

A REVIEW OF THE GENUS *WILDUS* (AMPHIPODA: PHOXOCEPHALIDAE) WITH A DESCRIPTION OF A NEW SPECIES FROM THE ANDAMAN SEA, THAILAND

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ABSTRACT

A fifth species of the genus *Wildus* Barnard and Drummond, 1978, *Wildus andamanensis* sp. nov. (Phoxocephalidae) is reported from the Andaman Sea off Phuket Island, Thailand. The present record extends the range of the genus previously reported from Australia, Fiji and the Red Sea. The genus *Wildus* is a senior synonym of the monotypic genus *Waipirophoxus* Gurjanova, 1980, in light of the new species exhibiting a combination of characters from both genera.

INTRODUCTION

Wildus Barnard and Drummond, 1978, a small genus of phoxocephalid amphipods, comprises *W. mullokus* Barnard and Drummond, 1978 and *W. thambaroo* Barnard and Drummond, 1978 from intertidal to 6 m off Australia, *W. parathambaroo* Myers, 1985 from shallow-water coral rubble in Taunovo Bay, Fiji and *W. spinitelson* Lyons and Myers, 1993 from 10 m in coral rubble in the Red Sea. Barnard and Karaman (1991) reviewed the status of phoxocephalid genera and acknowledged that the monotypic genus *Waipirophoxus* from shallow water off Wellington, New Zealand was probably not distinct from *Wildus* but they were hesitant to synonymise the two due to differences in setation of uropod 1 and the uropodal rami.

A small collection of phoxocephalid amphipods from five sites (40–72 m) in the Andaman Sea off Phuket, Thailand includes a new species of *Wildus* which is described here and compared to all other species of the genus. *Wildus* is here rediagnosed; the monotypic genus *Waipirophoxus* Gurjanova, 1980 is placed in synonymy with *Wildus*. The new species significantly expands the depth and geographic range of the genus.

MATERIALS AND METHODS

The material was collected from the BIOSHELF cruise in 1998 and kept at the PMBC Reference Collection. Full details for the BIOSHELF stations are given in 'The 1996–1998 BIOSHELF cruises' (Bussarawit and Aungtonya, 2002).

All dissections and illustrations follow the methods of Barnard and Drummond (1978) whereby the left side of the animal is illustrated unless otherwise stated. The rediagnosis of *Wildus* follows the style of Barnard and Karaman (1991) and the description of the new species closely follows that of other species of the genus described in Barnard and Drummond (1978).

Abbreviations are: A, antenna; H, head; rLM, right lacinia mobilis; MD, mandible; MX, maxilla; MP, maxilliped; GN, gnathopod; P, pereopod; EP, epimera; U, uropod; PL, pleopod; T, telson; r, right; m, male; tl, total length.

PMBC, Phuket Marine Biological Center, Thailand; NMV, Museum Victoria, Melbourne; AM, Australian Museum, Sydney, where material is lodged.

TAXONOMY

Family Phoxocephalidae

Wildus Barnard and Drummond

Wildus of Barnard and Drummond, 1978: 133.–
Barnard and Karaman, 1991: 635.

Waipirophoxus.—Gurjanova, 1980b: 98 (type
species: *Paraphoxus waipiro*, J.L. Barnard,
1972, monotypy).—Barnard and Karaman,
1991: 634, *syn. nov.*

Type species

Wildus thambaroo Barnard and Drummond, 1978,
by original designation.

Diagnosis

Rostrum unstricted. Eyes present. Antenna 1, peduncular article 2 short, ventral setae confined apically. Antenna 2, peduncular article 1 not ensiform, article 3 with 2 facial setules, facial robust setae on article 4 in 2+ rows, some thick, some thin. Right mandibular incisor with 3 teeth, right lacinia mobilis bifid, thin, molar not triturative, with 3 basally fused robust setae; palpar hump medium, apex of palp article 3 truncate. Maxilla 1, inner plate with 1–2 setae, palp 2-articulate. Maxilliped inner plates partly fused, both pairs small, poorly armed, apex of palp article 3 not protuberant, dactyl elongate, apical nail distinct.

Gnathopods dissimilar, gnathopod 2 weakly to strongly enlarged, carpus of gnathopod 1 free, of gnathopod 2 short and cryptic (posterior margin concealed by the abutment of propodus and merus), propodus of gnathopods 1–2 ovate, poorly setose anteriorly, palms oblique. Pereopods 3–4 carpus with posteroproximal setae, propodus with thin and thick armaments. Pereopod 5 basis of broad form, merus-carpus of pereopods 5–6 medium to narrow; pereopod 7 unreduced, ischium

not enlarged, dactyl not vestigial.

Epimera 1–2 without long facial brushes or posterior setae, epimeron 3 rounded posteriorly, bearing 3 or fewer long setae. Urosomite 3 without dorsal hook. Uropod 1 peduncle without inter-ramal spike, with major displaced robust seta apicomediaally, rami of uropods 1–2 not continuously setose to apex, without subapical robust setae or nails, inner ramus of uropod 1 with 0–1 row of marginal robust setae. Uropod 2 inner ramus ordinary. Uropod 3 unreduced, outer rami longer than peduncle, bearing article 2 on outer ramus, with 2 long apical setae. Telson ordinary to elongate.

