

Range extension of three crangonid shrimps (Decapoda, Caridea) to Japanese waters

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Abstract.—A range extension to Japanese waters is recorded for three crangonid shrimps: *Lissosabineia indica* (De Man, 1918) previously only known from the Philippines and Indonesia; *Parapontocaris levigata* Chace, 1984 known from the Indo-West Pacific up to Taiwan; and *Rhynocrangon sharpi* (Ortmann, 1895) known from the northern North Pacific including the Far East Russian coast of the Sea of Japan. The first two species are the only members of their genera recorded from Japan. Diagnosis and illustrations are given for *L. indica* and *P. levigata* for the species recognition. *Rhynocrangon sharpi* is fully re-described and illustrated, because there is no detail description of this species.

Introduction

The family Crangonidae, which is characterized by the presence of a subchelate first pereopod, is represented by 20 genera world-wide (Holthuis, 1993). The family is virtually cosmopolitan and can be found in the littoral to abyssal depth of 5852 m (Chace, 1984). Miyake (1998) enumerated 42 species belonging to 13 genera from Japanese waters.

During the course of a taxonomic study on the crangonid shrimps, the following three species not previously recorded from Japanese waters were found: *Lissosabineia indica* (De Man, 1918), *Parapontocaris levigata* Chace, 1984 and *Rhynocrangon sharpi* (Ortmann, 1895). Of these, the rather rare species, *L. indica* and the recently described shrimp, *P. levigata* extend their ranges northward to Japanese waters. *Rhynocrangon sharpi*

has never been recorded from Japanese waters, though this species is rather frequently reported from the northern North Pacific including the Far East Russian coast of the Sea of Japan (e. g., Doflein, 1900; Rathbun, 1904; Derjugin & Kobjakova, 1935; Kobjakova, 1936; 1937; 1955; 1958; 1959; Makarov, 1940; Vinogradov, 1950; Zarenkov, 1965; Komai, 1994). A diagnosis and illustrations are given for *L. indica* and *P. levigata*, as their morphological features have been well described. A full description of *R. sharpi* is provided, as many morphological details were previously unclear.

Specimens examined are deposited in the Kitakyushu Museum and Institute of Natural History, Kitakyushu (KMNH) and the National Fisheries University, Shimonoseki (NFU). Material belonging to the Zoological Laboratory of Kyushu University, Fukuoka (ZLKU), is now deposited in the KMNH.

Postorbital carapace length (CL) is used as an indication of the size of the specimens.

Systematic accounts

Lissosabineia indica (De Man, 1918)

Fig. 1a, b

Sabineia indica De Man, 1918: 304; 1920: 303, pl. 25, fig. 75, 75a–l; Chace, 1984: 59; Takeda & Hanamura, 1994: 30.

Lissosabineia indica – Christoffersen, 1988: 48 (in passim).

Material examined.—Off Tosa-shimizu, Kochi Prefecture, 146 m, 8 Mar. 1960, coll. K. Kurohara, 1 ♀ (CL 7.4 mm),

ZLKU 2057.

Diagnosis.—Integument not particularly firm, partly pubescent, with scattered long setae on dorsal surface of rostrum in proximal 0.60. Rostrum reaching slightly beyond distal margin of proximal segment of antennular peduncle, 0.38 times as long as carapace, pointed distally; distal half laterally compressed and slightly curved upward; lateral margin armed with spine on proximal part. Carapace 1.31 times as long as broad, having 3 longitudinal carinae; median carina with 2 strong spines; upper lateral carina unarmed; lower lateral carina with 2 spines, anterior (hepatic) spine strong, posterior spine smaller than anterior spine; hepatic groove distinct; antennal spine small; branchiostegal spine strong; pterygostomian spine minute. First, second, fourth and fifth abdominal somites rounded dorsally; third somite with blunt and arched median carina on posterior half; sixth somite flattened dorsally. Pleura of first to fifth somites rounded ventrally. Telson with shallow groove on anterior third. Scaphocerite rather slender, 0.72 times as long as carapace, 2.95 times as long as wide, with truncate blade. Second maxilliped without podobranch. Third maxilliped with two arthrobranchs, antepenultimate segment strongly flattened. First pereopod with palm 3.32 times as long as wide; mesial margin of merus with lamelliform carina on posterior two-thirds, terminating in small sharp spine; exopod absent. Second pereopod not chelate, not reaching half of merus of first pereopod. Fourth pereopod with propodus bearing tuft of setae on dorsodistal margin; merus with small spine dorsodistally. Thoracic sternum without pair of spines behind coxae of fifth pereopods. Pleurobranchs of fourth to eighth thoracic somites with ventral apex directed posteriorly.

