

**FIRST RECORDS OF LYSIANASSOID AMPHIPODS (CRUSTACEA)
FROM THE ANDAMAN SEA****Jim Lowry and Helen Stoddart***Division of Invertebrate Zoology, Australian Museum, 6 College Street, Sydney, NSW 2010, Australia***ABSTRACT**

This paper reports on the first records of lysianassoid amphipods from the Andaman Sea. The new family Amaryllididae is established for the genera *Amaryllis*, *Erikus*, *Bathyamaryllis*, *Pseudamaryllis* and *Vijaya*. *Vijaya tenuipes* Walker, 1904, a species not known since its original description from Sri Lankan material, is redescribed from specimens collected in the eastern Andaman Sea. The genus *Lepidepecreum* (Lysianassidae) is rediagnosed and problem areas in the genus are discussed. Four new species of *Lepidepecreum* are described, two from the Andaman Sea and two from Japanese waters. *Orchomenella lukini* Budnikova, 1999 is transferred to *Lepidepecreum*.

INTRODUCTION

For several years Dr. Somchai Bussarawit, Phuket Marine Biological Center (PMBC), has overseen the collecting of marine fauna off the western coast of Thailand. In December 1998, an international group of carcinologists attended a workshop at the PMBC, sponsored by the Danish International Development Agency (DANIDA), to study the crustaceans from these cruises. Among the amphipod collections were the first records of lysianassoid amphipods from the Andaman Sea. In this paper we consider species in the amaryllidid genus *Vijaya* and the lysianassid genus *Lepidepecreum*.

Vijaya tenuipes is an amaryllidid amphipod described from Sri Lanka by Walker, 1904. It has not been recollected since its original description. Stebbing (1910) synonymised *Vijaya* with *Amaryllis* Haswell, 1879, but Gurjanova (1962) included the genus in her key to lysianassoid genera. Barnard and Karaman (1991) considered *Vijaya* to be a valid genus closely related to *Amaryllis* and *Bathyamaryllis* Pirlot, 1933. We redescribe *V. tenuipes* based on new material from the Andaman Sea. As part of our ongoing family level revision

of the lysianassoid amphipods we establish the new family Amaryllididae.

Lepidepecreum is a widespread lysianassid genus known from all oceans in the world. Until now it has not been reported from the Andaman Sea. We describe two new species of *Lepidepecreum* from off Phuket Island. We also establish two closely related new species from Japan, *L. hirayamai* and *L. takeuchii*, previously identified as *L. vitjazi* Gurjanova, 1962 and *L. gurjanovae* Hurley, 1963. *Orchomenella lukini* Budnikova, 1999 is transferred to *Lepidepecreum*.

In this paper we use the terminology introduced by Poore and Lowry (1997: 898) to describe the angle of the gnathopodal palms: "a palm that is close to perpendicular to the longitudinal axis of the propodus is referred to as transverse; a palm in which the angle is less than 90° is referred to as acute; and a palm of more than 90° is referred to as obtuse". The taxonomic section of this paper was generated from our DELTA database of tryphosine species. The bold parts of the species descriptions are diagnostic descriptions, generated with the aid of Intkey (Dallwitz *et al.*, 1993 onwards; Dallwitz *et al.*, 1998).

Material used in this study is lodged in the Reference Collection, Phuket Marine Biological Center, Phuket, Thailand (**PMBC**); the Australian Museum, Sydney (**AM**); the Amakusa Marine Biology Laboratory, Japan (**AMBL**); and the Toyama Science Museum, Japan (**TSM**). The following abbreviations are used on the plates: **A**, antenna; **EP**, epimeron; **G**, gnathopod; **H**, head; **MD**, mandible; **MP**, maxilliped; **MX**, maxilla; **P**, pereopod; **T**, telson; **U**, uropod; **UR**, urosomite; **l**, left; **r**, right.

Amaryllididae new family

Type genus

Amaryllis Haswell, 1879.

Diagnosis

Head much deeper than long, with lateral cephalic lobe weak, midanterior notch present or absent. *Epistome* and *upper lip* fused. *Mandible*, left lacinia mobilis a stemmed serrate blade; accessory setal row well developed, usually with intermediate setae, with a large tuft of setae distally; molar a slightly setose flap with setose margins. *Maxilla 1*, outer plate with setal-teeth in a 6/5 arrangement, palp absent. *Maxilliped*, outer plate without distal or medial slender or robust setae; palp well developed, article 4 reduced. *Gnathopod 1* simple, coxa vestigial, merus and carpus not rotated, posterior margin of propodus serrate, dactylus simple, without subterminal tooth. *Gnathopod 2*, posterodistal corner of propodus with medial and lateral robust setae. *Pereopods 3 to 7* simple; propodus without posterodistal spur. *Telson* with slight to medium cleft.

Description

Head much deeper than long, lateral cephalic lobe weak, notch present or absent; rostrum absent to well developed; eyes present or absent, if present then oval, reniform, or ventrally tapering, slightly enlarged in reproductive male. *Antenna 1* short, medium length or long, about 0.2 to 0.4 times as long as body; peduncular article 1 short to very

long, 1 to 4 times as long as deep; ball-shaped proximally or not; distal spine may be absent, small to large, midmedial to midventral; accessory flagellum very short to long, not forming cap; callynophore, absent or well developed 1-field or 2-field in female, weakly developed 1-field or well developed 2-field in male; flagellum short to long; calceoli absent in female, present in reproductive male. *Antenna 2* subequal to or slightly longer than antenna 1, or much longer than body in reproductive male; peduncle with or without brush setae in reproductive male, peduncular articles 3 to 5 enlarged or not in male; calceoli absent in female, present in reproductive male. *Mouthpart bundle* subquadrate or subconical. *Epistome* and *upper lip* fused, straight or variously produced from a broad convex margin to a hook. *Mandible* incisors symmetrical, with slightly convex margins, left lacinia mobilis a broad stemmed cusped to smooth blade; accessory setal row well developed, left and right each with 5 to 18 robust setae, with or without intermediate setae, with a large or small distal setal tuft; molar a slightly setose flap with setose margins; mandibular palp attached midway to proximal; article 1 short, about as long as broad; article 2 elongate, slender, occasionally slightly broadened proximally in male, with or without D2-setae along distal posterior margin; article 3 spatulate, occasionally weakly falcate, A3-setae usually absent, occasionally present, D3-setae along most of posterior margin, and well developed E3-setae. *Maxilla 1* inner plate broad with apical simple or plumose setae (usually 2, occasionally 3 or absent); outer plate narrow, with 11 setal-teeth in a 6/5 arrangement, outer row with ST4–ST7 large, stout, with cusps, ST5 contiguous with ST6, ST6 contiguous or slightly displaced from ST7; STA to STD large, slender to broad, weakly to multicuspitate; palp absent. *Maxilla 2* inner and outer plates narrow to broad, subequal in length and breadth. *Maxilliped* inner plate large, subrectangular, densely covered in setae, apical nodular setae vestigial or absent, oblique setal row well developed to absent; outer plate large, subovate, occasionally subrectangular, large midmedial notch present or absent; apical setae

absent, medial setae vestigial or absent, submarginal setae vestigial or absent; palp large, 4-articulate, dactylus reduced, unguis absent.

Pereon. *Gnathopod 1* simple; coxa vestigial; carpus subrectangular, length 2 to 3 times breadth, posterior margin not lobate; shorter than to longer than propodus; propodus linear, elongate, subrectangular, length 2.5 to 6 times breadth, margins tapering distally; posterior margin serrate, straight, with or without robust setae; dactylus simple, without subterminal tooth. *Gnathopod 2* minutely subchelate to subchelate; coxa large, shorter to subequal in size to coxa 3; ischium long, occasionally short; carpus linear, long to very long, length 3 to 6 times breadth, posterior margin straight; propodus subrectangular or occasionally subovate, short to elongate, linear, length 2 to 3.5 times breadth; palm slightly acute to transverse, posterodistal corner with 0 to 6 medial robust setae and 0 to 4 lateral robust setae. *Pereopod 3* simple; coxa large; merus–carpus with or without brush of plumose or simple setae in male; propodus without posterodistal spur; dactylus short, stocky or long, slender, without setae on posterior margin. *Pereopod 4* simple; coxa deeper than wide, with large posteroventral lobe, ventral margin without short robust setae; merus weakly expanded anteriorly or not; merus–carpus with or without brush of plumose or simple setae; propodus without minutely denticulate surface, without posterodistal spur, with posterodistal locking setae; dactylus short or long, slender or stocky, without setae on posterior margin. *Pereopod 5* simple; coxa equilobate or posterior lobe slightly to strongly produced ventrally; basis linear to greatly expanded posteriorly; merus slightly to broadly expanded posteriorly; propodus without minutely denticulate surface, without anterodistal spur, with anterodistal locking setae; dactylus short, slender to stocky, short to long, without setae on posterior margin. *Pereopod 6* simple; coxa small, not lobate or slightly lobate posteriorly; basis expanded posteriorly; merus expanded or slightly expanded posteriorly; propodus without minutely denticulate surface, without anterodistal spur, with anterodistal locking setae; dactylus short or long, slender or stocky,

without setae on posterior margin. *Pereopod 7* simple; basis expanded posteriorly; merus slender, slightly expanded posteriorly; propodus without minutely denticulate surface, without anterodistal spur, with anterodistal locking setae; dactylus short to long, slender to stocky, without setae on posterior margin.

Pleon. *Pleonites 1* to 3 dorsally smooth. *Oostegites* from gnathopod 1 or 2 to pereopod 5. *Gills* from gnathopod 2 to pereopod 7, not pleated. *Epimeron 3* with posterior margin smooth or serrate, posteroventral corner narrowly or broadly rounded with a high notch on posterior margin or with a notched posteroventral corner, ventral margin without setae. *Urosomites 1* to 3 free; dorsally smooth. *Uropod 1* biramous; without long fine setae; rami subequal in length. *Uropod 2* biramous; without long fine setae; outer ramus usually shorter than inner, inner ramus with weak constriction, occasionally not constricted. *Uropod 3* biramous; peduncle short, 0.5 to 2.3 times as long as deep, without lateral flange; rami lanceolate, subequal in length, plumose setae absent or weakly developed in female, present or absent in male; outer ramus 1- or 2-articulate. *Telson* longer than broad with slight to medium cleft, without dorsal robust setae, distal margins rounded or truncated, with penicillate setae and simple setae on each margin.

Generic composition

The family contains five genera: *Amaryllis* Haswell, 1879; *Bathyamaryllis* Pirlot, 1933; *Erikus* Lowry and Stoddart, 1987; *Pseudamaryllis* Andres, 1981; and *Vijaya* Walker, 1904.

