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Description of a New Talitrid Genus *Ditmorchestia* with Redescription of *D. ditmari* (Derzhavin, 1923) comb. nov. (Crustacea, Amphipoda, Talitridae)

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Abstract *Ditmorchestia* gen. nov. is instituted to receive *Orchestia ditmari* Derzhavin, 1923. The new genus is defined by 4-dentate left lacinia of mandible, mediodistally lobate article 2, reduced article 4 on maxilliped palp, deeply subchelate gnathopod 1 (male), short and vertical palm of gnathopod 1 (female), cuspidactylate pereopods, outer ramus of uropod 1 marginally robust setose, and oostegites setae simple- or weakly curve-tipped. This genus is distinguished from *Traskorchestia* by having 4-dentate (*vs.* 4 and more) left lacinia and simple-tipped oostegite setae (*vs.* curl-tipped setae), and from *Orchestia* by having reduced pleopods (*vs.* well-developed).
Key words: Amphipoda, Crustacea, Talitridae, *Ditmorchestia,* new genus, *Ditmorchestia ditmari.*

Introduction

Derzhavin (1923) described *Orchestia ditmari* from coastal habitats (sublittoral, supralittoral to freshwater lakes) in Kamchatka, and Uéno (1935) recorded this species from a brackish lake on southern Sakhalin. After that, Iwasa (1939) and Stephensen (1944) described a talitrid species from Hokkaido and Sakhalin under the name of *O. ditmari*. Bousfield (1982) erected the genus *Traskorchestia* (type species＝*Orchestia traskiana* Stimpson, 1857) and transferred *O. ditmari*, together with *O. ochotensis* Brandt, 1851 and *O. georgiana* Bousfield, 1958, to this genus. In the paper of Bousfield (1982), redescription and illustration were given for *T. traskiana, T. ochotensis* and *T. georgiana*, but only a key for *T. ditmari*. As has been cautioned by Bousfield (1982), *T. ochotensis* has been incorrectly identified to *T. ditmari* in several literatures; in fact, Iwasa (1939), Stephensen (1944), and Gurjanova (1951) have treated *T. ochotensis* under the name of *T. ditmari*. Thus *T. ditmari* has never been redescribed since the original description, which may have caused this confusion. It has been known that two representatives of *Traskorchestia (T. ditmari* and *T. ochotensis*) occur in coastal habitats of northern Japan (Morino, 2015). The close examination of the Japanese specimens of *T. ditmari* has revealed inconsistency with the generic diagnosis for *Traskorchestia* in left lacinia of mandible and oostegites setae. In addition, no other talitrid genera fit this species, so that a new genus, *Ditmorchestia,* is instituted to receive *D. ditmari*. Full redescription of the species is also given.

Methods

The general methodology follows Morino (2014). The specimens were dissected under a stereomicroscope, and appendages and bodies were depicted under a light microscope using a drawing tube. The illustrated appendages were

fixed on slide mounts with Hoyer's medium or kept in tubes with bodies. The body length measured from the tip of head to the tip of telson along straightened dorsal margin. In the description of species, generic characters are basically not repeated. The specimens studied are lodged in the collection of the National Museum of Nature and Science, Tsukuba (NSMT), or in the private collection of Miyamoto.

Taxonomy

Family Talitridae

Ditmorchestia gen. nov.

[New Japanese name: Hokkai-hamatobimushi zoku]

Type species: *Orchestia ditmari* Derzhavin, 1923

Diagnosis. Body size medium-large. Eyes small-medium. Antenna 1 slightly exceeding end of peduncular article 4 of antenna 2, peduncle longer than flagellum. Antenna 2 in male not incrassate, flagellum subequal to peduncle in length. Upper lip lacking robust setae. Mandible, left lacinia 4-dentate. Maxilliped, outer margin of precoxa not stepped, palp articles 2 and 3 broad and mediodistally lobate, article 4 reduced, subapically positioned on article 3.

