



A new species of Talitridae (Amphipoda: Gammaridea) from Tioman Island, Malaysia

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Abstract

The amphipod crustacean *Talorchestia morinoi* **sp. nov.** collected on the west coast of Tioman Island, Malaysia is described and illustrated. So far no species belonging to the genus is known from Malaysia and this is the first record of the family Talitridae from Malaysia. Differences between the new species and related species within the *Talorchestia* sensu Morino & Miyamoto, 1988 group are discussed and a key is also included.

Key words: *Talorchestia morinoi*, Amphipoda, new species, Crustacea, Talitridae, Malaysia

Introduction

The genus *Talorchestia sensu lato* includes 50 species that are distributed on beaches over various regions of the world. The genus, however, is inadequately defined. The species within the genus possesses polyphyletic characters which apparently are incorporated in a monophyletic character group.

The problem in generic definition of *Talorchestia s. l.*, have been pointed out by several workers (Hurley, 1956, Morino 1972, Bousfield 1982, 1991; Morino & Miyamoto, 1988 and Miyamoto & Morino, 1999). Morino & Miyamoto (1988) redefined the genus and proposed the *spinipalma*-complex to include four species namely *Talorchestia gracilis* (Dana, 1852), *Talorchestia martensii* (Weber, 1892), *Talorchestia spinipalma* (Dana, 1852), *Talorchestia palawanensis* Morino & Miyamoto, 1988. Later, Miyamoto & Morino (1999) added *Talorchestia mindorensis* Oleröd, 1970 to the list. All the five known species of the *spinipalma*-complex are distributed in the Indo-Pacific region. The present species described herein falls in the Indo-Pacific cluster proposed by Morino & Miyamoto (1988).

Material and methods

A major part of the material was collected along the sandy beach of Tioman Island from beneath decaying macroalgae and other debris surrounding the beach area. Whole animals were transferred into glycerol and drawn with a camera lucida on an Olympus SZX9 dissecting microscope. The specimens were dissected and appendages and mouthparts mounted onto slides in glycerol and drawn under a Leica DMLB light microscope using a camera lucida. Types have been deposited at Universiti Kebangsaan Malaysia Muzium Zoologi (UKMMZ); and the Australian Museum, Sydney (AM). The following abbreviations are used in the figures presented. **A**, antenna; **ABD**, abdomen; **BH**, basal height; **G**, gnathopod; **HD**, head; **L**; left; **LL**, lower lip; **LM**, lacinia mobilis; **MD**, mandible; **MX**, maxilla; **MP**, maxilliped; **P**, pereopod; **PL**, pleopod; **R**; right; **T**, telson; **U**, uropod; **UL**, upper lip; ♂, male; ♀, female.

Description

Family Talitridae Rafinesque, 1815

Talorchestia Dana, 1852 (see Morino & Miyamoto, 1988 p. 91)

Talorchestia morinoi sp. nov

(Figs. 1–4)

Material examined

Holotype, male, body length 9.6 mm (from tip of rostrum to apex of telson) (Ref: UKMMZ-1154); allotype, female, body length 10.2 mm (UKMMZ-1155); paratypes, 2 males and 2 females (Australian Museum – P.72698); paratypes, 15 males and 15 females (UKMZ-1156).

Type locality: Air Batang beach, Tioman Island, East coast Peninsular Malaysia; latitude 2°50'29"N, longitude 104°9'34"E; among macroalgae, supralittoral; hand collected; coll. Azman B.A.R. and Josim J.J.; 25 October 2001.

Ecological type. Beach hoppers.

Male

Body shape not anteriorly hunched, laterally compressed, greatest width 1/5 of the body length from tip of head. Head longer than pereonite 1. Eyes present, large (greater than 1/3 head length), subcircular, as deep as long. Pereonite 1 smallest, following pereonites progressively increase in length, pereonite 4 ca. 3 times as long as pereonite 1.

Antenna 1 short, rarely longer than article 4 of antenna 2, but reaching middle of that article 4; peduncle article 1 subequal to peduncle article 3 in length; article 2 about 1.5 times as long as article 1; 5 flagellar articles. Antenna 2 up to half body length; peduncular articles narrow; peduncular article 5 approximately 1.6 times as long as article 4; peduncular articles with sparse, small robust setae; flagellum subequal than peduncles, 21-articulated.

