ISOPODA FROM THE COASTAL ZONE OF THE KURILE ISLANDS. II. SOME DATA ON THE MUNNIDAE MAINLY FROM THE MIDDLE KURILES

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INTRODUCTION

Marine benthic animals from the middle Kuriles were collected by collaborators of the Hydrobiological Laboratory of the Vladivostok Institute of Marine Biology (among whom V. Lukin, E. Shornikov and some others) during field work in the autumn of 1969. The material discussed here includes 9 species of Munnidae, of which 3 species are new. In addition, a description of a species of *Pleurogonium* from the northern part of Kunashir is given. The types of the new species are deposited in the Institute of Marine Biology, Vladivostok.

Munna (Munna) parvituberculata Kussakin, 1962

Kussakin, 1962: 93-95, figs. 19, 20. Material examined. — Simushir, depth 50-60 m, 5 specimens.

Distribution. — This is a Pacific high-boreal species, which occurs in the northern part of the Okhotsk Sea and the middle Kuriles.

Munna (Munna) crinita sp. n. (figs. 1-3)

Material examined. — Urup, depth 15 m, 1 $\,^{\circ}$ holotype (N 3/812) and 1 paratype; depth 5-43 m, 4 samples (4 specimens).

Matua, depth 10 m, 1 specimen.

Description. — Female holotype. The body is 3.1 mm long, it is oblong-ovate, nearly twice as long as wide across pereonal somite III. The dorsal surface of the body and pereopods is covered with numerous, very long, rather thin and soft setae.

The cephalon is broad, it is 3/8 as long as wide, its length is considerably less than the length of the two anterior perconal somites together. The orbital lobes are rather long and directed outwards, they do not cover the anterolateral angles of the first perconal somite. The preorbital lobe is well defined, rather long, rounded, and triangular, with one or two very thin and one rather thick short setae at the apex. The notch between the preorbital and orbital lobes has a single stout seta. The anterior part of the head is slightly expanded frontally, the anterolateral angles are evenly rounded; the frontal margin is deeply concave, and fringed with long setae.

Perconal somite I is nearly half as long again as somite II or somite IV and

only slightly shorter than the longest somite (III). The posterior three pereonal somites are short, they are subequal in length; the longest of the three is somite V which is a little shorter than somite I. The coxal plates are well defined, with rounded lateral margins bearing long setae.

The anterior pleonal somite is slender and short. The pleotelson is rather narrow and long.

The antennula is narrow and rather long, nearly reaching the distal end of the penultimate peduncular segment of the antenna; the flagellum is 3-segmented, the distal segment is very short. The antenna is short, less than half as long as the body. The flagellum is shorter than the peduncle, and composed of 10 segments.

The left mandible has the incisive part with five teeth; the movable lacinia has four teeth; the spine-row consists of five spines; the molar process is cylindrical, slightly widened towards the apex. The inner plate of the maxilliped has three long coupling hooks.

Pereopod I is rather weak; the carpus is little expanded, its inner margin has



Fig. 1. Munna crinita sp. n., holotype, female.

four robust, bifid spines; the propodus is subcylindrical, its inner distal angle has two bifid spines; both claws are long, the ventral claw is more than half as long as the dorsal. The inner margin of the carpus of pereopod VII carries about 10 robust setae, the outer margin has at least 11 stout, long setae (including the distal seta); the inner margin of the propodus shows seven bifid setae.

The width of the operculum (pleopod II) is subequal to the length. The lower surface of the operculum and the rounded posterior margin show some rather thick setae. The uropod is small and feeble, it is not longer than the distal setae of the pleotelson, its distal extremity has no tooth.

In most details the male agrees well with the female. Pleopod I is considerably



Fig. 2. Munna crinita sp. n., holotype, female. a, mandible; b, first maxilla; c, second maxilla;
d, first percopod; e, maxilliped; f, seventh percopod; g, operculum. Scale 1 represents 0.1 mm;
scale 2 represents 0.1 mm; scale 3 represents 0.2 mm; scale 4 represents 0.05 mm.

expanded in the proximal half, nearly twice longer than wide, the distal lateral angles are produced into rather short, narrow, triangular, apically pointed lobes that are directed obliquely backwards and outwards.

In alcohol the colour is pale greyish white, without any pigmentation; the eyes are brown.

Munna (Neomunna) avatchensis Gurjanova, 1936

- Gurjanova, 1936a: 52-53, fig. 18; Gurjanova, 1936b: 252-254, fig. 2; Gurjanova, 1950: 283; Kussakin, 1962: 78, fig. 4.
 - Material examined. Urup, depth 0-41 m, 17 samples (115 specimens).

