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Redescription of a Little Known Pandalid Shrimp, *Pandalopsis lamelligera* (Brandt) (Crustacea: Decapoda: Caridea) Based upon Topotypic Material from Shantar Islands, Northern Okhotsk Sea

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Abstract A little known pandalid shrimp, *Pandalopsis lamelligera* (Brandt, 1851) is redescribed and illustrated on the basis of six topotypic specimens from Shantar Islands, northern Okhotsk Sea. The presence of a small patch of short setae near the posterodorsal margin of the carapace suggests close relationship of this species to *P. japonica* Balss and *P. ochotensis* Kobjakova. Key to the species of the genus presented by Komai (1994) is partially revised.

Key words: Decapoda, Caridea, Pandalidae, *Pandalopsis lamelligera*, Shantar Islands, northern Okhotsk Sea, redescription.

Pandalopsis lamelligera was first described by Brandt (1851) on the basis of three specimens from Shantar Islands, northern Okhotsk Sea, and four specimens from Kamchatka. Although this species has been mentioned in previous literature several times (e. g., Brashnikov, 1907; Kobjakova, 1936a, 1936 b; Urita, 1942; Vinogradov, 1950; Komai, 1994), its features still remain unclear in detail and no illustration made in modern standard has been published. During the expedition to the northern Okhotsk Sea carried out by the staff of the Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University, in 1995, six specimens of this little known species were collected from Shantar Islands. The newly obtained topotypic material enables me to evaluate the specific status of this species more adequately and gives an opportunity to revise the key proposed by Komai (1994) for the identification of the species of *Pandalopsis*.

The specimens are deposited in the Natural History Museum and Institute, Chiba (CBM) with a code of ZC. The illustrations were prepared with the aid of a drawing tube mounted on an OLYMPUS SZH stereomicroscope. The postorbital carapace length (CL) is used as a standard measurement indicating the size of specimens.

Pandalopsis lamelligera (Brandt, 1851)

(Figs. 1, 2)

Pandalus lamelligerus Brandt, 1851: 124, pl. 5, fig. 20, 20a, b [type locality: the type series consists of specimens from two different locations: Shantar Islands, northern Okhotsk Sea; and Kamchatka]; Brashnikov, 1907: 99.

?*Pandalus annulicornis*: Doflein, 1900: 320 (part).

Pandalopsis lamelligera: Balss, 1914: 32; De Man, 1920: 105; Kobjakova, 1936a: 188 (key); 1936b: 190 (list), 191 (list), 202 (list), 209 (key), 214 (table), fig. 35; Urita, 1942: 11; Vinogradov, 1950: 195, fig. 21; Miyake, 1982: (list); Komai et al., 1992: 191; Komai, 1994: 536 (key).

Not *Pandalopsis lamelligera*: Yokoya, 1939: 264, fig. 1. [=*Pandalopsis coccinata* Urita, 1941.]

Material examined. CBM-ZC 2578, 4 males (CL 9.1–10.1 mm), 2 transitional males (CL 14.2, 15.0 mm), Lebyazhiya Bay, Shantar Islands, northern Okhotsk Sea, at depth of 23

