Zootaxa 4021 (2): 351–367
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.4021.2.6
http://zoobank.org/urn:lsid:zoobank.org:pub:78AB258C-42D4-4950-8682-DC2BE1B4855D

Revision of the cirolanid isopod genus *Odysseylana* Malyutina, 1995 (Crustacea) with description of two new species from Singapore

CONNI M. SIDABALOK[1,2,3] & NIEL L. BRUCE[1,2]

[1]*College of Marine and Environmental Sciences, James Cook University, Townsville, Queensland 4811 AUSTRALIA. E-mail: conni.sidabalok@my.jcu.edu.au*

[2]*Museum of Tropical Queensland, Queensland Museum, 70–102 Flinders Street, Townsville, Queensland, Australia, 4810; and Water Research Group (Ecology), Unit for Environmental Sciences and Management, North West University, Private Bag X6001, Potchefstroom, 2520, South Africa. E-mail: niel.bruce@qm.qld.gov.au*

[3]*Division of Zoology, Research Center for Biology, Indonesian Institute of Sciences (LIPI), Gedung Widyasatwaloka, Cibinong Science Center, Jl Raya Jakarta-Bogor Km 46, Cibinong 16911, Indonesia*

Abstract

The genus *Odysseylana* Malyutina, 1995 is revised and a new diagnosis presented; two new species from Singapore are described: *Odysseylana sakijang* **sp. nov.** and *Odysseylana temasek* **sp. nov.** The monotypic genus *Parilcirolana* Yu & Li, 2001, is placed in synonymy, bringing total number of species in *Odysseylana* to four including the type species *Odysseylana sirenkoi* Malyutina, 1995 and *Odysseylana setosa* (Yu & Li, 2001) **comb. nov.** The genus is known only from coastal waters from Singapore to off Macau, western Pacific. The principal distinguishing character of *Odysseylana* are an elongate body shape (2.9–3.5 long as greatest width), head without a rostral point, pentagonal and flat frontal lamina; antenna peduncle articles 1–3 short, 4 and 5 subequal in length and longest; and pleopod 1 peduncle quadrate, and a slender pleopod 1 endopod.

Key words: *Odysseylana, Parilcirolana,* Singapore, Indo-Malayan region

Introduction

The Cirolanidae is a large family with 61 genera and 497 species worldwide (Bruce & Schotte 2015). Of these, 44 genera and 412 species are marine (Poore & Bruce 2012). Cirolanids occur in all oceans, to a maximum depth of almost 3000 metres (Bruce 1986; Brusca *et al.* 1995; Menzies & George 1972), but the greatest diversity is to be found in tropical waters (Poore & Bruce 2012). In South-East Asia only 29 species of Cirolanidae have been recorded (Bruce & Schotte 2015). The Coral Triangle, which lies within the Indo-Malaysian region (Indonesia, Singapore, Malaysia, Philippines) is recognised to be a region of extremely high faunal diversity (Poore & Bruce 2012; Veron *et al.* 2009). Within this region the marine isopod fauna remains minimally documented. The earliest records from the Indo-Malaysian region are those of Bleeker (1857), who published on fish parasitic marine isopods from "Batavia" (= Jakarta). The few later contributions were summarized in the comprehensive account for the Cirolanidae in a *Siboga* Report (Nierstrasz 1931). More recently Bruce & Wong (2015) listed 117 species of marine isopods from Singapore.

The vast Indo-Malaysian region, spanning two oceans, has only 11 recorded cirolanid species (Bruce 1986; Nierstrasz 1931; Richardson 1910) while Thailand has 14 species (Rodcharoen *et al.* 2014). These totals are indicative only of the lack of attention given to the isopod fauna of the region. Comparable regions that are reasonably well-documented indicate the level of diversity to be expected, such as Queensland with 77 species in 12 genera (Bruce *et al.* 2002; Poore 2005) or the single locality of Madang, Papua New Guinea, with 27 species in 11 genera (Bruce 1993). Given the geographical range, abundant coral reefs and diverse marine habitats, and that the region is known to be highly diverse for molluscs and cryptic crustaceans (De Grave 2001; Meyer *et al.* 2005), there is no reason to expect the cirolanid diversity to be less than that of Queensland.

Accepted by J. Svavarsson: 27 Aug. 2015; published: 25 Sept. 2015

Among the species listed by Bruce & Wong (2015) three species were assigned to the hitherto monotypic genus *Odysseylana* Malyutina, 1995. One further examination these proved to be two undescribed species. Neither of these species was the type species *O. sirenkoi* Malyutina, 1995, which has a deeply incised pleotelson. In course of describing these new species and rediagnosing the genus it became apparent that *Parilcirolana* Yu & Li, 2001, also described from the South China Sea, did not differ in any generic character from *Odysseylana*. Therefore we here place *Parilcirolana* Yu & Li, 2001 into synonymy with *Odysseylana* Malyutina, 1995.

Materials and methods

All specimens were collected using baited traps (Keable 1995; Lowry & Smith 2003; Manning 1986) from different depths at different sites in Singapore. Appendages were dissected from paratypes and temporarily mounted in 85% lactic acid solution with lignin pink. Drawings of whole animals were done using a Leica MZ125 dissecting microscope and appendages were done using Leica DM2500 compound microscope with *camera lucida*. Drawings were inked using Adobe Illustrator with Wacom Intuos 4 drawing tablet. Description was prepared with DELTA (Coleman *et al.* 2010; Dallwitz 1980; Dallwitz *et al.* 1997, 2006) using Cirolanidae character set.

Abbreviations: MTQ—Museum of Tropical Queensland; CP—circumplumose; CPS—circumplumose setae; PMS—plumose marginal setae; RS—robust setae; BL—body length; ZRC—Zoological Reference Collection—Lee Kong Chian Natural History Museum, Singapore.

Taxonomy

Suborder CYMOTHOIDA Wägele, 1989

Family CIROLANIDAE Dana, 1852

Genus *Odysseylana* Malyutina, 1995

Odysseylana Malyutina, 1995: 101–109.
Parilcirolana Yu & Li, 2001: 59–64.

Type species. *Odysseylana sirenkoi* Malyutina, 1995; by monotypy. Type locality, 10°46'N, 109°43'E, off southern Vietnam, east of Phu Quy Island (Malyutina 1995).

Species included. *Odysseylana setosa* (Yu & Li 2001) **comb. nov.**, Beibu Gulf (Tonkin Gulf) to northern South China Sea; *Odysseylana sakijang* **sp. nov.** and *Odysseylana temasek* **sp. nov.**, both known only from Singapore.

Diagnosis (male). Body elongate, 2.9–3.5 as long as wide. Pereonites smooth, with or without fine tubercles on posterior margins of pleonites 4 and 5 and proximal surface of pleotelson. Cephalon anterior margin rounded or weakly produced, without rostral point, not medially indented. Pleonite 3 posterolateral margin acute, not extending posteriorly to posterior of pleonite 5; pleonite 4 rounded, encompassing and extending posterior to pleonite 5. Antennula peduncle articles 1 and 2 shortest, article 3 longest; flagellum equal or shorter than peduncle. Antenna peduncle article 3 about half as long as 4, article 4 longest, with row of long plumose setae (except *Odysseylana sakijang* **sp. nov.**); flagellum longer than peduncle. All pereopods with secondary unguis on dactylus. Pereopods 1–3 with superodistal margins of ischium and merus moderately produced; pereopod 1 merus inferior margin with single row of acute and blunt RS; pereopods 2 and 3 with single row of tubercular RS; carpus with a cluster of slender and acute setae on inferodistal; propodal palm with evenly-spaced row of stout acute RS. Pereopod 6 basis broader in inferior distal half; ischium and merus flat and widest distally; superodistal ischium–carpus with clusters of long acute RS and long simple setae; inferior margin of ischium–carpus with rows of long acute RS and long simple setae. Pereopod 7 similar with pereopod 6 but more slender. Penial processes present on sternite 7 as two papillae or small lobes. Pleopod 1 peduncle quadrate; endopod narrow, about 70% as long as wide. Pleopod 2 appendix masculina inserted basally.