Remarks

Amaryllidids are very distinctive amphipods. Haswell (1879: 253) originally placed *Amaryllis* in the “sub-family Stegocephalides”. Stebbing (1888) moved *Amaryllis* to the Lysianassidae where it has remained until now. Lowry and Stoddart (1990) considered the Wandinidae and the amaryllidid group to be sister taxa. Both groups have a fused epistome/upper lip, an elongate accessory setal row on the mandible, a rudimentary maxillipedal palp

article 4, first gnathopods with a vestigial coxa and a posteriorly serrate margin on the propodus and an elongate propodus on gnathopod 2 which is peculiar within the lysianassoid superfamily. Amaryllidids differ from wandinids in having a deep head with a lateral cheek notch, a mandibular molar, no palp on maxilla 1, a lobate coxa 5 and a cleft telson.

Aside from the wandinids, amaryllidids differ from other lysianassoid family groups by their distinctive head shape; distinctive, stemmed and distally cuspidate lacinia mobilis; no palp on maxilla 1; extremely reduced gnathopod 1 coxa; serrated posterior margin on the propodus of gnathopod 1; and a slender, elongate propodus on gnathopod 2. Most amaryllidids are immediately recognisable by their deep head shape with a midanterior notch and a relatively long antenna 1 peduncle.

Pirlot (1933) realised that there were at least two generic groups within the accumulated species of *Amaryllis*. The *Amaryllis* group, in which peduncular article 1 of antenna 1 was robust and article 2 was relatively short, included the shallow-water coastal species *A. macrophthalma* Haswell, 1879, *A. bathycephala* Stebbing, 1888 and *Vijaya tenuipes* Walker, 1904. The *Bathyamaryllis* group, in which peduncular article 1 of antenna 1 was slender and article 2 was elongate, included *B. haswelli* (Stebbing, 1888), *B. perezii* Pirlot, 1933, *B. rostrata* (Chevreux, 1911) and *B. conocephalus* (K.H. Barnard, 1925).

We agree with Pirlot (1933) that there are two groups, but we think that *Vijaya* belongs in the *Bathyamaryllis* group which is defined by the following characters: subquadrate mouthpart bundle; large robust setae on the posterior margin of the propodus of gnathopod 1; small, well defined notch on the posteroventral corner of epimeron 3; and elongate antenna 2 in the male. This group contains *Bathyamaryllis*, a well-described genus currently containing three deep-water species; *Pseudamaryllis* which was recently revised by Lowry and Stoddart (1993) and *Vijaya*, a poorly described monotypic genus. The *Amaryllis* group contains *Amaryllis* with two species, and the recently described monotypic genus *Erikus*.

Distribution

South-eastern North America, north-eastern Atlantic Ocean, southern and eastern Africa, Red Sea, Indian Ocean, Indonesia, Australia, New Zealand, southern South America.

Vijaya Walker

Vijaya Walker, 1904:241.– J.L. Barnard, 1969: 368.– Barnard and Karaman, 1991: 541.

Walker (1904) described an amaryllidid amphipod from Sri Lanka which he called *Vijaya tenuipes*. He based the genus on the fact that the male had a callynophore. Stebbing (1910) synonymised *Vijaya* with *Amaryllis* because males of that genus also have callynophores. Gurjanova (1962), J.L. Barnard (1969) and Barnard and Karaman (1991) all recognised *Vijaya*. Based on Walker's original description and our re-examination of his type material, plus new material reported here, we consider that *Vijaya* is a valid genus, more closely related to *Pseudamaryllis* and *Bathyamaryllis* than to *Amaryllis*.

Diagnosis

Head much deeper than long with midanterior notch, rostrum slightly developed, bent ventrally. *Eye* ventrally tapered (may be absent in preserved material). *Antenna 1* peduncular article 1 not proximally ball-shaped, peduncular article 2 of medium length (less than half as long as article 1), callynophore absent in female, present in male. *Antenna 2* elongate in male, with peduncular articles 4 and 5 enlarged, with calceoli. *Mouthpart bundle* subquadrate. *Mandible* lacinia mobilis a distolaterally cusped blade. *Maxilliped* inner plate, oblique row vestigial. *Gnathopod 1* serrated posterior margin of propodus with several strong robust setae. *Pereopod 4*, coxa expanded, anteroventral corner acutely produced. *Pereopods 3 and 4*, male merus and carpus with setal-brush on posterior margins. *Pereopod 5*, basis expanded. *Pereopods 5 to 7* with elongate distal articles, dactyli long, slender. *Epimeron 3* with notch on post-

eroventral corner. *Uropod 3* rami lanceolate, setose in male, weakly setose in female; outer ramus 1-articulate.

Type species

Vijaya tenuipes Walker, 1904, by monotypy.

Species composition

The genus contains 1 species: *Vijaya tenuipes* Walker, 1904.

Remarks

When Pirlot (1933) described *Bathyamaryllis*, the genus *Vijaya* was so poorly known that he could not have realised the close relationship of his species to the species that Walker (1904) described. Our examination of Walker's type material and the new material of *Vijaya tenuipes* has shown several generic level differences between these species. *Vijaya* has a ventrally tapered eye, a unique acutely produced anteroventral corner on coxa 4 and it does not have the proximally ball-shaped peduncular article 1 of antenna 1 which characterises *Bathyamaryllis*. *Pseudamaryllis* has reniform eyes, a callynophore in the female and subparallel anterior and posterior margins on coxa 4.

Amaryllidids live mainly in temperate waters and members of the *Bathyamaryllis* group typically live in the deep sea. *Vijaya* is the only member of the group which lives in shallow tropical waters.

Distribution

Vijaya is known from two relatively shallow-water areas in the north-eastern Indian Ocean, off Sri Lanka, Bay of Bengal and off Phuket Island, eastern Andaman Sea.

Vijaya tenuipes Walker (Figs 1–4)

Vijaya tenuipes Walker, 1904: 241, pl. 1 fig. 5.– Stebbing, 1906: 717.– J.L. Barnard, 1958: 89.– J.L. Barnard, 1964: 63.– Barnard and Karaman, 1991: 541.

Amaryllis tenuipes.– Nayar, 1966: 136.– Thurston and Allen, 1969: 354.

Material examined

PMBC 14898, 1 specimen, BIOSHELF St. C2, 09°00'N, 097°56'E, Ockelmann sledge, 60 m, coll. S. Bussarawit and C. Aungtonya, 17.02.1998;

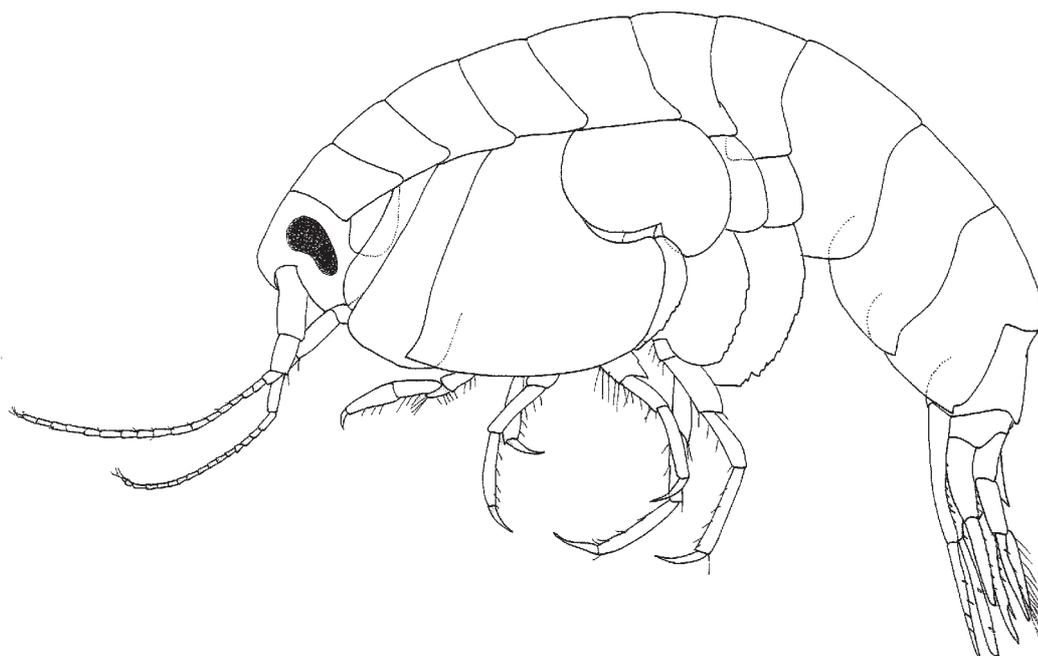


Figure 1 *Vijaya tenuipes* Walker. Female, 5.8 mm, AM P56829.

PMBC 14899, 160 specimens, BIOSHELF St. H2, 07°46'N, 098°14'E, Triangular dredge, 57 m, coll. S. Bussarawit and C. Aungtonya, 20.02.1998; PMBC 14900, 11 specimens, BIOSHELF St. I3-I2, 07°30'N, 098°19'E, Ockelmann sledge, 55 m, coll. S. Bussarawit and C. Aungtonya, 22.02.1998; PMBC 14901, 82 specimens and AM P56829, 50

specimens, BIOSHELF St. I3, 07°35'N, 098°16'E, Ockelmann sledge, 68 m, coll. S. Bussarawit and C. Aungtonya, 22.02.1998.

