



Title	The Occurrence of <i>Atylus ekmani</i> (Gurjanova, 1938) (Crustacea, Amphipoda, Gammaridea) from Southern Hokkaido, Japan
Author(s)	OKADO, Mika
Citation	北海道大學水産學部研究彙報, 44(1), 6-14
Issue Date	1993-02
Doc URL	http://hdl.handle.net/2115/24104
Type	bulletin (article)
File Information	44(1)_P6-14.pdf



[Instructions for use](#)

**The Occurrence of *Atylus ekmani* (Gurjanova, 1938)
(Crustacea, Amphipoda, Gammaridea) from
Southern Hokkaido, Japan**

Mika OKADO*

Abstract

Atylus ekmani (Gurjanova, 1938), (Amphipoda, Gammaridea, Atylidae) was collected from the Pacific coast of southern Hokkaido for the first time. It is described and illustrated on the basis of six specimens. This species is characterized by its dorsal teeth formula: 1, 1, 2 pleosome and 1 urosome median tooth/teeth on pleon 3, urosome 1, and fused urosomes 2 and 3, respectively. The sexual dimorphism, coloration of the living animal, and some biological aspects are noted.

Introduction

The genus *Atylus*, which belongs to the dexaminoidea family Atylidae (Bousfield, 1982; Schram, 1986; Bousfield and Kendall, in prep.), is now represented by 34 species worldwide (Barnard and Karaman, 1991; Hirayama, 1986). Up to the present, eight species of this genus have been reported from the northern part of the Western Pacific (Barnard and Karaman, 1991), and two of those were reported from Japanese waters: *Atylus japonicus* Nagata, 1961 from the Seto Inland Sea; *A. occidentalis* Hirayama, 1986 from Otsuchi Bay, northern Japan.

During a survey of the fauna around the Usujiri Marine Biological Laboratory of Hokkaido University in 1991, six specimens of *Atylus ekmani* (Gurjanova, 1938) were obtained. The species has been recorded from the Russian coast ranging from the Japan Sea to the Bering Sea (Gurjanova, 1951). These specimens represent the first record of *A. ekmani* from Japan. The Japanese specimens differ in a few respects from the description and figure of Gurjanova (1951).

The specimens were fixed in 5% sea water formalin and preserved in 75% ethyl alcohol. All appendages figured were removed from the left side of the animal in principle. Body length (BL) was measured from the tip of rostrum to the apex of telson, and the length of each article of appendage is measured from the proximal margin to the distal margin of distal projection, if present. All specimens are deposited at the Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University (HUMZ).

* Laboratory of Marine Zoology, Faculty of Fisheries, Hokkaido University
(北海道大学水産学部水産動物学講座)

Description

Family Atylidae

Genus *Atylus* Leach, 1815

Atylus ekmani (Gurjanova, 1938)

[Nom. Jap. nov: Nokogiri-futahana]

(Figs. 1-4)

Nototropis ekmani Gurjanova, 1938: 323, fig. 35; Gurjanova, 1951: 680 (key), 685, fig. 473; Bulycheva, 1957: 103; Mokievskii, 1960: 252; Tzvetkova, 1968: 172; Tzvetkova and Kudrjaschov, 1985: 303.

Atylus ekmani: Mills, 1961: 19 (key); Barnard, 1969: 164; Barnard and Karaman, 1991: 264 (list).

Material. HUMZ-C 1569, Usujiri, southern Hokkaido, Japan, light luring, 13 April 1991, 1 male (10.9 mm BL), 1 ovigerous female (18.0 mm BL); HUMZ-C 1570, off Usujiri, 10-15 m in depth, dredge, 18 June 1991, 2 females (16.6 mm, 17.3 mm BL), 2 immature specimens (11.5 mm, 11.6 mm BL).

Description of females. Body strongly compressed, dorsal margin sharply carinate over entire length.

