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(Crustacea, Decapoda, Crangonidae)

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A New Species of the Genus *Sclerocrangon* from Urup
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ABSTRACT A new species, *Sclerocrangon igarashii*, is described and illustrated based on 12 specimens collected from the Pacific side of Urup Island, Kurile Islands at the depth 450 m and off Kushiro, east of Hokkaido at the depth of 200-300 m. The new species is most closely related to *S. derjugini* KOBJAKOVA, 1937, which is an endemic species of the Okhotsk Sea, but it is readily distinguishable from the latter in having a spine on the postorbital carina immediately behind the orbit and on the middle portion of the branchial carina respectively.

A key to the species of the genus including the new species is proposed.

The crangonid genus *Sclerocrangon*, which is represented by eight nominal species, is typically characterized by the vestigial endopod and the stout appendix masculina of the second pleopod in male (ZARENKOV, 1965; CHRISTOFFERSEN, 1988). Members of the genus occur in cold and temperate regions of the northern hemisphere, and extend their vertical range from the continental shelf to the bathyal zone over 3000 m (BIRSHTEIN and VINOGRADOV, 1953; BUTLER, 1980). From the Japanese waters, the following five species have been recorded (MIYAKE, 1982; KOMAI and AMAOKA, 1989; KOMAI and TAKEDA, 1989): *S. horeas* (PHIPPS, 1774); *S. sarebrosa* (OWEN, 1839); *S. gasuyebi* YOKOYA, 1933; *S. derjugini* KOBJAKOVA, 1937; *S. unidentata* KOMAI and TAKEDA, 1989. Among these, however, specific validity of *S. gasuyebi* is doubtful because ZARENKOV (1965) excluded it from the species list of the genus revised by himself.

Recently, we had an opportunity to examine several specimens of crangonid shrimps belonging to the genus *Sclerocrangon* which were collected from the Pacific side of Urup Island, Kurile Islands and off Kushiro, east of Hokkaido. Though these specimens are very closely related to the Okhotsk species *S. derjugini* KOBJAKOVA, they clearly differ from the latter in several morphological features. Therefore, we will describe the Pacific form as a new species, *Sclerocrangon igarashii*, named for the late Professor Takao IGARASHI of Hokkaido University, who had already pointed out that the present form is distinct from other congeners.

The holotype and paratypes are deposited in Faculty of Fisheries, Hokkaido University (HUMZ), and National Science Museum, Tokyo (NSMT). Methods

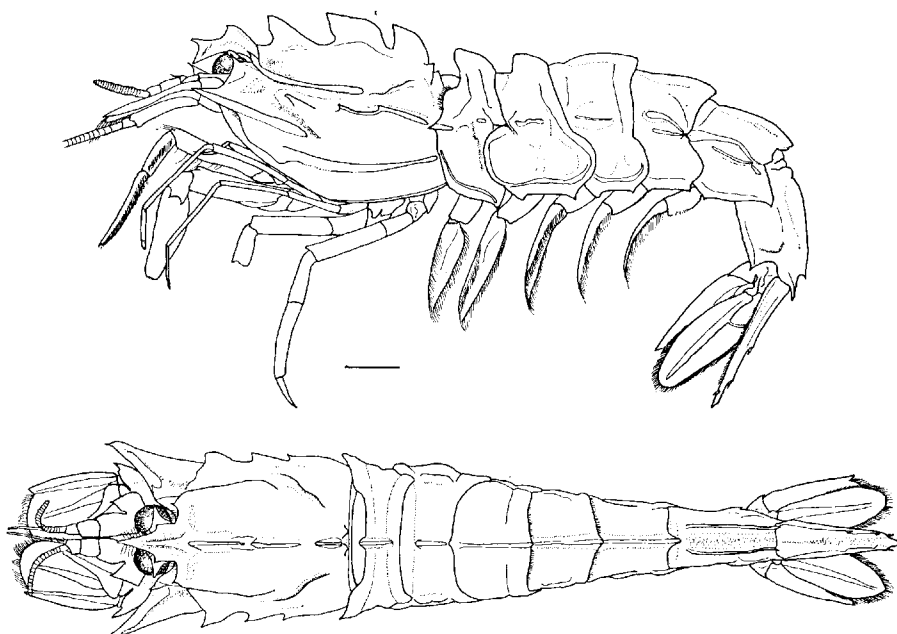


Fig. 1. *Sclerocrangon igarashii* sp. nov., holotype female, lateral and dorsal views. (Scale=10 mm).

of measurements and terminology follow BUTLER (1980) and KOMAI and TAKEDA (1989).