Description (male). *Body* about 2.9–3.5 times as long as greatest width. *Head* wide, approximately 66–71% as wide as pereonite 1, anterior margin evenly rounded, without rostral point. *Body surfaces* unornamented or ornamented; pereonite 1 between 0.9–1.5 times as long as pereonite 2 in dorsal view. *Pleon* unornamented or ornamented, about 11–18% BL, with 4–5 visible unfused segments, pleonite 1 usually not concealed by pereonite 7; pleonite 2 epimera not posteriorly produced. *Pleotelson* without longitudinal carinae, or with 2 rows of small tubercles; posterior margin with PMS and 4–9 RS.

Antennula peduncle articles collinear, articles 1 and 2 not fused or partly fused with weak suture; peduncular article 2 not at right angles to article 1; article 3 well developed, about 0.6–0.9 as long as combined lengths of articles 1 and 2; flagellum between 0.8–1.0 as long as peduncle; without callynophore. *Antenna* peduncular articles 1–3 shortest, articles 4 and 5 longest, 4 longer than 5; flagellum about 1.3 as long as peduncle.

Frontal lamina pentagonal, lateral margins parallel or weakly concave; ventrally flat, with lateral angles, anteriorly acute; posteriorly abutting clypeus; approximately 1.25–2.0 times as long as basal width, not projecting anteroventrally from posterior. *Clypeus* ventral surface not projecting relative to frontal lamina. *Mandible* incisor wide, right incisor tricuspidate; spine row with 8–11 RS. *Maxillula* mesial lobe with 3 CP RS. *Maxilliped* palp article 2 mesial margin with 6–7 slender setae, lateral margin with 1 slender seta; article 3 mesial margin with 13–18 slender setae, lateral margin with 11 slender setae; article 4 mesial margin with 9–13 slender setae, lateral margin with 5 slender setae; articles 3 and 4 distal margin width greater than proximal margin of article 4 and 5 respectively; endite with 2–3 coupling hooks.

Pereopods 1–7 dactylus with small secondary unguis present. Pereopod 1 dactylus longer than propodus palm; simple RS opposing dactylus. Pereopod 7 basis not noticeably broader in distal half compared to proximal half; margins with few discontinuous setae; ischium and merus flattened, distal margin between weakly and moderately expanded, inferior margins with few setae.

Pleopod 1 rami lamellar; endopod narrow, 0.6–0.7 as wide as exopod, 2.3–2.7 times as long as wide. Pleopod 2 appendix masculina 0.8–1.1 longer than endopod. Pleopods 1–5 with PMS present on all rami except endopod 5; pleopod 5 endopod shorter (0.8) than exopod. *Uropod* peduncle mesial margin produced; exopod lateral margin not excised.

Female. No ovigerous females present in material examined. Non-ovigerous females are similar to males but for the sexual characters; body size is slightly larger.

Remarks. *Odysseylana* Malyutina, 1995 can be identified by the following characters: elongate body shape (2.9–3.5 long as greatest width), the absence of rostral point; frontal lamina pentagonal; antenna peduncle articles 4 and 5 subequal in length with 4 the longest; pereopods 1–3 with the superodistal margin of ischium and merus moderately produced; pleopod 1 peduncle quadrate, and pleopod 1 endopod slender, 48–65% width of exopod. Malyutina (1995) included the highly distinctive shape and setation of the uropods and pleotelson in the generic diagnosis, but we consider those to be species-level characters.

Malyutina (1995) placed *Odysseylana* in the *Conilera* group of Bruce (1986) [= Conilerinae of Kensley & Schotte (1989)], sharing characters such as the short antennula, quadrate pleopod 1 peduncle, superodistal angles of pereopod 1–3 ischium and merus strongly produced and setose, and pereopods 5–7 with the ischium to carpus generally flattened and setose, sometimes the distal margin of the article also being expanded. In contrast *Odysseylana* differs significantly from that group in several critical characters, notably the antennal peduncle has articles 4 and 5 longest, the frontal lamina is pentagonal and relatively wide, with distinct anterolateral angles, pereopods 1–3 have the superodistal angles of the ischium and merus only moderately produced, and have a distinct secondary unguis on the dactylus; all these characters are in strong contrast to genera such *Politolana* Bruce, 1981 (Riseman & Brusca 2002), *Natatolana* Bruce, 1981 (Keable 2006) and *Dolicholana* Bruce, 1981 (Keable 1999). In conclusion we do not consider that *Odysseylana* belongs with the *Conilera* group of genera.

Odysseylana shares several diagnostic characters with the Indo-Pacific genera *Aatolana* Bruce, 1993, *Baharilana* Bruce & Svavarsson, 2003 and *Plakolana* Bruce, 1993. These characters include the anterior margin of the head lacking a rostral point, being rounded or weakly medially protruded, the superodistal angles of the ischium and merus of pereopods 1–3 being moderately produced, quadrate pleopod 1 peduncle and the presence of lateral setae on uropod peduncle. *Odysseylana* differs from both *Aatolana* and *Plakolana* in lacking prominent and flattened penial processes, and also in having a pentagonal frontal lamina (linear in *Plakolana*, anteriorly rounded and posteriorly narrowed in *Aatolana*), pereopods 1–3 have a small, blunt secondary unguis (absent or seta-like in *Aatolana* and *Plakolana*) and relatively elongate pleopod 1 rami (exopod broadly rounded, endopod narrow in

Plakolana; pleopod 1 endopod in *Aatolana* has strongly convex lateral margin, and pleopod peduncles are complex). *Odysseylana* is most similar to *Baharilana* but differs in having two coupling hooks on the maxilliped endite rather than one, pleopod 2 appendix masculina is basal (vs. sub-basal) and straight (vs curved at tip).

The genus *Parilcirolana* Yu & Li, 2001 was described from the northern Gulf of Tonkin, Hainan Island and northern South China Sea near Macau. Yu & Li (2001) were apparently unaware of Malyutina's (1995) publication as they made no mention of *Odysseylana* Malyutina, 1995 in their discussion or remarks. At the generic level we can find no differentiating characters to support *Parilcirolana*, with the diagnostic antennal, pereopodal and pleopod morphology entirely consistent with that of *Odysseylana*.