Gnathopod 1 sexually dimorphic; in male, propodus deeply subchelate, carpus and propodus with pellucid lobe, propodus lateral surface with rows of submarginal and facial robust setae; in female, propodus palm vertical, shorter than dactylus, carpus and propodus lacking pellucid lobe, propodus posterodistal corner covered with scabrous surface. Gnathopod 2 in male, propodus powerfully subchelate, dactylus not attenuate; in female, mitten-shaped, basis moderately expanded anteroproximally, propodus with facial and submarginal setae on lateral surface. Pereo-

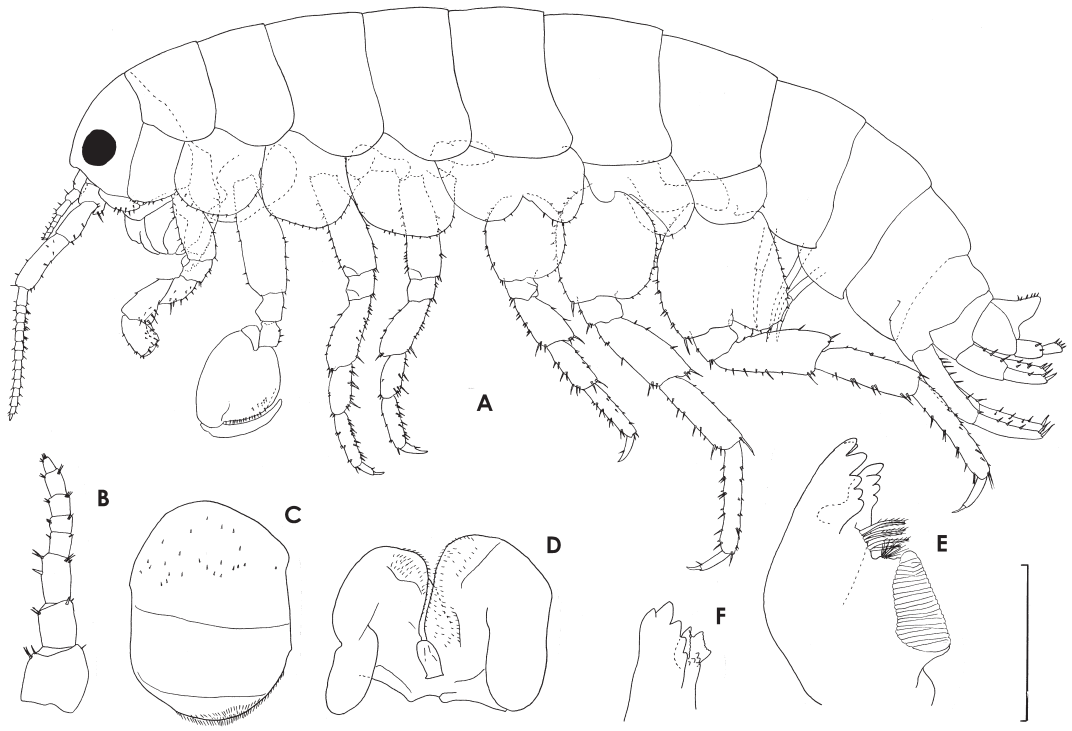

Fig. 1. *Ditmorchestia ditmari* (Derzhavin, 1923). Male, 11.0 mm (NSMT-Cr 24207). Daikoku Is., Akkeshi, Hokkaido, Japan. —A, habitus, lateral view (after Morino, 2015); B, antenna 1; C, upper lip; D, lower lip; E, left mandible; F, distal part of right mandible. Scale: A, 1.85 mm; B, 0.71 mm; C–F, 0.42 mm.

pods cuspidactylate (bi-cuspate), propodi with minute locking robust setae. Coxa of pereopod 4 wider than deep. Posterior lobe of coxa of pereopod 6 smoothly curved. Pereopod 7 weakly sexually dimorphic. Coxal gills of pereopods 2 and 6 larger than those of pereopods 3–5, gill of pereopod 2 lobed, others convoluted. Oostegites subobate, with numerous simple-tipped setae.