Genus *Sclerocrangon* SARS, 1883

Sclerocrangon igarashii sp. nov.

(Figs. 1-5)

Sclerocrangon derjugini ZARENKOV, 1965: 1765, fig. 6 (not *Sclerocrangon derjugini* KOBJAKOVA, 1937).

Type series. Holotype: HUMZ-C 216, female, 32.7 mm cl, off Urup Island, Kurile Islands, 45°17'2N, 149°28'2E, 450 m, 25 Jan. 1971, method unknown. Paratypes: HUMZ-C 152, 1 female, collected with holotype; HUMZ-C 214, 1 female, dissected, off Kushiro, east of Hokkaido, 200-300 m, 20 Nov. 1968, trawl; HUMZ-C 215, 3 males and 2 females, collected with HUMZ-C 214; HUMZ-C 1084, 2 females, collected with HUMZ-C 214; NSMT-Cr 10237, 1 male and 1 female, collected with HUMZ-C 214.

Description. Body (Fig. 1) large, stout, subcylindrical. Integument thick, well calcified, moderately sculptured, covered with fine setae.

Rostrum (Figs. 2A, B) moderately triangular in dorsal aspect, distinctly

exceeding cornea of eye, apex pointed; dorsal surface sulcate medially with paired longitudinal grooves converging anteriorly; lateral margin strongly raised, armed with one broad spine situated on midlength of rostrum; ventral surface possessing a strong process obliquely directed downward, reaching or slightly overreaching rostral apex. Carapace (Fig. 1) broad, 1.2–1.5 times as long as wide, having depressed gastric region; median carina high, armed with three large spines throughout carapace length, anteriormost one having nearly straight dorsal margin, intermediate one largest with strongly curved dorsal margin, and last one having rounded dorsal margin; postorbital carina continuing laterally from margin of rostrum without interruption, curving posteriorly, and extending beyond midlength of carapace, armed with small spine mesial to curve behind orbit; branchial carina extending from midlength to near posterior margin of carapace, produced anteriorly as spine, armed with one spine on its middle portion; branchiostegal carina supporting branchiostegal spine, reaching level of anterior one third of carapace; subbranchial carina beginning from inferior portion of branchiostegal spine, extending to near posterior margin of carapace; interolateral and posterior margins of carapace sharply ridged; antennal spine moderately large; branchiostegal spine strong, with bluntly carinate anterior margin, flared laterally, distally exceeding basicerite, having a depression on dorsal and ventral surface respectively; hepatic spine followed by deep furrow along inferior part of its base, arranged in a line with branchiostegal spine and two spines on branchial carina; pterygostomial spine usually present; one pair of tubercles placed immediately behind last median spine.

Abdomen (Fig. 1) furnished with well developed median carina extending from first to fifth somite; median carina on first and second somites especially high, produced anteriorly as prominent lobe, those on fourth and fifth somites produced posteriorly as blunt spine respectively. First somite armed with a spine supported by tuberculated longitudinal carina on uneven anterolateral margin; tergum provided with two blunt transverse carinae converging adjacent to median carina; pleuron possessing submarginal carina along anterior margin, with one spine on posteroventral corner. Second somite provided with feeble, wide carina along dorsoposterior margin; lateral carina short, tuberculate; pleuron having submarginal carina along nearly whole margin, armed with two spines ventrally. Third somite furnished with widely carinated dorsoposterior margin and smooth lateral carina; pleuron with marginal carina along ventral margin, bearing two spines ventrally. Fourth and fifth somites having three lateral carinae converging to articular knob and marginally raised pleuron armed with two spines ventrally. Sixth somite 0.5–0.6 times as long as carapace, possessing dorsally two parallel submedian carinae each extending beyond posterior margin as sharp spine; dorsal surface deeply sulcate; lateral surface bearing vertical groove near posterior margin, flared laterally, armed with a spine on posteroventral corner; posterolateral process strong, sharply pointed, supported by short carina. Telson tapering into acute tip, 0.8–0.9 times as long as carapace, armed with three pairs of dorsolateral spines, dorsal surface sulcate medially.