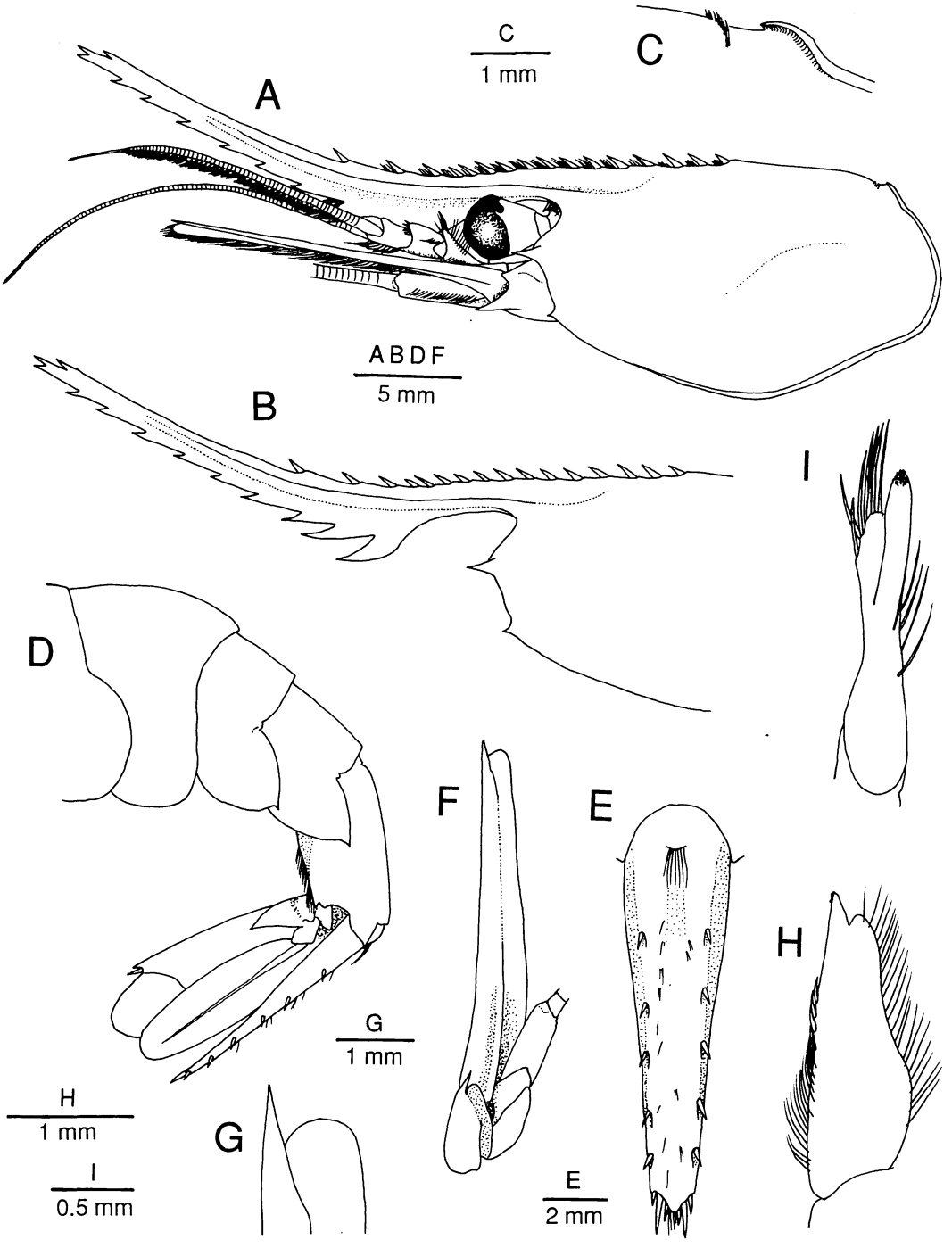

Fig. 1. *Pandalopsis lamelligera* (Brandt, 1851). A–G, transitional male (CL 14.2 mm), H, I, functional male (CL 10.1 mm), from Shantar Islands, northern Okhotsk Sea, CBM-ZC 2578. A, carapace and cephalic appendages, lateral; B, anterior part of carapace, lateral, setae omitted; C, posterodorsal part of carapace, lateral; D, posterior four abdominal somites, telson and uropods, lateral, setae omitted; E, telson, dorsal; F, antenna, ventral, setae omitted; G, distal part of scaphocerite, ventral; H, endopod of left first pleopod, ventral; I, appendix interna and appendix masculina of left second pleopod, mesial.

m, rocky bottom, 31 July 1995, beam trawl, coll. M. Yabe.

Description. Integument of body almost naked, devoid of scales, but with small patch of short setae near posterodorsal margin of carapace (Fig. 1C).

Rostrum (Fig. 1A, B) moderately curving dorsad, not arched over eyes, distinctly overreaching scaphocerite, 1.6–1.7 times as long as carapace; dorsal margin armed with 13–16 movable spines, including 5–7 on carapace posterior to level of orbital margin, posteriormost spine arising from mid-length of carapace, and with 1 or 2 fixed teeth near apex, leaving subdistal half unarmed; ventral margin armed with 9 or 10 teeth, posteriormost tooth much stronger than preceding teeth. Carapace (Fig. 1A) with postrostral ridge low, extending near to posterior one-third length of carapace; antennal and branchiostegal spines moderately strong.

