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<u>Figure 61 .</u> <u>Menigrates angustipes</u> Gurjanova sp.n. Sea of Okhotsk, ♀, length 11 mm.

<u>Figure 62.</u> <u>Menigrates spinirami japonica</u> Gurjanova ssp.n. Sea of Japan.

Body strongly inflated, powerful, with broadly arched back; head longer than peraeon segment 1; interantennal lobe drawn out forward and slightly downward, triangular, with blunt apex; eyes oval, light-yellow in alcohol. The anterior margin of the epistome concave, upper lip short, rounded, does not protrude beyond the epistome. The lower lip without inner lobes; mandibles with a simple cutting edge and a weakly developed molar process with an obliquely truncated apex, palp at the level of the molar process, well developed; its segment 2 longer than segment 3 and armed with setae in its distal part. Maxilla 1 with well developed narrowly oval inner lobe armed with 2 setae, distal segment of palp weakly broadens toward the apex with a toothed margin; outer lobe armed with strong spines, partly with a pectimate margin. Plate of maxilla 2 narrow, inner considerably shorter than the outer, with hairs on its inner margin; at the apices of both plates, there are normal setae. Antennae almost equal in length, short; antenna 1 with an almost cylindrical peduncle, flagellum 8-segmented, segment 1 as long as the 4 subsequent ones; accessory flagellum 5-segmented, its segments almost uniform in length; antenna 2 with an 8-segmented flagellum; segment 4 of the peducnle thicker and longer than segment 5, both weakly armed with setae.

Coxal plate 1 with strongly convex anterior margin which covers the lower part of the eye, tapers distally. Gnathopod 1 with thick basal segment armed with sparse setae on anterior margin; segment 6 shorter than segment 5, tapers distally at the apex; palmar margin finely dentate, shorter than posterior margin of hand, almost vertical and restricted by 2 locking spines; segment 5 cup-shaped, without lobe. Gnathopod 2 longer than gnathopod 1, but relatively strong; segment 3 elongated, longer than segment 4; segment 6 about half the length of segment 5, broadens toward the middle and tapers distally, densely covered with coarse hairs which almost cover palm and dactyl; palmar margin short, transverse, weakly concave, dactyl reaches palmar angle. Peraeopods 3 - 5 with deep coxal plates; coxal plate of peraeopod 3 slightly larger and longer, lower margin bilobed, lobes short; coxal plate 4 of peraeopods with posterior lobe drawn out downward; lobe of peraeopod 5 similar, but short. Basal segments of peraeopods 3 - 5 bear spinules along the anterior margin, their posterior margin weakly dentate, the lobe of the wing-shaped broadening developed poorly, short, scarcely reaches the middle of segment 3 with its rounded apex, segment 4 of all last three peraeopods almost linear, weakly broadens distally. All branchial vesicles simple, without folds and accessory lobes. The postero-distal angle of epimeral plate 3 straight, its posterior margin weakly convex. Urosome segment 1 with saddle-shaped depression. Uropod 1 longer than uropod 2, ends of uropods 2 and 3 at same level. Peduncle of uropod 2 shorter than outer ramus, armed with spines; inner ramus considerably shorter than the outer, both rami armed with spines along inner margin. Peduncle of uropod 3 cylindrical, with spinules at the distal angles; inner ramus shorter than outer, as long as segment 1 and bears 2 spines on inner margin; apical segment of outer ramus large, about 1/3 length of segment 1. Telson entire, slightly tapering distally, the width of its base smaller than its length, posterior margin with a shallow notch; at the apex of short lobes, there are 2 short setae. In alcohol, the animal is whitish; maximum length of the animal is 11 mm.

4 specimens found in the Sea of Okhotsk at the west coast of Kamchatka, on shoal of sandy bottom /1 specimen ♀ with young (4 specimens juv.) and 3 ♂♂/ and 1 specimen in the northern part of the sea at a depth of 110 - 135 m.

2. Menigrates spinirami japonica Gurjanova ssp.n. (Figure 62).

It differs from the typical Arctic species described from the Kara Sea (Guryanova, 1951: 211, Figure 78) in the detail of the structure of its gnathopods, the last three peraeopods, uropod 3, telson, and epimeral plate 3. Segment 6 of gnathopod 1 rather shorter, as long as segment 5, while segment 6 of the typical form much longer than segment 5 and narrow; segment 6 of gnathopod 2 twice as short as segment 5 and narrower than the distal end of segment 5. The lobe of coxal plate 5 shorter and blunt, and segment 4 of peraeopod 3 relatively considerably broader; it is 1½ times broader than long; the lobe of the basal segment of peraeopod 3 drawn out considerably lower than the level of distal end of segment 4; segment 4 of peraeopod 4 also more strongly broadened, and the lobe of the wing-shaped broadening of basal segment more developed. Posterior margin of epimeral plate 3 convex in the middle; inner ramus of uropod 3 considerably shorter than the outer; posterior margin of the wing-shaped broadening of peraeopods 3 - 5 smooth, while it is distinctly finely dentate in the typical form; on the posterior margin of telson, there is only a slight depression in the middle, and not a rounded notch. The remaining features are similar to those of the basic subspecies. The animal is 11 mm long.

Only 1 specimen was discovered in the Sea of Japan, in Peter the Great Bay, in the coastal area.

21. The Genus SCHISTURELLA Norma, 1900
Guryanova, 1951: 212.

This genus is close to the genus Hirondellea Chevreux, but it has a number of essential differentiating generic features related to the structure of its oral parts, telson, and branchial vesicles.

The features, to one of which Birstein and M. Vinogradev refer, 1955: 232 (the structure of segment 6 of gnathopod 1), the small coxal plate 1, which is very strongly reduced and covered with expanded plate 2, as well as the rounded postero-distal angle of epimeral plate 3, the structure of the inner ramus of uropod 2, and the weakly developed wing-shaped broadening of the basal segments of peraeopods 3 - 5 for the representatives of the family Lysianassidae play a secondary role in the systematics of this family and serve chiefly as good diagnostic, but not generic, features of its structure; they become diagnostically important only when combined with the peculiarities of the structure of the oral parts and are accessory when the genera are diagnosed.

Figure 63A. Schisturella palchra (Hansen). Southern part of Sea of Okhotsk, ♀.

Figure 63Б. Schisturella pulchra (Hansen). Southern part of Sea of Okhotsk, ♀.

We consider it impossible to unite the genus Schisturella with the genus Hirondallas Chevrexu (Tetronychia Stephensen) due to the following factors[1].

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[1] For the description and figures of oral parts and branchial vesicles Schisturella, see: Shoemaker, 1929, Contr. Canad. Biol. Fischer. /Sic! Translator/, V, No. 10: 14, f. 4 - 6; for the description and figures of oral parts of Hirondellea sea: Chevreux, 1900, Res. Camp. Sci., Monaca, XVI: 21, pl. IV, f. 1; for those of Tetronychia, see: Stephensen, 1923, Ingolf-Ex., III, No. 8: 63, f. 8; Schellenberg, 1926, Deutsche Südpolar Exp., XVIII, Zool, X: 251, f. 8; K.H. Bernard, 1930, Terra Nova Exp., VIII, No. 4: 319, f. 2; Birstein and M. Vinogradov, 1955, Tr. Inst. (Connog., XII: 229-231, figure 11, 12.

The mandibles of _Schisturella_ are powerful, with a massive body, long palp whose segments are relatively thick, and a large strong cylindrical molar process with a broad triturating surface. The mandibles of _Hirondellea_ are relatively weak, with a quite narrow and long palp whose segments are thin and the molar process long, conical, without the triturating surface, bearing thin hairs at its apex. Maxilla 1 of both genera have some resemblance in structure, but both apical plumose setae of the inner lobe of _Schisturella_ are normal, dentate strong spines of the outer lobe form 1 oblong row along the strongly oblique apical margin, and the inner margin of the apical segment of the palp is smooth, while the setae of the inner lobe of _Hirondellea_ are highly specialized (the inner- rather a special spine, and not a seta, is bent and densely fringed by coarse hairs along the lower margin; the base of this "spine" is strongly broadened); the outer lobe with a weakly oblique apical margin the spines of which are rather weaker and form 3 short rows, and the inner margin of the long apical segment of the palp with a dentate notch at the distal end.

Maxilla 2 of _Schisturella_ rather more normal, its inner lobe shorter and narrower than the outer, tapers distally, and the last plumose setae noticeably larger than the remaining ones, while the inner lobe of _Hirondellea_ shorter, but not narrower than the outer; the larger plumose seta of the inner lobe may be absent (for instance, in both Chevreux's apecies).

The maxillipeds of _Schisturella_ have rather shorter outer plates whose apex is armed with short strong spines and reaches only the middle of segment 2 of the palp, which is relatively long, the outer plates of Hirondellea reach by their apices beyond the level of the distal end of segment 2 of a somewhat shortened palp and lack the armature of spines. As far as the relative thickness of the segments of the palp is concerned, we share Barnard's view that they must be normal in thickness, and the nature of its presentation in Chevreux' figure (1900, pl. IV, f. 1, h) reveals that its segments 1, 2, and 3 are turned edgewise, and this is the only reason that they seem to be thin. In essence, the different structure of both genera is due to the upper lip, the epistome, the lower lip, the branchial vesicles, and the telson. The epistome of Schisturella is high, its anterior surface concave, upper lip forms a long linguliform process which greatly protrudes forward beyond the epistome; the lower lip long, its lobes converge along the middle line, their width truncated perpendicalarly toward the inner margin, broad; the branchial vesicles of gnathopod 2 and peraeopods 1 - 3 with transverse folds on both sides, and in peraeopods 3 - 5 they have one sausage-shaped accessory lobule on each; the telson elongated and cleft almost to the base[1].

The epistome of Hirondellea (see Stephensen's figure and description, 1923) is relatively short, its anterior surface strongly con-

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[1] In the diagnosis of the genus Schisturella of my summary for 1951, it is stated that the branchial vesicles of S. pulchra are simple; however, this is erroneous; the first three pairs of all specimens from the northern and Far-East seas have transverse folds on both sides, and the last three ones have one accessory lobule each.

vex and slightly protrudes forward beyond the upper lip; upper lip simple and lacks the linguliform process; lower lip broad and short, its apices rounded and strongly diverge. However, Barnard (1930) has a remark regarding the fact that the branchial vesicles of _H. antarctica_ in segments 5 and 6 have short pointed processes (accessory lobules); the vesicles themselves do not have any folds, as Barnard does not mention them, and, judging from his drawing (K.H. Barnard, 1930: 320, f. 2 c), they are simple. None of the other authros who described the species _Hirondellea_ (= _Tetronychia_) mentions the branchial vesicles, and we may think that they were simple in all cases, as the folding of their walls occurs not too frequently in the family Lysianassidae, which is a reliable diagnostic feature, and, if it takes place, the authors, as a rule, mention it. The telson of _Hirondellea_ is abbreviated and cleft not further than to the middle. Thus, we consider that sufficient bases are lacking for merging _Schisturella_ and _Hirondellea_ (= _Tatronvchia_) into one genus.

Until new, in the genus _Schisturella_ only 1 species is known.

1. _Schisturella pulchra_ (Hansen, 1887) (Figure 63).
   Guryanova, 1951: 212, Figure 79.

In September, 1 ♀ with young was discovered east of Iturup Island (the Kurile Range) at a depth of 110 m, 1 ♀ comes from the Sea of Okhotsk, from a depth of 2440 m, and 2 species (♂ and ♀) from the eastern part of La Perouse Strait, depth 150 m.

The Pacific specimens do not differ in anything from the Arctic.

Contrary to the specimens from the area of the Atlantic coast of Canada, the postero-distal angle of epimeral plate 3 of both the Atlantic and the Far-East specimens has a distinct small tooth, as is pointed out by Hansen (1887) for Greenland specimens.

22. The Genus ARIȘTIAS Boeck, 1871

Guryanova, 1951: 213.

Within the genus, there are only 14 species, 2 of which are described here for the first time. There are 5 species in the northern part of the Pacific Ocean.

1 (2). Inner ramus of uropod 3 shorter than segment 1 of outer ramus..........1. Aristias tumidua (Kröyer, 1846).

2 (1). Inner ramus of uropod 3 as long or longer than outer ramus.

3 (8). Eyes strongly reduced, without optical elements or lacking completely.

4 (5). On each side of urosome segment 2, from its posterior margin, there extends an oval chitinous plate which extends to the level of the middle part of telson; on sides these "wings" protect urosome segment 3. The animal is blind; accessory flagellum of antenna 1 two-segmented, flagellum of antenna 2 four-segmented; segment 6 of gnathopod 1 tapers distally, slightly bent, longer than segment 6 /Sic! "5"?E.B./ and armed with 2 short spines and thin crenulation along the inner margin.

Segment 6 of gnathopod 2 linear; shorter and considerably narrower than segment 5; basal segments of paraeopods 3 - 5 relatively narrow, with weakly developed wing-shaped broadenings; telson with rounded margins, slightly tapers distally, cleft almost to the base, with 1 apical spinule at apices of lobes..........* A. topseuti Chevreux, 1900.[1]

Res. Camp. Sci., Monaco, XVI: 18, pl. III, f. 2. a-o.

(Northern part of the Atlantic Ocean, Newfoundland, depth 1267 m).

5 (4). Urosome without "wings", normal in structure.

6 (7). Telson short and broad, broader than long; greatly reduced eyes present, without optical elements, only a dull spot in place of the eye; accessory flagellum 2-segmented..........* A. microps G. Sars, 1895.

(Northern part of the Atlantic Ocean, near Norwegian coasts, depths 600 - 1484 m; near Newfoundland - 25 - 40 m).

7 (6). Telson elongated, distinctly tapering distally, longer than broad; the species is blind. Accessory flagellum has more than 2 segments. Segment 6 of gnathopod 1 as long as segment 5, strongly tapering distally, with 3 - 4 spines on the posterior margin; segment 6 of gnathopod 2 at the base as broad as segment 5, almost twice as short and slightly broadening distally. Coxal plate 3 and 4 of peraeopods with strongly developed posterior lobe drawn out downward almost to the middle

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[1] Omitted in Stebbing's summary (Stebbing, 1906); this omission is mentioned by the author / probably Stebbing. Translator/ on page 718.

of the basal segment; the basal segment of peraeopod 5 tapers distally, the posterior margin of basal segment 3 - 5 distinctly dentate, especially in peraeopod 5; the posterior margin of epimeral plate 3 smooth.......... ..* _A._ _falcatus_ Stephensen, 1923.

Ingolf-Exp., III, No. 8: 73, f. 14.

(Northern part of Atlantic Ocean, 870 - 1700 m).

8 (3). Eyes present and always with distinct eptical elements, but in alcohol frequently very light, hence their boundaries difficult to determine.

9 (12). Eyes enormous, occupy almost entire lateral surface of head, red when alive.

10 (11). Telson cleft beyond the middle; posterior margin of epimeral plate 3 smooth.........* _A._ _megalops_ G. Sars, 1895.

(West coast of Norway).

11 (10). Telson cleft only to the middle; posterior margin of epimeral spate 3 with several deep notches. Rami of uropods 1 and 2 equal equal; inner margin of outer ramus of uropod 3 forms a large triangular pointed process at the end; telson distinctly tapering distally, considerably longer than broad; spical spine at the apex of lobes large and located in the notch; apical segment of the outer ramus of uropod 3 very large, as long as the outer margin of segment 1.........* _A._ _tropicus_ Schellenberg, 1938.

Kungl. Sv. Vet. Ak. Handl., 16, No. 6: 5, f. 1.

(Tropical region of the Pacific Ocean; Bismarck Archipelage; inhabits, apparently, the coastal zone).

12 (9). Eyes moderate, never reach either the level of the crown or the lower margin of head; well-pigmented more frequently dark, almost black, in alcohol sometimes yellowish with indistinct border.

13 (18). 2 or 3 apical spinules at the apex of lobes.

14 (15). Eyes round, pale, reddish. Accessory flagellum of antenna 1 five-segmented; postero-distal angle of epimeral plate 3 straight, its posterior margin smooth; segment 6 of gnathopod 1 as long as segment 5, its inner margin dentate; segment 6 of gnathopod 2 twice as short as segment 5; dactyl together with drawn out palmar angle of segment 6, forms a small claw; basal segment of peraeopods 3 - 5 strongly broadened, with dentate posterior margin. At the distal end of the inner ramus of uropod 3, there are 3 spinules on outer margin; the inner margin of the outer ramus finely dentate, apical segment small; telson cleft to base..........* _A. commensalis_ Bonnier, 1896.

(Bay of Biscay, depth 800 - 960 m).

15 (14). Eyes oval or broadening downward, dark-brown or black.

16 (17). Posterior lobe of coxal plate of peraeopod 3 considerably more strongly developed than the anterior lobe, and drawn out downward almost to the middle (?) of basal segment..........2. _A. pacificus_ Schellenberg, 1936.

17 (16). Posterior lobe of coxal plate of peraeopod 3 only slightly larger than the anterior and weakly drawn out downward.......... * A. neglectus Hansen, 1887.

(Mediterranean Sea, northern part of Atlantic Ocean, south-western area of Barents Sea).

18 (13). Apices of lobes of telson bear 1 apical spinule each.

19 (22). Lateral margins of telson bent at an angle where it is produced into its distal end.

20 (21). On the dorsal side of urosome segment 1, there is a saddle-shaped depression, and little nobulous tooth behind it. The posterior margin of the basal segment in peraeopod 5 finely dentate; telson cleft 2/3, width of its base same as its length, lateral spines lacking; the posterior margin of the basal segments of peraeopods 3 and 4 dentate only in its distal part; the ends of rami of uropod 3 bear small spinules; the anterior margin of upper lip rounded..........* A. collinus K.H. Barnard, 1932.

Discovery Rep., V: 44, f. 8.

(Antarctic, eas of Shetland Islands).

21 (20). Urosome segment 1 without a saddle-shaped depression and lacks process..........3. A. spinipes Gurjanova sp.n.

22 (19). Lateral margins of telson uniformly rounded or straight.

23 (28). Accessory flagellum of antenna 1 5- or 4-segmented.

24 (25). Eyes large, broaden downward; postero-distal angle of epimeral plate 3 drawn out backward and pointed. Segment 6 of gnathopod 1 slightly shorter and narrower than segment 5, tapers distally; its posterior margin concave and armed with 4 spines. Segment 6 of gnathopod 2 considerably shorter than segment 5, slightly tapers distally, with weak convex palmar margin, dactyl well developed; posterior margin of basal segment of peraeopods 3 and 4 smooth, with indistinct crenulation only in its distal part; posterior margin of basal segment of peraeopod 5 dentate along the entire length. The ends of the inner ramus of uropod 3 bear fine spinules. Telson cleft 2/3 its length, with rounded margins, its base almost as broad as long..........* A. antarcticus Walker, 1906.

Ann. Mag. Nat. Hist., XVII: 454, for more complete description and figures see: 1907, Nat. Antarct. Exp., III: 11, pl. 3, f. 5.

(Antarctic, Millurdo Bay, 40 m).

25 (24). Eyes large but bright; in alcohol their borders are sometimes scarcely discernible. The postero-distal angle of epimeral plate 3 straight or slightly drawn out backward, but not pointed.

26 (27). The interantennal lobe of head broadly triangular, its pointed apex directed forward. The posterior lobe of the coxal plate of peraeopod 3 similar to the anterior, and the apices of both lobes at same level..........4. A. cartises Gurjanova sp.n.

27 (26). Interantennal lobe of head triangular, with blunt apex. The posterior lobe of the coxal plate of peraeopod 3 linguliform, narrower and longer than the anterior one; its apex considerably lower

than the level of the anterior lobe..........5. A. japonicus Gurjanova sp.n.

28 (23). Accessory flagellum of antenna 1 two-segmented. Segment 6 of gnathopod 1 longer than segment 5; lateral angles of head slightly extended, blunt; eyes broadly oval; segment 6 of gnathopod 1 longer than segment 5; eyes broadly oval; postero-distal angle of epimeral plate 3 straight, posterior margin finely dentate, telson cleft 2/3, as broad as long, apical spinule at the apex of lobes large and located in notch; segment 6 of gnathopod 1 slightly longer and narrower than segment 5, with 3 - 4 spines along posterior margin. Segment 6 of gnathopod 2 slightly narrower and longer than segment 5. Basal segment of peraeopods 3 - 5 with weakly convex posterior margin, with small notches (3 - 4 in peraeopods 3 and 4 and 6 in peraeopod 5); rami of uropod 3 bear fine spinules along margins; apical segment of outer ramus as long as half of segment 1; inner ramus longer than segment 1 of outer ramus..........* A. symbiotica K.H. Barnard, 1916.

Ann. S. Afr., XV, III: 121.

(South coast of Africa, 200 m).

1. Aristias tunidus (Kröyer, 1846).

Guryanova, 1951: 214, Figure 80.

This circumpolar Arctic species in the Pacific Ocean was discovered only at the coasts of Asia, in the Bering Sea (northern shallow-water part of the latter and eastern coast of Kamchatka, in the coastal region), in the Sea of Okhotsk (Shelekhov Bay, at the northern extremity of Sakhalin, at the west coast of Kamchatka) at depths ranging from 30 to 400m, in the northern Kurile straits (at depths of 30 - 40 m), at east shores of Iturup Island (depths of 100 to 270 m), at the northern extremity of Shikotan Island (at 180 m), and in the Sea of Japan, at the west coast of south Sakhalin (at 60 - 70 m). Like in northern specimens, coxal plates 3 and 4 of peraeopods have a linguliform posterior lobe whose apex extends below the apex of the anterior lobe (G. Sars does not mention this in his text, but, in his drawing, he illustrates both lobes of these coxal plates of almost the same size).

2. Aristias pacificus Schellenberg, 1936.

Schellenberg, 1936, Zool. Anz., 116, M. 5/6 (Figure absent).

It is similar to A. tumidus (Kröyer) in accordance with Sars' description and fiugres, but the flagellum of antenna 1 is 10-segmented, the accessory flagellum does not reach half the length of the main flagellum. The flagellum of antenna 2 is 8- 9-segmented. The width of segment 6 of gnathopod 2 is about 2/3 the width of segment 5; the lobe of segment 4 of peraeopods 3 - 5, drawn out backward, reaches only the middle of segment 5. The postero-distal angle of the epimeral plates 1 and 2 has a very small blunt tooth; posterior margin of plate 3 smooth. The inner ramus of uropod 3 slightly longer than segment 1 of the outer; telson cleft 4/5 the length; at the apex of its lobes, there are 2 apical spines on each. Coxal plates 2 - 4 broadened distally and blunt; posterior lobe of plate 5 much longer than the anterior; basal segment of peraeopod 5 shorter than the remaining part of the extremity. Oral parts differ from those presented by Sars for A. neglectus (G. Sars, 1895, Crust. Norway. I: 17) in that the lobes of the lower lip adhere more to one another; segment 3 of palp of mandibles not bent, its inner margin bears single short thick setae; palp of maxillipeds reaches only the level of the apex of the outer lobe.

Eyes darkly pigmented, borders of facets distinctly visible.

In the structure of its eyes and segment 4 of peraeopods 3 - 5, it resembles A. tumidus, and in the structure of uropod 3 and epimeral plate 3, A. neglectus.

The animal is 6.5 mm long.

Obtained at the east coast of Vancouver Island (east coast of North America), at a depth of 20 - 30 m.

3. Aristias spinipes Gurjanova sp.n. (Figure 64).

For an amphipod, this species possesses a remarkable feature, i.e. it has 2-jointed rami in the first two uropods; this jointing is secondary, of course, and is connected with the parasitic way of life of the animal. In general habitus, it is close to Aristias tumidus (Kröyer) a typical species of the genus; it is easily distinguished from the latter species by its armed spinules of peraeopods (the species was named after this feature), the rather narrower, strongly tapering distally segment 6 of gnathopod 1 and its massive dactyl, narrow coxal plate 4, which is lower than plates 2 and 3, the strongly downward extended posterior lobe in coxal plates 5 and 6, which reaches the level of the upper third of the length of the basal segment, the structure of uropod 3 whose inner ramus is not shorter but longer than segment 1 of the outer ramus, the large apical segment of the outer ramus, and the shape of the telson. Body weakly inflated, compact; eyes large, occupy the larger part of the lateral side of head, slightly broaden downward, light-brown, reddish, moderate in size; urosome segment 1 smooth, without processes and depressions. Segments of peduncle in antenna 1 have small thickenings on distal margin; flagellum 7-segmented, accessory flagellum 4-segmented. Flagellum of antenna 2 five-segmented. Coxal plate 1 has a triangular process in the middle of lower margin; segment 6 of gnathopod 1 as long as segment 5, tapers distally; its anterior margin convex, posterior concave and armed with a thin pectinate crenulation and 4 spines 2 of which are located at the distal end. Gnathopod 2 with long segment 3, which exceeds almost twice the length of segment 4; segment 6 narrow, strongly elongate, slightly shorter than segment 5, tapers distally; strong dactyl together with short palmar margin drawn out forward form a small claw. Coxal plate 4 has a small notch which is shorter than the greatly oblique remaining part of the posterior margin; coxal plates in peraeopods 3 and 4 have a greatly developed posterior lobe which in the last plates lowers almost to the middle of the basal segment. The postero-distal angle of epimeral plate 3 drawn out backward, but with a blunt end, posterior margin of plate smooth. The anterior margin of all segments of all peraeopods armed with 1 - 3 strong spines; basal segments of peraeopods 3 - 5 have a small rounded lobe at the distal end. Uropods 1 and 2 with distinctly 2-segmented rami of both pairs armed with large spines. Inner ramus of uropod 3 reaches the end of upper third of the apical segment of outer ramus, its inner margin finely serrate-dentate; segment 1 of outer ramus with a pair of spines at the distal end, apical segment large, about 2/3 the length of segment 1. Telson elongated, its width at the base is shorter than length; cleft 2/3 the length; lateral margins of telson, where they are produced into lobes, form a characteristic bend, so that its distal end is considerably narrower than the base; apices of telson have 1 apical spine. In alcohol, the animal is yellowish, the male is 4 mm long.

A few specimens were discovered in the Bering Sea at a depth of more than 500 m, at the east coast of Kamchatka.

Figure 64A. *Aristias spinipes* Gurjanova sp.n. Bering Sea.

Figure 64б. *Aristias spinipes* Gurjanova sp.n. Bering Sea.

Figure 65. *Aristias curtipes* Gurjanova sp.n. East coast of Iturup Island.

4. *Aristias curtipes* Gurjanova sp.n. (Figure 65).

In the structure of coxal plate 4, which has a long, posterior lobe drawn out downward, and the armature of peraeopods 3 - 5 with spinules, it resembles *A. spinipes* sp.n.; in the structure of gnathopods 1 and 2, segment 4 of peraeopods 3 - 5, whose lobe is drawn out backward and reaches the distal end of segment 5, the deep coxal plate 5, with a deep posterior notch and telson, on the other hand, it is close to Aristias tumidus (Kröyer). It differs from both these species sharply in its inflated and stout body, and the massive structure of all extremities, the shortened urosome and uropods, the very short segment 5 in all peraeopods, the small, but free, coxal plate 1, which is not covered with the next plate 2, and the presence of two pairs of branchial vesicles in peraeopods 3 and 4.

Moreover, it differs from A. spinipes in the shape of coxal plate 5 with lower lobes of same size and the dentate posterior margin of epimeral plate 3, and from A. tumidus, in the presence of the spinules on the segment of peraeopods 3 - 5, their rather narrower basal segments of a different shape, and the structure of uropod 3 the inner ramus of which is longer than segment 1 of the outer, and the peduncle is broadened to such an extent that it is as broad as long. Eyes well developed, moderate in size, broaden downward, light-brown; interantennal lobes broadly triangular. Antenna 1 considerably shorter than antenna 2, with 12-segmented base and well-developed 4-segmented accessory flagellum. Flagellum of antenna 2 nine-segmented. Lower margin of coxal plate 1 concave, without a process; coxal plates of peraeopods 3 - 5 with a well developed posterior lobe, but not as long as in the proceding species. Segment 6 of gnathopod 1 slightly shorter than segment 5, tapers weakly distally, with convex anterior and an almost straight posterior margins which are finely serrate-dentate almost to the base and armed with 4 large spines located at equal intervals from one another; at the distal end, instead of a spine, there is a long seta. In its structure, gnathopod 2 similar to that in _A. spinipes_. There are small spinules along the anterior margin of segments of the last three peraeopods; posterior margin of basal segments has a distinct sparse crenulation. Uropods strongly shortened, with enlarged segments; rami of uropods 1 and 2 one-segmented, as long as the peduncle; both the peduncle and the rami armed with spines. Uropod 3 considerably shorter than uropod 1 and 2, with a thick peduncle which is almost as wide as long; the spines are found only at the distal end of the peduncle; inner ramus as long as segment 1 of the outer ramus, with smooth margins, the inner margin of the outer ramus finely serrate-dentate, apical segment considerably longer than half of segment 1; both rami lacking spines. Telson with rounded margins, slightly tapers distally; cleft 3/4, with a pair of apical spines. The animal is 6 m /Sic! Probably "mm". Translator/, whitish.

A significant peculiarity of this species is the presence, on coxal plate of peraeopod 3, of an accessory gill, which is completly separated and in size equal to the main gill attached at the place where the basal segment is joined to the coxa; a similar gill is also found on the inner side of the coxa of peraeopod 4.

1 specimen was discovered north of Shikotan Island, at a depth of 414 m.

5. _Aristias japonicus_ Gurjanova sp.n. (Figure 66).

In the shape of its head, it resembles the North Atlantic species A. neglectus Hansen and A. microps G. Sars, since the anterior margin of the broad interantennal lobe is convex and forms a straight angle with its lower margin; in other features, it is close to A. spinipes sp.n. It differs from the latter not only in the head structure, but also in the size, the shape, and the eye colour, the rather weaker armature of the segments of peraeopods 3 - 5 with spines, their shortened distal part all segments of which together are as long as the basal segment (like in A. tumidus), the linear, and not the broadened, segment 5, and not the smooth but dentate posterior margin of basal segment, the structure of epimeral plate 3 and the telson, the rather more massive and with shorter rami of uropods. Like in A. tumidus, the basal segment of peraeopods 3 - 5 is as long as the remaining segments of the leg together, but other features, especially the shape of the coxal plates, the spinules on the segments of peraeopods, the relatively long inner ramus of uropod 3 which exceeds the length of segment 1 of outer ramus, and the large apical segment of outer ramus differentiate this species from A. tumidus.

Figure 66. Aristias japonicus Gurjanova sp.n. Peter the Great Bay (Sea of Japan).

Eyes large, lightly coloured, with facets, but indistinct borders. Antennae almost similar in length; flagellum of antenna 1 seven-segmented, accessory flagellum four-segmented, as long as segment 1 - 3 of main flagellum together; flagellum of antenna 2 six-segmented. Posterior margin of epimeral plate 3 smooth, and the postero-distal angle almost straight; segment 6 of gnathopod 1 slightly longer than segment 5, markedly tapering distally, with straight posterior margin armed with thin dentate crenulation along the entire length and 2 spines in the distal third. Gnathopod 2 similar to that of the preceding species. Coxal plate 3 of peraeopods with deep linguliform lobe; one branchial vesicle, but with a small accessory lobe. Coxal plate of peraeopod 4 with a linguliform posterior lobe drawn out almost to the middle of basal segment; basal segments in both peraeopods relatively weakly broadened, with a distinct crenulation along posterior margin. Anterior margin of segments 2 - 5 of peraeopods 4 and 5 bears small spinules; segment 4 enlarged, weakly broadens distally. Uropods with relatively longer and narrow segments than those of the preceding species; peduncle of peraeopod 1 cylindrical, without spines, rami equal, armed with spines; along the inner margin of the inner ramus, there is a fine serrate crenulation. Uropod 2 shorter than uropod 1, and more stout; peduncle a armed with 3 thick spinules along inner margin, rami bear 1 spinule each at the level of end of second third of the length of ramus.

Uropod 3 with abbreviated peduncle, smooth margins, lacking spines; inner ramus longer than segment 1 of the outer, sharply tapering toward the pointed end; at the inner distal angle of segment 1 of the outer ramus, there is a molar process drawn out downward; apical segment over half the length of segment 1. Telson with rounded lateral margins, cleft more than 2/3; lobes tapering distally, rounded at the apex and bearing each 1 apical spine. The animal is

6 mm long, yellowish.

2 specimens were obtained from the Sea of Japan, Peter the Great Bay, at depths of 892 and 900 m.

23. The Genus ANONYX Kröyer, 1893

Guryanova, 1951: 228 (Chironesimus):

G. Sars, 1891, Crust. Norw., I: 108 (Chironesimus).

The presence of new species of this genus in the northern part of the Pacific Ocean forces us to make more precise its diagnosis, even more so since the structure of branchial vesicles and a sharply expressed specific sculpture of the tegument in some of the species bring this genus closer to the genus Hippomedon. The diagnosis of the genus Anonyx, which has been most completely compiled by G. Sars (1895), should be supplemented by some essential details which separate it as an independent genus from the genera Hippomedon, Lakota, and Onisimus which are similar to it.

The head has a well-developed interantennal lobe and a lowerantennal notch; the eyes are well developed and have dark pigment even in abyssal forms. There are no peaked protuberances on the distal end of the segments of the peduncle of antenna 1; sometimes there is only a low longitudinal keel on the first of them. Often both pairs of the antennae in the male bear calceoli. The mandibles have a elongated body and a long strong palp attached in front and above the molar process. The latter lacks the triturating surface, almost conical in shape, with a narrow linguliform lobe on the tip covered with hair. The inner plate of maxilla 1 has two plumose setae; the apex of the outer plates is strongly oblique and armed with strong pectinate spines and setae; sometimes, when the oblique end of the apex is produced into the inner end of the plate, there is a dense cluster of simple delicate or lanceolate setae. The apical segment of the palp is expanded distally and armed with teeth or spines on the upper margin. Maxilla 2 has a short inner plate bearing spiniform setae and 1 large plumose seta. The outer plate is considerably longer, narrows distally, is armed with spiniform setae on the apex and on the inner margin. The lower lip lacks inner plates or has only vestiges of them. Maxillipeds have relatively short plates; outer plates scarcely reach the apical middle of segment 2 of the palp, their inner margin possesses small teeth; inner plates reach only the base of segment 1 of the palp and are armed with plumose setae on the apex, and often also on the inner margin. Gnathopod 1 short, strong, with a well-developed subchela; palmar margin of segment 6 is transverse or weakly oblique and always separated from the posterior margin of the hand by 1 - 2 strong locking spines. Gnathopod 2 considerably longer than gnathopod 1, with a strongly extended segment 3 which exceeds the length of the 4th. Peraeopod 4 as long as peraeopod 5. The dactyl of peraeopods 1 and 2 relatively short and thick; the locking spine simple or hooked. Branchial vesicles entire or present only in gnathopod 2, or in gnathopods 1 and 2 of peraeopod with transverse of diagonal folds and accessory lobules; usually, in gnathopods 3 and 4 of peraeopods, branchial vesicle have 1 - 2 accessory sausage-shaped short lobules. The branchial vesicles always present in peraeopod 5; however, it is considerably smaller than that of the preceding peraeopods, and, for the most part, lacks accessory lobules and transverse folds. At the postero-distal angle, epimeral plate 3 forms a short tooth directed backwards and upwards. Uropod 2 shortened; the ends of the rami of uropod 1 extend beyond the level of the ends of the rami of uropod 2; uropod 3 extends beyond the level of the ends of uropod 1.

The inner ramus of uropod 2 is usually slightly or considerably shorter than the outer rami; sometimes it is simple; more frequently, however, it has a constriction at the end of the second third of its length which terminates in a rounded lobe armed with a long spine at the apex; the last third of the ramus is elongated in the shape of an acute process, straight or bent. The broadly linguliform upper lip is separated from the epistome by a deep sinus; quite frequently, it protrudes forward, sometimes very strongly, beyond the end of the epistome. The telson is elongated, deeply cleft, almost to the base.

The tegument is smooth or has a specific sculpture of various types.

As may be seen from the diagnosis presented, the genus Anonyx has not many things in common with the genus Hippomedon, in regard to the structure of its head, oral parts, gnathopods, and peraeopods, while the structure of its branchial vesicles (which in Hippomedon are very complex and have, besides accessory lobes and folds, also special invaginations which increase the breathing surface of the gills) in simple, without invaginations. The species of Anonyx differ greatly from the genus Onisimus in the structure of their oral parts, branchial vesicles, and telson, although a considerable resemblance in the structure of the head and the uropods is observed. If Holme's description (1909) is accurate that all branchial vesicles in L. carinata are simple, then the differences in the genus Lakota are found only in the structure of the branchial vesicles, while the structure of the head, oral parts, and appendages fully corresponds to that in the species Anonyx. As far as the genus Chironesimus (established by G. Sars in 1891 for Anonyx debruyni, 1822) is concerned, this genus has no grounds whatsoever for being singled out as independent and should be reduced to the synonymy of the genus Anonyx. In order to make more precise the interrelations between all the genera mentioned, we shall present the features of their resemblances and differences.