Four posterior thoracic sterna armed each with a spine inclined forward

and diminishing in size posteriorly; second and third sterna with one pair of tubercles respectively; four anterior abdominal sterna likewise armed each with a median spine; preanal spine present; sternal spines except for preanal one reduced in ovigerous female.

Eye (Fig. 3A) large with well developed cornea, subspherical; prominent

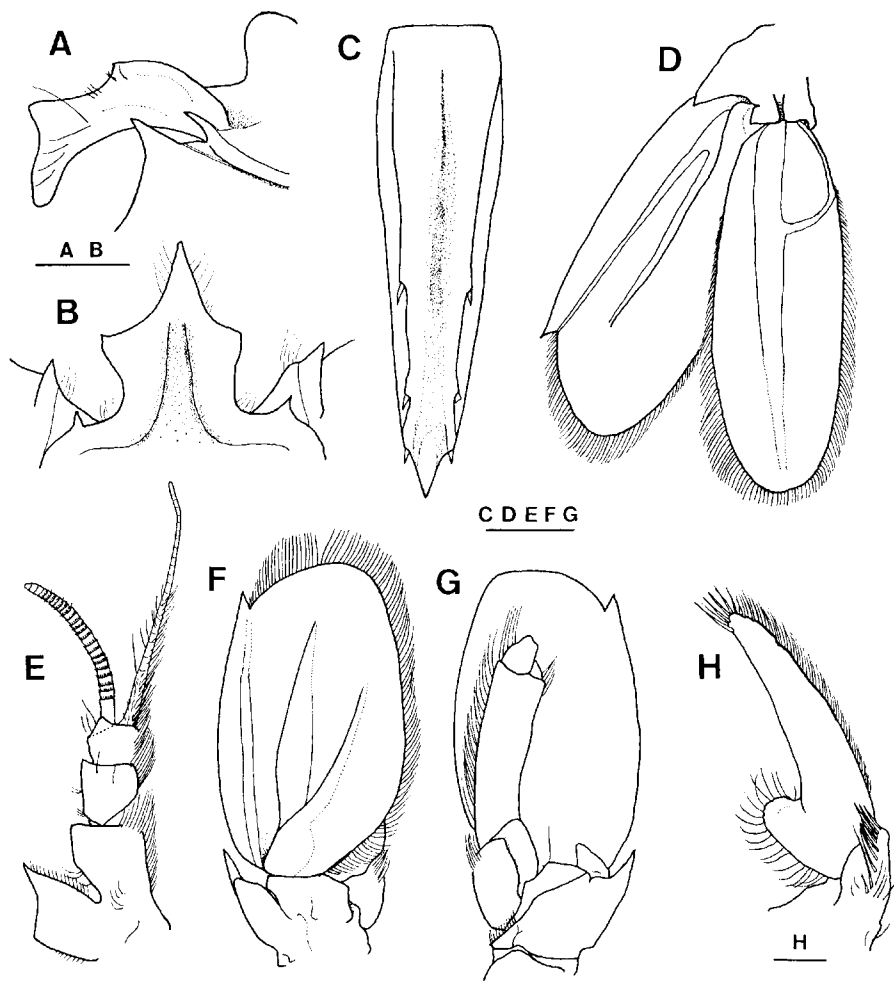


Fig. 2. *Sclerocrangon igarashii* sp. nov., paratype female (A-G) and paratype male (H). A, rostrum in lateral view; B, same in dorsal view; C, telson in dorsal view; D, uropod in dorsal view; E, antennule in dorsal view; F, antenna in dorsal view; G, same in ventral view; H, endopod of 2nd pleopod. (Scales: 5 mm in A-G; 1 mm in H).

triangular process covered with short setae raised from boundary of eye-stalk on dorsal surface; eye-stalk provided with small papilla on anterior surface near boundary.