Distribution.—Indonesia, Philippines, and Pacific coast of southern Ja-

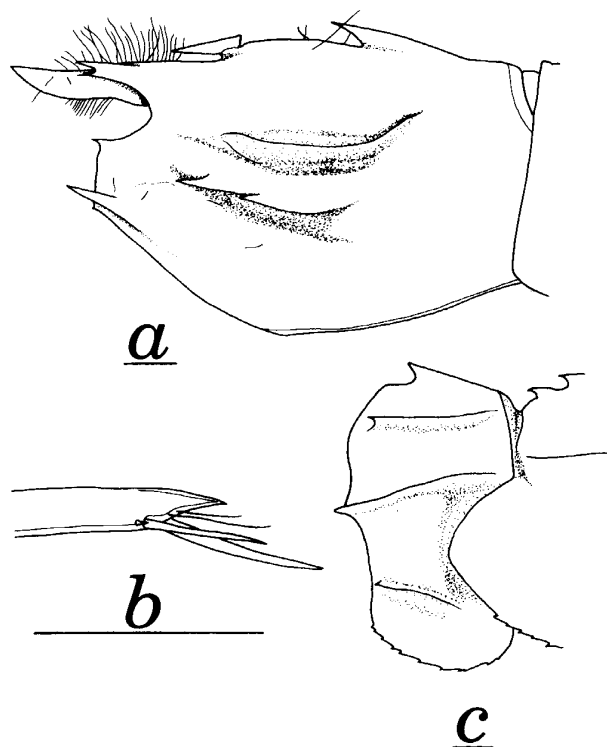


Fig. 1. *a, b*, *Lissosabineia indica* (De Man, 1918), female (CL 7.4 mm, ZLKU 2057) from off Tosashimizu; *c*, *Parapontocaris levigata* Chace, 1984, female (CL 14.9 mm, ZLKU 1891) from Tosa Bay: *a*, carapace, lateral, anterior median spine broken; *b*, distal part of telson, lateral; *c*, first abdominal somite, lateral. Scales = 1 mm.

pan; 146–545 m (Chace, 1984; present study).

Remarks.—The present material, representing only the fourth record of this species, agrees well with De Man's (1918, 1920) original and subsequent descriptions, except for the following two minor points. In the present specimen the dorsal surface of the rostrum bears a scattering of long setae (Fig. 1a), not mentioned by De Man (1918, 1920). Also, the telson is provided with two pairs of subdistal spines (Fig. 1b) similar to Chace's (1984: 59) specimen, while in the De Man's descriptions only one pair of subdistal spines is mentioned.

The genus *Lissosabineia* contains only two species, *L. tridentata* (Pequegnat, 1970) known from the Gulf of Mexico and

the present species, *L. indica*. These species can be distinguished from each other by the following characters: *L. indica* has the carapace with two spines on the median carina, unarmed on the upper lateral carina, and two spines on the lower lateral carina (Fig. 1a), while in *L. tridentata* the carapace harbors three spines on the median carina and a single spine on each of the upper and lower lateral carinae.

Christoffersen (1988), who examined *Lissosabinea* cf. *tridentata* (Pequegnat, 1970) from off Uruguay, considered that the genus *Lissosabinea* harbors only one gill at the base of the third maxilliped. The present species, however, has two arthrobranchs at the base of the third maxilliped; one is large with the other one (situated at the back of the large one) being much smaller. An examination of the type species of the genus, *L. tridentata* needs to be carried out to investigate the presence of the second smaller arthrobranch.