The following features are similar in both Anonyx and Hippomedon: 1) the complexity of the structure of branchial vesicles; 2) the specific sculpture of the tegument; 3) the development of a large sharp tooth, turned upwards and backwards, on the postero-distal angle of epimeral plate 3; 4) the reduction of branchial vesicles in peraeopod 5; 5) the elongated telson, cleft almost to the base. The distinguishing features of the genus Hippomedon are: 1) the absence of the interantennal lobe and poor development of eyes which lack dark pigment, or complete absence of eyes, which is not observed even in abyssal forms or Anonyx; 2) the complexity of branchial vesicles through the development of invaginations, in addition to the folds and accessory lobes; 3) the strong cylindrical molar process of mandibles, with a triturating surface; 4) the increase in the number of the setae on the inner plate of maxilla 1, from 2 to 8; 5) the elongated outer plates of maxillipeds the apex of which extends further than the distal end of segment 2 of the palp; 6) the strongly elongated and considerably weaker gnathopods, especially gnathopod 2, and an underdeveloped subchela in gnathopod 1; 7) the fine long dactyls in peraeopods and lack of the locking spine on segment 6 of the first two pairs at the base of the dactyl; 8) peraeopod 4 longer than peraeopod 5; 9) the complete disappearance of branchial vesicles in the last peraeopod in the majority of species.

Because of those peculiarities, the general habitus of the species Hippomedon is completely different from that of the Anonyx species; in addition, the entire body of Hippomedon is weak, with poorly developed visual elements of the eyes of a completely different type than the stout inflated body of the Anonyx species which has strong appendages and well-developed eyes with dark pigment.

The representatives of Anonyx are close to the species of the genus Onisimus in their common habitus - they possess a similar stout body with a well-developed lowerantennal lobe of the head and eyes and strong shortened limbs, the development of a tooth at the postero-distal angle of epimeral plate 3, the structure of maxilla 1, the shortened outer plates of the maxillipeds which do not extend to the end of segment 2 of the palp, the similar shape of coxal plates, the structure of gnathopods which have a very close structure of the subchela and, in particular, of segment 6 of pair 2 which often expands strongly distally and has a long concave palmar margin; peraeopod 4, similar to that of Anonyx, is as long as peraeopod 5, while the inner ramus of uropod 2 is sometimes constricted. Contrary to Anonyx, all branchial vesicles in the species Onisimus are simple and have neither folds nor accessory lobes and in peraeopod 5, the gills are well developed. The tegument is, for the most part, smooth and lacks the specific sculpture, except for a coarse-penctate one in some species; the locking spine is lacking on segment 6 of peraeopods 1 and 2; the telson is wholly-edged or weakly cleft; 1 to 3 - 4 long bent spinules are always present at the apex of the outer plates of maxillipeds; there are elongated narrow plates in maxilla 2, whose inner plate is only slightly shorter than the outer one; the cluster of setae and hair are lacking on the inner margin of the outer plate in maxilla 1. Contrary to Anonyx, the upper lip of the representatives of the genus Onisimus never protrudes beyond the end of the epistome and, on the other hand, the epistome is frequently broadened and protrudes beyond the end of the upper lip; the molar process of the mandibles is powerful, cylindrical, with a triturating surface, while in Anonyx it is weak, conical, with a linguliform process at the apex covered with hair.

The essential characteristic features on the basis of which Holmes separated the genus Anonyx from the genus Lakota are that the upper lip in the representatives of the former genus forms a tongue-shaped plate protruding forward beyond the end of the epistome (the same was also indicated by Chevreux for his species) and simple branchial vesicles; all the remaining characteristic feature of the genus correspond exactly to those of the genus Anonyx. The study of Pacific material show, however, that the upper lip in Anonyx, too, has the same structure, while the branchial vesicles have a varied degree of complexity. In some species (*A. nugax*, *A. debruyni*), all branchial vesicles have folds, in others (*A. birulai*, *A. robustus*), the folds are present only in one or two pairs of branchial vesicles, while in *A. ochoticus*, *A. oculatus*, *A. minimus* all gills are simple, without folds, but with accessory lobules; these lobules in various species of the *Anonyx* genus are developed on the gills to a various extent and found on the four anterior pairs or only on two, or even one pair. K.H. Barnard (1925) describes two new species from South Africa (temporarily, he ascribes these species to the genus *Lakota* Holmes); he expresses his doubts regarding the justification for the separation of this genus as independent and is inclined to consider it as a synonym of the genus *Chironesimus* G. Sars, 1891. However, the inadequate description of the species *Lakota* found in all three authors - Holmes, Chevreux, and Barnard - does not allow us to solve this problem regarding the independence of this genus, which, for the time-being, we are forced to leave yet in the system of the genera of the family Lysianassidae (p. 301*).

As far as the genus *Chironesimus* G. Sars, 1891, is concerned /it was separated from *Anonyx debruyni* described by Hock (1882)/, we flatly reject its indepaendence, for the characteristic features on the strength of which this genus could be separated - they were proposed also by Sars (broadened distally segment 6 of gnathopod 2) and by Stebbing (ordinary branchial vesicles, upper lip, strongly protruding in front of the epistome and forming a large outgrowth) - are also found in a number of the *Anonyx* species. A thorough comparison of the structure of oral

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* In the original. Translator.

parts, limbs, branchial vesicles, head, telson, and the sculpture of the tegument in Chironesimus debruyni, typical of the genus, with those of the representatives of the genus Anonyx, reveals that they all are completely identical. Ch. debruyni possesses also a strong, stout inflated body, a well-developed interantennal lobe and eyes, a large tooth at the postero-distal angle of epimeral plate 3, a locking spine on segment 6 of peraeopods 1 and 2, a coarse-punctate sculpture of the tegument, and a structure of oral parts, gnathopods and uropods 2 and 3, and telson completely similar to those found in Anonyx.

Especially typical are both "Anonyx" pairs of maxillae, mandibles, and maxillipeds. As was stated above, the strong upper lip which forms a process, segment 6 expanding distally in gnathopod 2, and the simple structure of branchial vesicles cannot be regarded as the basis for the separation of A. debruyni Hoek into an independent genus, as similar characteristic features are also observed in Anonyx, and they are of a species, and not generic imporatnce to the general system of the genera Anonyx, Lakota, Onisimus, and Chironesimus.

On the same basis we include also Chironesimus multiarticulatus Pearse, 1913, in the system of the species of the genus Anonyx, although the too brief a description of this species and the lack of information on a whole series of the most important characteristic features in Pearse's diagnosis and figures, along with the lack of this species in our collections, make doubtful the independence of A. multiarticulatus, which is, apparently, close to A. nugax and A. lilljeborgi.

Thus, until present, along with the species described here, there are known 26 species, 3 subspecies, and 2 forms of the genus *Anonyx*. A number of species previoulsy described belong to other genera, not to mention Kröyer's species; for instance, *A. nobilis* Stimpson, 1853 - *Tretonyx*; *A. filiger* Stimpso, 1864, - *Lepidepecreum*; *A. annulatus* Bate, 1862, *Lepidepecreum*; *A. longicornis* Bate, 1862, - *Lepidepecreum*; *A. punctatus* Bate, 1862, - *Onisimus*?; *A. obesus* Bate, 1862, - *Tryphosites*; *A. nordonis* Hellor, 1866, - *Socarnes*?; *A. schmardae* Heller, 1866, - *Tryphosa*?; *A. femoratus* Pfeffer, 1888, - *Onizimus*?; *A. elegans* Tompson, 1897, - *Orchomene*? Some of the species became part of the synonymy. For instance *A. lagena* Kröyer, *A. ampulla* Kröyer are *A. nugax* (Phipps, 1774), and so is also *A. lagena* Kr. presented in Bate's catalogue. A great number of species are very poorly described and cause doubts in regard to their independence; *A. indicus* Giles, 1890; *A. albus* Goese, 1850; Stimpson's species described by him in 1853 (*A. pallidus*, *A. politus*, and *A. exiguus*) moreover, *A. broachii* Gatto, 1875; *A. amaurus* Giles, 1888.

The species *A. wolfendeni* Tattersall (1909, Wolfenden's Sci. Biol. Rech.), from the Azores, described by Tattersall, has remained unknown to us, as Tattersall's work turned out to be unobtainable, hence this species has not been included in the present identification key.

Sexual dimorphism, which concerns not only the strong elongation of the flagella of the antennae and the appearance of the calceoli in ♂♂, but also the structure of gnathopod 2, uropod 2, and, somethimes, epimeral plate 1, is characteristic of many representatives of this genus. This is why ♂♂ and ♀♀ of one and the same species are sometimes separated in the key, since the diagnostic features are different. It should be remembered that the species differences within this genus are well defined not only in regard to the structure of their gnathopods, peraeopods, and uropods, epimeral plates, and the upper lip (frequently, the latter forms an outgrowth which protrudes forward beyond the end of the epistome). The accuracy of the indentification is greatly facilitated by the form, size, and colour of live specimens and specimens preserved in alcohol, hence this information is given for each species.

Genotype: A. nugax (Phipps, 1774).

1 (56). Inner ramus of uropod 3 as long as or longer than segment 1 of outer ramus.

2 (29). Inner ramus of uropod 2 with typical constriction at the end of second third of its length; its broadened proximal part at the distal end forms a rounded lobe at the apex of which is a spine, which in size usually exceeds marginal spines and frequently as long as the thinner end of ramus.

3 (24). Inner ramus of uropod 2 only slightly shorter or as long as the outer, and its broadened proximal part not broader than the outer ramus; the rather thinner end of the inner ramus serves as a direct continuation of its broadened part, so that the outer margin of

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Since Pearse, 1913, while describing A. multiarticulatus (Chironosimus), does not mention anything regarding the specificity of the structure of the inner ramus of uropod 2, we assume that it is simple, without constriction, and we include it in the group of the species whose determination commences with couplets 29 in the present key.

ramus is straight or slightly bent.

4 (23). On the posterior margin of epimeral plate 3, above the base of the tooth of the postero-distal angle, the small notch or sinus is lacking.

5 (18). Segment 6 of gnathopod 2 tapers or only slightly broadens distally; dactyl reaching or slightly short of reaching the end of palm.

6 (17). Dactyl of gnathopod 1 as long as palm, or only its pointed end protrudes slightly beyond the palmar angle of segment 6.

7 (14). Eyes black or brown.

8 (11). Upper lip simple, does not protrude beyond the anterior margin of epistome, eyes broaden sharply downward.

9 (10). Height of eyes slightly larger than half the height of head; their broadened lower part does not enter the base of the interantennal lobe; last segment of peduncle in antenna 2 as broad, but shorter than the penultimate; there is a long seta on segment 6 of peraeopods 1 and 2, in the front of the locking spine; the anterior margin of epimeral plate 1 bears setae in its lower part..........1a. *A. nugax nugax* (Phipps, 1774).

Arctic Ocean and northern parts of Atlantic and Pacific (?) oceans.

10 (9). Height of eyes more than 2/3 the height of head, their broadened lower part occupies larger part of the surface of interantennal

lobe; last segment of peduncle in antenna 2 narrower and slightly longer than or even as long as the last; in front of locking spine of segment 6 of peraeopods 1 and 2, the masking seta lacking; anterior margin of epimeral plate 1 lacking setae..........1 . A. nugax pacificus Gurjanova ssp.n.

11 (8). Upper lip protrudes beyond anterior margin of epistome; eyes broadening weakly downward.

12 (13). Apex of upper lip rounded; epimeral plate 2 with straight postero-distal angle; its lower anterior angle forms rounded lobe. Eyes light-brown..........23. A. ochoticus Gurjanova sp.n.

13 (12). The apex of the upper lip narrow, linguliform, protrudes far beyond epistome; epimeral plate 2 with blunt posterior and rounded anterior distal angles without lobe. Eyes black..........24. A. schokalskii Gurjanova sp.n.

14 (7). Eyes light, become colourless in alcohol.

15 (16). Eyes enormous, almost contiguous dersally; posterior margin of basal segment in peraeopod 4 has a notch or cavity in its lower part which is devoid of teeth; apical segment of the outer ramus in uropod 3 small, about 1/5 length of segment 1..........18. A. ampulloides Bate, 1862, ♀.

16 (15). Eyes very large, but separated dorsally; posterior margin of basal segment of peraeopod 4 becomes uniformly rounded at the posterio-distal angle and lacks a notch or depression; spical segment of

uropod 3 large, more than half the length of segment 1..........22. A. oculatus Gurjanova sp.n.

17 (6). Dactyl of gnathopod 1 considerably longer than palm, not less than half of it protrudes forward, when closed, beyond palmar angle of segment 6; eyes dark-brown..........21. A. compactus Gurjanova sp.n.

18 (5). Segment 6 of gnathopod 2 strongly broadens distally, dactyl far from reaching the end of palm.

19 (22). Segment 6 of gnathopod 1 does not taper distally, its palmar margin strongly oblique, straight, along posterior margin of hand, there are only simple setae; locking spines found also at the palmar angle. Upper lip does not protrude forward beyond the epistome.

20 (21). Segment 6 of gnathopod 2 as long as segment 5; coxal plate 1 strongly broadens downward, the postero-distal angle of epimeral plate 2 forms a narrowly triangular process which is directed backward and downward; sculpture of tegument not distinct, consists of densely arranged short striae..........20. A. derjugini Gurjanova sp.n.

21 (20). Segment 6 of gnathopod 2 considerably shorter than segment 5, about 2/3 its length; coxal plate 1 does not become broadened downward; the postero-distal angle of epimeral plate 2 lacks process, almost straight; sculpture of tegument distinct, consists of short striae which form a wavy pattern..........19. A. knipowitschi Gurjanova sp.n.

22 (19). Segment 6 of gnathopod 1 noticeably tapers distally, its palmar margin strongly oblique and deeply concave; in addition to

locking, there are also deeply cleft claw-shaped spines along posterior margin of hand. Upper lip forms large process, which protrudes forward far beyond epistome..........* _A._ _debruyni_ Hoek, 1882, ♀.

(Northern part of the Atlantic and Arctic oceans).

23 (4). On the posterior margin of epimeral plate 3, above the base of the tooth formed by its postero-distal angle, there is a small but deep notch..........11. _A._ _robustus_ Gurjanova sp.n.

24 (3). The inner ramus of uropod 2 considerably shorter than the outer, and its broadened proximal part broader than the outer ramus; thin distal end of inner ramus bent backward, so that the outer margin of ramus is not straight, but forms rounded angle at the constriction.

25 (26). Upper lip does not protrude forward beyond the anterior margin of the epistome; the basal segment of peraeopod 3 clearly tapers distally; the sculpture of the tegument coarsely-punctate; the antero-distal angle of epimeral plate 1 forms a process bent upward in form of a hook..........15. _A._ _eous_ Gurjanova sp.n.

26 (25). Upper lip forms a process which protrudes forward far beyond the anterior margin of the epistome; the basal segment of peraeopod 3 does not taper distally; the sculpture of the tegument reticulate; the antero-distal angle of epimeral plate 1 of plate does not form a hooked process.

27 (28). The postero-distal angle of epimeral plate 2 forms a triangular process drawn out backward; along the posterior margin of hand

in gnathopod 1, there are thin setae cleft at the apex; the palmar margin of the relatively short and broad segment 6 of gnathopod 2 weakly convex and armed with short thick spines at the end; the alveolar sculpture of tegument complex; within each cell, there is a spine, and the entire surface of cells is densely covered with dots..........17. _A_. _pavlovskii_ Gurjanova sp.n.

28 (27). The postero-distal angle of epimeral plate 2 straight, without a pointed process; along the posterior margin of hand of gnathopod 1, there are, besides clusters of simple setae, large claw-shaped spines with forked apices; the palmar margin of elongated segment 6 of gnathopod 2 concave and armed with thin setae. Sculpture of tegument reticulate, with transverse rows of very short striae..........16. _A_. _birulae_ Gurjanova sp.n.

29 (2). Inner ramus of uropod 2 simple, without constriction, gradually tapering toward distal end.

30 (31). Eyes very large, occupy almost the entire lateral surface of head and almost contiguous dorsally; the posterior margin of basal segment of peraeopod 4 at the distal end forms a small notch..........18. _A_. _ampulloides_ Bate, ♂.

31 (30). Eyes moderate or small, separated at crown by a wide space; the posterior margin of the basal segment of peraeopod 4 lacks notches at the distal end.

32 (43). Dactyl of gnathopod 1 powerful and considerably longer

than palm, so that palmar angle, when closed, hardly reaches its middle.

33 (42). The tooth at the postero-distal angle of epimeral plate 3 large, directed backward and slightly upward. Eyes lacking light rim.

34 (39). Segment 6 of gnathopod 1 as long as or shorter than segment 5; posterior margin of hand bearing strong claw-shaped spines; short palmar margin very strongly oblique, almost vertical. The postero-distal angle of epimeral plate 2 straight or rounded.

35 (38). Upper lip protrudes beyond epistome; segment 6 of gnathopod 2 broadens distally; its palmar margin armed with short thick spines; last segment of peduncle of antenna 2 as long as the penultimate.

36 (37). Segment 6 of gnathopod 2 uniformly broadens distally, its transverse palmar margin weakly convex, dactyl almost reaching the end of palm..........* 14a. A. debruyni Hoek, 1882, ♂.

37 (36). Segment 6 of gnathopod 2 strongly and sharply broadening distally, its palmar margin deeply concave; dactyl reaching only slightly beyond the middle of palm..........14 . A. debruyni orientalis Gurjanova ssp.n.

38 (35). Upper lip does not protrude beyond the epistome; segment 6 of gnathopod 2 slightly tapers distally, oblong-oval, its palmar margin unarmed, slightly drawn out forward and forms, with dactyl, a small claw; the last segment of peduncle of antenna 2 shorter than the penultimate..........13. A. magnus Gurjanova sp.n.

39 (34). Segment 6 of gnathopod 1 longer than segment 5; the posterior margin of hand bears thin acicular spines or setae; palmer margin transverse, short and straight; the postero-distal angle of epimeral plate 2 of plate drawn out backward into a small pointed process.

40 (41). Upper lip strongly protruding forward beyond the epistome; coxal plate 1 of plate narrow, its width much smaller than depth; acicular spines on posterior margin of hand in gnathopod 1 simple, with hair-like apex; eyes black..........3. A. makarovi Gurjanova sp.n.

41 (40). Upper lip does not protrude beyond epistome; coxal plate 1 very broad, as broad as deep; the acicular one on the posterior margin of hand in gnathopod 1 with a forked apex; eyes black..........25. A. laticoxae Gurjanova sp.n.

42 (33). Tooth at the postero-distal angle of epimeral plate 3 very small, directed backward; eyes dark-brown, with a light rim.........
..7. A. japonicus Gurjanova sp.n.

43 (32). Dactyl of gnathopod 1 moderate in size, as long as or slightly longer than palm; when closed, the palmar angle almost reaches the end of dactyl.

44 (45). Eyes very small, dark-brown, surrounded with a broad light rim; appendages almost lacking armature of spines and setae; posterior margin of basal segment in peraeopods 3 - 5 smooth, anterior margin only with 1 spine, at the lower angle..........12. A. minimus Gurjanova sp.n.

45 (44). Eyes moderate in size, black, without a light rim; appendages armed with spines and setae along the margins of segments; the posterior margin of the basal segment in peraeopods 3 - 5 dentate, anterior margin bears spines almost along the entire length.

46 (47). Flagellum of antenna liwth numeroud (over 30) short and broad segments; the apical segment of outer ramus in uropod 3 small, no more than 1/8 length of segment 1.........8. A. multiarticulatus Pearse, 1913.

47 (46). Flagellum of antenna 1 with small number (no more than 10 - 15) elongated segments; apical segment of the outer ramus of uropod 3 large, no less than 1/5 the length of segment 1.

48 (53). Upper lip protrudes forward beyond the epistome; segment 6 of gnathopod 1 as long as segment 5.

49 (50). Upper lip forms a long linguliform process which protrudes far beyond the anterior margin of the epistome; the palmar margin of segment 6 in gnathopod 2 strongly drawn out forward and up and, together with dactyl, forms a small claw. Eyes black.........10. A. anivae Gurjanova sp.n.

50 (49). Upper lip with a simple, broadly rounded apex which protrudes beyond the upper margin of the epistome; palmar margin of segment 6 of gnathopod 2 transverse, weakly concave in the middle, forms, together with dactyl, a subchela.

51 (52). The interantennal lobe of head triangular, with a

blunt apex; anterior margin of epimeral plate 1 convex in the middle; its lower anterior angle forms a triangular lobe which is separated from the middle of anterior margin by a small notch. Eyes black..........2. A. lilljeborgi Boeck, 1871.

52 (51). Interantennal head lobe broadly rounded; anteiror margin of epimeral plate 1 concave, and the antero-distal angle simply greatly drawn out forward without a notch above its base. Eyes black.........
..2a. A. lilljeborgi lebedi Gurjanova ssp.n.

53 (48). Upper lip with a rounded apex does not protrude forward beyond the epistome; segment 6 of gnathopod 1 slightly longer than segment 5.

54 (55). Sculpture of tegument very peculiar; it consists of concentric circles varying in size and a web of interlacement between them; telson lobes almost parallel to one another; coxal plate 5 (of peraeopod 3) with lobes of uneven length - the one at the back larger than the one at the front; coxal plate 6 (of gnathopod 4) with distinctly developed hind lobe on lower margin; basal segment of peraeopod 4 does not taper distally. Eyes black..........4. A. sculptifer Gurjanova sp.n.

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2 subspecies- the typical which inhabits the Arctic Ocean and the Pacific subspecies which inhabits the waters of the Far East of our country. The Pacific specimens differ from the typical ones in their considerably smaller size (in the Kara Sea, according to our collections, ♂♂ reach a length of 66 mm; the largest specimens from the Far East measure 51 mm). In addition, all Far-East specimens possess considerably larger eyes and are noted for the details of the structure of their appendages. This comparison permits us also to make the diagnosis more precise.

For instance, G. Sars (1895) notes, among other things, that A. lilljoborgi differs from A. nugax in that the former species has a short hooked spine (locking spine) at the distal end of segment 6 at the base of the dactyl of peraeopods 1 and 2; in Sars' diagnosis of A. nugax, there is no indication in regard to the existence of this spine in A. nugax; it is also lacking in Sars' figure of this species.

Moreover, Sars does not say anything about the peculiarity of the structure of the inner ramus of uropod 2 in A. nugax he presents it in his figure as a simple ramus which gradually tapers distally. Meanwhile, all the northern specimens of the species, both ♂♂ and ♀♀, large and small, possess a small, short, hooked locking spine at the base of the dactyl on segment 6 of peraeopods 1 and 2, while the inner ramus of uropod 2 has a constriction at the end of the second third of its length which separates the broadened proximal part of the ramus from its distal part which forms a considerably narrower tapering process; the broad part of the ramus terminates in a rounded lobe at the apex of which there is a spine which is rather larger and longer than the marginal spine. The presence of a locking spine in peraeopods 1 and 2 in A nugax, as also is the case in all the other species which we know, forces us to consider it as a diagnostic criterion of the genus, while the presence of the constriction on the inner ramus of uropod 2 brings A. nugax close to A. lilljeborgi and the majority of the species from the Pacific Ocean which we are describing anew; only in 7 species (A. laticoxae, A. affinis, A. japonicus, A validus, A. kurilicus, A. minimus, and A. sculptifer), the inner ramus of uropod 2 is simple, without any vestiges of the "constriction"; and in A. maguus and A. lilljeborgi lebodi it hardly begins to show and is not clearly defined. It is of interest to note that this "constriction" is also found in the young animals of the northern subspecies, A. nugax nugax and is absent in very young specimens, just hatched from the egg of the Pacific subspecies A. nugax pacificus. Of great interest is the comparison between the populations of the northern subspecies which inhabit the coasts of Norwary, Greenland, the Barents Sea and the Siberian Sea, as well also as the comparison of the populations of the Pacific subspecies from various areas of the Bering Sea, Sea of Okhotsk, and Sea of Japan. However, we did not have enough time to do this and leave this tedious job to be done independently. This is why we are not yet in the position to state with certainty whether this type species penetrates the waters of the Far East and whether the Pacific subspecies extends to the Siberian Sea, and also where their migratory routes are. We cannot yet make more precise the geographical ranges of both subspecies. Below we present only some distinguishing features of the subsepecies, their figures, and a table of characteristic feature (Table 3). We consider the populations from the centre of the geographical range, i.e. the specimens from the Kara Sea and the seas of Siberia as the most typical of this species. The specimens from the Barents Sea have some characteristic features which bring them closer to the Norwegian specimens, hence the diagnosis is made from the specimens from the Kara Sea.

1a. Anonyx nugax nugax (Phipps, 1774) (Figure 67).
Guryanova, 1951: 222.

The eyes are black, sharply and strongly broadened below, moderate in size; the length of the eye is about half the height of the head. The expanded lower part of the eye enters only the base of a triangular interantennal lobe with a blunt apex. Segment 2 of the palp of the mandibles is cylindrical; the upper lip has a rounded tip and slightly protrudes beyond the anterior end of the epistome. At the distal end of segment 6 of peraeopods 1 and 2, at the base of the dactyl, there are a small hooked locking spine and a long setae in front of it; the anterior margin of the segment above the locking spine is covered with isolated setae. The basal segment of peraeopod 3 becomes noticeably tapering distally, the length of its distal margin is only slightly greater than one half the width of the proximal part; the width of segment 4 is smaller than its length. Epimeral plate 1 bears setae on the anterior margin. The interior ramus of uropod 2 is weakly broadened, has a constriction, as it forms a small lobe at the end of the second third of its length; the spine at the apex of this lobe is relatively short, shorter than one half the length of the distal ramus which is narrower. Both rami of uropod 2 are of the same length, while their inner ramus possesses a constriction, both in adult male and female and the young animals. The inner ramus of uropod 3 is slightly shorter than segment 1 of the outer ramus; the telson has three pairs of marginal spines. The last segment of the peduncle of antenna 2 is shorter than the penultimate. The maximum length of the animal is 62 mm (from the Siberian sector of the Arctic Ocean).

The circumpolar Arctic subspecies probably penetrates also into the northern part of the Pacific Ocean (into the Bering Sea?). This is the most common abundant form found in high latitudes on the shelf of the Arctic Ocean and in the depths of the White Sea. Here, according to Kuznetsov's data, after a trap with bait was exposed for every two hours during a 24-hour period (12 catches), there were gathered from 45 to 119 individuals. Various authors indicated the increase in the size of the individuals as they moved from the northern part of the Atlantic Ocean to high latitudes and the east. At the coasts of Norway, the usual size is, according to Sars, only 18 mm, while mature female specimens in the seas of Siberia reach 50 - 62 mm in length. While examining our collections from the northern seas, one could notice that the difference between the populations from various areas is not limited only by the size of the specimens, as there are also some morphological differences. For instance, specimens from the Kola Bay and from the south-western part of the Barents Sea are similar and differ noticeably from the Kara and the

Siberian forms also in the shape and size of their eyes - their eyes are smaller and not as strongly expanded below; the upper lip has a blunt apex and protrudes noticeably more beyond the anterior end of the epistome than the rounded apex of the upper lip in the Kara and the Siberian specimens; the basal segment of peraeopods 3 does not become narrower distally but is almost of the same width along its entire length, and the lobe at its postero-distal angle is rather more strongly elongated downwards, while segment 4 is shorter and broader. Gnathopod 1 has an almost straight and not concave hind margin of segment 6, and segment 6 of gnathopod 2 is shorter and not as narrow as in the Kara and Siberian specimens. The telson has three or two pairs of marginal spines, while the Kara specimens possess only three pairs. However, we did not have a sufficient number of the specimens from the western part of the Arctic, hence we cannot speak with certainty about the degree of persistence of these differences.

1 . Anonyx nugax pacificus Gurjanova ssp.n.
(Figures 68 and 69).

Eyes considerably larger than those of the Arctic subspecies; their length is considerably greater than 2/3 the height of head, while the broadened lower part occupies almost the entire surface of the interantennal lobe, leaving free only a narrow strip at its anterior and posterior margins. Dentate spines on outer plate of maxilla 1 larger and coarser than those of the northern subspecies; segment 2 of palp of mandibles shorter and thick, broadens in its middle part. Upper lip strongly protrudes beyond the epistome and forms an angle readily visible laterally. Last segment of the peduncle of antenna 2 slightly thinner and longer than the penultimate. On distal margin of segment 6 of peraeopods 1 and 2, at the base of dactyl, there is only a small hooked locking spine, and the seta in front of it is lacking; along the posterior margin of segment, above the locking spinule, there are thin (specimens from the Sea of Japan) or thick (specimens from the Sea of Okhotsk), densely arranged setae. Basal segment of peraeopod 3 broad, rounded, does not taper distally; it is as broad as long, while the posterior lower lobe is completely underdeveloped. Anterior margin of epimeral plate 1 straight, obliquely truncated backward, hence the entire plate narrower than the segment corresponding to it, and it does not bear setae, while lower margin of epimeral plate 3 bears setae, which is not observed in the typical form. Segment 6 of gnathopod 2 not as narrow as that of the Siberian form, its width more than half the length, and the short palmar margin not straight, but deeply concave in the middle. Remaining features (Structure of antenna 1, gnathopod 1, uropod and telson) similar to those of typical Siberian specimens (Table 3).

Figure 67A. Anonyx nugax (Phipps). Kara Sea, ♂ and ♀.

Figure 67B. Anonyx nugax (Phipps). Gp 1, Gp 2 and Pp 3 - 5 - Barents Sea, ♀; C - Norwegian Coast.

Figure 68A. Anonyx nugax pacificus Gurjanova ssp.n. Sea of Japan, ♂.

Figure 68b. Anonyx nugax pacificus Gurjanova ssp.n. Sea of Japan, ♂.

Figure 69A. Anonyx nugax pacificus Gurjanova ssp.n. Sea of Okhotsk, ♀.

Figure 69b. Anonyx nugax pacificus Gurjanova ssp.n. Sea of Okhotsk, ♀.

However, as is the case in the Arctic Ocean, persistent deviations of populations inhabiting its area are observed in various parts of the geographical range of the subspecies. For instance, the eyes of the specimens from the Sea of Japan are even larger than those from the Sea of Okhotsk, and broaden downward even more; segment 6 of gnathopod 2 is even more broadened, but its palmar margin is not concave but straight a and almost transverse; on the other hand, the basal segment of peraeopod 3 resembles, in form, that of the Siberian specimens, while segment 4 is broader still than that of the specimens from the Sea of Okhotst, and it is broader than long. Epimeral plate 1 is as broad as the segment, but its anterior margin is deeply concave, so that the antero-distal angle forms a broad triangular process, and the postero-distal angle of epimeral plate 3 forms a rather finer and longer pointed tooth. Uropod 2 of ♀♀ uniform in length with a narrow lobe at the constriction of the inner ramus, with a short spine at its apex, and the inner ramus of ♂♂ is shorter than the outer, the lobe on the constriction is broad, and the spine at its apex long, exceeding the middle of the narrow distal margin of the ramus. In the young, both rami of uropod 2 are of same length and their inner ramus still lacking the constriction. Uropod 3 with rather broader rami. Upper lip similar in form, but the palp of mandibles stronger, with segment 2 broadening in the middle part. The telson has not three but four - seven pairs of marginal spines. The maximum length of the specimens of the Pacific subspecies is 51 mm.

It is distributed in the Far East (the Sea of Okhotsk and the Sea of Japan) within the continental shoal at varied depths and in the Kurile Islands north of Ekaterina Strait (this species is lacking in the South-Kurile Staight). The Pacific subspecies, like the typical form, is cold-poikilothermic, which unmistakably avoids areas warmed up by warm currents; it migrates into deeper levels where the temperature is lower during strong warming of coastal and surface waters. For instance, during summer conditions in Peter the Great Bay, this animal remains at a depth of 50 - 100 m, and appears at the sea surface only in winter; at the western coast of southern Sakhalin, in summer, it also is found in the zone of low temperature above zero; it is lacking in the southern part of the Sea of Okhotsk, in the zone of Soya current, and in the South-Kurile Strait, where in summer the temperature near the bottom reaches 14 - 16°. Largest specimens occur in Aniva Bay and on the Pacific platform of Iturup Island (to 50 mm in length); at the western coast of southern Sakhalin and in Peter the Great Bay in the Sea of Japan, the length of specimens does not exceed 20 - 30 mm.

The species <u>A. nugax</u>, with its subspecies and forms, is arctic-boreal; circumpolar in the Arctic, it spreads far to the south in northern parts of the Atlantic and the Pacific oceans; as it moves to the south, it keeps to deeper and deeper areas and reduces its vertical range.

Some differences, observed between the specimens from the Sea of Japan (Figure 68) and those from the Sea of Okhotsk (Figure 69) point to some differentiation of the Pacific subspecies in regard to the Sea of Japan and the Sea of Okhotsk forms which at present are separated from one another by the strongly desalinized Amur lagoon, Nevelsky Strait in the north and the warm-water area of Maneron Island and southern Sakhalin at La Perouse Strait in the south.

2. *Anonyx lilljeborgi* Boeck, 1871 (Figure 70).
Guryanova, 1951: 223, Figure 38.

Some authors (K. Stephensen, 1925, for instance) consider this species synonymous with *A. nugax* (Phipps). In our collections, however, many specimens of *A. lilljeborgi* are found from our seas in the north and in the Far East. The differences between these two species are quite clear. The eyes of *A. lilljeborgi* are black, moderate in size, ovate, taper toward the middle, weakly broadening downward, and do not enter the interantennal lobe. The locking spine at the distal end of segment 6 in peraeopods 1 and 2 at the base of the dactyl large, clearly seen even under the magnifying glass; the apex of this spine is bent in the form of a hook; there is a scale at the base of the spine. Last segment of the peduncle of antenna 2 is narrower and shorter than the penultimate. Segment 6 of gnathopod 1 longer than segment 5, with a straight posterior margin; segment 6 of gnathopod 2 larger than half the length

Table 3

COMPARISON OF DISTINGUISHING FEATURES OF ANONYX NUGAX (PHIPPS) FROM THE KARA SEA AND THE SEAL OF JAPAN

Feature	A. nugax nugax (from Kara Sea)	A. nugax pacificus (from Sea of Japan)
Mandible (Md)	Palp slender. Segment 3 of palp longer than segment 2, weakly broadens at base; segment 2 of palp linear, with parallel margins. Mandibular incisor relatively short.	Palp relatively coarse and shorter. Segment 3 of palp as long as segment 2, strongly broadens at base; segment 2 of palp broadens in the middle part. Mandibular incisor elongated.
Antenna 2 (Ant 2)	Last segment of peduncle shorter than penultimate.	Last segment of peduncle longer than penultimate.
Gnathopod 1 (Gp 1)	Segment 6 clearly tappers distally, with strongly concave posterior margin of hand. Width of distal margin $2\frac{1}{2}$ times shorter than the length of segment along middle line.	Segment 6 does not taper distally, its posterior margin weakly concave. Width of distal margin of segment only 2 times smaller than its length along the middle line.
Peraeopods 1 and 2	At base of dactyl, long setous spine, and above it, small locking spine without scale at its base.	At the base of dactyl, setous spine lacking; locking spine with scale at its base.

Table 3 (Cont.)

COMPARISON OF DISTINGUISHING FEATURES OF ANONYX NUGAX (PHIPPS) FROM THE KARA SEA AND THE SEA OF JAPAN

Features	*A. nugax nugax* (from Kara Sea)	*A. nugax pacificus* (from Sea of Japan)
Peraeopod 3 (Pp 3)	Segment 4 only about 1 3/4 times shorter than segment 5, weakly broadens distally; its width $1\frac{1}{2}$ times smaller than length.	Segment 4 shortened, $1\frac{1}{2}$ times shorter than segment 5, strongly broadens distally, as broad as long.
Peraeopod 4 (Pp 4)	Segment 4 elongate, over 2 times longer than segment 3.	Segment 4 shortened; its length only $1\frac{1}{2}$ times greater than segment 3.
Epimeral plate 1 (Ep. 1)	Antero-distal angle weakly drawn out forward; there are setae on anterior margin.	Antero-distal angle strongly drawn out forward; anterior margin lacks setae.
Epimeral plate 3 (Ep. 3)	Tooth at the postero-distal angle short and broad.	Tooth at the postero-distal angle oblong and narrower.
Uropod 3 (Up. 3)	Inner ramus considerably shorter than the outer.	Rami of almost same length.

of segment 5 (in A. nugax it is as long as half the length of segment 6), distaintly broadens distally, with palmar margin obliquely truncated forward. The inner ramus of uropod 2 in ♀♀ without a constriction, in ♂♂, the constriction is weak and not always visible; on its inner margin, in the broadened proximal part, there are only 2 or 3 spines; the rami of uropod 3 are relatively longer and narrower, gradually tapering toward the distal end, and not broadly lanceolate, tapering immediately only at the distal end, as is the case in A. nugax.

