm for C–D.

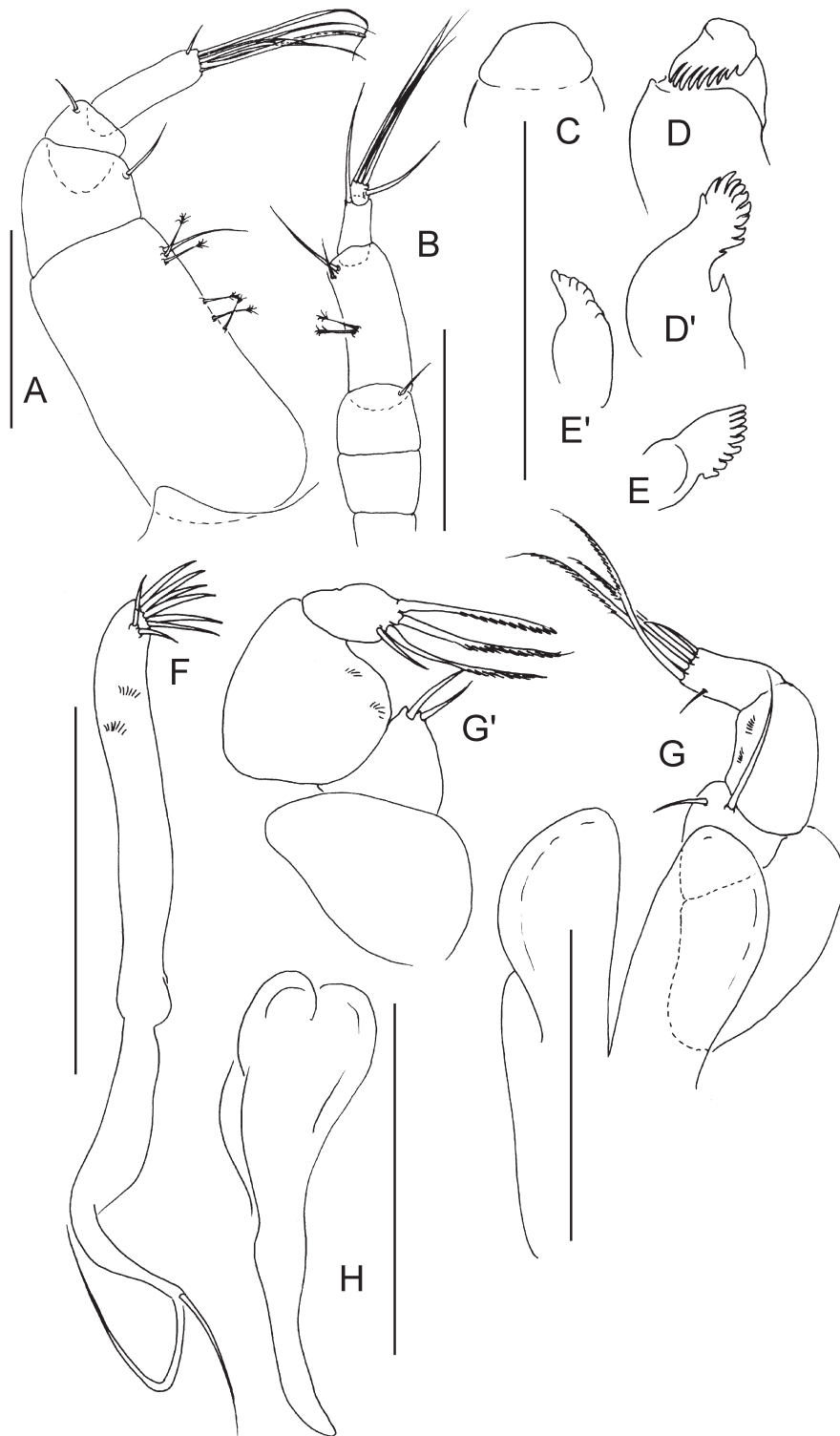


Figure 2. *Pooreotanis gari* gen. et sp. nov., female: A, antennule; B, antenna; C, labrum; D, left mandible, outer aspect; D', left mandible, dorsal aspect; E, right mandible, outer aspect; E', right mandible, dorsal aspect; F, maxillule; G, Maxilliped; G', maxilliped palp, outer-ventral aspect; H, epignath. Scale lines = 0.01 mm.