The present report is not only the first record of this rare species in Japanese waters but also a considerable range extension further north.

***Parapontocaris levigata* Chace, 1984**

Fig. 1c

Parapontocaris levigata Chace, 1984: 34, figs. 12-14; Holthuis, 1993: fig. 292 (after Chace, 1984); Chan, 1995: 324.

Material examined.—Tosa Bay, 24 Dec. 1959, coll. K. Sakai, 1 ♀ (CL 14.9 mm), dry specimen, ZLKU 1891. —?Off Tosa, ?1963, coll. K. Sakai, 2 ♂ (CL 10.5, 11.3 mm), dry specimens, KMNH IvR 000002. —Certain locality unknown, 1 ♀ (CL 12.0 mm), KMNH IvR 000003.

Diagnosis.—Integument hard, pubescent. Rostrum slightly overreaching distal margin of corneas, 0.19 times as long as carapace, distally pointed and slightly elevated, with 2 lateral spines. Carapace 1.51 times as long as broad, having 4 longitudinal carinae; median carina with 5

spines; first lateral carina with 4 spines, anteriormost spine situated posterior to base of rostrum; second lateral carina with 3 spines; third lateral carina with 1 or 2 spines, continuous with branchiostegal spine; hepatic groove absent; antennal spine small; branchiostegal spine moderately large; pterygostomian spine minute. First abdominal somite with 4 longitudinal carinae, without median carina, upper 3 carinae sharp and pointed anteriorly, fourth carina blunt or sharp, rarely pointed anteriorly; second to fourth somites with median carina, that of second somite with 2 anterior spines, that of fourth somite pointed posteriorly; second somite with 3 lateral carinae, uppermost carina pointed anteriorly; third somite with 2 lateral carinae; fourth somite with 4 short lateral carinae; fifth somite with paired submedian carinae unarmed and posteriorly divergent, each carina pointed posteriorly, lateral surface with 2 unarmed carinae; sixth somite with pair of submedian carinae bearing 2-4 pairs of teeth dorsally, lateral surface with 1 unarmed carina. Pleura of first to fifth somites with serial teeth ventrally, that of fifth somite with posterior spine. Telson with broad median groove in almost entire length. Scaphocerite moderately broad, 0.46 times as long as carapace, 2.50 times as long as wide, with rounded blade. Second maxilliped with podobranch. Third maxilliped with two arthrobranchs, antepenultimate segment slightly flattened. First pereopod with palm 3.88 times as long as wide; mesial margin of merus unarmed; exopod present. Second pereopod chelate, reaching anterior 0.33 of palm of first pereopod. Fourth pereopod with propodus lacking tuft of setae on dorsodistal margin; merus without spine. Thoracic sternum with pair of spines behind coxae of fifth pereopods. Pleurobranchs of fourth to eighth thoracic somites with ventral apex directed anteriorly.

Distribution.—Madagascar, Indonesia, Philippines, Taiwan, New Caledonia and Japan (Tosa Bay); 217–605 m (Chan, 1995).

Remarks.—Although the present material, including three dry specimens, is not in good condition, the material generally agrees with Chace's (1984) original description. However, the fourth lateral carina on the first abdominal somite, which was said to be usually blunt and unarmed (Chace, 1984: fig. 12), is rather variable. In the female from Tosa Bay (CL 14.9 mm, ZLKU 1891), it is sharp and pointed anteriorly (Fig. 1c).

Parapontocaris levigata is widely distributed in the Indo-West Pacific (Chan, 1995), but has never been recorded from Japanese waters. The present find extends the northern range of this species from Taiwan to the Pacific coast of southern Japan.

Rhynocrangon sharpi

(Ortmann, 1895)

Figs. 2–4

Paracrangon echinata – Sharp, 1893: 126 (not Dana, 1852).

Crangon (Sclerocrangon) sharpi Ortmann, 1895: 178; Doflein, 1900: 324.

