RAFFLES BULLETIN OF ZOOLOGY Supplement No. **36**: 95–100
Date of publication: 6 August 2021
DOI: 10.26107/RBZ-2021-0032
http://zoobank.org/urn:lsid:zoobank.org:pub:0A26E39B-3CE1-4F65-8DC5-D2FD71722E6F

A new species of deep-sea isopod in the genus *Dolichiscus* Richardson, 1913 (Crustacea: Isopoda: Austrarcturellidae) from Indonesia

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Abstract. A new species of deep-sea isopod is described from the Sunda Strait and Indian Ocean off southern Java, Indonesia, from depths of between 312−1,068 m. *Dolichiscus selatan*, new species (Austrarcturellidae) is characterised by the number and length of spines emanating from the basis, ischium, and merus on pereopods 2–4, and the presence of a medial smooth ridge and four rows of prominent spines on the dorsal region of the pleotelson. This is the fourth *Dolichiscus* species to be documented from the Indo-Pacific region.

Key words. taxonomy, tropical Indo-Pacific, Indian Ocean, South Java, Sunda Strait, SJADES

INTRODUCTION

Members of the valviferan isopod family Austrarcturellidae Poore & Bardsley, 1992 are mostly deep-sea dwellers (Poore & Bardsley, 1992; Poore, 1998; Boyko et al., 2008 onwards). Of the five genera currently assigned to the family, four contain species distributed in the Indo-Pacific region (Poore & Bardsley, 1992; Boyko et al., 2008 onwards). Members of *Pseudarcturella* Tattersall, 1921 are confined to New Zealand (Poore & Bardsley, 1992). All males of this family share an additional lateral ramus (the distolateral lobe in *Dolichiscus* Richardson, 1913) to the exopod of the first pleopod (Poore & Bardsley, 1992; Poore, 1998).

The genus *Dolichiscus* is the largest genus in the family with 25 species (Boyko et al., 2008 onwards). Most of them are distributed in the southern hemisphere, mainly in the Antarctic region (Poore, 1998; Kussakin & Vasina, 2001; Boyko et al., 2008 onwards). Three species have been recorded from the Indo-West Pacific region and share common distribution in Indonesia, namely *Dolichiscus cornutus* (Beddard, 1886) which is also distributed in the Philippines and New Caledonia, and two other species which so far appear to be endemic to Indonesia (Kai Islands and adjacent area), *D. kai* Poore, 1998, and *D. tanimbar* Poore, 1998 (Poore, 1998). The depth distribution of the members of this genus is mostly in the bathyal zone (200–2,000 m) from which 19 species have been recorded (Kussakin & Vasina, 2001; Boyko et al., 2008). Two species occur in the Atlantic Ocean, i.e., *Dolichiscus ludmilae* Kussakin & Vasina, 2001, and *D. marinae* Kussakin & Vasina, 2001 (Kussakin & Vasina, 2001). Here we describe the fourth *Dolichiscus* species from the Indo-Pacific region.

MATERIAL AND METHODS

Specimens were collected from several locations off the coast of southwest Java, Indonesia by the SJADES 2018 expedition, which was a joint research project between Indonesia and Singapore to explore the deep-sea biodiversity in the area (Fig. 1; see also Chim et al., 2021, this volume, for a fuller description of collection stations). Photographs of fresh specimens were taken on board (Fig. 2). All specimens were preserved in 90% ethanol. In the laboratory, illustrations were prepared under the Leica M205C stereomicroscope with a camera lucida attachment. Pencil drawings were digitally scanned and the lines edited in Adobe Photoshop 2021. Due to the nature of the pereopod shape and dimensions, the right pereopods were dissected from the holotype, flattened on a glass slide, and drawn to show the relative lengths accurately. Measurement methods, terminology, and body orientation used in the description follow Poore (1998).

The following abbreviations are used: LIPI = Indonesian Institute of Sciences; MZB = Museum Zoologicum Bogoriense, Bogor, Indonesia; NUS = National University of Singapore; SJADES 2018 = South Java Deep-Sea Biodiversity Expedition 2018; ZRC = Zoological Reference Collection, Lee Kong Chian Natural History Museum, Singapore.