Upper lip (labrum) entire, apical margin with hair-like setae. Lower lip (labium) with wide lobes and shoulders apically setose.

Mandible stout, incisor multi-dentate, left lacinia 5-dentate, molar finely serrated.

Maxilla 1 inner plate narrow with oblique apex and 2 stout apical robust setae; outer plate with 9 spine-like, medially serrate robust setae; palp very short, uni-articulate.

Maxilla 2 inner plate narrower with 1 stout long, plumose seta medially; outer plate rounded distally armed with robust setae.

Maxilliped inner plates with plumose setae on apical and medial margin; outer plate slightly shorter than basal height in length, with plumose setae apically; palp article 1 with oblique distal margin, article 3 rounded apically and densely covered with stout setae, article 4 not visible.

Gnathopod 1 coxa with straight anterior margin and anterodistally subacute; basis slightly expanded posterodistally, as long as merus and carpus combined in length; ischium shortest, rounded posteriorly; merus and carpus connected by diagonal joint; carpus approximately 1.6 times as long as propodus, slightly curved posteriorly with narrow tumescent protuberance or "rugose" lobe posterodistally; propodus expanded distally, palmar margin much shorter than dactylus; dactylus narrow, parachelate.

Gnathopod 2 coxa slightly wider than deep with short posteroproximal process; basis subrectangular; ischium narrow; carpus distinct; propodus elongate oval, slight protuberance near dactylar hinge, palmar margin equipped with row of spines; dactylus curved distally, subchelate.

Pereopods 3 – 7 cuspidactylate. Pereopod 3 coxa subquadrate with pointed process postermarginally; basis with straight anterior and weakly convex posterior margin; ischium shortest; merus slightly expanded; carpus approximately 0.7 times as long as merus; propodus slender, slightly longer than carpus; dactylus slender.