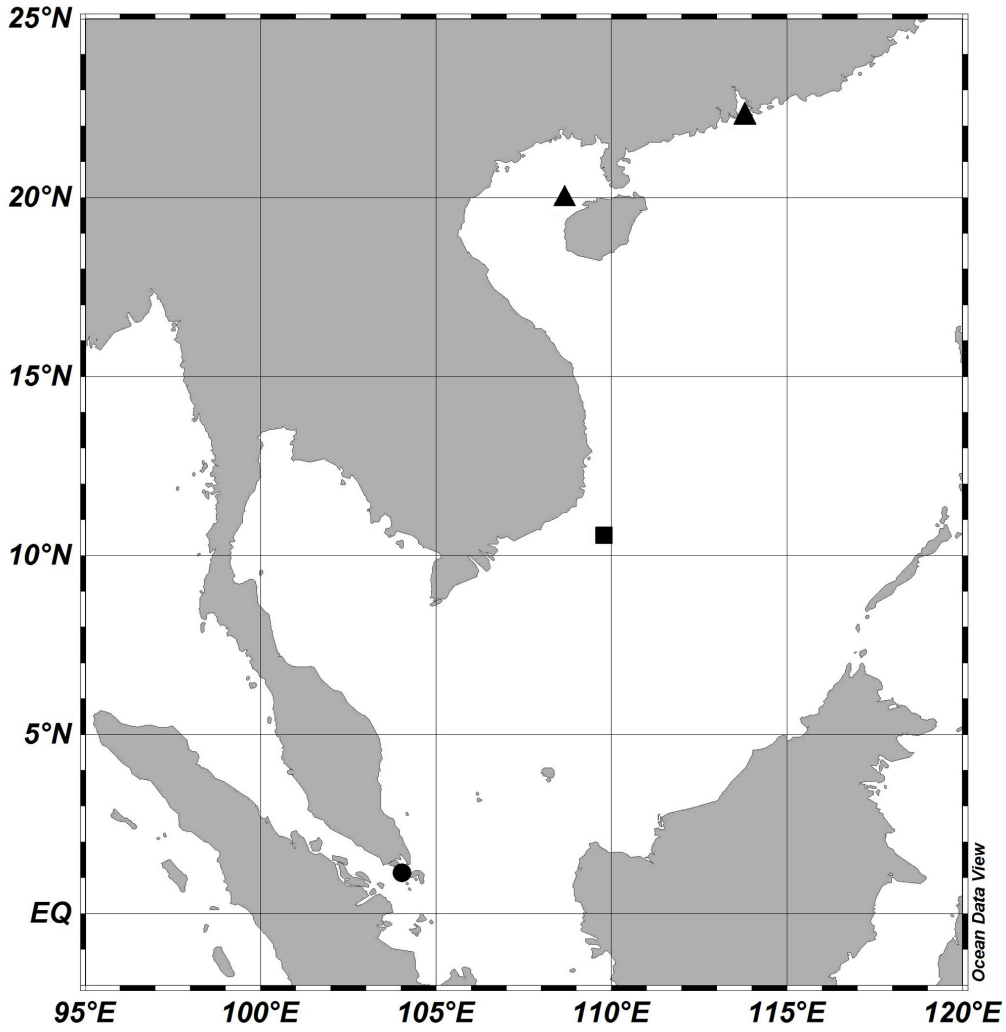

FIGURE 1. Map showing distribution of *Odysseylana* species, ▲*Odysseylana setosa*; ■*Odsseylana sirenkoi*; ●*Odysseylana sakijang* and O. *temasek*.

Some generic characters that were identified as diagnostic by Malyutina (1995) are here considered to be species characters, such as the incised distal margin of the pleotelson and conical shape of uropod exopod. Similarly, the dense setae on the pereopod 7 of *O. setosa* (Yu & Li 2001) is also regarded as a species-level character.

Distribution. *Odysseylana* has a distribution centred on the tropical and subtropical western Pacific (Fig. 1), from Singapore in the south to Macau in the north-east. The genus is absent from the relatively well-documented regions of Australia, South Africa and also the tropical western Indian Ocean.

Key to the species of *Odysseylana*

1. Body length more than 3 times greatest width, uropod exopod longer than endopod 2
– Body length less than 3 times greatest width, uropod exopod shorter than endopod 3
2. Pleotelson posterior margin medially indented, with dorsal plumose setae . . . . . *Odysseylana sirenkoi*
– Pleotelson posterior margin not medially indented, with smooth dorsal surface . . . . . *O. temasek* **sp. nov.**
3. Uropod peduncle with lateral setae, pleonites 4–5 and pleotelson with dorsal tubercles . . . . . *O. sakijang* **sp. nov.**
– Uropod peduncle without lateral setae, pleonites 4–5 and pleotelson dorsally smooth . . . . . *O. setosa*

***Odysseylana sakijang* sp. nov.**
(Fig 2–5)

Odysseylana sp. 3.—Bruce & Wong, 2015: 4.

Material examined. All material from Singapore. *Holotype*: ♂ (6.8 mm), between St John's Island and Lazarus Island, 1.218718°N, 103.853968°E, 31 May 2013, baited trap, 25 m, stn SW 137, SS 4942, coll. N.L. Bruce & J.K. Lowry (ZRC 2015.0359).
Paratypes: 7 ♂, 11 ♀ (6.7 mm broken [part dissected], 5.0–6.8 mm, average 6 mm), same data as holotype (ZRC 2015.0360, ZRC 2015.0361); 4 ♂, 16 ♀ (unmeasured) same data as holotype (MTQ W34314, MTQ W34315); 48 ♀ (42 measured, average 7.4 mm), same data as holotype (ZRC 2015.0362). 7 ♂, 12 ♀, and 5 mancas (unmeasured), between St John's Island and Lazarus Island, 31 May 2013, baited trap, 13.5 m, SW 138, SS 4941, coll. N.L. Bruce & J.K. Lowry (MTQ W34316).

Description. *Body* 2.9 times as long as greatest width, dorsal surfaces smooth, widest at pereonite 4, lateral margins subparallel. *Eyes* separated by about 82% width of head, each eye made up of ~5–6 transverse rows of ommatidia, each row with ~6 ocelli, eye colour black. *Pereonite* 1 and coxae 2–3 each with posteroventral angle rounded; coxae 5–7 with incomplete oblique carina; posterior margins of pereonites 5–7 smooth. *Pleon* with pleonite 1 largely concealed by pereonite 7; pleonites 4–5 posterior margin with 7 irregular small nodules on each; posterolateral angles of pleonite 2 forming acute point, not posteriorly produced; pleonite 3 with posterolateral margins not extending to posterior margin of pleonites 5, acute; clearly extending beyond posterior margin of pleonite 5, posterolateral margin of pleonite 4 rounded and extending to posterior margin of pleonite 5; pleonite 5 with posterolateral angles overlapped by lateral margins of pleonite 4. *Pleotelson* 0.9 times as long as anterior width, dorsal surface without longitudinal carina but with nodules on the proximal region; lateral margins straight, smooth, posterior margin sub-truncate, without median point, with 6 or 8 RS.

Antennula peduncle articles 1 and 2 distinct, articulated; article 2 0.8 times as long as article 1, articles 3 and 4 0.7 times as long as combined lengths of articles 1 and 2, article 3 1.4 times as long as wide; flagellum with 9 articles, extending to pereonite 2. *Antenna* peduncle article 4 2 times as long as wide, 1.6 times as long as article 3, inferior margin with 0 plumose setae, and 2 short simple setae; article 5 0.9 times as long as article 4, 2.4 times as long as wide, inferior margin with 7 pappose setae, anterodistal angle with cluster of 4 short simple setae; flagellum with 15 articles, extending to middle of pereonite 2.

Frontal lamina pentagonal, ventral surface entirely flat, 1.8 longer than greatest width, lateral margins straight and parallel, anterior margin acute, without small median point.

Mandible molar process anterior margin with 18 flat teeth; with proximal cluster of long simple setae; right mandible spine row composed of 9 spines, left with 10 spines; palp article 2 with 14 distolateral setae, palp article 3 with 4 robust biserrate setae. *Maxillula* lateral lobe with 13 RS. *Maxilla* lateral lobe with 6 long simple setae; middle lobe with 9 long simple setae; mesial lobe with 10 distal simple setae, with 10 proximal simple and plumose setae. *Maxilliped* palp article 2 mesial margin with 6 slender setae, lateral margin distally with 1 slender setae; article 3 mesial margin with 14 slender setae, lateral margin with 11 slender setae; article 4 mesial margin with 10 slender setae, lateral margin with 7 slender setae; article 5 distal margin 16 setae, lateral margin with 7 setae; endite with 3 long CPS, and 2 coupling setae.