Description

Based on female 6.0 mm, male 5.0 mm and juvenile male 3.5 mm. *Head* much deeper than

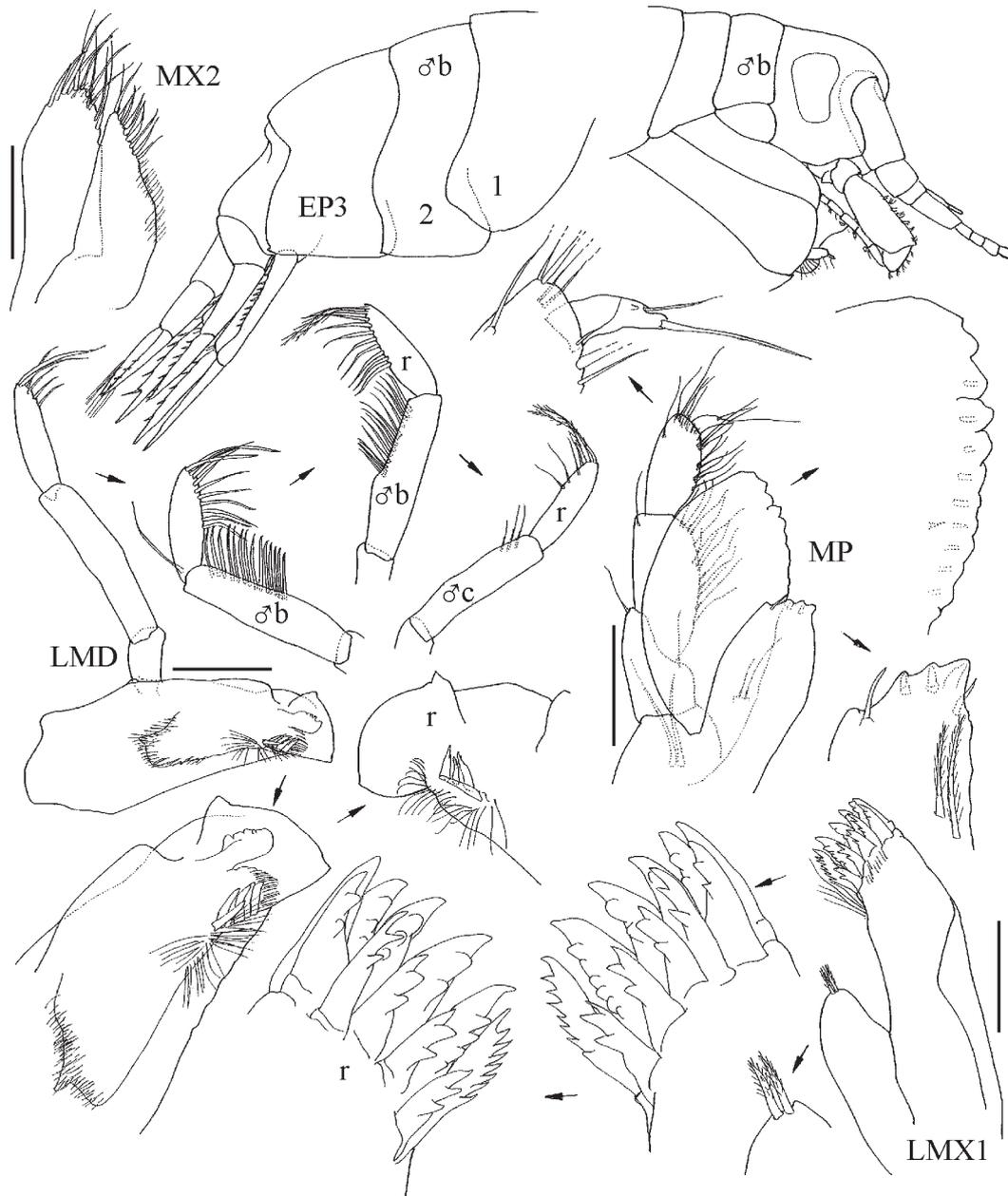


Figure 2 *Vijaya tenuipes* Walker. **a**: female, 6.0 mm; **b**: mature male, 5.0 mm; **c**: immature male, 3.5 mm; AM P56829, Phuket Island, Andaman Sea. Scales represent 0.1 mm.

long, with notch; rostrum present; eye present, ventrally tapered. *Antenna 1* peduncular article 1 not ball-shaped proximally, distal margin with well developed medial spine, article 2 medium length; flagellum without callynophore, calceoli absent. *Antenna 2* flagellum about as long as that of

antenna 1, without calceoli. *Mouthpart bundle* subquadrate. *Epistome/Upper lip* with broad midanterior step (lateral view). *Mandible lacinia mobilis* a stemmed distolaterally cusped blade; accessory setal row with intermediate setae; palp article 2 without posterodistal setae; palp article 3

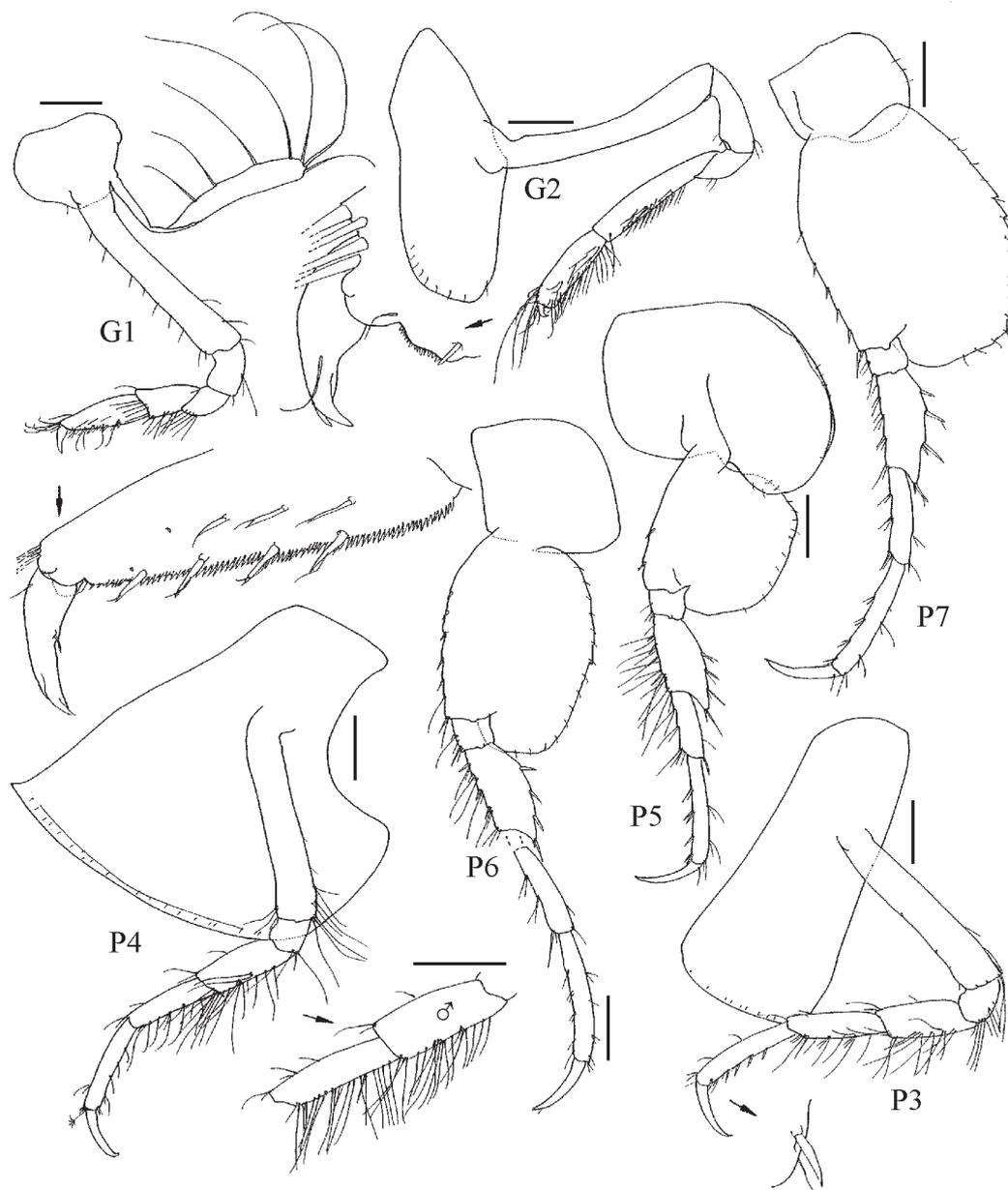


Figure 3 *Vijaya tenuipes* Walker. **a:** female, 6.0 mm; **b:** mature male, 5.0 mm; AM P56829, Phuket Island, Andaman Sea. Scales represent 0.2 mm.

with proximal A3-seta (in male only). *Maxilliped* outer plate with distal margin serrate, medial margin without notch.

Gnathopod 1 carpus shorter than propodus; propodus, posterior margin with robust setae.

Gnathopod 2 palm transverse, without lateral robust setae, with 1 to 4 medial robust setae (1 small). *Pereopods 3 and 4* merus and carpus without setal fringe. *Pereopod 4* coxa with anterior and posterior margins subparallel, anteroventral

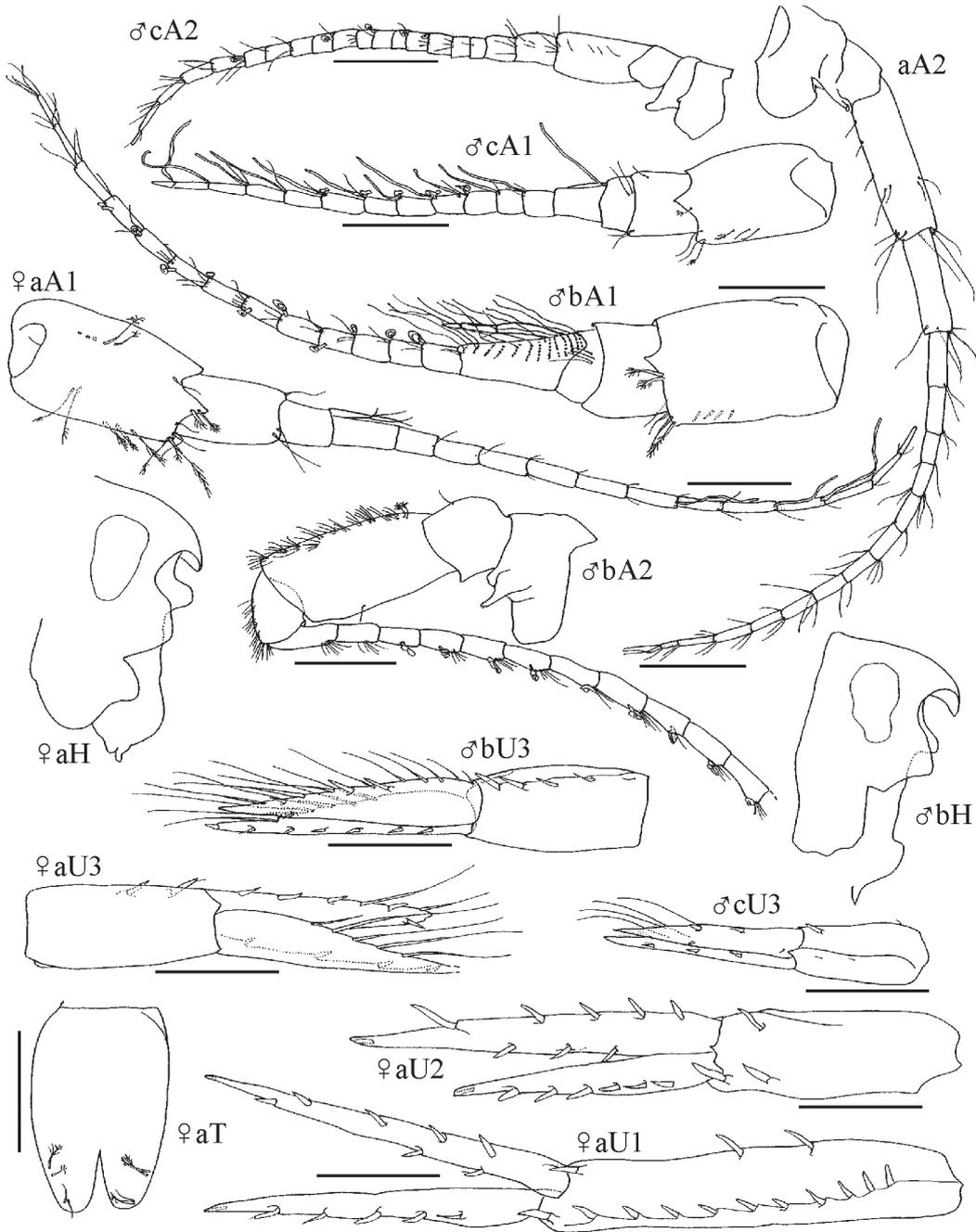


Figure 4 *Vijaya tenuipes* Walker. **a:** female, 6.0 mm; **b:** mature male, 5.0 mm; **c:** immature male, 3.5 mm; AM P56829, Phuket Island, Andaman Sea. Scales represent 0.2 mm.

corner acutely produced. *Pereopods* 5–7 with distal articles elongate; dactyli long and slender. *Pereopod* 5 basis expanded posteriorly, rounded. *Pereopod* 7 basis subrectangular, posteroventral corner subquadrate, posteroventral margin straight.