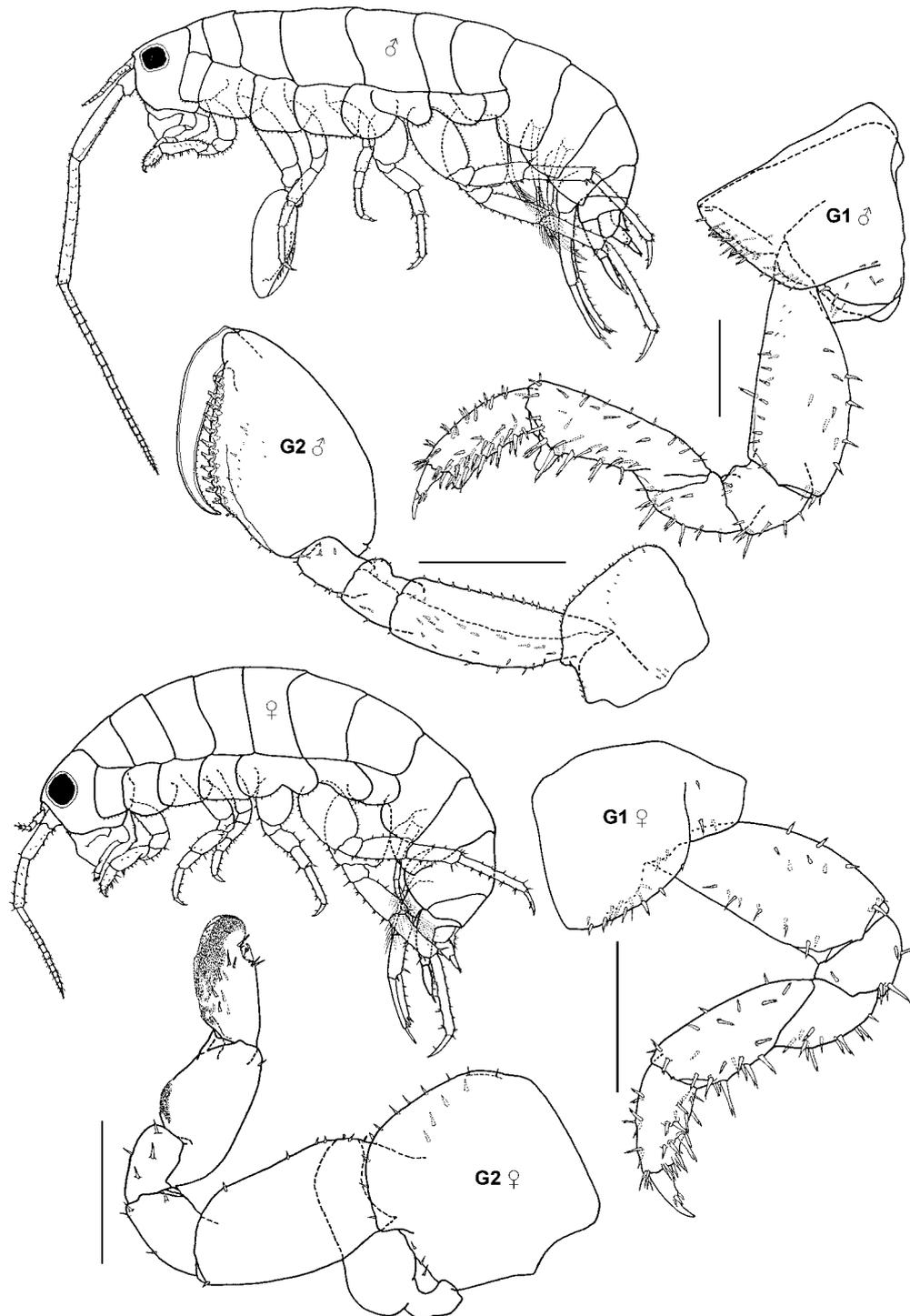


FIGURE 1. *Talorchestia morinoi* n. sp., holotype, male, (UKMMZ-1154) 9.6 mm, allotype, female, (UKMMZ-1155), 10.2 mm. Tioman Island, Peninsular Malaysia. Scales for G1 male and G1 female represent 1.0 mm, G2 male and G2 female represent 0.5 mm.

Pereopod 4 coxa subquadrate with posterior process; basis to propodus shorter but as wide as pereopod 3; carpus significantly shorter than carpus of pereopod 3; dactylus base pinched.

Pereopod 5 coxa bilobed, anterior lobe wider and slightly longer than posterior one; basis ovoid; ischium wider than long; merus as wide as ischium, slightly produced posterodistally; carpus subequal to merus in length; propodus narrow, distinctly longer than carpus; dactylus with single seta anteromarginally.