Antennule (Fig. 2E) with peduncle slightly exceeding midlength of scaphocerite, proximal segment longer than combined length of distal two segments; distal segment of peduncle shorter than intermediate one, with blunt process on dorsodistal portion; stylocerite slightly overreaching midlength of proximal segment of peduncle, sharply pointed distally, with angulate lateral margin; outer flagellum bearing bristles on anterior margin of each articulation; inner flagellum densely setose in proximal half. Antenna (Fig. 2F, G) with stout basicerite bearing strong lateral spine; carpocerite moderately flattened, slightly recurved, considerably falling short of scaphocerite; scaphocerite with slightly convex lateral margin, 0.5–0.6 times as long as carapace, 1.6–2.1 times as long as wide, having three longitudinal ridges on dorsal surface; laterodistal spine falling short of broadly rounded distal margin of blade; flagellum stout, spinose.

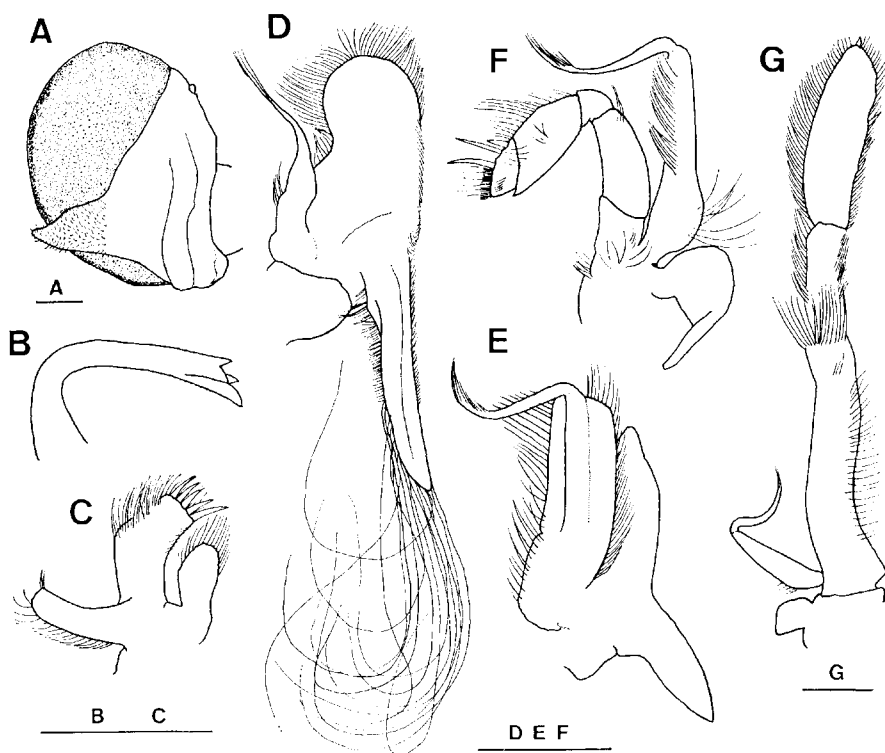


Fig. 3. *Sclerocrangon igarashii* sp. nov., paratype female. A, eye in dorsal view; B, mandible; C, maxillule; D, maxilla; E, 1st maxilliped; F, 2nd maxilliped; G, 3rd maxilliped. (Scales: 1 mm in A–F; 5 mm in G).