Head a little longer than first two pereons combined (Fig. 1). Rostrum (Fig. 2a) somewhat decurved distally, clavate, overreaching distal 1/3 of peduncular article of antenna 1. Lateral cephalic lobe defined inferiorly by relatively deep sinus. Pterygostomial angle produced forward, falling short of lateral lobe. Eyes (Fig. 2a) small, reniform or subovate, upper margin not reaching at level of lower margin of rostrum.

Pereon 1 to 7 (Fig. 1) moderately deep, anterior five having 2 and posterior two having 1 lateral ridges along ventral margin; dorsoposterior margin of pereon 6 and

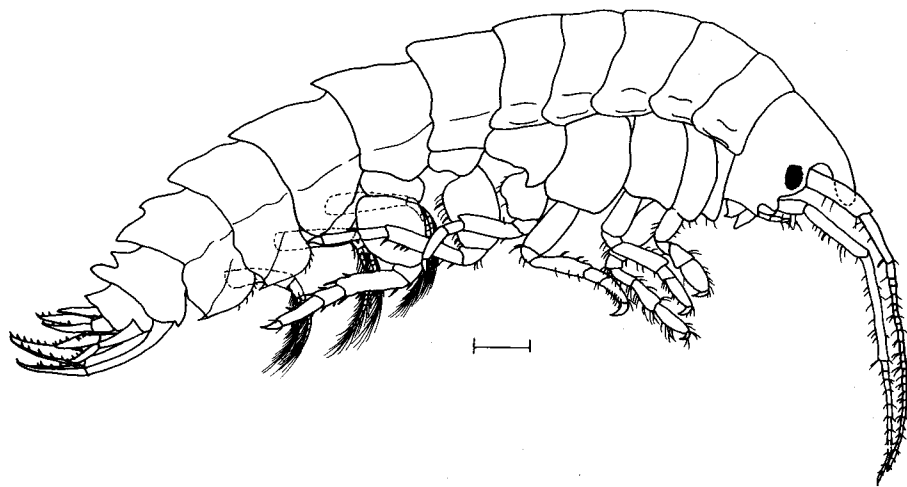


Fig. 1. *Atylus ekmani* (Gurjanova). HUMZ-C 1569, female (18.0 mm BL). (Scale=1 mm).