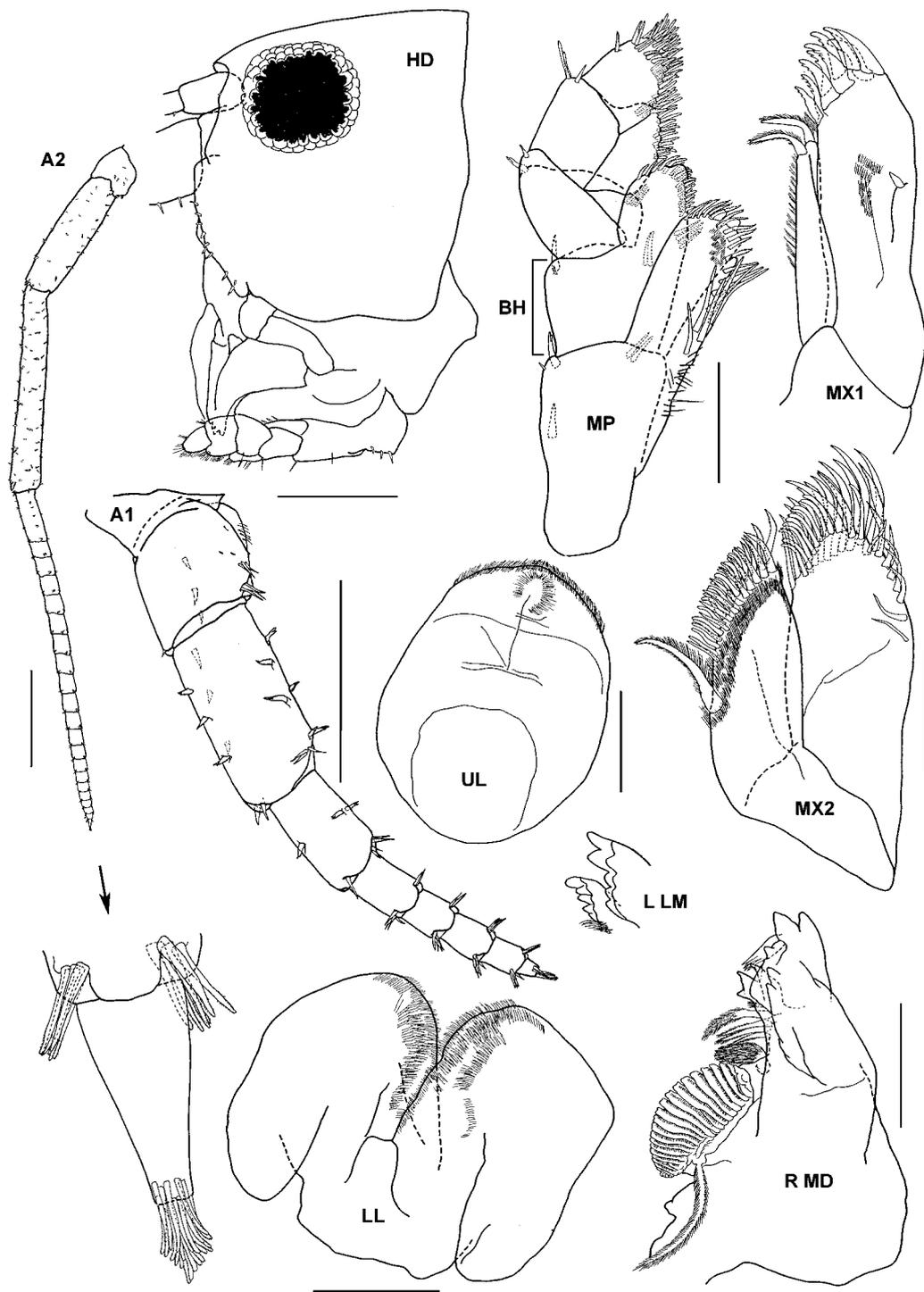


FIGURE 2. *Talorchestia morinoi* n. sp., holotype, male, (UKMMZ-1154) 9.6 mm. Tioman Island, Peninsular Malaysia. Scales for HD and A1 represent 0.5 mm; A2 represents 1.0 mm; MX1, MX2, MP, MD, LL and UL 0.25 mm.

Pereopod 6 much longer than preceding pereopods; coxa bilobed, anterior lobe much shorter and narrow than posterior lobe, posterior lobe half the length of basis, with 5 or more marginal setae; basis ovoid, posterior margin moderately expanded; ischium with posteromarginal notch; merus slightly expanded distally; carpus subrectangular, longer and narrower than merus; propodus very narrow, approximately 1.3 times of merus length, dactylus narrow with seta anteromarginally.

Pereopod 7 subequal to pereopod 6; coxa rounded posteriorly; basis broadly rounded, posterodistal lobe present, shallow; remaining articles as for pereopod 6.