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ISSN 2345-7600 (electronic) | ISSN 0217-2445 (print)

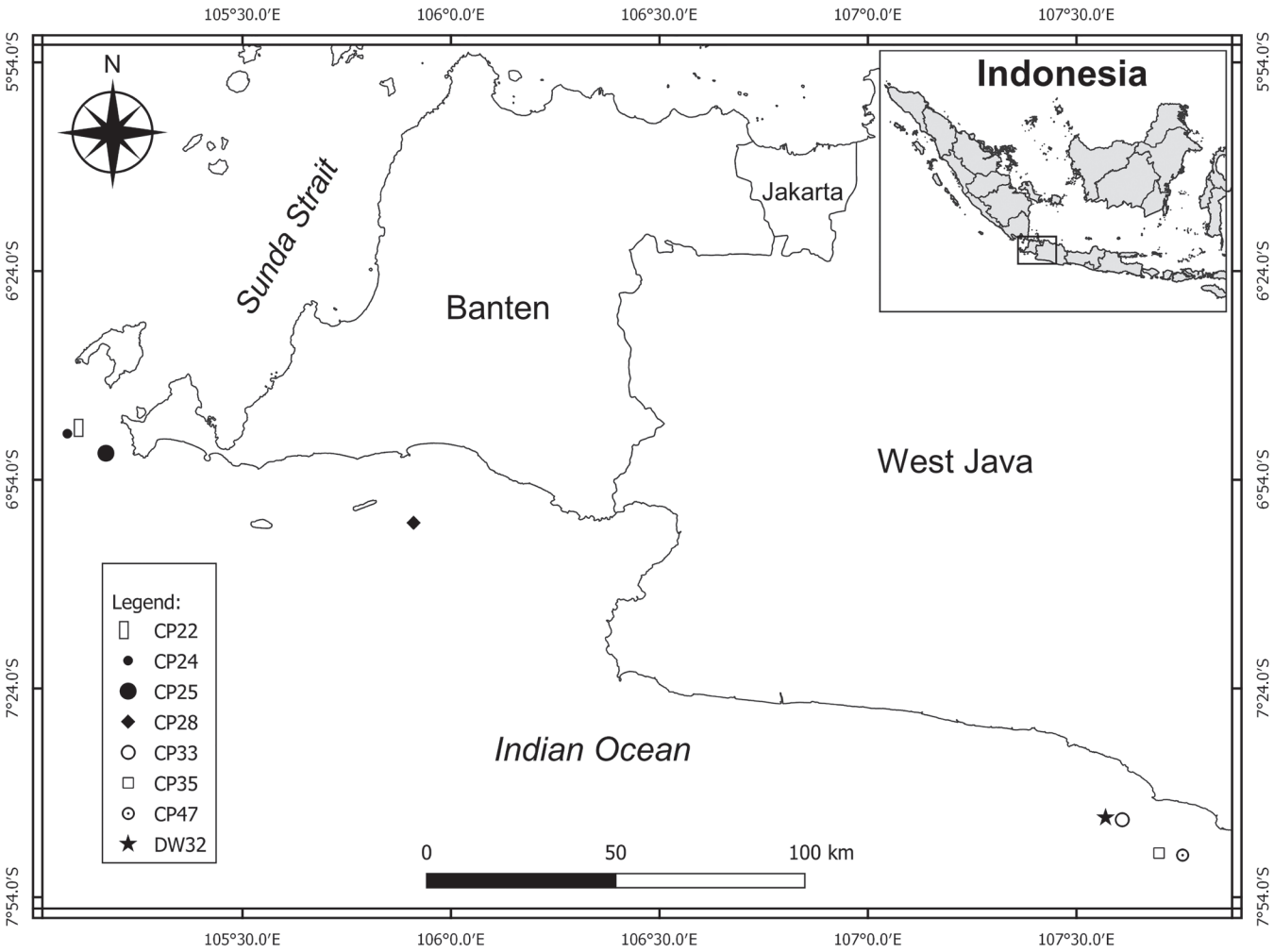

Fig. 1. Station localities where *Dolichiscus selatan*, new species, were collected (see also Chim et al., 2021, this volume, for station details).