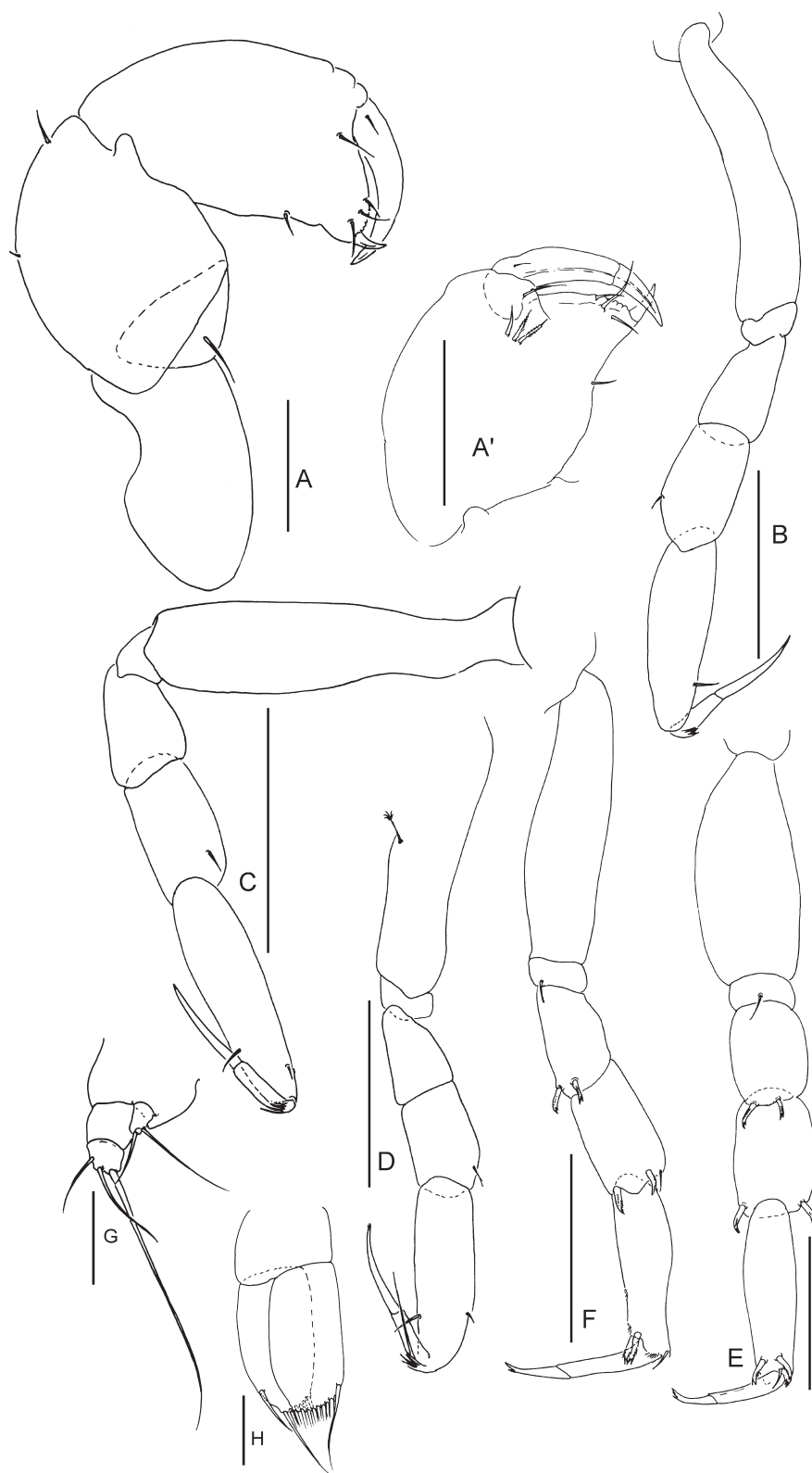


Figure 3. *Pooreotanis gari* gen. et sp. nov., female: A, cheliped; A', chela inner face; B, pereopod 1; C, pereopod 2; D, pereopod 3; E, pereopod 5, ventral; F, pereopod 6; male: G, uropod; H, pleopod. Scale lines = 0.1 mm for A–A', 0.01 mm for B–H.