Pleonite side plates lacking marginal pits; pleopod peduncles with 2 retinacula, marginally and facially robust setose, rami moderately reduced. Uropod 1, peduncle distolateral robust seta shorter than subdistal one; inner ramus with outer and dorsal marginal robust setae, outer ramus with marginal robust setae. Uropod 2, rami subequal in length, with marginal robust setae. Uropod 3, peduncle slightly expanded, bearing ventromarginal robust setae; ramus stout, shorter than peduncle. Telson longer than broad, with dorsolateral, distolateral and distal robust setae.

Remarks. *Ditmorchestia* gen. nov. is broadly characterized by having the following features: 1) male antenna 2 not incrassate, 2) male gnathopod 1 deeply subchelate, carpus and propodus with broad-based pellucid lobe; in female, weakly subchelate, propodus palm shorter than dactylus, carpus and propodus lacking distinct pellucid lobe, 3) uropod 1, outer ramus bearing marginal robust setae, 4) mandible, left lacinia 4-dentate, and 5) oostegites with simple-tipped setae.

The first three features are shared with: *Traskorchesita* Bousfield, 1982 (in most species), *Orchestia* Leach, 1814 sense of Lowry and Fanini, 2013, and *Australorchestia* Serejo and Lowry, 2008. *Traskorchestia* is distinguished from *Ditmorchestia* by having curl-tipped setae

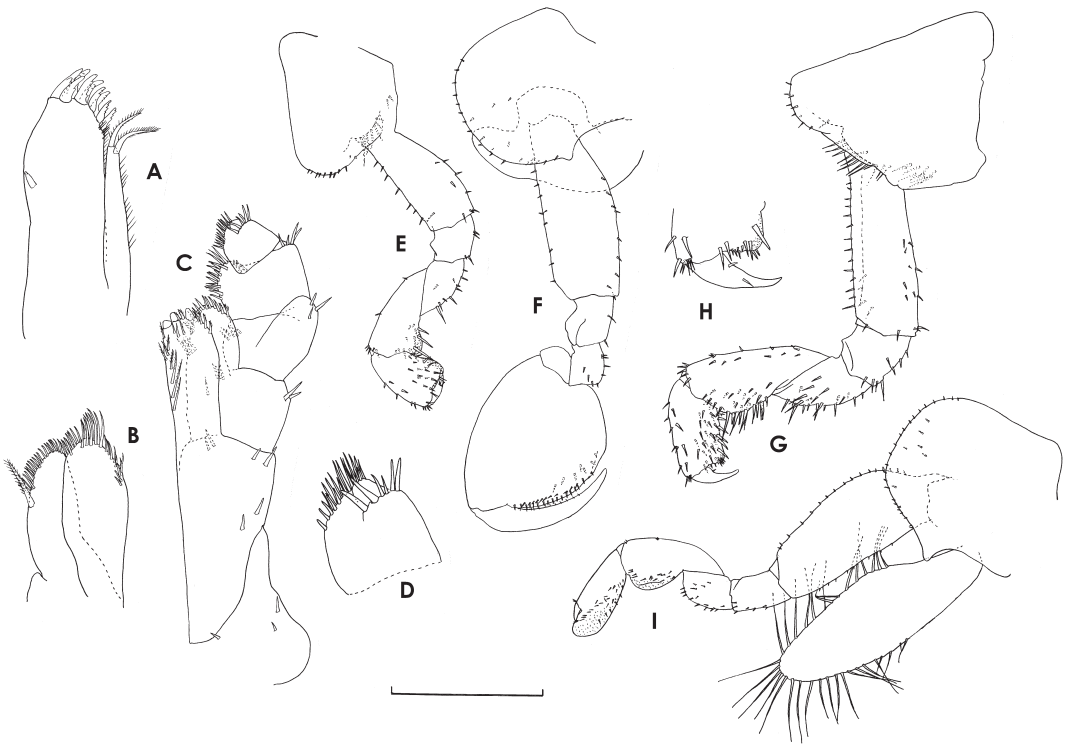

Fig. 2. *Ditmorchestia ditmari* (Derzhavin, 1923). Male, 11.0 mm (NSMT-Cr 24207); female, 15.0 mm (NSMT-Cr 24208). Daikoku Is., Akkeshi, Hokkaido, Japan. —A, maxilla 1; B, maxilla 2; C, maxilliped; D, palp article 4 of maxilliped; E, G, gnathopod 1; F, I, gnathopod 2; H, palm and dactylus of gnathopod 1 (G). G–I, female; others, male. Scale: A–C, 0.36 mm; D, 0.18 mm; E–G, 1.09 mm; H, 0.54 mm; I, 0.72 mm.