Abdomen (Fig. 1D) with third somite rounded posteriorly, unarmed, without median carina or projection. Pleura of anterior three somites rounded, those of fourth and fifth armed with sharp posteroventral tooth. Sixth somite 0.44–0.51 times as long as carapace and 1.57–1.93 times as long as proximal depth, with posteroventral tooth. Telson (Fig. 1D, E) 1.6 times as long as sixth somite, armed with 6 pairs of dorsolateral spines, posteriormost pair situated dorsolateral to base of longer lateral spine of 2 posterior pairs.

Eye (Fig. 1A) broadly subpyriform, corneal region subequal in length to stalk; ocellus distinct, in broad contact with cornea.

Antennular peduncle (Fig. 1A) not reaching mid-length of scaphocerite; stylocerite short, broadly rounded; intermediate segment with few spinules on anterodorsal margin. Outer flagellum with thickened aesthetascs bearing portion distinctly shorter than carapace.

Antenna (Fig. 1A, F) with scaphocerite equal or subequal in length to carapace, lateral margin slightly concave, distolateral tooth distinctly overreaching rounded distal margin of blade (Fig. 1G).

Mouthparts typical of genus. Third maxilliped (Fig. 2A) stout, reaching anterior one-fourth to two-fifths length of scaphocerite; ultimate segment longer than penultimate segment; antepenultimate segment strongly compressed laterally, dorsal margin strongly expanded, with stiff setae mesially, ventral margin with numerous stiff setae; exopod absent.

Pereopods with well developed epipods on anterior four pairs. First pereopod (Fig. 2B) falling short of mid-length of scaphocerite, with microscopic chela; propodus somewhat compressed laterally; carpus with prominent excavation dorsomesially; merus slightly inflated ventrally; ischium with broad laminar expansion, its ventral margin with short stiff setae laterally and with long stiff setae mesially; basis with ventrodistal corner strongly produced. Second pereopod (Fig. 2C) equal or subequal, overreaching scaphocerite by length of chela; chela (Fig. 2D) relatively long, about 0.4 times as long as carpus, with dactyl about 0.7 times as long as palm; carpus divided into 15–18 articles; merus about half length of ischium, without annulation. Ischium of posterior three pairs of pereopods armed with 1 ventral spine. Third pereopod (Fig. 2E) overreaching scaphocerite by length of dactyl and at most by distal one-sixth of propodus; dactyl (Fig. 2F) 0.25–0.26 times as long as propodus, with 3 or 6 accessory spinules distributed almost over entire length of flexor margin; propodus with flexor surface bearing scattered spinules flanked by row of longer spines; carpus about half length of propodus, with 2 lateral spines, mesial surface with numerous spinules (Fig. 2G); merus 0.89–0.93 times as long as carapace, with 6 or 7 lateral and 5–8 ventral or ventromesial spines. Fourth pereopod (Fig. 2H) just reaching or overreaching scaphocerite by tip of dactyl; mesial surface of carpus less spinose than in third; merus 0.81–0.83 times as long as carapace. Fifth pereopod (Fig. 2I) not overreaching scaphocerite; dactyl about 0.2 times as long as propodus; propodus with tufts of grooming setae terminally or subterminally; carpus without mesial spinules; merus 0.72–0.77 times as long as carapace.

Endopod of first pleopod (Fig. 1H) in functional males with distinct appendix interna, mesial margin with row of 4 or 5 slender, curved spines distal to level of its mid-length.