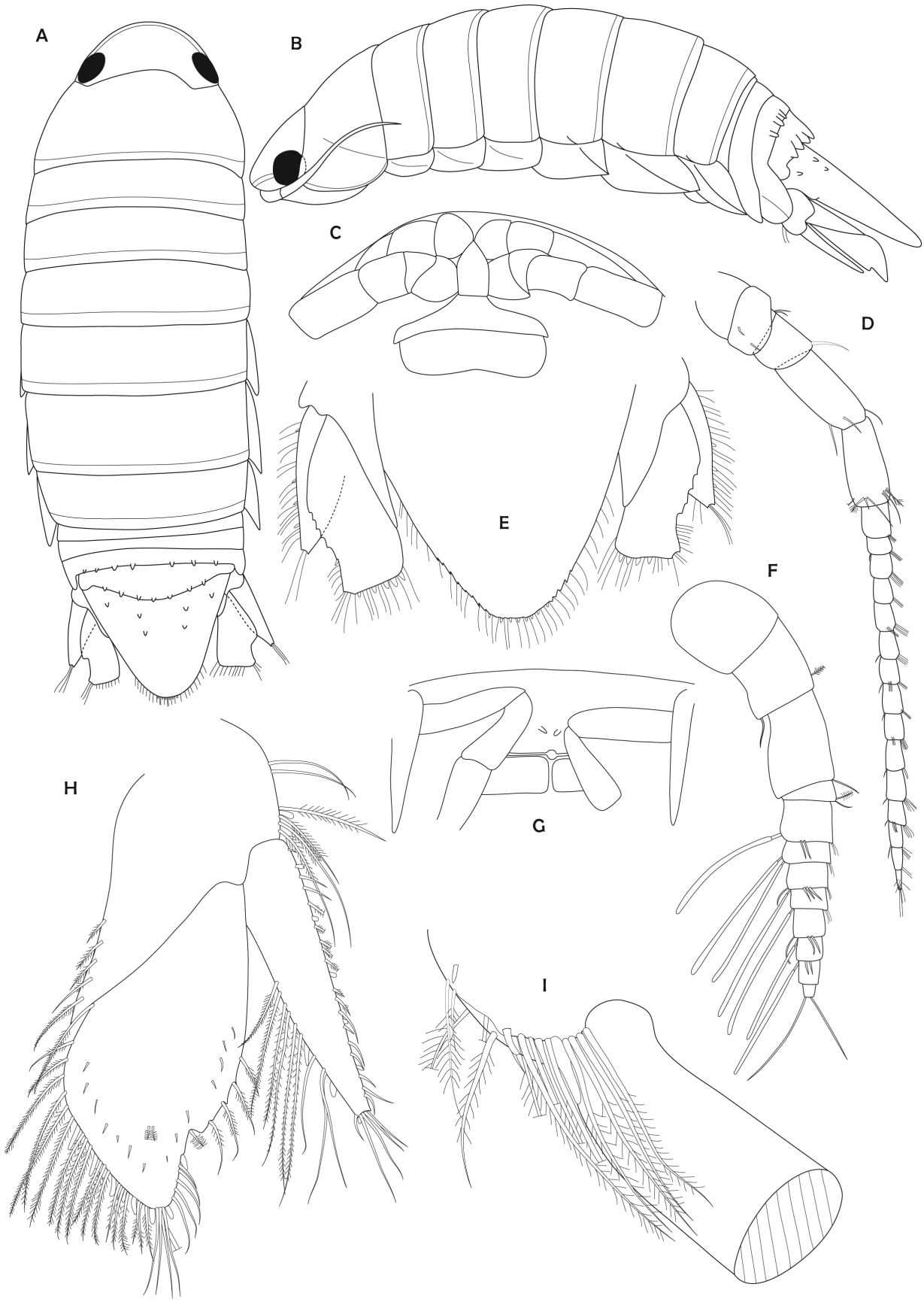

FIGURE 2. *Odysseylana sakijang* **sp. nov.**, holotype (6.8 mm) (A–C); paratype (6.7 mm) (D–I): A, dorsal view; B, lateral view; C, frons; D, antenna; E, pleotelson and uropods; F, antennula; G, sternite 7 showing penial openings; H, uropod; I, uropod peduncle ventrolateral margin.

FIGURE 3. *Odysseylana sakijang* **sp. nov.**, paratype (6.7 mm, ZRC 2015.0360): A, right mandible; B, molar process of right mandible; C, right mandible palp; D, maxilliped; E, maxillula; F, maxilla.

Pereopod 1 basis 1.5 times as long as greatest width, superior distal angle without acute setae; ischium 0.7 times as long as basis, inferior margin with 2 setae, superior distal margin with 4 slender setae and 2 distal mid-margin setae; merus inferior margin with 7 molariform RS, set as single row with 2 blunt, 1 acute and 1 slender seta, superior distal angle with 2 setae; carpus inferior margin with 1 slender setae; propodus 1.8 times as long as wide, inferior margin with 3 RS (2 on palm and 1 opposing the dactylus); dactylus 0.6 as long as propodus; inferior margin with setal fringe on propodus– ischium. Pereopod 2 ischium inferior margin with 2 stout, bluntly rounded RS and 1 acute setae, superior distal margin with 0 RS and 5 slender setae; merus inferior margin with 5 stout RS,1 acute and 1 slender seta, set as single row; dactylus 0.7 as long as propodus. Pereopod 3 similar to pereopod 2.