Epimeron 3 posterior margin smooth, with notch on acute posteroventral corner. *Uropod* 1 outer ramus without large spines between robust setae. *Uropod* 2 inner ramus slightly constricted. *Uropod* 3 rami lanceolate; with plumose setae; outer ramus 1-articulate. *Telson* slightly cleft.

Male (sexually dimorphic characters). *Antenna* 1 flagellum with callynophore, calceoli present. *Antenna* 2 peduncular articles 4 and 5 enlarged; flagellum longer than body, with calceoli. Mandible palp article 2 with posterodistal setae. *Pereopods* 3 and 4 merus and carpus with setal fringe.

Remarks

This is the first record of *Vijaya tenuipes* since its original description (Walker, 1904). Our redescription confirms its generic status and places it in the *Bathyamaryllis* group. *Vijaya tenuipes* becomes the only shallow-water member of the group and the only member of the amaryllidids living in shallow tropical waters. The distribution of *V. tenuipes* is extended from Sri Lanka to the eastern Andaman Sea.

Distribution

Coast of Sri Lanka; eastern Andaman Sea; to a depth of 68 m.

Lysianassidae Dana

Lepidepcreum Bate and Westwood

Lepidepcreum Bate and Westwood, 1868: 509.– Stebbing, 1888: 686.– Sars, 1891: 112. – Stebbing, 1906: 78.– Chevreux and Fage, 1925: 62.– Stephensen, 1929: 67.– Gurjanova, 1951: 274.– Hurley, 1963: 48.– J.L. Barnard, 1969: 348.– Lincoln, 1979: 72.– Ledoyer, 1986: 777.– Diviacco and Ruffo, 1989: 490.– Barnard and Karaman, 1991: 496.

Diagnosis

Body expanded to form a lateral bulge (not known for all species). *Antenna* 2 peduncular article 3 elongate. *Mandible* molar columnar (sometimes reduced) oval, fully triturating. *Gnathopod* 1 coxa large, about as long as coxa 2 (more than 0.7); carpus long (length 2 to 3.9 x breadth). *Uropod* 3 outer ramus 2-articulate.

Type species

Lepidepcreum carinatum Bate and Westwood, 1868 (= *Anonyx longicornis* Bate and Westwood, 1861) by monotypy.

Species composition

Lepidepcreum contains 31 species: *Lepidepcreum alectum* Gurjanova, 1962; *L. andamanensis* n.sp.; *L. clypeatum* Chevreux, 1888; *L. clypodentatum* J.L. Barnard, 1962; *L. comatum* Gurjanova, 1962; *L. crenulatum* (Chevreux, 1925b); *L. crypticum* Ruffo and Schiecke, 1977; *L. eoum* Gurjanova, 1938; *L. foraminiferum* Stebbing, 1888; *L. garthi* Hurley, 1963; *L. gurjanovae* Hurley, 1963; *L. hirayamai* n.sp.; *L. infussum* Andres, 1983; *L. kasatka* Gurjanova, 1962; *L. longicorne* (Bate and Westwood, 1861); *L. lukini* (Budnikorg, 1999); *L. madagascarensis* Ledoyer, 1986; *L. magdalenensis* (Shoemaker, 1942); *L. nautilus* Gurjanova, 1962; *L. rostratum* Gurjanova, 1962; *L. sagamiensis* Gamo, 1975; *L. serraculum* Dalkey, 1998; *L. serratum* Stephensen, 1925; *L. somchaii* n. sp.; *L. subclypeatum* Ruffo and Schiecke, 1977; *L. takeuchii* n.sp.; *L. twalae* Griffiths, 1974; *L. typhlops* Bonnier, 1896; *L. umbo* (Goës, 1866); *L. urometacarinatum* Andres, 1985; *L. vitjazi* Gurjanova, 1962.

Remarks

Species in the genus are distinguished from other tryphosine amphipods by the combination of an elongate peduncular article 3 on antenna 2 and a long carpus on gnathopod 1. One species, *L. crenulatum*, has a short article 3, but the species is based on a juvenile. In all species we have seen there is a midlateral bulge in the body which gives it a diamond-shaped appearance in cross-section

and this may be a synapomorphic character of the genus. Most species have some form of dorsal carina. It may extend for the entire body length, but it is most obvious on the pleonites and urosomites. Within the genus there is a trend towards anterodistal lobes on antennae 1 and 2 and in some species the basis of pereopod 7 becomes dorsodistally extended to a point where it covers the whole leg. Nearly all species have a moderately to deeply cleft telson.

The nearest geographic record of *Lepidepcreum* to the Andaman Sea is that of *L. foraminiferum* Stebbing, 1888, recorded by Nayar (1959) from the Madras Coast of India, in the northern Indian Ocean. Nayar's material is clearly not *L. foraminiferum* which was originally described from Kerguelen Island in the Southern Ocean. Nayar's material differs from that species in having: antenna 1 peduncular article 1 not strongly produced dorsodistally; gnathopod 2 palm transverse; pereopod 7 basis less produced posterodistally; pereopod 7 merus with a strong posteroproximal shoulder; female uropod 3 with plumose setae on outer ramus. No molar is shown on the illustration of the mandible. If a molar were present, then this material would represent a new species of *Lepidepcreum*.

There are no records of *Lepidepcreum* from the Gulf of Thailand or the seas bordering the coasts of Vietnam and China. *Lepidepcreum nudum* Imbach, 1967, from the Bay of Nhatrang, Vietnam has been transferred to the genus *Waldeckia* by Lowry (2000). Several species of *Lepidepcreum* are known from the Sea of Japan and the Sea of Okhotsk.

Chevreur (1925a) described the new species *L. serratum*. However, this name is a homonym of *L. serratum* Stephensen, 1925. In an erratum slip, issued with his second paper on the amphipods collected during the voyages of the schooner *Melita*, Chevreur (1925b) recognised this homonymy and proposed the new name *L. crenulatum*. Gurjanova (1938), apparently unaware of Chevreur's correction, introduced the replacement name *L. chevreuxi* which has been used since. Based on priority, *Lepidepcreum*

crenulatum is the valid name for the species.

Lepidepcreum cingulatum K.H. Barnard, 1932 has some characters of the genus *Lepidepcreum*, but it has no dorsal carinae and no anterodistal lobes on the peduncle of antenna 1. It is excluded from *Lepidepcreum* by gnathopod 1 which has a short carpus with a posterior lobe. Based on the characters available from the original description the species appears to belong in the genus *Orchomenella*.

Lepidepcreum magdalenensis was originally placed in the genus *Orchomenella*. De Broyer, 1984 included it in an unnamed subgenus of *Orchomenella*. In fact it appears to fit into the group of *Lepidepcreum* species without anterodistal lobes on the peduncle of antenna 1. This group includes *L. andamanensis* and *L. madagascarensis* plus a number of undescribed Australian species.

Implicit characters

Unless indicated otherwise, the following attributes are implicit throughout the *Lepidepcreum* descriptions, except where the characters concerned are inapplicable. Antenna 1 accessory flagellum present, not forming cap, terminal article not offset; calceoli small. Antenna 2 articles 3 to 5 not enlarged. Epistome/Upper lip separate; upper lip not produced. Maxilla 1 outer plate setal-tooth 7 present. Maxilliped basis without recurved hook. Pereonite 1 dorsally smooth. Gnathopod 1 without setal patch on merus and propodus; propodus small, sparsely setose along posterior margin. Pereonite 2 dorsally smooth. Pereonite 3 dorsally smooth. Pereonite 4 dorsally smooth. Pereopod 5 basis without photophore, not posteroproximally excavate, posterior margin not serrate, posterior margin without midcentral spine, without posteroventral lobe or spine. Pereonite 6 dorsally smooth. Pereonite 7 dorsally smooth. Pereopod 7 basis not posterodistally excavate. Urosomite 1 not projecting over urosomite 2. Uropods 1 and 2 rami without stout striated robust setae. Uropod 2 inner ramus without constriction. Uropod 3 stout; peduncle without dorsolateral flange.

Lepidepcreum andamanensis sp. nov.
(Figs 5–7)

Material examined

Holotype: PMBC 14902, female, 3.4 mm. BIOSHELF St. A2, 09°30'N, 097°51'E, sandy mud, fine sand and shell fragments, box corer, 61 m, coll. S. Bussarawit and C. Aungtonya, 18.04.1996.

Type locality

West of Phuket Island, Thailand, Andaman Sea, 09°30'N 097° 51'E, 61 m depth.

Description

Based on holotype female, 3.4 mm. *Body* expanded to form a lateral bulge. *Head with lateral cephalic lobe semidome, apically subacute*; eyes apparently absent (not apparent in preserved material). *Antenna 1 peduncular articles 1 and 2 without anterodistal lobe*; accessory flagellum vestigial; flagellum without calynophore; robust setae absent from proximal articles; calceoli absent. *Antenna 2 peduncular article 3 elongate*; flagellum short, calceoli absent. *Epistome/upper lip* with epistome produced equally with upper lip, slightly concave; upper lip not produced. *Mandible* molar columnar with oval fully triturating surface; palp attached proximally, article 3 without A3-setae.

Maxilla 1 outer plate left and right setal-tooth 7 symmetrical, cuspidate distally; palp distal margin with apical robust setae. *Maxilliped* outer plate without apical robust setae.