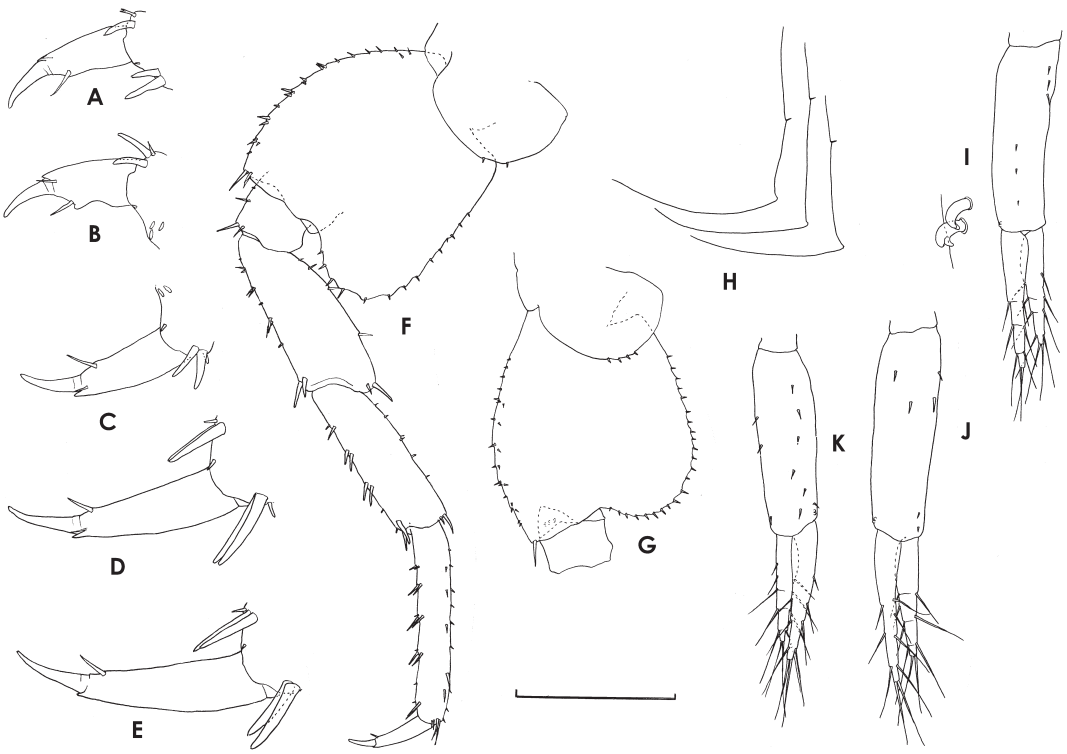

Fig. 3. *Ditmorchestia ditmari* (Derzhavin, 1923). Male, 11.0 mm (NSMT-Cr 24207); female, 15.0 mm (NSMT-Cr 24208). Daikoku Is., Akkeshi, Hokkaido, Japan. —A–E, distal parts of pereopods 3–7; F, pereopod 7; G, basis of pereopod 7; H, pleonite side plates; I–K, pleopod 1–3 with retinacula of pleopod 1. G, female; others, male. Scale: A–E, 0.36 mm; F–G, 1.09 mm; H–K, 0.71 mm (retinacula, 0.035 mm).

on oostegites. *Australorchestia* is by having marginally bare outer ramus on uropod 2, gills of pereopod 2–5 similar in size and shape. Morphologically the new genus is close to *Orchestia*. However *Orchestia* is separable by having well developed pleopods, inhabiting the supralittoal habitats around Atlantic and New Zealand waters (Lowry and Fanini, 2013, see also Wildish, 2014). *Cryptorchestia* Lowry and Fanini, 2013, a genus very close to *Orchestia*, occupies the terrestrial habitats, though this genus has a pellucid lobe on merus of gnathopod 1 (male) and well developed pleopods. The propodus of female gnathopod 1 with scabrous surface at posterodistal angle is common to *Ditmorchestia* and *Traskorchestia* (with a small lobe). And the overlapped distributional ranges of both genera in north Pacific, suggest that *Ditmorchestia* is phylogenetically most closely related to *Traskorchestia*.