The upper lip forms a broad lobe which protrudes far beyond the anterior margin of the epistome; the touch at the postero-distal angle of epimeral plate 3 is wider and blunt. The animal is smaller in size and no more than 19 - 20 mm long.

The Pacific specimens of the species differ from the North-Atlantic species in a rather more elongated and pointed interantennal head lobe, the relatively shorter uropod 3 whose distal end protrudes slightly beyond the ends of the rami of uropods 1 and 2, the somewhat thickened segments of the distal part in peraeopods 3 - 5, rather more oblong telson, and the structure of segment 6 of gnathopod 1, which does not taper distally but is uniform in width both at the distal end and at the base. The number of the marginal spinules of the telson varies from one to two pairs.

Figure 70A. Anonyx lilljeborgi Boeck. Sea of Okhotsk, ♂ and ♀.

Figure 70B. Anonyx lilljeborgi Boeck. Sea of Okhotsk, ♂.

Figure 71. Anonyx lilljeborgi lebedi Guryanova ssp.n. East coast of Paramushiro Island, ♂.

This is an amphiboreal species which is widely distributed in the northern part of the Atlantic Ocean at the coasts of Europe; along the axis of the warm Nansen currents, it spreads along the slope of the continental shoal around Spitsbergen and Franz Josef Land and enters the northern part of the Kara Sea; along the coast, from the shores of Norway, it spreads to Kurman and is found in the White Sea. It is distributed in the Pacific Ocean near the shores of Asia, where it is found in the Bering Sea, the Sea of Okhotsk and the Sea of Japan at depths ranging from 20 - 40 to 900 m. The maximum size (19 mm) is attained in Aniva Bay (the Sea of Okhotsk), in the areas washed by warm currents, the length is 10 - 13 mm. This species can tolerate warmer temperatures than the previous species, since it is discovered in the Arctic Ocean only in places where Atlantic water currents pass; it is found in the seas of the Far East in Peter the Great Bay and in the South-Kurile Strait at depths of 12 - 40 m, near Iturup Island, and near the northern islands of the Kurile Range at 100 - 180 m, where it deviates from the typical form to such an extent (Figure 71) that we identify it as a subspeceis described below.

2a. Anonyx lilljeborgi lebedi Gurjanova ssp.n.
Figure 71).

It differs from the tupical North-Atlantic specimens in the form of its eyes, the interantennal lobe, epimeral plates 1, 2 and 3, the structure of gnathopods 1 and 2. Head shorter than segment 1; eyes black, not ovate but broadening distally; interantennal lobe wider and more blunt than in typical specimens. Epimeral plate 1 with uniform concavity on the anterior margin and longer and narrower lobe at the antero-distal angle; posterior margin of plate 2 not straight but convex, and the postero-distal angle of epimeral plate 3 shorter and broader at base than in the typical form. Last 2 segments of the peduncle of antenna 1 relatively longer and narrower. Gnathopod 1 with narrow and longer segment 6 with straight oblique palmar margin, 2 long locking spines and thin setae, with a forked apex, along the posterior margin of hand; segment 5 also narrower and more ablong than in the typical form. Segment 6 of gnathopod 2 with a short dactyl reaching only to the middle of palm and, besides thick hair cover, bears individual long setae along the posterior margin of hand. Locking spine on segment 6 in peraeopods 1 and 2 with short scale, along its posterior margin thick spines and short setae, while typical form has only long setae; uropod 2 armed with thicker and more numerous spines; inner ramus without a constriction, with a broader distal end; uropod 3 also with larger number of spines than in the typical form, and slightly shorter rami. Branchial vesicles of peraeopods 3 and 4 with short and broad accessory lobule; branchial vesicle of peraeopod 5 very small, without folds and accessory lobes.

A few specimens found on the Pacific plateform of Paramushiro Island (the Kurile Range), at a depth of 280 m.

3. Anonyx mararovi Gurjanova sp.n.[1] (Figure 72).
([1] see next page)

It is general habitus and a number of features (the form and the black colour of eyes, deep coxal plates, the form of all 3 epimeral plates, the lack of constriction on the inner ramus of uropod 2), it resembles both forms of A. lilljeborgi Boeck; it differs from them in a number of quite essential features, in particular, in the structure of its upper lip, gnathopod 1, and the relative length of the rami of uropod 3. Body thinner and more slender, head not shorter but longer than peraeon segment 1, and its interantennal lobe has not a blunt or rounded but pointed apex; upper lip protrudes considerably far beyond the epistome; segment 4 of antenna 2 not short and broad, but rather narrower and more oblong, its length 2 times larger than its width; segment 6 of gnathopod 1 not as long as segment 5 and not parallel to anterior and posterior margin, but considerably longer than segment 5, distinctly tapers distally, and its posterior margin concave; the dactyl of gnathopod 1 more powerful and almost 2 times as long as the palmar margin. Segment 6 of gnathopod 2, on the other hand, shorter than that of A. lilljeborgi, and only about half the length of segment 5; uropod 3 with a relatively longer inner ramus.

Head longer than peraeon segment 1, interantennal lobe relatively short and broad, triangular, with a pointed apex directed forward. Eyes large, black, gradually broadening downward. Antenna 1 with a short peduncle and an 11-15-segmented flagellum; segment 1 of peduncle inflated, almost as broad as long, bearing 6-7 sensory setae on its upper surface; segment 2 and 3 of peduncle large, of some length, together as long as

[1] This species is named in honour of Admiral S.O. Makarov, one of the greatest oceanologists.

half of segment 1, with sensory setae at the postero-distal angle; segment 1 of the flagellum short, not as long as last two segments of the peduncle together; accessory flagellum 6-segmented; its segment 1 thickened, longer than segment 1 of basic flagellum, armed with short setae along the lower margin. Last segment of peduncle of antenna 2 thinner and shorter than segment 4, both bear short seate on the anterior margin. Upper lip forms a short and broad process, protruding forward beyond the epistome, slightly larger than that of A. lilljeborgi, but not as strongly as in A. debruyni or A. anivae.

Figure 72. Anonyx makarovi Gurjanova sp.n. Southern part of the Sea of Okhotsk, ♂.

Coxal plate 1 strongly broadening distally, forming a rounded broad lobe at the anterior lower angle; basal segment of gnathopod 1 short and thick, bears a dense row of setae along the anterior margin; segment 6 almost as long as but slightly narrower than segment 5, tapers distally, with a convex anterior margin and a concave posterior one, which is armed with thin spines (4-5) and seate; palmar margin short, straight, transverse, finely dentate, with 2 locking spines; dactyl large, considerably longer than palm and bears setae on the inner margin. Coxal plate 2 also broadening distally. Segment 3 of gnathopod 2 long, considerably longer than segment 4, and almost as long as segment 5; segment 6 slightly larger than half segment 5, almond-shaped, weakly tapering distally; its palmar margin short, almost transverse, straight, dactyl as long as palm. Locking spine at the apex of segment 6 in peraeopods 1 and 2 at the base of dactyl hooked, with small scale in the middle of the inner margin. Peraeopod 3 with a short and broad coxal plate, its height considerably smaller than its width and smaller than the length of the basal segment; segment 4 broadens distally, almost as broad as long; segment 5 narrower and considerably longer than segment 4. Coxal plate of peraeopods 4 and 5 normal (typical of the genus); segment 4 of peraeopod 4 elongated, broadens distally, its width slightly more than half the length; segment 4 of peraeopod 5 almost linear. Anterior margin of basal segment of all last 3 peraeopods armed with spinules, strongly concave at the middle in peraeopod 5; posterior margin distainctly dentate. All branchial vesicles with folds; moreover, 1 accessory lobule found in each, peraeopod 3 and peraeopod 4; branchial vesicle of peraeopod 5 small, 2 times smaller in length than that of peraeopods 3 and 4. Epimeral plate 1 with lobe drawn out forward and almost triangular at the antero-distal angle; postero-distal angle rounded; plate 2 with an almost rounded anterior and a lower posterior angle drawn out forward in the form of a sharp tooth; the tooth at the postero-distal angle of plate 3 large, sharp, with obliquely truncated posterior margin. Urosome segment 1 with a weak dorsal saddle-shaped depression, without a keel; segment 3 with integumental lobes on the sides of the base of telson. Uropod 2 with rami almost of same length; inner ramus without a constriction, with 3 long spines along the inner margin; outer ramus slightly longer than the inner, with 3 thin long spines along the inner margin and a short thick spine on the outer margin.

Peduncle of uropod 3 considerably shorter than rami, broadens distally, with very long thin spinules at the outer distal angle and short spine at the inner angle; rami become pointed distally; inner ramus, but slightly shorter than the latter, densely covered with spines and a few setae along the inner and 3 - 4 spines along the outer margins; outer ramus with spines on the outer and setae on the inner margins.

Telson tapering distally, with narrowly rounded apices of lobes whose outer angle on the inner side of the apical spine forms a blunt process; on the dorsal side of the telson, there are 2 pairs of spines and 2 sensory setae on the side of the cleft, closer to the base. The animal is whitish, 12 mm long.

A few specimens were found in the Sea of Okhotsk (in the eastern part of La Perouse Strait, at a depth of 126 m, in Aniva Bay, at a depth of 40 m), and in the northern part of the Bering Sea, near Cape Clutorsky, at a depth of about 50 m.

4. Anonyx sculptifer sp.n. (Figure 73).

It differs sharply from all the species of the genus in its complex and orginal sculpture of the tegument. It adjoins the group of species close to A. lilljeborgi Boeck, with a black pigment of eyes and short segment of the flagellum of antenna 1, which species lack a constriction on the inner ramus in uropod 2 and have a long inner ramus in uropod 3, which is longer than segment 1 of the outer ramus. It differs from A. lilljeborgi, besides in the sculpture of the tegument, also in the structure of the upper lip whose apex does not extend beyond the epistome, the rather more massive and long segment 6 in gnathopod 1 which slightly exceeds the length of segment 5, the form of segment 6 in gnathopod 2, and the rather narrower and more oblong basal segments in peraeopods 3 and 4.

Head longer than peraeon segment 1, its interantennal lobes broad, triangular, with blunt apex; eyes large, ovate. Urosome segment 1 with short sinus on dorsal side and low rounded keel; segment 3 with short integumental lobes on sides of the telson base. It differs readily from all other species in the very peculiar sculpture of its tegument, which is espeically distinct on the epimeral plates, the coxal and the basal segments of peraeopods. This sculpture consists of transparent bands forming rings concentrically arranged and a pattern between them which resembles spider's web (see the figure).

Antenna 1 with inflated segment 1 and well developed segments 2 and 3 of peduncle; there is a cluster of 7-8 sensory setae on the lower margin of segment 1 of the peduncle above the base of segment 2; 6-7 similar setae found on upper margin of segment; flagellum with short first segment, 11-segmented; accessory segment 7-segmented, long, more than half the length of main flagellum; its segment 1 long, as long as 3 subsequent segments with 1 spine on lower margin. Antenna 2 longer than antenna 1; last segment of peduncle narrower and shorter than the penultimate; at its distal lower corner, there is 1 simple and 1 plumose sensory setae; on lower surface of penultimate segment, there are three similar setae, and along the anterior margin, there are clusters of simple setae, 2 setae in each cluster.

Coxal plate 1 weakly broadens distally; there are setae along the anterior margin of the basal segment of gnathopod 1; segment 6 slightly longer than segment 5, its posterior margin concave, with groups of setae, palmar margin weakly oblique, armed with 2 unequal locking spines; dactyl as long as palm. Segment 3 of gnathopod 2 strongly oblong, almost twice as long as segment 4; segment 6 extended-oval, more than half the length of segment 5, with short palmar margin directed forward; dactyl reaching the end of palm. At the base of dactyl, on the 6th segment of peraeopods 1 and 2, there is a hooked locking spine with a scale at its basal part. Basal segments in peraeopods 3 and 4 ablong and rather narrower than those in other species; in this regard, they resemble A. knipowitschi; basal segment of peraeopod 5 rather broader. Anterior margin of basal segment of all last three peraeopods 3-5 weakly broadening distally. Inner ramus of uropod 3 almost as long as the outer; it is simple, without a constriction, with 1 spine on inner margin. Uropod 3 with narrow pointed rami, with spines at the distal corners of peduncle and along the outer margin of outer ramus, plumose setae along the inner margin of both rami; inner ramus slightly shorter than the outer; the apical segment of the outer large, about 1/3 the length of segment 1. Telson with 1 pair of apical, one pair of marginal spines and with 2 plumose setae on each side at its basal part, at the level of the end of the cleft. The animal is 8 mm long. Alive, the animal is pink.

Only 2 specimens obtained in Bay of Kasatkn, near Iturup Island, at a depth of 49 m.

5. Anonyx affinis Ohlin, 1895 (Figure 74).

Guryanova, 1951: 224, Figure 89

Since the diagnosis of the genus has been specified and because of the description of a whole number of new species of the genus, this species should be described rather more thoroughly; so, we present its description according to our collections and the drawings of the specimens from the Sea of Japan, as figured in my works of 1938 and 1951.

Figure 73. Anonyx sculptifer Gurjanova sp.n. East coast, Iturup Island.

Head longer than peraeon segment 1; interantennal lobe well developed, broadly triangular, with a rounded apex; eyes large, black, narrow-reinform, gradually broadening distally. Urosome segment 1 with a saddle-shaped depression and a low rounded keel overlapping anterior part of segment 2; urosome segment 3 forms integumental lobes on the sides of telson's base. Segment 1 of peduncle in antenna 1 inflated, lacking oblong keel; in the upper part of its anterior margin, there are 5 small sensory plumose setae, at the antero-distal angle, 2 such setae; segment 3 of peduncle shorter than segment 2; segment 1 of flagellum short, shorter than segment 2 of peduncle and segment 1 of accessory flagellum; flagellum 6- 8-segmented; accessory flagellum 5- 6-segmented, slightly shorter than main flagellum its segment 1 as long as 2 subsequent segments together. Last 2 segments of peduncle in antenna 2 short, almost equal; flagellum 7- 8-segmented, its segment 1 as long as two subsequent ones together. Coxal plate 1 broadens distally. Anterior margin of basal segment in gnathopod 1 with a few setae; segment 6 longer than segment 5, with a straight posterior margin and a short transverse palmar margin equipped with 1 locking spine; dactyl as long as palm. Gnathopod 2 with greatly enlarged segment 3 considerably exceeding the length of segment 4; segment 6 larger than half the length of segment 5, does not broaden distally, with a short palmar margin slightly directed forward; dactyl slightly extending beyond the palmar angle.

Segment 6 in peraeopods 1 and 2 with a large hooked spine with a scale at its base; on the posterior margin of segment, there is an oblong row of powerful spines and 3 accompanying setae. Basal segment in peraeopod 3 weakly tapering distally, segment 4 broadened, as broad as long; segment 5 as along as segment 4. Basal segment in peraeopod 4 more oblong, longer than broad. Basal segment of last peraeopod broader than in the two preceding ones, does not taper distally; segment 4 also broadened, as broad as long. Posterior margin of basal segment in all three peraeopods dentate, there are spinules along the anterior margin. All branchial vesicles, except pair 1 (in gnathopod 2), simple; there are a few transverse folds in the proximal part of the vesicle in pair 1. There is a pair of coupling dentate spinules on the basal segment of peraeopods. The form of epimeral plates - see figure; tooth of plate 3 small, sharp. Uropod 2 abbreviated, its end does not reach the level of the ends of rami in pair 1; its inner ramus simple, without a constriction, as long as outer ramus; both rami bear each 1 powerful spine on the inner margin. Uropod 3 extends beyond the end of uropod 1, inner ramus considerably shorter than segment 1 of outer ramus, without spines, only with 1 seta at the base of the ramus on the inner margin; outer ramus narrow, enlarged, with 2 large plumose setae on the inner margin and the spines at the end of segment 1; apical segment well developed. Telson with one pair of dorsal and a pair of apical spines. Tegument without a specific sculpture. The animal is up to 13 mm long.

This is an amphiboreal species, known from Baffin Bay and from the Sea of Japan, where it is found at depths ranging from 1 to 80 m, especially in sea weed growths, from Peter the Great Bay westward to Tatarsky Strait, inclusively.

6. Anonyx validus Gurjanova sp.n. (Figure 75).

It is closest to A. affinis Ohlin, espcially in regard to the structure of the upper lip, epimeral plates 1-3, and uropods 2 and 3; it differs readily from the latter species in a rather shorter and more compact body and peraeopods, the head structure - head not longer but shorter than peraeon segment 1 - in the interantennal lobe drawn out down, and in the eyes extended vertically, in the development of the oblong keel on segment 1 of the peduncle in antenna 1, in the enlarged segment 4 of the peduncle in antenna 2, which segment is not as long but twice longer than segment 3 and its last segment, and in the abbreviated, broadened distally, segment 6 in gnathopod 2.

Head shorter than peraeon segment 1; interantennal lobes extended below; eyes black, narrowly reniform, arranged along the anterior margin of lobe. Plates hard, brittle, greatly calcified. Urosome segment 1 with a saddle-shaped depression and a low rounded keel; urosome segment 3 does not form integumental lobes along the sides of telson's base.

Segment 1 of the peduncle of antenna 1 with a large oblong keel overhanging segment 2 with its rounded apex; flagellum short, 5-segmented, its segment 1 as long as all remaining segments together; accessory flagellum 4-segmented, almost as long as main flagellum with long segment 1, which is as long as segment 1 of the main flagellum. Antenna 2 longer than antenna 1; segment 4 of peduncle, lined with groups of setae along the anterior margin, thicker and twice as long as the latter; closer to the base, on its lower surface, there are found 5 - 8 plumose sensory setae; flagellum shorter than peduncle, 10-segmented. Locking spine of segment 6 in peraeopods 1 and 2 at the base of dactyl; it is thick, short, but simple, covered only with an indistinct transverse striation; 3 spines along posterior margin of segment; at the postero-distal angle of segment 5, there are 4 short spinules and 1 long seta. Along the anterior margin of the basal segment in gnathopod 1, there are short setae; segment 6 as long as segment 5, with a short transverse palmar margin, 2 locking spines and 4 spines along the posterior margin of hand. Segment 3 in gnathopod 2 considerably longer than segment 4; segment 6 slightly longer than half of segment 5, weakly broadens distally, with a short transverse palmar margin; dactyl as long as palm. Basal segment in peraeopods 3 - 5 broad, especially in peraeopod 3, in which the width of this segment equals its length; anterior margin of segments in peraeopods 3 - 5 bears spinules and long setae, posterior margin of basal segments finely dentate; branchial vesicles simple, only in pair 1 (in gnathopod 2), there are 2 - 3 transverse folds, and in peraeopod 3, 1 short sausage-shaped accessory lobule. Tooth at the posterio-distal angle of epimeral plate

3 small. Uropods with short, thick, pointing rami; inner ramus in uropod 2 simple, with 1 spine in the middle of inner margin. Uropod 3 with cylindrical peduncle armed with spines at distal angles, inner ramus considerably shorter than segment 1 of the outer ramus, with smooth margins and 1 seta on the inner margin closer to the base of ramus; outer ramus with a well developed apical segment, setae on the inner margin, and 2 spines on the outer. Telson short and broad, without marginal and dorsal spines, only with a pair of apical spines. The animal is 15 mm long.

Figure 74. Anonyx affinis. Sea of Japan, ♂.

Figure 75. Anonyx validus Gurjanova sp.n. Bussol Strait (the Kurile Islands), ♀.

1 specimen comes from the Bussol Strait, in the central part of the Grand Range (15 mm long) and 2 specimens come from the Sea of Japan, the west coast of south Sakhalin (Cape Kostromskoy), the depth of 73 m (smaller in size, 9 mm).

7. Anonyx japonicus Gurjanova sp.n. (Figure 76).

It is similar to the preceding species, A. validus; it also has an abbreviated compact body and peraeopods, a simple (without a constriction) inner ramus in uropod 2, epimeral plates 1 - 3 almost similar in form (but the denticle at the postero-distal angle is even less developed) and with an enlarged segment 4 of the peduncle in antenna 2. It differs readily from this species in a shorter yet head, a broad triangular interantennal lobe, broader eyes, with a light rim, the lack of the oblong keel on segment 1 of the peduncle in antenna 1, a rather longer, with parallel margins, segment 6 in gnathopod 2 which is as long as the inner ramus in uropod 3 (the latter ramus is not shorter but as long as or longer than segment 1 of the outer ramus, and a rather longer telson which greatly tapers distally).

Head shorter than peraeon segment 1; interantennal lobes broadly triangular, directed forward; eyes moderate in size, black, with a light rim, irregularly oval. Urosome segment 1 with a saddle-shaped depression, segment 3 forms integumental lobes on sides of telson's base. Segment 1 of peduncle in antenna 1 inflated, but without a median keel; on its lower surface, there are 3 sensory plumose setae, on anterior margin above the base of segment 2, there is 1 simple setae; segment 1 of flagellum short, shorter than last 2 segments of peduncle together and as long as $2\frac{1}{2}$ subsequent segments of flagellum together; flagellum 9 - 10-segmented; accessory flagellum slightly shorter than the main flagellum, 6-segmented, its segment 1 enlarged, slightly longer than segment 1 of the main flagellum. Antenna 2 almost as long as antenna 1, penultimate segment of peduncle considerably thicker and longer than the last; on its anterior margin, there are clusters of setae, 2 - 3 setae in a cluster; on lower margin, there are 3 sensory plumose setae; flagellum 6-segmented. Coxal plate 1 weakly broadens distally. Basal segment in gnathopod 1 bears setae along anterior margin; segment 6 slightly longer than segment 5, slightly tapering distally; palmar margin short, weakly oblique, with 1 locking spine and a rather larger spine below the locking spine, in the upper part of posterior margin; dactyl almost twice as long as palm. Gnathopod 2 with segment 3 greatly enlarged, longer than segment 4; segment 6 larger than half of segment 5, weakly broadens distally, with a short claw and a palmar margin directed slightly forward; dactyl as long as palm. Segment 6 in peraeopods 1 and 2 with 2 spines on posterior margin and a powerful locking spine at the base of claw, with a hooked apex and a lateral tooth. Basal segments in last three peraeopods broad, do not taper distally; their anterior margin with spines posterior margin toothed; segment 4 in peraeopods 3 and 4 broadens distally, relatively short, in peraeopod 3 as broad as long, in peraeopod 5 almost linear; segment 5 as long as segment 4 in peraeopods 3 and 4, and slightly longer in peraeopod 5. Branchial vesicles simple; only peraeopod 1 (in gnathopod 2) has a few transverse folds in the proximal part of the vesicle. On the distal margin of the peduncle in pleopods, there is a pair of short notched coupling spinules. Tooth at the postero-distal angle of epimeral plate 3 small. Ends of uropods 1 and 2 on the same level, uropod 3 extending beyond its tips. Uropod 2 with a simple inner ramus, devoid of constriction, bearing 1 thick spine on inner margin, outer ramus slightly longer than the inner and also armed with 1 spine along the inner margin. Peduncle of uropod 3 broadens distally and armed with 1 spine along the inner margin. Peduncle of uropod 3 broadens distally and armed with spines at the lower angles; rami narrow, oblong, inner slightly longer than segment 1 of the outer ramus, with 2 setae on inner margin; outer ramus with 3 setae on the inner margin and 1 large spine at the outer lower angle of segment 1; apical segment large, slightly larger than 1/3 the length of segment 1. Telson with a pair of apical, and one pair of lateral spines and each bearing 2 sensory plumose setae on the dorsal side at the level of the end of the cleft. Tegument with a specific alveolar sculpture.

The animal is up to 12 mm long. The male is noted for its rather more abundant setae on segments of the peduncle in antenna 2, on segments 2 and 3 of the peduncle in antenna 1, on segment 6 in gnathopod 1, and along the margins of the rami in uropod 3; on the telson of the male, besides apical and marginal spines, there are accessory spines on the dorsal surface, and the saddle-shaped depression in urosome segment 1 is deeper than in the female.

Many specimens were caught in the Sea of Japan at the west coast of south Sakhalin (Yablochnoye), in the coastal lagoon in the rhizoids of the laminarians, in the rootstocks of Phyllospadix, in the growths of red algae, at a depth from 0.5 to 1.5 m; in South-Kurile Strait; in the littoral of Shikotan-Island- the west (Krabovaya and Matsuba bays) and the Pacific coasts (Dimitrov Bay) among the rockweed; in the Sea of Okhotsk capture at Cape Levenorn at the est coast of south Sakhalin at a depth of 35 m; moreover, discovered in Kasatka Bay, the eastern coast of Iturup Island, at a depth of 12 m, and in the Bering Sea (Bya Korfu*).

8. Anonyx multiarticulatus Pearse, 1913 (Figure 77).

Pearse, 1913, Proc. U.S. Natl. Mus., 35: 572, f. 2.

Description according to Pearse. Body powerful, broadly rounded above. Head about as long as peraeon segment 1; lateral angles of

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* Transliterated from Russian. Translator.

head drawn out forward and rounded. Anterior coxal plates twice as large as body height; coxal plate 1 slightly broadens downward, its anteior angle rounded; coxal plate 4 deeply notched at the back and forms a somewhat angular broadening below; coxal plate 5 small, longer than deep. Epimeral plate 3 drawn out at the posterior angle and forms a tooth slightly turned up. Eyes oval, broadening downward, with a constriction in the middle. Antenna 1 as long as head length and first 2 segments of the body together; segment 1 of peduncle very large and thick, flagellum more than twice as large as peduncle, 28- 30-segmented in ♂ and 10-segmented in ♀; accessory flagellum as long as peduncle, 8-segmented in ♂ and 7-segmented in ♀. Antenna 1 usually bent under the body, more than twice as long as antenna 1, flagellum 60-segmented. Segment 6 in gnathopod 1 1/3 longer than segment 5 and almost as broad; palm terminates in a tooth. Segment 6 in gnathopod 2 almost as long as half of segment 5, oblong-oval, does not broaden distally, dactyl small. Last peraeopod as long as peraeopod 4; basal segment large (broadened), segment 4 broadened. Uropod 3 extends beyond the end of uropod 3, inner ramus slightly shorter than the outer; telson almost twice as long as broad; telson cleft further than to the middle; its lobes blunt, each with 1 apical spine and a seta. When alive, the back of the animal is pink. In alcohol, the eyes are black. The length 22 m.

Captured at St. Paul Island (the Pribylov Islands) in the Bering Sea.

Figure 76A. *Anonyx japonicus* Gurjanova sp.n. Sea of Japan, ♀.

Figure 76b. Anonyx japonicus Gurjanova sp.n. Sea of Japan.

Figure 77. Anonyx multiarticulatus. According to Pearse, 1913.

Figure 78. Anonyx kurilicus Gurjanova sp.n. East coast of Iturup Island, ♂ and ♀.

9. Anonyx kurilicus Gurjanova sp.n. (Figure 78).

In the structure of the upper lip, the simple inner ramus in uropod 2, without constriction and the enlarged segment 4 of the peduncle in antenna 2 which is longer than last segment, it is close to A. affinis Ohlin and to new sepecies A. validus and A. japonicus. It differs from them essentially in its long outer ramus, which is longer than segment 1, in the inner ramus of uropod 3, in the presence of a characteristic reticular sculpture of its tegument, in the greatly developed tooth-shaped process of the postero-distal angle in epimeral plate 3, in the more slender peraeopods, in the distally tapering basal segment in peraeopod 4, and in segment 6 of gnathopod 1 considerably longer than segment 5, with an oblique, and not transverse, palmar margin.

Head somewhat longer than peraeon segment 1; interantennal lobe large, drawn out forward beyond the middle of segment 1 in antenna 1, with a blunt triangular apex. Eyes broadening downward, dark-brown, almost black in alcohol. Upper lip slightly protrudes forward beyond the borders of the epistome and separated from it by a sinus. Lower lip without inner lobes. Outer lobe of maxilla 1 bears a large dense cluster of setae at the place where the oblique apex is produced into inner margin; spines at the apex in the inner row simple, powerful, bent (3 spines), spines on oblique margin (6) pectinate. Maxilla 2, mandibles and maxillipeds typical of the genus. Coxal plate 1 broadens distally.

Antenna 1 with small rounded median keel on segment 1 of peduncle bearing a short seta; segment 1 of flagellum short, as long as segments 2 and 3 of peduncle, does not taper distally; flagellum 10- 11-segmented; accessory flagellum 5- segmented; its segment 1 longer than segment 1 of the main flagellum, bears setae along the lower margin. Antenna 2 considerably longer than antenna 1; segment 3 and 4 of peduncle equal in length; last segment about 2/3 the length of segment 4; on the anterior margin of segment 4 (penultimate) of peduncle, there are dense clusters of short setae; segment 6 markedly longer than segment 5, slightly ; palmar margin short, transverse, finely dentate, weakly convex, with 2 locking spines; posterior margin of hand weakly concave, with a few clusters (1 - 2) of setae; segment 5 short, cup-shaped, slightly longer than segment 4 and shorter than segment 6.

Gnathopod 2 long, thin; its segment 3 greatly enlarged, only slightly shorter than segment 5 and much longer than segment 4; segment 6 almond-shaped, with a short palmar margin directed upward, dactyl reaches the end of palm, and a small claw is formed.

At the base of dactyl, on segment 6 in peraeopods 1 and 2, there is a short but powerful hooked locking spine with a short scale at the base and with an indistinct oblong striation.

Posterior margin of basal segment in peraeopods 3 - 5 densely serrate-dentate; segment 4 in peraeopod 3 short and broad, as broad as long. Segment 4 in peraeopod 4 broadening distally, but more oblong, slightly broader than half the length. Segment 4 in peraeopod 5 almost linear, very weakly broadens distally. Branchial vesicles in gnathopod 2 and in peraeopods 1 and 2 long, simple; in peraeopod 3, with transverse folds in the proximal part and a short accessory lobule; branchial vesicles in last two peraeopods short and broad, without folds and accessory lobes. Epimeral plate 3 with a very large tooth at the postero-distal angle turned backward and slightly up. At the inner lower angle of the peduncle in pleopods, there are 2 hooked spinules with denticles.

End of uropod 1 extends slightly beyond the level of the end in the rami of uropod 3; uropod 2 slightly shorter than uropod 3; its inner ramus slightly shorter than the outer and lacks the constriction instead of which there is a spine that is rather larger than 2 others; along the inner margin of the outer ramus, there are 3 short, thick spines. The peduncle of uropod 3 has groups of spines at its distal angles; rami enlarged, considerably longer than peduncle, inner ramus slightly shorter than the outer, armed with spines on both margins; outer ramus bears spines along the outer and setae along the inner margins; its apical segment large, more than 1/3 the length of segment 1. Telson deeply cleft, with lobes diverging and with rounded apices of lobes each armed with 1 apical spine; there are spines on the dorsal side of the lobes, at the level of the end of the cleft closer to the base of the telson - one pair of small simple setae on each. The sculpture of the tegument is alveolar, the cells are rounded, with one small spinule in the middle. The animal is up to 15 mm long.

27 specimens were captured in the area of the Fifth Kurile Strait (depth 35 m), in the Sea of Okhotsk in Terpeniya Bay (depth being 53, 21, and 12 m, respectively), and at the northern termination of Sakhalin Island at a depth of 65 m.

10. Anonyx anivae Guryanova sp.n. (Figure 79).

In many respects, it is close to A. kurilicus Gurjan. It readily differs from the latter species in its upper lip greatly protruding in front of the epistome, in the hand of gnathopod 2 which forms a small distinct claw, in a rather shorter tooth-shaped process at the postero-distal angle of epimeral plate 3; it possesses a similar sculpture of the tegument and lacks the constriction on the inner ramus in uropod 2.

In the structure of its upper lip the apex of which extends beyond the border of the anterior margin of the epistome, in gnathopod 1 whose segments 5 and 6 are equal in length, in the form of epimeral plates 1 - 3, and in the correlation of the length of the rami in uropod 3 whose inner ramus is slightly longer than segment 1 of the outer ramus, it also is close to A. lilljeborgi Boeck; however, it differs from the latter species in an even more developed linguliform process of the upper lip, the straight and oblique, and not convex and transverse palmar margin of segment 6 in gnathopod 1, the greatly extended forward palmar margin of segment 6 in gnathopod 2 which, together with the dactyl, forms a miniature claw, while this margin in A. lilljeborgi is transverse, and in rather larger and broader eyes.

Head almost as long as peraeon segment 1; eyes moderate in size oval, black. Upper lip forms a process with upper horizontal margin; this process extends much forward in front of the epistome. Antenna 1 similar to that in A. kurilicus, with an almost cylindrical segment 1 of peduncle and with relatively large segments 2 and 3; flagellum 7-segmented, its segment 1 short, as long as 2½ subsequent segments; accessory flagellum 4-segmented, its segment 1 as long as 2 subsequent and as long as segment 1 of main flagellum. Antenna 2 as long as antenna 1; last two segments of peduncle of same length and width, flagellum 9-segmented, its segment 1 longer than each of the 2 subsequent ones, as in A. kurilicus; however, the last segment of peduncle in A. kurilicus is considerably narrower and shorter than the penultimate. Coxal plate 1 slightly broadens distally; basal segment in gnathopod 1 with a small number of setae along the anterior margin; segment 6 as broad and as long as segment 5, does not taper distally, its palmar margin straight, weakly oblique, with 2 locking spines; posterior margin straight, not concave, armed with 2 - 3 long seteus spines with a cleft apex and 2 groups of setae, 2 - 3 setae in each. Gnathopod 2 slightly thinner and longer than gnathopod 1; segment 6 almond-shaped, does not broaden like in A. kurilicus, but tapers distally, 2/3 the length of segment 5, while in A. kurilicus segment 6 in gnathopod 2 about 3/5 the length of segment 5, i.e. relatively larger; palmar margin, armed with a thick locking spine, greatly extended forward and forms, together with the dactyl a distinct small claw, which is not observed in A. kurilicus, where the palm is almost horizontal. The locking spine at the apex of segment 6 in peraeopods 1 and 2 at the base of the claw has 1 scale in young and 3 scales in mature specimens and also a hooked apex, like in _A. kurilicus_, but rather shorter and thicker.

Last three peraeopods similar in structure to those of _A. kurilicus_, only the posterior margin of their basal segments is notched more sparsely and coarsely. Branchial vesicles with folds and accessory lobes.

Anterior lower margin of epimeral plate 1 drawn out forward considerably more and has a rather deeper sinus above it than in _A. kurilicus_; the antero-distal angle of plate 2 rounded and not straight, while the posterior angle, on the other hand, straight, and not drawn out slightly and pointed, like in _A. kurilicus_; the tooth at the postero-distal angle of plate 3 considerably more powerful than in _A. kurilicus_, and the anterior rounded angle forms a lobe drawn out forward. Urosome segment 1 with a small saddle-shaped depression, lateral tegumental lobes on sides of the telson in segment 3 short. Uropod 2 with a simple inner ramus devoid of constriction, completely without armature in the young, and with 3 spines along the inner margin in adult specimens; outer ramus slightly longer than the inner, with 2 - 3 spines along the inner margin.

Peduncle of uropod 3 almost cylindrical, with powerful spines at distal angles; inner ramus shorter than the outer, but longer than its segment 1, lacking the armature in the young and with spines on both margins in mature specimens; outer ramus with 2 apical, 1 - 4 spines on the outer margin, and with several setae on the inner margin of segment 1; apical segment large, about half as long as segment 1 in the young and slightly more than 1/3 of its length in mature specimens. Telson greatly enlarged, tapers distally, deeply cleft, but its lobes, contrary to those in *A. kurilicus*, do not diverge, are not with broad, but with narrow apices, with a pair of apical spines; on the dorsal side, there is one pair of small spinules and, along the sides of the apex, 2 equal plumose setae on each. The sculpture of the tegument, similar to that in *A. kurilicus*, alveolar, the cells rounded, with a small spinule in the middle. The animal is 11 mm long.

2 specimens (♂♂) obtained in the Sea of Okhotsk, in the Aniva Bay, at the south coast of Sakhalin, at a depth of 42 m (sandy bottom) and 17 specimens (♂♂ and ♀♀) at the south termination of Kamchatka, south of Ozerny, depth 45 m.

Figure 79. *Anonyx anivae* Gurjanova sp.n. Aniva Bay (Sea of Okhotsk).

11. *Anonyx robustus* Gurjanova sp.n. (Figure 80).

It differs readily from other species in the presence of a sinus on posterior margin of epimeral plate 3, above the base of a tooth directed backward and up, at the postero-distal angle of the plate. It is assigned to the group of the species of the genus which have a constriction on the inner ramus in uropod 2. In its general habitus, the structure of both gnathopods, all five peraeopods, and the telson form, it is close to the typical *A. nugax* (Phipps); however, it readily differs from the latter in the form and the light colour of its eyes (the form protrudes beyond the borders of the upper lip), the structure of epimeral plates 1 - 3, and in long, thin rami of uropod 3, with the apical segment of the outer ramus considerably (relatively speaking) longer than in _A_. _nugax_.