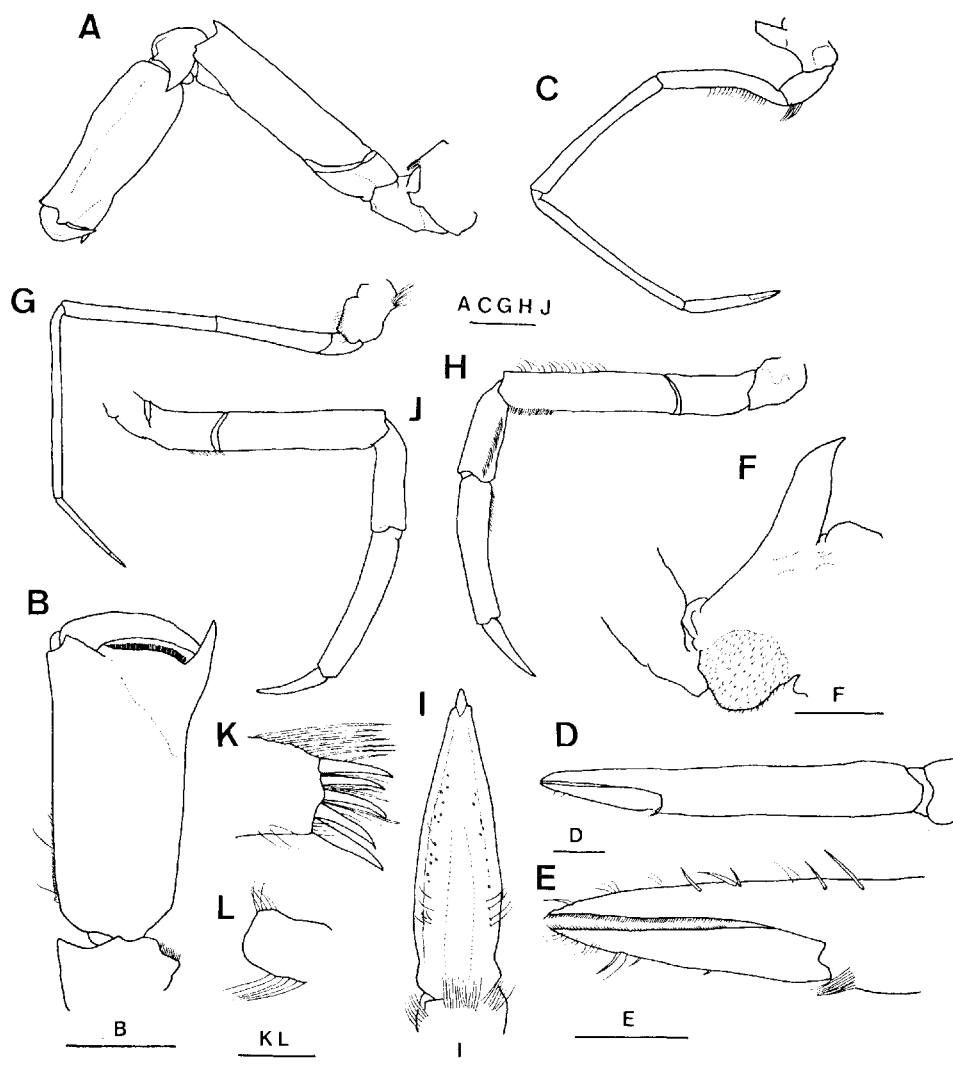


Fig. 4. *Sclerocrangon igarashii* sp. nov., paratype female. A. 1st pereopod in lateral view; B, chela of 1st pereopod in ventral view; C, 2nd pereopod in lateral view; D, chela of 2nd pereopod in lateral view; E, fingers of same; F, coxa of 2nd pereopod; G, 3rd pereopod in lateral view; H, 4th pereopod in lateral view; I, dactylus of same in dorsal view; J, 5th pereopod in lateral view; K, distal endite of maxillule; L, palp of same. (Scales: 5 mm in A-C, G-H, J, 1 mm in D-F, I, K-L).

Mouthparts usual crangonid type. Mandible (Fig. 3B) simple, consisting only of strongly curved molar process, divided distally into four teeth. Maxillule (Fig. 3C) with proximal endite spatulate, distal margin bearing many setae mesially; distal endite (Fig. 4K) curved inward, distal margin truncate, armed with five stout spines; palp (Fig. 4L) barely curved, simply pointed distally, having some apical setae. Maxilla (Fig. 3D) with vestigial endites, distal endite bearing several setae on mesial margin; palp slender, tapering distally, with many apical setae; scaphognathite fringed with uniformly long, fine setae on anterior and mesial borders, and shorter setae along entire lateral margin, posterior lobe strongly elongate, tapering distally, fringed with strikingly long setae on distal tip and adjacent on it. First maxilliped (Fig. 3E) with poorly developed endite, palp well developed, flattened, reaching articulate portion of exopod, mesial margin of endite and palp fringed with setae; exopod having well developed lash, caridean lobe rather narrow, bordered with setae laterally; epipod large, bilobed. Second maxilliped (Fig. 3F) pediform, mesial margin of distal two segments with setae; dactylus armed with three long spines on anterior half of mesial margin and dense setae on posterior half; exopod with lash, proximal portion expanded laterally; epipod distorted semicircular, lacking podobranch. Third maxilliped (Fig. 3G) stout, four-segmented, depressed dorso-ventrally, exceeding scaphocerite by length of ultimate segment; ultimate segment spatulate, 2.3–4.0 times as long as wide, mesial margin bearing several short spines as well as stout setae; penultimate segment with transverse tracts of dense setae along mesial surface; antepenultimate segment longest, with long setae on distal margin; coxa provided with subrectangular process on lateral side; exopod having well developed lash.