Species

Wildus andamanensis sp. nov.; *W. mullokus* Barnard and Drummond, 1978; *W. parathambaroo* Myers, 1985; *W. spinitelson* Lyons and Myers, 1993; *W. thambaroo* Barnard and Drummond, 1978; *W. waipiro* (J.L. Barnard, 1972) comb. nov.

Habitat and distribution

Marine 0–72 m. Southern Australia; Western Australia; New Zealand; Fiji; Gulf of Aqaba, Red Sea; Andaman Sea, Thailand.

Remarks

Barnard and Karaman's (1991) generic diagnosis has been modified to accommodate the new species and to reflect the synonymy of *Waipirophoxus*. The diagnosis of the inner plate of maxilla 1 has been changed from 2 to 1–2 setae to accommodate *W. andamanensis* sp. nov. which has a single seta. Gnathopod 2 was described as weakly enlarged which has been amended to allow the strongly enlarged gnathopod 2 seen in *W. spinitelson* Lyons and Myers, 1993. The inner ramus of uropod 1 has been amended to 0–1 row of marginal robust setae to accommodate the naked rami of *W. waipiro* (J.L. Barnard, 1972) and *W. spinitelson* Lyons and Myers, 1993.

Key to world species of *Wildus*

1. Uropod 1 inner ramus dorsally without setae.....2
- Uropod 1 inner ramus with 1–2 dorsal robust setae.....3
2. Gnathopod 2 propodus weakly enlarged; inner ramus of uropod 3 less than half length of article 1 of outer ramus.....*W. waipiro* (New Zealand)
- Gnathopod 2 propodus strongly enlarged; inner ramus of uropod 3 more than half length of article 1 of outer ramus.....*W. spinitelson* (Red Sea)
3. Coxa 4 with 2 short setules only, without long setae.....*W. thambaroo* (Western Australia)
- Coxa 4 with 2 short setules and 2 or more long setae.....4
4. Uropods 1–2 rami without articulated large apical nails, with apical flake; each telsonic lobe with 2 robust setae (and 1 slender seta).....*W. andamanensis* sp. nov. (Thailand)
- Uropods 1–2 rami with articulated large apical nails; each telsonic lobe with 0–1 robust seta (and 1–2 slender setae)5
5. Pereopod 7 basis strongly serrate posteriorly; each telsonic lobe bearing a pair of subdistal slender setae and no robust seta.....*W. parathambaroo* (Fiji)
- Pereopod 7 basis weakly serrate posteriorly, each telsonic lobe bearing one subdistal slender seta and one robust seta.....*W. mullokus* (southern Australia)

Wildus andamanensis sp. nov.
(Figs 1–5)

099°03'E, triangular dredge, 42 m, coll. S. Bussarawit and C. Aungtonya, 23.02.1998.

Material examined

Holotype: PMBC 17458, female, tl 3.60 mm, BIOSHELF St. I2, 07°30'N, 098°30'E, Ockelmann sledge, 59 m, coll. S. Bussarawit and C. Aungtonya, 22.02.1998.

Allotype: PMBC 17459, male, tl 3.65 mm, same data as holotype.

Paratypes: PMBC 17460, 5 females, tl 2.75–3.70 mm, 1 male, tl 3.35 mm, AM P58295, 5 females, tl 2.10–3.45 mm, 1 male, tl 3.25 mm, and NMV J47238, 5 females, tl 2.50–4.55 mm, 1 male, tl 3.55 mm, all with same data as holotype; NMV J47239, 4 females, tl 3.50–4.35 mm, and AM P58296, 3 females, tl 3.30–3.75 mm, 2 males, tl 3.30–3.75 mm, BIOSHELF St. B2, 09°15'N, 097°54'E, triangular dredge, 61 m, coll. S. Bussarawit and C. Aungtonya, 17.02.1998.

Other material: NMV J47240, 1 male, tl 3.85 mm, BIOSHELF St. C1, 09°01'N, 098°03'E, Ockelmann sledge, 41 m, coll. S. Bussarawit and C. Aungtonya, 17.02.1998; AMP58297, 1 female, tl 4.00 mm, BIOSHELF St. T2, 06°43'N, 098°57'E, Ockelmann sledge, 72 m, coll. S. Bussarawit and C. Aungtonya, 25.02.1998; PMBC 17461, 1 female, tl 3.10 mm, BIOSHELF St. J1, 07°15'N,

Diagnosis

Gnathopod 2 propodus weakly enlarged. Coxa 4 with long setae. Pereopod 7 basis strongly serrate posteriorly. Uropod 1 inner ramus with 1–2 dorsal robust setae. Uropod 3 inner ramus more than half length of article 1 of outer ramus. Uropods 1–2 rami without articulated apical nails, with apical flake. Each telsonic lobe bearing one subdistal slender seta and 2 robust setae.