Gnathopod 1 subchelate; coxa large, about as long as coxa 2, subrectangular, with concave anterior margin; **basis moderately setose along anterior margin**; ischium short; carpus long, subequal in length to propodus, without posterior lobe; without setal patch on merus and propodus; propodus margins subparallel, **palm acute, entire, slightly concave**. *Gnathopod 2* **palm slightly obtuse**. *Pereopod 4* **coxa without distinct lateral ridge**, with a well developed posteroventral lobe. *Pereonite 5* **dorsally smooth**. *Pereopod 5* **coxa without distinct lateral ridge, without umbo; basis about as long as broad**. *Pereopod 7* **basis posterodistally produced to about distal end of merus**.

Pleonite 1 without mid-dorsal carina, **not produced dorsodistally**. *Pleonite 2* without mid-dorsal carina, **not produced dorsodistally**. *Pleonite 3* with mid-dorsal carina, **produced dorsodistally, apically acute, posterodorsal margin produced**. *Epimeron 3* posterior margin smooth, **posteroventral corner narrowly rounded**. *Urosomite 1* projecting over urosomite 2, posterodistally acute. *Uropod 3* stout; **inner and**

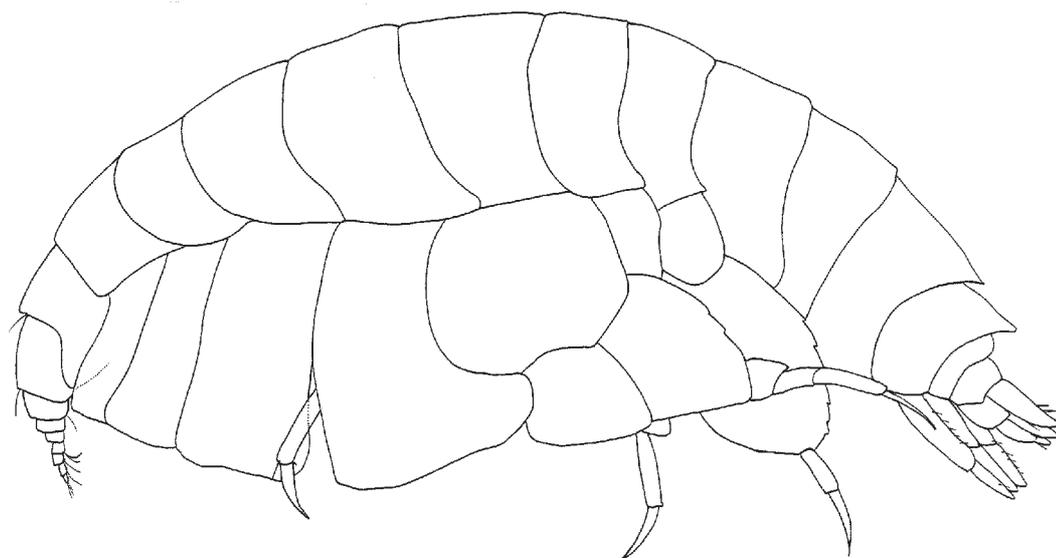


Figure 5 *Lepidepcreum andamanensis* sp. nov. Holotype female, 3.4 mm, PMBC 14902, Andaman Sea.

outer rami well developed; outer ramus article 2 short, rami without plumose setae. *Telson* moderately cleft, with dorsal robust setae, with 1 apical robust seta on each lobe.

Etymology

The geographic epithet *andamanensis* is given to distinguish this species from its nearest relative living in Madagascar.

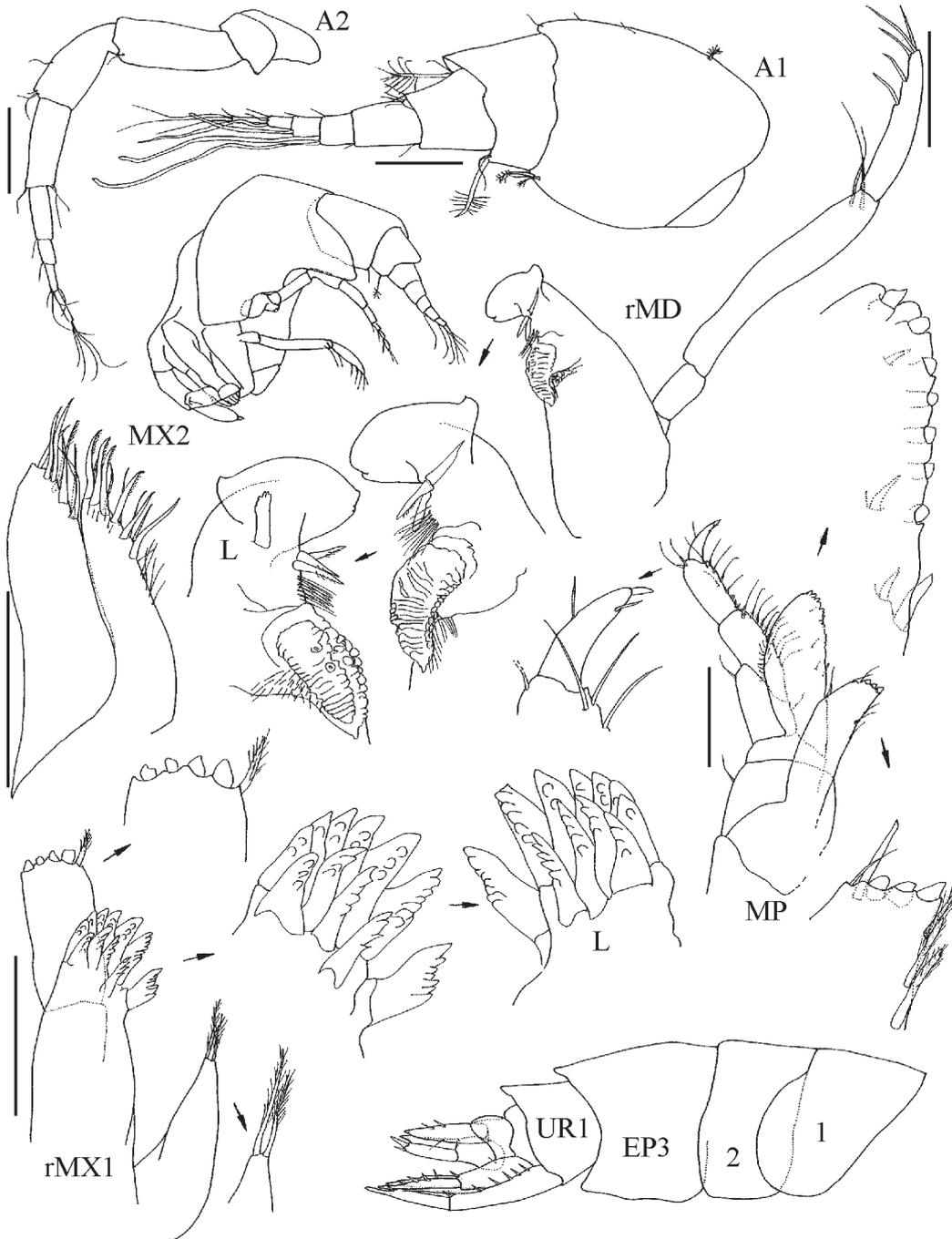


Figure 6 *Lepidepcreum andamanensis* sp. nov. Holotype female, 3.4 mm, PMBC 14902, Andaman Sea. Scale represents 0.1 mm.

Remarks

Lepidepecreum andamanensis belongs in the group of species without projecting lobes on the peduncle of antenna 1. It is very similar to *L. madagascarensis* Ledoyer, 1986. The two species are distinguished from each other by a number of small differences: in *L. andamanensis* the lateral

cephalic lobe forms a semidome which is apically subacute (not subtriangular and apically rounded); the anterior margin of the basis of gnathopod 1 is moderately setose (not sparsely setose); the carpus of gnathopod 1 is subequal in length to the propodus (not longer than propodus); the mid-dorsal carina of pleonite 3 is acutely produced

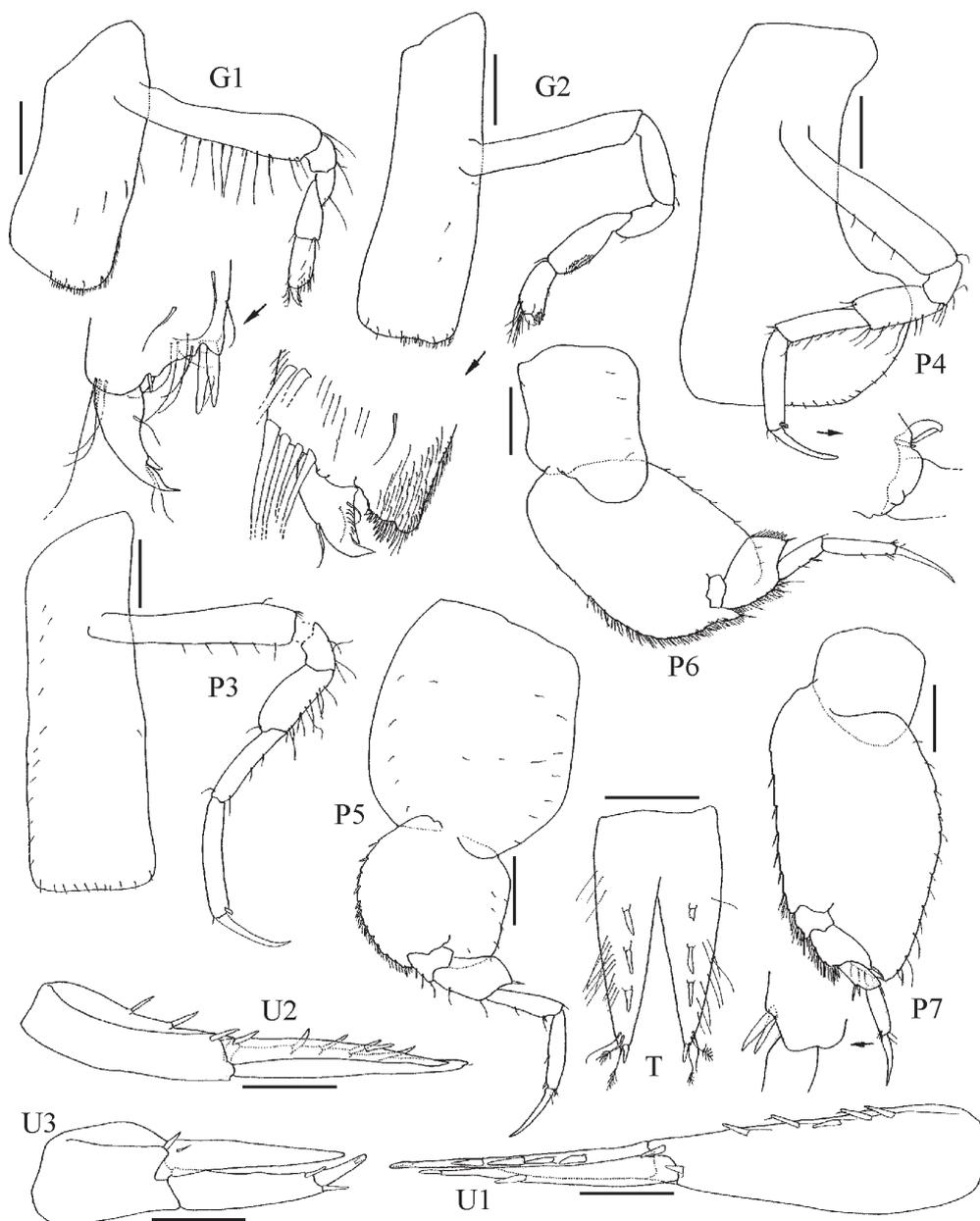


Figure 7 *Lepidepecreum andamanensis* sp. nov. Holotype female, 3.4 mm, PMBC 14902, Andaman Sea. Scales for U1-3, T represent 0.1 mm, remainder represent 0.2 mm.

dorsodistally (not truncated); the posteroventral corner of epimeron 3 is narrowly rounded (not broadly rounded); and the telson is moderately cleft (not deeply cleft).