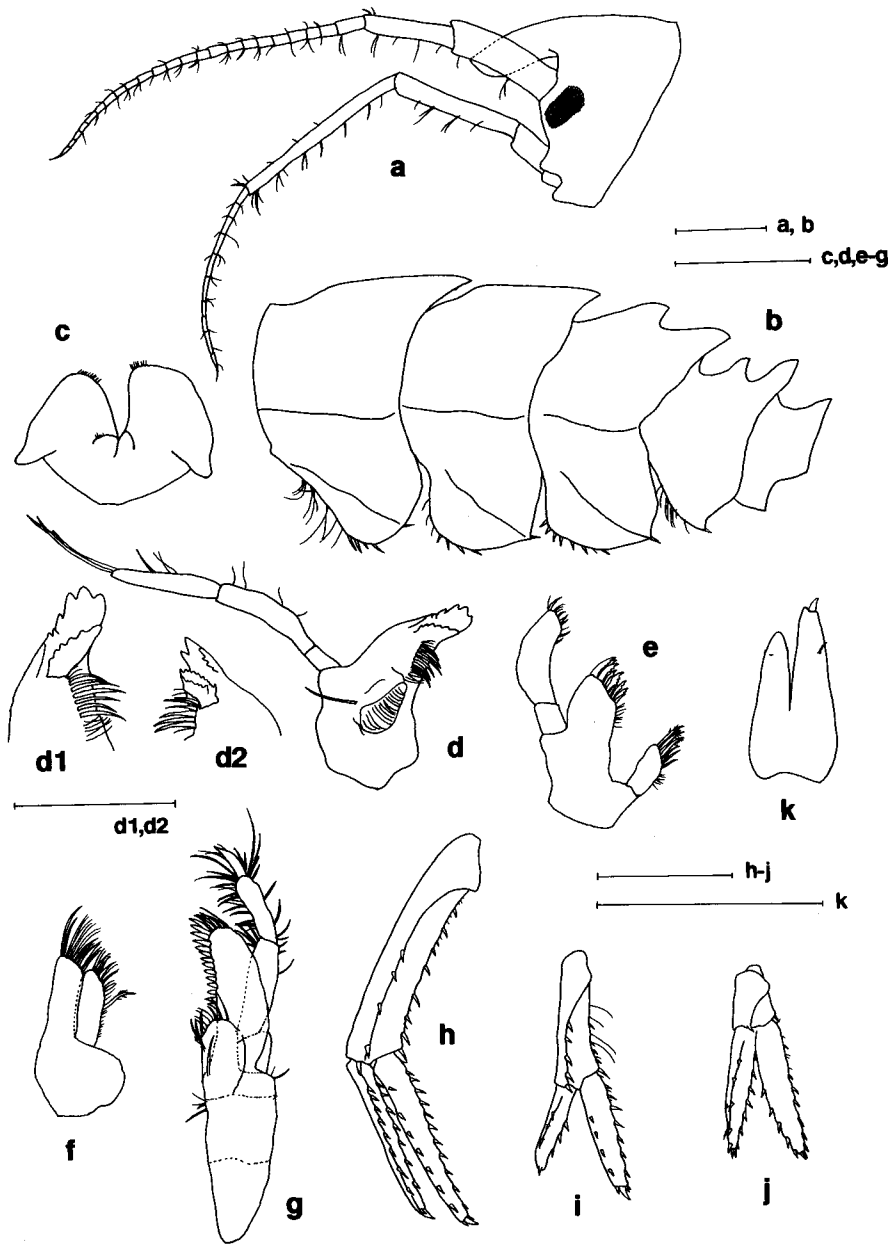


Fig. 2. *Atylus ekmani* (Gurjanova). a-b, d-k, HUMZ-C 1569, (female 18.0 mm BL); c, HUMZ-C 1570 (female, 16.6 mm): a, head and antennae (mouthparts removed); b, pleon and urosome; c, lower lip; d, left mandible in mesial; d1, left incisor and lacinia mobilis in mesial; d2, right incisor and lacinia mobilis in mesial; e, maxilla 1 in dorsal; f, maxilla 2 in dorsal; g, maxilliped in ventral; h-j, uropods 1 to 3 in dorsolateral; k, telson in dorsal. (Scales: a, b, h-j, k=1 mm; c-g=0.5 mm).

7 produced posteriorly as strong tooth.

Pleon 1 and 2 (Fig. 2b) armed with a strong posteromedial tooth, pleon 3 armed with a strong median tooth in addition to posteromedial tooth. Epimera having lateral and obliquely transverse ridges; epimeron 1 with rounded posterior margin fringed with setae and spines; epimera 2 and 3 with anterolateral margins broadly rounded with spines and setae, posterolateral margins squarish with a spine just at corners.

Urosome 1 (Fig. 2b) armed with 2 dorsal teeth, both directed posterodorsally; ventral margin with many setae anteriorly, and pointed posteriorly. Urosomes 2 and 3 coalesced, dorsal margin with strong posteromedial tooth directed dorsally.

Antenna 1 (Fig. 2a) as long as antenna 2, about 2.5 times as long as head; peduncle shorter than flagellum, bearing short setae ventrally, relative length of articles 1 to 3 4:3:1; flagellum 19 to 22-articulated; accessory flagellum absent. Antenna 2 with peduncle longer than flagellum, having simple setae or bundle of setae along anterior and posterior margins; peduncle 4 3-4 times and peduncle 5 4-5 times as long as peduncle 1 respectively; flagellum 10 or 11-articulated.