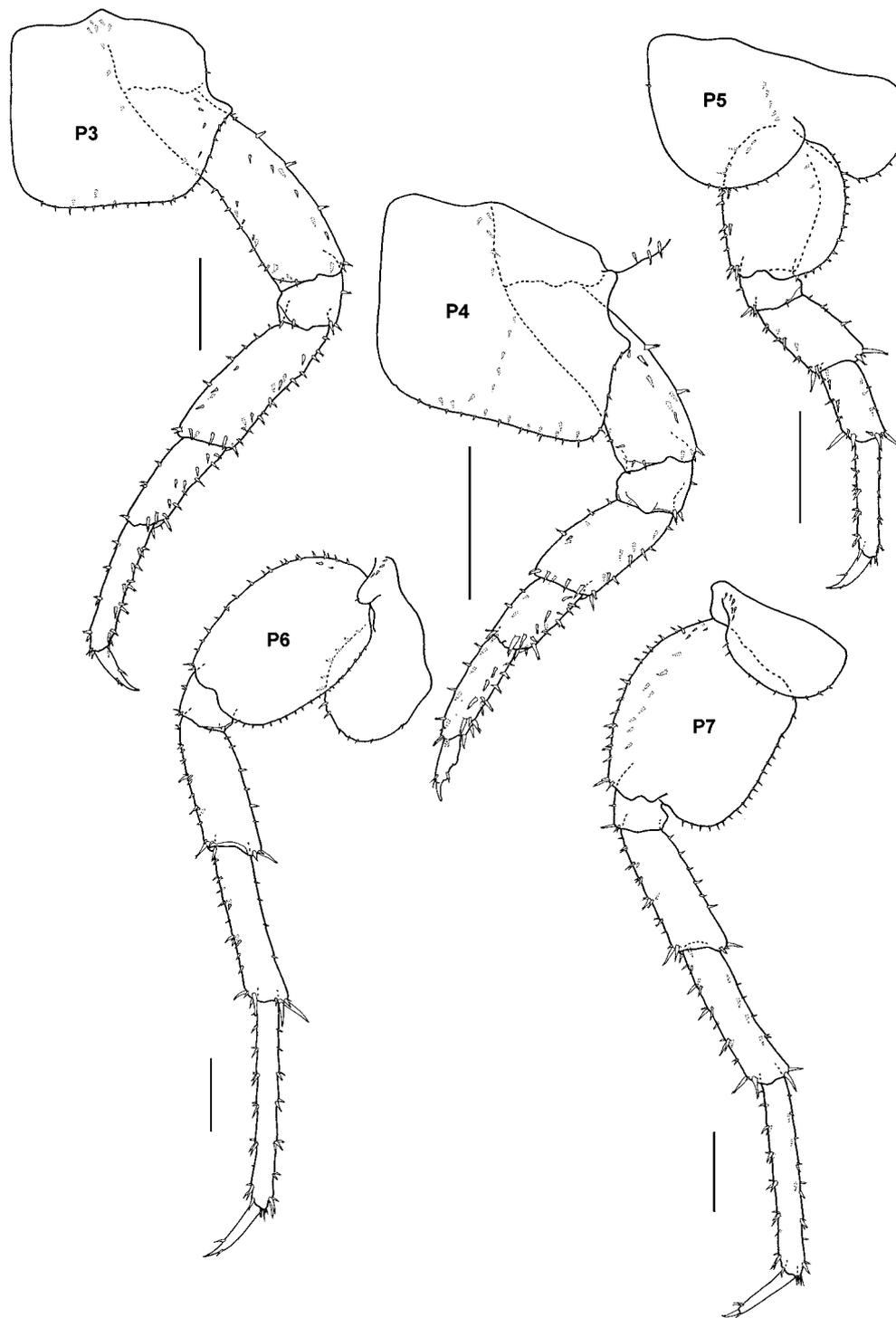


FIGURE 3. *Talorchestia morinoi* n. sp., holotype, male, (UKMMZ-1154) 9.6 mm. Tioman Island, Peninsular Malaysia. Scales for P3 - P7 represent 0.5 mm.

Pleopods well developed; peduncles not expanded, bearing downward setae along margin.

Pleopod 1 peduncle with marginal robust setae; biramous, outer ramus shorter than peduncle, inner ramus subequal in length to outer; rami multiarticulate; inner ramus with 6–10 articles; outer ramus with 6–10 articles.

Pleopod 2 peduncle with marginal slender setae, biramous, inner ramus subequal in length to outer, outer ramus shorter than peduncle, rami multiarticulate; inner ramus with more than 10 articles; outer ramus with more than 10 articles.