First pereopod (Fig. 4A) very stout, overreaching scaphocerite by length of chela; palm of chela (Fig. 4B) moderately flattened, 0.4–0.5 times as long as carapace, 2.2–2.3 times as long as wide, cutting edge almost transverse, bordered with thin plate, fixed finger spiniform; movable finger folded transversely; carpus subglobular, armed with two anterolateral and one anteromesial spines; merus having dorsodistal spine; coxa bearing prominent tubercle on lateral side. Second pereopod (Fig. 4C) much slender than first, exceeding scaphocerite by length of chela and distal 1/4 of carpus; chela (Fig. 4D, E) about half length of carpus, fingers 0.4 times as long as palm, both cutting edges armed with numerous minute spinules inclined anteriorly in two rows; carpus slightly longer than merus; ischium somewhat curved, slightly shorter than merus; coxa (Fig. 4F) having membranous region covered with short setae and wing-like process on lateral side. Third pereopod (Fig. 4G) as slender as second, overreaching scaphocerite by length of distal two segments; dactylus short, 0.3 times as long as propodus; carpus far longer than combined length of distal two segments; merus barely shorter than carpus, but longer than ischium. Fourth pereopod (Fig. 4H) stout, overreaching scaphocerite by tip of dactylus; dactylus (Fig. 4I) 0.6 times as long as propodus, subspatulate, fringed with irregular row of setae on dorsal surface along margin, ventral surface slightly ridged; carpus possessing a blunt process on anteromesial margin; coxa having tubercle on lateral side. Fifth pereopod similar to fourth,

slightly falling short of scaphocerite.

Five pleurobranch gills inclined anteriorly present on fourth to eighth thoracic somites.

Endopods of pleopods lacking appendix interna in both sexes. Male second pleopod (Fig. 2H) composed of degenerative subovate endopod sparsely fringed with setae and strong appendix masculina dorsally covered with stout setae.

Uropod (Fig. 2D) with rami almost equal in length, overreaching tip of telson; posterolateral corner of protopodite terminating in acute tip; exopod dorsally having two longitudinal carinae converging proximally, lacking diacresis, lateral margin slightly convex, armed with a fixed spine far falling short of blade; endopod having one longitudinal carina and branching carina turned anteriorly along mesial margin.

Color. Unavailable.

Variations. The female is considerably larger than the male: the carapace length of the largest female specimen is 36.4 mm and that of the largest male is 22.7 mm. The ovigerous females are 33.4–36.4 mm in carapace length.

Proportional length to width of the scaphocerite (Fig. 5A) decreases with growth, ranging 1.62–2.12.

Proportional length to width of the ultimate segment of the third maxilliped (Fig. 5B) tends to decrease with growth, ranging 2.59–4.00.

Distribution. The present material were all collected from the Pacific coast of Kurile Islands and off Kushiro, east of Hokkaido. Dr. Austin B. WILLIAMS kindly informed us that a female specimen collected from the Okhotsk Sea, which is deposited in National Museum of Natural History, Smithsonian Institution (USNM 120629), is referable to *S. igarashii*, sp. nov.

Remarks. Eight nominal species of the genus *Sclerocrangon* have been known from the world ocean (KOMAI and TAKEDA, 1989). The present new species is most closely related to *S. derjugini* KOBJAKOVA, 1937 among the congeners in having one pair of lateral spines on the rostrum, three strong median spines on the carapace, and a large eye with prominent process. The first character, considered to be an apomorphic condition (CHRISTOFFERSEN, 1988), indicates the close geneological relation of these two species. But *S. igarashii* can be readily distinguished from *S. derjugini* by its possession of a spine on the turning corner of postorbital carina and on the middle portion of the branchial carina. Considering the presence of these two kinds of spines, it is thought that *S. derjugini* figured by ZARENKOV (1965) is conspecific with the present new species, though we can not get detailed information on ZARENKOV's specimen.