Left mandible, palp (Fig. 2d) long and slender, article 3 slightly shorter than article 2, bearing 2-3 long apical setae; molar process (Fig. 2d1) tritritative, with 1 long molarial seta; incisor process with 6 denticles; lacinia mobilis with 5-6 denticles; seta row composed of 6 stout and several slender setae. Right mandible similar to left one in general; lacinia mobilis (Fig. 2d2) bifid, each outer and inner plates with 6-11 and 3-6 minute denticles respectively. Lower lip (Fig. 2c), with outer lobes rounded distally, fringed with fine setae anteromesially; inner lobes small. Maxilla 1 (Fig. 2e) with small inner plate bearing 3 plumose setae and 2 or 3 simple setae; outer plate with 8 pectinate spines and short setae on mesial margin; palp 2-articulated, with apical setae. Maxilla 2 (Fig. 2f), outer plate as wide as inner but longer than inner. Maxilliped (Fig. 2g) with 4-articulated palp; outer plate armed with 15-17 mesial teeth, exceeding distal end of palp article 2.

Gnathopod 1 (Fig. 3a), coxa narrow, slightly curved anteriorly, gradually attenuated ventrally, fringed with many setae along posterior margin; basis long, with short setae on anterior surface and with moderately long setae on posterior surface, attached to distal 40-50% of length of coxa (Fig. 3a2); carpus triangular from lateral aspect, with a few transverse rows of setae on anterior and posterior surfaces; propodus (Fig. 3a1) about 1.3 times as long as carpus, having transverse row of setae on mesial surface and 3-8 spines on posterior surface sometimes arranged in a few rows; dactylus with short setae on flexor margin. Gnathopod 2 (Fig. 3b) generally somewhat longer than gnathopod 1 especially in carpus and propodus; basis long, with short setae along both margins, attached to distal 30% of length of coxa (Fig. 3b1); carpus roughly triangular, more slender than that of gnathopod 1, posterior surface with some transverse tracts of spines.

Pereopod 3 (Fig. 3c), coxa 1.1-1.3 times as long as basis, produced anteroventrally, anteroventral corner having 1 long seta, posterior margin fringed with many setae; carpus short, 0.5 times as long as propodus; propodus lacking grasping spines; dactylus claw-like, with a simple seta on extensor and flexor margins respectively. Pereopod 4 (Fig. 3d) similar to pereopod 3 except coxa with anteroventral corner less produced. Pereopod 5 (Fig. 3e) shorter than pereopod 6 and 7, coxa 1.1-1.3 times as deep as basis; anteroventral corner protruding ventrally as