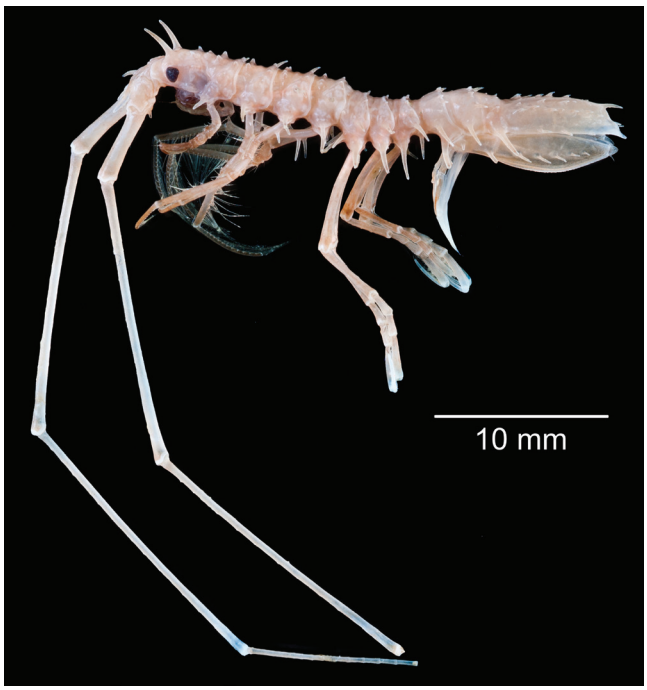

Fig. 2. *Dolichiscus selatan*, new species. Holotype, male (25.6 mm) (MZB Cru.Iso 114), live specimen lateral view.

TAXONOMY

Suborder Valvifera G. O. Sars, 1883

Family Austrarcturellidae Poore & Bardsley, 1992

Dolichiscus Richardson, 1913

Type species. *Dolichiscus pfefferi* Richardson, 1913 (by original designation).

Remarks. See Poore (1998) for synonymy and detailed diagnosis of the genus. *Dolichiscus* was previously placed in the family Arcturidae Dana, 1849, but transferred to Austrarcturellidae by Poore (2001) in his phylogenetic analysis of the suborder Valvifera, by the following synapomorphies: the pattern of dorsolateral ridges on the pleotelson which ends in the middle of the posterior spine and the dactylus of pereopod 1 which is often paired with an anterior lobe.

Dolichiscus selatan, new species
(Figs. 2–4)

Material examined. Holotype: 1 male (length 25.6 mm) (MZB Cru.Iso 114), station CP22, south of Panaitan Island,

Sunda Strait, 6°47.450′S, 105°07.613′E, 846–870 m, coll. SJADES 2018, 27 March 2018. Paratypes: 1 male (34 mm), (MZB Cru.Iso 115), station CP24, south of Panaitan Island, Sunda Strait, 6°47.914′S, 105°06.485′E, 1044–1068 m, 27 March 2018. 1 male (31.5 mm), 1 female (31 mm), (MZB Cru.Iso 116), CP25, Sunda Strait (south of Panaitan Island), 6°50.185′S, 105°10.353′E, 876–937 m, coll. SJADES 2018, 27 March 2018. 1 ovigerous female (24.9 mm), (ZRC 2021.0569), station CP28, Indian Ocean (east of Tinjil Island), 7°00.194′S, 105°54.624′E, 957–1022 m, coll. SJADES 2018, 28 March 2018. 1 female (16.2 mm), (ZRC 2021.0570), station DW32, Indian Ocean (south of Tanjong Boyongkareuceng), 7°42.583′S, 107°34.535′E, 805–977 m, coll. SJADES 2018, 29 March 2018. 1 male (23 mm) (ZRC 2021.0571), 1 ovigerous female (33.2 mm) (ZRC 2021.0572), station CP33, Indian Ocean (South of Tanjong Boyongkareuceng), 7°42.912′S, 107°36.559′E, 312–525 m, coll. SJADES 2018, 29 March 2018. 2 ovigerous females (29.5, 37.8 mm), (MZB Cru.Iso 117), 1 ovigerous female (26.0 mm), (ZRC 2021.0573), station CP35, Indian Ocean (south of Tanjong Boyongkareuceng), 7°47.681′S, 107°42.477′E, 603–686 m, coll. SJADES 2018, 29 March 2018. 1 male (20.6 mm), (ZRC 2021.0574), station CP47, Indian Ocean (South of Pameungpeuk), 7°47.972′S, 107°45.298′E, 476–530 m, coll. SJADES 2018, 01 April 2018.

Description. Holotype male.