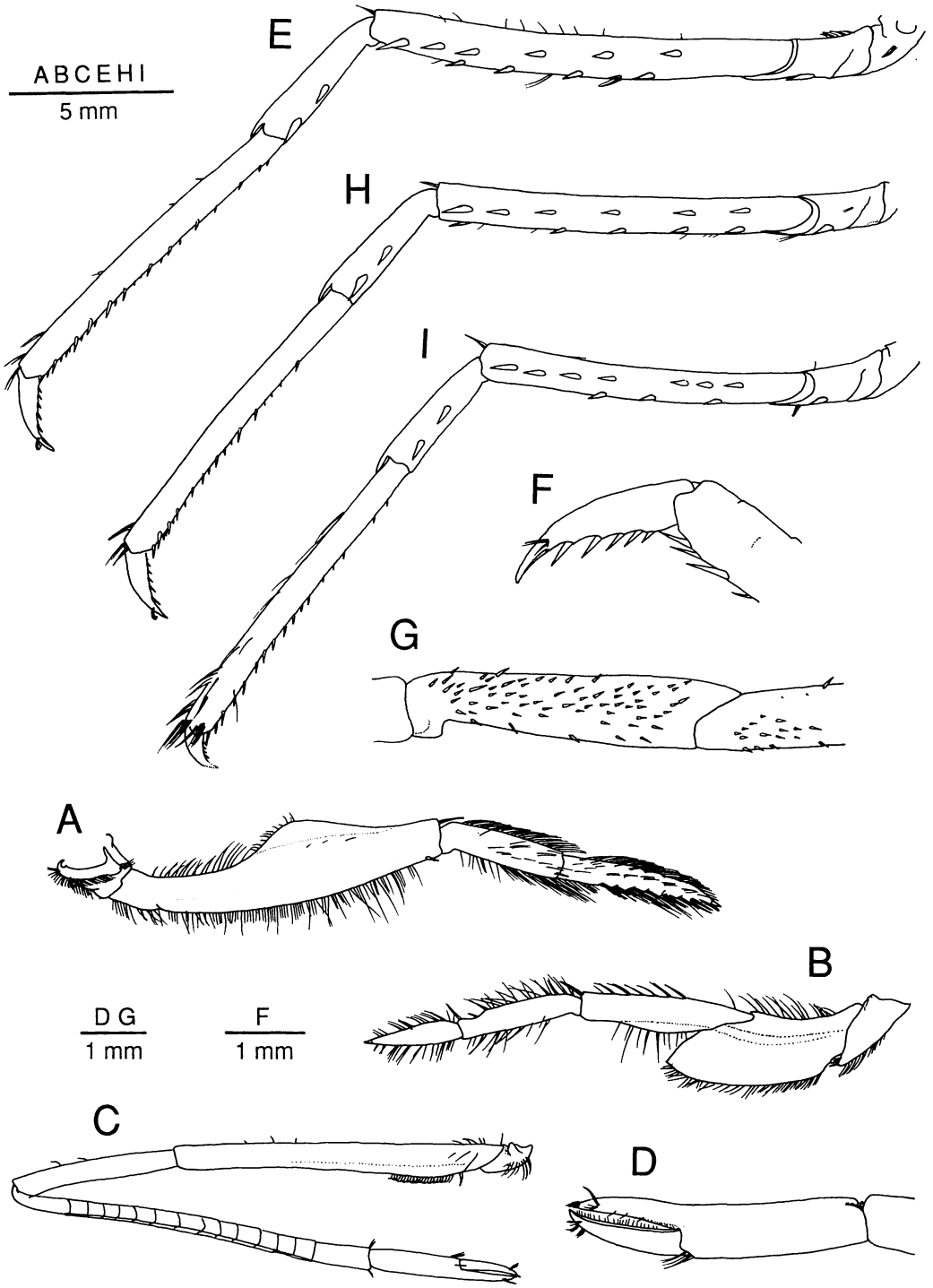

Fig. 2. *Pandalopsis lamelligera* (Brandt, 1851). Transitional male (CL 14.2 mm) from Shantar Islands, northern Okhotsk Sea, CBM-ZC 2578. All but third maxilliped removed from left side. A, right third maxilliped, lateral; B, first pereopod, lateral; C, second pereopod, lateral; D, chela of same, lateral; E, third pereopod, lateral; F, dactyl and distal part of propodus of same, lateral, setae omitted; G, carpus and proximal part of propodus of same, mesial; H, fourth pereopod, lateral; I, fifth pereopod, lateral.

Appendix masculina of second pleopod in functional males (Fig. 1I) distinctly shorter than appendix interna, terminally or subterminally with 7 long spines; spines greatly reduced in transitional males.

Coloration. "Body marked with several longitudinal pink streaks; intermediate area light yellow; median dorsal line of abdomen yellowish-white" (after Urita, 1942). In the present specimens, which had been preserved in 10% formalin water, color was almost faded out, but the brownish bands of the antennal flagellum and of the ambulatory pereopods and brownish longitudinal stripes on the sixth abdominal somite were still preserved.

Distribution. Petropavlovsk, Kamchatka; Okhotsk coast of Saghalien; continental coast of Japan Sea; 14–30 m. There has been no certain record of *Pandalopsis lamelligera* from Japanese main islands, though Miyake (1982) enumerated this species in his list of Japanese macruran and anomuran Crustacea.