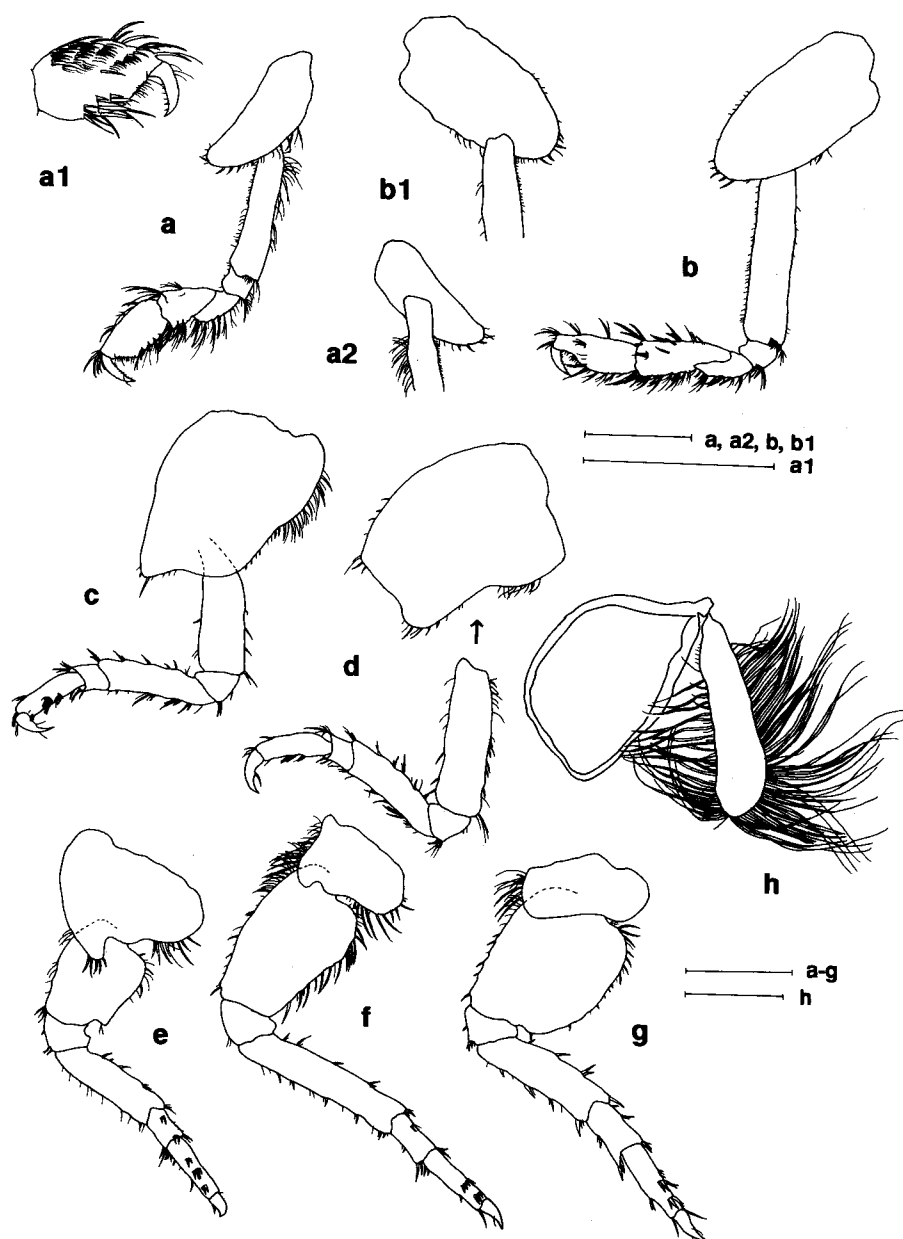


Fig. 3. *Atylus ekmani* (Gurjanova). HUMZ-C 1569, female (18.0 mm BL): a, gnathopod 1 in lateral; a1, propodus and dactylus of gnathopod 1 in mesial; a2, coxa and basis of gnathopod 1 in mesial; b, gnathopod 2 in lateral; b1, coxa and basis of gnathopod 2 in mesial; c-g, pereopods 3 to 7 in lateral; h, coxal gill and brood plate of pereopod 4. (Scales = 1 mm).

round lobe fringed with 5 or 6 distal setae; basis subrectangular with posteroventral process; carpus short, 0.6–0.7 times as long as propodus; dactylus claw-like with a short seta on extensor and flexor margin. Pereopod 6 (fig. 3f), coxa 0.5 times as deep as basis, ventral margin sinuous at anterior 1/3, with many setae on anterior and posterior margins; basis rectangular, fringed with setae on anterior and posterior margins; merus longer than those of pereopod 5 and 7. Pereopod 7 (Fig. 3g), coxa rectangular, 0.4 times as deep as basis, ventral margin straight, anterior margin setose; basis suboval, fringed with some spines and setae on anterior margin and with setae on posterior margin.

Coxal gills present on gnathopod 2 and pereopods 3–7, not pleated (Fig. 3h).

Brood plates of gnathopod 2 and pereopods 3–5 elongate, with long setae marginally (Fig. 3h).

Pleopods normal.