Sclerocrangon sharpi – Rathbun, 1904: 134, pl. 3, fig. 1, 1a; De Man, 1920: 252 (list); Derjugin & Kobjakova, 1935: 142 (list); Kobjakova, 1936: 201 (list), 212, 224 (key); 1937: 94 (list), 134; 1955: 151, pl. 37, fig. 5; 1958: 244 (list); 1959: 70 (list); Makarov, 1940: 133; Vinogradov, 1950: 218, pl. 19, fig. 85.

Rhynocrangon sharpi – Zarenkov, 1965: 1765 (list), fig. 5; Burukovskii, 1974: fig. 169 (after Zarenkov, 1965); Holthuis, 1993: fig. 298 (after Kobjakova, 1955); Komai, 1994: 83 (list), 99 (no new locality); Miyake, 1998: 189 (list).

Material examined.—Off Noto Peninsula to Sado Island, Sea of Japan, 19 Sept. 1974, coll. N. Horii, 1 ♀ (CL 7.8 mm), NFU 530-2-2133.

Description of female.—Body (Fig. 2) robust, slightly depressed dorsoventrally.

Integument hard, strongly sculptured, with pubescence and scattered long plumose setae.

Rostrum (Fig. 2) 0.42 times as long as carapace, reaching distal margin of proximal segment of antennular peduncle, directed forward, pointed distally, compressed laterally; lateral margin with long stout seta on distal third, distal margin with several short stout setae. Carapace (Fig. 2) 1.08 times as long as broad, having 2 distinct carinae; median carina high, armed with 4 laterally compressed, strong spines; anteriormost spine situated at midlength of rostrum, directed obliquely upwards, basal 0.30 with lateral carina originating from orbital margin; second spine immediately behind base of rostrum, directed upward; third spine arising from midlength of carapace, slightly curved anteriorly; posteriormost spine smallest, less curved anteriorly than second spine; lateral carina with 4 acute spines curved anteriorly, anteriormost (branchiostegal) spine largest, flared anterolaterally, second (hepatic) spine medium in size, posterior 2 equal in size, smallest; antennal spine small; pterygostomian spine minute; postorbital carina short, continued from rostral lateral carina; longitudinal suture originating from anterior margin of carapace superior to antennal spine, extending backwards to midlength of carapace; lower branchial region with reticulate pattern of carinae.

Abdomen (Fig. 2) provided with distinct median carina on first to fifth somites; median carinae on first and second somites each produced anteriorly in triangular process, that of third somite produced posteriorly in blunt process, with convex dorsal margin in lateral view, those of third to fifth somites with shallow median furrow. Lateral surfaces of pleurae of first to four somites each with 2 transverse irregular grooves and some tubercles and ridges. Tergite of fifth somite with small spine on lateral surface and