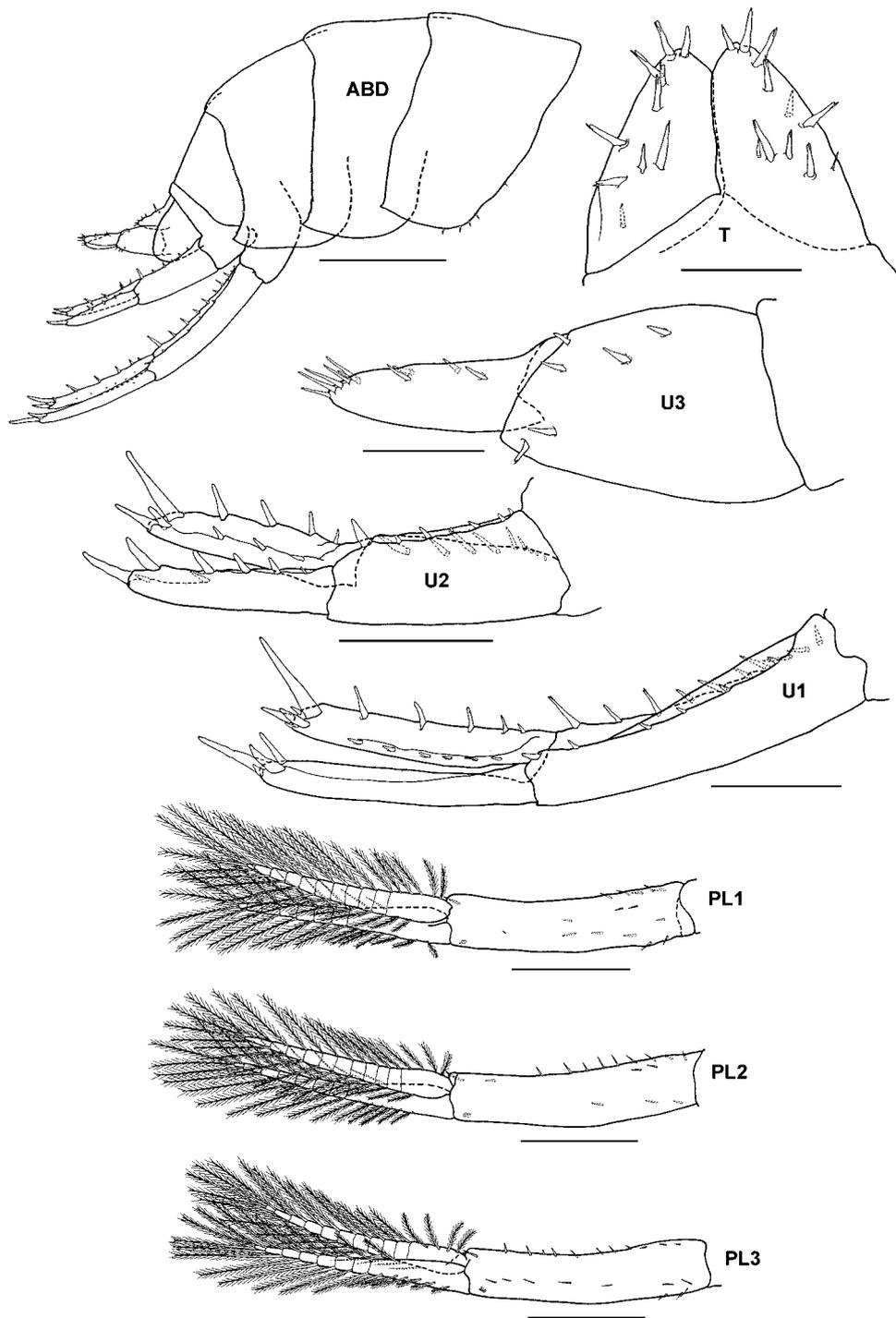


FIGURE 4. *Talorchestia morinoi* n. sp., holotype, male, (UKMMZ-1154) 9.6 mm. Tioman Island, Peninsular Malaysia. Scales for U3 and T represent 0.25 mm; ABD represents 1.0 mm; U1, U2, PL1 – PL3 represent 0.5 mm.

Pleopod 3 peduncle with marginal slender setae, biramous, inner ramus subequal in length to outer, outer ramus shorter than peduncle, rami multiarticulate; inner ramus with 6–10 articles; outer ramus with 6–10 articles.

Epimeron 2 subequal in length to epimeron 3. Epimeron 3 posterior margin smooth, posteroventral corner with small subacute tooth, ventral margin robust setae present.