setae, two simple inner setae, distal-most inner seta exceeding distal margin of palp article 3; article 3 as wide as long, with no inner or outer setae, sparse inner submarginal microtrichia; article 4 with single subdistal simple seta and four distal setae minutely denticulate in their distal half; basis naked; endites large, naked. Epignath (fig. 2H) elongate, tapering from bilobed anterior, naked.

Cheliped (figs. 3A, A') robust, with rounded, elongate basis about twice as long as wide; merus subtriangular with one ventral seta; carpus just longer than wide, with fine mid-dorsal seta, longer dorsodistal seta, but no ventral setae; propodus longer than wide, with one ventral seta, cutting-edge of fixed finger almost perpendicular to axis of propodus, fixed finger with one proximal and three distal outer setae, cutting edge minutely crenulated distally, inner setal row at base of dactylus of three setae; dactylus with proximal outer seta only.

Pereopod 1 (fig. 3B) coxa naked; basis slender, 5.2 times as long as wide, naked; ischium compact, naked; merus shorter than carpus, naked; carpus with one dorsal subdistal seta; propodus almost as long as carpus and merus together, with single ventral subdistal seta; dactylus slender with dorsoproximal setal tuft, extending into longer slender unguis, the two together some 0.75 times as long as propodus. Pereopod 2 (fig. 3C) similar to pereopod 1, but propodus with two subdistal setae. Pereopod 3 (fig. 3D) similar to pereopod 2, but basis with penicillate seta, dactylus with one longer seta in proximal setal tuft.

Pereopods 4 and 5 (fig. 3E) identical to each other, basis stouter than on anterior pereopods, 3.9 times as long as wide, naked; ischium with one ventrodorsal seta; merus and carpus subequal, merus with two minutely denticulate, subdistally bifurcate ventrodorsal spines; carpus with fine outer distal seta and two minutely denticulate, subdistally bifurcate ventrodorsal spines; propodus with three minutely denticulate ventrodorsal spines and adjacent simple seta; dactylus and unguis not fused, unguis shorter than dactylus, distally bifurcate. Pereopod 6 (fig. 3F) as pereopod 5, but propodus bearing distal marginal microtrichia and only two minutely denticulate ventrodorsal spines.

Pleopods absent.

Uropod as in male.

Description of male. Similar in appearance to but smaller than female (fig. 1A) (allotype length 1.72 mm), pleon 0.55 times total body length; cephalothorax 4 times as long as each of subequal pereonites 1 to 3, pereonite 4 expanded, twice as long as pereonite 1, pereonite 5 three times as long as pereonite 1, pereonite 6 just shorter than pereonite 5. Inflated pleonites each bearing pair of pleopods.

Antennule, antenna, mouth part, cheliped and pereopods the same as in female.

Pleopods (fig. 3H) biramous; exopod twice as long as wide with nine setae distally; endopod little shorter than exopod with one inner seta and 6 setae distally. All setae simple.

Uropod (fig. 3G) compact, biramous, basis wide and naked; exopod of one segment, half as long as proximal endopod segment, with one shorter and one longer distal setae; endopod of two segments, proximal segment as wide as long, naked,

distal segment little shorter than proximal segment, with three distal setae.

Etymology. Named in honour of Gary Poore (noun in apposition), in gratitude for all his assistance to both authors over many years—and for originally introducing us.

Pooreotanaïs ningaloo sp. nov.

Figs 4–5

Material. Holotype female (Reg WAM 42784), NIN 14C, Ningaloo Reef front, south of Tintabiddy, Western Australia, 21° 54.505'S 113° 57.963'E, small and medium rubble in gully, 10 m depth, 15 June 2008. Paratype: 1 female dissected on slides, 2.1 mm long, (Reg WAM 42785), NIN 5C, Ningaloo Reef, Western Australia, 21° 52.942'S 113° 58.367'E, dead head of coral, 4–5 m depth, 7 June 2008.