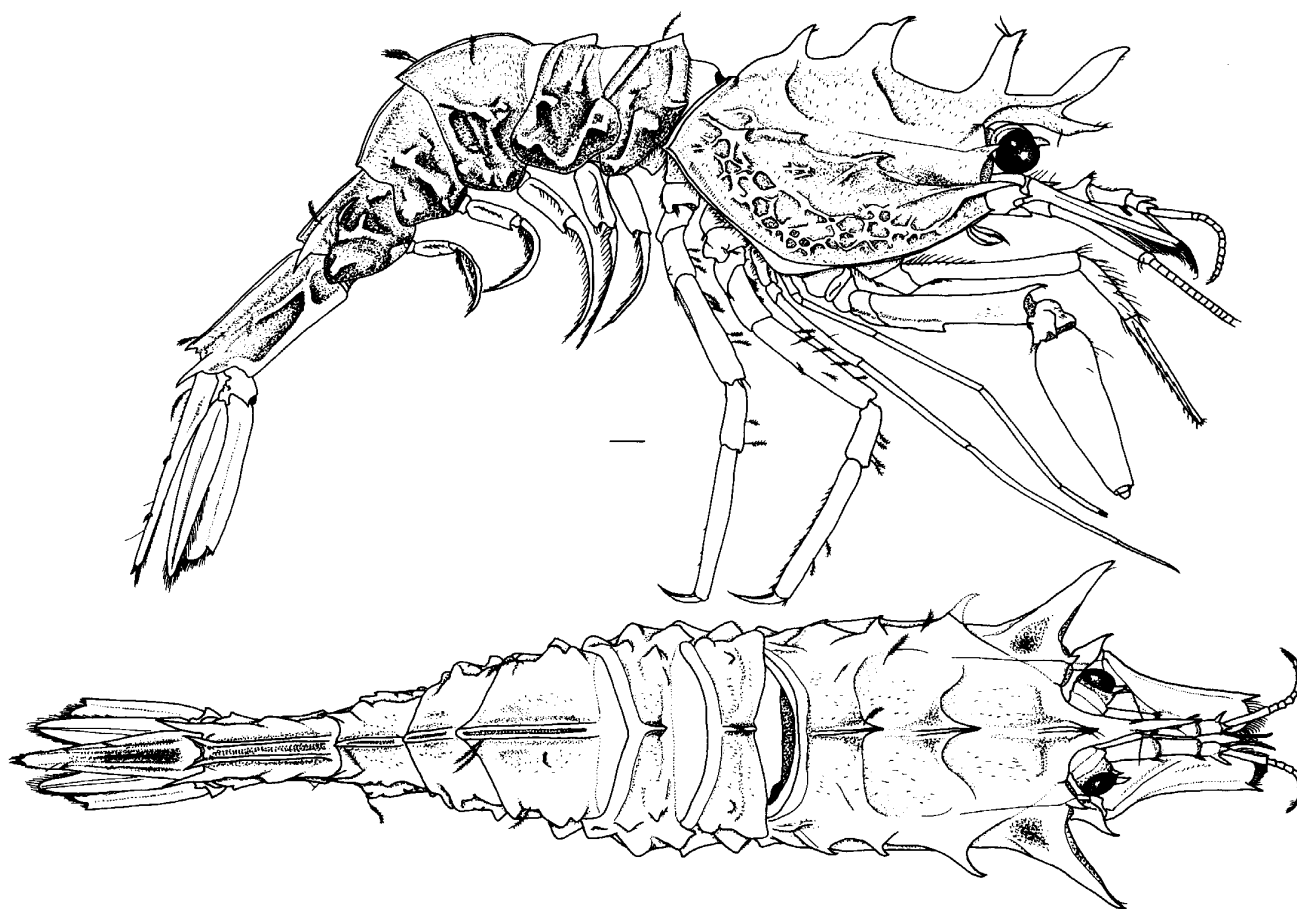


Fig. 2. *Rhynocrangon sharpi* (Ortmann, 1895), female (CL 7.8 mm; NFU 530-2-2133) from off Noto Peninsula to Sado Island: entire animal in lateral view (upper) and dorsal view (lower). Scale = 1 mm.

strong spine on posterior margin. Ventral margins of pleurae of first to fourth somites each with blunt point, that of fifth somite rounded. Sixth somite 0.54 times as long as carapace, dorsally with two submedian carinae, each extending beyond posterior margin as acute spine with small additional spine inferiorly; lateral surface with indistinct longitudinal carina; posterolateral process strong, sharply pointed; posteroventral spine blunt. Telson (Fig. 2) 0.91 times as long as carapace, tapering into acute tip, with 2 dorsal carinae, sulcate medially; 3 pairs of small spines on dorsolateral carinae; posterior margin with 2 long spines, inner spine slightly longer than outer one.

Four posterior thoracic sternites each with acute median spines diminishing in

size posteriorly. Anterior 5 abdominal sternites each with median spine curved anteriorly; sixth sternite with blunt median carina anteriorly; preanal spine present.

Eye (Fig. 2) with cornea moderately large, spherical; eyestalk with acute dorsal process.