Description of female

Head about 15 percent of total body length, greatest width about 90 percent of length; rostrum unstricted, broad, exceeding anterior margin of peduncular article 2 on antenna 1. Eyes small, largely occluded with pigment. Antenna 1, peduncular article 1 about 1.6 times as long as wide, about 2.1 times as wide as article 2, ventral margin with about 5 apical setules; article 2 about 0.4 times as long as article 1, with apicoventral cycle of 4–5 setae; primary flagellum with 7 articles, about 0.7 times as long as peduncle, bearing aesthetascs; accessory flagellum with 5 articles. Antenna 2, peduncular article 4 robust setae as illustrated, dorsal margin with notch bearing 2

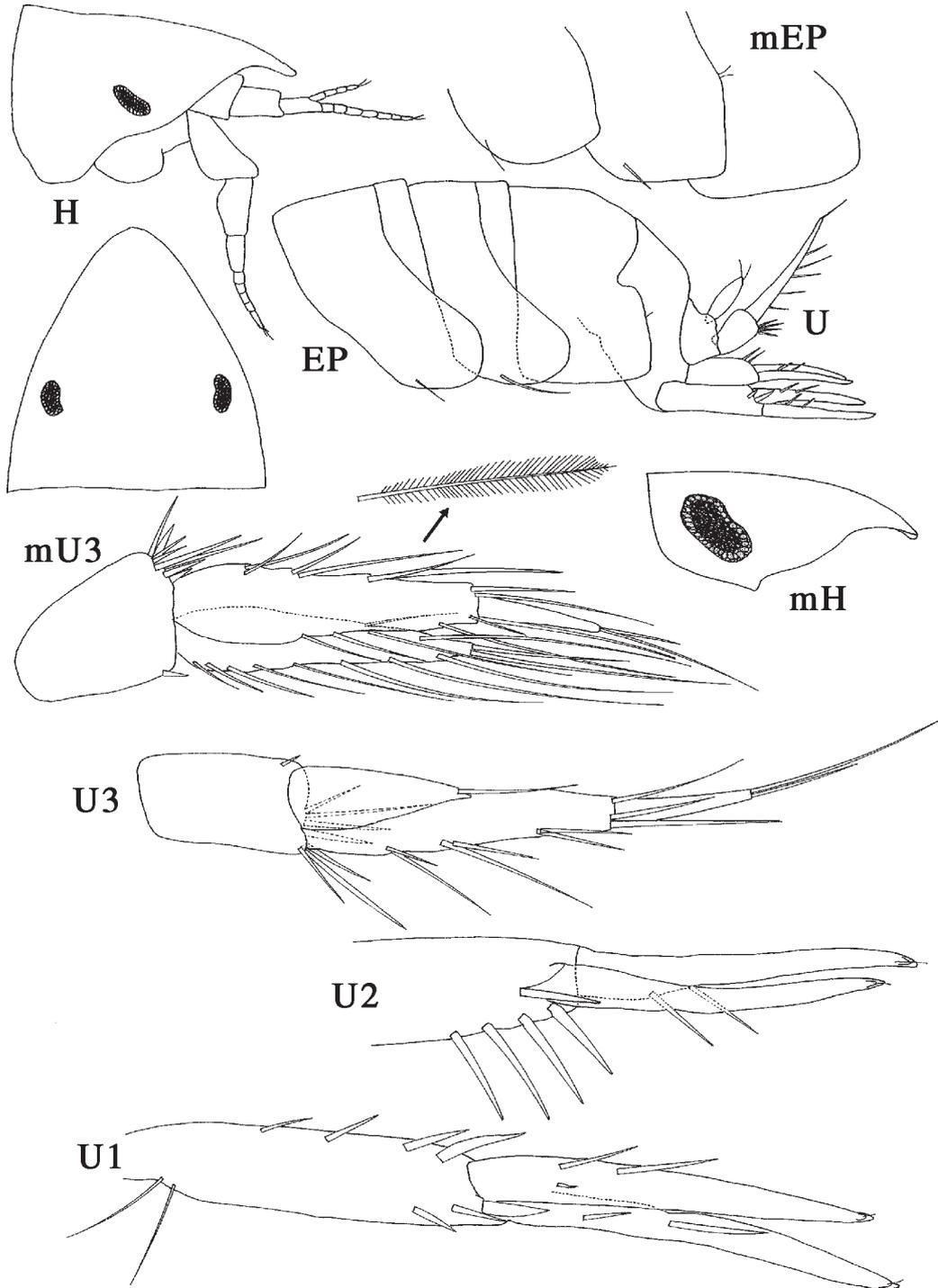


Figure 1 *Wildus andamanensis* sp. nov. Holotype, female, tl 3.60 mm (m = male, allotype, 3.65 mm).