Simushi, depth 5-10 m, 3 specimens.

Matua, depth 3-4 m, 1 sample (23 specimens).



Fig. 3. Munna crinita sp. n., paratype, male. a, first pleopod (1); b, second pleopod (1); c, second antenna (2); d, first antenna (1). The numbers in parentheses refer to the corresponding scales in fig. 2.

Distribution. — A Pacific high-boreal species, known from eastern Kamchatka and the middle Kuriles.

Munna (Neomunna) arnholdi Gurjanova, 1933

Gurjanova, 1933: 87, figs. 13, 14; Gurjanova, 1936a: 51-52, figs. 17a, b; Kussakin, 1962, 92-93, figs. 17, 18.

Material examined. - Urup, depth 50-60 m, 1 specimen.

Distribution. — A Pacific high-boreal species, known from the Commander Islands, western Kamchatka and the middle Kuriles.

Munna (Neomunna) hirsuta Kussakin, 1962

Kussakin, 1962: 75-78, figs. 2, 3. Material examined. — Matua, depth 10 m, 3 specimens.

Distribution. — A Pacific high-boreal species, known from the northern and middle Kuriles.

Munna (Neomunna) stephenseni Gurjanova, 1933

Gurjanova, 1933: 88, fig. 15; Gurjanova, 1936a: 50-51, fig. 16; Menzies, 1952: 124-128, figs. 40-51; Kussakin, 1962: 73-75, fig. 1. Material examined. — Urup, depth 3.5 m, rocks, 1 specimen.

Distribution. — A boreal species widely distributed in the North Pacific: Okhotsk and Bering Seas, the Kurile Islands and northern California.

Munna (Neomunna) setosa Kussakin, 1962

Kussakin, 1962: 89-92, figs. 15, 16.

Material examined. — Urup, depth 3-46 m, rocks, among red algae, 8 samples (19 specimens). Simushir, intertidally, rocks, among the red alga *Ptilota*, 3 samples (20 specimens). Matua, depth 3-4 m, 1 sample (16 specimens).

Munna (Neomunna) urupica sp. n. (figs. 4, 5)

Material examined. — Urup, depth 15 m, 1 holotype (N 8/906) and 81 paratypes; depth 5-10 m, pebbles, stones, 5 samples (29 specimens); depth 15-20 m, 2 samples (6 specimens); depth 38-48 m, 2 samples (6 specimens).

Simushir, depth 50-60 m, 1 specimen.

Description of male holotype (length 3.15 mm). — Body rather flattened, oval, nearly 2.3 times as long as wide (width measured across pereonal somite IV). The dorsal surface is covered with short setae.

The cephalon is relatively long, being only $1\frac{1}{2}$ times wider than long; the anterior part projects strongly forward, so that the mouth parts are almost invisible



Fig. 4. Munna urupica sp. n., holotype, male.

in dorsal view. The frontal margin is strongly concave, with minute spine-like setae; the anterolateral border is evenly rounded. The eyes are bulging, oval, moderately developed and placed on short but rather broad, immovable stalks; they reach a little beyond the lateral margin of the first pereonal somite. The preorbital lobes are well developed, with 2 or 3 spine-like setae at the rounded apex.

The pereonal somites are of about equal width; somite I is nearly half as long as somites II or III; somites II and III are of about equal length, somite IV is



Fig. 5. Munna urupica sp. n., holotype, male. a, first pleopod (2); b, seventh percopod (3); c, mandible (1); d, second pleopod (1); e, second maxilla (4); f, maxilliped (2); g, first percopod (2); h, second percopod (3). The numbers in parentheses refer to the corresponding scales in fig. 2.

shorter than the preceding ones; the three posterior somites are rather short. The coxal plates are slender, especially on the anterior somites.

The pleotelson is elongate, oval, being nearly $1\frac{1}{2}$ times longer than wide; the lateral margins are smooth, with some minute setae; the posterior margin is produced between the uropods and is broadly rounded with an indistinct distal concavity.

The antennula is moderately developed and 6-segmented. The proximal two segments are wide, the others are slender; the third and fourth are short and subequal in length; the fifth is long, being twice as long as the third and fourth segments together; the sixth is tiny; the distal end of the antennula bears three long setae and two aesthetascs. The antenna is well developed, the segments of the stalk are rather thick, the penultimate segment is as long as the distal one and is provided with a strong spine on the distal inner angle; the distal segment is considerably narrowed in the proximal part; the flagellum is thin, shorter than the stalk and 12-segmented.

The spine-row of the left mandible bears 4 setae; the third segment of the palp has 3 curved setae in the distal part of the outer margin. The inner plate of the maxilliped shows 3 coupling hooks.