Lepidepecreum andamanensis also shows many similarities to *Lepidepecreum magdalenensis* (Shoemaker, 1942) from Californian coastal waters. They differ as follows: in *L. andamanensis* the epistome is produced equally with the upper lip (not produced beyond upper lip); the outer plate of the maxilliped is without apical robust setae (not present); the palm of gnathopod 1 is concave (not straight); the basis of pereopod 7 is posterodistally produced to about distal end of merus (not less than halfway along merus); the dorsal margin of pleonite 3 has an acutely produced dorsodistal carina (not without mid-dorsal carina); and the telson is moderately cleft (not deeply cleft).

Distribution

West of Phuket Island, Thailand, eastern Andaman Sea; 61 m depth.

Lepidepecreum hirayamai sp. nov.

(Fig. 8)

? *Lepidepecreum vitjazi*.— Nagata, 1965: 145.

Lepidepecreum vitjazi.— Hirayama, 1985: 197–201, figs 185–188.

Holotype: AMBL-Amph 58, female, 6.25 mm, Shijiki Bay, Tomioka Bay or the Ariake Sea, west Kyushu, Japan, East China Sea (not examined). [originally identified as *L. vitjazi* by Hirayama, 1985]

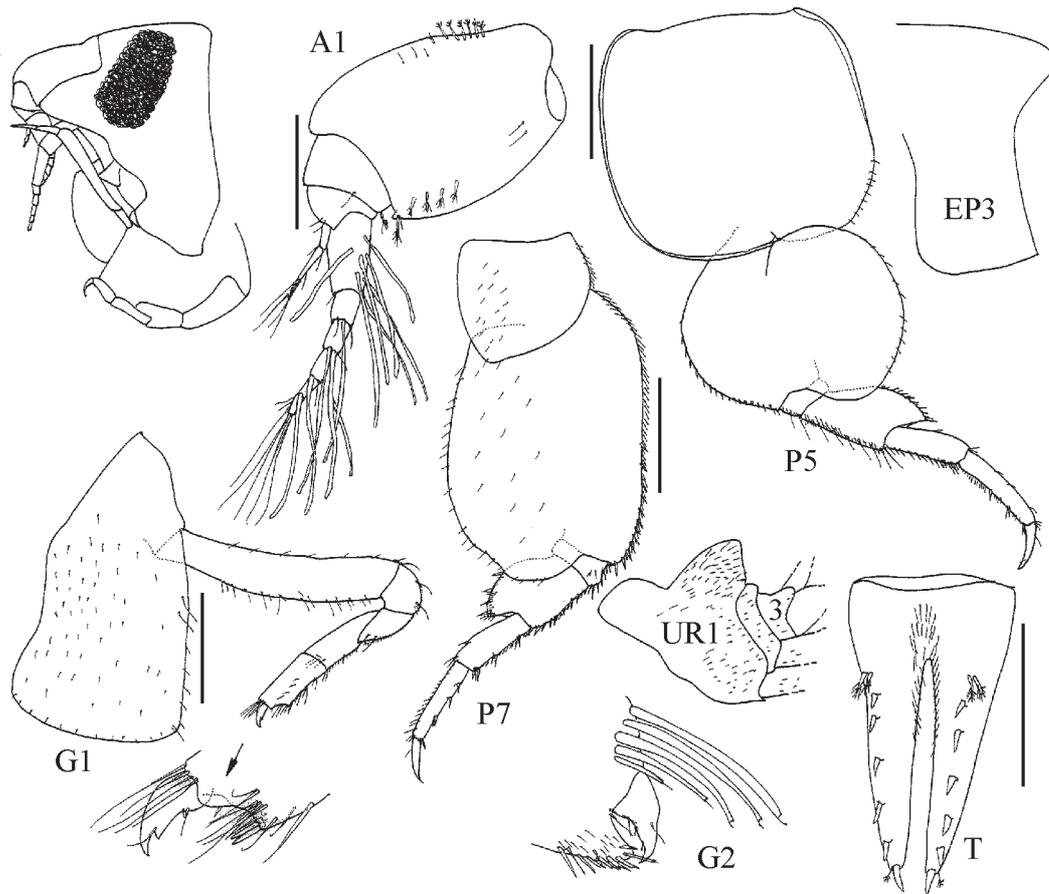


Figure 8 *Lepidepecreum hirayamai* sp. nov. Holotype, female, 6.25 mm, AMBL-58, west Kyushu, Japan. Scales for A1, T represent 0.2 mm, remainder represent 0.5 mm. All after Hirayama, 1985.

Type Locality

Shijiki Bay, Tomioka Bay or the Ariake Sea, west Kyushu, Japan, East China Sea.

Description

Based on holotype female, 6.25 mm. *Body* without dorsal carina. **Head with lateral cephalic lobe semidome, apically acute**; eyes oval or subrectangular. **Antenna 1 peduncular article 1 with weakly developed anterodistally rounded lobe; article 2 without anterodistal lobe**; accessory flagellum 3-articulate; flagellum with weak 1-field calynophore; robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 elongate; flagellum short; calceoli absent. *Epistome/Upper lip* with epistome produced beyond upper lip, broadly rounded; upper lip not produced. *Mandible* molar columnar with oval fully triturating surface; palp attached proximally, article 3 without A3-setae. *Maxilla 1* outer plate setal-tooth 7 present, [symmetry not known; cuspidation not known]; palp distal margin with apical robust setae. *Maxilliped* [outer plate apical robust setae not known].

Gnathopod 1 subchelate; coxa large, about as long as coxa 2, subrectangular, with concave anterior margin; **basis moderately setose along anterior margin**; ischium short; carpus long, longer than propodus, without posterior lobe; propodus, margins subparallel, **palm acute, entire, concave. Gnathopod 2 palm obtuse.**

Pereopod 4 coxa without distinct lateral ridge, with a well developed posteroventral lobe.

Pereonite 5 dorsally smooth. **Pereopod 5** coxa without distinct lateral ridge, without umbo; basis broader than long. **Pereopod 7** basis posterodistally produced less than halfway along merus, posterodistally excavate.

Pleonite 1 without mid-dorsal carina, **not produced dorsodistally. Pleonite 2** without mid-dorsal carina, **not produced dorsodistally. Pleonite 3** **not produced dorsodistally, posterodorsal margin not produced. Epimeron 3** posterior margin smooth, **posteroventral corner subquadrate. Urosomite 1** projecting over urosomite 2, posterodistally acute to subacute. **Uropod 3** stout; **inner and outer rami well**

developed; outer ramus article 2 short, with plumose setae on outer ramus. **Telson deeply cleft**, with dorsal robust setae, with 1 apical robust seta on each lobe.

Etymology

This species is named for Akira Hirayama in recognition of his work on the amphipod fauna of the western Pacific Ocean.

Remarks

Hirayama (1985) misidentified his material as *L. vitjazi* Gurjanova (1962). *Lepidepcreum hirayamai* is very similar to *L. vitjazi* but can be distinguished from that species by: pereopod 5 basis broader than long (not as long as broad); pereopod 7 basis posterodistally excavate (not entire); pleonite 3 not produced dorsodistally (not with a weakly rounded dorsodistal carina); and epimeron 3 posteroventral corner subquadrate (not acutely produced). The posterodorsal projection of urosomite 1 is less acute in *L. hirayamai* than in *L. vitjazi*, but this character can vary between males and females. *Lepidepcreum hirayamai* is known only from females and *L. vitjazi* only from males (Gurjanova's 1962 figure 112 is incorrectly labelled as female).

Hirayama (1985) originally had eight specimens from three localities (Shijiki Bay, Tomioka Bay and the Ariake Sea) all in west Kyushu. He illustrated one female, which we have designated as the holotype, but he did not indicate to which locality this specimen belonged. Consequently the type locality is imprecise, but confined to west Kyushu.

Nagata (1965) also recorded *L. vitjazi* from Japan but noted several differences between his material and Gurjanova's (1962) description: no oblique row of setae on coxa 1; marginal setae on propodus of gnathopod 1 not hooked at apex; telson with five pairs of dorsal spines; posterodorsal end of pleonite 3 feebly carinate, not projecting or upraised; urosomite 1 dorsal projection distally less acute. In all of these characters Nagata's material corresponds to that of Hirayama (1985).

Distribution

Ariake Sea and Seto Inland Sea, Japan.

Lepidepecreum lukini (Budnikova) comb. nov.

Orchomenella lukini Budnikova, 1999: 245, figs 6–10.

Remarks

Although not one of the highly ornamented species this taxon belongs in *Lepidepecreum* because of the combination of long third article on the peduncle of antenna 2 and elongate carpus of gnathopod 1. This species is similar to both *L. hirayamai* and *L. vitjazi*. It differs from *L. hirayamai* in the triangular lateral cephalic lobe, the almost transverse palm of gnathopod 1 and the acutely produced posteroventral corner of epimeron 3; and from *L. vitjazi* in the posterodistally excavate basis of pereopod 7 and the dorsally unproduced pleonite 3.

Lepidepecreum somchaii sp. nov.
(Figs 9–11)

Material examined

Holotype: PMBC 14903, female, 5.4 mm, BIOSHELF St.B2, 09°14'N, 097°54'E, triangular dredge, 61 m, coll. S. Bussarawit and C. Aungtonya, 17.02.1998.