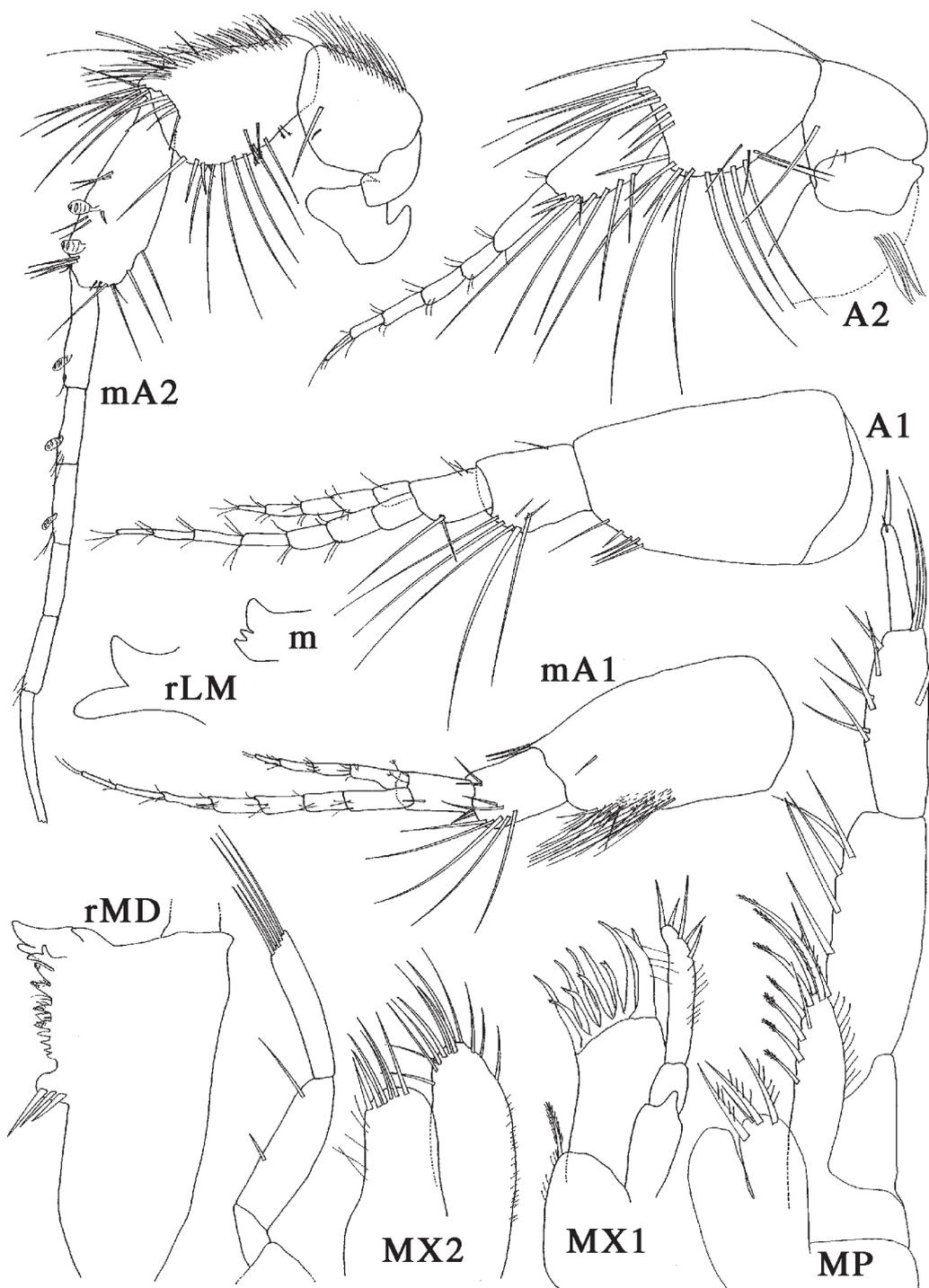


Figure 2 *Wildus andamanensis* sp. nov. Holotype, female, tl 3.60 mm (m = male, allotype, 3.65 mm).