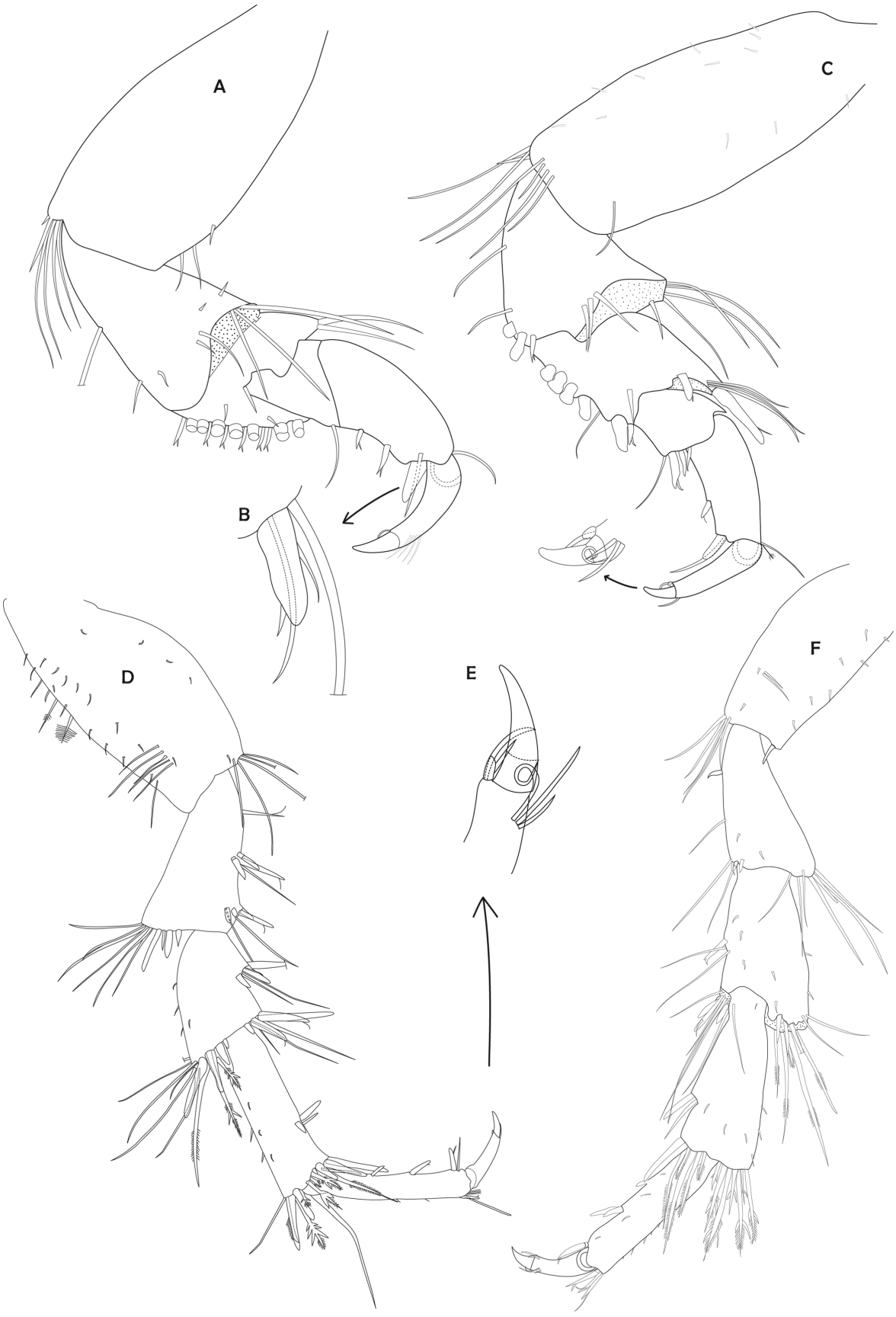

FIGURE 4. *Odysseylana sakijang* **sp. nov.**, paratype (6.7 mm, ZRC 2015.0360): A, pereopod 1; B, robust setae on propodus inferodistal of pereopod 1; C, pereopod 2; D, pereopod 6; E, dactylus of pereopod 6; F, pereopod 7.

FIGURE 5. *Odysseylana sakijang* **sp. nov.**, paratype (6.7 mm, ZRC 2015.0360): A–E, pleopods 1–5 respectively.

Pereopod 6 similar to pereopod 7. Pereopod 7 basis 1.9 times as long as greatest width, superior margin straight, inferior margin with 7 palmate setae; ischium 0.7 as long as basis, inferior margin with 0 RS, superior distal angle with 4 RS, inferior distal angle with 7 RS; merus 1.1 as long as ischium, 1.9 times as long as wide, inferior margin

with 2 RS, superior distal angle with 9 RS, inferior distal angle with 10 RS; carpus 0.9 as long as ischium, 2.1 times as long as wide, inferior margin with 3 RS, superior distal angle with 6 RS, inferior distal angle with 7 RS; propodus 1.1 as long as ischium, 4 times as long as wide, inferior margin with 3 clusters of RS, superior distal angle with 1 slender setae, inferior distal angle with 3 RS; dactylus 0.3 as long as propodus.

Penes separated by 10% sternal width, opening flush with surface of sternite 7.

Pleopod 1 exopod 1.7 times as long as wide, lateral margin distally concave, distally narrowly rounded, medial margin weakly oblique, mesial margin straight, with PMS from distal half, with ~16 PMS; endopod 2.4 times as long as wide, distally narrowly rounded, lateral margin straight, with PMS on distal margin only, mesial margin with PMS on distal margin only, endopod with ~42 PMS; peduncle 0.7 times as wide as long; mesial margin with 4 coupling setae. Pleopod 2 exopod with ~53 PMS, endopod with ~17 PMS; appendix masculina with parallel margins, 1.0 times as long as endopod, distally acute. Pleopod 3 exopod with ~58 PMS, endopod with ~13 PMS. Pleopod 4 exopod with ~59 PMS, endopod with ~9 PMS. Pleopod 5 exopod with ~63 PMS. Pleopods 2–5 peduncle distolateral margin with prominent acute RS, 3–5 endopods with distomesial serrate scales.

Uropod peduncle ventrolateral margin with 1 RS, 10 plumose setae, 1 acute seta and lateral margin with 1 medial short acute RS, posterior lobe about three-quarters as long as endopod; rami extending beyond pleotelson, marginal setae in single tier, endopod apex blunt and exopod apex bifid. Endopod apically not bifid; lateral margin sinuate, without prominent excision, proximal lateral margin with 0 RS; distal lateral margin with 2 RS, mesial margin weakly convex, with 6 RS. Exopod not extending to end of endopod, 4.2 times as long as greatest width, apically shallowly and equally bifid; lateral margin straight, with 5 RS; mesial margin straight, with 3 RS.

Female. Non-ovigerous females are similar to males except for the sexual characters.

Size. Adult males 5.0–6.8 mm, mean 6.0 mm (n = 18); adult females 5.7–9.1 mm, mean 7.3 mm (n = 43).

Distribution. Known only from Singapore.

Remarks. *Odysseylana sakijang* **sp. nov.** can be identified and distinguished from all other species in the genus by the less elongate body (2.9 as long as wide compared to 3.5), smaller male size (5.0–6.8 mm) than others (8.5–10.5 mm), the presence of small acute tubercles on the posterior margin of pleonites 4–5 and anterior surface of the pleotelson.

Odysseylana sakijang **sp. nov.** is most similar to *Odysseylana temasek* **sp. nov.** and *O. setosa* Yu & Li, 2001. *O. sakijang* can be readily separated by the presence of fine, low tubercles on the posterior margin of pleonite 4 and 5 and anterior of pleotelson, an evenly rounded pleotelson, less elongate body, absence of long PMS in article 4 of antenna peduncle, the presence of lateral setae of uropod peduncle, and greater rami proportion in pleopod 1 (~70%). *Odysseylana sirenkoi* differs from *Odysseylana sakijang* **sp. nov.** in having a medially indented pleotelson posterior margin with plumose setae on the pleotelson surface and the uropod exopod extends posteriorly beyond the endopod and being distally narrowed.

Etymology. The epithet is the Malay word sakijang, meaning "barking deer", and alludes to the original name of St John's Island.

Odysseylana temasek **sp. nov.**

(Fig 6–9)

Odysseylana sp. 6.—Bruce & Wong, 2015: 4.
Odysseylana sp.— Bruce & Wong, 2015: 4.

Material examined. All material from Singapore. *Holotype*: ♂ (8.6 mm), between St John's Island and Lazarus Island, 31 May 2013, baited trap, 25 m, stn SW 137, SS 4942, coll. N.L. Bruce (ZRC 2015.0363).

Paratypes: 1 ♂ (9.6 mm broken [part dissected]), 15 ♀ (6.1–9.4 mm, average 7.9 mm), same data as holotype (ZRC 2015.0364, ZRC 2015.0365). 2 ♂ (9.5, 9.2 mm), 4 ♀ (7.0, 8.1, 8.2, 9.7 mm), between St John's Island and Lazarus Island, 31 May 2013, 13.5 m, SW 138, coll. N.L. Bruce & J.K. Lowry (ZRC 2015.0366). 1 ♀ (6.9 mm), St John's Island jetty, 1°13.020'N, 103°51.122'W, 30 May 2013, 3–5 m, SW 119, coll. N.L. Bruce (MTQ W34312). 3 ♀ (7.5, 8.5, 7.8 mm), SS 0854(ZRC 2015.0367); 1 ♀ 5718 ORI-39 coll. N.L. Bruce (ZRC 2015.0368). 2 ♀ (unmeasured) St John's Island lagoon, 1°12.913'N, 103°51.080'W, 29 May 2013, 3–5 m, SW 106, coll. N.L. Bruce, H.P.S. Wong & J.K. Lowry (MTQ W34313).