Paratypes: PMBC 14904, male, 4.5 mm, same

data as holotype; AM P56713, 3 specimens, BIOSHELF St. PB7, 07°44'N, 098°41'E, Ockelmann sledge, 32 m, coll.S. Bussarawit and C. Aungtonya, 21.02.1998.

Type locality

North-west of Phuket Island, Thailand, Andaman Sea, 09°14'N, 097°54'E, 61 m.

Description

Based on holotype female, 5.4 mm. *Body* expanded to form a lateral bulge. **Head with lateral cephalic lobe a semidome, apically subacute**; eyes oval. **Antenna 1 peduncular articles 1 and 2 with well developed anterodistally rounded lobe**; accessory flagellum well developed (4–5 articles); flagellum without calynophore; robust setae absent from proximal articles; calceoli absent. *Antenna 2* peduncular article 3 elongate; flagellum short; calceoli absent. *Epistome/upper lip* with epistome produced beyond upper lip, broadly rounded; upper lip not produced. *Mandible* molar columnar with oval fully triturating surface; palp attached proximally, article 3 without A3-setae. *Maxilla 1* outer plate left and right setal-tooth 7 symmetrical, cuspidate distally; palp distal margin with apical robust setae. *Maxilliped* outer plate without apical robust setae.

Gnathopod 1 subchelate; coxa large, about

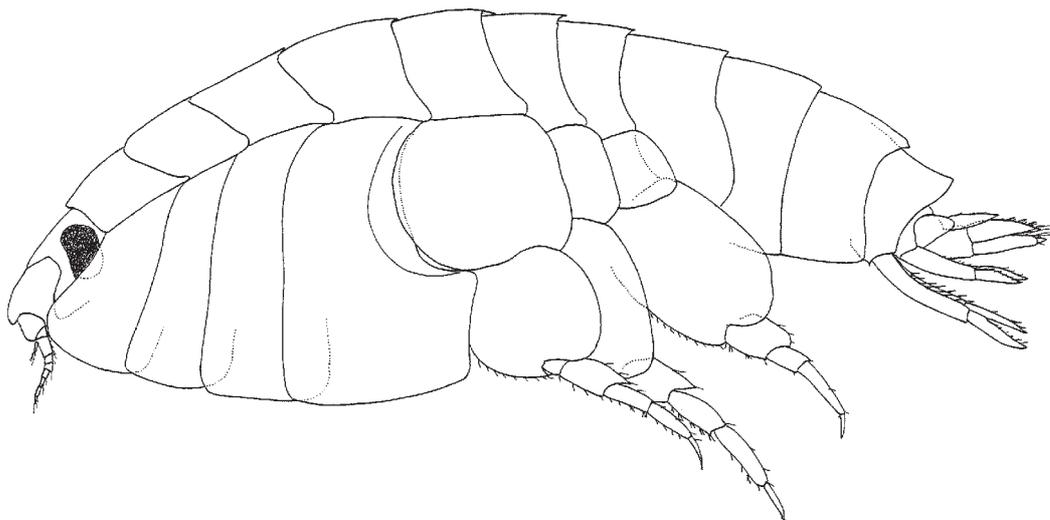


Figure 9 *Lepidepecreum somchaii* sp. nov. Holotype female, 5.4 mm, PMBC 14903, off Phuket Island, Andaman Sea.

as long as coxa 2, subrectangular with concave anterior margin; **basis moderately setose along anterior margin**; ischium short; carpus long, longer than propodus, without posterior lobe;

propodus margins subparallel, **palm acute, entire, slightly concave**. **Gnathopod 2 palm transverse**. **Pereopod 4 coxa without distinct lateral ridge**, with a well developed posteroventral lobe.

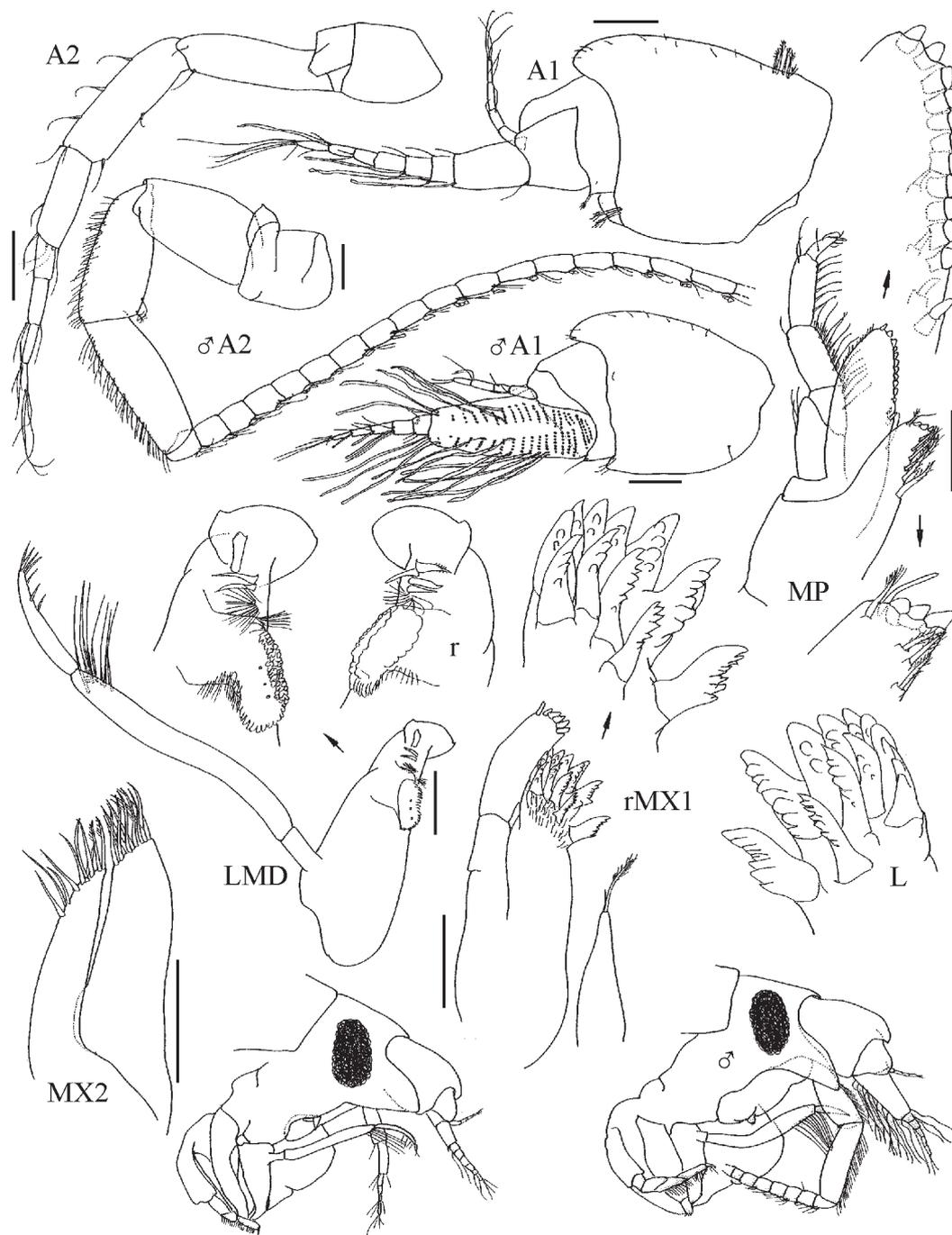


Figure 10 *Lepidepecreum somchaili* sp. nov. Holotype female, 5.4 mm, PMBC 14903; paratype male, 4.5 mm, PMBC 14904; off Phuket Island, Andaman Sea. Scales represent 0.1 mm.

Pereonite 5 dorsally smooth. Pereopod 5 coxa without distinct lateral ridge, without umbo; basis about as long as broad. Pereopod 7 basis

posterodistally produced less than halfway along merus, posterodistally excavate.

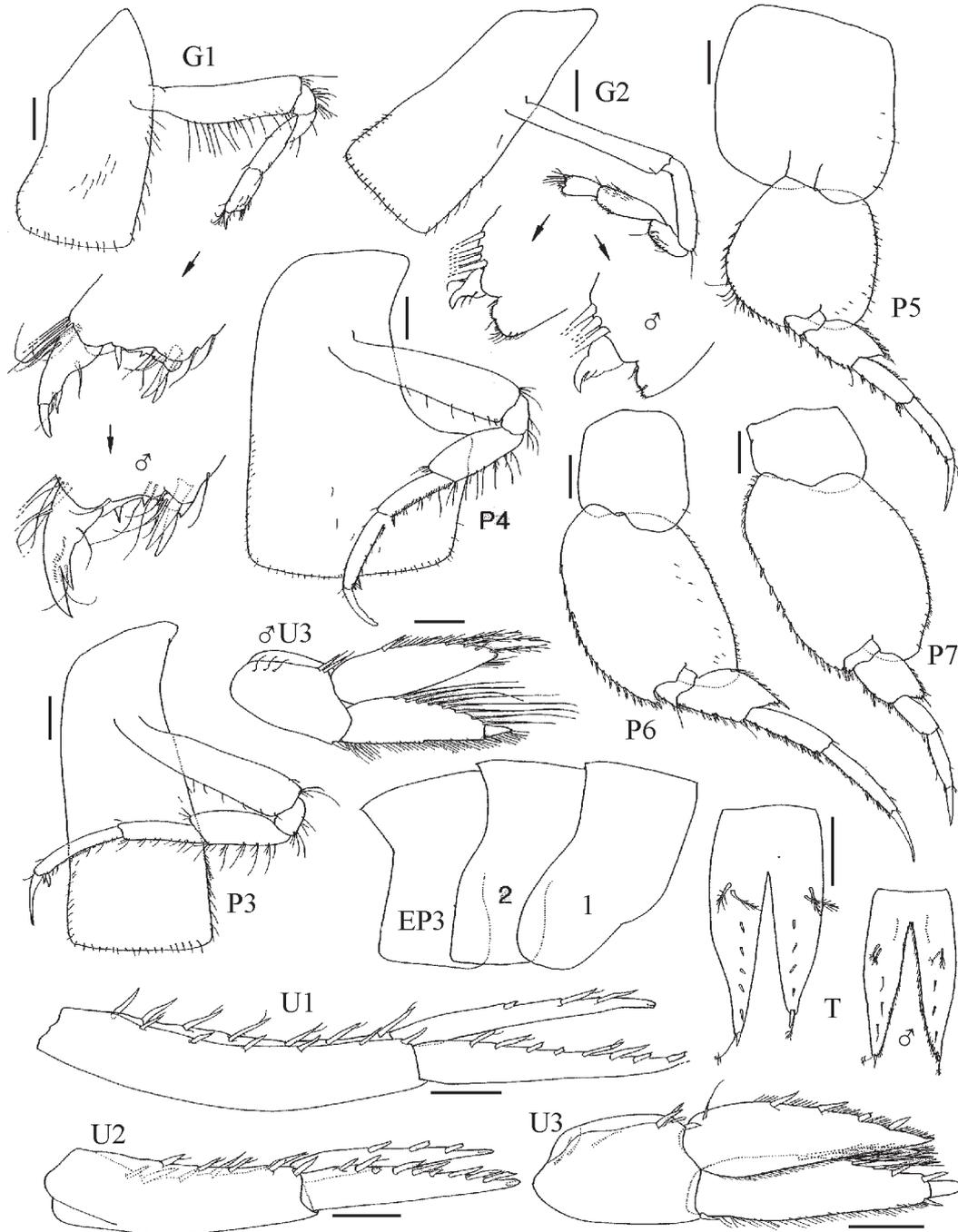


Figure 11 *Lepidepecreum somchaili* sp. nov. Holotype female, 5.4 mm, PMBC 14903; paratype male, 4.5 mm, PMBC14904; off Phuket Island, Andaman Sea. Scales for U1-3, T represent 0.1 mm, remainder represent 0.2 mm.