Uropod 1–3 not sexually dimorphic. Uropod 1 peduncle longer than rami, with 16 robust setae along lateral margin, distolateral robust seta small; outer ramus slightly longer than inner ramus, marginally bare; both rami with rounded apex and long stout distal robust setae; inner ramus with more than 5 marginal robust setae. Uropod 2 peduncle slightly longer than rami, bearing long and stout spine-like marginal setae; inner ramus subequal in length to outer ramus, with 7 marginal robust setae; outer ramus with 4 marginal robust setae. Uropod 3 uniramous; peduncle stout, with 6 medial and distal robust setae; ramus shorter than peduncle, linear, with 4 marginal and 6 apical setae.

Telson broader than long, apically incised, with more than 10 marginal and apical robust setae.

Female

Antenna 1 reaching beyond of middle of peduncular article 4 of antenna 2. Antenna 2 peduncular article 4 shorter than head (about 0.5 of head length), article 5 approximately 1.6 times as long as article 4.

Gnathopod 1 coxa subquadrate, as wide as long, ventral margin bearing robust setae; basis stout, anterior margin straight, posterior margin convex, linear distally; carpus and propodus with no tumescent protuberances posterodistally; propodus, palmar margin shorter than base of dactylus. Gnathopod 2 coxa subquadrate, as wide as long; basis weakly convex posteromarginally, strongly rounded and expanded anteromarginally, almost 2 times ischium width; ischium slightly elongate; merus roundly produced posterodistally; carpus lobately produced halfway posteromarginally with scabrous surface; propodus and dactylus mitten-shaped; propodus convex posteromarginally with rounded weakly anteriorly curved lobe, much shorter than carpus in length (ca. 0.8 times); dactylus inserted proximally of this lobe, tapering distally and curved posteriorly.

Key to the Genus *Talorchestia* sensu Morino & Miyamoto, 1988 (Male)

1. Coxae 2-4 as wide as deep 2
- Coxae 2-4 as wider than deep 4
2. Dactylus of gnathopod 1 longer than palm 3
- Dactylus of gnathopod 1 subequal length to palm *T. gracilis* (Dana, 1852)
3. Posteroventral corner of epimeron 3 with large subacute tooth *T. martensii* (Weber, 1892)
- Posteroventral corner of epimeron 3 subquadrate *T. palawanensis* Morino & Miyamoto
4. Outer lobe of maxilliped shorter than basal height 5
- Outer lobe of maxilliped subequal to basal height *T. spinipalma* (Dana, 1852)
5. Eyes medium (1/5-1/3 head length); telson as broad as long *T. mindorensis* Oleröd, 1970
- Eyes large (greater than 1/3 head length) ; telson broader than long *T. morinoi* **n.sp.**

Remarks

At first glance, this species seems to represent just a larger specimen of *T. martensii*. However, on closer examination, the two species differ in many aspects: in *T. martensii*, the telson is longer than wide ($L/W = 1.2$), whereas in the present species it is distinctly wider than long ($L/W = 0.8$); the inter-ramal robust seta on uropod 1 is much longer in *T. martensii* whereas it is smaller in the present species. In the female, on the other hand, the basis of gnathopod 2 in *T. martensii* is expanded anteriorly, by contrast, it is relatively shallow in the present species.

The present species also reveals strong affinities with *T. spinipalma* in having; (1) slender article 4 and 5 of male antenna 2 peduncle; (2) peduncle of uropod 1 with small distolateral robust seta; (3) small prominence near dactylar hinge of pereopod 4; (4) elongate dactylus of pereopod 4. But the two species can easily be separated by the well-defined protuberance on the palm of male gnathopod 2 in *T. spinipalma*, whereas the palm is moderately smooth in the present species, and the outer lobe of maxilliped is subequal to its basal height in *T. spinipalma*, whereas in the present species the outer lobe is much shorter.

T. palawanensis, on the other hand, can be distinguished from the present species in having the followings: (1) eyes subround (broader than deep); (2) stouter article 4 and 5 of antenna 2; (3) longer distal robust setae of uropod 1; (4) very short dactylus of pereopod 4; (5) sturdy protuberance near dactylar hinge of male gnathopod 2; (6) telson longer than wide.