Description of female. Body (fig. 4A) glabrous, generally cylindrical, with cephalothorax and pereonites 1 to 6 slender, pereonite 6 expanded, and pleon (“abdomen”) grossly inflated; holotype 2.27 mm long, pleon 1.7 mm long (0.75 times the length of the whole body). Cephalothorax subrectangular, wider than long, with slight rostrum, eyelobes and eyes absent. Six free pereonites; pereonite 1 shortest, 0.24 times as long as cephalothorax; pereonites 2, 3, 4 and 5 subequal in length, 2.75 times as long as pereonite 1, pereonite 6 expanded, twice as long as pereonite 5. Pleon of five free subequal pleonites plus pleotelson, all expanded; pleonites progressively longer, pleonite 1 about 1.5 times as long as pereonite 6 to pleonite 5 twice as long as pereonite 6; pleotelson stout, rounded, 1.3 times as long as last pleonite.

Antennule (fig. 4B) of four articles; proximal article stout, 1.7 times as long as wide, just shorter than distal three articles together, with one simple outer distal seta; article 2 just longer than wide, 0.5 times as long as article 1, with single distal inner and outer setae; article 3 half length of article 2 with single distal inner and outer setae; article 4 comparatively slender, three times as long as wide and 0.7 times as long as article 2, with six distal setae and one aesthetasc.

Antenna (fig. 4C) of six articles, proximal article compact, naked; article 2 as long as wide, with dorsodistal seta; article 3 wider than long, 0.75 times as long as article 2, with dorsodistal seta; article 4 longest, twice as long as article 2, twice as long as wide, with distinct indication of pseudoarticulation at mid-length, coincident with one penicillate seta, distally with three penicillate and three simple setae; article 5 half as long as article 4 with one long distal seta; article 6 comparatively minute, one-quarter length of article 5, with one subdistal and three distal strong setae.

Labrum (fig. 4D) rounded, naked. Left mandible (fig. 4F) with eight triangular teeth distally on *pars incisiva*; *lacinia mobilis* a slight, fused tooth; *pars molaris* not seen; right mandible (fig. 4E) with five distal triangular teeth, without *lacinia mobilis*. Labium (not figured) naked, without palp. Maxillule (fig. 4G) endite with five distal spines; palp distinct, unsegmented, with two distal setae. Maxilla (fig. 4G) small, ovoid, naked. Maxilliped (fig. 4H) palp article 1 naked; article 2 subrectangular, no outer setae, one simple inner seta; article 3 almost as wide as long, with one stout inner simple seta;