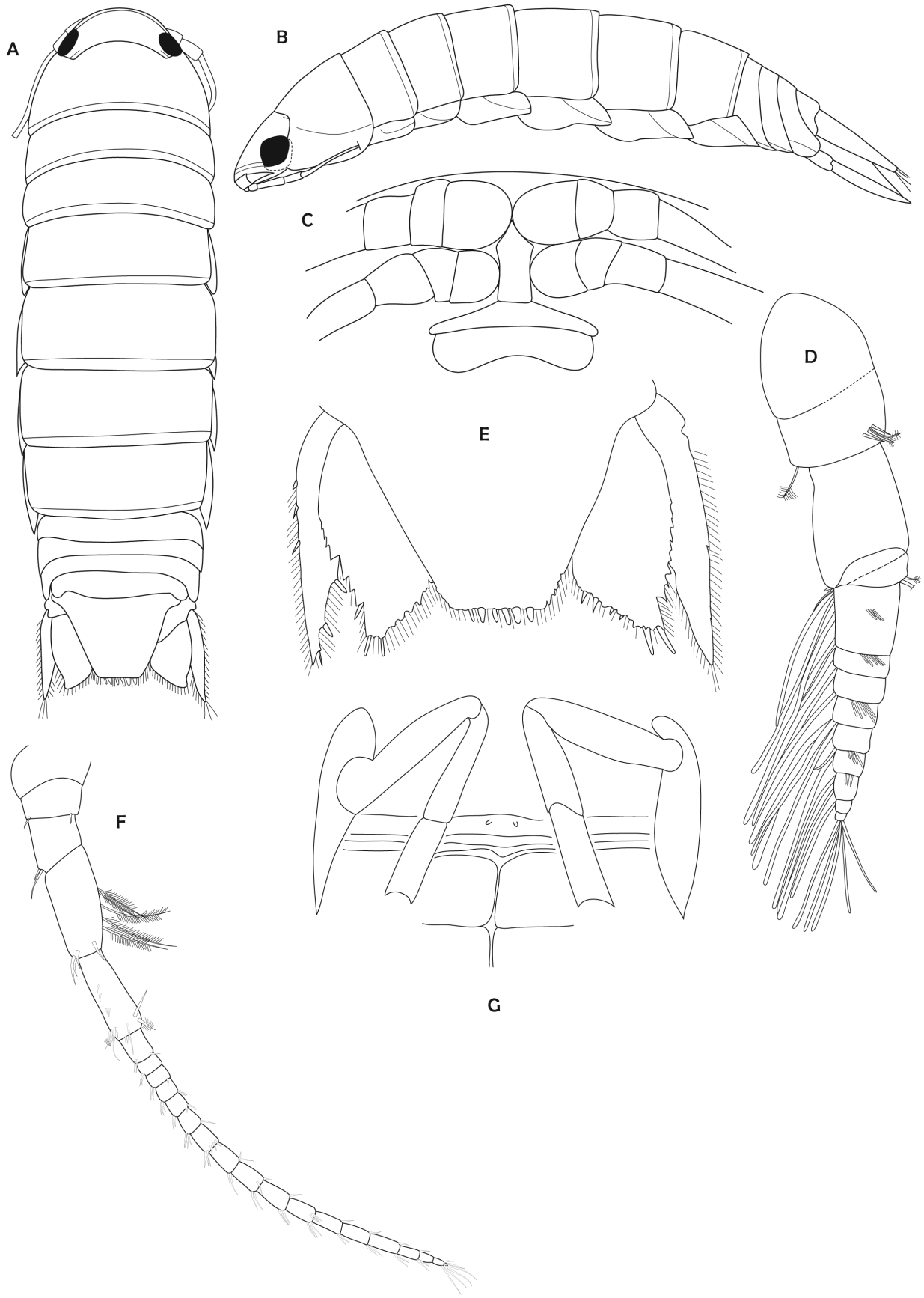

FIGURE 6. *Odysseylana temasek* **sp. nov.**, holotype (8.6 mm) (A–C); paratype (9.6 mm) (D–G): A, dorsal view; B, lateral view; C, frons; D, antennula; E, pleotelson and uropods; F, antenna; G, sternite 7 showing penial openings.

FIGURE 7. *Odysseylana temasek* **sp. nov.**, paratype (9.6 mm, ZRC 2015.0364): A, maxilla; B, maxilliped; C, maxillula; D, right mandible; E, uropod.

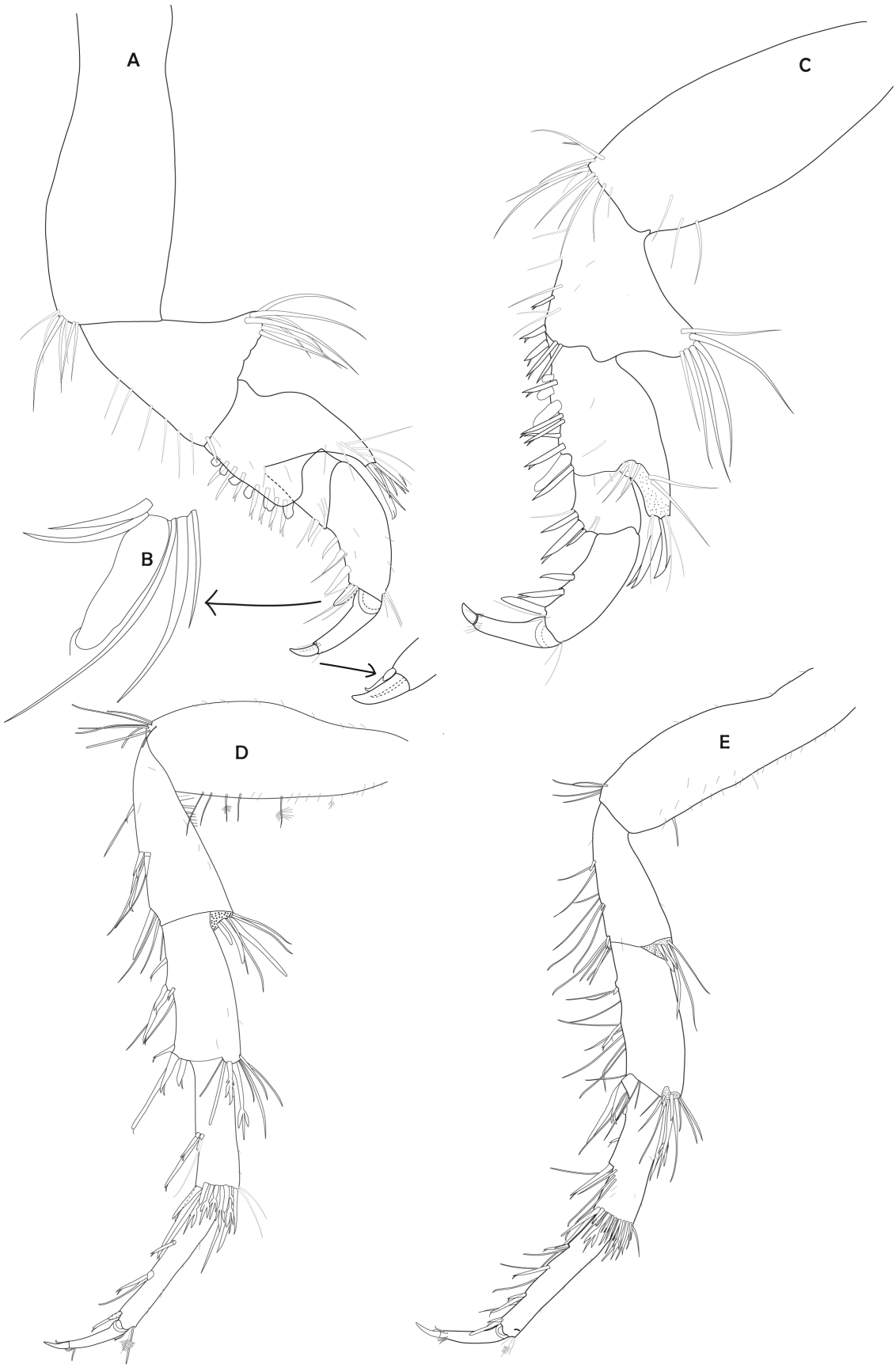

FIGURE 8. *Odysseylana temasek* **sp. nov.**, paratype (9.6 mm, ZRC 2015.0364): A, pereopod 1; B, setae on propodus inferodistal margin of pereopod 1; C, pereopod 2; D, pereopod 6; E, pereopod 7.