Uropods spinous, rami lanceolate. Uropod 1 (Fig. 2h) with elongate peduncle, 1.3–1.5 times as long as outer ramus; inner ramus slightly longer than outer. Uropod 2 (Fig. 2i) with peduncle 1.5 times as long as outer ramus; inner ramus 1.4–1.5 times as long as outer ramus. Uropod 3 (Fig. 2j) with short peduncle, 0.5 times as long as outer ramus; inner ramus slightly longer than outer.

Telson (Fig. 2k) relatively long, cleft about 2/3 of its length, each lobe bearing 1 subapical spine and 1 dorsal seta situated at about midlength.

Description of male. Male differs from females in several points noted below.

Eyes (Fig. 4a) apparently larger, upper margin reaching at level of lower margin of rostrum.

Antennae (Fig. 4a) slightly longer than those of female, 2.7 times as long as head.

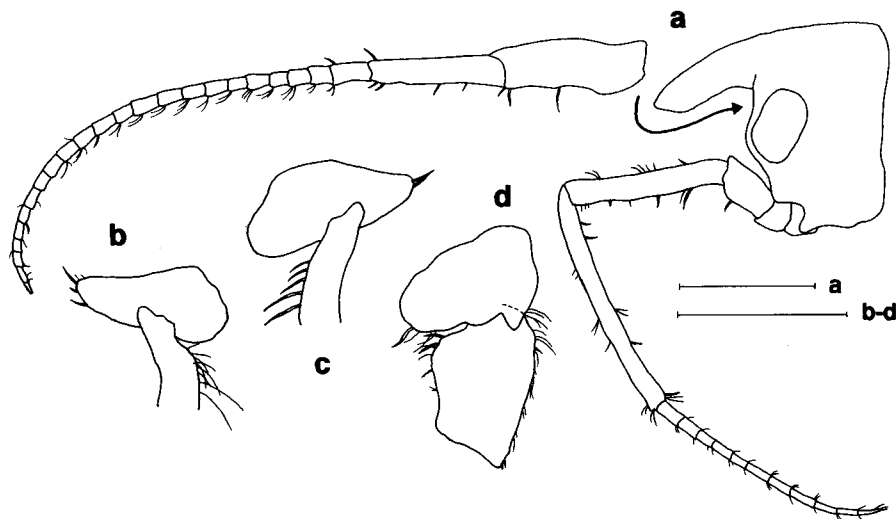


Fig. 4. *Atylus ekmani* (Gurjanova). HUMZ-C 1569, male (10.9 mm BL): a, head and antennae; b, c, coxae and bases of gnathopods 1 and 2 in mesial; d, coxa and basis of pereopod 5 in lateral. (Scales=1 mm).

Attachment of bases to coxae of gnathopods 1 and 2 on about distal 50–60% and 40–50% respectively (Fig. 4b, c).

Coxa of pereopod 5 shorter than basis (Fig. 4d).

Coloration. In fresh, entirely fulvescent; having black spots on lateral surface with pereon having brown patches on median dorsal surface. Eyes light pink and shining.

Biological note. Of the six specimens examined here, four were dredged at the depths of 10–15 m in the day time, where the substrate was volcanic pebbles with the remnants of seaweeds; the remaining specimens were found among the plankton samples collected by light luring at night. According to the previous authors (e.g., Gurjanova, 1951; Tzvetkova, 1968), *A. ekmani* is primary benthic inhabitant of littoral zone, and is sometimes associated with clump of algae and oyster shells. Further, Tzvetkova and Kudrjaschov (1985) indicated that it sometimes occurs in epipelagic zone. The ovigerous female figured here (18.0 mm BL) was collected in April; the other two mature females (16.6 mm and 17.3 mm in BL) collected in June were not ovigerous. Smaller specimens (11.5 mm and 11.6 mm BL) seem to be immature, and thus their sex could not be determined.