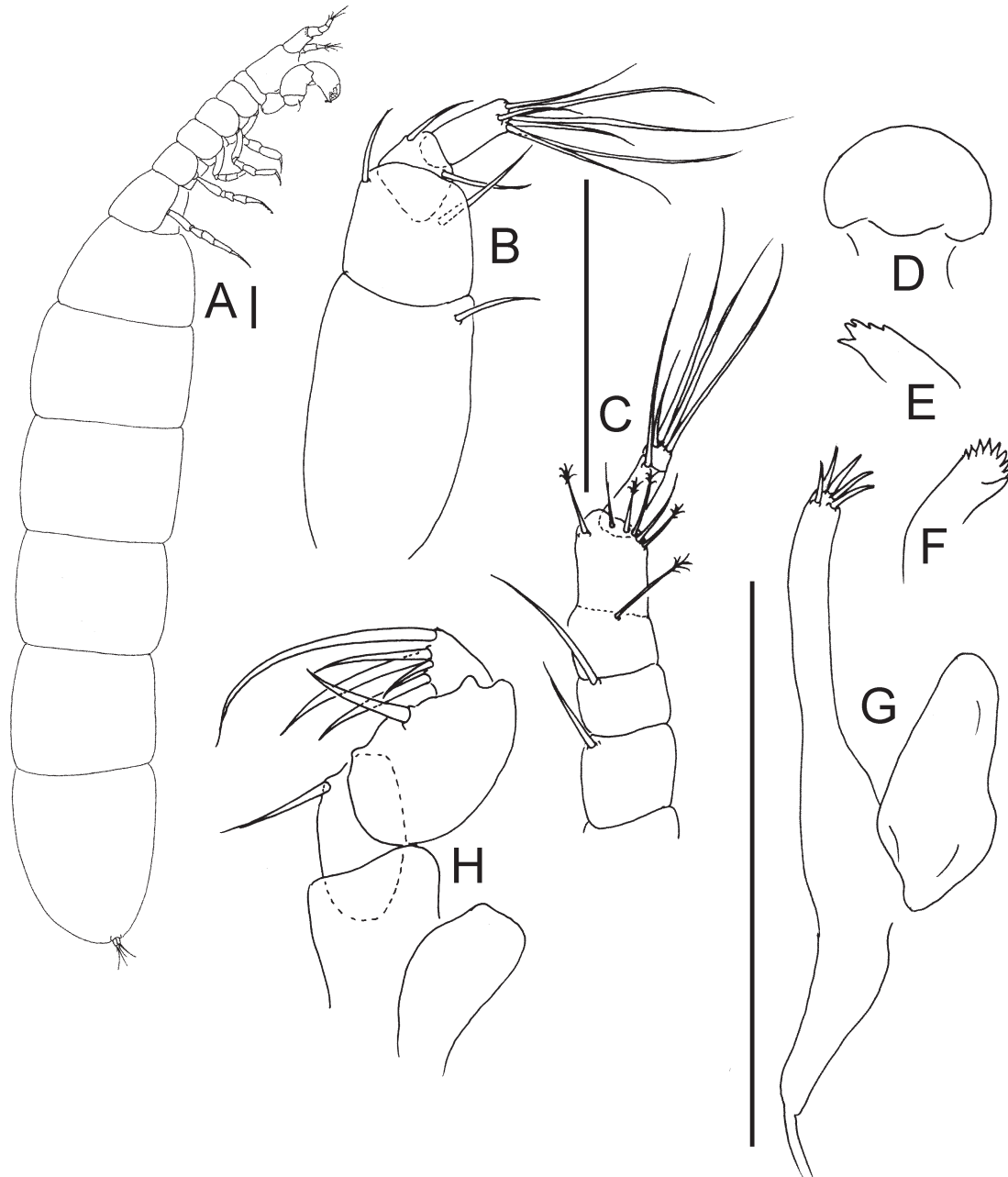


Figure 4. *Pooreotanis ningaloo* gen. et sp. nov., female: A, body laterally; B, antennule; C, antenna; D, labrum; E, right mandible incisor; F, left mandible incisor; G, maxillule and maxilla; H, maxilliped. Scale lines = 0.1 mm.