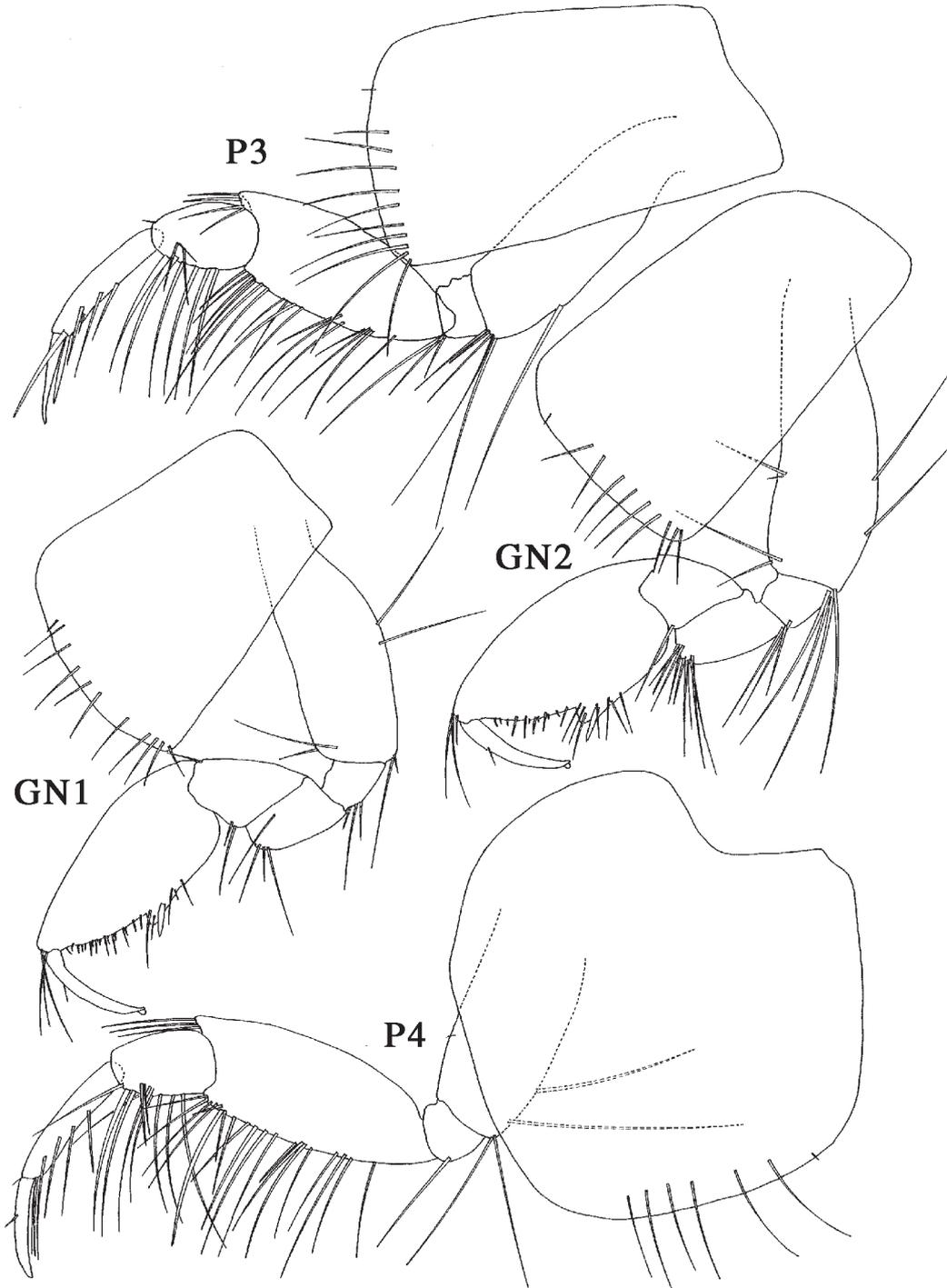


Figure 3 *Wildus andamanensis* sp. nov. Holotype, female, tl 3.60 mm.