Further, the new species differs from *S. derjugini* in having the following characters: dorsal margin of intermediate median spine on carapace strongly curved (nearly straight or slightly uneven in *S. derjugini*); protuberance on eye moderately triangular and covered with short setae (acute spiniform and naked distally); pleuron of fifth abdominal somite invariably armed with 2 ventral spines (2–5 spines often asymmetrically arranged on both sides); ultimate segment of third maxilliped in large individuals very broad, 2.3–3.4 times as long as wide (moderately broad, about 5.3 times as long as wide).

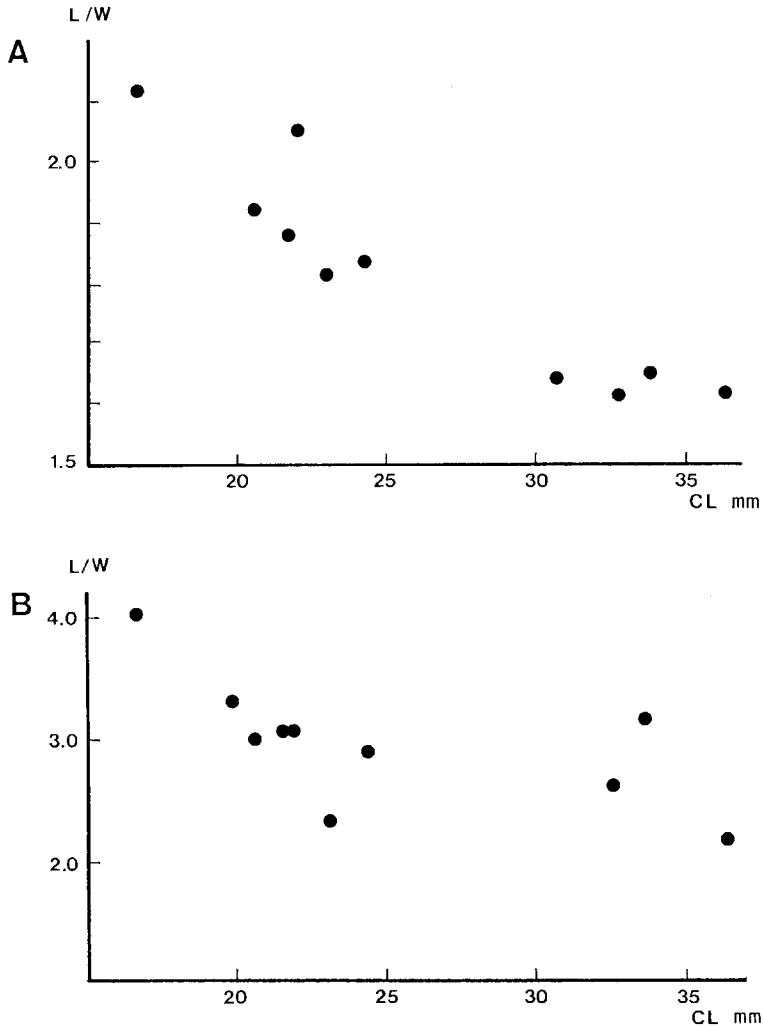


Fig. 5. Variation in proportionate length to width of scaphocerite (A) and same of ultimate segment of 3rd maxilliped (B) with growth in *Sclerocrangon igarashii* sp. nov.

Since material of all but two of the 9 species assignable to this genus has been available to us, we attempt to propose a key to all of the known species. However, *S. gasuyebi* YOKOYA, 1933, which was described based on the specimens collected from the Japan Sea, is excluded from the present key, because its specific validity is very doubtful (ZARENKOV, 1965). Judging from YOKOYA's original description, *S. gasuyebi* is very closely related to *S. sarebrosa*,

and it is difficult to find significant differences between these two species on the basis of the description and figure. According to our examination, actually, the specimens identified as *S. gasuyebi* by IGARASHI (1969) are certainly conspecific with *S. sarebrosa*. This key should be used with caution, however, for we have seen no specimens of *S. atrox* and *S. zenkevitchii*.