T. mindorensis described from Mindoro Island, Philippines by Oleröd (1970) differs from the present species in having elongated distal robust seta on uropod 1; the telson being subequal in length to width; and the basis of female gnathopod 2 expanded anteriorly and evenly convex.

In *T. gracilis*, the bases of pereopods 5–7 are narrowly oval; in contrast, in the present species the bases are more expanded. The length of antenna 2 in the mature male of *T. gracilis* is usually longer than the whole body length. However, the most striking character that differentiates *T. gracilis* from all the species in the group is the relatively weak protuberance near dactylar hinge and smooth convex palmar margin of male gnathopod 2.

Compared with all five species currently assigned to *Talorchestia sensu* Morino & Miyamoto, the present species appears to be the only species whose telson is wider than long, and in which the basis of gnathopod 2 in females has a shallower anterior margin and only slightly expanded posterior margin. A summary of the distinguishing characters that separate the present species from the rest of the species in the group is given in Table 1.

Etymology

This species is named in honour of Dr. Hiroshi Morino of Ibaraki University, Japan, who contributed much to the knowledge on talitrid amphipods.

TABLE 1. Summary of features distinguishing *Talorchestia morinoi* **sp. nov.** from the existing species of *Talorchestia sensu* Morino & Miyamoto.

Species	Telson	Uropod 1, distal robust seta	Uropod 3, peduncle	Pereopod 4, dactylus
<i>T. spinipalma</i> (Dana, 1852)	Longer than wide	Short	Less stout (less than 3 x width of ramus); longer than telson	Dactylus elongate, with protuberance
<i>T. palawanensis</i> Morino & Miyamoto, 1988	Longer than wide	Elongate	Stout (3 x width of ramus); longer than telson	Dactylus short, without protuberance
<i>T. mindorensis</i> Oleröd, 1970	As long as wide	Elongate	Stout (3 x width of ramus); longer than telson	Dactylus elongate, with protuberance
<i>T. gracilis</i> (Dana, 1852) (Type species)	Longer than wide	Short	Stout (3 x width of ramus); longer than telson	Dactylus elongate, with protuberance
<i>T. martensii</i> (Weber, 1892)	Longer than wide	Elongate	Less stout (less than 3 x width of ramus); shorter than telson	Dactylus elongate, with protuberance
<i>T. morinoi</i> sp. nov.	Wider than long	Short	Less stout (less than 3 x width of ramus); longer than telson	Dactylus elongate, with protuberance

TABLE 1 continued.

Species	Gnathopod 2 (♂), palm	Gnathopod 2 (♀), basis	Maxilliped, outer plate height	Distribution
<i>T. spinipalma</i> (Dana, 1852)	Well-defined protuberance (anteriorly directed) near dactylar hinge	Expanded anteriorly and slightly convex	Lobe subequal to basal height	Tropical Pacific Islands of Tongatabu (Type locality), Queensland, Bismarck Archipelago, Philippines, New Caledonia, PNG
<i>T. palawanensis</i> Morino & Miyamoto, 1988	Well-defined protuberance (anteriorly directed) near dactylar hinge	Expanded anteriorly and evenly convex	Lobe shorter than basal height	Philippines (Type locality), Thursday Island, Queensland.
<i>T. mindorensis</i> Oleröd, 1970	Well-defined protuberance (hump-shaped) near dactylar hinge	Expanded anteriorly and evenly convex	Lobe shorter than basal height	Mindoro Island, Philippines (Type locality), Taiwan
<i>T. gracilis</i> (Dana, 1852) (Type species)	Weakly rounded protuberance near dactylar hinge	-	-	North Borneo (Type locality)
<i>T. martensii</i> (Weber, 1892)	Insignificant protuberance near dactylar hinge	Expanded anteriorly and evenly convex	Lobe shorter than basal height	Flores Island (Type Locality), Chilka Lake, India, Mentawai, Indonesia, Taiwan.
<i>T. morinoi</i> sp. nov.	Insignificant protuberance near dactylar hinge	Expanded anteriorly and posteriorly and not evenly convex,	Lobe shorter than basal height	Tioman Island, Malaysia

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