Head with pair of long dorsolateral spines anterior to eyes, two pairs of short dorsolateral spines posterior to eyes (dorsal pair longer) (Fig. 3A, B).

Pereonite 1 with two pairs of dorsolateral spines (posterior pair slender), three rows of dorsal transverse low ridges, one pair of ventral lateral spines. Pereonites 2−4 with one pair of dorsolateral spines, one pair of ventral lateral spines, dorsal transverse low ridge near anterior margin and posterior margin. Pereonite 5 with two pairs of ventral lateral spines, dorsal transverse low ridge near posterior margin. Pereonites 6 and 7 with one pair of ventral lateral spines, and a dorsal transverse low ridge near posterior margin. Pleonite 1 with two pairs of ventral marginal spines, one pair of ventral lateral spines, and five short spines of uneven length near posterior margin. Pleonite 2 with one pair of ventral lateral spines, one pair of dorsal lateral spines, and four short spines of uneven length near posterior margin. Pleonites 3−5 fused with pleotelson. Pleonites 3−5 with one pair of ventral lateral spines, three rows of dorsal transverse low ridges, and one pair of short dorso-lateral spines (Fig. 3A, B). Pleotelson with a medial smooth ridge, four rows of prominent spines (dorsal rows with six spines, lateral rows with eight spines), and lateral margins with row of three spines; a median dorsal posterior spine is also present; distally a concave posterior margin separates a pair of diverging, flat posterolateral spines (Fig. 3A, B).

Antenna 2 article 2 with one upper spine; article 3 with lower spine; articles 1–3 taken together is as long as head to pereonite 2; article 4 2.3 times as long as articles 1–3; article 5 1.06 times as long as article 4; flagellum (broken) with more than 11 articles (Fig. 3B).

Coxae 1–3 unarmed. Coxa 4 with 1 ventral lateral spine. Coxa 5 with two ventral lateral spines (posterior one longer), and one ventral spine. Coxae 6, 7 each with one ventral spine (Fig. 3A).

Pereopod 1 basis to dactylus unarmed, dactylus with no apical setae (Fig. 3B, D). Pereopods 2−4 basis of each with one anterior spine; ischium and merus each with one distal spine; carpus and propodus unarmed; dactylus of pereopod 2 with two long apical setae and tuft of short apical setae, dactylus of pereopod 3 with no apical setae, dactylus of pereopod 4 with tuft of short apical setae (Fig. 3B, E–G). Pereopods 5−7 basis to merus unarmed; carpus and propodus with short robust setae along posterior margins (Fig. 3B, H).

Pleopod 1 peduncle thickened, with eight coupling hooks and irregularly dentate lateral margin; endopod as long as exopod, both 1.3 times as long as peduncle; exopod thickened through most of length, with marginal plumose setae distally, setae up to four-fifths length of exopod. Medial and lateral setae shorter, diagonal groove along posterior face enclosed as a channel by overlying flaps in distal two-thirds of exopod, opening near apex of broad-based triangular projection, extending as far as 0.4 exopod width, with soft convex distal margin (Fig. 4A). Pleopod 2 peduncle 0.4 times length of pleopod 1, without coupling hooks; rami membranous; endopod broader, 1.08 times as long as exopod, marginal plumose setae up to four-fifths length of exopod; appendix masculina slightly shorter than endopod, tapering and distally curved anteriorly (Fig. 4B). Pleopod 3 1.2 times as long as pleopod 2, with short peduncle, one plumose seta on peduncle; rami membranous; endopod and exopod of same length; exopod with 16 marginal short plumose setae and three short distal plumose setae; exopod enclosing endopod proximally (Fig. 4C). Pleopods 4, 5 longer; peduncle short, narrower than rami; rami membranous; endopod subacute, with short distolateral plumose setae; exopod with sparse marginal short simple setae from anterior half of exopod, sparse marginal plumose setae on posterior half of exopod; exopod enclosing endopod proximally (Fig. 4D, E).

Penial plate split in distal third (Fig. 4F).

Uropod with anterior spine and row of seven spines with most anterior spine longest; endopod 0.3 length of exopod, with rounded setose apex (Fig. 3C).