Head as long as peraeon segment 1; interantennal lobes large, triangular, directed forward; eyes light-brown, greatly discoloured in alcohol, extended along anterior margin of head, gradually broadening downward. Urosome segment 1 with a saddle-shaped depression; segment 3 with a pair of oblong, low lateral keels on the dorsal side. Antenna 1 shorter than antenna 2; segment 1 of peduncle with the median overhanging segment 2; flagellum 12-segmented, its segment 1 enlarged, more than half the length of segment 1 in peduncle; accessory flagellum 7-segmented, shorter than main flagellum; its segment 1 long, as long as segment 1 of the main flagellum. Segment 4 of peduncle in antenna 2 slightly thicker and longer than the last; both segments bear groups of setae along the anterior margin and clusters of long setae on the lower margin. Coxal plate 1 broad, gradually broadens distally. Along the anterior margin of basal segment in gnathopod 1, there are setae; segment 6 shorter than segment 5, slightly tapers distally, with a weakly oblique short palmar margin armed with 1 locking spine and 2 equal acicular setae; similar setae form an oblong row along the posterior margin of hand; dactyl as long as palm. Gnathopod 2 with a greatly enlarged basal segment and segment 3; segment 6 larger than half the length of segment 5, oblong-oval, with a short, oblique, directed slightly forward, palmar margin; dactyl as long as this. Segment 6 of peraeopods 1 and 2 with a large hooked locking spine at the base of dactyl and with crowded paired setae along posterior margin. Basal segments in last three peraeopods with dentate posterior margin and spines along the anterior margin; basal segment in peraeopod 3 somewhat tapering distally, segment 4 broadening distally, but longer than broad. Branchial vesicles simple, only in peraeopod 1 (in gnathopod 2) with a few transverse folds. Epimeral plate 1 with a deep notch in the lower part of the anterior margin and the antero-distal angle drawn out forward in the form of a lobe; epimeral plate 3 with a powerful, pointed denticle at the postero-distal angle and a small notch (sinus) above the latter's base; there are 6 - 7 setae along the lower margin of the plate. The inner margin of the peduncle and rami in uropod 2 slightly shorter than the outer, with a constriction and a long spine at the apex of the lower part of the broadened part of the ramus. Uropod 3 with enlarged sharp rami almost equal in length; basal segment broadens distally, with groups of spines at lower angles; there are 4 long sharp spines along the inner margin of the inner ramus; there are short spinules on the outer ramus; the apical segment of the latter, about half as long as segment 1. Telson with broad apices in lobes, a pair of apical and a pair of dorsal spines. The sculpture of the tegument alveolar. The animal is 8 - 15 mm long.

6 specimens were captured in the northern part of the Chuckchee Sea at a depth of 68 m and 1 specimen (female) (type) in the Sea of Okhotsk, at the east coast of Sakhalin, at a depth of 134 m, south of Terpeniya Bay.

12. Anonyx minumus Gurjanova sp.n. (Figure 81).

It differs readily from other species in its very small eyes and an almost complete lack of the armature in the peraeopods, especially in the last three. It is possible that we dealt only with the young, sexually immature specimens of the preceding species, A. robustus sp.n., since, in spite of the abundance of the specimens of A. minumus, not even one female was discovered among them, neither ovigerous nor with well developed brood plates. However, there is a number of distinguishing characters which do not depend upon the age that permit us to identify this form as an independent species. These characters are as follows: the development of a light eye rim, the specific armature of segment 3 in mandibles which bears transverse rows of coarse setae on the anterior surface /these setae form a brush (figure 81)/, coxal plate 1 greatly broadening distally, the formation of gnathopod 2 by segment 6 and dactyl. The lack or the weak development of the armature in the appendages is generally characteristic of the very young specimens of the amphipods, but the development of sensory setae (on the antennae, on the telson), the well defined form of coxal and epimeral plates are observed only in quite definitive, although sexually immature specimens.

Figure 80A. Anonyx robustus Gurjanova sp.n. Sea of Okhotsk, ♀.

Figure 80Б. Anonyx robustus Gurjanova sp.n. Sea of Okhosk, ♀.

Figure 81A. Anonyx minimus Gurjanova sp.n. East coast of Iturup Island.

Figure 81 . Anonyx minumus Gurjanova sp.n. East coast of Iturup Island.

Head slightly longer than peraeon segment 1; interantennal lobe large, broadly triangular; eyes very small, light-brown in alcohol, with a yellow rim, reniform. Urosome segment 1 with an insignificant dorsal depression. The tooth at the postero-distal angle of epimeral plate 3 well developed, large. Antennae equal in length, with short 3- 4-segmented flagelli, segments 1 and 2 of peduncle in antenna 1 with sensory plumose setae at the distal angles; segment 1 of flagellum very large, as long as 2 remaining segments; accessory flagellum 2-segmented, its segment 1 longer than segment 1 of the main flagellum. Antenna 2 with short segments in peduncle, last segment shorter than segment 4; segment 1 of flagellum longer than the last segment of peduncle. Coxal plate 1 greatly broadening distally; basal segment in gnathopod 1 without setae on anterior margin; segment 6 slightly longer than segment 5, with parallel lateral margins and a short transverse palmar margin armed with 3 equal locking spines; dactyl slightly longer than palm. Coxal plate 2 also slightly broadening distally; segment 6 of gnathopod 2 slightly longer than half of segment 5, tapering distally and, together with the dactyl, forming a small claw; palmar margin of this segment 6 obliquely truncate and directed slightly forward, and the thick dactyl insignificantly longer than palm. Segment 6 in peraeopods 1 and 2 with a short thick locking spine at the base of the claw and with a smooth posterior margin devoid of spines and setae. Basal segments of last three peraeopods with smooth margins, without denticles and spines, only at the antero-distal angle, there is 1 long spine on each; remaining segments also armed with only spinules at the distal angles. Branchial vesicles simple, transverse folds present only in pair 1 and in their proximal part. Uropods also almost unarmed, uropod 2 slightly shorter than uropod 1; ends of uropod 3 reach far beyond the borders of uropods 1 and 2. Inner ramus in uropod 2 simple, without constriction, spines, and setae, slightly shorter than the outer ramus. Peduncle in uropod 3 cylindrical, inner ramus longer than segment 1 of the outer ramus, without spines and setae. At the distal end of segment 1 in the outer ramus, there is 1 spine on each side; apical segment large, larger than half of segment 1. Telson with 1 pair of large apical spines and one pair of dorsal plumose setae. Entire body and appendages covered with a fine punctate sculpture. Very characteristic of the species is the specialization of the last segment of the palp in mandibles - on its anterior surface, there is a special, well developed brush formed by weakly bent transverse rows of short coarse setae. The maximum length of the animal is 6 mm.

36 specimens were captured in Terpeniya Bay, at a depth of 19 mm, on the sand in the area of Paranaysk, 1 specimen comes from the same locality, depth of 23 m, and a few dozen specimens from the northern part of the Bering Sea (the St. Lawrence region), depth of 35 - 37 m.

13. Anonyx magnus Gurjanova sp.n. (Figure 82).

In the structure of the antennae, gnathopod 1, epimeral plates 1 - 3, uropod 3, and the telson, as well as in the colouration and the form of the eyes, it is close to A. debruyni (Hoek); it differs from the latter species in its upper lip that extends weakly or scarcely at all beyond the border of the epistome, in the blunt rectangular interantennal lobe (in A. debruyni it is greatly extended forward, triangular, with a pointed apex), in the oval segment 6 of gnathopod 2 tapering distally; the palmar margin of the latter is short, drawn out forward and forms, t together with the dactyl, a claw; it is not transverse and long, like in A. debruyni in which this segment broadens distally in both sexes and the dactyl does not reach the end of the palm; basal segments in all three peraeopods in A. magnus relatively more broadened than those in A. debruyni, the lobe in peraeopod 3 drawn out more backward, and the inner ramus in uropod 2 has not 1, but 2 oblong rows of spines.

Figure 82A. Anonyx magnus Gurjanova sp.n. Sea of Japan, ♂.

Head short and high, shorter than peraeon segment 1; eyes brown, reddish in alcohol, narrowly-reniform, extended along anterior head margin. Interantennal lobe small, almost rectangular. Urosome segment 1 with a saddle-shaped depression, a low medial and 2 lateral keels, 1 on each side from the median keel. Segment 2 in urosome very short, segment 3 with very small lobes on sides of telson's base.

Segment 1 of peduncle in antenna 1 greatly inflated, with sensory plumose setae along lower margin and a small rounded keel at the distal end of the anterior margin; segment 1 of 8- 10-segmented flagellum considerably larger than half the length of segment 1 in the peduncle; segment 1 of 4-segmented accessory flagellum bears setae along the inner margin and as long as segment 1 of the main flagellum.

Coxal plate 1 does not broaden distally. Anterior margin of the basal segment in gnathopod 1 bears setae; segment 6 as long as segment 5, slightly tapering distally, with a short, greatly oblique palmar margin armed with 12 locking spines cleft at the apex and with setae; along the posterior margin of hand, there are 5 - 8 powerful cleft-tipped spines; dactyl with a powerful accessory denticle, longer than palm. Gnathopod 2 with enlarged segment 3 whose length is larger than the length of segment 4; segment 6 extended-oval, considerably shorter than segment 5; palmar margin oblique, directed slightly forward, dactyl as long as palm. Posterior margin of segment 6 in peraeopods 1 and 2 with long acicular spines and a thick locking spine at dactyl's base. Basal segments in last three peraeopods scarcely taper distally; their anterior margin armed with spinules, posterior margin distinctly notched in peraeopod 3, and almost smooth in peraeopods 4 and 5; segment 4 in all three peraeopods broadens distally, but longer than broad. Branchial vesicles with transverse folds. Epimeral plate 3 with a large pointed tooth at the postero-distal angle and a convex posterior margin. Uropod 1 slightly extends beyond the tips of uropod 2; uropod 3 extends far beyond the ends of the two preceding uropods. Peduncle in uropod 2 on margins armed with powerful spines, inner ramus simple, without constriction; both rami along inner margin bear short powerful spines; inner ramus has 2 rows of spines. Peduncle in uropod 3 bears 3 - 4 spines at the distal angles, inner ramus slightly shorter than the outer, with 2 spines and 2 setae along the inner margin; outer ramus armed with spines along the outer and with setae along inner margins; its apical segment about $\frac{1}{4}$ the length of segment 1.

Telson broad, hardly tapering distally, apices of lobes broadly rounded, with a powerful apical spine and 1 plumose seta on its outer side; on the dorsal surface of the telson, two pairs of small spines and closer to the base - a pair of similar plumsoe setae on each side. Tegument with a fine-reticulate sculpture and densely covered with large punctate depressions. The animal is 13 mm long.

1 specimen captured at the west coast of south Sakhalin in the Sea of Japan, in the area of the village of Yablochnoye, at a depth of 40 - 50 m and in the Sea of Okhotsk - 6 specimens in Aniva and Terpeniya bays, and 1 specimen comes from the area of Paranaysk, depth of 32 - 40 m.

*14a. Anonyx debruyni debruyni hoek, 1882 (Figure 83).

Hoek, 1882, Niederl. Arch. Zool., Suppl., Bd. 1, No. 7: 44, pl. III, f. 30 (A. debuynii); G. Sars, 1891, Crust. Norw., I: 109, pl. 37, f. 2 (Chrinosimus); Guryanova, 1951: 262, Fig. 132 (Chironesimus).

We had an opportunity to compare in detail the representatives of this species from our northern seas (Barents Sea, Kara Sea, Kola Bya) with the specimens from the seas in the Far East. It was found that there are considerable and quite stable differences which point to the differentiation of the species under conditions of the seas of the Arctic and the Pacific oceans into 2 forms the degree of the divergence of which we regard as subspecific or, perhaps, even more than that. Since the specimens described by Hoek (type) were gathered in the Barents Sea, we identify the Far-East form as a specific subspecies, although there is no doubt that the initial form for the northern typical form was the

North-Pacific one. The results of the comparative analysis of all species of the genus force us to change and to supplement Sars' description, to name a number of characters unnoticed either by Sars or by Hoek, the author of this species, the characters which play an important role in the diagnostic specificity of the genus. Our diagnosis is based upon the study of collections pertaining to this species from the Barents and the Kara seas; the figures are in accordance with the specimens from the southern part of the Kara Sea. The sexual dimorphism is so strongly pronounced that we present the description of ♀ and of ♂ separately.

The Female. Body strongly inflated, powerful, with a broad arched back. Head somewhat shorter than peraeon segment 1; internatennal lobe triangular, with a bluntly pointed apex directed forward. Eyes light-yellow in alcohol, red when alive, bottle-shaped, with a rounded broadened lower part, drawn out at head's height. Urosome segment 1 with a small saddle-shaped depression on the dorsal side; last segment of urosome forms transparent integumental lobes on the sides of the telson's base. Antennae 1 and 2 correspond to Sars' description and figures.

Figure 82b. *Anonyx magnus* Gurjanova sp.n. Sea of Japan, ♂.

Figure 83A. *Anonyx debruyni debruyni* Hoek. Kara Sea, ♀.

Figure 83 . *Anonyx debruyni debruyni* Kara Sea, ♂ and ♀.

Upper lip forms a large linguliform process with a rounded apex and horizontal upper margin and extends far beyond the tips of the epistome, being divided from the latter by a narrow sinus; remaining oral parts normal for the genus; in the tooth row of mandibles, there are a few short spines and clusters of thin setae.

Coxal plate 1 with parallel lateral margins, does not broaden downward. Basal segment in gnathopod 1 bears setae on the anterior margin; segment 6 narrower and shorter than segment 5, distinctly tapers distally; its short palmar margin deeply concave, finely serrate-notched, almost vertical and armed with 2 locking spines; along the posterior margin of hand, there is an oblong row of powerful, cleft to the middle, spines and groups of setae; dactyl powerful, bent, longer than palm, with accessory tooth on the lower margin. Gnathopod 2 considerably longer and with a subchala considerably larger than in gnathopod 1; segment 6 large, slightly shorter than segment 5, greatly broadens distally; its palmar margin transverse, weakly concave, armed with short setae and short thick spines in the distal part; dactyl greatly bent, reaches only the middle of palm, bears setae along the lower margin.

At the apex of segment 6 in peraeopods 1 and 2, at the base of dactyl, there is a powerful, short locking spine with a small scale and covered with a fine striation; along posterior margin of segment 6, there is an oblong row of thick flat setae directed downward and overlapping one another. Anterior margin of basal segments in peraeopods 3 - 5 armed with fine spinules, posterior margin distinctly notched; basal segment in peraeopod 3 with a broad wing, weakly tapers distally, segment 4 broadens distally, its greatest width slightly shorter than length, segment 5 narrower and slightly longer than segement 4; in peraeopod 4 basal segment and segment 4 relatively narrower and more oblong, segment 5 considerably narrower and longer than segment 4; broad basal segment in peraeopod 5 does not taper distally, segment 4 almost linear, $1\frac{1}{2}$ times as short as segment 5. Branchial vesicles short and broad; all peraeon legs with simple gills, except in gnathopod 2 where gills have a few transverse folds characteristic of the typical representatives of the genus. The structure of epimeral plates corresponds to Sars' drawing. Uropod 2 shorter than uropods 1 and 3 the ends of which extend beyond the borders of uropod 1; inner ramus in uropod 2 with constriction: upper 2/3 of its length of same width as the outer ramus, along its posterior margin, there are 5 sharp spines; at the distal end, there is a narrow, rounded lobe at the apex of which there is a similar, but a rather longer apical spine; lower third of ramus forms a thin process separated from the lobe of the broadened part of the ramus by a sinus; outer ramus slightly longer than the inner, armed with spinules along the inner margin; peduncle in uropod 2 as long as the outer ramus, also armed with spines along the inner margin. Uropod 3 with peduncle broadening distally with a group of spines at both lower angles; rami longer than peduncle, gradually become pointed toward the distal end; inner ramus longer than segment 1 of the outer ramus, armed with spines and setae along the inner margin; segment 1 of outer ramus with spinules and setae along the inner margin; its apical segment moderate in size, about $\frac{1}{4}$ the length of segment 1. Telson with broadly rounded apices in lobes bearing 1 apical spine and a setae each. Sculpture of tegument coarsely punctate.

The Male. In the structure of its branchial vesicles, which are fleshy, have large transverse folds in the first three pairs and in the folds and short accessory lobules on pairs 4 - 6 of peraeon appendages, it is close to A. nugax and A. lilljeborgi, only in the latter pair (in peraeopod 5), the branchial vesicle is almost twice as short as in the preceding ones.

In structure, oral parts similar to those in ♀; however, the outer lobe in maxilla 1 has, besides large pectinate spines, a dense cluster of setae in the place where the oblique apex continues into the inner margin, as it is characteristic fo the Pacific species. Upper lip protrudes very strongly in front of the epistome. Head slightly longer than peraeon segment 1; interantennal lobe narrowly triangular, directed forward with its pointed apex and reaching the middle or extending even furthern than the middle of segment 1 of the peduncle in antenna 1. In alcohol, eyes yellowish, reddish, strongly broaden downward. Coxal plate 1 with parallel lateral margins, does not broaden distally. Urosome segment 1 similar to that in A. magnus, with 1 medial and 2 low lateral keels. Antenna 1 shorter than antenna 2; segment 1 of peduncle with a low small keel overlapping segment 2; flagellum multisegmented, considerably longer than in ♀, bears calceoli; segment 1 of flagellum enlarged conical; accessory flagellum 6-segmented, its segment 1 longer than segment 1 of the main flagellum and bears 8 - 9 short setae along the inner margin. Antenna 2 with short setae along the upper margin in last two segments of peduncle, last segment of peduncle narrower and as long as the penultimate; flagellum multisegmented, considerably longer than in ♀.

Basal segment in gnathopod 1 bears setae along the anterior margin, powerful, thicker than all remaining segments; segment 6 slightly shorter and narrower than segment 5; its short palmar margin greatly oblique, armed with 3 locking spines and a long seta between them; along posterior margin of hand, there are powerful spines; these spines, like also the locking spines, also are peculiar in form - they broaden toward the middle and their apex is deeply cleft. In structure, segment 6 in gnathopod 2 close to that in _A. derjugini_ and _A. knipovitschi_, strongly broadens distally, and its enlarged palmar margin armed with short tooth-shaped spinules equal in size; contrary to the species mentioned above and to ♀, palm not concave but straight, dactyl falls slightly short of reaching palmar angle; segment 6 longer than half of segment 5. Locking spine on segment 6 in peraeopods 1 and 2 small, short and thick, without scale. Basal segment in peraeopod 3 weakly tapers distally; segment 4 broadens downward, but longer than broad; basal segment 4 narrow, enlarged, does not taper distally; segment 4 also enlarged and weakly broadens distally. Basal segment in peraeopod 5 broader than in peraeopod 4, uniformly broad, segment 4 linear. Along anterior margin of basal segment in peraeopods 3 - 5, there are spinules; posterior margin toothed. The structure of epimeral plates similar to that in ♀. Uropod 2 densely lined with sharp spines on both sides in both the peduncle and the rami; inner ramus without constriction, as long as and in form identical to the outer ramus. Peduncle in uropod 3 weakly broadens distally, armed with the spines at lower angles; rami lanceolate, armed along the outer margin with spines, with setae along the inner margin, (more densely than in

♀♀); inner ramus slightly shorter than the outer; apical segment of outer ramus about $\frac{1}{4}$ the length of segment 1; telson with broad apices of lobes, with a pair of small apical spines and two pairs of dorsal spines. Body and appendages covered with large punctate depressions and, in addition, here and there, tegument bears dense short striation (on coxal plates, on telson, and on basal segments in last three peraeopods) well discernible when slightly magnified, which is not observed in ♀♀. The animal is up to 21 mm long (Kara Sea).

It inhabits the northern part of the Atlantic Ocean, the Barents Sea, the southern part of the Kara Sea, and the northern shallow waters of the Siberian seas washed by Atlantic waters which penetrated the Polar basin.

14 . *Anonyx debruyni orientalis* Gurjanova ssp.n. (Figure 84).

It differs from the North-Atlantic and Arctic forms in its upper lip drawn out rather more weakly (this lip extends slightly forward beyond the border of the epistome), its shorter and stouter appendages, a rather more inflated compact body, and the details of the structure in gnathopods 1 and 2, uropods 2 and 3, and peraeopod 3.

Head and eyes similar to those in the typical form; coxal plate 1 relatively broader, but also does not broaden downward. Basal segment in gnathopod 1 thick, armed with setae along the anterior margin and the lower part of the posterior margin; segments 3, 4, and 5 also closely armed with long setae on the margin, which is not observed in the typical form; segment 6 with a broadened base and very strongly broadens distally; posterior margin of hand concave, armed with spines, typical of the species, cleft at the apex; palmar margin shorter yet than that of the main subspecies, concave, almost vertical; dactyl large, when closed extends far beyond the border of palm; segment 5 broader and slightly longer than segment 6. Gnathopod 2 very powerful, stronger than that in Arctic specimens, segment 6 only slightly shorter than segment 5, strongly broadens distally; long palmar margin deeply concave, armed with setae, and, in the distal part, also with short thick spines; dactyl bears short setae along the inner margin and reaches not the middle of the palm, like in the northern specimens, but its end. Locking spine on segment 6 in peraeopods 1 and 2, on the other hand, thinner and more slender than that of the typical subspecies, with rather a larger scale and an enlarged pointed apex. Basal segment in peraeopod 3 considerably broader, its width almost equals its length; segments 3,4, and 5 bear hairs along the anterior margin. Basal segment in peraeopod 4 also broader and scarcely tapers distally; segments 3, 4, and 5 more massive and also armed with setae along the anterior margin.

All branchial vesicles short and broad, without transverse folds. Epimeral plates similar to those in the typical subspecies, only the tooth at the postero-distal angle in peraeopod 3 longer and sharper.

Uropod 2, contrary to that in Arctic specimens, with equal rami; inner ramus without constriction, in structure similar to the outer one; both rami and peduncle lined with spines along the inner margin.

Uropod 3 massive, with almost equal rami; peduncle almost cylindrical, with spines at lower angles, rami $1\frac{1}{2}$ longer than the peduncle. Segment 1 of outer ramus with parallel margins, bears spines along the outer and setae along the inner margins; its apical segment is less than $\frac{1}{4}$ the length of segment 1; inner ramus broadly lanceolate; tapers only at the very end and armed with setae along the inner margin and two - three pairs of spines at the distal end. Telson similar to that in the typical form; sculpture of tegument also coarsely-punctate. Length up to 22 mm.

Figure 84. Anonyx debruyni orientalis Guryanova ssp.n. Sea of Japan, ♂.

Captured in the Sea of Japan - in Peter the Great Bay (3 specimens), at depths of 84 and 180 - 210 m, in Tatar Strait at the coasts of Primorye (4 specimens), and at the west coast of south Sakhalin, at depths of 50 to 54 m (1 specimen); in the Sea of Okhotsk - the eastern part of La Perouse Strait, at a depth of 95 m (1 specimen), and near Paramushir Island (1 specimen), in the Bering Sea, east of St. Lawrence Island (1 specimen).

15. Anonyx eous Guryanova sp.n. (Figure 85).

This species, along with the two that follow (A. birulai sp.n. and A. pavlovskii sp.n.), among all the species of the genus possessing a constriction on the inner ramus in uropod 2, is united into one group by the general trend in regard to the specialization of thsi appendage:

for this group, characteristic of these species is the inequality of the rami in uropod 2 in both sexes; the inner ramus is not only strongly abbreviated, but also broadened in its proximal part (to the constriction), and its thin distal part is drawn out backward. The biological sense of this peculiarity is not clear. As far as other characters (the structure of head and eye pigmentation, the upper lip whose apex is at the same level as the anterior margin of the epistome, basal segments tapering distally in peraeopods 3 and 4, the form of epimeral plate 3) are concerned, _A. eous_ is similar to _A. ampulloides_ Bate and _A. derjugini_ sp.n. It differs from _A. birulai_ and _A. pavlovskii_ in the form and size of eyes, the structure of the upper lip, which in _A. birulai_ and _A. pavlovskii_ protrudes strongly forward beyond the boundaries of the epistome, the form of epimeral plates 1 - 3, the enlarged, tapering distally basal segments in peraeopods 3 and 4, and the armature of the telson. It readily differs from _A. ampulloides_ and _A. derjugini_, besides in the structure of the inner ramus in uropod 2, in the form of epimeral plate 1 whose antero-distal angle is drawn out into a hooked process bent upward, and in the coarsely-punctate sculpture of the tegument.

Head longer than peraeon segment 1; interantennal lobes developed strongly and more pointed than in the preceding species, while the eyes are ralatvely smaller, light-brown, located on the anterior margin of the head, broaden downward. There is a deep saddle-shaped depression on the dorsal side of urosome segment 1, 2 oblong keels on each of the 2 subsequent segments; at the end, these keels form integumental lobes on the sides of the telson's lobes. Segment 1 of peduncle in antenna 1 short and inflated, with an oblong keel on the anterior surface; 2 subsequent segments very short; segment 1 of the flatellum as long as segment 1 of the peduncle; flagellum multisegmented, in ♂♂ with calceoli; accessory flagellum 7-segmented, its segment 1 as long as segment 1 of the main flagellum and bears setae along the lower margin. Last segment of peduncle in antenna 2 narrower and longer than the penultimate, both bear very short coarse setae on the anterior margin, flagellum multisegmented, in ♂♂ with calceoli.

Coxal plate 1 distally broadens along the anterior margin. Gnathopod 1 with a thick basal segment fringed with setae along the anterior margin; segment 5 strongly broadens distally, segment 6 as long as segment 5, with a short oblique palmar margin and 2 large locking spines. Gnathopod 2 with segment 3 strongly enlarged; the latter is longer than half of basal segment and 1½ times longer than inflated segment 4. Segment 5 considerably longer than segment 6; segment 6 in ♀ distinctly broadens distally, its weakly concave palmar margin is lined with setae and tooth-shaped spinules along the lower margin. In ♂ segment 6 in gnathopod 2 weakly broadens toward the middle and again slightly tapers distally; palmar margin transverse, with long setae and tooth-like spinules, dactyl extends slightly further than to the middle of palm, does not reach the palmar angle. At the distal end of segment 6 in peraeopods 1 and 2, at the base of the claw, there is a weak locking spine, without scale; thick setae along anterior margin of segment 6 commence considerably above the locking spine. Coxal plate in peraeopod 3 with a bilobed lower margin, its width considerably larger than its depth;

basal segment strongly tapers distally, forms a rounded lobe with smooth margins at the postero-distal angle. Basal segment in uropod 4 rather larger, weakly tapers distally, and the lobe is pronounced less than in peraeopod 3; basal segment in peraeopod 5 tapers distally, its anterior margin strongly concave in the middle, the lobe is hardly developed, and the crenulation of the posterior margin deeper than that in peraeopods 3 and 4, and especially sharp in its lower part. Branchial vesicles in gnathopod 2 and in peraeopods 1 - 4 very large, fleshy, bear folds and strongly inflated invaginations on both sides; in peraeopods 3 and 4, there is one relatively short sausage-shaped accessory lobule on branchial vesicles; the branchial vesicle in peraeopod 5 three times smaller than the remaining ones, without folds but with 2 rounded invaginations at the neck. At the distal end of peduncle in pleopod 2, there are 2 spinous processes, segment 1 of their rami with plumose setae. Epimeral plate 1 at the antero-distal angle forms a thin hooked pointed process; the postero-distal angle of this plate rounded; plate 2 with a broad lobe at the antero-distal angle, its posterior margin convex, and the pointed postero-distal angle slightly drawn out backward and separated from the anterior lower lobe by a diagonal rib transversing the upper surface of the plate. Epimeral plate 3 broad, with a short tooth at the postero-distal angle. The ends in all three uropods at the same level; peduncle and rami of the first two uropods bear long acicular spines along margins; inner ramus in uropod 2 very short, only about 2/3 the length of the outer one; its upper 2/3 forms a broad wing with a long acicular spine at the apex of a broadened lobe, a similar spine on the lateral surface, and 4 spines on the posterior margin; the lower third of the ramus forms a narrow bent process which is separated from the wing of the broadened part of the ramus by a deep sinus. Uropod 3 with an almost cylindrical peduncle, rami gradually tapering distally, armed with spinules and setae especially abundant in the male. Telson weakly tapers distally, cleft slightly further than to the middle, bears four pairs of lateral spines; the apices of the lobes broadly rounded, with a few (up to 5) thin apical spines. Tegument with a distinct coarsely-punctate sculpture. The animal is up to 35 mm long.

This is an abyssal species, especially abundant at a depth more than 1000 m; it is widely distributed in the Sea of Okhotsk, the Bering Sea, and the Kurile Islands; in the area of the Bering Sea and the Sea of Okhotsk at a depth not exceeding 3000 m, in the Kurile straits, at a depth ranging between 200 and 380 m.

Figure 85A. *Anonyx eous* Gurjanova sp.n. Sea of Okhotsk, ♂.

Figure 85Б. *Anonyx eous* Gurjanova sp.n. Sea of Okhotsk, ♀.

16. *Anonyx birulai* Gurjanova sp.n.[1] (Figure 86).

The structure of head and of antennae, the very large and light eyes, the form and the size of coxal and epimeral plates make this species resemble very much *A. ampulliodes* Bate. However, the abbreviated and broadened proximally inner part of the ramus of uropod 2, the upper lip

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1 Named in honour of A.A. Birula, a prominent zoologist, zoogeographer, and carcinologist.

strongly protruding forward, the form and armature of segment 6 in gnathopod 1 whose palmar margin is not transverse but oblique, segment 6 of gnathopod 2 broadening distally, and the broad basal segment of peraeopod 3 and 4, non-tapering downward, permit us to differentiate easily the species described from _A. ampulloides_. On the other hand, in these namely characteristic features, except the first, _A. birulai_ is related more closely to _A. debruyni_ (Hoek). The structure of uropod 2 and the specific sculpture of the tegument differentiate sharply _A. birulai_ from both species mentioned above.

Body inflated, compact; head as long as peraeon segment 1; interantennal lobe short, triangular, with a blunt apex, directed forward; eyes large, ovate, light-brown, almost yellow in alcohol. Antenna 1: segment 1 of peduncle abbreviated, segments 2 and 3 of peduncle enlarged; segment 1 of flagellum conical, somewhat shorter than segment 1 of peduncle, segment 2 as long as segment 3 and 4 together; in ♀ flagellum 16-segmented, accessory flagellum 7-segmented, its segment 1 slightly shorter than segment 1 of main flagellum. Antenna 2 with a multisegmented flagellum; last segment of peduncle narrower, but as long as the penultimate; on lower margin of segment 4, there are 8 - 10 plumose sensory setae, at the postero-distal angle of segment 5, there are 3 similar setae, while at its antero-distal angle, there is a small pointed process. Lower lip forms a large process with a horizontal upper margin and protrudes far forward, beyond the tips of the epistome, as is the case in _A. debruyni_.

Coxal plate 1 broadens distally with rounded lower angles. Basal segment of gnathopod 1 bears setae on the anterior margin; segment 6 slightly narrower and almost as long as segment 5, weakly tapers distally; its anterior margin convex, posterior almost straight and armed with long, cleft-tipped paired spines resembling the corresponding spines in _A. debruyni_; there are groups of long setae on the lateral surface of the segment; palmar margin straight, serrate-dentate, weakly oblique, armed with 1 large locking spine and a thin acicular spine of same length at palmar angle; dactyl relatively thin, slightly longer than palm, bears an accessory denticle on lower margin. Segment 6 of gnathopod 2 shorter than segment 5, strongly broadens distally, its long transverse palmar margin weakly concave and armed with setae; dactyl greatly bent, extends slightly further than to the middle of palm, devoid of setae on the lower margin.

The locking spine on segment 6 of peraeopods 1 and 2 at the base of claw thick, massive, without scale, covered with concentric striae; along the posterior margin of segment 6, there is an oblong row of paired flat setae overlapping one another.

Basal segment of all last three peraeopods broad, hardly tapers distally, even in peraeopod 4, armed with spinules on the anterior and with denticles along the posterior margins. Segment 4 of peraeopods 3 and 4 enlarged, broadens distally, almost linear in peraeopod 5.

Branchial vesicles of gnathopod 2 simple; in peraeopod 1 with two accessory lobes, but without folds, in peraeopods 2 without accessory lobes, but with transverse folds; in all last three peraeopods, short, with an accessory lobe, and not numerous folds. Epimeral plate 1 forms a short blunt tooth at the antero-distal angle; in plate 2 this angle is broadly rounded; the denticle at the postero-distal angle of plate 3 short, pointed.

Urosome segment 1 with a small saddle-shaped depression and a low oblong medial keel. Segment 3 of urosome with transparent integumental lobes on sides of the base of the telson; ends of uropods 1 and 2 almost at the same level, in uropod 3 extending far beyond the ends of this level. In structure, uropod 2 similar to that in A. eous - the proximal part of the inner ramus strongly broadened, armed with 6 spines on the posterior margin and a long apical spine on the broadly rounded apex of the lobe, the distal narrow part of the ramus bent at an angle to the anterior margin of the broadened part of the ramus; outer ramus with spines along the inner margin, longer than the inner ramus. Telson with broadly rounded apices of lobes and a pair of apical spines. The sculpture of the tegument very peculiar: it is reticulate, but in addition, there are short, desely arranged striae forming transverse rows. The animal is up to 27 mm long.

Figure 86. Anonyx birulai Gurjanova sp.n. Sea of Japan, ♀.

1 specimen (♀) taken in the Sea of Japan in Tatar Strait at the coasts of the Primorye Territory at a depth of 80 m, and 7 specimens (♂♂ and ♀♀) at four stations on the Pacific Platform of Paramushi Island (northern islands of the Kurile range) at depths from

80 - 300 m.

17. *Anonyx pavlovskii* Gurjanova sp.n.[1] (Figure 87).

It resembles *A. birulai*; it differs readily from the latter in the size of its eyes, form 2, and a rather more powerful molar process at the postero-distal angle of epimeral plate 3, the relatively shorter and broader segment 6 of gnathopod 2, and, on the other hand, in a rather narrower and more enlarged segment 6 of gnathopod 1, and the sculpture of the tegument.

Head longer than peraeon segment 1; eyes moderate in size, black, tapering in the middle, weakly broadening downward. Upper lip forms a process strongly protruding in the front, with an almost horizontal upper margin and a rounded apex; interantennal lobe large, broadly triangular. Antenna 1 of the male slightly shorter than antenna 2; segment 1 of peduncle inflated, bears sensory setae on lower margin (8) and a group of rather more sensory setae at its distal end; segments 2 and 3 large, together almost as long as the half of segment 1; segment 3 almost as long as segment 2; flagellum 10-segmented, its segment 1 about one half of segment 1 of peduncle and as long as 5 subsequent segments of the flagellum together; accessory flagellum more than 2/3 the length of the main flagellum, 5-segmented, segment 1 as long as the remaining 4 segments, its apex at the level of the apex of segment 1 of the main flagellum. Seg-

[1] The species is named in honour of Academician Ye.N. Pavlovsky.

ment 4 of the peduncle of antenna 2 thicker and longer than segment 5, both with sensory setae on posterior margin, flagellum 14-segmented, lacking calceoli. Coxal plate 1 slightly broadens distally; basal segment of gnathopod 1 bears setae along the anterior margin; segment 6 slightly longer than segment 5 and narrower than the latter, with a concave posterior margin, slightly tapers distally, its width at the base twice shorter than the length, palmar margin transverse, with 2 large locking spines; along the posterior margin, there are 4 long thin setous cleft-tipped spines and 2 groups of setae with 1 - 2 setae in each. Gnathopod 2 considerably longer and thinner than gnathopod 1; segment 6 somewhat shorter than segment 5, strongly broadens distally; its maximum width 3/4 the length, while in _A. birulai_ the maximum length of this segment only 3/5 its length; palmar margin deeply concave at the very base of the claw, then horizontal and armed with 4 short thick spines at the distal end, while in _A. birulai_ the palmar margin of segment 6 in gnathopod 2 uniformly concave along the entire length and armed only with setae; the dactyl of both species extends slightly further than to the middle of the palm, but in _A. pavlovskii_ it is not smooth but bears short setae along the inner margin. The locking spine at the apex of segment 6 of peraeopods 1 and 2 at the base of the claw has a short scale and a hooked apex; the coxal plate of peraeopod 3 short and broad, considerably broader than deep; basal segment with a very short lobe of a wing-shaped broadening, the greatest width of the segment equals the length of its middle part; segment 4 broadened, as broad as long, segment 5 somewhat narrower than segment 4 and as long, while the width of segment 4 of peraeopod 3 in A. birulai shorter than its length, and segment 5 is almost linear and considerably longer than segment 4. Basal segment of peraeopod 4 with a weakly convex anterior margin whose upper part becomes sharply rounded and extends forward beyond the ends of the anterior margin of coxal plate 6, contrary to A. birulai in which this margin is strongly convex in the middle and its apex does not extend beyond the ends of the anterior margin of the coxal plate; segment 4 also relatively larger than in A. birulai; peraeopod 5 similar in structure to that in A. birulai; however, its basal segment in A. pavlovskii is more straight and not as strongly concave in the middle, if compared with that in A. birulai. Anterior margin of basal segments in all last three peraeopods armed with spinules, posterior margin notched; the notches themselves are more sparse and not as deep as in A. birulai. Branchial vesicles with folds, and, in addition, in peraeopods 3 and 4 have each 1 accessory short sausage-shaped lobule; the branchial vesicle of peraeopod 5 small, twice as short as in the proceding appendages and devoid of folds and accessory lobes. The antero-distal angle of epimeral plate 1 not as sharp, with a rather longer concavity above it than in A. birulai, the antero-distal angle of epimeral plate 2 rounded, while the posterior angle is drawn out and pointed, forming a denticle; the denticle at the postero-distal angle large, with a longer and sharper apex than in A. birulai. Urosome segment 1 with a small saddle-shaped depression, segment 3 with short integumental lobes on the sides of the telson's base. Uropod 2 similar to that in A. birulai, only along the inner margin of the inner lobe there are not 5 - 6, but 4 spines, and the spines along the outer margin of the peduncle not as dense. Uropod 3, on the other hand, is armed with spines more than in A. birulai; peduncle broadens distally with spines at the lower angles; inner ramus only slightly shorter than the outer one and armed with 5 spines and setae along the inner margin; outer ramus with 5 spines along the outer margin, 2 apical spines at the apex of segment 1, 1 on each side, and with a few setae along the inner margin; apical segment about 1/3 the length of segment 1. Telson with broadly rounded apices of lobes armed with 1 apical spine; dorsal spines and setae wanting.