The percopods are strong and comparatively robust. The inner margin of the carpus of percopod I bears five bifid setae. The propodite is elongate, oval, with two bifid setae and some strong setae on the inner margin. The inner claw is nearly half as long as the outer. The carpus of percopod II is elongate, oval, the inner margin bears one, the outer two spines, one of which is placed at the distal extremity of the segment. The inner margin of the propodus bears 6 strong and rather long bifid setae. The inner claw is less than half as long as the outer. The merus of percopod VII has some bifid setae on the distal edge. The distal half of the inner margin of the carpus has 8 long bifid setae, three of these form a group on the inner distal angle of the segment, four are placed on the protuberance located near the middle, and one is between these two groups; the inner margin bears 5 setae, the outer has 2 long spines and a few setae.

Pleopod I is relatively wide, being twice as long as wide, it gently tapers posteriorly; the lateral margins are nearly straight, both sides of the distal half are provided with 9 setae near or on the lateral margin; the disto-lateral corners are produced, forming small triangular processes; the distal margin is nearly straight with 6 pairs of setae. The uropods are very small, they are almost conical, and are subacute at the apex; the inner margin shows 2 tiny spine-like protuberances near the distal extremity.

The females generally resemble the males and are not considerably different in width. The operculum is nearly circular, the length being subequal to the width; the lateral margins and posterolateral angles are rounded; the posterior margin is straight, with a slightly visible median concavity, it bears some setae.

The body of the alcohol specimen is light yellowish-grey, the pleotelson is mainly light-brown, in some specimens it is faintly pigmented; the eyes are nearly black.

Remarks. — A combination of features as the strongly concave frontal margin, the lack of spines on the lateral margin of the pleotelson, the small distal inner process on the uropod and some peculiarities in the armature of the pereopods show the present species to be distinct from the described species.

Munna (Neomunna) coxalis sp. n. (figs. 6, 7)

Material examined. — Only one specimen, the female holotype (N 1/940) with empty brood pouch, length 2.55 mm, from Urup Island, depth 20 m.

Description. — The body is rather flattened, widely-oval, nearly 1 2/3 times longer than wide (width measured across pereonal somite III without the coxal plates). The dorsal surface is smooth, without setae.

The cephalon is relatively short and wide being only 3 times wider than long. The eyes are placed on slender, rather long, immovable stalks reaching a little beyond the lateral margin of the first pereonal somite, but do not cover it. The preorbital lobes are not large, but are clearly isolated, and triangular. The frontal margin is noticeably concave, the anterolateral borders are rounded. The dorsal surface bears 2 rather high tubercles, which are situated on each side of the median line near the posterior margin, and a distinct mesial arcuate transverse keel.

Pereonal somite I is narrower and considerably shorter than the three following somites, which are subequal in length. Along the posterior margin of each of the four anterior pereonal somites there is a distinct arcuated keel, which does not reach the lateral margins of the corresponding somite. On each half of pereonal somites II to IV, a short but distinct, bluntly conical process is present near the lateral margin. These processes are directed upwards and outwards, the longest is placed on the second somite and the shortest on the fourth somite. The three posterior pereonal somites are very short, subequal in length, each being noticeably shorter than the first pereonal somite. The lateral parts of these three somites are strongly incurved backwards, they are rounded, and slightly raised, but without any distinct processes or tubercles. The coxal plates of pereonal somites II to VII



Fig. 6. Munna coxalis sp. n., holotype, female.



Fig. 7. Munna coxalis sp. nov., holotype, female. a, first antenna (1); b, second maxilla (1); c, maxilliped (1); d, first maxilla (4); e, operculum (1); f, lower lip (1); g, uropod (4); h, mandible (1). The numbers in parentheses refer to the corresponding scales in fig. 2.

are well developed, they are strongly produced, subacute, and increase in length from the second to the seventh somite.

The pleotelson is comparatively slender and long, it is oblong-oval and nearly twice as long as wide; the lateral margins are smooth, without spines or setae, the posterior margin is faintly convex.

The antennula is rather small and 6-segmented. The proximal two segments are wide, the others are slender, the third and fourth segments are subequal in length, the fifth is nearly 3 times as long as the third and fourth segments together,

the sixth segment is tiny. The apex of the antennula bears 2 aesthetascs and 2 long setae. The antenna is broken, only the proximal articles being present.