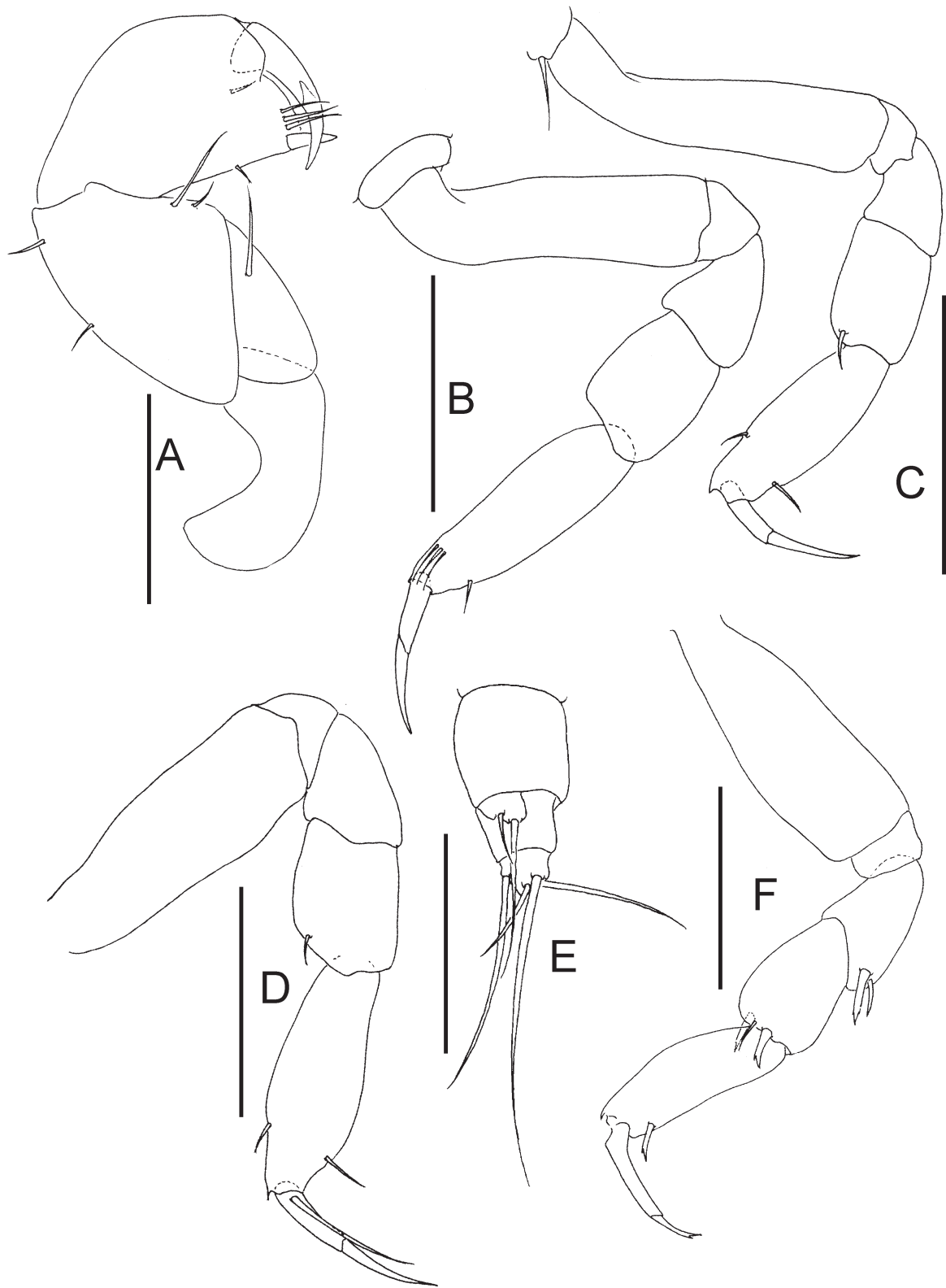


Figure 5. *Pooreotanis ningaloo* gen. et sp. nov., female: A, cheliped outer side; B, pereopod 1; C, pereopod 2; D, pereopod 3; E, uropod; F, pereopod 5. Scale lines = 0.1 mm

article 4 with one shorter and four longer simple distal setae; basis naked; endites large, naked. Epignath not seen.

Cheliped (fig. 5A) robust, with rounded, elongate basis just less than twice as long as wide; merus subtriangular with one ventral seta; carpus just longer than wide, with mid-dorsal seta and dorsodistal seta, and two ventral setae; propodus longer than wide, with one ventral seta, cutting-edge of fixed finger almost perpendicular to axis of propodus, fixed finger with three distal outer setae, cutting edge minutely crenulated distally, inner setal row at base of dactylus of one seta; dactylus naked.

Pereopod 1 (fig. 5B) coxa naked; basis slender, 3.8 times as long as wide, naked; ischium compact, naked; merus shorter than carpus, both naked; propodus longer than carpus and merus together, with single ventral subdistal seta and three dorsodistal setae; dactylus slender, naked, extending into subequal curved unguis, the two together some 0.6 times as long as propodus. Pereopod 2 (fig. 5C) similar to pereopod 1, but coxa with a seta, carpus with one dorsodistal seta, propodus dorsally with one subdistal seta. Pereopod 3 (fig. 5D) similar to pereopod 2, but dactylus with one long proximal seta.

Pereopods 4 and 6 missing.