Etymology The genetic name is a combination of specific name of the type species, *ditmari* and generic name *Orchestia*.

Ditmorchestia ditmari (Derzhavin, 1923)
[Japanese name: Hokkai-hamatobimushi]
(Figs. 1–5)

Orchestia ditmari Derzhavin, 1923: 187, pl. 6; Uéno, 1935, 90 (locality).

Non *Orchestia ditmari*: Iwasa, 1939: 263, figs. 7–8, pl. 11 (=*Traskorchestia ochotensis*); Stephensen, 1944: 60, figs. 18–19 (=*T. ochotensis*); Gurjanova, 1951: 806, fig. 561 (=*T. ochotensis*).

Traskorchestia ditmari: Bousfield, 1982: 10 (key); Morino, 2015, 1085 (fig. 2), 1089.

Material examined. HOKKAIDO: Male 11.0 mm (NSMT-Cr 24207), female 15.0 mm (NSMT-

Cr 24208), ovig. female 14.3 mm (NSMT-Cr 24209), male 14.0 mm (NSMT-Cr 24210), 5 males, 7 ovig. females, 9 females, 1 juvenile (NSMT-Cr 24206); Daikoku Island (grass land (*Artemisia* spp.) on the cliff)), Akkeshi, Kushiro; 19 Jul. 1986; Udagawa, T. collect. 12 males, 36 females (Miyamoto collection); Shiundai (base of cliff, under decayed wood material), Kushiro; 30 Jul. 1988; Miyamoto, H. collect.

Description of male (NSMT-Cr 24207, 11.0 mm). Antenna 1 (Fig. 1A–B) slightly exceeding end of peduncular article 4 of antenna 2, peduncular article 3 subequal to article 2 in length; flagellum with 5 articles. Antenna 2 (Fig. 1A), flagellum with 14 articles, basal 2–6 articles with closely packed dense setae on medial side (Fig. 5B). Mandible, left lacinia 4-dentate (Fig. 1E). Other mouth parts (Figs. 1C–D, F, 2A–D) as described in generic diagnosis or same as other talitrid species. Gnathopod 1 (Fig. 2E), carpus *ca.* 1.3 times as long as propodus, pellucid lobes of carpus and propodus not prominent, merus lacking pellucid lobe. Gnathopod 2 (Fig. 2F), propodus distally broaden, palm smooth, slanted, as long as posterior margin. Pereopods, propodus locking robust setae minute (Fig. 3A–E). Dactylus of pereopod 4 pinched (Fig. 3B). Bases of pereopods 5–6 (Fig. 1A) posteriorly rounded. Basis of pereopod 7 (Fig. 3F) posterodistally produced, robust setae on posterodistal angle stronger than others.

Pleonite side plates 1–3 (Fig. 3H), posterodistal corner weakly acuminate, posterior margin with seta. Pleopods 1–3 (Fig. 3I–K), peduncle with stiff robust setae on outer margin and surface; rami moderately reduced, 0.73, 0.70, 0.71 times as long as peduncle, respectively, with 3–4 articles. Uropod 1 (Fig. 4A), peduncle with 6 outer, 6 inner-medial marginal robust setae; outer ramus with 3 marginal robust setae, inner ramus with 3 outer and 3 dorsal marginal robust setae. Uropod 2 (Fig. 4B), peduncle with 3 outer, 6 inner-medial marginal robust setae; outer ramus with marginal robust seta, inner ramus with 2 robust setae on outer and dorsal margin each. Uropod 3 (Fig. 4C), peduncle weakly expanded, with 2 dorsodistal robust setae and 6 ventromarginal robust setae; ramus short, slightly expanded, with 10 + robust setae distally. Telson (Fig. 4D), longitudinal suture not clear, with 5–7 robust setae per lobe.