The spine-row of the left mandible consists of 4 setae, that of the right one of 5 setae; the outer margin of the second segment of the palp has 2 setae near the distal extremity, the third segment is considerably narrower than the others and is provided with 3 distal setae. The inner lobe of the first maxilla bears 3 setae. The inner lobe of the second maxilla has 13 long setae, the inner lappet of the outer lobe has 3, the outer lappet 4 long setae. The inner plate of the maxilliped bears 3 coupling hooks; the surface of the epipodite shows at most vestiges of small scales. The percepods are lost. The operculum is considerably wider proximally than distally, it is longer than wide, the margins are without setae. The uropods are very long for the genus, they are narrow and conical, reaching a little beyond the distal extremity of the pleotelson; the tip is truncated and bears one seta and one distinct but blunt tooth, which is feebly curved inwards.

The colour in alcohol is pale yellowish-grey; along the pleotelson there are 4 longitudinal dark-brownish stripes; the eyes are black.

Remarks. — This species can be distinguished from the others of the genus Munna (1) by the strong development of the coxal plates, not only on the posterior pereonal sometimes but also on segments II to IV, (2) by the long uropods, and (3) by the distal tooth of the uropods which is faintly curved and not pointed at the apex as in the other species of the subgenus Neomunna.

It is possible that these differences are sufficiently important for the erection of a new subgenus but we refrain from this for lack of additional material.

Pleurogonium angustum sp. n. (fig. 8)

Material examined. — Kunashir, north-east coast, depth 40 m, 1 $\,$ without oostegites. (N 1/1034) and 20 paratypes.

Description. — The female holotype has a length of 1.25 mm. The body is comparatively narrow, oblong-ovate and nearly 2.3 times longer than wide across pereonal somite III. The dorsal surface of the body is smooth, lacking any conspicuous setae. The integument is only weakly calcified, very thin, delicate and translucent.

The cephalon is comparatively slender, being only 1.3 times wider than long; the frontal margin is wide and convex. Eyes are lacking.

The width of the pereonal somites increases slightly from somite I to somite III, and then slightly decreases to somite VII. Somites II to IV are longer and somites VI and VII are shorter than somites I and V; somites I and V are subequal in length. The lateral margins of the pereonal somites are without spines or setae. The lateral margins of the four anterior pereonal somites are slightly convex, those of the posterior three are rounded. The coxal plates are small and dorsally visible on somites V to VII only.

The pleotelson is comparatively short and wide, the width is subequal to the



Fig. 8. Pleurogonium angustum sp. n., a, c-g, i, k, female holotype; b, h, j, male paratype. a, holotype, female; b, paratype, male; c, maxilliped (7); d, mandible (7); e, seventh pereopod (6); f, operculum (1); g, second antenna (6); h, first pleopod of male (5); i, first antenna (7); j, second pleopod of male (5); k, first pereopod (6). The numbers in parentheses refer to the corresponding scales in fig. 2. Scale 5 represents 0.05 mm; scales 6 and 7 represent 0.025 mm.

length. The posterior part of the pleotelson is short, wide, and triangular, its margin is finely serrated and fringed with setae; the tip is rounded.

The antennula is short; the flagellum is composed of 4 segments, it is somewhat longer than the two distal peduncular segments together. The antenna is considerably thicker and longer than the antennula, the flagellum is 6-segmented.

The incisive part of the mandible ends in five teeth. The inner plate of the maxilliped is nearly rectangular and bears two coupling hooks.

Pereopod I is massive. The carpus is comparatively short and very wide in the distal half; it is more than $1\frac{1}{2}$ times as wide as long, the inner distal angle is produced into a small semicircular pectinate lobe; there is one bifid spine on each side of this lobe, the spine situated proximally is rather long. The propodus is distinctly curved, the greater part of its inner margin is produced into a short and wide lobe; the latter is widely rounded at the apex and armed with four small simple setae. The other pereopods are slender, and long; each has a rather long dactylus. The operculum (pleopod II) is nearly obcordate, it is 1.2 times as long as wide, the distal part of the posterior margin has one seta on each side, between these setae the margin is finely and bluntly serrated. The uropod is small and dorsal, its branches are narrow, conical and apically pointed; the endopodite is very small, with one rather long distal seta.

The maximum length is 1.3 mm (a \bigcirc with empty pouch).

Remarks. — This species is closely allied to *P. inermis G. O. Sars*, although easily distinguishable by its considerably smaller size, the more slender body, by the presence of serrations on the posterior margin of the pleotelson, the different shape of the uropods, and of the carpus and propodus of pereopod I, and in some other characteristics.

RÉSUMÉ

Dix espèces de Munnidés (Isopoda, Asellota) ont été trouvées dans les eaux littorales des Kouriles, pendant l'automne 1969. Les localités de récolte sont mentionnées et quatre espèces, nouvelles pour la science, sont décrites: Munna crinita n. sp., M. urupica n. sp., M. coxalis n. sp. et Pleurogonium angustum n. sp.

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