Figure 87A. Anonyx pavlovskii Gurjanova sp.n. East coast of Paramushiro Island, ♂.

Figure 87 . Anonyx pavlovskii Gurjanova sp.n. East coast of Paramushiro Island, ♂ and ♀.

The sculpture of the tegument alveolar, with a spinule in the middle of some of the cells; the surface of the cells has a dense minute punctation. The animal is 15 mm long (♂).

A few specimens (♂♂ and ♀♀) were obtained at the east coast of Paramushiro Island (the northern island of the Grand Kurile Range) from a depth of 60 m, on the sandy-gravel bottom.

18. Anonyx ampulloides Bate, 1862 (Figure 88).

Bate, 1862, Catal. Amphip. Brit. Mus.: 78, t. XII, f. 8; Stebbing, 1888, Rep. Voy. Challenger, 29: 608, pl. III; (non Guryanova, 1951: 225, Figure 90).

Head as long as peraeon segment 1; lateral lobes weakly developed, rounded at the end; eyes very large, light, indistinct in alcohol; occupy almost the entire lateral surface of head and almost contiguous dorsally. On the back side of urosome segment 1, there is a saddle-shaped depression and a low oblong keel, urosome segment 3 on telson's sides forms integumental lobes which are but the continuation of low oblong combs on segment's back side. Segment 1 of peduncle in antenna 1 large, inflated; segments 2 and 3 short; segment 1 of accessory flagellum long, as long as segment 1 of main flagellum and almost as long as the 6 remaining together. Segment 4 of peduncle in antenna 2 broader and longer than the last, both bear each an oblong row of short setae on the anterior margin. Coxal plate 1 weakly broadens distally; segment 6 of gnathopod 1 narrower and slightly longer than segment 5, tapers distally, with 2 spines at the palmar angel and 4 thinner spines in the upper part of the posterior margin of hand; palm transverse, straight; basal segment bears setae on both margins. Segment 6 of gnathopod 2 larger than half segment 5, narrow, slightly tapers distally in both sexes; palmar margin short, weakly concave, dactyl almost reaches the palmar angle, segment 3 two times longer than segment 4; segment 6 of peraeopod 1 with a hooked spinule without scale at the base of the claw. Basal segment of peraeopod 3 strongly tapers distally, with a very short posterior lower lobe; its almost straight posterior margin serrate-dentate, slightly concave at the distal end; anterior margin convex, armed with spinules; segment 4 broadens distally. Basal segment of peraeopod 4 oval, tapers distally, with a narrow drawn out downward lobe of a wing-shaped broadening; segment 4 weakly broadens distally. Basal segment of peraeopod 5 with almost parallel margins, anterior margin slightly concave, posterior margin sharply serrate-dentate; does not taper distally; segment 4 linear. Branchial vesicles of peraeopods 3 - 5 with transverse folds and an accessory lobule; epimeral plate 1 with a blunt triangular and a rounded posterior lower angles; the antero-distal angle of plate 2 forms a broad lobe, while the posterior angle almost straight; epimeral plate 3 with a strongly drawn out (in the form of a blunt 1 lobe) antero-distal angle and a small tooth at the posterior angle. On the peduncle of pleopod 3, there are 2 or more denticles, segment 1 (large) of the ramus with plumose setae. Ends of basal segments and rami of the first two uropods bearing close powerful spinules; rami of uropod 2 almost equal in length, inner ramus at the end of the second third of the length sharply tapers forming a claw-shaped straight process above the base of which, at the apex of a rounded lobe formed by the lower part of the proximal end of the ramus, there is a long setous spine. End of uropod 2 does not reach the level of the end of uropod 1. Uropod 3 with long lanceolate rami, almost equal in size, armed with spinules and setae; the apical segment of the outer ramus small. Telson almost twice as long as broad at its base; it is deeply cleft, with 2 apical spinules and a seta at the broad oblique apex of each lobe and with a few spines and two pairs of sensory setae on the back side. The sculpture of tegument indistinct. The animal is 13 - 16 mm long.

Figure 88A. *Anonyx ampulloides* Bate. East coast of Iturup Island, ♂.

Figure 88 . *Anonyx ampulloides* Bate (Stebbing, 1888). East coast of Iturup Island, ♀.

Earlier was known only from the area of northern Japan, from a depth of 1419 m on the Pacific side. We discovered it in the samples taken north of Shikotan Island at a depth of 414 m (2 specimens, ♀ and ♂), and near the northern islands of the Kurile Range, at a depth more than 200 m (2 specimens, ♂ and ♀). All specimens from the Sea of Japan, determined earlier by us as *A. ampulloides* Bate (Guryanova, 1951), belong to the new species, *A. derjugini*.

19. *Anonyx knipowitschi* sp.n.[1] (Figure 89).

It differs from all other known species in the alveolar sculpture of its tegument with oblong wavy rows of densely arranged short striae and a strongly convex epistome. In the structure of uropods 2 and 3 and gnathopod 1, it resembles the group of species

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[1] Named in honour of N.M. Knipovich, a prominent researcher of the Soviet seas.

4. Segment 6 of peraeopods 1 and 2 at the inner distal angle at the base of the claw with two short thick spines - one hooked, another apicular. Basal segment of peraeopod 3 tapers distally, segment 4 weakly broadens at the end; basal segment of peraeopod 4 long, narrow, almost twice as long as broad, segment 4 almost linear. Peraeopod 5 almost of a similar structure like in the preceding species, but with a relatively narrower basal segment; posterior margin of basal segments of peraeopods 3 - 5 finely notched. Branchial vesicles of gnathopod 2 and of peraeopods without accessory lobes, with scarce transverse folds, the branchial vesicles of pair 2 very small and without folds.

Figure 89. Anonyx knipowitschi Gurjanova sp.n. Bering Sea, ♀.

The antero-distal angle of epimeral plate 1 slightly drawn out forward and down, with a blunt apex; the postero-distal angle of plate 2 almost straight and only slightly drawn out backward. Epimeral plate 3 with a small molar process and a sharply rounded margin. End of uropod 3 extends slightly beyond the tips of the rami of the first two pairs; peduncle and rami 1 and 2 only slightly shorter than the outer, with a constriction; its distal end has the form of a straight process. The rami of uropod 3 relatively short, slightly longer than peduncle, inner ramus almost as long as the outer; both rami bear spines and setae along margins. Telson with narrow lobe apices, bears one pair of apical and one pair of marginal adjoining A. nugax (Phipps), in the structure of gnathopod 2, it is close to A. debruyni in the weakly broadened basal segment of peraeopod 4, with strongly drawn out forward narrowly triangular interantennal lobe and integumental lobes on the sides of telson's base, which also are found in a number of other species (A. ampulloides Bate, A. pavlovskii sp.n., A. birulai sp.n., A. anivae ap.n., A. affinis Ohlin, A. debruyni Hoeck, A. deryugini sp.n., A. oculatus sp.n., and A. laticoxae sp.n.).

Head almost as long as peraeon segment 1; lateral (interantennal) head lobes narrowly triangular, strongly drawn out forward and pointed. Eyes moderate in size, located on the anterior head margin, narrowly separated distally; light-brown, in alcohol slightly yellowish, strongly broaden downward. On the back side of urosome segment 1, there is a weak depression; low oblong keels on segments 2 and 3 form integumental lobes on telson's sides. Segment 1 of the peduncle in antenna 1 cylindrical; segment 1 of the flagellum short; accessory flagellum 7-segmented; its segment 1 as long as segment 1 of the main flagellum; last segment of peduncle of antenna 2 as broad and as long as the penultimate; flagelli of both antennae multisegmented. Coxal plate 1 hardly broadens distally; segment 6 of gnathopod 1 as long as segment 5, with a weakly concave posterior margin; its short, weakly oblique palmar margin with 4 locking spines almost equal in length; at the posterior and anterior ends of hand, there are clusters of setae. Segment 6 of gnathopod 2 considerably shorter than segment 5, very strongly broadens distally, with a deeply concave palmar margin bearing spinules; dactyl reaches only the middle of palm; segment 3 long, considerably longer than segment spines. Contrary to other species, the epistome slightly protrudes above the narrow lingule of the upper lip. The tegument has a distinct alveolar sculpture and vivid striation; short transverse striae fringe the anterior margin of the cells and are arranged in wavy, oblong bands on coxal and epimeral plates and on the basal segments of peraeopods; the striation on the telson also oblong. The animal is 29 mm long.

2 females were taken at a depth of 510 m in the Bering Sea.

20. Anonyx derjagini Gurjanova sp.n.[1] (Figure 90).

Guryanova, 1951: 225, Figure 90 (A. ampulloides err., non A. ampulloides Bate, 1862).

In the general habitus, the structure of gnathopod 1, the epimeral plates, peraeopod 3, uropod 3, and the telson, it resembles A. ampulloides Bate, but sharply differs from the latter in the structure of gnathopod 2 whose segments 5 and 6 equal in length and broaden distally, in a considerably smaller size of the eyes broadening downward, and in the triangular interantennal lobe drawn out forward. The relative length of segments 5 and 6 of gnathopod 2 differentiates A. derjugini also from all other known species of the genus.

Head longer than peraeon segment 1; lateral (interantennal)

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1 This species is named in honour of K.M. Beryugin, a prominent zoologist and researcher of the fauna of the Soviet seas.

lobes well developed, triangular, strongly extended forward and rounded at the apex. Eyes large, narrow in the upper part and broadened downward, light-brown, in alcohol yellowish, located at the anterior end of head and separated dorsally by a broad space. On the back side of urosome segment 1, there is a weak depression; on urosome segment 2, there are 2 low oblong dorsal keels which also continue on last segment and form integumental lobes on the sides of the telson's base. Segment 1 of the peduncle of antenna 1 weakly inflated, segments 2 and 3 very short, flagellum long, multisegmented, with short segment 1; flagella in the male longer than in the female and bears calceoli; accessory flagellum considerably longer than segment 1 of main flagellum, 7-segmented, its segment 1 as long as segment 1 of main flagellum, bears setae on the inner margin. Antenna 2 bears an oblong row of short coarse setae on the anterior margin of the last two segments; there are long setae on their lower side; last segment narrower and considerably longer than the penultimate; flagellum multisegmented. Coxal plate 1 very strongly broadens distally; basal segment of gnathopod 1 with long setae on the anterior margin; segment 6 bent, narrower, and slightly longer than segment 5; palmar margin short, almost transverse, with 2 long powerful locking spines; on the concave surface of the inner margin of hand, there is an oblong row of long setae. Segment 6 of gnathopod 2 strongly broadened distally, only slightly shorter than segment 5, as long as its broadened part; palmar margin weakly concave, with a crown of short broad tooth-shaped spinules; dactyl far from reaching the palmar angle; segment 3 strongly enlarged, longer than segment 4. Segment 6 of peraeopods 1 and 2 with a short powerful spine of a peculiar form at the base of the claw (Figure 90B). The basal segment of peraeopod 3 tapers distally, relatively short and broad, the width of its base slightly shorter than its length; the lobe at the postero-distal angle of the wing-shaped broadening broad and short; segment 4 broadens distally. The basal segment of peraeopod 4 considerably longer than that of peraeopod 3, weakly tapers distally, segment 4 weakly broadens distally. The basal segment of peraeopod 5 slightly longer than that of peraeopod 4, tapers distally, with a concave anterior margin, and a very short, rounded lobe of the wing-shaped broadening; segment 4 linear. The posterior margin of the basal segment of all last three peraeopods serrate-dentate. Branchial vesicles of gnathopod 2 and peraeopods 1 - 4 large, with fleshy inflated surface at the neck, with diagonal large folds on both sides and with pocket-like processes in the proximal part; the branchial vesicle of peraeopod 2 has 1 inflated invagination strongly protruding above the surface of the vesicle, there are 2 such invaginations in peraeopod 3, and, in addition, 1 accessory, short sausage-shaped lobule; there are 2 short accessory lobules in peraeopod 4. The branchial vesicles of peraeopod 5 twice as small as the preceding ones, devoid of folds on its surface, with a long fleshy neck and without accessory lobules. The denticles on the peduncle of pleopod 3 wanting, segment 1 of the outer ramus with plumose setae.

The antero-distal angle of epimeral plate 1 strongly extended forward, pointed, anterior margin concave; postero-distal angle broadly rounded; the antero-distal angle of epimeral plate 2 broadly rounded, postero-distal angle forms a triangular denticle drawn out backward, while the lower margin of the plate concave; the denticle at the postero-distal angle of plate 3 small, directed backward, the lower margin of the denticle oblique and continues gradually into an almost straight lower margin of the plate. The ends of the basal segments and rami of uropods 1 and 2 with long acicular spines. The inner ramus of uropod 2 slightly shorter than the outer, similar in structure to that in the preceding species. The ends of the rami of the first two uropods at the same level, uropod 3 slightly extends beyond its tip. The rami of uropod 3 long, narrow, become pointed at the end, almost similar in length; they are $1\frac{1}{2}$ as long as the basal segment at the lower end of which there are long powerful spines surrounding the base of the outer ramus; the apical segment of the outer ramus small; the ends of the rami armed with spinules and setae. The telson enlarged, weakly tapers distally; cleft more than to the middle; apices of lobes broad, rounded, with an oblique inner margin and 3 - 4 apical spines; ther are found pairs of marginal and two pairs of rather smaller accessory spines at the back side. The tegument with an indistinct alveolar sculpture, granulation, and an indistinct striation. The animal is up to 25 mm long.

<u>Figure 90A</u>. <u>Anonyx derjugini</u> Gurjanova sp.n. Sea of Japan, ♀.

<u>Figure 90Б</u>. <u>Anonyx derjugini</u> Gurjanova sp.n. Sea of Japan, ♀.

It is widely distributed in the Sea of Japan at a depth of 2000 m and more; in the northern part of the sea, it comes to a depth ranging between 300 and 250 m.

21. <u>Anonyx compactus</u> Gurjanova sp.n. (Figure 91)

In the form of its head (rectangular interantennal lobe, strong development of eyes), the structure of its antennae, the epistome, peraeopods 3 - 5, and uropods 2 and 3, this species is similar to <u>A. ampulloides</u> Bate. It readily differs from the latter species in its dark coloured, almost black eyes and the structure of gnathopod 1 - in <u>A. ampulloides</u>, segments 5 and 6 are more massive, their width being only $1\frac{1}{2}$ times smaller than their length, while in <u>A. compactus</u> both these segments narrow, enlarged, and their width $2\frac{1}{2}$ times smaller than their length.

<u>Figure 91A</u>. <u>Anonyx compactus</u> Gurjanova sp.n. Iturup Island, ♂.

<u>Figure 91Б</u>. <u>Anonyx compactus</u> sp.n. Iturup Island, ♂ and ♀.

Head as long as peraeon segment 1; interantennal lobe with a blunt apex. Eyes moderate in size, black, brownish in hue, broaden downward. Urosome segment 1 with a deep depression on the dorsal side forming a sinus. Both antennae in the male with calceoli. Last 2 segments of the peduncle of antenna 1 abbreviated; segment 1 of the flagellum slightly shorter than segment 1 of the peduncle, there is a short spinule at its distal end, as there is one at the distal end of segment 2. Accessory flagellum 7- 8-segmented, its enlarged segment 1 bears thin spinules along the inner margin. In the male, there is a small medial keel on segment 1 of the peduncle in antenna 1, and 8 sensory plumose setae on the lower surface at the distal end. Last 2 segments of the peduncle in antenna 2 equal in length; there are sensory plumose setae on the lower margin of the penultimate segment of the peduncle. The epistome with a concave anterior surface; lower lip, separated by a sinus from the epistome, rounded and does not extend beyond its tips. Oral parts normal in structure; the outer plate of maxilla 1 has a dense cluster of acicular setae at the border where the oblique lobe apex continues into its inner margin. The acicular spines of the inner margin of the outer plate of maxilla 2 with 3 - 4 accessory spinules near the middle of their lower margin. The inner plates of the maxillipeds have plumose setae at the apex and along the inner margin. Along the anterior margin of last two segments of the peduncle in antenna 2, there are quadrancular plates, each with 1 hair-like spinule at the centre. Gnathopod 1 with segment 6 tapering distally, its width at the distal end 4 times smaller than its length; the short transverse palmar margin has two spines; similar spines found also on the posterior margin of the hand bearing, in addition, setae; dacyl considerably longer than palm, with an accessory denticle on the lower margin and spinules on the outer margin; segment 5 slightly longer and, at the distal end, slightly broader than segment 6; gnathopod 2 thin, long; segment 6 almost twice as short as segment 5, gradually broadens distally, with a short transverse convex palmar margin; dactyl well developed, falls slightly short of reaching the end of palm.

Peraeopods 1 and 2 at the distal end of segment 6, at the base of the claw, bearing a large thick locking spine devoid of scale at the base; its apex rounded, and the surface covered with a distinct diagonal striation. Peraeopods 3- 5 with a distinctly notched posterior margin of basal segment. Branchial vesicles with folds in the proximal part in gnathopod 2 and peraeopod 1 and 2, and in peraeopods 3 and 4, in addition, with short sausage-shaped accessory lobules; the branchial vesicle of peraeopod 5 small, simple, without folds, but with 1 accessory lobule. At the inner distal angle of the peduncle of pleopods, there are 2 pectinate hooked spinules. Epimeral plate 3 with a well developed, large denticle and, sometimes, with a small accessory denticle at its base. Uropod 1 extends beyond the level of the ends of uropod 2; peduncle and both rami of uropods 1 and 2 lined with marginal spines.

The inner ramus of uropod 2 slightly shorter than the outer, with a well developed constriction and a long spine at the lobe's apex (which is the termination of the broad part of the ramus). The rami of uropod 3 considerably longer than the peduncle, gradually tapering distally, almost of same length, with marginal spines along the outer margin of the outer ramus and with setae along the inner margin of the inner ramus; apical segment of the outer ramus large, slighlty shorter than half segment 1. Telson deeply cleft, with broadened apices each bearing 1 apical spine. The sculpture of the tegument resembles that of the representatives of the genus Hippomedon: regular cells with a microscopic spinule at the centre of almost every cell. The animal is up to 14 mm (♀) and 18 mm (♂) long.

About 40 specimens were obtained on the Pacific Platform of Iturup Island at depths ranging from 30 to 414 m; individual specimens were taken from the areas of the islands of the Kurile Range in the Pacific Ocean and in the Sea of Okhotsk,as well as in the northern Kurile straits at a depth of 35 - 65 m; in the Sea of Okhotsk - in Terpeniya and Aniva bays, at depths ranging from 23 to 125 m; at Cape Levenorn (east coast of south Sakhalin), and in the northern shallow waters; 1 specimen was taken in the Sea of Japan, Tatar Strait, at a depth of 65 m.

22. Anonyx oculatus Gurjanova sp.n. (Figure 92).

This species resembles A. ampulloides Bate. Head slightly longer than peraeon segment 1; interantennal lobes almost rectangular, directed downward; eyes large, ovate, taper in the middle, light brown, red-hued in alcohol, occupy a considerable part of the lateral side of head, but dersally divided by a broad space. Peraeon segment 1 slightly longer than segment 2. Urosome segment 1 with anterior part inflated in the form of a hump and a deep saddle-shaped depression, segment 2 of urosome short, segment 3 with integumental lobes on the sides of the telson's base. Antenna 1 with enlarged segments 2 and 3 of the peduncle; its segment 1 with 1 low medial keel overlapping more than half the anterior margin of segment 2; flagellum 10-segmented in ♀♀ and multisegmented in ♂♂; its segment 1 conical, as long as 4 subsequent; accessory flagellum 5-segmented; its segment 1 slightly longer than segment 1 of main flagellum, cylindrical, as long as segments 2, 3, and half segment 4 together; smooth on the outer margin. Antenna 2 longer than antenna 1, in ♂♂ with a considerably longer and thinner flagellum than in the female; segment 4 of peduncle thicker and longer than the last, with dense clusters of long setae at the postero-distal angle, bears 8 long sensory setae densely covered with thin hairs. Coxal plate 1 weakly broadens distally. Basal segment of gnathopod 1 bears setae on the anterior margin; segment 6 slightly shorter than segment 5, with almost parallel lateral margins and a short oblique palmar margin armed with two locking spines; there are 2 groups of setae on the posterior margin. Gnathopod 2 with enlarged segment 3 which is considerably longer than segment 4; segment 6 large, broadens distally, considerably longer than half segment 5; its palmar margin almost transverse, dactyl as long as palm. Segment 6 of peraeopods 1 and 2 with setae along the posterior margin and a thick blunt striated locking spine. Anterior margin of basal segment in all last three peraeopods armed with spinules, posterior margin dentate. Segment

4 of peraeopods 3 and 4 enlarged, broadens distally, longer than broad; segment 4 of peraeopod 5 almost linear. Branchial vesicles of gnathopod 2 simple, in peraeopods 1, 2, and 3 with 1 short sausage-shaped accessory lobules; branchial vesicles of peraeopod 5 very small, without folds and accessory lobes; transverse folds present only in the proxiaml part of the branchial vesicles of peraeopods 1 and 2. The denticle at the postero-distal angle of epimeral plate 3 large, with an obliquely truncated posterior margin. Inner ramus of uropod 2 shorter than the outer, with a constriction; the lobe of the broadened part of the ramus well developed, with a long spine at the apex; there are 2 short spines along the inner margin of the ramus; outer ramus with 3 spines along the inner margin. Uropod 3 extends slightly beyond the ends of uropod 1; its peduncle broadens distally and bears spines at the inner lower angle; the inner part of the ramus slightly shorter than the outer, armed with spines on both margins; outer ramus with spines at the distal end and on the outer margin of segment 1; apical segment about half the length of segment 1. Telson with broad lobe apices and a pair of apical spines; there is 1 small plumose setae on the outer side of each of these spines. Tegument lacking specific sculpture. The animal is up to 18 mm long.

Figure 92A. *Anonyx oculatus* Gurjanova sp.n. Sea of Okhotsk, ♀.

Figure 92B. *Anonyx oculatus* Gurjanova sp.n. Sea of Okhotsk, ♀.

The species described differs from *A. ampulloides* Bate in a somewhat smaller size of its eyes, dorsally separated by a rather large space, in the pointed, almost rectangular interantennal head lobes, the rather more enlarged segments 2 and 3 of the peduncle in antenna 1, the form of the basal segments in peraeopods 3 and 4, the very large apical segment of the outer ramus of uropod 3 whose bath rami are rather narrower and more extended, as well as in the considerably weaker armature of spines along the margin of the peduncles and the rami in all three uropods, in the fact that segment 6 of gnathopod 1 not longer but shorter than segment 5 and its palmar margin not transverse but oblong; the denticle of epimeral plate 3, on the other hand, considerably larger and of a different shape.

3 specimens captured in Bussol Strait at a depth of approximately 100 m, 1 specimen comes from the Sea of Okhotsk, Shelekov Bay, at a depth of 115 m, and 1 specimen was taken in the Pacific Ocean, east of Iturup Island, at a depth of 414 m.

23. *Anonyx ochoticus* Gurjanova sp.n. (Figure 93).

It is close to the preceding species *A. oculatus* sp.n. It differs from the latter species in a well developed triangular, extended forward and pointed interantennal lobe, in a considerably smaller size of its eyes, the rather shorter segment 1 of the flagellum of antenna 1, and the inguliform upper lip strongly protruding forward beyond the ends of the epistome. Segment 3 of gnathopod 2 not longer, but as long as segment 4, segment 6 not larger, but as long as half segment 5; apical segment of the outer ramus of uropod 3 shorter, less than half of segment 1; telson's armature different, it is armed with two pairs of dorsal spines and sensory (paired) setae, which in A. oculatus are wanting.

Figure 93A. Anonyx ochoticus Gurjanova sp.n. Southern part of the Sea of Okhotsk.

Figure 93B. Anonyx ochoticus Gurjanova sp.n. Southern part of the Sea of Okhotsk.

Head considerably longer than peraeon segment 1; internatennal lobe triangular, extended forward and pointed. Eyes light-brown in alcohol, moderate in size, enlarged along head's height, taper in the middle and weakly broaden downward. Urosome segment 1 with a concave dorsal surface and a somewhat rounded dorsal keel at the segment's posterior margin; segment 3 of urosome lacks lobes on the sides of the telson's base. Segment 1 of the peduncle in antenna 1 weakly inflated, without keel; segments 2 and 3 well developed; flagellum 10-segmented; its segment 1 relatively short, as long as the two subsequent segments together; accessory flagellum long, 5-segmented; its segment 1 as long as the two subsequent and as segment 1 of the main flagellum; there are a few setae on its inner surface. Antenna 2 slightly longer than antenna 1; segment 4 of peduncle thicker and longer than the last, bears short setae on the anterior margin and a cluster of long setae at the postero-distal angle; there are 5 - 6 sensory setae on the posterior margin; there are also short setae on the anterior margin of the last segment; flagellum 10-segmented. The upper lip linguliform and extends strongly in front of the epistome. Coxal plate 1 broadens distally; basal segment of gnathopod 1 bears setae along the anterior margin; segment 6 slightly shorter than segment 5, slightly tapers distally; its palmar margin short, weakly oblique, armed with two uneven locking spines; there are spinous setae along the posterior margin of hand; claw slightly longer than palm. Gnathopod 2 with enlarged segment 3; segment 6 about half as long as segment 5, oval; palmar margin concave, short; dactyl slightly shorter than palm. Segment 6 of peraeopods 1 and 2 with a strongly hooked locking spine with a scale at the base of claw and with paired setae along the posterior margin. Basal segment of peraeopod 3 markedly tapers distally; segment 4 weakly broadens distally, longer than broad. Anterior margin of all last peraeopods bears spinules, posterior margin slightly notched. Branchial vesicles simple, only pair 1 (in gnathopod 2) has a few transverse folds, and last three pairs with a short sausage-shaped accessory lobule. The denticle at the postero-distal angle of epimeral plate 3 large, with an obliquely truncated posterior margin. Uropod 1 extends slightly beyond the borders of the level of the ends of uropods 1 and 2. The inner ramus of uropod 2 slightly shorter than the outer, with a deep constriction; there is a long spine at the apex of the lobe of the broadened part of the ramus; on the inner ramus, there are 2 spines. The outer ramus with 4 large spines on the inner margin. Uropod 3 with narrow, gradually pointing rami; peduncle weakly broadens distally and, at the lower angles, is armed with spines; the inner ramus slightly shorter than the outer, with 3 spines along the inner margin and a pair of spines at the distal end of segment 1; apical segment large, slightly shorter than half the length of segment 1. Telson with a deep notch at the lobe's apices; within the notch, there are an apical spine and a seta, with two pairs of dorsal spines and two pairs of sensory setae. Tegument lacking specific sculpture. The animal is 12 mm long.

Discovered in the Sea of Okhotsk, in the eastern part of La Perouse Strait, at depths of 95, 118, and 263 m (16 specimens), at the east coast of south Sakhalin at depths of 69 and 187 m, and at the west coast of Kamchatka, at a depth of 200 m.

24. Anonyx schokalskii Gurjanova sp.n.[1] (Figure 94).

Figure 94. Anonyx schokalskii Guryanova sp.n. Mordvinov Bay (Sea of Okhotsk).

It resembles most A. ochoticus Guryanova, but the eyes are black, upper lip forms a powerful process with a horizontal upper margin and protrudes much beyond the borders of the epistome, like in A. debruyni; compared with A. ochoticus, it possesses a different form of epimeral plates and strong armatures of spines on the rami of uropod 3. Head slightly longer than peraeon segment 1; interantennal lobe large, broadly triangular, with a blunt apex; eyes black, ovate. Antenna 1 shorter than antenna 2; segment 1 of peduncle weakly inflated, almost cylindrical, segments 2 and 3 relatively large; accessory flagellum 6-segmented, its segment 1 long, longer than segment 1 of the main flagellum, as long as the remaining 4 segments together and armed with a few setae along the upper margin. Last segment of peduncle of antenna 2 narrower and almost as long as segment 4. Upper lip forms a large linguliform process which

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[1] This species is named in honour of Uy.M. Shokalsky, a very prominent geographer and ocenaographer.

extends forward far beyond the borders of the epistome; coxal plate 1 relatively short and broad, very weakly broadens distally. Basal segment of gnathopod 1 thin, bears setae on the anterior margin; segment 6 almost as broad and as long as segment 5, relatively narrow, as it is twice as long as broad, weakly tapers distally; palmar margin short, weakly oblique, finely notched, armed with 1 powerful and 1 spinous locking spines and a small spinule at the base of the claw; the long posterior margin of hand armed with 4 spines and groups of setae; dactyl slightly longer than palm. Gnathopod 2 with a strongly enlarged segment 3; segment 6 about half the length of segment 5, oblong-oval, its greatest breadth twice as small as its length; palmar margin very short, angle drawn out forward, concave; distal part of posterior margin covered with setae turned into scales overlapping one another; there are 3 large, shortly plumose, along the inner margin, setae slightly above the middle of the posterior margin; claw short, reaches the end of palm and forms, together with the latter, a small claw. The locking spine at the apex of segment 6 of peraeopods 1 and 2 at the base of the claw hooked, with a small scale approximately in the middle of its inner margin. In structure, peraeopods 3 - 5 similar to those of A. ochoticus, but coxal plate of pair 3 with a very indistinctly bilobed lower margin, and its depth smaller than the length of the basal segment, contrary to A. ochoticus in which the depth of the coxal plate of peraeopod 3 as long as the basal segment; segment 4 of peraeopod 3 quite broadened, as broad as long, while this segment in A. ochoticus weakly broadens distally and longer than broad. Segment 5 considerably narrower and longer than segment 4, while in A. ochoticus it is narrower, but as long as segment 4; segment 4 of peraeopods 4 and 5 also relatively broader and shorter than in A. ochoticus, noticeably broadens distally, which is not observed in A. ochoticus. The form of all three epimeral plates quite different: plate 1 with a drawn out forward short, rounded at the end, process at the antero-distal angle, plate 2 almost square, with almost straight postero- and antero-distal angles and a concave lower margin, the denticle at the postero-distal angle of epimeral plate 3 rather larger and broader, with a uniformly rounded posterior margin, while in A. ochoticus this denticle shorter, and its posterior margin obliquely truncated. All branchial vesicles have folds. Urosome segment 1 with a weak saddle-shaped depression and a low rounded keel behind this depression. Uropod 2 with a short peduncle broadened at the base, armed with spines along the inner margin; inner ramus slightly shorter than the outer, with a distinct constriction; its broadened proximal part not broader than the outer ramus; there is 1 spine on the inner margin; at the apex of the lobe of the broadened part of the ramus, the spine large, but it does not reach the end of the distal process of the ramus; there are 4 - 5 spines along the inner margin of the outer ramus. The peduncle of uropod 3 almost cylindrical, slightly shorter than the rami; armed with groups of spines at distal angles; inner ramus longer than segment 1 of the outer ramus; both rami armed with spines not only on margins, but also on lateral surfaces; there are setae on the outer margins of both rami. Telson enlarged, lobes do not diverage, bears 1 spine at the apex of the lobes and three pairs of dorsal spines. In alcohol, the animal is reddish-violet, the maximum length being 12 mm.

Several specimens were captured in the Sea of Okhotsk at the east coast of south Sakhalin, on the mud ground, at a depth of 61 m (Mordvinov Bay).

25. Anonyx laticoxae Gurjanova sp.n. (Figure 95).

It differs from all other species of the genus in its very broad coxal plate 1; along the lower margin, its width greater than its height, the antero-distal angle drawn out forward and rounded, forming a small rounded lobe; plate 2 also broadens distally. It resembles most A. lilljeborgi Boeck, and especially A. kurilicus sp.n. Besides the considerably broader coxal plate 1, it differs readily from both species in the light-brown, and not black, colouration of its eyes, in the enlarged segment 1 of the flagellum of antenna 1 (which at least twice exceeds the length of its subsequent 4 segments together), in the enlarged last segment of the peduncle of antenna 2 (which is not shorter, but as long as segment 4), in the form of epimeral plate 2 the postero-distal angle of which is drawn out into a pointed triangular process directed back and downward, in the rather more weakly broadened basal segment (especially in peraeopod 4) in last three peraeopods, in the rather more massive and broadened rami of uropod 3, similar to those in A. nugax (Phipps), and in the coarsely-punctate sculpture of its tegument. Also very characteristic of A. laticoxae is segment 6 of gnathopod 1, which is even larger than in A. kurilicus, the length of which is at least $1\frac{1}{2}$ times larger than that of segment 5.

Figure 95. Anonyx laticoxae Gurjanova sp.n. East coast of Paramushiro Island, ♂.

Head almost as long as segment 1 with a small rostrum. Eyes large, L-shaped, broadened in the lower part, light-brown in alcohol. Urosome segment 1 with an oblong medial and two lateral keels which continue on segments 2 and 3 and form integumental lobes along the sides of the telson's base. Uropod 2 much shorter than uropod 1. Antenna 1 with a strongly inflated segment 1 and with short segments 2 and 3 of the peduncle; segment 1 of the multisegmented flagellum 8-segmented, twice as long as segment 1 of the main flagellum, with enlarged segment 1. Antenna 2 with a multisegmented flagellum, which is especially long in ♂♂, bearing calceoli; last segment of the peduncle narrower, but as long as the penultimate. Upper lip rounded, does not extend beyond the borders of the epistome and not separated from it by a deep sinus. Oral parts normal for the genus. Gnathopod 1 with a thick basal segment fringed with setae along the anterior margin; segment 5 short, cup-shaped; segment 6 $1\frac{1}{2}$ times longer than segment 5, tapers distally, with a concave margin of the hand bearing setae, and a short, straight transverse palmar margin with 1 locking spine; claw sharp, smooth on the lower margin, slightly longer than palm. Gnathopod 2 with a long segment 3, which is longer than segment 5; segment 6 oval, about 2/3 length of segment 5, with a transverse, weakly concave palmar margin and a short dactyl reaching the end of palm; segment 5 without the "pine-apple cushion". Peraeopods 1 and 2 with a large locking spine devoid of scale at the base of the claw and thick sharp spines and setae along the posterior margin of the coxal plate of peraeopod 3 bilobed; the basal segment slightly tapers distally, segment 5 longer than segment 4, slightly tapers down. The basal segments of peraeopods 4 and 5 also taper distally, with a very short lower lobe; the anterior margin of the basal segment of peraeopods 3 - 5 lined with fine spinules, posterior margin finely notched.

The posterior margin of epimeral plate 2 strongly convex; its postero-distal angle drawn out into a sharp maolar process; the denticle at the postero-distal angle of epimeral plate 3 short and broad. Uropod 1 with equal rmai, armed with spines; uropod 2 short, with weakly armed rami; inner ramus simple, without a constriction. Uropod 3 with a short peduncle and long lanceolate, almost equal, rami armed with spines and setae. Telson long, hardly tapers distally, cleft at its 4/5 of length, bears three pairs of marginal and a pair of apical spines and 2 plumose setae on each side of the end of the telson's cleft. Tegument covered with a coarse punctate sculpture. The animal is up to 27 mm long.

Several specimens (♂♂ and ♀♀) were captured on the Pacific Platform of Paramushino Island (the Kurile Range) at a depth of about 150 m.

24. The Genus ARUGA Holmes, 1909

Holmes, 1909, Proc. U.S. Nat. Mus., XXXV: 504; Pirlot, 1936, Siboga-Exp., XXXIIIё: 256; 263; J.L. Barnard, 1955, Bull. So. Californ. Acad. Sci., 54, p. 2: 97.