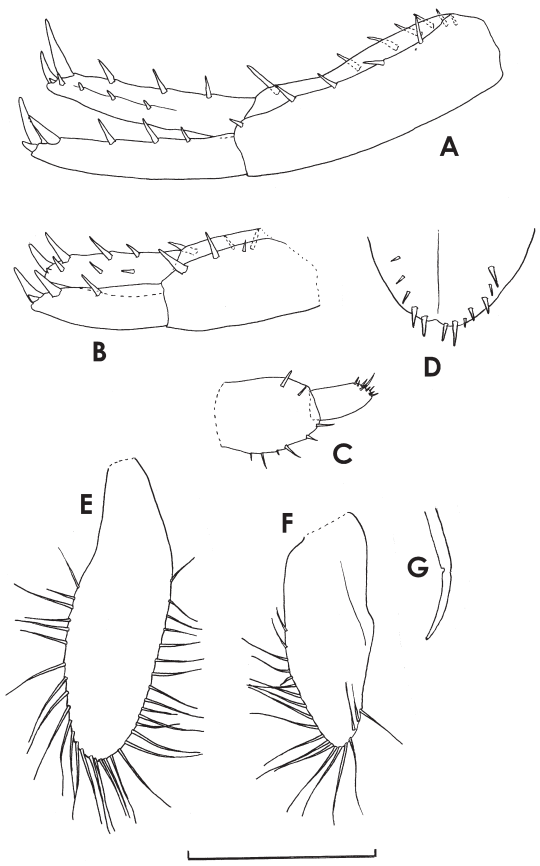

Fig. 4. *Ditmorchestia ditmari* (Derzhavin, 1923). Male, 11.0 mm (NSMT-Cr 24207); female, 15.0 mm (NSMT-Cr 24208); ovigerous female, 14.3 mm (NSMT-Cr 24209). Daikoku Is., Akkeshi, Hokkaido, Japan.—A, uropod 1; B, uropod 2; C, uropod 3; D, telson; E, oostegite of pereopod 3; F, oostegite of pereopod 5; G, tip of oostegite seta on pereopod 5. E–F, female (NSMT-Cr 24208); G, ovig. female (NSMT-Cr 24209); others, male. Scale: A–D, 0.71 mm; E–F, 0.72 mm; G, 0.08 mm.

Supplemental description of larger male (NSMT-Cr 24210, 14.0 mm). Antenna 1 with 6 flagellar articles. Antenna 2 (Fig. 5A), peduncular article 5 stout, weakly bowed; flagellum with 18 articles, basal articles 3–8 with packed dense