Pereopod 5 (fig. 5F) basis stouter than on anterior pereopods, 2.8 times as long as wide, naked; merus and carpus subequal, merus with two minutely denticulate, subdistally bifurcate slender ventrodorsal spines; carpus with fine outer distal seta and two minutely denticulate, subdistally bifurcate curved ventrodorsal spines; propodus with one minutely denticulate ventrodorsal spines; dactylus and unguis not fused, unguis less than half as long as dactylus, distally bifurcate.

Pleopods absent.

Uropod (fig. 5E) compact, biramous, basis as wide as long, naked; exopod of one segment, half as long as proximal endopod segment, with one shorter and one longer distal setae; endopod of two segments, proximal segment wide than long, naked, distal segment 0.6 times as long as proximal segment, with four distal setae.

Male: unknown.

Etymology. Named after Ningaloo Reef, the type-locality (noun in apposition).

Remarks. *Pooreotanaïs ningaloo* sp. nov. shows the same features of the coarsely denticulate mandibular incisor and other mouthpart morphology, leg setation and proportionate length of expanded pleon as *P. gari*, and as listed in the diagnosis of the genus, to which it is accordingly attributed, and by which it is comfortably distinguished from *Mirandotanaïs vorax*.

The present species is equally distinct from *P. gari* on a number of features: the pereonites 4 and 5 are not expanded, but the inflated pleon contributes three-quarters of the body-length (two-thirds in *P. gari*); the pleotelson is longer than any pleonites (shorter in *P. gari*); the articles of the antennule and antenna are more compact, and the pseudoarticulation of the antennal article 4 is not found in *P. gari*; there are fewer distal spines on the maxillule endite, fewer teeth on the mandibular incisor, fewer inner setae on the maxilliped palp article 1, conversely one inner seta on the article 2 (none in *P. gari*); there are also subtle differences in the (sparse) setation of the cheliped and pereopods.

Discussion

The three species discussed above show a consistent but aberrant morphology in the extreme inflation of the pleon, including to some degree the posterior pleonites. A proportionately overlarge and cylindrical pleon is also found in *Cetiopyge* Larsen & Heard, 2002, *Collettea* Lang, 1973 and *Filitanaïs* Kudinova-Pasternak, 1973, although only the first of these genera shows such gross inflation (albeit laterally compressed), the pleon of the other two rather being uniformly cylindrical with the pereon and cephalothorax. These genera also show a similar morphology of the reduced, stout uropods, of the number and proportions of antennular and antennal articles (although *Cetiopyge* has a small fifth antennule article), and of the reduced setation of the maxilliped, the cheliped and (other than *Cetiopyge*) the pereopods. Other than the structure of the pars molaris, *Collettea* and *Filitanaïs* also have a similar mandibular morphology to *Mirandotanaïs vorax*, although not to either species of *Pooreotanaïs*.

The discovery of two further species in the family Mirandotanaidae sheds no further light on the reasons for their unusual gross morphology. Their habitats range from coral and coral rubble, to sand and muddy sand, without any suggestion of common sympatric taxa which may offer a food resource or a host; while the inference of tubicolity from Sieg's (1986b) material (see above) conflicts with Kusakin and Tzareva's (1974) idea of parasitism, the dactyli and unguis of the pereopods 1 do not appear adapted for secretion for tube-building, being hardly different from those of pereopods 2 or 3.

When considering possibly analogous morphologies outside the Tanaidacea, gnathiid isopods (and termites!) develop a grossly-inflated "abdomen" for the development of eggs in the female, but this is not the case in these tanaidaceans, as the same morphology is shown by the mature male (and tanaidacean gonads extend through the pereon as well). Equally, the pleon inflation is not shown by the juvenile stages (e.g. Kusakin and Tzareva, 1974: fig. 1.4; Sieg, 1984: fig. 3), so it is a feature of sexual maturity. Sieg (1986b) found 52 "brood-pouch embryos" of *Mirandotanaïs vorax* with a female in an Antarctic sample at 60-90 m depth, implying a comparatively high fecundity for a tanaidomorph tanaidacean, so maximized gamete production may be the reason for the inflated pleon. If this were the case, histological examination of the gonads/gametes of a mature male (and in comparison with, for example, a male *Collettea*) would prove most revealing.

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