Key to species of *Sclerocrangon*

1. Pleura of 2nd and 3rd abdominal somites armed with 1 ventral spine respectively 2
 - Pleura of 2nd and 3rd abdominal somites armed with 2 ventral spines respectively 3
2. Carapace armed with 3 or 4 median spines throughout length; rostrum depressed dorsoventrally, with ventral protuberance
 - *S. boreas* (PHIPPS, 1774)
(Northern North Pacific; North Atlantic)
 - Carapace armed with 2 median spines on anterior 2/3; rostrum compressed laterally, unarmed *S. zenkevitchii* BIRSHTEIN et VINOGRADOV, 1953
(Bering Sea)
3. Integument covered with spiniform tubercles; carapace armed with 2 blunt median spines on posterior half; pleura of 4th and 5th abdominal somites armed with 3 ventral spines respectively *S. sarebrosa* (OWEN, 1839)
(Bering Sea; Okhotsk Sea; Japan Sea)
 - Integument not spiny; carapace armed with 3 strong median spines throughout length; pleuron of 4th abdominal somite armed with 2 ventral spines 4
4. Rostrum strongly compressed, without any groove 5
 - Rostrum flattened or sulcated dorsally, with paired grooves 6
5. Rostrum having lateral carina fringed with setae; carapace lacking subbranchial carina; branchiostegal spine moderately strong, falling short of proximal segment of antennular peduncle *S. atrox* FAXON, 1895
(Pacific off Mexico)
 - Rostrum lacking lateral carina; carapace provided with subbranchial carina; branchiostegal spine extremely strong, far exceeding proximal segment of antennular peduncle *S. unidentata* KOMAI et TAKEDA, 1989
(Pacific off north-east of Honshu, Japan)
6. Rostrum strongly curved upward, lateral margin not raised, unarmed; eye moderate in size *S. ferox* SARS, 1883
(North Atlantic; Chukchi Sea)
 - Rostrum directed horizontally, lateral margin strongly raised, armed with a spine; eye large in size 7
7. Carapace armed with small spine behind orbit and on middle portion of branchial carina respectively *S. igarashii* sp. nov.
(Okhotsk Sea; Pacific off southern Kurile to east of Hokkaido)
 - Carapace lacking spine behind orbit and on middle portion of branchial carina *S. derjugini* KOBJAKOVA, 1937
(Okhotsk Sea)

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We wish to express our gratitude to Dr. Austin B. WILLIAMS of the Smithsonian Institution for informing us of a specimen of the present new species contained in their collection, as well as critical reading of the manuscript. We are indebted to the staff of Hokkaido Kushiro Fisheries Experimental Station for collecting the material. We are also grateful to Dr. Masatsune TAKEDA of National Science Museum, Tokyo, and Mr. Hisakatsu MINEI of Kyushu University for helpful advice in the maintenance of the type specimens. Finally, we thank Dr. Ken-ichi HAYASHI of Shimonoseki University of Fisheries for his helpful suggestions and for providing us some important literature.

摘 要

駒井智幸・尼岡邦夫（北海道大学水産学部水産動物学講座）——千島ウルップ島と北海道釧路沖から得られたキジンエビ属の1新種（甲殻上綱十脚目エビジャコ科）

千島のウルップ島沖と北海道東部の釧路沖から得られた標本に基づいてキジンエビ属の1新種 *Sclerocrangon igarashii* (新称：コウダカキジンエビ) を記載した。本種はオホーツク海固有種であるオホーツクキジンエビ *S. derjugini* KOBJAKOVA に類似し、系統的にも非常に近縁であると考えられるが、眼窩の後方と頭胸甲の鰓隆起上にそれぞれ棘をもつことによって容易に識別される。また、本新種を含む本属の種の検索表を提唱した。

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Erratum

- Igarashi, T. 1969. A list of marine decapod crustaceans from Hokkaido, deposited at the Fisheries Museum, Faculty of Fisheries, Hokkaido University, I. Macrura. *Contrib. Fish. Mus. Fac. Fish. Hokkaido Univ.*, **11**: 1-15, pls. 1-20.