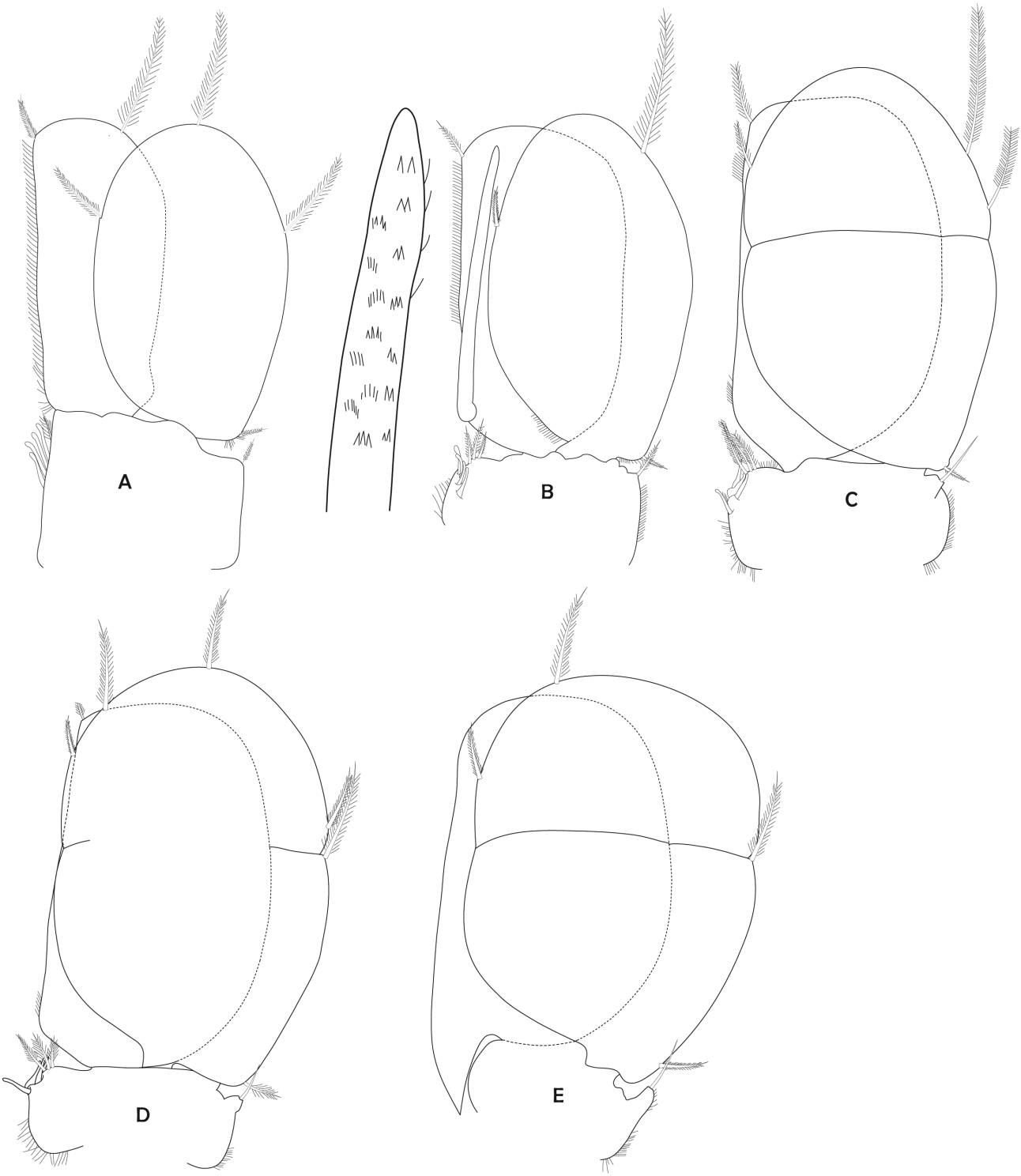

FIGURE 9. *Odysseylana temasek* **sp. nov.**, paratype (9.6 mm, ZRC 2015.0364): A–E, pleopods 1–5 respectively.

Description. *Body* 3.5 times as long as greatest width, dorsal surfaces smooth, widest at pereonite 4, lateral margins ovate. *Rostral point* absent. Eyes separated by about 84% width of head, each eye made up of ~5–6 transverse rows of ommatidia, each row with ~5 ocelli, eye colour black. *Pereonite 1* and coxae 2–3 each with posteroventral angle right-angled; coxae 5–7 with entire oblique carina; posterior margins of pereonites 5–7 smooth. *Pleon* with pleonite 1 visible in dorsal view; pleonites 3–5 posterior margin smooth; posterolateral angles of pleonite 2 forming acute point, not posteriorly produced; pleonite 3 with posterolateral margins not extending to posterior margin of pleonite 5, acute; pleonite 4 with posterolateral margin clearly extending beyond posterior margin of pleonite 5, rounded. *Pleotelson* 0.6 times as long as anterior width, dorsal surface without longitudinal

carina; lateral margins straight, margins crenulate, posterior margin truncate, without median point, with 6 robust setae.

Antennula peduncle articles 1 and 2 fused, suture present; article 2 0.5 times as long as article 1, articles 3 and 4 0.8 times as long as combined lengths of articles 1 and 2, article 3 1.0 times as long as wide; flagellum with 10 articles, extending to posterior margin of eye. *Antenna* peduncle article 4 2.0 times as long as wide, 1.8 times as long as article 3, inferior margin with 5 plumose setae, and 1 short simple seta; article 5 0.9 times as long as article 4, 2.5 times as long as wide, inferior margin with 0 pappose setae, anterodistal angle with cluster of 5 short simple setae; flagellum with 17 articles, extending to posterior of pereonite 2.

Frontal lamina pentagonal, ventral surface entirely flat, 1.3 longer than greatest width, lateral margins straight, diverging slightly towards anterior, anterior margin acute, without small median point.

Mandible molar process anterior margin with 19 flat teeth; with proximal cluster of long simple setae; right mandible spine row composed of 11 spines, left with 2 spines; palp article 2 with 14 distolateral setae, palp article 3 with 14 robust biserrate setae. *Maxillula* mesial lobe with 3 large and circumplumose RS; lateral lobe with 9 RS. *Maxilla* lateral lobe with 4 long simple setae; middle lobe with 9 long simple setae; mesial lobe with 6 distal simple setae, with 9 proximal simple and plumose setae. *Maxilliped palp* article 2 mesial margin with 7 slender setae, lateral margin distally with 1 slender seta; article 3 mesial margin with 13 slender setae, lateral margin with 11 slender setae; article 4 mesial margin with 12 slender setae, lateral margin with 5 slender setae; article 5 distal margin 13 setae, lateral margin with 5 setae; endite with 5 long CPS, and 2 coupling setae.