Remarks. Compared with the description of each species (Bulycheva, 1955; Oldevig, 1959; Mills, 1961; Nagata, 1961; Barnard, 1970, 1972; McKinney, 1980; Bellan-Santini, 1982; Ledoyer, 1982; Moore, 1984; Hirayama, 1986), *Atylus ekmani* appears to be unique among the members of the genus *Atylus* in having the pleon 3, urosome 1, and the last urosome armed with 2, 2, and 1 median tooth/teeth, respectively. The present specimens were identified as *A. ekmani* in having this striking character. But they differ from the description and the figure of Gurjanova (1951) in the presence of a distinct sinus on the ventral margin of the coxa of pereopod 6. Presumably this discrepancy is due to intraspecific variation, if she is correct. Although Gurjanova (1951) described that the propodus of gnathopod 1 bears 2 spines on the posterior surface, the present material shows that the number of spines of this species varies considerably, ranging 3 to 8.

In the key of the genus *Nototropis* (now junior synonym of *Atylus*) provided by Gurjanova (1951), *A. ekmani* was erroneously included in the group having 2 median teeth on the last urosome in spite of actually having only 1 tooth (see Gurjanova, 1951: 681, couplet 13(16)). Mills (1961), who synonymized *Nototropis* with *Atylus*, proposed a key to all species of the genus then known chiefly following the Gurjanova's key. Unfortunately he made the same mistake as Gurjanova (1951). A comprehensive key of this genus has not been published since Mills' (1961).

The previous records suggest that *A. ekmani* is a Pacific boreal species: the Russian coast of Japan Sea, Okhotsk Sea and Bering Sea (Gurjanova, 1951; Tzvetkova, 1968; Bulycheva, 1968), Kurile Islands (Kudrjaschov, 1972), the southern Sakhalin (Tzvetkova and Kudrjaschov, 1985); intertidal to the depth of 80 m (Gurjanova, 1951; Tzvetkova and Kudrjaschov, 1985). And thus the present material may represent the southern limit of the distribution of this species.

Acknowledgments

I am indebted to Mrs. K. Nomura and H. Arashida, the technical staff of the Usujiri Marine Biological Laboratory of Hokkaido University for their help in

collecting the material. I am grateful to Dr. E.L. Bousfield of Royal British Columbia Museum, Mr. S. Ishimaru of Kanazawa Women's College of Ishikawa, and Prof. K. Amaoka of Hokkaido University, for their valuable advice and critical reading of the manuscript. Mr. C.O. Nyako of Hokkaido University kindly corrected the English of the manuscript. Drs. H. Morino of Ibaraki University, A. Hirayama of Asia University, S. Shirai of the University Museum-University of Tokyo, and Miss K. Kuribayashi of Hokkaido University complied my requests to some important literature. Finally, I am grateful to Mr. T. Komai of Hokkaido University for his helpful advice and revision of drafts of the manuscript.