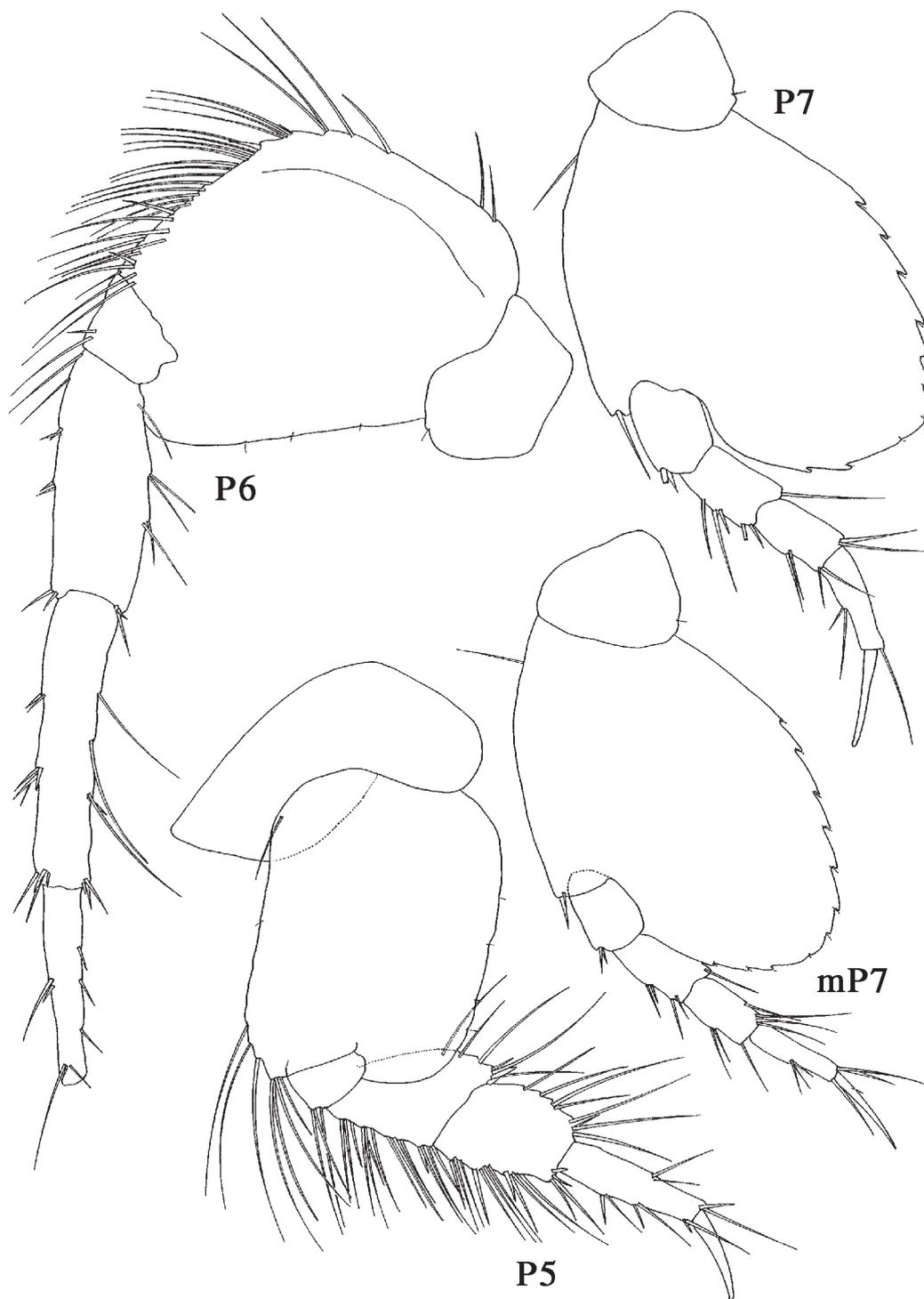


Figure 4 *Wildus andamanensis* sp. nov. Holotype, female, tl 3.60 mm (m = male, allotype, 3.65 mm).

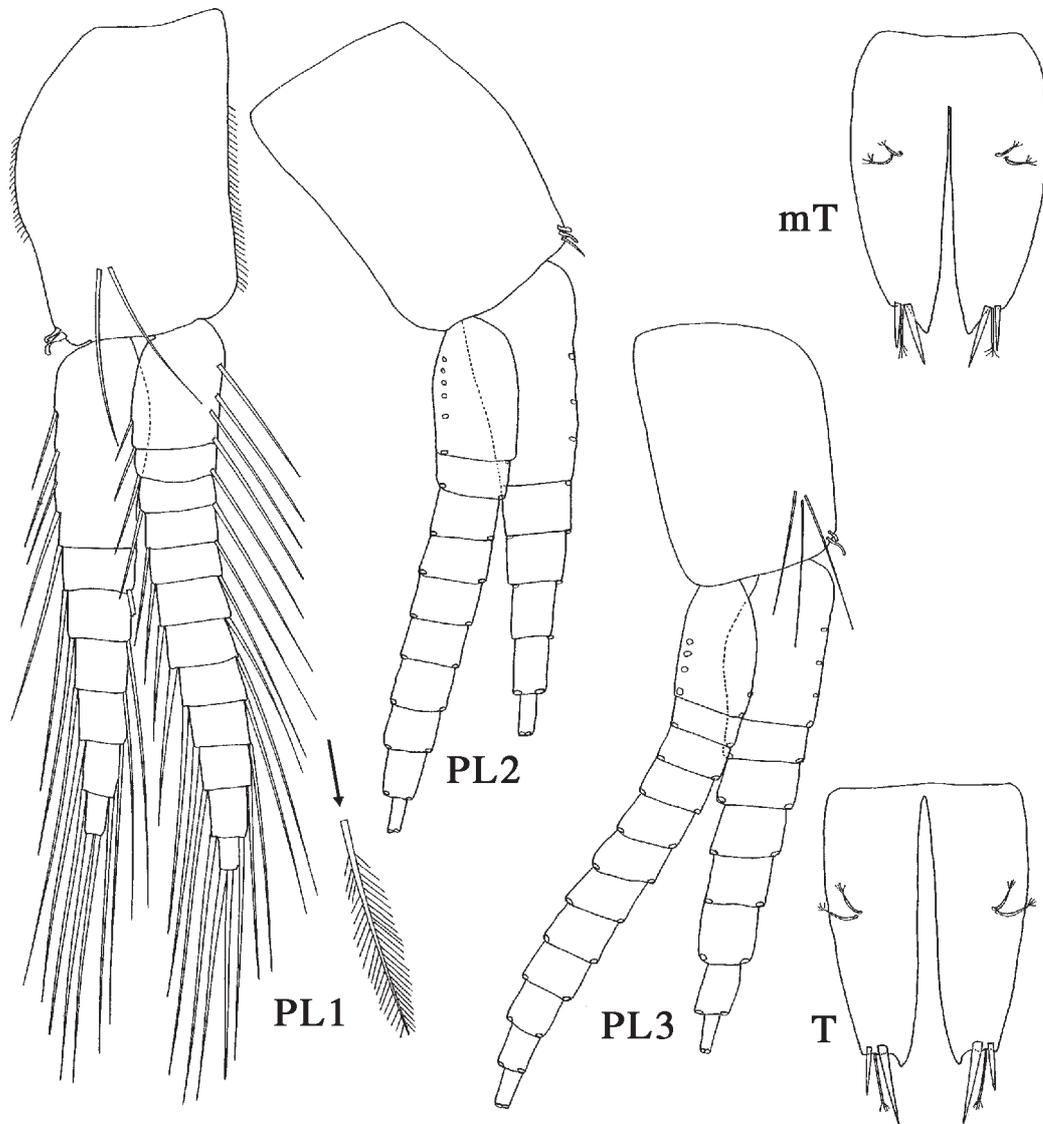


Figure 5 *Wildus andamanensis* sp. nov. Holotype, female, tl 3.60 mm (m = male, allotype, 3.65 mm).