Antennule (Fig. 3a) with peduncle reaching anterior 0.33 of scaphocerite; proximal segment subequal to distal 2 segments combined, with unarmed longitudinal carina on ventromesial margin; stylocerite reaching anterior 0.33 of proximal segment, pointed distally, with angulate posterolateral margin; distal segment about half length of second segment, with acute process laterally. Outer flagellum with 12 segments, stouter and

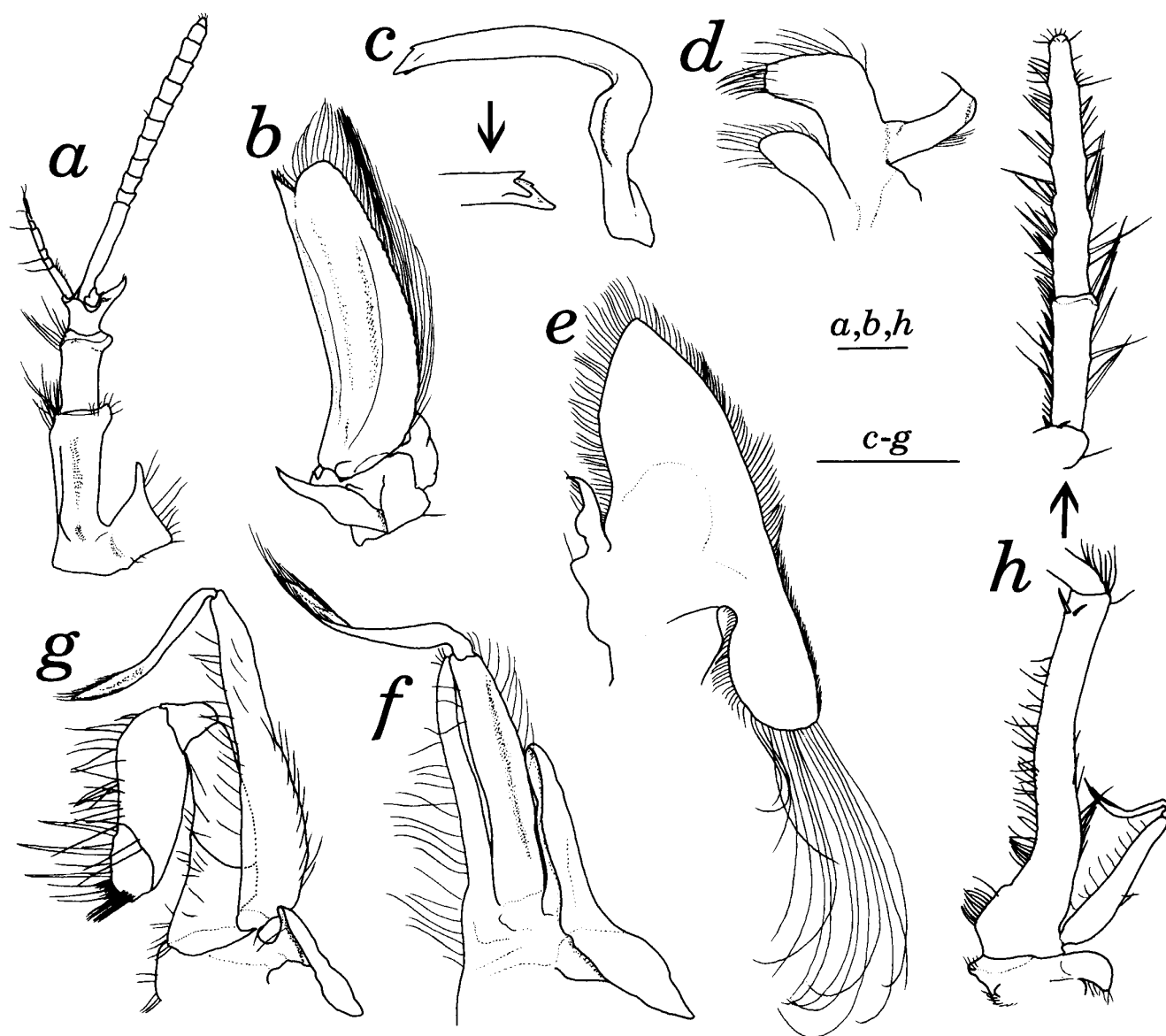


Fig. 3. *Rhynocrangon sharpi* (Ortmann, 1895), female (CL 7.8 mm; NFU 530-2-2133) from off Noto Peninsula to Sado Island; appendages dissected from left side: *a*, antennule, ventral; *b*, antenna, dorsal; *c*, mandible, external (arrow indicated internal view); *d*, maxillule, external; *e*, maxilla, external; *f*, first maxilliped, external; *g*, second maxilliped, external; *h*, third maxilliped, flexor. Scales = 1 mm.

longer than inner flagellum composed of 7 segments.