Our collections lack the representatives of this genus. The diagnosis is given in accordance with Holmes, with Pirlot's specifications.

Coxal plate deep. Antennae short, segment 2 of peduncle in pair 1 not very short, segment 3 very short, accessory flagellum well developed. Segment 1 of main flagellum enlarged and bears setae, peduncle of pair 2 lacks broadened segments. Upper lip extended forward into a rounded keel-shaped process separated from the epistome by a narrow slit. Mandibles relatively narrow; palp thin, 3- segmented and attached about the middle of the body of the mandible; the cutting edge narrow and lacking denticles; molar process quite powerful, with a triturating surface and located closer to the distal end of the body of the mandible than to the palp; there are 4 elements in the dental row of the setae. Maxilla 1 with a narrow inner plate, with 1 or 2 (!) plumose terminal setae; palp 2-segmented, bent around the oblique outer lobe armed with notched spines, segment 2 finely-dentate at the distal end. The plates of maxilla 2 narrow and long, equal in length, bear setae at the distal end. Maxillipeds with narrow inner plates, without spinules and reach the middle of the outer plates; outer plates devoid of spinules, finely dentate along the margin; palp thin, its segment 4 falcate. Gnathopod 1 simple; gnathopod 2 with a subchela (almost a small true claw). Peraeopods quite thin, basal segments of all last three pairs strongly broadened. Branchial vesicles with folds on both sides. Uropods with styloid rami, last uropod smaller than uropod 1 and uropod 2, with equal rami. Inner ramus of uropod 2 with a constriction and a spine above this constriction. Telson short, entire.

This genus resembles Lysianella G. Sars, but differs from it in the presence of a quite powerful molar process with a triturating surface on the mandibles and in the simple segment 6 of gnathopod 1 which does not form a subchela with the dactyl. The type of the gnus A. oculata Holmes. Pirlot (1936) notes the close resemblance among the genera Lysianassa Milne-Edw., Aruga Holmes, Arugella Pirlot, and Shoemakerella Pirlot; the last two segments of the peduncle of antenna 1 in the representatives of all these genera not short, as it is typical of the lyssianassids, but enlarged; the upper lip forms a linguliform lobe which strongly extends forward beyond the borders of the epistome, and is separated from the latter by a deep sinus; the branchial vesicles of all 4 genera have folds. However, there are common characteristic features which, on the one hand, bring Lysianassa closer to Arugella (in the structure of maxilla 1), Aruga to Shoemakerella (also in regard to the structure of maxilla 1), and Aruga to Arugella (in the structure of maxilla 2); on the other hand, Aruga, Arugella, and Shoemakerella (in the structure of uropod 3), hence they could be united into one genus (Lysianassa Milne-Edw.). However, each of the genera has also its specific features which, in some cases, are generically important, and Pirlot considers it rather more expedient to acknowledge now all 4 genera. We cannot solve this problem as the representatives of these genera are not present in our collections.

J.L. Barnard (1955) justly assigns Lysianopsis Holmes, 1904 (1905) to this same group of genera and points out that the genera Lysianassa, Aruga, Arugella, Shoemakerella, and Lysianopsis form a special group of the family Lysianassidae which possess a number of features that differentiate them from other lysianassids. Characteristic of all these

5 genera are: 1) simple gnathopod 1, devoid of the subchela; 2) entire telson; 3) upper lip extending in front of the epistome (this lip is broadened into a large vertical plate); 4) simple, smooth cutting edge of the mandibles; 5) lack of the molar process in mandibles; 6) oral parts non-prickly; 7) paired eyes; 8) coxal plates 1 and 2 moderate in size; 9) 2-segmented palp of maxilla 1; 10) 4-segmented palp of maxillipeds, and 11) biramous uropod 3. The differences among these genera are, relatively speaking, not great; they are given in the table compiled by Barnard and listed below:

1 (2). Peduncle of uropod 3 simple, cylindrical.......... Lysianassa.

2 (1). Peduncle of uropod 3 broadens distally into a narrow plate extended above the base of the inner ramus.

3 (4). Maxilla 1 with two types of spines on the inner lobe... ....Arugella.

4 (3). Maxilla 1 with 1 type of spines on the inner lobe.

5 (8). Antenna 2 equal in both male and the female.

6 (7). Inner plate of maxilla 2 massive.........Shoemakerella.

7 (6). Inner plate of maxilla 2 weak, thin,.................. Lysianopsis.

8 (5). Antenna 2 of the male much longer than that of the female..........Aruga.

To the genus Aruga belong 5 species: 4 species from the northern part of the Pacific Ocean and 1 species from the Antarctic. However, Pirlot considers (1936) that A. macromerus Shoemaker should be assigned to another genus; A. subantarctica Schellenberg remains doubtful, until a male of this species is discovered; as regards A. dissimilis, the opinions vary: Pirlot includes this species in the genus Aruga, while according to J.L. Barnard, this species should be identified as a special new genus, since the structure of its upper lip and epistome is different from those of the species Aruga. Thus, the classification position has been accurately determined only for two species, i.e. A. oculata and A. holmesi.

1 (8). Upper lip strongly extends forward beyond the borders of the epistome; the surface of the latter concave.

2 (3). There is a short tooth-shaped process directed backward and up at the postero-distal angle of epimeral plate 3.........1. A. oculata Holmes, 1909.

3 (2). No tooth-shaped process present at the postero-distal angle of epimeral plate 3.

4 (7). The postero-distal angle of epimeral plate 3 straight.

5 (6). Posterior margin of epimeral plate 3 strongly convex... ....4. A. holmesi J.L. Barnard, 1955.

6 (5). Posterior margin of epimeral plate 3 straight......... 2. A. macromerus Shoemaker, 1916.

7 (4). The postero-distal angle of epimeral plate 3 rounded... ....* A. subanterctica Schellenberg, 1931.

Swedish Antarct. Exp., II, No. 6: 9, f.3.

(Southern part of the Atlantic Ocean at the coast of South America).

8 (1). Upper lip does not extend forward beyond the borders of the epistome whose surface is strongly convex..........3. A. disimilis (Stout, 1913).

1. Aruga oculata Holmes, 1909 (Figure 96).

Holmes, 1909, U.S. Nat. Mus., XXXV: 505, f. 14, 15.

Only 2 specimens know, both females. Description in accordance to Holmes (the generic characters omitted).

Figure 96A. Aruga oculata Holmes. According to Holmes, 1909.

Figure 96B. Aruga oculata Holmes. According to J.L. Barnard, 1955.

Eyes large, extended in regard to height. Lateral head angles extended into a pointed triangular lobe. Segment 2 of the peduncle of antenna 1 almost as long as broad, segment 3 very short; segment 1 of the flagellum enlarged, accessory flagellum 5-segmented. Antenna 2 almost as long as antenna 1, last two segments of the peduncle almost equal in length. Gnathopod 1 quite powerful; coxal plate 1 broadens distally, large. Gnathopod 2 with a very narrow basal segment, segment 6 about half as long as segment 5, broadens distally and forms, with the dactyl, a small claw. Segment 4 of peraeopods 1 and 2 broadens distally and forms a pointed lobe drawn out downward at the postero-distal angle. Peraeopod 3 short, basal segment broadened, as broad as long, segment 4 broadened, with the postero-distal angle drawn out downward. Peraeopods 4 and 5 longer. Their broad basal segment notched along the posterior margin, segment 4 slightly broadened in peraeopod 4, dactyls narrow and smooth. Epimeral plate 3 with a notch above the small lateral angle. Urosome segment 1 has a dorsal depression at the base. The ends of the rami of uropods at the same level; their peduncle armed with spines which are well developed in uropod 2 and small in uropod 3.

The rami of uropod 1 equal, shorter than the peduncle, pointed at the end and bear several spines; rami of uropod 2 equal in length and much longer than the peduncle; inner ramus with a constriction, has a little lobe at the end of the second third of the length, with a large spine at the apex and a narrow pointed distal end. Uropod 3 with narrow, equal rami which are shorter than the peduncle and bear each one or more small spinules at the apex. Telson slightly longer than broad, its posterior margin slightly concave and bears a pair of very short setae on sides. The animal is 14 mm long.

Obtained (2 specimens) at a depth of nearly 50 m near south California (Cape Lom*).

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* Transliterated from Russian. Translator.

2. <u>Aruga macromerus</u> Shoemaker, 1916.

Shoemaker, 1916, Proc. Biol. Soc. Washington, XXXIX: 157.

The diagnosis is in accordance with Shoemaker. Only one male known.

It differs from the preceding species in that it has several small setae at the apex of the inner plate of maxilla 1, while the plates of maxilla 2 are not as narrow.

Eyes large, oval, black. Lateral head lobes with a slightly bent anterior margin bearing several small setae, their anterior angle rounded. Segment 1 of the peduncle of antenna 1 thick, segments 2 and 3 much smaller; flagellum 7-segmented; accessory flagellum 5-segmented. Antenna 2 with segment 4 slightly broadened below, flagellum 8-segmented. The postero-distal angle of epimeral plate 3 straight; dorsal side of body segments without processes. Gnathopod 1 simple, dactyl small and weak. Segments 4, 5, and 6 with clusters of thin setae on the lower surface. Gnathopod 2 long and very thin, segment 4 below has thin setae, segments 5 and 6 densely covered with thin setae, dactyl very small and weak. Segment 4 of peraeopods 1 and 2 broadened, with the antero-distal angle drawn out downward; at the lower end of segment 6; there is a small scale pointed backward, which is almost as long as half the length of the dactyl. The basal segment of peraeopods 3 - 5 broadened and behind forms a broad lobe drawn out downward; segment 4 strongly broadened and also forms a lobe, drawn out downward whose apex almost reaches the lower end of segment 5. The branchial vesicles of peraeopod 1 and 2 have accessory lobules. The epistome extends forward beyond the borders of the upper lip and rounded. Mandibles long and narrow, the palp behind the middle of the body; the cutting edge smooth, the lobe extended forward, just above the cutting edge; there are 3 setae in the tooth row, the molar process small, pointed. Maxilla 1 with a narrow inner plate bearing several small setae at the apex; the outer plate with large 6 spines notched on the inner margin; segment 2 of the peduncle long, notched at the apex; the palp bent parallel to the outer margin of the outer plate. The plates of maxilla 2 narrow, oval, with spines on the inner margin. The inner plates of the maxillipeds narrow, with setae along the inner margin and 1 - 2 spinules at the apex, the outer plates broad, oval, with 6 - 7 small spinules on the inner margin notched in the upper part; segment 4 of the palp falcate. Uropod 1 longer than uropods 2 and 3, its rami pointed, shorter than the peduncle, the outer ramus slightly longer than the inner. Rami of uropod 2 equal, inner ramus with a constriction at the distal end and a spine at the apex of the lobe of the proximal part. Uropod 3 shorter than uropod 2; rami shorter than the peduncle, outer ramus longer than the inner; lower angles of peduncle square and drawn out downward. Telson short, with convex lateral margins, lower margin forms a blunt angle with s small spinule on each side of this angle.

The animal is 5 mm long.

1 speciment obtained near south California.

The position of this species in the genus Aruga is doubtful.

3. Aruga dissimilis (Stout, 1913)[1] (Figure 97).

Stout, 1913, Zool. Yahrb. /Sic! Translator/ Systemat., Geogr. u. Biol. Tiere, 34: 638, f. A-C (Mannonyx); Shoemaker, 1941, Proc. Biol. Soc. Washington, 54: 187; 1942, Smits. Miscell. Coll., 101, No. 11: 7, f. 2; J.L. Barnard, 1955, Bull. So. Californ. Acad. Sci., 54, 2: 100, pl. 29, f. g., i.

J.L. Barnard (1955) writes that this species is difficult to distinguish from A. holmesi, that even the sex differences are the same in these both species; however, the differences in the structure of the upper lip are so great that they are beyond one's imagination regarding the genus Aruga, since the epistome in all other species of this genus is concave and the lower lip forms a plate extending forward far beyond the ends of the epistome, while in A. dissimilis, contrary to this, the epistome is strongly convex and extends forward to the level of the anterior margin of the upper lip. Unfortunately, the author of this species does not furnish us with figures and restricts himself to a short description the translation of which follows below.

Body powerful, arched, smooth. Head lacking rostrum; lateral

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[1] The description by the author of this species is so bad and deprived of individuality that Shoemaker, 1916, using his words "hardly recognized this species". Shoemaker recognizes the existence of this species inhabiting in large numbers the waters of south Califormia, but he does not prsent his description, although his work of 1942 contains good figures.

head lobes large, triangular. Eyes large, black, irregular in outline, sometimes marging dorsally. Coxal plates deep, smooth, plate 5 about half the depth of plate 4, bilobed, both lobes equal in size. Peduncle of antenna 1 powerful, segment 1 enlarged, segments 2 and 3 short, segment 2 slightly longer than segment 3; flagellum 13-segmented, accessory flagellum 8- 9-segmented. Antenna 2 almost as long as antenna 1, thin, peduncle longer than 14-segmented flagellum; penultimate segment of peduncle long, segment 3 slightly shorter than the last. Gnathopod 1 long, thin, without subchela. Gnathopod 2 thin, long; segment 3 enlarged, segment 5 slightly longer than segment 6; segments 5 and 6 densely covered with short setae, segment 6 small, palm and claw very small. Peraeopods 1 and 2 thin, basal segment not extended, and segment 4 extended distally and backward. Pleopods well developed, biramous, bear retinicules. Uropods 1 and 2 with almost equal rami, rami shorter than peduncle. Rami of uropod 3 shorter than peduncle, outer 2-segmented, slightly longer than the inner; peduncle with several plumose spinules on the inner margin. Telson quadrangular, short, entire, its length not exceeding its height; apex very weakly concave, with one small spinule at each distal angle. Palp of mandibles 3-segmented, segment 2 the longest, and segment 3 bent; cutting edge and accessory plate smooth, molar process wanting, in its stead, there is a cluster of setae near the tooth row of spines. Inner plate of maxilla 1 very small, with 2 setae at the apex; outer plate with 8 notched teeth; palp large, 2-segmented, segment 2 long, but unarmed, with a notched upper margin. Outer plate of maxilla 2 longer than the inner, both weakly fringed with setae along the inner margin.

Palp of maxillipeds 4-segmented, not enlarged, segment 4 small, with a small claw; outer plates large, slightly notched; inner plates thin, small; their apex irregularly armed.

Figure 97. Aruga dissimilis (Stout). According to Shoemaker, 1942, and J.L. Barnard, 1955.

Figure 98. Aruga holmesi J.L. Barnard. According to J.L. Barnard, 1955, ♂.

It differs from the other species of the genus in the inner plates of maxillipeds and in the narrow, but not enlarged, flagelli of the antennae. The colour is white; the female with bright-orange eggs. The length is 4 - 6 mm.

Very numerous in Lagune Beach, California, in grassy cables raised from depths.

4. Aruga holmesi J.L. Barnard, 1955 (Figure 98 and 99).

J.L. Barnard, 1955, Bull. So. Californ. Acad. Sci., 54, part 2: 100, pl. 27, 28.

It differs from A. oculata Holmes in the form of epimeral plate 3 which lacks the tooth-shaped process at the straight posterior angle and the posterior end of which is strongly convex. The lower lip extends strongly forward, beyond the ends of the concave epistome. Eyes large. Antenna 1 shorter than antenna 2, flagellum 12-segmented, accessory flagellum 7-segmented. Antenna 2 of the male with a very long flagellum.

Coxal plate 1 strongly broadens distally, almost twice as broad as the next. Segment 6 of gnathopod 1 as long as segment 5, simple, tapering distally; segment 3 of gnathopod 2 long, twice as long as segment 4; segment 6 with a small claw, more than half the length of segment 5; segments of peraeopods 3 - 5, except for the broadened base, linear, thin, enlarged. The postero-distal angle of epimeral plate 2 drawn out backward into a small pointed denticle; the postero-distal angle of epimeral plate 3 straight, the posterior margin of plate strongly convex.

Figure 99. Aruga Holmesi J.L. Barnard. Acc. to J.L. Barnard, 1955, ♂!

The outer ramus of uropod 2 with a constriction and a large spine at the place of the constriction; uropod 3 with a broadened peduncle, rami equal in length, the outer 2-segmented, its apical segment small. Telson entire, slightly tapering distally, posterior margin short, concave, on the sides of the concavity there is 1 small spinule and a short plumose setae on each. The animal is 11.5 mm long.

Known at the shores of California, at depths ranging from 0 to 100 m.

25. The Genus LAKOTA Holmes, 1909

Guryanova, 1951: 261.

When we examined thoroughly the diagnosis of the genus made by Holmes and the descriptions of the two known species of this genus -

L. carinata Holmes, 1909, and *L. chelata* Chevreux, 1926, and also the South-African species – *L. rotundus* and *L. adversicola* described by K. Baran in 1925, with the representatives of two other genera, which are close to *Lakota-Anonyx* (including *Chironesimus*), *Onisimus* and *Tryphosa*, we come to the conclusion regarding the doubtfulness of the existence of this genus, in which we agree with Barnard's opinion. From the works of Holmes and Chevreux, we could conclude that the only characteristic features of the species, described by these authors, which truly are of generic importance, are as follows: 1) upper lip is strongly protruding forward beyond the end of the epistome; 2) small and pointed, covered with setae, molar process of the mandibles which is located below the place where the palp is attached; 3) short and broad inner plates and relatively short outer plates of the maxillipeds (the plates do not extend to the end of segment 2 of the palp); 4) simple branchial vesicles; 5) deeply cleft telson, and 6) presence of a dense cluster of setae on the margin of the oblique apex of the outer plate of maxilla 1 where it is produced into its inner margin.

All these features, except the 4th, however, are inherent in genus *Anonyx* to which, in our opinion, also *L. carinata* and *L. chelata* belong; as far as the South-African species are concerned, they should be assigned to other, and at the same time different, genera, since the coxal plate 1 in *L. rotundatus* becomes narrower distally and is covered with the second one; the postero-distal angle of epimeral plate 3 is rounded and does not form a tooth; the outer plates of the maxillipeds are long, reach the end of segment 2 of the palp; in *L. diversicola*, coxal plate 1 becomes narrower distally and the outer plates of the maxillipeds reach the end of segment 2 of the palp, but the postero-distal angle of epimeral plate 3 forms a large tooth, the telson is relatively broad and short, hardly cleft to the middle. Lack of good and complete descriptions and figures of the oral parts of all the four mentioned species prevents us from establishing accurately their generic affiliation. As far as the structure of the branchial vesicles is concerned, one single indication that they are simple, bearing in mind that all branchial vesicles in A. nugax and A. lilljeborgi have transverse folds, does not mean anything yet, since the majority of the species of the genus Anonyx have several folds on the branchial vesicles, either 1 or 3 pairs, while all the other remaining pairs are usually simple, with or without accessory lobules. This is why it is important to examine thoroughly all the branchial vesicles and to give accurate instructions regarding their structure. On this basis, the "simplicity" of the structure of the branchial vesicles in Lakota causes great doubts, and this characteristic feature should be verified. Also the lack of the description and figures of peraeopods 1 and 2 prevent us from making more precise the position in the family Lysianassidae and the affiliation of L. carinata and L. chelata to the genus Anonyx; in particular, it is not known whether on segment 6 they bear the locking spine which is present in all Anonyx species. This is why we are forced to retain still the genus Lakota, since, judging by the descriptions on hand, both species of Lakota essentially differ from both the genera Tryphosa and Onisimus and Chironesimus = Anonyx. For instance, the coxal plate in Tryphosa tapers distally and at the back is partly covered with the second plate, the molar process of maxillipeds is cylindrical, with triturating surface; the outer plates of the maxillipeds extend above the distal end of segment 2 of the palp, and the inner ones reach the end of segment 1. The genus is noted for rather narrower plates of almost the same length of maxilla 2, the epistome which protrudes beyond the limits and overhangs above the upper lip, and weak gnathopod 1. Lakota differs from the genus Onisimus in the lack of spines at the tip of the outer plates of the maxillipeds and in rather shorter, both outer and inner, plates of maxilla 1, a conical (with a lingule) and a considerably weaker molar process of the maxillipeds, deeply cleft elongated telson and rather longer uropod 3; the latter protrudes backwards beyond the boundaries of the first and the second pair. Lakota differs from the genus* in the structure of the upper lip which only slightly protrudes forward beyond the end of the epistome, and in rather shorter inner plates of the maxillipeds. The circumstance which brings these genera closer to one another is that while having considerably smaller oral parts and limbs, both possess rather simpler branchial vesicles, which fact separates them from the typical representatives of the genus Anonyx.

1. Lakota carinata Holmes, 1909 (Figure 100).

Holmes, 1909, Proc. U.S. Nat. Mus., 35: 499, f. 9; Thorsteinson, 1941, Univ. Washington Publ. Oceanogr., IV, No. 2: 54, pl. 2, f. 16 - 17.

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* We consider the genus Chironasimus as a synonym of the genus Anonyx (see p. 210) /in the original. Th.P./.

Description according to Holmes. Eyes large, reniform, light-brown; interantennal lobes strongly developed, their tapering tip almost reaches the distal end of segment 1 of the peduncle of antenna 1. Both pairs of antennae short; accessory flagellum 4-jointed, its first segment elongated. Antenna 2 about 1/3 the body length. Segment 6 of gnathopod 1 as wide and almost as long as the 5th, has almost parallel margins and a palmar margin, without locking spines. Segment 6 of gnathopod 2 more than half the length of segment 5, has almost parallel margins and a brief transverse palmar margin. Segment 4 of peraeopods 1 and 2 broad, has an elongated angle; segment 5 about 2/3 the length of the 6th which is almost as long as the 4th. Dactyl about half the length of segment 6; segment 4 of peraeopod 3 broadened, in peraeopod 4 not as wide, while in peraeopod 5 slightly broader than segment 5; dactyl about half the length of segment 6 in pair 3 and about 1/3 the length of segment 6 in the subsequent pair. Coxal plate 5 expanded, its width is slightly greater than its depth. Epimeral plate 3 has a tooth at the postero-distal angle. Urosomal segment 1 has a dorsal rounded keel and a depression in front of it. Uropod 1 extends beyond the end of rami of uropod 2 in pair 2, but not in 3. The rami are of the same length, about 2/3 the length of the peduncle, lanceolate, armed with spines. The rami of uropod 2 almost as long as the peduncle, armed with spines, inner ramus slightly shorter than the outer, constricted at the boundary of the last third of the length of the ramus. On lower rounded margin of upper part of ramus, in front of the constriction, there is a large long spine. Uropod 3 possesses rami with spinules and setae, inner ramus slightly shorter than the outer, but it extends slightly beyond its apical segment. Telson deeply cleft, at the tip of each lobe, there is a short spinule and one setae.

The animal is 10 mm long.

Known at the coast of California (depths 100 – 120 m) and from the gulfs of Alaska.

26. The Genus SOCARNES Boeck, 1871.

Guryanova, 1951: 225.

Of the six known species, two species are represented in the Northern Pacific*.

1 (10). Body smooth, lacking hairs of setae on the surface of segments; posterior margin of the basal segment of peraeopod 4 notched.

2 (5). Posterior margin of epimeral plate 3 has a tooth in the middle; the postero-distal angle of this plate either straight or rounded.

3 (4). Posterior margin of epimeral plate concave and higher and lower than the middle tooth, so that the plate appears to be bidentate ....1. S. bidonticulatus (Bate, 1858).

4 (3). Posterior margin of epimeral plate 3 deeply concave only above the middle tooth; below it, the posterior margin almost

* "Of the six known species in the Northern Pacific, two species are represented"? Translator.

straight, and the plate seems to be monodentate.........* _S. unidentatus_ Schellenberg, 1931.

Swedish Antarct. Exp., II, No. 6: 24, f. 10.

(Southern Atlantic, the coast of South America).

5 (2). Posterior margin of epimeral plate 3 lacking the middle tooth; postero-distal angle blunt, rounded.

6 (7). At the base of the dactyl of gnathopod 1, in segment 6, there is a large, bent, bidentate spine.........* _S. kröyeri_ (White, 1848).

(Indian Ocean and coast of Australia).

7 (6). On segment 6, in gnathopod 1, at the base of the dactyl, such a spine is lacking; only the setae present.

8 (9). Eyes reniform, black; accessory flagellum of antenna 1 seven-segmented.........2. _S. vahli_ (Kröyer, 1838).

9 (8). Eyes oval, red, in alchohol poorly noticeable; accessory flagellum of antenna 1 four-segmented.........* _S. erythrophthalmus_ Robertson, 1892.

(English Channel, sea surface; west Africa, Segnegal, 22 m deep).

10 (1). Body covered with coarse hairs or plumose setae; posterior margin of the basal segment of peraeopod 4 smooth.

11 (12). There are coarse hairs on the surface of segments. Apical spinule on the inner side of the apex of each of the telson's lobes..........* S. concavus Shoemaker, 1933.

Carnegie Inst. Publ., No. 435: 247, f. 1.

(Atlantic Ocean, the coast of Florida).

12 (11). There are tender plumose setae on the surface of segments. There is an apical spinule at the apex of each of the telson's lobes..........1a. S. bidenticulatus Gurjanova ssp. n.

1. Socarnes bidenticulatus (Bate, 1858) (Figure 101).

Guryanova, 1951: 226, Figure 92.

Under conditions of the Far-East seas, this species is not homogeneous and forms local forms in the Sea of Okhotsk and the Sea of Japan, while in the Bering and the Chuckchee seas it is represented by the typical form widely distributed in the seas of the Arctic Ocean. Typical specimens from the Siberian seas are quite stable and possess a number of stable features which characterize the Arctic population and differentiate it from those of the Sea of Okhotsk and the Sea of Japan.

These characteristic features are as follows. On the dorsal side of the body segments, there are neither hairs nor plumose setae. The lateral head lobe protrudes strongly forward and down; its anterior margin is convex, especially in the middle, and forms, together with the lower margin, a straight angle. The eyes are narrowly reniform, black, of same length both on the upper and the lower ends, dorsally arranged at the base of the lateral lobe at an equal distance from the lower end of the head. Eyes about three times longer than wide. Segments 2 and 3 of the peduncle of antenna 1 short, together their length is about four times as small as the length of segment 1. Epimeral plate 3 has two distinct blunt teeth on the posterior margin the upper of which is larger than the lower. Telson cleft less than to the middle, its lobes diverage distally. At the apex of each lobe, there is 1 apical spine and 1 setum. At the base, the telson is slightly longer than broad. The posterior margin of the basal segments of all last three peraeopods distinctly notched. Segment 6 of gnathopod 1 as long as segment 5, tapers distally, its length at the base twice as large as broad. Segment 6 of gnathopod 2 twice as short as segment 5, clearly broadens distally; the short palmar margin drawn forward, weakly convex; the lower margin of the dactyl smooth. The basal segment of peraeopod 3 has a well developed lobe the apex of which extends beyond the lower margin of segment 3; the greatest width of the segment equals the length of its anterior margin. On urosome segment 1, there is a pair of low lateral median keels which are more distinct in ♂ than in ♀. The lateral head lobe of young specimens relatively larger than in adult specimens, and the tooth of epimeral plate 3 relatively larger. The animal reaches 44 mm in length.

Figure 101A. Socarnes bidenticulatus (Bate). Kara Sea, ♀.

This species is widely distributed in the Arctic Ocean and it definitely avoids the warm south-western parts of the Barents Sea and the coast of Norway. In the Pacific Ocean, it inhabits the Bering and the Chuckchee seas, is found near the Kurile Range where its distribution is not quite clear.

Specimens from the southern fresh-water part of the Laptev Sea are slightly smaller, but their body is inflated (all other characteristic features resembling those of the typical specimens). Specimens from the Sea of Okhotsk (the north-western part, Terpeniya and Aniva bays) differ sharply in the form and the size of their lateral head lobes and eyes (Figure 101), their body, which is more slender but not as strongly inflated, in a rather narrower and pointed upper and strongly pronounced lower tooth of epimeral plate 3. Telson extended somewhat more; at the apex of lobes, there is only 1 apical spine in each, while segment 6 of gnathopod 1 rather narrower and more weakly tapering distally. Segments 2 and 3 of the peduncle of antenna 1 rather longer than those of typical specimens, forming together about half the length of segment 1. The striking feature is the narrow long form of its eyes. The lower end of the latter is slightly broadened and comes close to the lower end of head; the width of the upper narrow end of the eye almost 5 times as small as its length. The posterior margin of the basal segment of last three peraeopods notched rather more coarsely, but less distinctly.

Figure 101b. *Socarnes bidenticulatus* (Bate) forma *ochotica*. Sea of Okhotsk, ♀.

We regard the form from the Sea of Okhotsk we have studied as *S. bidenticulatus* f. *ochoticus* (Figure 101) which has already changed, to some extend, in regard to the northern population of the typical form. It seems that in the eastern part of the Sea of Okhotsk, there still is a typical northern form which is found near the Kurile Islands; however, the aforesaid requires some additional study.

1a. Socarnes bidenticulatus japonicus Gurjanova ssp.n. (Figure 101).

The Sea of Japan specimens of the species differ from the Sea of Okhotsk, and, in addition, they live under conditions when the water in shallow places is quite warm during the summer period. The lateral head lobes are less developed, the anterior end of the head is concave, the eye is relatively larger and broader, distinctly reniform, the length being about twice as large as its width; the last two segments of the peduncle of antenna 1 are slightly larger than the length of segment 1. The upper tooth of epimeral plate 3 is large, the posterior margin of the plate below it is slightly concave, and the postero-distal angle rounded. The telson is cleft further than to the middle, relatively narrower and longer, with 1 apical spine at the apex of its lobes; the width of the base is slightly larger than half its length. Segment 6 of gnathopod 1 slightly longer than segment 5, tapers distally, the width of its base measures half the length of the entire segment. Segment 6 of gnathopod 2 shorter than half the length of segment 5, weakly broadens distally; short palmar margin drawn out forward, concave; dactyl has teeth along the inner margin. The width of the basal segment of peraeopod 3 equals its length; lower posterior lobe under-developed; the same is also observed in the last two pairs. The posterior margin of the basal segment of peraeopods 3 - 5 is notched. Body strongly inflated; on the surface of the antennae and on all segments of the body, there are small fine plumose setae especially dense on the urosome. Accessory flagellum 5-segmented, while in the typical and the Sea-of-Okhotsk forms it is 7-segmented. The length of the animal does not exceed 16 - 20 mm.

Figure 101β. Socarnes bidenticulatus Gurjanova ssp. Sea of Japan, ♀.

It is distributed only in the north-western part of the Sea of Japan, both near the Primorye Territory and Sakhalin, at depths ranging from 25 to 125 m; in winter, it approaches the shore line; it also occurs in Aniva Bay, at a depth of 16 m.

2. Socarnes vahli (Kröyer, 1838).

Guryanova, 1951: 226, Figure 91.

Circumpolar in the Arctic (at depths of 10 - 100 m), it spreads into the northern Atlantic, south of the southern extremity of Greenland, and to the northern and eastern shores of Iceland, descending to a depth of 300 m. In the Pacific Ocean and in all three seas of the Far-East, it is found at depths ranging from 3 - 5 to 240 m; the maximum length of the animal in the Pacific Ocean is 10 mm, in the Arctic, up to 15 mm.

27. The Genus PARACALLISOMA Chevreux, 1903.

Chevreux, 1903, Bull. Soc. Zool. France, XXVIII: 84; Schellenberg, 1926, Deutsche Südpolar Exp., XVIII, Zool., X: 257;

Chevreux, 1935, Res. Camp. Sci. Albert I, Monaco, X c: 39.

Chevreux described only the species typical of the genus, without mentioning the characteristic features of the genus he defined; Schellenberg pointed out the characteristic features of the genus, but also did not give the diagnosis. The diagnosis is given on the strength of the specimens of this species and some literary sources.

Body strongly inflated; head short, shorter than segment 1 of the thorax, with well developed lateral lobes. First three pairs of coxal plates small, their depth being smaller than the height of the segments corresponding to them; coxal plate 4 strongly developed, stegocephalian, with a deep notch on the posterior margin and a powerful lobe, drawn out backward, in the lower part of the posterior margin; plate 5 very large and broad, broader than deep. Gnathopod 1 has a peculiar structure, similar to that of the representatives of the genus Scopelochairus: its segment 6 extended, truncated on the distal end, bears (in the typical species) a dense cluster of flat lanceolate setae which surround the small rudimentary dactyl. Gnathopod 2 has a subchela, the palmar margin of segment 6 transverse. Antennae short, antenna 1 shorter than antenna 2; their flagelli few-segmented. Epistome protrudes slightly above the upper lip which is very short and separated from the epistome by a furrow. Lower lip lacks inner lobes; mandibles have a weakly developed conical process pointed at the end, without the triturating surface; the palp of the mandibles well developed, 3-segmented, attached below the molar process. Maxilla 1 with a 2-segmented palp whose apex is armed with a powerful, cleft at the end or with simple spines; inner lobe strongly oblique and armed with numerous (up to 18) thick plumose setae at the apex and along the oblique inner margin. The plates of maxilla 2 short, equal in length, inner much broader than the outer; maxillipeds normal, palp well developed, its segment 4 dactylate; outer lobes armed with sharp spines along the inner margin, the apex of the lobe reaches the distal end of segment 2 of the palp; inner lobes large, with plumose setae along the inner margin and with spinules and setae at the apex which reaches the level of the distal end of segment 1 of the palp. The basal segment of the last three peraeopods broadens weakly, considerably longer than broad. Telson deeply cleft; all three uropods biramous, all five peraeopods thin and weak.

It differs from the genus Scopelocheirus in : 1) the structure of head and anterior coxal plates the depth of which is considerably smaller than the height of corresponding segments, while pair 4 resembles that of the representatives of the Stegocephalidae; 2) thin, weak peraeopods; 3) relatively weakly broadened basal segments of peraeopods 3 - 5. In the structure of its oral parts, and especially in the specific form of the last segments of gnathopod 1, Paracallisoma is so close to the genus Scopelocheirus (even in detail, their structure is quite analogous in the representatives of both genera) that we accept it with great doubts as independent; if it were not for the head unusual for the Lysianassidae and the ratio of the height of the peraeon segments and coxal plates, we would not hesitate to join both general into one. Only 1 species known.

1. Paracallisoma alberti Chevreux, 1903 (Figure 102).

Chevreux, 1903, Bull. Soc. Zool. France, XXVII: 84, f. 2, 3; Holmes, 1909, Proc. U.S. Nat. Mus., 35: 500, f. 10 - 12 (Scopelocheirus coecus); Schellenberg, 1926, Deutsche Südpolar Exp., XVIII, Zool., X: 258, f. 11; Chevreux, 1935, Res. Camp. Sci., Monaco, X c. pl. I, f. 3, pl. IX, f. 2, pl. XVI, f. 5; Birshtein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 223.

Head short, shorter than peraeon segment 1, with a deep upper-antennal notch and a well developed, drawn out forward and down, lateral lobe bluntly rounded at the apex. Urosome segment 1 with a deep trough-like dorsal depression which continues also along the last two urosome segments. Eyes lacking; in live specimens, violet eye spots (according to Birshtein and Vinogradov). Antenna 1 short, with a strongly inflated, short segment 1 of the peduncle hardly reaching the apex of the lateral head lobe; flagellum 6-segmented, its segment 1 very large, as long as the remaining 5 together, conical; accessory flagellum 3-segmented, slightly longer than segment 1 of main flagellum; segment 1 of the accessory flagellum almost as long as segment 1 of the main flagellum, two others short, equal in length. Antenna 2 almost twice as long as antenna 1; segment 4 of the peduncle thicker and longer than segment 5, flagellum multisegmented. Coxal plate 1 narrow, linguliform, its apex reaching the distal end of the basal segment of gnathopod 1, its width at least twice as short as its depth; segment 6 of gnathopod 1 distinctly tapering distally, considerably shorter than segment 5; the dactyl distinct, bent and sharp, with a powerful accessory tooth on inner margin. Coxal plate 2 slightly longer than but as broad as coxal plate 1. Segment 6 of gnathopod 2 has parallel margins, weakly broadens distally, with a short transverse palmar margin; there are short transverse rows of setae along its anterior and posterior margins; the dactyl reaching the distal angle of palm. Segment 4 of peraeopods 1 and 2 does not broaden distally, almost linear, its width $3\frac{1}{2}$ times larger than its length; segments 5 and 6 equal in length, thin, linear, each considerably shorter than segment 4.