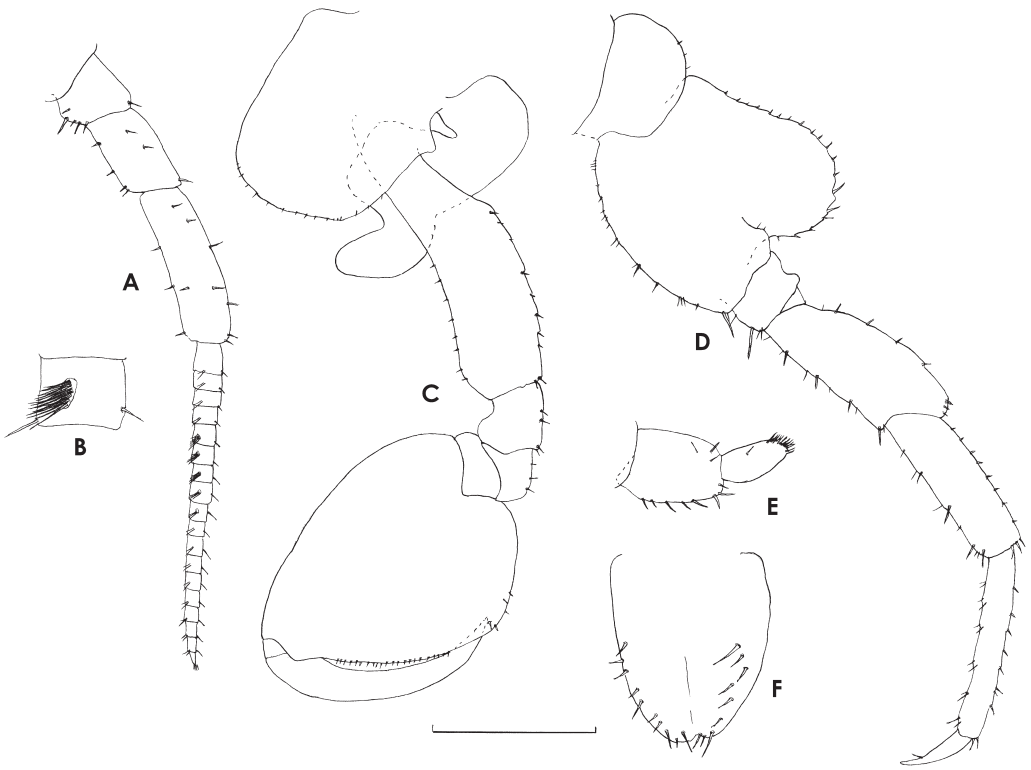

Fig. 5. *Ditmorchestia ditmari* (Derzhavin, 1923). Male, 14.0 mm (NSMT-Cr 24210). Daikoku Is., Akkeshi, Hokkaido, Japan. —A, antenna 2; B, flagellar article 6 of antenna 2 (medial side); C, gnathopod 2; D, pereopod 7; E, uropod 3; F, telson. Scale: A, C, 1.06 mm; B, 0.30 mm; D, 1.52 mm; E–F, 0.76 mm.

setae (Fig. 5B). Gnathopod 2 (Fig. 5C), basis proximally slender and weakly curved. Pereopod 7 (Fig. 5D), merus-carpus stout. Pleopods 1–3, rami 0.83, 0.68, and 0.77 times as long as respective peduncle, with 5–6 articles. Uropod 1, peduncle with 7 outer and 9 inner-medial marginal robust setae; outer ramus with 3 marginal, inner ramus with 4 dorsal and 5 (6) outer marginal robust setae. Uropod 2, peduncle with 3 outer and 8 inner-medial marginal robust setae, outer ramus with 2, inner ramus with 3 dorsal and 4 (5) outer marginal robust setae. Uropod 3 (Fig. 5E), peduncle with 3 dorsal, 8 ventromarginal robust setae; ramus shorter than peduncle, 0.67 times as long as peduncle, with a few marginal and 10＋ distal setae. Telson (Fig. 5F) distinctly longer than wide, with 9–10 robust setae per lobe.

Female (Sexual characters; NSMT-Cr 24208, 15 mm; NSMT-Cr 24209, 14.3 mm). Antenna 2, flagellum lacking packed dense setae. Gnathopod 1 (Fig. 2G), carpus *ca.* 1.4 times as long as propodus, propodus with small scabrous surface on posterodistal corner (Fig. 2H). Gnathopod 2 (Fig. 2I), basis slightly expanded anteroproximally, merus lacking pellucid lobe, propodus submarginal setae *ca.* 5 in number. Basis of pereopod 7 (Fig. 3G) weakly produced posterodistally, posterior margin richly robust setose, with strong robust setae on posterodistal corner. Oostegite of pereopod 2 with more than 30 setae (Fig. 4E), tip of setae constricted subterminally and slightly curved to tip (Fig. 4G).

Distribution. This species occurs in intertidal to subtidal zones (8 m deep), as well as a freshwater lake in Kamchatka (Derzhavin, 1923), and shores of a brackish lake in southern Sakhalin (Uéno, 1935). In Japan, it is found in coastal ter-