Variation: All ovigerous females have one acute spine on the posterodistal margin of each pereonites 1–4. Coxae 2−4 each with one medially directed strong spine supporting marsupium. Smaller specimen (ZRC 2021.0570) has overall short spines as compared to rest of the specimens. One ovigerous female (the smallest of MZB Cru.Iso 117 material) possesses two spines occurring on basis of pereopods 2–4 (vs. absence or 1 only on male holotype), but otherwise it has the same characters as the others. Another ovigerous

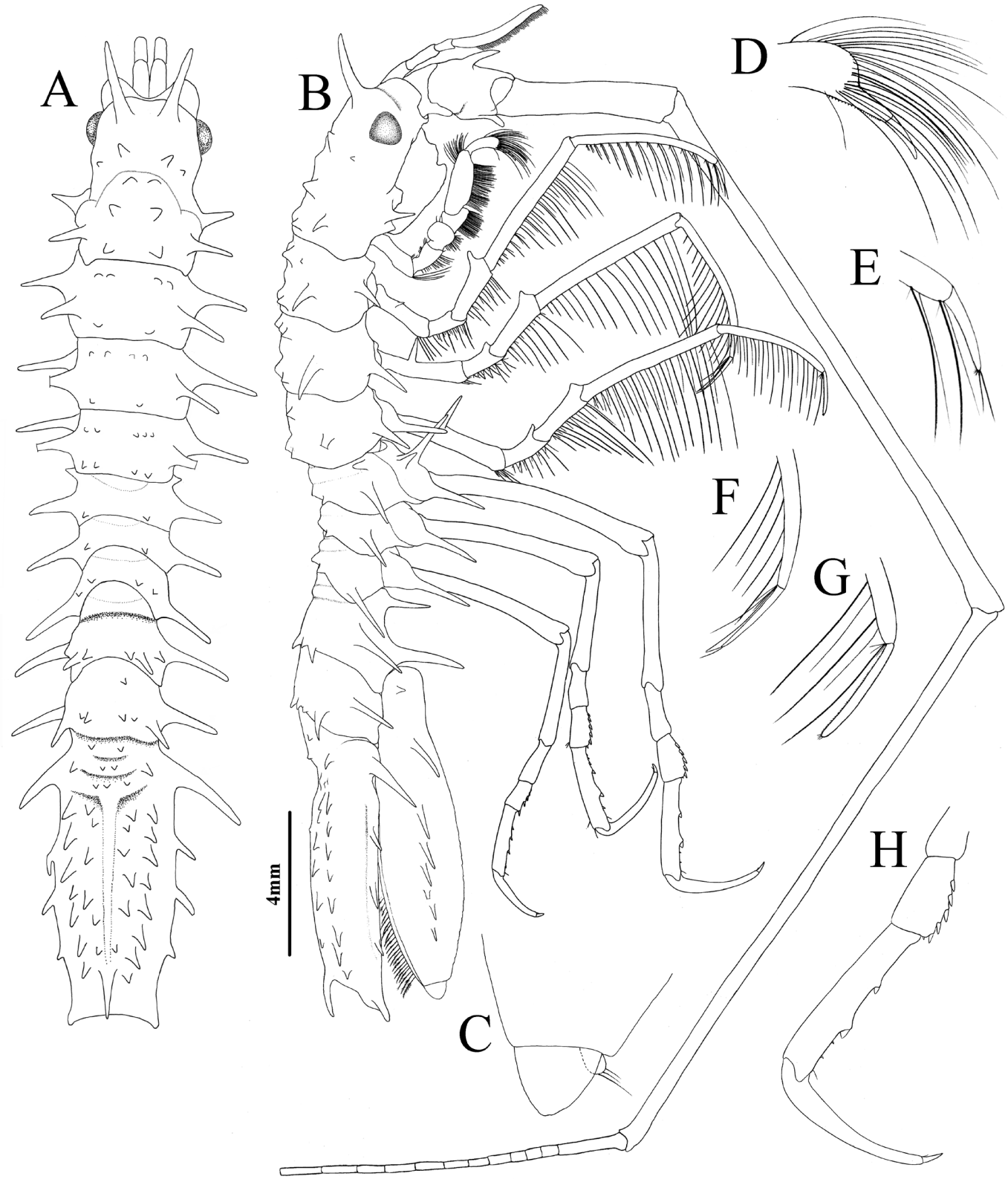

Fig. 3. *Dolichiscus selatan*, new species. Holotype, male (25.6 mm) (MZB Cru.Iso 114). **A**, body, dorsal view; **B**, body, lateral view; **C**, exopod and endopod of uropod; **D**–**H**, dactylus of pereopods 1–5.

female (ZRC 2021.0572) has three pairs of dorsolateral spines posterior to eyes (vs. two pairs of short dorsolateral spines posterior to eyes on the male holotype).