The basal segment of peraeopod 3 strongly bent, narrow at the base and broader in its remaining part; its anterior margin strongly convex, bears spinules, the posterior one parallel-concave, smooth, the posterior distal part of the segment forms a large, pointed at the apex, lobe which is drawn out downward to the point where segment 4 commences; segment 4 broadens weakly distally; segment 5 narrower and longer than segment 4, segment 6 considerably longer than segment 5. The basal segment of peraeopod 4 tapers distally; its anterior margin strongly convex in the upper part and straight in the lower; the posterior margin strongly concave at the end of the upper third, below it straight, notched, with short setae, the lobe on the distal end narrower than in peraeopod 3, also reaches the place where segment 4 begins; segment 4 broadens distally, armed with spines along both margins, segments 5 and 6 linear, armed with spinules and setae; segment 6 slightly longer than segment 5, form, the basal segment of peraeopod 5 close to that of peraeopod 4, but its posterior margin lacks the concavity, almost straight, with distinct teeth along the entire length; the lobe narrower, with a blunt apex, extends beyond the level of the distal end of segment 3 which is almost linear; segment 5 longer than segment 4, segment 6 as long as segment 5. Uropods 1 and 2 have a powerful peduncle tapering distally, and relatively short rami of unequal length. Uropod 3 extends slightly beyond the ends of the rami of uropods 1 and 2, have a short peduncle and rami of almost same length which are armed with spinules and setae. In alcohol, the animal is yellowish; live specimens (according to Birshtein and Vinogradov) are bright-orange. All specimens of our collection are females; the maximum length (specimens from the Sea of Okhotsk) is 26 mm.

Figure 102. Paracallisoma alberti. Bering Sea, ♀.

The specimens of the species at our disposal differ from Chevreux's description and figures of P. alberti from the area of the Azores in a rather longer and narrower coxal plate 1, the form and the ratio of the length of segments 6 and 5 of gnathopods 1 and 2, segment 4 of peraeopod 2, segments 5 and 4 of peraeopods 3, and the basal segment of peraeopod 5. All the appendages of our specimens are rather thinner and weaker than those described and figured by Chevreux; in these characteristic features, our material corresponds more to Holmes' description and figures for the Californian specimens, which are, it must be added, incomplete and poorly executed. The differences in the structure of gnathopods 1 and 2 and peraeopods, compared to Schellenberg's description and figures made from a young specimen from the Antarctic, are considerable.

The species has a broad geographical range, inhabiting the depths from 100 to 4400 m of the tropical part of the Atlantic and the Pacific oceans, the Kurile-Kamchatka depression, and the Bering Sea and the Sea of Okhotsk. Our collections contain specimens discovered in the Bering Sea at depths of 1150 to 3330 m and in the Sea of Okhotsk, near the west coast of Kamchatka, at a depth of 664 m.

28. The Genus PARACALLISOMOPSIS Gurjanova gen. n.

The new genus which is being determined is close to the genera Paracallisoma Chevreux, 1903, Scopelocheirus Bate, 1857, Scopelochiropsis Schellenberg, 1926, and Aroui Chevreux, 1910, which form a group of related genera (in the structure of the oral parts and gnathopod 1). However, all genera, including the one which is being treated, are already well differentiated from one another, presenting now final branches of five different evolutionary lines proceeding from the initial form. Closest to the original form are the representatives of the genus Scopelocheirus which have well developed oral parts with a powerful armature of spines and setae, deep, large coxal plates of the first four pairs and strongly broadened, with a powerful posterior whing, basal segments of last three peraeopods. Already in this genus, we notice a completely different structure of last segments (6 and 7) of gnathopod 1, compared to the usual simple subchela or the true claw. The same type of structure of gnathopod 1 and of oral parts is also preserved in other three genera mentioned above. Their evolution, however, went along the line of (a) the decrease in the coxal plates of the first four pairs the depth of which is considerably smaller than the height of the segments corresponding to them, (b) the secondary reduction of the basal segments of the last three peraeopods, and some reduction of the oral parts which reached a various degree in the representatives of different general; the final link in the chain of these changes is Scopelocheiropsis; this Antarctic genus stands somewhat apart both in regard to the structure of its highly specialized peraeopods and the far-pogressed reduction of both the maxillipeds and the mandibles.

In order to understand better the relationships between the genera, we give a comparative table of characters of the generic significance within the Lysianassidae (Table 4) for 4 genera.[1]

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[1] Aroui Chevreux, the fifth genus, is close to the genus Scopelocheirus but differs from it as follows: the lower margin of coxal plates is fringed with setae, the epistome does not extend beyond the border of the upper lip, the palp of the mandibles is less developed and shorter than the body of the manidible, the outer plates of the maxillipeds reach the apex of segment 2 of the palp, the outer plate of the maxillae shorter and much broader than the inner; there is a noticeable difference in the length of gnathopods 1 and 2; pereaeopods 4 and 5 of equal length, the telson is not narrow but broad.

Table 4

Comparative Table of Generic Characters*

Character	Scopelocheirus Bate	Paracallisoma Chevreux
Antenna 1	Segment 1 inflated; segments 2 and 3 of the peduncle short; main flagellum 8- 9-segmented; accessory flagellum well developed.	Segments 1 strongly inflated, short; segment 2 very short; segment 3 of peduncle longer than segment 2; main and accessory flagella well developed but few-segmented, main flagellum 6-segmented, accessory 3-segmented.
Antenna 2	Normal, with a long multisegmented flagellum; considerably longer than antenna 1.	Normal, with a long multisegmented flagellum; considerably longer than antenna 1.
Mandibles	Powerful, with a long strong 3-segmented palp which is much longer than the body of the mandible. Mandibular edge well developed. Molar process large, conical, with a blunt apex, without triturating surface. There are a few setae in the tooth row. Movable accessory plate small. Segments 2 and 3 of the palp armed with numerous setae.	Rather weaker, palp 3-segmented, somewhat abbreviated, as long as the body of the manible, segment 3 abbreviated. Mandibular edge well developed. Molar process weaker than in Scopelocheirus, in the shape of a thin, small, pointed process. There are a few setae in the tooth row; accessory cutting plate narrow; spiniform. Segments 2 and 3 of the palp armed with numerous setae.

* The right-side columns of this table appear on the odd numbers. Translator.

Paracallisomopsis Gurjanova	Scopelocheiropsis Schellenberg
Short, segment 1 of the peduncle weakly inflated, segments 2 and 3 enlarged; main and accessory flagella reduced; main flagellum consists of 4 segments, entire flagellum 2-segmented, with a very small apical segment.	Identical to that of Scopelocheirus.
Short, only slightly longer than antenna 1; flagellum rudimentary, 3-segmented, with large segment 1 and a very small apical.	Normal, with a long multisegmented flagellum.
Powerful; palp 3-segmented, abbreviated, its length smaller than the length of the body of the mandible. Cutting edge well developed. Molar process in the form of a large process pointed at the apex. Tooth row of setae and spines wanting; accessory cutting plate broad, notched. Segment 3 of palp slightly shorter than segment 2; setae present only at the apex of segment 3.	Weak; their body thin, narrow, palp 3-segmented, longer than the body; its segment 2 longer and considerably thicker than segment 3. Cutting edge well developed. Molar process reduced completely. There are 2 setae in the tooth row; accessory cutting edge spiniform. Segment 2 and 3 of palp armed with setae at the apex and in the upper part of the inner margin.
Palp powerul, 2-segmented, extends far beyond the level of the outer plate; its upper margin armed with thin spines. Outer plates relatively short, armed at the apex with only 4 powerful spines. Inner plate	Palp powerful, 2-segmented, armed at the apex with 6 strong spines. Outer plate abbreviated, with 11 strong spines at the apex; palp extends far beyond the level of the outer plate. Inner plate with 9 plumose setae along

Table 4

Comparative Table of Generic Characters (Cont.)

Character	Scopelocheirus Bate	Paracallisoma Chevreux
Maxilla 1	Palp powerful, 2-segmented extends far beyond the level of the outer plate; its upper margin armed with strong spines. Outer plates relatively short, with a rounded apex armed with numerous spines of unequal length; inner plate large, narrowly triangular, with powerful plumose setae (no less than 10) along the inner margin.	Palp powerful, 2-segmented, extends far beyond the level of the outer plate and armed with strong spines on the surface. Outer plates relatively short armed like those of the preceding genus. Inner plate triangular, large, with powerful plumose setae (no less than 10) along the inner margin.
Maxilla 2	Both plates short and broad, densely armed with setae. Inner plate slightly broader than the outer and bears thick plumose setae along the inner margin.	Both plates short and broad, densely armed with setae. Inner plate slightly broader than the outer and bears plumose setae along the inner margin.
Maxillipeds	Palp long, well developed 4-segmented; segment 4 long, narrow, dactylate, its length slightly smaller than the length of segment 3. Outer plates abbreviated, their apex reaching only the level of the middle part of segment 2 of the palp,	Palp somewhat abbreviate, but well developed, 4-segmented; segment 4 dactylate, its length almost equal to that of segment 3. Outer plates broad, well developed, their apex reaches the level of the apex of segment 2 of the palp, armed with long setae, inner

Paracallisomopsis Gurjanova	Scopelocheiropsis Schellenberg
large, narrowly-triangular, bears only 5 thick plumose setae; 2 at the apex and 3 in the upper part of the inner margin.	the inner margin.
Greatly reduced, small, both plates equal in length, the inner slightly broader than the outer. Armature weak; there are only short and not numerous simple setae at the apices; the inner margin of the inner plate smooth, without setae.	Inner plate shorter than the outer, tapers distally. It is not clear how their armature is, as the author did not present data in his description and also the figures of the oral parts, except for the mandibles.
Palp still more abbreviated, especially its segment 3; segment 4 large, dactylate, but shorter than segment 3. Outer plates large, their apex extends slightly beyond the level of segment 2 of palp, bears 1 setum; the inner plates are long, their tooth apex beyond the distal end of segment 1 of palp and bears an oblique row of simple setae. Plumose setae lacking on the inner margin.	Palp still more abbreviated, with a simple rudimentary segment 4 at the apex of which there is a cluster of setae. The apex of outer plates extends to the apex of segment 2 of palp; along their margin, there are strong spines, and at the apex, long setae; segment 4 of palp twice as narrow and about 1/6 as long as segment 3.
Epistome shorter than the long upper lip, with convex lower part overhanging the lip and protruding forward beyond the level of lip.	Epistome and upper lip like in Scopelocheirus.

Table 4

Comparative Table of Generic Characters (Cont.)

Character	*Scopelecheirus* Bate	*Paracallisoma* Chevreux
Maxillipeds	inner margin of outer plates armed with small falcate spines; inner plates do not reach the apex of segment 1 of palp.	margin and armed with small spines; inner plates large, reach almost the apex of segment 1 of palp; setae on their apex and on the inner margin similar to those in *Scopelecheirus*.
Epistome and upper lip	Epistome longer than upper lip, its lower part convex and over-hangs the short upper lip, protruding forward beyond the level of the lip.	Epistome longer than upper lip, but weakly convex, does not protrude beyond the border of the level of the upper lip.
Gnathopod 1	Thin, long, only slightly shorter than gnathopod 2. At the apex of segment 6 there is a dense cluster of setae; a similar cluster of still longer setae located on the proximal end of the small upper rudimentary dactyl; in the anterior part of the upper margin of dactyl, there is a dense row of short setae.	In structure similar to that of *Scopelocheirus*, but the second cluster of setae lacking on the base of the claw and the setae on the distal margin. In their stead, along the entire margin of the claw, there are broad flat setae.

Paracallisomopsis Gurjanova	Scopelocheiropsis Schellenbers
Quite strong, almost as long as gnathopod 2; at the apex of segment 6, the dense row of setae covering dactyl is lacking. Bent along the entire length of the upper margin of dactyl, there are smooth setae equal in length, flat, sword-shaped, closely adjacent to one another. Dactyl apparently, fits into segment 6.	Like in Scopelocheirus, with 2 bundles of setae - at the apex of segment 6 and near the base of the rudimentary dactyl.
Quite strong, slightly longer than gnathopod 1; segment 6 elongated-oval, with a very short, almost underdeveloped, weakly tapered palmar margin which, together with dactyl, forms a subchela. Dactyl longer than palm. Segment 3 oblong, about half the length of basal segment.	Longer and stronger than gnathopod 1. Segment 6 only slightly shorter than segment 5 and as thick, with parallel margins; palmar margin very short, transverse; dactyl as long as palm.
Plates 1 - 4 deep, considerably deeper than the height of corresponding segments; lower posterior lobe of plate 4 powerful, with a broad, obliquely truncated apex extending considerably further than the middle of the lower margin of plate 5 (almost to the posterior margin of the plate).	Low, plates 1 - 4 deeper than the height of corresponding segments; plate 4 also deep, with a notch on the posterior margin, but with an underdeveloped lower posterior lobe the pointed apex of which does not extend beyond the level of the posterior margin of the plate itself.

Table 4

Comparative Table of Generic Characters (Cont.)

Character	Scopelocheirus Bate	Paracallisoma Chevreux
Gnathopod 2	Thin, slightly longer and almost as long as gnathopod 1. Segment 6 forms, together with the dactyl, a small claw. Segment 3 enlarged, no less than half the length of basal segment.	Longer and stronger than gnathopod 1. Segment 6 broadens distally, with a long oblique palmar margin which, together with the dactyl, forms a subchela; segment 3 only slightly shorter than basal segment, strongly enlarged.
Coxal plates	Plates 1 - 4 deep, large, deeper than the height of corresponding segments; lower posterior lobe of plate 4 weakly developed, its apex does not reach even the middle of the lower margin of plate 5.	Plates 1 - 4 low, lower than the height of corresponding segments; lower posterior lobe of plate 4 strongly drawn out backward, tapers at the end, and its apex extends further than the middle of the lower margin of plate 5.
Peraeopods 1 - 5	Segment 6 in all peraeopods simple, linear; there is a locking spine both in peraeopod 1 and peraeopod 2 at the base of dactyl.	Segment 6 in all peraeopods simple, linear; locking spine at the base of dactyl absent.
Basal segment in peraeopods 3 - 5	Very broad, with a large wing; basal segment in peraeopod 3 broader than long, in peraeopod 4 slightly smaller, and in peraeopod 5 as long.	Relatively narrow, with a weakly developed wing; the width of the basal segment in all three peraeopods considerably smaller than its length. Expecially weakly broadened is the basal segment in peraeopod 3.

Paracallisomopsis Gurjanova	Scopelocheiropsis Schellenberg
Segment 6 of peraeopods 1 and 2 thickened, with a locking spine at the base of dactyl; dactyl strong, weakly curved; segment 6 in the last three peraeopods linear, without locking spine; dactyl strong, straight, pointed at the end.	Peraeopods 1 - 2 with a clearly defined tendency of forming a subchela; segment 5 strongly abbreviated, segment 6 thickened, with strong locking spines at its distal posterior margin; dactyl strong and curved.
Relatively narrow, with a weakly developed posterior wing; in peraeopod 3, almost linear, only weakly broadening and rounding at the distal end.	Relatively narrow; in peraeopod 4 only slightly broadened distally, forming a small, narrow lobe at the postero-distal angle (this lobe is drawn out downward).
Peraeopod 3 shorter than peraeopod 4 and slightly longer than peraeopod 5; peraeopod 4 longer than peraeopod 5.	Segment 6 in all last three peraeopods with a clear tendency of forming a subchela, especially in peraeopods 1 and 2; in peraeopods 3 - 5, segment 6 in thickened, with powerful spines along anterior margin.
Apical segment of outer ramus very large, considerably greater than half the length of segment 1.	Apical segment of outer ramus large, about half the length of segment 1.
Deeply cleft, almost to the base.	Abbreviated, triangular, as broad as long; cleft 2/3 its length.
P. beljaevi Gurjanova sp.n.	S. abyssalis Schellenberg, 1926.

The diagnosis of the new genus Paracallisomopsis is as follows.

Head short, shorter than peraeon segment 1; coxal plates 1 - 3 small, their height being considerably shorter than the height of segments corresponding to them. Both antennae possess reduced flagellae; flagellum of antennal 4-segmented. The size of segments decreases immediately toward the distal end; last segment rudimentary. Accessory flagellum 2-segmented, its segment 1 long, conical; apical segment small, underdeveloped. Flagellum of antenna 2 3- 4-segmented; segments of the peduncle and flagellum decreases in length gradually, from the third to the last and only segment 1 of flagellum is longer than the last segment of peduncle. Epistome strongly projects above the long, flattened upper lip. Basal segment of peraeopods 3 - 5 is weakly expanded, with a poorly developed wing; the basal segment of peraeopod 3 is the narrowest, with parallel margins. Gnathopod 1 has a specific structure of its last two segments, resembling the structure of Scopelocherius, only the cluster of long bristles is lacking on the apex of segment 6. The underdeveloped, retractive dactyl is freely seen; on it upper margin, there is a close row of flat, lanceolate setae. Gnathopod 2 has an underdeveloped subchela, the palm of which is very short. Mandibles have a large, pointed molar process and a broad accessory cutting plate. Palp 3-segmented, shorter than the body of mandible; dental row of spines or setae absent. Maxilla 1 similar to that of Scopelocheirus; however, the outer plates have only 4 spines at their apices, while the inner plates have only 5 plumose setae and a bare inner margin. Maxilla 2 small, armed with a few setae only at the apex; maxilliped with a 4-segmented, but abbreviated palp; plates inadequately armed, the apex of the outer extending further than to the apex of segment 2 of palp; the apex of inner plates extends beyond the distal end of segment 1 of palp. Peraeopod 4 longer than peraeopod 5. Telson deeply cleft, almost to the base; uropod 3 biramous, outer ramus 2-segmented, its apical segment is very large, considerably larger than half the length of segment 1.

1. Paracallisomopsis beljaevi Gurjanova sp.n.[1]

(Figure 103).

Body strongly inflated, hemispherical; coxal plates relatively small, in height considerably smaller than the thoracic segments corresponding to them; plate 2 overlaps from behind plate 1, plate 3 overlaps plate 2; coxal plate 4 has a deep notch on the posterior margin and its lower posterior lobe is strongly extended. Head is shorter than peraeon segment 1, the interantennal lobe poorly developed, and the anterior lateral head margin forms with the lower margin almost a straight angle. Eyes present, brown-reddish in alcohol, elongated-oval. Epistome strongly protrudes in front of the upper lip and is separated from the latter by a deep sinus. Mandibles with elongated thick body and a strong 3-segmented palp; molar process large, conical, pointed, located above the place where the palp is attached; dental row of setae wanting; at the base of the dentate mandibular incisor, there is a well developed accessory plate. Maxilla 1 with a 2-segmented palp, at the apex of segment 2, there also are found spines; outer plate is shorter than the palp, with 4

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1 Named in honour of G.M. Bel'ayeva in whose collections it was discovered.

strong spines at the apex, the middle ones being pectinated; inner plate large, conical, with 2 plumose setae at the apex and 3 similar setae along the inner margin at its distal end. Maxilla 2 with short, equal in length plates armed with simple setae only at the apex. Maxillipeds with a normal 4-segmented palp, outer plates reach the distal end of segment 2 of palp, armed with 1 seta at the apex and with 2 spines in the upper part of the inner margin; inner plates long, their apex extends above segment 1 of palp and is armed with 3 teeth and 2 setae on the upper margin and an oblique row of 5 setae on the inner surface of plate. Antenna 1 with strongly inflated segment 1 of peduncle and well developed, almost equal in length, segments 2 and 3; flagellum thick, oblong-conical, 4-segmented; accessory flagellum also extended-conical, 2-segmented; its segment 1 long, longer than segment 1 of main flagellum, segment 2 very short, underdeveloped. Antenna 2 slightly longer than antenna 1, with segments 3 - 5 uniformly decreasing toward the distal end and a very short, 3-segmented flagellum.

Figure 103A. Paracallisomopsis beljavevi Gurjanova gen.n. sp. n. Bering Sea.

Figure 103Б. Paracallisomopsis beljaevi Gurjanova gen.n. sp.n. Bering Sea.

Figure 103B. Paracallisomopsis beljaevi Gurjanova gen.n. sp.n. Bering Sea.

Gnathopod 1 similar to that of Scopelocjeirus and Peracallisoma alberti; however, the thick cluster of setae surrounding the underdeveloped dactyl at the apex of segment 6 is lacking, and on the "dorsal" surface of the dactyl, there are flat, short, bent setae, which closely adjoin the pointed tip of the dactyl (Figure 103B). In structure, gnathopod 2 is similar to that in the preceding species, but the palmar margin of segment 6 is shorter and not as oblique; and at the apex of segment 5, there are a few thin, long setae divided at the apex, with plumosity in the upper part of the seta. Peraeopods 1 - 5 weak, thin, with expanded segments; peraeopod 1 with one short locking spine at the apex of segment 6, near the base of the dactyl; peraeopod 2 has two parallel locking spines. The coxal plate of peraeopod 3 (plate 5) is low, but broad, with poorly defined lower lobes; basal segment broadened very weakly and uniformly, with parallel anterior and posterior margins and a short rounded posterior lower lobe. Basal segments of peraeopods 4 and 5 also slightly broadened, taper distally, with a very short lower posterior lobe. Segments of all peraeopods almost unarmed, with 1 - 2 apical spines or setae at the distal end; dactyls almost straight. Epimeral plate 3 with oblique posterior margin. Lower posterior angle drawn out into a small tooth. Urosome segment 1 smooth, lacks depression or notched depression on the dorsal side. Ends of all three uropods at one level, with almost unarmed rami; inner ramus of uropod 1 slightly, and in uropod markedly shorter than the outer; uropod 3 with a short peducnle and long, equal in length, rami; apical segment of outer ramus large, considerably longer than half of segment 1. Telson deeply cleft, tapers distally, without lateral spines; at their apex, on the dorsal side of lobes, there is 1 setae on each. In alcohol, the animal is reddish, 5 mm long.

More than ten specimens were captured in the Bering Sea, north to the east coast of Kamchatka (Olyutorsky Gulf), at a depth of 150 m.

29. The Genus Scopellocheirus Bate, 1857 Guryanova, 1951: 241.

At present, there are known four species, two of which are distributed in the northern part of the Atlantic Ocean, one species in the Arctic, and one species was discovered in 1958 in the Pacific Ocean at the bottom of the Kurile-Kamchatka depression. Scopelocheirus coecus Holmes, 1909, is the synonym of Paracallisoma alberti Chevreux, 1903. Scopelocheirus abyssi sp.n. /Oldevig, 1959, Goteborgs Kungl. Vetensk. och Vitterhets-Samh. Handl., (B), 8, No. 2: 16/, described from high latitudes of the Arctic from a depth of 3200 m, is not included in the identification key, as Oldevig in his brief diagnosis does not state the characters on the strength of which five other relative genera (Scopelocheirus, Bate, Paracallisoma Chevreux, Aroui Chevreux, Scopelocheiropsis Schellenberg, and Paracallisomopsis Gurjanova gen.n.) are identified. Hence it is impossible to assert with certainty that S. abyssi is indeed a representative of the genus Scopelocheirus.

Figure 104A. Scopelocheirus schellenbergi Birstein et M. Venogradov. After Birstein and M. Vinogradov, 1958.

Figure 104b. Scopelocheirus schellenbergi Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1958.

1 (4). Gnathopods 1 and 2 weak, thin, almost equal in length; segment 6 of peraeopods 1 and 2 thin, linear.

2 (3). Segment 6 of gnathopod 1 much longer than segment 5; posterior margin of epimeral plate 3 smooth..........* S. hopei (A. Costa, 1851).

(Northern part of the Atlantic Ocean; Mediterranean Sea).

3 (2). In length segment 6 of gnathopod 1 almost equal to segment 5; posterior margin of epimeral plate 3 weakly dentate..........* S. crenatus Bate, 1857.

(Northern part of the Atlantic Ocean).

4 (1). Gnathopod 1 strong, much shorter than ganthopod 2; segment 6 of peraeopods 1 and 2 expanded, tapers distally, tends to form a subchela..........1. S. schellenbergi Birstein et M. Vinogradov, 1958.

1. Scopelocheirus schellenbergi Birstein et M. Vinogradov, 1958 (Figure 104).

Schellenberg, 1955, Rep. swedish /Sic! Translator/ Deep-sea Exp., 2, Zool., No. 18: 185 (Paracallisoma sp.); Birstein and M. Vinogradov, 1958, Tr. Inst. Oceanol. 27: 224, Figure 3 and 4.

The authors of the species are right in assigning it to the genus Scopelocheirus, characteristic of which are in contrast to the genus Paracallisoma Chevreux, not only shorter and broader outer and inner plates of the maxillipeds, but also the strongly broadened basal segments of the last three peraeopods and the normal shape of coxal plate 4; the posterior part of plate 4 in Paracallisoma is strongly extended backwards and, similar to that in the family Stegocephalidae, underlines coxal plate 5.

Eyes lacking; there is a deep depression on the last urosome segment and a weak, low oblong keel on pleon segments 3 - 5. Flagellum of antenna 1 9 -11-segmented; accessory flagellum, 3-segmented. Segment 5 of the peduncle in antenna 2 one and a half times longer than segment 4 and twice the size of segment 3. Oral parts typical of the genus; as a peculiarity, we should stress the maxillipeds, which are stronger than in other species; maxillipeds, the outer and the inner plates of which are broadened and far away from the middle line, have a deep and broad rounded sinus between them. Coxal plate broadens strongly distally, the height of plate 2 only slightly excedes the width of plate 1. Plate 4 low and broad, with a shallow sinus on the posterior margin. Basal segment of gnathopod 1 broadens distally; segments 4 and 5 abbreviated, together almost equal the length of segment 6, hence the entire extremity is considerably shorter than gnathopod 2. The dactyl of gnathopod 1 almost hidden behind a dense crown of setae at the apex of segment 6. All coxal plates, especially the first four, are relatively larger and lower than those in two other species; segment 6 of peraeopods 1 and 2 strong, its base being only slightly broadened and has spinules along the posterior margin (it resembles the initial stage of the subchela with a strong dactyl). Segment 6 of peraeopods 2 - 5 normal, linear, while segment 4 is relatively more oblong and narrower than in other species of the genus; the postero-distal angle of epimeral plate 3 with a small tooth-shaped process and smooth posterior margin. Telson oblong-oval and relativley not as narrow as in other two species, deeply cleft, with five pairs of submarginal and one pair of apical spines; its lobes with a straight inner and a rounded outer margin, immediately tapering distally. Rami of uropod 3 equal in length, armed with spinules and plumose (in ♂) setae. 42 mm long, dirty-white.

Captured in the northern part of the Pacific Ocean between 38° n. lat. and 44° n. lat. in quantitative samples from a depth of 6000 - 8000 m to the surface. Schellenberg's specimen from the Atlantic Ocean was captured in 19°49' n.lat., 65°10' w.long., more than 3000 m deep.

30. The Genus TRYPHOSA Boeck, 1871

Guryanova, 1951: 248.

It seems that this genus rich in species has no representatives (except for one species indicated by A. Derzhavin, in 1930) in the sea of the Far East; three other species described from the Pacific Ocean should be assigned ot other genera: we include _T. annulata_ Bate, 1862, in the genus _Lepidepecreum_; _T. coeca_ Holmes, 1909, in the genus _Hippomedon_, and _T. nugax_ Holmes, 1910, in the genus _Orchomenella_. Thus, only one species of the genus _Tryphosa_ is known from the northern part of the Pacific Ocean.

1. _Tryphosa nanoides_ (Lilljeborg, 1865).

Guryanova, 1951: 250, Figure 144.

This species is widely distributed in the North of the Atlantic Ocean, within the boundaries of the shelf, from the North Sea and the west coast of Iceland to the Barents Sea, inclusively (East Murman). Mentioned by Derzhavin (1930) for the Bering Sea and the Sea of Okhotsk. We do not have it in our material.

31. The Genus LEPIDEPECREUM Bate et Westwood, 1868

Guryanova, 1951: 274.

The ten earlier known specimens are supplemented by six new species from the Pacific Ocean (their description follows below). Seven species come from the western part of the Pacific Ocean.

1 (4). No dorsal keels on any body segment.

2 (3). Segment 6 of gnathopod 1 broad, with parallel margins; slighlty narrower than the length of the posterior margin of tarsus; palmar margin deeply concave; segment 6 of gnathopod 2 two times as short as that of segment 5..........* L. cingulatum K.H. Barnard, 1932.

Discovery Rep., V: 60, f. 22.

(South of the Atlantic Ocean, South Orkney Islands).

3 (2). Segment 6 of gnathopod 1 narrow, slightly tapers distally; it is twice as narrow as long; palmar margin transverse, straight; segment 6 of gnathopod 2 slightly shorter than segment 5..........7. L. annulatum (Bate, 1862).

4 (1). Keels, usually high and sharp, present on the dorsal side of peraeons or pleons.

5 (8). Large keel, in the shape of a process, present only on urosome segment 1; other segments lack high dorsal keels.

6 (7). Segment 1 of the flagellum of antenna 1 long, longer than all remaining segments together; segment 4 of the peduncle of antenna 2 as long as segment 5..........* L. typhlops Bonnier, 1896.

(Biscay Bay).

7 (6). Segment 1 of the flagellum of antenna 1 short, shorter than two subsequent segments together; segment 4 of the peduncle of antenna 2 $1\frac{1}{2}$ times longer than segment 5..........2. L. nautilus Gurjanova sp.n.

8 (5). Large dorsal keels present also on other segments.

9 (20). At the distal end of segment 1 of the peduncle of antenna 1, there is one large sharp keel-shaped process.

10 (11). The wing-shaped broadening of the basal segment of peraeopod 5 strongly drawn out below, forming a lobe which reaches the middle of segment 5 of the leg with its apex..........* L. clypeatum Chevreux, 1888.

(North of Atlantic Ocean, Golfe de Cascogne).

11 (10) Lobe of the wing-shaped broadening of the basal segment of peraeopod 5 considerably shorter and is far reaching segment 5 of

the leg.

12 (15). There are transverse ridge-like keels in the upper part of anterior coxal plates.

13 (14). Pleon segment 3 with a large pointed keel-shaped process, directed backwards; transverse ridge-shaped lateral keel present only on coxal plates 4 – 6..........* L. longicorna (Bate et Westwood, 1863).

(North of Atlantic Ocean, from Mediterranean to Norway).

14 (13). Pleon segment lacks the large keel-shaped process; transverse ridge-shaped lateral keel distinct in all 7 coxal plates..... .....3. L. rostratum Gurjanova sp.n.

15 (12). Transverse keels absent in the upper part of anterior coxal plates.

16 (17). Coal plate 5 conical, convex, the apex of the cone being located in the centre of the plate; there is a low medial keel on the last 3 and 2 anterior pleon segments; keel-shaped, pointed, upwardly processes present on pleon segments 3 and 4..........* L. umbo (Goës, 1866).

(North of Arctic Ocean).

17 (16). Coxal plate 5 without a cone at the centre; keel-shaped, bent upwards, sharp processes present also on pleon segments 3 and 4; however, the median keel on other segments developed much more.

18 (19). Median dorsal keel with a pointed end on all or almost all peraeon segments; tegument covered with a coarse punctate sculpture and dense cover of short minute hairs..........4. L. comatum Gurjanova sp.n.

19 (18). Dorsal median keel with a pointed end present only on segments commencing with peraeon 5 and ending with urosome 1; tegument with a microscopic striated sculpture and lacks the cover of minute hairs ....* L. serratum Stephensen, 1925.

Ingolf-Exp., III, No. 9: 118, f. 32.

(North of Atlantic Ocean, south of Iceland).

20 (9). Segment 1 of the peduncle of antenna 1 with an underdeveloped keel on the anterior surface; at the distal end, this keel either forms an enlarged rounded process, or it is lacking altogether.

21 (22). Telson cleft no further than to the middle.........
* L. foramenlforum Stebbing, 1888.

(Subantarctic, Kergualen Island).

22 (21). Telson cleft much further than to the middle.

23 (24). Posterior margin of the basal segment of peraeopods 3 and 4 deeply dentate..........* L. chevreuxi Gurjanova, 1938*.

Tr. Hydrobiol. Exp. Zool. Inst. Academy of Sciences of the USSR, 1934, re: the Sea of Japan, Issue 1: 252.

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* L. chevreuxi Gurjanova, 1938, nom.n., stands for L. serratum Chevreux 1925, Bull. Soc. Zool. France, L, No. 6/7: 286, f. 1 - 2.

(Atlantic Ocean, near the north-west coast of Africa).

24 (23). Posterior margin of the basal segment of peraeopods 3 and 4 almost smooth or finely dentate.

25 (26). Dorsal process on the posterior margin of pleon segment inflated, rounded at the apex..........1. L. eoum Gurjanova, 1938.

26 (25). Dorsal process on the posterior margin of pleon segment 3 keel-shaped, pointed at the apex.

27 (28). Telson with only apical spines; posterior margin of the basal segment of peraeopod 5 smooth, with a deep sinus at distal end ....6. L. kasatka Gurjanova sp.n.

28 (27). Besides apical spines, telson has numerous spines on dorsal side; posterior margin of the basal segment of peraeopod 5 shallowly toothed, uniformly rounded, and lacks the notch at the distal end.

29 (30). Tegument's sculpture cancellate, with microscopic spinules; the entire surface of the covers covered with minute hairs.... ......5. L. alectum Gurjanova sp.n.

30 (29). Tegument's sculpture coarsely punctate..........8. L. vitjazi Gurjanova, sp.n.

1. Lepidepecraum eoum Gurjanova, 1938

(Figure 105).

Guryanova, 1951: 277, Figure 146.

This is a coastal species; it is widely distributed among the algae in the Sea of Japan (Peter the Great Bay, area of Preobrazheniya Bay, west coast of South Sakhalin) at a depth ranging between 0 and 25 m; under conditions of South Sakhalin, it also inhabits the tidal zone and occurs abundantly among the rockweed growths and in the rhizoids of sea staff; discovered at the coast of Shikotan Island (east coast, Dimitrov Bay), on the littoral, among the rockweed; also found near the water line among the growth of eelgrass, on the littoral near Korsakov, in Aniva Bay; females with eggs were captured in August, in the area of the Second Kurile Strait, at a depth of 130 m.

2. Lepidepecreum nautilus Gurjanova sp.n.

(Figure 106).

This species is close to the North-Atlantic abyssal species L. typhlops Bonnier in regard to the lack of a longitudinal keel peraeon and the first three pleon segments, the development of a large process bent back and up on the dorsal side of urosome segment 1, and the structure of antenna 1, which can bend down at a right angle at the place where segments 1 and 2 of the peduncle join (antenna 1 has a very small 2-segmented accessory flagellum). However, it differs sharply from L. typhlops Bonnier in regard to the following features: 1) presence of eyes; 2) 2) structure of head, which lacks the long linguliform interantennal lobe directed downward; 3) lack of last two oblong keels on the epistome; 4) correlation of the length of the segments of the peduncle of antenna 2, last segment being quite reduced, shorter than segment 4; form of coxal plates 5 - 7, basal segments of peraeopods 3 - 5 and epimeral plate 3; a different structure of segment 6 of gnathopod 2; 7) presence of four pairs of dorsal spines on the telson, which are absent in L. typhlops.

Body lenticular, oblong; low median keel scarcely seen on posterior peraeon segments; peraeon segment 3 on dorsal side thickened in the form of a hump; on urosome segment 1, there is a saddle-shaped depression and a large process, pointed at the end and bent up. Eyes well developed, yellowish in alcohol, fabiform. The sculpture of tegument fine-meshed, with regular, parallel rows of microscopic dots and a dense cover of minute hairs fringing coxal plates and margins of all leg segments. Rostrum small, anterior margin of the lateral head lobes strongly convex in the middle, with a depression at the distal end and a blunt lower lobe angle slightly drawn out forward. Segment 1 of the peduncle of antenna 1 with an oblong keel, terminating in a rounded rostrum at the distal end. Segment 3 of the peduncle of antenna 2 slightly shorter than segment 4. Last segment is thicker and considerably shorter than segment 4. Epistome rounded and projects forward beyond the upper lip. Segments 5 and 6 of gnathopod 1 equal in length and width; segment 6 with a transverse, almost straight palmar margin armed with two strong locking spines of same size; dactyl as long as the palm with accessory tooth and setae at the distal end. Segment 6 of gnathopod 2 considerably larger than half the length of segment 5, broadens distally, with two transverse rows of thick setae at the distal end of anterior margin; palmar margin weakly convex, palmar angel slightly drawn out forward. Coxal plate 1 does not become broader distally.

Figure 105. Lepidepecreum eoum Gurjanova.

Sea of Okhotsk, ♂.

Figure 106. Lepidepecreum nautilus Gurjanova sp.n. East coast of Iturup Island, ♂.

Figure 107. Lepidepecreum rostratum Gurjanova sp.n. East coast of Iturup Island, ♂.