Remarks. Like other species of *Pandalopsis,* there is an indication of protandry in this species, evidenced from morphology of the anterior two pairs of the pleopods (e.g., Berkely, 1932; Butler, 1980; Komai, 1994), though no female specimen has been available to me. The carapace lengths of the present specimens, which have fully developed appendices masculinae and reduced ones, are 9.1–10.1 mm and 14.1 and 15.0 mm in CL, respectively.

The examination of the present material discloses that *P. lamelligera* actually has a small patch of short setae near the posterodorsal margin of the carapace. Such a character state is found in two species within *Pandalopsis,* i.e., *P. japonica* Balss, 1914, and *P. ochotensis* Kobjakova, 1936a (see Komai, 1994). *P. lamelligera* is readily separated from both *P. japonica* and *P. ochotensis* by the absence of dorsal rostral spines arising anterior to the level of the rostral length, fewer dorsal rostral spines of the rostrum (13–16 versus 21 or 22 in *P. japonica* and 18 in *P. ochotensis*), thickened part of the outer antennular flagellum distinctly shorter than the carapace, rather than slightly or distinctly longer than that, and distolateral tooth of the scaphocerite distinctly overreaching the distal margin of the blade, rather than falling short of or reaching that.

Richters (1884) suggested that *Pandalopsis lamelligera* (as *Pandalus lamelligerus*) might represent a large example of *Pandalus annulicornis* Leach, 1815. Following Richters' suggestion, Doflein (1900) considered that *Pandalus lamelligerus* is synonymous with *Pandalus annulicornis.* However, there is little doubt that *Pandalus annulicornis* is a junior synonym of *Pandalus montagui* Leach, 1814 (De Man, 1920; Williams, 1984), quite distinct from *Pandalopsis lamelligera.*

As Komai (1994) indicated, there is little doubt that the specimen from Konorihama, Miyagi-ken, Japan, referred to as *Pandalopsis lamelligera* by Yokoya (1939), actually represents *P. coccinata* Urita, 1941.

Key to species of *Pandalopsis,* provided by Komai (1994), proves to be erroneous, so I have partially revised it for the identification of the species of the genus *Pandalopsis.*

4. Rostrum with posteriormost ventral tooth distinctly stronger than preceding one; carapace with small patch of short setae near posterodorsal margin 5
— Rostrum with posteriormost ventral tooth not stronger than preceding one; carapace without small patch of short setae near posterodorsal margin (except for *P. ochotensis*) 6
5. Rostrum armed with 20 or more dorsal spines over almost entire length; telson with more than 6 dorsolateral spines on either side; thickened part of outer antennular lagellum slightly longer than carapace; scaphocerite with distolateral tooth not reaching distal margin of blade .....*P. japonica* Balss, 1914
— Rostrum armed with less than 20 dorsal spines, subdistal half length unarmed; telson with 6 dorsolateral spines on either side; thickened part of outer antennular flagellum distinctly shorter than carapace; scaphocerite with distolateral tooth distinctly overreaching distal margin of blade.....*P. lamelligera* (Brandt, 1851)

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オホーツク海北部シャンタル諸島において採集された標本に基づくモロトゲエビ属の1種 *Pandalopsis lamelligera* (Brandt) の再記載

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オホーツク海北部シャンタル諸島から採集された6個体の標本に基づき，タラバエビ科モロトゲエビ属の1種 *Pandalopsis lamelligera* (Brandt, 1851) を再記載した．本標本の採集された産地は本種の模式産地である．本種の従来の記載は簡潔なもので，細部の特徴は不明のままとされていたが，本研究により，その特徴と他種との関係がより明確なものとなった．本種は，頭胸甲の後縁付近に短毛の小さなパッチを持つことが明かとなり，この点において，モロトゲアカエビ *P. japonica* Balss, 1914 とオホーツクモロトゲエビ *P. ochotensis* Kobjakova, 1936 に類似するが，額角上縁から頭胸甲上にかけて並ぶ棘の数が少ないこと，第1触角外鞭の肥厚部が頭胸甲より明らかに短いこと，触角鱗の外縁末端歯が葉状部の先端を明らかに超えるなどの特徴により両種から識別される，

Komai (1994) によって提唱された本属の検索表のうち，本種に関する部分について誤りがあることが判明したので，改訂した．