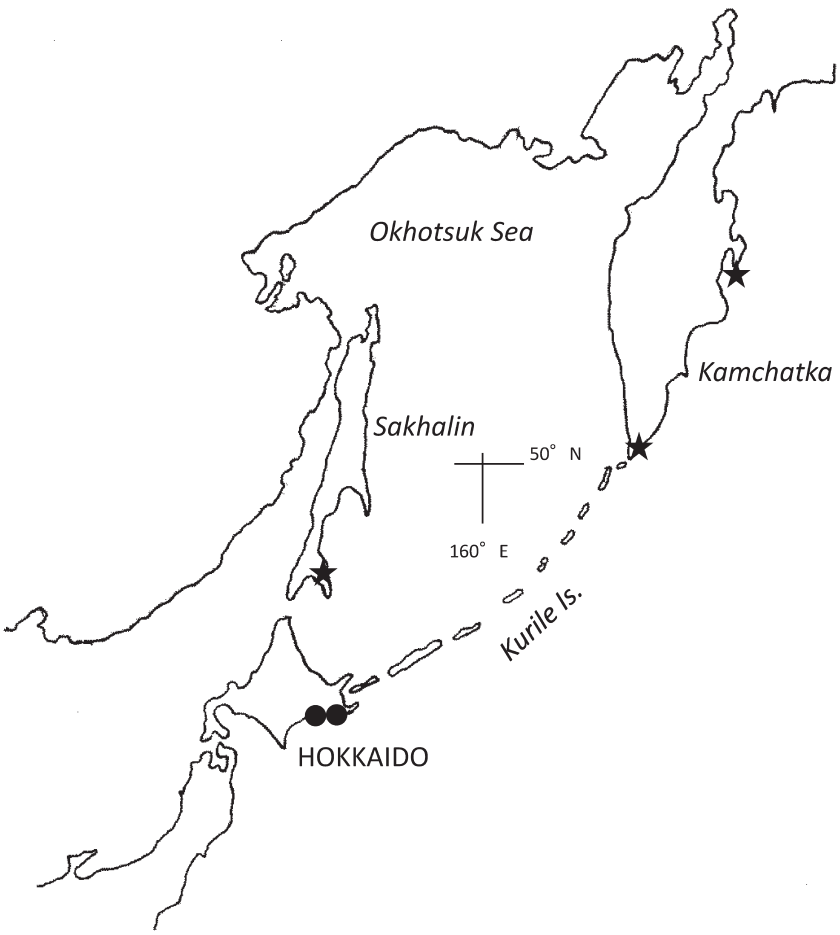

Fig. 6. Distribution of *Ditmorchestia ditmari* (Derzhavin, 1923). Star marks: from literature.

restrial habitats, including grassland, in eastern Hokkaido (Fig. 6).

Remarks. The present specimens agree well with the original description in general facies and peculiar features in produced basis of pereopod 7 (male) and robust setose ventral margin of uropod 3 peduncle. Also the original figure of antenna 2 in male illustrates the tuft of setae on several basal flagellar articles. This species has been placed into *Traskorchestia* Bousfield, 1982, but the 4-dentate left lacinia on mandible and simple- or slightly curve-tipped setae on oostegites of this species exclude it from the genus *Traskorchestia*. However, this species shows a few similarities to *T. ochotensis* within *Traskorchestia* in having moderately reduced pleopods, male gnathopod 1 lacking pellucid lobe on merus, evenly spaced marginal robust setae on outer ramus of male uropod 1.

Ditmorchestia ditmari exhibits distinct characters in having densely packed setae on flagellar articles of antenna 2 (in male), which is not known for the authors so far. Since it is confined to male, it would be related to reproductive function. This study discloses the weakly curve-tipped setae on oostegites, the terminal part from the constriction of the setae is weakly curved and spatulate in form. The similar structure has been documented by SEM in *Floresorchestia malayensis* by Lowry and Springthorpe (2015). The curve tipped or spatulate features are not always easy to recognize, for the configuration depends

on the angle of each seta. In this description they are described as simple-tipped.

The habitat of this species is peculiar in showing both terrestrial (coastal) and aquatic (saline and freshwater) environment. Geographical range covers from eastern Hokkaido to middle Kamchatka. In Hokkaido, *Kokuborchestia kokuboi* (Uéno, 1929) and "*Orchestia*" *solifuga* Iwasa 1939 also occur in the coastal terrestrial habitats (Morino and Miyamoto, 2015). These two species are separable from *Ditmorchestia ditmari* by elongate antenna 1 (reaching mid-point of peduncular article 5 of antenna 2) and homopodous pereopods 5–7.

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