Distribution. East Indian Ocean, off the coast of southwest Java; depth range 312–1,068 m.

Etymology. This species epithet is an Indonesian word meaning south, referring to the position of sampling locations off the southern part of Java. It is used as a noun in apposition.

Remarks. *Dolichiscus selatan*, new species, is characterised by the pattern of spines on the pleotelson, particularly the presence of four row of spines on the pleotelson, and also the

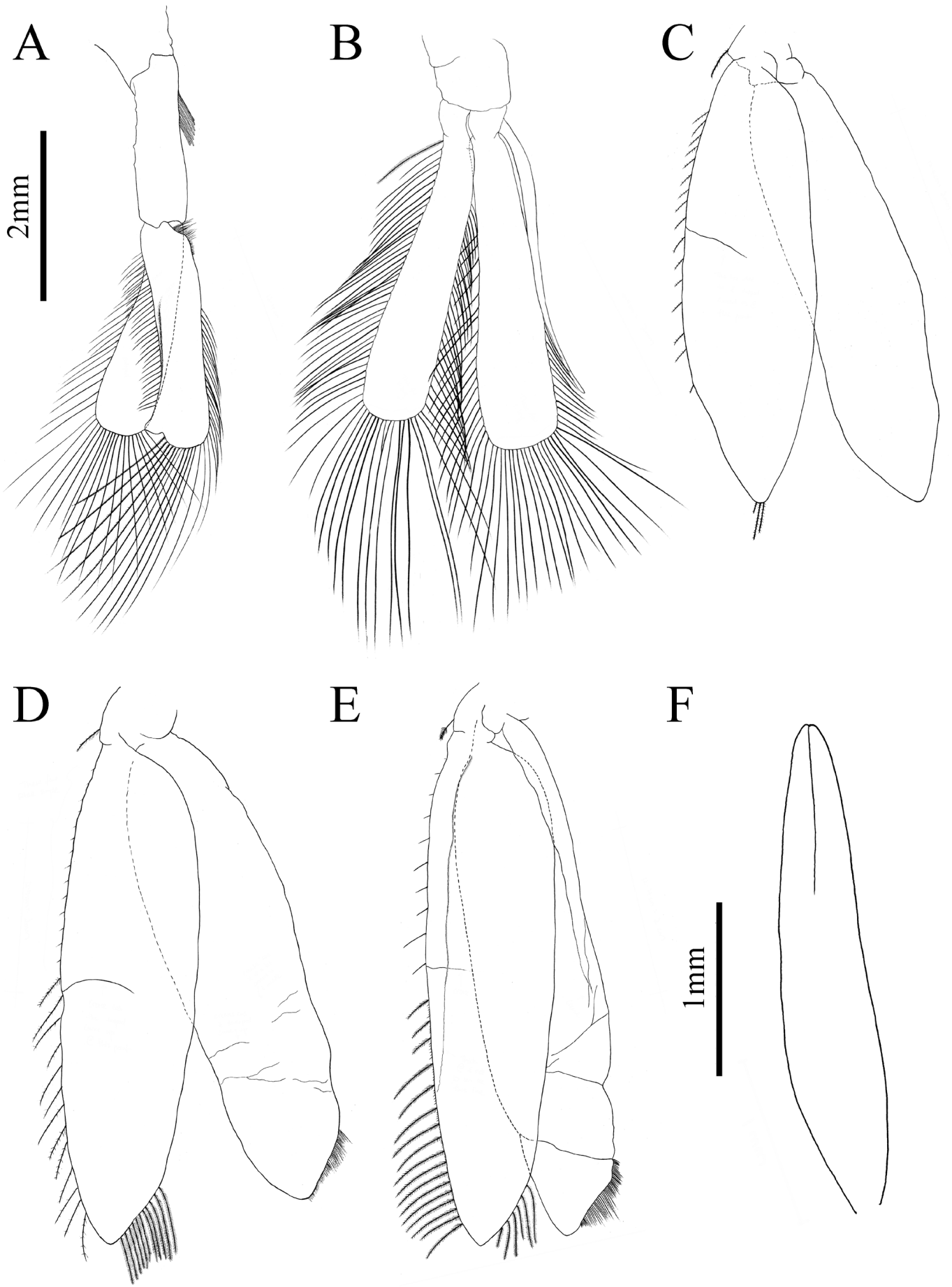

Fig. 4. *Dolichiscus selatan*, new species. Holotype, male (25.6 mm) (MZB Cru.Iso 114). **A**–**E**, pleopod 1−5; **F**, penial process.