Pereopod 1 basis 2.5 times as long as greatest width, superior distal angle without cluster of acute setae; ischium 0.5 times as long as basis, inferior margin with 6 setae, superior distal margin with 7 slender setae and 3 distal mid-margin setae; merus inferior margin with 6 molariform RS, set as single row, superior distal angle with 9 setae; carpus inferior margin with 1 RS; propodus 2.4 times as long as wide, inferior margin with 3 RS; dactylus 1.8 as long as propodus; inferior margin with setal fringe on propodus–ischium. *Pereopod 2* basis superior margin convex, superior distal with 3 simple setae, inferior margin convex, inferior distal with 9 long simple setae; ischium inferior margin with 3 RS and 4 long simple setae, superior distal margin with 6 slender setae; merus inferior margin with 3 acute RS, 4 RS and 3 simple setae set as single row, superior distal margin with 4 acute RS and 6 slender setae; carpus inferodistal angle with 2 big RS, 1 small RS and 1 simple seta; propodus 2.7 as long as wide, half inferodistal angle with 2 acute RS, 1 blunt RS and 2 simple setae; dactylus 0.6 as long as propodus. *Pereopod 3* similar to pereopod 2. *Pereopod 6* similar to pereopod 7. *Pereopod 7* basis 3.1 times as long as greatest width, superior margin straight with 1 long and 17 simple setae and, inferior margin convex with 10 simple small setae, inferior margin distal with 4 long simple setae; ischium 0.5 as long as basis, inferior margin with 3 clusters of 1 RS and 2 simple setae, 1 RS and 4 simple setae, 1 RS and 4 simple setae; superior distal angle with 3 long simple setae and 4 acute RS, mid distal angle with 1 RS; merus 1.1 as long as ischium, 2.4 times as long as wide, inferior margin with 2 clusters of 1 RS and 3 simple setae, 2 RS and 5 simple setae; superior distal angle with 2 RS, 6 long simple setae and 2 biserrate RS, inferior distal angle with 2 RS and 3 long simple setae; mid distal margin with 2 long simple setae; carpus 0.9 as long as ischium, 3.5 times as long as wide, inferior margin with 1 cluster of 1 RS and 4 simple setae and 1 RS, superior distal angle with 4 long simple setae and 5 biserrate RS, inferior distal angle with 2 RS, 2 simple and 4 biserrate setae; propodus 1.3 as long as ischium, 5.7 times as long as wide, inferior margin with 4 clusters of 2 RS and 1 simple seta, 1 RS and 1 simple seta, 2 RS and 1 simple seta and 2 RS; superior distal angle with 2 simple and 2 palmate setae, inferior distal angle with 2 RS; dactylus 0.5 as long as propodus.

Penes separated by 10% sternal width, opening flush with surface of sternite 7.

Pleopod 1 exopod 1.6 times as long as wide, lateral margin weakly concave, distally broadly rounded, mesial margin weakly convex, with PMS from base, with ~46 PMS; endopod 2.3 times as long as wide, distally subtruncate, lateral margin straight, with PMS on distal margin only, mesial margin with PMS from distal half, endopod with ~18 PMS; peduncle 0.8 times as wide as long; mesial margin with 4 coupling setae. *Pleopod 2* exopod with ~53 PMS, endopod with ~20 PMS; appendix masculina with parallel margins, 0.9 times as long as endopod, distally acute. *Pleopod 3* exopod with ~53 PMS, endopod with ~14 PMS. *Pleopod 4* exopod with ~55 PMS, endopod with ~11 PMS. *Pleopod 5* exopod with ~51 PMS. Pleopods 2–5 peduncle distolateral margin with prominent acute RS, 3–5 endopods with distomesial serrate scales.

Uropod peduncle ventrolateral margin with 0 RS, lateral margin without medial short acute robust seta, posterior lobe about one-third as long as endopod; rami extending to pleotelson apex, marginal setae in single tier, apices acute. *Endopod* apically not bifid; lateral margin straight, proximal lateral margin with 0 RS; distal lateral

margin with 3 RS, mesial margin straight, with 5 RS. *Exopod* extending beyond end of endopod, 4.8 times as long as greatest width, apically deeply bifid; lateral margin straight, with 6 RS; mesial margin straight, with 4 RS.

Female. Non-ovigerous females as for male except sexual characters.

Size. Adult males 9.2–9.5 mm (2 specimens); non-ovigerous females 7.0–9.7 mm (5 specimens).

Distribution. Known only from Singapore.

Remarks. *Odysseylana temasek* **sp. nov**. can be identified by the elongate body, weakly indented and sub-truncate pleotelson posterior margin, smooth dorsum and the uropodal exopod extending posteriorly beyond the endopod. In addition to its similarity to *Odysseylana sakijang* (see 'remarks' for that species), *Odysseylana temasek* is also similar to *Odysseylana sirenkoi*, differing in having fewer plumose setae on antenna peduncle article 4, 2 coupling setae on maxilliped endite (vs 3), sub-truncate pleotelson posterior margin (vs deeply incised), more robust uropodal rami (vs slender and narrow exopod and posteriorly narrowed endopod), dorsally smooth pleotelson, weakly concave lateral and anterior margins of frontal lamina. *Odysseylana temasek* shares the smooth dorsal surface with *Odysseylana setosa* but differs in having a sub-truncate pleotelson posterior margin (vs rounded), the uropod exopod extending beyond the endopod, less setose pereopod 7, and the appendix masculina is shorter than the rami of pleopod 2.

Etymology: The species name temasek is the Malay word meaning "Sea Town", the old name for Singapore.

Acknowledgements

The first author would like to thank the following: Ministry of Research, Technology and Higher Education Indonesia for the Riset Pro scholarship to pursue a PhD degree at James Cook University, Australia; Museum of Tropical Queensland for access to use the research facilities. Material was collected by NLB during the Comprehensive Marine Biodiversity Survey of Singapore, 2010–2014. The Johor Straits marine biodiversity workshop on Pulau Ubin, Singapore was organised by the National Parks Board and National University of Singapore and held from 15 October to 2 November 2012 at the Outward Bound School, Pulau Ubin. The workshop, as part of the Comprehensive Marine Biodiversity Survey (CMBS) was supported by generous contributions from Shell Eastern Petroleum, Hong Kong and Shanghai Banking Cooperation 'Care for Nature' Trust Fund, and Asia-Pacific Breweries. We also wish to thank the management and staff of the Outward Bound School for kindly accommodating our special needs for a successful workshop. Material was also collected during the Comprehensive Marine Biodiversity Survey of Singapore, 2010–2014, a project organised and primarily supported by the National Parks Board of Singapore (NParks), together with the Tropical Marine Science Institute (TMSI) and Lee Kong Chian Natural History Museum (LKCNHM) of the National University of Singapore. We thank: Chim Chee Kong, Lim Swee Cheng, Ng Heok Hee, Lee Yen-Ling, Gan Bin Qi, Teresa Stephanie Tay, Joycelin Teo, Tan Chia Sing, Tay Ywee Chieh, Ong Joo Yong, student helpers and NParks volunteers for helping with the collection, sorting, tissue sampling and preservation of the specimens. Arthur Anker, Tan Heok Hui and Rene Ong are thanked for taking good quality photos of the specimens. We are grateful to Wong Ann Kwang and the crew of RV *Galaxea* for their much needed assistance during dredging trips out at sea, and also to Mohamad Razali Bin Duriat for his help in setting out baited traps.

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