Antenna (Fig. 3b) with scaphocerite moderately slender, 0.64 times as long as carapace, 3.57 times as long as wide; lateral margin concave posteriorly; distolateral spine slightly exceeding distal margin of blade. Basicerite with acute lateral spine curved anteriorly; carpocerite falling short of blade of scaphocerite.

Mouthparts similar to other crangonids, as illustrated (Fig. 3c-h); third maxilliped (Fig. 3h) depressed dorsoventrally, exceeding scaphocerite by ultimate segment; ultimate segment longer than penultimate segment; antepenultimate segment slightly shorter than distal 2 segments combined, with 2 small subdistal spines on ventral surface; exopod with well developed lash; epipod

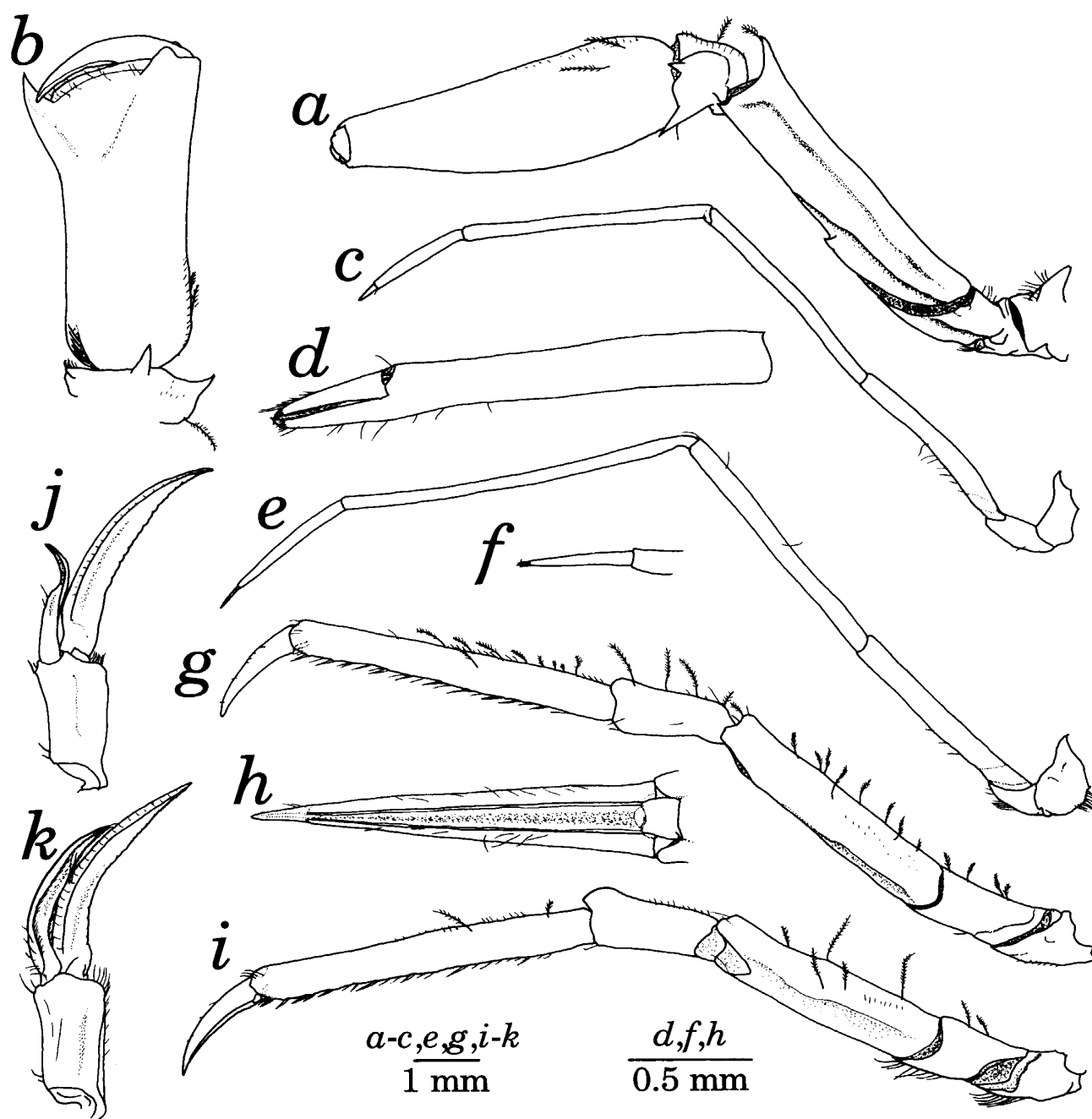


Fig. 4. *Rhynocrangon sharpi* (Ortmann, 1895), female (CL 7.8 mm; NFU 530-2-2133) from off Noto Peninsula to Sado Island; appendages dissected from left side: *a*, first pereopod, lateral; *b*, same, chela, flexor; *c*, second pereopod, lateral; *d*, same, chela, flexor; *e*, third pereopod, lateral; *f*, same, dactylus, lateral; *g*, fourth pereopod, lateral; *h*, same, dactylus, flexor; *i*, fifth pereopod, lateral; *j*, first pleopod, ventral; *k*, second pleopod, ventral.

subrectangular.

First pereopod (Fig. 4a, b) overreaching scaphocerite by half of palm and slightly falling short of third maxilliped; chela (Fig. 4b) with palm moderately stout, 2.68 times as long as wide, cutting

edge almost transverse, immovable finger short and stout; carpus short, armed with 2 lateral spines; merus with strong dorso-distal spine and stout spine situated at posterior 0.33 of mesial margin. Second pereopod (Fig. 4c, d) chelate, overreaching

scaphocerite by half of chela and falling slightly short of first pereopod; chela (Fig. 4d) 0.52 times as long as carpus, dactylus 0.29 times as long as palm, both fingers with minute spinules on distal 0.75 of cutting edge; coxa with short triangular process laterally. Third pereopod (Fig. 4e, f) slender, overreaching scaphocerite by distal 2 