robust setae; article 5 about 0.7 times as long as article 4, without facial robust seta, dorsal margin naked; flagellum 0.95 times as long as articles 4–5 of peduncle combined, with 6 articles. Mandibles with medium palpar hump; right incisor with 3 teeth and notch; right lacinia mobilis bifid, distal branch shorter than proximal, narrow, simple, proximal branch simple, blunt; right raker with 4 plus 3 rudimentary robust setae; molar in form of short protrusion demarcated mainly by robust setae, right molar with 3 long robust setae, none disjunct; palp article 1 slightly elongate (longer than broad), article 2 with one medium inner apical seta

and one other shorter inner seta, article 3 subequal with article 2, apex oblique with 5 robust–slender setae, without basofacial setae. Maxilla 1 inner plate large, bearing one apical pluseta; palp article 2 with 1 apical robust seta on protrusion, 4 apical–lateral marginal robust setae and numerous slender setae. Maxilla 2 inner plate shorter and slightly narrower than outer, setation of inner and outer plate as illustrated. Maxilliped inner plates partly fused, each with one large, thin apical robust slender seta, 3 apicofacial setae, no medial setae; outer plate with 8 medial and apical robust setae, no apicolateral setae; palp articles 1–2 without apicolateral setae,

article 3 with 1 facial seta, no lateral setae, nail of article 4 long, with one accessory setule. Coxa 1 expanded distally, anterior margin straight; main ventral setae of coxae 1–4 = 10-10-10-6, coxae 1–3 posteriormost seta slightly shortened; coxa 4 anterior and posterior margins convergent, posterior margin straight, posterodorsal corner rounded, posterodorsal margin short, width/length ratio of coxa 4 almost = 1:1. Setae on basis of gnathopods 1–2 and pereopods 3–4 as illustrated.

Gnathopod 2 weakly enlarged, width ratios of carpus–propodus on gnathopods 1–2 = 2:3 and 5:9, length ratios = 16:33 and 7:18; palmar humps ordinary, palms strongly oblique; gnathopod 1 carpus triangular, posterior margin rounded, lobate; gnathopod 2 carpus short, triangular. Pereopods 3–4 similar, facial setae on merus, carpus and propodus as illustrated; carpus lacking proximoposterior robust setae; acclivity on inner margin of dactyls of pereopods 3–4 obsolescent, midfacial pluseta ordinary. Coxae 5–7 posteroventral setule formula = 0-1-1; merus and carpus of pereopod 5 narrow of pereopod 6 medium, facial ridge formula on basis of pereopods 5–7 = 0-1-0; width ratios of basis, merus, carpus and propodus of pereopod 5 = 33:17:15:6, of pereopod 6 = 45:14:9:6, of pereopod 7 = 41:7:6:9, length ratios of pereopod 5 = 45:17:18:21, of pereopod 6 = 50:34:43:29, of pereopod 7 = 56:12:11:14; pereopod 7 posterodistal extension of basis reaching junction of merus and carpus. Pleopods 1–3 as illustrated.

Epimeron 1 posteroventral corner rounded, anteroventral margin with one short seta, posteroventral face lacking setae, without facial setae; epimeron 2 posteroventral corner rounded, facial setae = 1; epimeron 3 posteroventral corner weakly protuberant, posterior margin with one setule notch, ventral margin and face naked, posterior face with one weak setule. Urosomite 1 naked. Uropods 1–2 rami without articulate apical nails, with apical flake, uropods 1–2 outer and inner rami with one accessory setule, uropod 1 outer and inner rami with 2 dorsal robust setae, uropod 2 outer ramus with 2 dorsal robust setae, inner ramus naked; uropod 1 peduncle with 2 apicolateral robust setae and 2 basofacial slender setae, inner face with 4 marginal robust setae becoming

increasingly enlarged towards distal end, plus one larger robust seta at base of inner ramus; uropod 2 peduncle with 4 dorsal robust setae, medially with one small apical robust seta. Uropod 3 peduncle with 7 ventral robust setae, 2 of these elongate, dorsally with one lateral robust seta; inner ramus extending to 55% mark on article 1 of outer ramus, apex with one seta, medial and lateral margins naked, article 2 of outer ramus elongate, 0.44, bearing 2 medium and long setae. Telson elongate, length/width ratio = 7:5, not fully cleft, each apex narrow, rounded to truncate, lateral acclivity broad, shallow, bearing ordinary lateral setule, one elongate and one medium robust seta, midlateral setules subequal in size.