Pleonite 1 without mid-dorsal carina, **not produced dorsodistally**. **Pleonite 2** without mid-dorsal carina, **not produced dorsodistally**. **Pleonite 3** with mid-dorsal carina, **not produced dorsodistally, posterodorsal margin not produced**. **Epimeron 3** posterior margin smooth, **posteroventral corner narrowly rounded**. **Urosomite 1** projecting over urosomite 2, dorsodistally truncated. **Uropod 3** stout; **inner and outer rami well developed, outer ramus article 2 short**, with plumose setae on outer ramus. **Telson deeply or moderately cleft**, with dorsal robust setae, with 1 apical robust seta on each lobe.

Male (sexually dimorphic characters). Based on paratype male, 4.5 mm. **Head** with lateral cephalic lobe subtriangular, apically subacute. **Antenna 1** flagellum with strong 2-field callynophore; calceoli absent. **Antenna 2** peduncular articles 3 to 5 enlarged; flagellum elongate, calceoli present. **Uropod 3** rami with plumose setae on each ramus. **Telson** deeply cleft.

Etymology

This species is named for Somchai Bussarawit in recognition of his efforts to make known the crustacean fauna of the Andaman Sea.

Remarks

Lepidepcreum somchaiti is very similar to both *L. hirayamai* and *L. vitjazi*. It can be distinguished from both these species by: the rounded anterodistal lobe on antenna 1 peduncular article 2; the transverse palm of gnathopod 2; and the truncated posterodistal projection on urosomite 1. It is further distinguished from *L. hirayamai* by the absence of a callynophore on female antenna 1 and by having pereopod 5 basis about as long as broad; and from *L. vitjazi* by the posterodistal excavation of pereopod 7 basis and the narrowly rounded posteroventral corner of epimeron 3.

Distribution

West of Phuket Island, Thailand, eastern Andaman Sea; 31–61 m.

Lepidepcreum takeuchii sp. nov. (Fig. 12)

Lepidepcreum gurjanovae.— Hirayama and Takeuchi, 1993: 152–156, figs 8–11.

Holotype: TSM Asia-7, male, 12.6 mm, Matsukawa-ura Inlet, Fukushima Prefecture, Japan, Y. Oozeki *et al.*, 12–13.02.1989 (not examined). [originally identified as *L. gurjanovae* by Hirayama and Takeuchi, 1993].

Type Locality

Matsukawa-ura Inlet, Fukushima Prefecture, Japan.

Description

Based on holotype male, 12.6 mm. **Body**. [shape not known]. **Head with lateral cephalic lobe subtriangular, apically acute or subacute**; eyes slightly lageniform. **Antenna 1 peduncular article 1 with well developed anterodistally rounded lobe; article 2 without anterodistal lobe**; accessory flagellum 4-articulate; flagellum with strong 2-field callynophore; robust setae absent from proximal articles; calceoli present. **Antenna 2** peduncular article 3 elongate; articles 3 to 5 enlarged; flagellum elongate, calceoli present. **Epistome/Upper lip** [not known]. **Mandible** molar columnar with oval fully triturating surface; palp attached proximally, article 3 without A3-setae. **Maxilla 1** outer plate setal-tooth 7 present, [symmetry not known], cuspidate distally; palp distal margin with apical robust setae. **Maxilliped** [outer plate apical robust setae not known].

Gnathopod 1 subchelate; coxa large, about as long as coxa 2, subrectangular with straight or concave anterior margin; **basis sparsely setose along anterior margin**; ischium short; carpus long, slightly longer than propodus, without posterior lobe; propodus margins subparallel, **palm acute, entire, convex**. **Gnathopod 2 palm obtuse**. **Pereopod 4 coxa without distinct lateral ridge**, with a well developed posteroventral lobe. **Pereopod 5** dorsally smooth. **Pereopod 5 coxa without distinct lateral ridge, without umbo**;

basis about as long as broad. *Pereopod 7* basis posterodistally produced less than halfway along merus, posterodistally slightly excavate.

Pleonite 1 without mid-dorsal carina, not produced dorsodistally. *Pleonite 2* without mid-dorsal carina, not produced dorsodistally.

Pleonite 3 not produced dorsodistally, posterodorsal margin produced. *Epimeron 3* posterior margin smooth, posteroventral corner subquadrate. *Urosomite 1* projecting over urosomite 2, dorsodistally rounded. *Uropod 3* stout; inner and outer rami well developed,

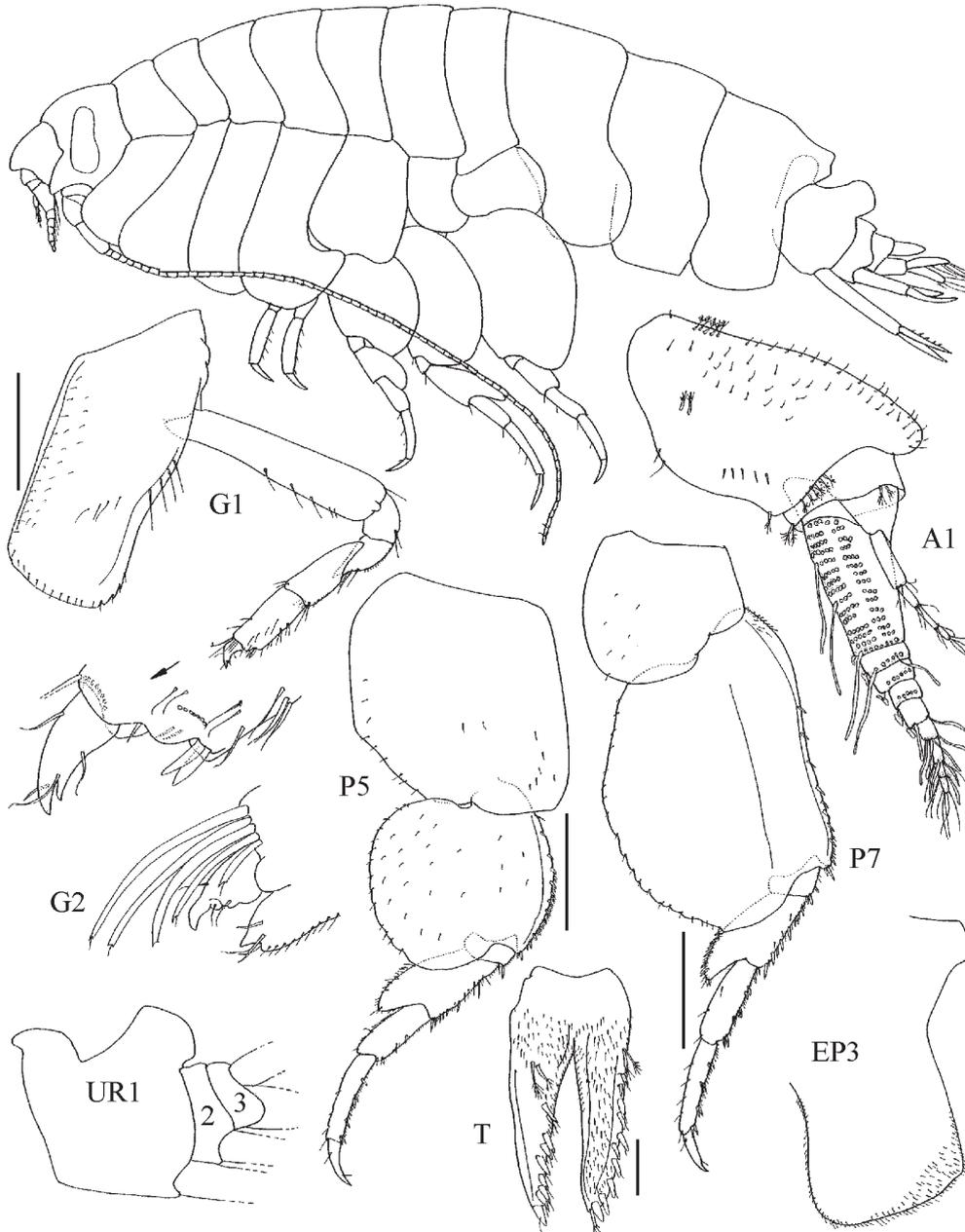


Figure 12 *Lepidepecreum takeuchii* sp. nov. Holotype, male, 12.6 mm, TSM Asia-7, Matsukawa-ura Inlet, Japan. Scales for A1, T represent 0.1 mm, remainder represent 0.5 mm. All after Hirayama and Takeuchi, 1993.

outer ramus article 2 short, rami with plumose setae on each ramus. **Telson deeply cleft**, with dorsal robust setae (about 9 per lobe), with 1 apical robust seta on each lobe.

2 palm obtuse (not transverse); pereopod 7 basis posterodistally excavate; posteroventral corner of epimeron 3 subquadrate (not acutely produced); and dorsal projection on urosomite 1 distally rounded (not distally acute).

Etymology

Named for Ichiro Takeuchi in recognition of his work on the caprellidean amphipods of the seas of the Western Pacific Ocean.

Distribution

Matsukawa-ura Inlet, Japan.

Remarks

Lepidepcreum takeuchii was originally identified by Hirayama and Takeuchi, 1993, as *L. gurjanovae* Hurley, 1963, known from the west coast of North America. *Lepidepcreum takeuchii* can be distinguished from *L. gurjanovae* by: gnathopod 1 palm convex (not straight); gnathopod

ACKNOWLEDGEMENTS

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International Workshop on the Crustacea of the Andaman Sea

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