spination of the basis, ischium, and merus on pereopods 2–4. This species aligns with *Dolichiscus tanimbar* as they share a similar dorsal body spine pattern as well as the presence of a pair of long dorsolateral spines anterior to the eyes (cf. Poore, 1998: fig. 10). However, *Dolichiscus selatan* differs from *D. tanimbar* in the following features: short posterior spines on head dorsal (Fig. 3B) (long prominent ones on *D. tanimbar*; Poore, 1998: fig. 10); one upper spine on antenna 2 article 2 (Fig. 3B) (four on *D. tanimbar*; Poore, 1998: fig. 10), absence of spines on antenna 2 article 3 (Fig. 3B) (four spines on *D. tanimbar*; Poore, 1998: fig. 10); short spine on pereopods 2–4 (Fig. 3B) (long spine; Poore, 1998: fig. 10); absence of spine on pereopods 5–7 (Fig. 3B) basis (spines present; Poore, 1998: fig. 10); and the presence of a dorsomedial smooth ridge on the dorsal side of the pleotelson (Fig. 3A) (ridge absent; see Poore, 1998: fig. 11B).

Dolichiscus selatan can be distinguished from *D. cornutus* by the longer dorsolateral spines on the head (Fig. 3A) (shorter dorsolateral spines on the head of *D. cornutus*; Poore, 1998: fig. 5B) and the presence of four rows of spines on the dorsal region of pereonites (Fig. 3A) (two rows of spines on *D. cornutus*; Poore, 1998: fig. 5C).

Dolichiscus selatan, new species, can be separated from another species *Dolichiscus kai*, which also occurs in Indonesia, by the presence of three pairs of dorsolateral spines on the head (Fig. 3B) (one pair on *D. kai*; Poore, 1998: fig. 7A); the presence of spines on the dorsal region of the pereonites (Fig. 3B) (the absence of spines on the dorsal region of the pereonites; Poore, 1998: fig. 7A); four rows of prominent spines on the dorsal region of the pleotelson (Fig. 3A) (two rows of finer spines on the dorsal region of the pleotelson; Poore, 1998: fig. 7C); the presence of spines on the uropod (Fig. 3B) (without medial spines on the uropod; Poore, 1998: fig. 7A); and one spine on pereopod 2–4 basis (Fig. 3B) (two or three spines on pereopods 2 and 3 basis; Poore, 1998: fig. 7A). Both *Dolichiscus selatan* and *D. kai* have a medial smooth ridge on the dorsal region of the pleotelson.

ACKNOWLEDGEMENTS

The SJADES 2018 biodiversity cruise was a joint Indonesian–Singapore expedition to southern Java funded by the NUS and the Research Center for Oceanography, LIPI. We thank the chief scientists Dwi Listyo Rahayu and Peter Ng for organising this trip, and to the participants on board for obtaining live photographs of the specimen. Specimens were collected under the research permit RISTEKDIKTI 80/SIP/FRP/E5/Dit.KI/III/2018. We are grateful to Gary Poore (Museums Victoria, Melbourne, Australia) and an anonymous reviewer for providing valuable information which has helped in the description of the new species, as well as their constructive comments and suggestions. Farid Rifaie (Research Center for Biology LIPI, Indonesia) generated the map, and Lee Bee Yan (Tropical Marine Science Institute, NUS) provided helpful comments on an earlier draft of this manuscript. Heartfelt thanks are due to the staff of the Lee Kong Chian Natural History Museum, especially Jose Christopher Escano Mendoza and Muhammad Dzaki bin Safaruan for their kind assistance during our time spent at the museum. The authors would also like to acknowledge St. John's Island National Marine Laboratory (SJINML), a national infrastructure supported by the National Research Foundation (Singapore) for providing the research facilities used in this study.

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