References

- Barnard, J.L. (1969). The identity of *Dexaminica* and *Prinassus* with a revision of Dexaminidae (Amphipoda). *Crustaceana* 19, 11-15.
- Barnard, J.L. (1970). Sublittoral Gammaridea (Amphipoda) of the Hawaiian Islands. *Smiths. Contr. Zool.* 34, 1-286.
- Barnard, J.L. (1972). The marine fauna of New Zealand: algae-living littoral Gammaridea (Crustacea Amphipoda). *Mem. New Zealand Ocean. Inst.* 62, 7-216.
- Barnard, J.L. and Karaman, G.S. (1991). The families and genera of marine gammaridean Amphipoda (except marine gammaroids). *Rec. Aust. Mus. Suppl.* 13, 1-866.
- Bellan-Santini, D. (1982). Family Dexaminidae. p. 212-232. In S. Ruffo (ed.), The Amphipoda of the Mediterranean, Part 1, Gammaridea (Acanthonotozomatidae to Gammaridae). *Mem. Inst. Oceanogr.* 13, 1-364.
- Bousfield, E.L. (1982). Amphipoda, p. 254-285. In S.P. Parker (ed.) *Synopsis and classification of living organisms*. Vol. 2. 1232 pp. McGraw-Hill Book Company, New York.
- Bousfield, E.L. and Kendall, J.A. (in prep.). The superfamily Dexaminidea on the North American Pacific coast. Family Atylidae: systematic and distributional ecology. *Tech. Rep. Royal B.C. Museum*.
- Bulycheva, A.I. (1955). Novye vidy bokoplavov (Amphipoda, Gammaridea) iz Japonskogo Morja. II. *Trudy Zool. Inst., Akad. Nauk. SSSR* 21, 193-207.
- Bulycheva, A.I. (1957). Amphipody (Amphipoda) severo-zapadnoi chasti Japonskogo Morja. *Issled. Dal'nevost. Morei SSSR* 4, 85-126.
- Gurjanova, E.F. (1938). Amphipoda Gammaroidea of Siaukhu Bay and Sudzukhe Bay (Japan Sea). *Rep. Japan Sea Hydrobiol. Exp. Zool. Inst. Acad. Sci. USSR in 1934* 1, 241-404. (in Russian). (not seen).
- Gurjanova, E.F. (1951). Amphipoda of adjacent sea of SSSR. (Amphipoda-Gammaridea). *Opred. Faune SSSR, Akad. Nauk.* 41, 1-1029. (in Russian).
- Hirayama, A. (1986). A new atylid species (Crustacea; Amphipoda) from Otsuchi Bay, Northeast Japan. *Proc. Japn. Soc. Syst. Zool.* 33, 4-10.
- Kudryashev, V.A. (1972). On the fauna and ecology of amphipods (Amphipoda, Gammaridea) of the inlet zone of the Kuril Islands. *Uchenie Zap. Dal'nevost. Gos. Univ.* 60, 79-116. (in Russian). (not seen).
- Ledoyer, M. (1982). Crustacea amphipodes gammariens. Familles des Acanthonotozomatidae a Gammaridae. *Faune Madagascar* 59, 1-598.
- McKinney, L.D. (1980). Four new and unusual amphipods from the Gulf of Mexico and Caribbean Sea. *Proc. Biol. Soc. Wash.* 93, 83-103.
- Mills, E.L. (1961). Amphipod crustaceans of the Pacific coast of Canada, I. Family Atylidae. *Nat. Mus. Canada Bull.* 172, 13-33.
- Mokievskii, O.B. (1960). Fauna of intertidal zone of northwestern coast of Japan Sea. *Trav. Inst. Ocean. Acad. Sci. USSR* 34, 242-328. (in Russian).
- Moore, P.G. (1984). Gammaridean Amphipoda (Crustacea) collected by the yacht Tulip from surface waters of the Arabian Sea. *J. Nat. Hist.* 18, 369-380.
- Nagata, K. (1961). A new atylid amphipod from Japan. *Annot. Zool. Japon.* 34, 216-218.

- Oldevig, H. (1959). Arctic, subarctic and Scandinavian amphipods in the collections of the Swedish Natural History Museum in Stockholm. *Goteborgs Kunglia Vetenskaps-Vitterhets-Samhalles Handlingar* (6B)8(2), 1-132.
- Schram, F.R. (1986). Crustacea. *Oxford Univ. Press, New York*, 1-606.
- Tzvetkova, N.L. (1968). On the fauna and ecology of amphipods (Amphipoda, Gammaridea) of the Possjet Bay (the Sea of Japan). *Acad. Sci. USSR, Zool. Inst. Expl. Fauna Seas* 5, 160-195. (in Russian).
- Tzvetkova, N.L. and Kudrjaschov, V.A. (1985). On the fauna and ecology of gammarids (Amphipoda, Gammaridea) and biocoenoses of the upper parts of the shelf of the south Sakhalin. *Issled. Fauny Morei* 30, 292-345. (in Russian).