segments; dactylus (Fig. 4f) short, with fine setae distally; carpus 2.11 times as long as distal 2 segments combined. Fourth pereopod (Fig. 4g, h) moderately stout, overreaching scaphocerite by dactylus; dactylus (Fig. 4h) 0.32 times as long as propodus, subspatulate, lateral margin with fine setae; propodus 2.79 times as long as carpus, ventral margin with serial small spines and setae; carpus bluntly produced on dorsodistal margin; propodus to ischium with long plumose setae on dorsal margin. Fifth pereopod (Fig. 4i) reaching distal margin of blade of scaphocerite, similar to fourth pereopod but less setose.

Pleurobranchs present on fourth to eighth thoracic somites, each inferior apex directed posteriorly.

First pleopod (Fig. 4j) with endopod reaching about midlength of exopod, distal half curved mesially. Second pleopod (Fig. 4k) with endopod reaching anterior 0.33 of exopod, broader than that of first pleopod. Endopods of second to fifth pleopods without appendix interna.

Uropod (Fig. 2) with endopod slightly falling short of posterior end of telson; exopod shorter than endopod, with small movable spine directly mesial to posterolateral tooth.

Distribution.—Bering Sea, Aleutian Islands, Alaska, northern Kurile Islands, central and northern coast of the Sea of Japan, but not recorded from the Okhotsk Sea; 30–270 m (Kobjakova, 1937).

Remarks.—The present species is readily distinguished from its sympatric congener, *R. alata* (Rathbun, 1902), by having a laterally compressed rostrum with a strong dorsal spine and four strong

spines on the median carina of the carapace (Fig. 2). *Rhynocrangon alata* has a dorsally sulcate rostrum without dorsal spine and two spines on the median carina of the carapace.

Miyake (1998) listed *R. sharpi* in his list of Japanese decapods without any description, material examined, locality and pertinent literature. Therefore, the present material represents the first definite record of *R. sharpi* from Japanese waters.

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