Description of male

Similar to female but eyes larger. Antenna 1 like female but with dense medial setation on peduncular article 1. Antenna 2 elongate, peduncular articles 3–4 with dense dorsal setation (see illustration), flagellum 20-articulate, peduncular article 5 about 1.10 times as long as article 4, dorsal margin bearing 2 calceoli and 3 groups of male setae, articles 1–3 of flagellum bearing one calceolus. Maxilliped and maxilla 1–2 similar to female. Right mandible with 6 raker and 2 rudimentary robust setae; right lacinia mobilis bifid, distal branch longer than proximal, simple, proximal branch bifid; palp article 2 with 2 medium inner apical setae and one other shorter inner seta, article 3 with 2 basofacial setae, with 5 apical setae on article 3. Gnathopods 1–2 propodus slightly thinner than in female. Pereopod 7 basis more elongate than female reaching to the middle of merus. Uropod 3 with inner ramus elongate, almost reaching to apex of article 1 on outer ramus, naked except for 2 apical setae. Telson elongate, length/width ratio = 5:3.

Illustrations

Pereopods 3–4 illustrated in 2 sections joined together, coxa–merus from left side, carpus–dactyl from right side; dactyl of pereopod 6 missing from both sides of holotype and therefore not illustrated.

Etymology

Named after the Andaman Sea.

Remarks

The following variations from the holotype were observed in the paratypes and material examined. The main ventral setae of coxae 1–4 = (6–10)–(7–10)–(6–10)–(6–9). Uropod 1 outer ramus with 2–3 dorsal robust setae, inner ramus with 1–2 dorsal robust setae. Uropod 2 outer ramus with 1–2 dorsal robust setae, inner ramus with 0–1 dorsal robust setae.

The new species differs from all other species of the genus by the lack of an articulated apical nail on the rami of uropods 1–2 and the presence of a single seta on the inner plate of maxilla 1. The presence of long setae on coxa 4 distinguishes it from *W. thambaroo* and the presence of 2 robust setae on each telsonic lobe distinguishes it from *W. parathambaroo* and *W. mullokus*.

DISCUSSION

Barnard and Drummond (1978) erected the genus *Wildus* for two new species from Australia and two tentatively assigned species, *Parharpinia fuegiensis* Schellenberg, 1931 (designated the type species of the genus *Fuegiphoxus* J.L. and C.M. Barnard, 1980), and *Paraphoxus waipiro* J. L. Barnard, 1972. The authors acknowledged that in the case of *Paraphoxus waipiro* there was a need for further examination of fresh material. Gurjanova (1980) published a revision of all species of the family Phoxocephalidae. She believed that after an 'estimation of functional importance of features and their complexes' the erection of a new monotypic genus *Waipirophoxus* for the species *Paraphoxus waipiro* was valid. In 1991, Barnard and Karaman recognised the genus *Waipirophoxus* in their major work on the families and genera of the amphipoda stating however that it was probably not distinct from *Wildus*, the only morphological differences being that the inner ramus of uropods 1–2 lacked marginal robust setae and that the apex of peduncle on uropod 1 had 2 robust setae (versus 1). Myers (1985) described *W. parathambaroo*

from Fiji and Lyons and Myers (1993) described *W. spinitelson* from the Red Sea.

The new species from the Andaman Sea closely fits Barnard and Karaman's (1991) diagnosis of *Wildus*, but overlaps somewhat with characters diagnostic for the genus *Waipirophoxus*. The diagnosis states that the inner ramus of uropods 1–2 bears 2 robust setae in *Wildus* and is without setae in *Waipirophoxus*. The new species bears 1–2 robust setae on the inner ramus of uropod 1 (closest to *Wildus*) but has 0–1 robust seta on uropod 2 inner ramus (closest to *Waipirophoxus*). Furthermore, illustrations of both *W. spinitelson* and *W. parathambaroo* reveal the inner rami of at least one uropod is naked and that the diagnosis of this character should be broadened to accommodate all of the species described since Barnard and Karaman's (1991) work. Other phoxocephalid genera show similar interspecific variation in this character. For example, the spination on the inner ramus of uropod 1 varies from 0–1 for species of *Limnoporeia* and 1–4 for *Birubius*. Therefore this character in isolation does not support the separation of *Wildus* and *Waipirophoxus* as distinct genera. Barnard and Karaman's diagnosis further states that *Wildus* has a single robust seta on the apex of peduncle on uropod 1 while *Waipirophoxus* has two. The new species bears 2 robust setae (as in *Waipirophoxus*) whereas all other species of the genus bear one. Again, interspecific variation occurs for this character in other phoxocephalid genera the most extreme example seen in *Birubius*, where the number of apical robust setae varies from 1–9.

As *Wildus* and *Waipirophoxus* can only be separated based on the above-mentioned characters of Barnard and Karaman, 1991 and it is shown that similar interspecific variation is observed in other genera of phoxocephalids, the decision to synonymise the two has been made. The older name of *Wildus* has priority with *Waipirophoxus* now declared a junior synonym.

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