Basal segment of peraeopod 3 very broad, lacks the lobe drawn out below; it is broader than long, posterior margin slightly notched; s segment 4 broadens strongly distally, with a lobe drawn out below almost to the end of segment 5, on margins armed with strong setae; segment 6 longer than segment 4 and two times as long as segment 5; dactyl strong, slightly bent. Basal segment of peraeopod 4 with a short and broad rounded distal lobe; its posterior margin slighlty toothed only in the middle part; segment 4 strongly broadened, with a large pointed lobe at the postero-distal angle; segment 5 shorter than segment 4 and segment 6, with spines along the anterior margin, dactyl longer and thinner than that in peraeopod 3. Basal segment of peraeopod 5 strongly broadened equally broad at the base and the distal end; it is slightly longer than broad, posterior margin coarsely toothed; the lobe at the distal end of segment large, broad, with an almost straight lower margin, with a two-cone teeth serration, passes below the middle of segment 4; segment 4 with a large lobe drawn out below the apex of which goes beyond the middle of segment 5, which also is shorter than segments 4 and 6. Anterior margin of the basal segment of last three peraeopods is armed with spines and setae, which are strongly enlarged at the distal end. The postero-distal angle of epimeral plate 3 drawn out back, almost straight. Telson cleft much more than to the middle, with enlarged lobes tapering distally, armed with large lateral spines and one apical spine at the apex of each lobe. Uropod 3 with relatively short, strong rami of same length; apical segment of the outer ramus well developed.

The animal is up to 8 mm long.

Male specimens were captured in the area of the southern islands of the Kurile Range, at a depth of 414 m, on the ridge north of Shikotan Island and in the south of the Sea of Okhotsk, on an abyssal band north of Kokkaido Island, at a depth of 150 m.

3. _Lepidepecreum_ _rostratum_ Gurjanova sp.n.
(Figure 107).

In its dorsal comb and the edge of keel on segment 1 of the peduncle of antenna 1, it is close to _L._ _serratum_ Stephensen and _L._ _longicorne_ (Bate et Westwood). While very close in the shape of its head and the structure of both gnathopods to _L._ _serratum_, it sharply differs from the latter in the sculpture of its tegument, the considerably less developed dorsal comb, presence of eyes, shape of coxal plate 5, which lacks the postero-distal lobe drawn out below, form of basal segments of peraeopods 3 - 5, and telson's armature. It differs from _L._ _longicorne_ in a considerably less developed lobe, straight, lacking the keel, segment 2 of the peduncle of antenna 1, the weakly convex epistome, the sculpture of its tegument, and the form of basal segments of peraeopods 3 - 5. The development of low transverse ridge-like keels above coxal plates also brings the species described closer to L. longicorne.

Body with an indistinct median dorsal deel, which is formed by short and low teeth on the posterior margin of last peraeon segments and pleon segment 1; urosome segment 1; urosome segment 1 with a small depression in front of the outgrowth which forms a pointed process, bent back and up, with a broad base; urosome segment 3 with pointed triangular lobes along the sides of the telson's base. The lateral head lobe triangular, projected forward and below, with a blunt apex; eyes small, narrow, drawn out vertically. Tegument with a typical squamate sculpture formed by thin short striae (see the figure) or hairs. Margins of coxal plates and leg segments densely fringed with thin short hairs. Segment 1 of the peduncle of antenna 1 with a large keel-shaped process drawn out forward and pointed at the tip. Relative length of segments of the peduncle of antenna 2 differs from that in the preceding species: segment 3 almost as long as segment 4, last segment thinner and almost as long as segment 4. Gnathopod 1 a narrow segment 6 with parallel margins, the palmar margin of which is deeply concave and armed with two long, locking spines. Segment 6 of gnathopod 2 almost equals half the length of segment 5, but it does not broaden distally, is relatively narrow, with three transverse rows of thick setae at the distal end of the upper surface; palmar margin almost straight, short, weakly oblique inwards; dactyl slightly longer than palm, with teeth at the distal end of the inner margin. Coxal plate 5 deep, its maximum width almost equal in size to its length; basal segment of peraeopod 3 broad-oval, longer than broad, distal lobe broad, rounded, does not reach the middle of segment 4; segment 5; segment 5 slightly shorter than segment 4, slightly broadens distally; segment 6 considerably longer than segment 5; dactyl strong, slightly more than half the length of segment 6, weakly bent; basal segment of peraeopod 4 coxo-oval, with a broad rounded lobe at the postero-distal angle and an oblique distal part of the anterior margin. Segment 4 strongly broadened; segment 5 shorter than segment 4 and considerably shorter than segment 6. Anterior margin of the basal segment of peraeopods 3 and 4 armed with spines which pass into thick strong setae at the distal end; posterior margin sparsely and weakly dented, with one short seta at each dent. Basal segment of peraeopod 5 with a straight anterior margin armed with spines, tapers distally, the lobe at its postero-distal angle short; posterior margin coarsely dented, with a sinus at the distal end and setae between the dents; segment 4 short and broad, its width larger than the length of the anterior margin. Epimeral plate 3 with a weakly convex posterior margin, postero-distal angle forms a small dent. Uropod 3 with strong rami of same size, armed with 2 - 3 thick, strong spines; apical segment of the outer ramus about half the length of the main segment. Telson oblong-triangular, cleft more than to the middle, with one pair of lateral spines and a pair of spines at the base of lobe apices. Up to 4.5 mm long.

Male specimens discovered in the area of the south islands of the Kurile Range, in the range north of Shikotan Island, at a depth of 414 m.

4. Lepidepecreum comatum Gurjanova sp.n.
(Figure 108).

In the strong development of its dorsal comb, presence of a keel on segment 1 of the peduncle of antenna 1, and the sculpture of tegument, this species is closest to L. longicorne (Bate et Westwood) and, in the same characteristic features, except for the sculpture of covers, to L. serratum Stephensen. It differs considerably from both species mentioned above in the fact that its dorsal comb is double, its denticles are of a different shape and rather higher and that its head is not smooth, but with two oblong, low, ridge-like keels divided by a lonitudinal furrow. Moreover, it differs from L. longicorne in : 1) a rather coarser, distinct sculpture of its tegument; 2) a considerably less convex epistome which does not protrude beyond the boundaries of the upper lip; 3) an interantennal lobe protruding forward, and not below, with a horizontal (and not almost vertical, like in L. longicorne) lower margin; 4) small, round, and not oval eyes; 5) lack of a keel on segment 2 of the peduncle of antenna 1; 6) a different shape of segment 6 of gnathopods 1 and 2, which is relatively broader and shorter than that of L. longicorne; 7) the shape of coxal plates and basal segments of peraeopods 3 - 5, and 8) a stronger armature of telson. It differs from L. serratum in the sculpture of its tegument, the relative length of last three segments of the peduncle of antenna 2, and also the form of coxal plates and basal segments of peraeopods 3 - 5, and a large number of spines on the dorsal side of telson.

Body very compact, with a well developed dorsal comb. As a rule, peraeon segment 1 lacks the comb both in young and adult specimens; it only has a transverse ridge-like protuberance at the posterior margin, which is separated from the anterior margin of the segment by a groove; on peraeon segment 2, there is either a similar ridge, or (in young specimens from the Sea of Japan) with a cone-shaped pointed process projecting straight up. All remaining peraeon segments have a comb each, which terminates in a denticle turned back; two anterior pleon segments each bear one lower pointed keel, pleon segment 3 with a long, pointed process, bent slightly up; a similar, but shorter, pointed process is also located on the dorsal side of urosome segment 1; last two urosome segments lack the keels, only along the sides of the base of telson, segment 3 forms small rounded lobes. Comb on the back of peraeon is double; between them, there is a deep lengthwise groove; a similar groove is found on the crown. Eyes small, round, indistinct in alcohol. The sculpture of tegument coarse, with large, deep punctate depressions and a dense cover of very fine short hairs. Epistome rounded, does not protrude beyond the boundaries of the upper lip. Antenna 1 with a large keel-shaped pointed process on segment 1 of the peduncle directed forward and down. Coxal plate 1 narrow, slighlty tapering distally. On its posterior margin, there is a group of a few large setae; coxal plate 1, and it broadens distally; plate 4 with straight antero-distal angle. Segments 5 and 6 of gnathopod 1 differ in length; palmar margin of segment 6 transverse, finely dentate, weakly oblique, palmar angle with two locking spines, with close bases and divergent apices. Segment 6 of gnathopod 2 short and broad, strongly broadens distally, with a long concave palmar margin and the palmar angle drawn out and upwards forming a small claw with dactyl being shorter than the palm; segment 5 strongly inflated at the distal end. Basal segment of peraeopod 3 broad, almost round, with a smooth posterior margin, finged by only most minute short hairs; it is as broad as long, the lobe is absent; lower margin of the segment rounded. Basal segment of peraeopod 4 broad, with a concave anterior margin and a convex posterior margin, slightly depressed at the distal end; its lower margin is almost straight. Basal segment of peraeopod 5 with a deep notch at the distal end of the posterior margin; its middle part is finely toothed. Segment 4 of last three peraeopods broadens distally, segment 5 of peraeopod 3 as long as that of peraeopod 4, and longer than segment 5 of peraeopods 4 and 5; dactyls strong, considerably longer than segment 6. Epimeral plate 3 with a concave posterior margin and a postero-distal angle slightly drawn out and back. Uropod 3 with enlarged rami, almost the same in length, armed with spines; apical segment of the outer ramus 1/3 the length of the outer. Telson cleft slightly further than to the middle, its lobes sharply pointed at the end and diverging; their apex bears 1 apical spine, the outer margin of the lobes armed with spines and three plumose setae. 10.5 mm long.

Many specimens of ♂♂ and ♀♀ were captured on the range to the north of Shikotan Island at depths ranging from 100 to 150 m, in the area of the northern Kurile straits at a depth of 40 - 50 m; in the Sea of Japan - the Tatar Strait (216 m deep), at the west coast of the north of Sakhalin at a depth of 100 m, and near the Primorye area, at a depth of

50 - 500 m*; in the Sea of Okhotsk, in the eastern part of La Perouse Strait, at a depth of 188 m.

Figure 108. Lepidepecreum comatum Gurjanova sp.n. East coast of Iturup Island, ♂.

5. Lepidepecreum alectum Gurjanova sp.n.

(Figure 109).

This species is closest to L. chevreuxi Gurjanova, 1938 (nom.n. for L. serratum Chevreux, 1925, Bull. Soc. Zool. France, L, No. 6 - 7: 286, Figure 1, 2) in regard to the development of its dorsal keel only on pleon segment 3 and urosome segment 1, the structure of gnathopods 1 and 2, peraeopods 3 - 5, and uropod 3; it differs from the mentioned species in the lack of the rostrum, the shape of the interantennal lobe, which is not narrow and linguliform, but with a deeply concave lower margin which forms the lower antennal notch, but broadly triangular, with a blunt apex and a straight horizontal lower margin; L. chevreuxi also lacks the oblique row of setae on the upper surface of coxal plate 1, which is typical of L. alectum; the epistome of L. chevreuxi is convex and protrudes

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* The specimens from the Sea of Japan which we examined were determined by A.I. Bulycheva as L. serratum Stephensen (the area of Rynd Bay /Transliterated from Russian. Translator / and as L. longicorne (Bate et Westwood) of the Syurkum /Transliterated. Translator/ area turned out to be all belonging to the new species, L. comatum Gurjanova.

forward, beyond the upper lip, posterior margin of the basal segment of peraeopods 3 and 4 is deeply serrate-dentate, and the telson weakly tapers distally and completely lacks the armature; even the apical spines at the apices of lobes are lacking, while the epistome of the species described has a concave anterior surface and does not project beyond the anterior margin of the upper lip; posterior margin of the basal segment of peraeopods 3 and 4 finely and shallowly notched, and the telson tapers distally and is armed with both the apical and dorsal spines (up to seven pairs). The apecies described has a distinct reticulate sculpture of the tegument, which feature is not given for L. chevreuxi.

Body compact, abbreviated; the low, indistinct dorsal keel forms tooth-shaped processes along the body only on pleon - segment 3 and urosome segment 1; last two urosome segments without combs and lobes along the sides of the telson. The keel, which is pointed and drawn out into a strong tooth, of pleon segment 3 is directed back and below; the keel on urosome segment 1 with a saddle-shaped depression in front of the base and forms a large pointed process bent up. The sculpture of the tegument is reticulate, with microscopic spinules within cells (see the figure); the entire body is covered with finest microscopic hairs; similar somewhat longer hairs fringe the edges of the segments of all legs and coxal plates. The lateral head lobe large, triangular, protrudes forward, with a rounded apex; eyes small, round, located at the base of the lateral lobe, indistinct in the specimens in alcohol. Segment 1 of the peduncle of antenna 1 with an indistinct oblong keel, distally terminates in a small rounded process. The epistome does not at all protrude above the lip, forms a flat depression at the middle of the anterior surface. Coxal plate 1 shorter than coxal plate 2, bears a diagonal row of setae on the upper surface; segment 6 and 5 of gnathopod 1 almost equal in length and width, both with parallel margins; palmar margin of segment 6 deeply concave, with two strong locking spines, which are parallel in regard to one another, and an oblique row of setae on the lateral surface of the segment. Segment 6 of gnathopod 2 about half the length of segment 5, with two transverse rows of thick flat setae on the anterior margin; palmar angle strongly drawn out forward and forms, together with the dactyl a true, small claw. The anterior margin of the basal segment in last three peraeopods bears fine spines, posterior margin distinctly notched; segment 4 in these three pairs strongly broadens distally, with spines along both margins and a well developed lobe at the distal end; segment 5 considerably shorter than segments 4 and 6, dactyl strong, weakly bent, as long or slightly more than half the length of segment 6.

Figure 109. Lepidepecreum alectum Gurjanova sp.n. East coast of Iturup Island, ♂.

The basal segment of peraeopod 3 very broad, round, considerably broader than long, the distal lobe is wanting, lower margin smooth; the basal segment in peraeopod 4 oblong, with slightly concave anterior margin and a slightly marked distal lobe; basal segment of peraeopod 5 oblong, does not taper distally, without a lobe or a notch on the posterior margin. The postero- distal angle of epimeral plate 3 sharp, but not drawn out back. Uropod 3 similar to that of other species; telson oblong-triangular, densely covered with minute hairs, cleft more than to the middle; lobes armed with an apical spine at the apex and an oblong row of large somewhat disorderly arranged dorsal spines. The development of two pairs of short hook-shaped spines at the distal end of segment 6 in peraeopods 1 and 2 (one pair located at the base of the dactyl, the second one on the lateral surface of the segment) should be regarded as the distinguishing feature of this species. The animal is 8 mm long.

Three male specimens were captured in the Pacific Ocean, east of Zeleny Island (the Small Kurile Range), at a depth of 129 m.

6. *Lepidepecreum kasatka* Gurjanova sp.n.*
(Figure 110).

In many regards, this species resembles the previous species (lack of a keel process on the peduncle of antenna 1, the structure of the epistome, combs on pleon segments 3 and 4, presence of hook-shaped spines on peraeopods 1 and 2); unfortunately specimens of *L. alectum* are represented only by ♂♂, while *L. kasatka*, on the other hand, only by ♀♀, and one might think that they belong to one and the same species; however, the difference in the sculpture of the tegument, the structure of coxal plate 1, gnathopod 1, eyes, the basal segment of peraeopod 5, and the telson's armature forces me to separate these species, although I am not too sure whether this division is justified. *L. kasatka* (♀♀) also with an abbreviated compact body and a weakly expressed dorsal keel on all

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* Named after Kasatka Bya, Iturup Island, where the helotype was obtained.

body segments, except for pleaon segments 3 and 4, as also in ♂♂ L. alectum; the sharp keel on pleon segment 3 is directed slightly up, while the keel on urosome segment 1, on the other hand, is turned back and triangular, and does not appear as a thin process with a broad base. Lateral head lobes also protrude forward, triangular; in alcohol, the eyes quite distinct, oblong-oval, light-yellow. The epistome does not protrude beyond the upper lip and is concave at the centre; does not form a flat surface, upper lip separated by a deep groove. Segment 1 of the peduncle of antenna 1 with an indistict oblong keel, which has a short, round process at the distal end. Coxal plate 1 strongly broadens distally, shorter than coxal plate 2, is densely covered with thin short hairs and lacks the oblique row of large setae; no hairs are notices on other plates and on the segments of legs, and the dense fringe of finest hairs along the margins of coxal plates and the leg segments, too, is lacking. The microscopic sculpture of the tegument is similar to that in L. nautilus (transverse dotted lines in each cell), but it is much more tender and is noticed under the microscope; the palmar margin of segment 6 of gnathopod 1 straight, short, weakly oblique, and armed with two parallel locking spines.

Figure 110. Lepidepecreum kasatka Gurjanova sp.n. East coast of Iturup Island, ♂.

Segment 6 of gnathopod 2 less than half the length of segment 5, broadens distally; on the anterior margin, there are not two, but only one transverse row of thick setae the ends of which are bent and dented along the inner margin. Peraeopods 1 and 2 at the distal end of segment

6, at the base of dactyl, have hook-shaped spines, but only one pair, and not two, as is in L. alectum. Basal segment of peraeopod 3 - 5 with a smooth, and not ntoched posterior margin, and in peraeopod 5 with a notch at the distal end, which is not observed in L. alectum. Segment 4 in all three peraeopods strongly broadened and enlarged, segment 5 short, while dactyl relatively longer, as long as segment 6 in peraeopods 3 and 4, and slightly shorter than in the last peraeopod. The postero-distal angle of epimeral plate 3 almost striaght.

Uropod 3 similar to that of L. alectum, but its rami are armed with a smaller number of spines, while the lower margin of the peduncle, on the other hand, has more spines. Telson of a completely different structure, cleft deeper, does not taper as distally, and the margins of the lobes are not concave, but convex. At the apex of lobes, there is 1 very strong apical spine on each apex; dorsal spines are absent; however, there are two setae closer to the base of the lobes, and not round dorsal spines. The sculpture of the tegument is covered with close, most minute, thin and short hairs, like those of L. comatum. The animal is 5 mm long (o with eggs).

Three specimens were captured (♀♀) on the underwater ridge, north of Shikotan Island, at a depth of 123 m and one specimen (♀) comes from the east of Iturup Island, a depth of 229 m, in the open Kasatka Bay.

7. *Lepidepecreum annulatum* (Bate, 1862).

(Figure 111).

Bate, 1862, Catal. Amphil. Brit. Mus.: 79, pl. XIII, f. 3. (*Anonyx*).

We did not have at hand any specimens of this species described by Bate from specimens of the U.S. Survey Expedition from the northern part of the Pacific Ocean (from the Sea of Japan). It was Stimpson who described this species in his unpublished manuscript. These same species were transmitted to Bate, who supplied drawings from them and presented a brief description.

Bate's diagnosis. Eyes oval. Antenna 2 slightly longer than the upper pair. Gnathopod 1 with an oblique short palmar margin fringed on sides with sparse hairs; dactyl longer than palm. Segment 5 of gnathopod 2 somewhat longer than segment 6, strongly broadened in the middle, bears short spines (?) or scales on the anterior surface. Segment 6 forms a small claw, which is densely covered with hairs. Pleon segment 4 (urosome 1) has a dorsal sinus. About $\frac{1}{4}$ inch (6 mm) long.

Discovered in the Sea of Japan, near Japan.

Figure 111. *Lepidepecreum annulatum* (Bate). According to Bate, 1862.

8. *Lepidepecreum vitjazi* Gurjanova sp.n.*

In many respects, it is close to *L. alectum*; however, it differs from the latter species in the sculpture of its tegument, its well developed eyes, the armature of its telson, and other features.

The dorsal keel present only on pleon segments 3 and 4; the keel on urosome segment 1 forms a broader and shorter process than that of *L. alectum*; head with a rather longer and narrower interantennal lobe and enlarged, almost colourless eyes, which are quite visible in alcohol. Antenna 1, from the middle part of the upper margin of segment 1 of the peduncle, has a distinct oblong keel, which on segment 1 forms a blunt striangular process that adjoins the base of segment 2; segment 1 of the flagellum longer and not shorter, than segments 2 and 3 of the peduncle, and the accessory flagellum is shorter than segment 1 of the main flagellum. Antenna 2 much stronger and has a considerably larger peduncle than in *L. alectum*; flagellum multisegmented, in ♂ very long. Coxal plate 1 with 1, and not 2 diagonal rows of short setae on the upper surface; palmar margin of segment 6 of gnathopod 1 not concave, but straight, transverse; at the apex of the segment, at the palmar angle and along the posterior margin, the legs are long, hook-shaped, and not the simple setae. Gnathopod 2 resembles those of *L. alectum*. Peraeopods 1 and 2

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* Named in honour of the research vessel VIT'AZ of the Academy of Sciences of the USSR, which operated in the waters of the northern part of the Pacific Ocean and brought in rich collections of amphipods.

with 1, and not 2 pairs of strong hook-shaped spines at the distal end of segment 6, and along its posterior margin, there are not spinous setae, but strong spines, often with a cleft apex. Coxal plate 4 of a completely different structure: while the notch on the posterior margin of L. alectum reaches the postero-distal angle of the plate and the lower margin of the latter is uniformly rounded, the notch of A. vitjazi reaches only slightly further than the middle part of the plate, forming with the lower part of the straight, slightly oblique posterior margin an almost right angle; the lower margin of the plate is straight and forms a right angle with the posterior margin. Basal segments of peraeopods 3 - 5 more elegant and not as broad, their posterior margin not as notched, while the armature of the anterior margin with spines is not as pronounced. Uropod 3 similar in structure. Telson cleft more deeply, dorsal spines number not five, but six pairs. The sculpture of the tegument coarsely punctate. The animal is 8 mm long.

A few specimens (♂♂) were captured in the Bering Sea, near Olyutorsky Gulf, at a depth of 40 m.

Figure 112. Lepidepecreum vitjazi Gurjanova sp.n. Bering Sea, ♀.

The Genus BURYTHENES Smith, 1882.

Guryanova, 1951: 264.

Three species known: one with a wide, almost universal geographical distribution, two other species come from depths of the northern part of the Pacific Ocean.

1 (2). Segment 6 of gnathopod 2 considerably shorter than segment 5 and broadens distally considerably. Segment 4 in last three peraeopods broad, with a distinct drawn out below, pointed lobe at the postero-distal angle..........1. E. gryllus (Lichtenstein, 1882).

2 (1). Segment 6 of gnathopod 2 longer than segment 5, with parallel margins. Segment 4 of last three peraeopods almost linear, without a lobe at the postero-distal angle.

3 (4). Eyes lacking; lower margin of coxal plates in last three peraeopods without a notch and lacks lobes; basal segment of last peraeopod broadened uniformly along its entire length..........2. E. fusiformis Birstein et M. Vinogradov, 1955.

4 (3). Eyes present; lower margin of coxal plates in last three peraeopods with a small notch and forms 2 lobes differing in size; basal segment of last peraeopod sharply tapers distally..........3. E. microps Birstein et M. Vinogradov, 1958.

1. Eurythenes gryllus (Lichtenstein, 1882).

Guryanova, 1951: 265, Figure 134; Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 225.

In the Pacific Ocean discovered in the sea wreck on the coast of Bering Island, Alaska Strait, near the Kermadec Island (the southern part of the ocean), and at a depth of 4000 m from the north-western part of the area of the Kurile-Kamchatka depression. Our collections contain specimens from the Bering Sea (depth 2116 m) and the Sea of Okhotsk (depth 3400 m), the maximum length being 90 mm.

2. Eurythenes fusiformis Birstein et M. Vinogradov, 1955 (Figure 113).

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII; 225, Figure 10.

Body spindle-shaped, without spines and keels; eyes absent; rostrum lacking. Urosome segment 1 with a uniform depression. Segment 1 of the peduncle of antenna 1 as long as segments 2 and 3 are broad, it is slighlty longer than the latter two segments together; flagellum multisegmented, its segment 1 being slightly larger than the two subsequent segments together; accessory flagellum 6-segmented, its segment 1 as large as segments 2 and 3 together. Segment 1 of the peduncle of antenna 2 with a broad lobe, the notch of which includes segments 2 and 3; segment 4 longer than segment 5, and also longer than segments 2 and 3 together; its margins are armed with setae. Setae also present at the posteró-distal angles of segments 3 and 5; flagellum multisegmented (in adult ♀ up to 41). The structure of the oral parts differs in details from that found in the helotype (see the figures). Coxal plate 1 small, rounded, broadens distally; its overlapped by the large square plate 2, leaving free only the antero-disal angle which bears a few short setae; plate 3 rectangular, deeper than broad; plate 4 almost square, with a notch on the posterior margin; last three plates decreases in size from plate 5 to plate 7, which are broader than deep. Gnathopod 1 with a well defined subchela; segment 6 with almost parallel margins, $1\frac{1}{2}$ times as long as segment 5; palmar margin slightly oblique and concave, with three locking spines; dactyl reahces beyond the palmar angle.

Figure 113. *Eurythenes fusiformis* Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1955.

Figure 114. *Eurythenes microps* Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1958.

Gnathopod 2 long, thin, weak; segment 6 longer than segment 5, linear, three times as long as broad; palmar margin transverse, weakly oblique, dactyl reaches slightly beyond the palmar angel. Peraeopods 1 and 2 similar in structure; their segment 4 enlarged and broad, more than two times as wide as segment 6 and twice as wide as segment 5; dactyl three times as short as segment 6. Basal segment of peraeopod 3 - 5 with a wing-shaped broadening, remaining segments being linear, dactyl straight, three times as short as segment 6. Basal segment of peraeopod 4 tapers distally. The postero-distal angle of epimeral plate 3 slightly rounded; its lower margin bears short setae, on the anterior margin are a few plumose setae. The outer ramus of uropods 1 and 2 shorter than the inner, their peduncle and rami armed with setae on margins. Uropod 3 with flat lanceolate rami; inner ramus slightly shorter than the outer; the apical segment of the outer ramus $4\frac{1}{2}$ times as short as segment 1. Telson cleft 3/4 the length, oblong-triangular; apices of its lobes bedentate. The animal is 17 mm long.

One female specimen with eggs comes from the Kurile-Kamchatka depression, the north-eastern part of the Pacific Ocean, the catch of 0 to 5500 m deep.

Figure 114. *Eurythenes microps* Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1958.

3. *Eurythenes microps* Birstein et M. Vinogradov, 1958 (Figure 114).

Birstein and M. Vinogradov, 1958. Tr. Inst. Oceanol., XXVII: 229, Figure 5 (1 - 10).

This species is very close to the species described above, but its eyes are small, reniform, brown in alcohol; its lower margin of coxal plates 5 - 7 bilobed, and the basal segments of the last two peraeopods sharply taper below. Coxal plate 4 with a deeper notch on the posterior margin than that of *E. fusiformis*; it differs from the latter species also in the details of the armature of its both pairs of lobes in maxillipeds. The animal is muddy-white, up to 10 mm long. Captured in the Pacific Ocean, the Kurile-Kamchatka depression, depression of Japan, and Bonin depression in total samples at a depth of 8480, 8000, and 6380 m.

33. The Genus VALETTIOPSIS Holmes, 1909

Holmes, 1909, Proc. U.S. Nat. Mus., XXXV: 494.

We do not have representatives of this genus in our collections. The diagnosis of this genus and descriptions of a typical species of this genus is given after Holmes. Segment 1 of the peduncle of antenna 1 only moderately enlarged, while its flagellum is enlarged. Mandibles with a dentate mandibular incisor, accessory plate, tooth row of spines and a well developed palp, which is attached behind the molar process. Maxilla 1 with numerous plumose setae along the inner margin of the plate; the outer plate with an oblique distal margin and is armed with tooth spines, palp 2-segmented and armed with short spinules on the distal margin. Maxilla 2 with almost equal plates, there are setae along the inner margin and at the apex of the inner plate. The outer plates of maxillipeds armed with spines along the inner margin, do not reach the penultimate segment of palp; inner plate well developed. Gnathopod 1 with a subchela. Gnathopod 2 with a well developed subchela, the dactyl attached to the anterior angle of segment 6. Branchial vesicles simple. Uropods with narrow rami. Telson deeply cleft.

The author points out that the genus differs from other genera of the family in the molar incisor of its mandibles, that segment 1 of the peduncle of antenna 2 is more or less usual for this type, but slightly enlarged, and segments 2 and 3 longer than those of the majority of other representatives of the family. The subchela of gnathopod 2 approximates the form typical of the family, as it possesses the "lysianassid" characters. All this indicated, according to the author, the primitive and transitory nature of the genus; in addition, it could be said that the coxal plates are relativley poorly developed, their height does not exceed the height of the corresponding segments; the wing in basal segments of peraeopods 3 - 5 is weakly developed, and so is the structure of the mandibles, of both the maxillae and the maxillipeds, which are similar (in structure) to those in the Gammaridea; the primitive character of these features is quite pronounced especially in the abyssal Atlantic species V. macrodactyla Chevreux in which even gnathopod 2 is more of a gammarid type, and not that of the lysiassids. Two species are known.

The genotype: V. dentatus Holmes, 1909

1 (2). Segment 6 of gnathopod narrower and shorter than segment 5, tapers distally; palmar margin very short, transverse, without locking spines..........1. V. dentatus Holmes, 1909.

2 (1). Segment 6 of gnathopod 2 broader and longer than segment 5, broadens distally; palmar margin oblique, longer than half the posterior margin of the leg and armed with one tooth and 2 strong locking spines at the postero-distal angle...........* V. macrodactyla Chevreux, 1900.

(The northern half of the Atlantic Ocean, more than 1500 m deep).

1. Valettiopsis dentatus Holmes, 1909

(Figure 115).

Holmes, 1909, Proc. U.S. Nat. Mus., XXXV: 495, f. 5, 6.

The species has been inadequately described, the number of figures small. The diagnosis is after Holmes. Eyes lacking. Lateral head lobes narrowly rounded. Antenna 1 about half the body length, segment 1 of the peduncle enlarged, almost two times as long as thick and slightly longer than the two subsequent segments together; accessory flagellum 4-segmented and extends beyond the distal end of segment 1 of the main flagellum. Antenna 2 almost as long as antenna 1, last segment of the peduncle slightly longer than the preceding one. Mandibles with molar incisor and a dented margin of an accessory plate; molar process broad, with a ribbed triturating surface; last segment of the palp about half the length of segment 2. Outer plates of maxilla 1 with ten dented spines at the distal end; palp with 8 short spinules on the distal margin, the inner and the outer spinules being thinner than the other.

Figure 115. Valettiopsis dentatus Holmes. After Holmes, 1909.

The inner plate of maxillipeds with three short strong spines at the distal end; the outer plate bears 12 strong spines at the inner end. Gnathopod 1 with almost rectangular segment 6, palmar margin transverse, segment 6 of gnathopod 2 enlarged, tapers somewhat distally; palmar margin short, transverse. The postero-distal angle of epimeral plate 3 sharp. Urosome segment 1 with a large dorsal tooth directed back. Uropods with narrow rami; rami of uropod 3 thinly dented in form of a comb along the margins and armed with 2 or 3 spines each. Telson cleft almost to the base, armed with a pair of spinules at the apex of each lobe and one spine on each side on the anterior margin. The animal is 6 mm long.

The only specimen was captured in the Pacific Ocean, in the area of San-Diego (California), at a depth of 440 - 513 m.

34. The Genus PACHYNUS Bulycheva, 1955

Bulycheva, 1955, Tr. Zool. Inst., AS SSSR, XXI: 193.

As pointed out by A.I. Bulycheva, this genus possesses a number of features which affiliate it with the genus *Pachychelium* Stephensen, 1925 (see also the diagnosis of this genus in Schellenberg's work, 1931). Both genera are characterized by: 1) a powerful peduncle of antenna 1 with unusually large, extremely developed segments 2 and 3 and reduced 2- 3-segmented bases and accessory flagella; 2) relatively weak antenna 2, which is as long as antenna 1 and also has a strongly reduced flagellum consisting of several segments; 3) abbreviated urosome; 4) short, entire telson; 5) a quite similar structure of peraeopods 3 - 5, with strongly broadened basal and 4th segments, short segment 5, and strong short dactyls. Moreover, the representatives of both genera are noted for their considerable differences (in regard to the structure of oral parts), which for the family Lysianassidae are of a generic significance. For instance, the mandibles of *Pachynus* bear a broad cutting plate, three spines in their dental row, and a well developed conical, pointed at the apex, molar process, which is not found in the mandibles of *Pachychelium*; maxilla 1 of *Pachynus* has a well developed 2-segmented palp, maxilla 2 has well developed, although differing in size, plates, while the palp of maxilla 1 in *Pachychelium* is completely reduced, the inner plate of maxilla 2 being underdeveloped; maxillipeds of Pachynus are noted for their well developed inner plates and an abbreviated palp segment 4 of which is underdeveloped, while the maxillipeds in Pachychelium do not have inner plates, their palp is considerably larger, and its segment 4 normal. Gnathopod 1 of Pachynus forms a powerful true claw, while gnathopod 1 of Pachychelium has a subchela. The geographic distribution of both genera also differs: Pachynus is a North-Pacific genus, Pachychelium is represented in the north of the Atlantic Ocean and in the southern hemisphere.

Thus, the following characteristic features are observed in the genus Pachynus. Powerful and thick antenna 1 with large segments 2 and 3, which are more developed than in other general of the family, and a rudimentary flagellum; short weak antenna 2 with a 2- 3-segmented flagellum; abbreviated biramous uropods and a wholly-edged telson. Mandibles with a straight mandibular incisor, an accessory cutting plate, a few spines in the dental row, and a narrow, pointed at the end molar process* and a thin 3-segmented palp the last segment of which is as long as segment 2. Maxilla 1 with 2-segmented spines at the apex, the inner plate very small, without setae. Maxilla 2 with narrow oblong plates armed with setae only at the apex, the inner plate shorter than the outer. Maxilli-

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* Bulycheva's diagnosis of the genus has a mistake: the author points out that the mandibles lack the molar process; however, all specimens of the helotype we examined possess an oblong, narrow molar process, with a pointed apex; this process has no triturating surface.

peds noted for well developed inner plates armed at the apex, and well developed outer plates with a straight inner margin which bears simple setae; palp abbreviated, 4-segmented, with an underdeveloped (in the form of a tubercle) last segment*. Upper lip with a rounded anterior margin; episome slightly protrudes forward, beyond the upper lip. Lower lip lacks inner lobes. Coxal plates abbreviated, the first four pairs are slightly deeper than the corresponding segment. Gnathopod 1 short and thick, with a well developed narrow claw; gnathopod 2 thin, longer than gnathopod 1, typically lyssianassid, with a small claw. Peraeopods 3 - 5 with a strongly broadened basal segment and segment 4. Uropods abbreviated, biramous; their rami lack spines and setae; ramus 2 shorter than ramus 1, ends of uropod 3 at the level of the ends of ramus 1; the inner ramus of uropod 2 shorter than the outer; the inner ramus of uropod 3 as long or slightly longer than segment 1 of the outer ramus; the apical segment of the outer ramus of uropod 3 large, more than half the length of segment 1; telson wholly-edged. Only one species known.

1. Pachynus chelatum Bulycheva, 1955

(Figure 116).

Bulycheva, 1955, Tr. Zool. Inst. AS USSR, XXI: 194, Figure 1.

Head longer than peraeon segment 1, armed with well developed hook-shaped rostrum, pointed at the end; interantennal lobes triangular,

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* In Bulycheva's diagnosis it is stated that the palp of the maxillipeds is 3-segmented; this is a mistake.

with a blunt apex. Eyes moderate in size, with large ommatidta, light-brown in alcohol. Antenna 1 thick, short, with a powerful peduncle; all segments gradually taper distally, hence the entire antenna is oblong-coned in shape; segment 1 of the peduncle thick, cylindrical, on sides forms processes which encompass the base of the next segment; segments 2 and 3 abnormally large, flagellum underdeveloped, 4-segmented, its segments small, especially the last one; accessory flagellum underdeveloped, consists of two short segments of same size. Antenna 2 slightly shorter and as long as antenna 1, but thin and relatively weak; last segment of the peduncle narrower and shorter than the penultimate one, flagellum underdeveloped, 2- 3-segmented. It is of interest to note that at the base of segment 1 of the palp of mandibles, there is an amentaceous organ, which resembles a calceole (see the drawing); a similar structure in the form of an attached tubercle encompassed by setae is located on the anterior margin of segment 6 of gnathopod 1 at the base of the dactyl, and at the distal end of the posterior margin of the basal segment in peraeopod 2. Coxal plate 1 broadens below, has a small rounded lobe in the lower part of its anterior margin; gnathopod 1 powerful, short, with an abbreviated thick basal segment and a short, cup-shaped segment 5 equipped with a narrow linguliform lobe; segment 6 powerful, strongly inflated, its palmar margin strongly drawn out forward and forms, along with a thick short dactyl, a true claw. Gnathopod 2 thin, weak, longer than gnathopdd 1; segment more than half the narrow oblong segment 5, slightly tapers distally; palmar margin drawn out forward and along with the dactyl, f forms a small claw; segment 3 enlarged, longer than segment 4 and more than half the length of the basal segment. Peraeopods 1 and 2 powerful, with thickened segments and a strongly developed segment 4 which forms a lobe drawn out below on the posterior margin. Peraeopod 3 with a broad bilobed coxal plate which is twice as broad as it is deep; basal segment broad, round, with 2 - 3 clusters of long setae on the anterior margin and an almost smooth posterior margin; segment 4 strongly broadened, wider than long; segment 5 short, slightly broadens distally, segment 6 linear, almost twice as long as segment 5; dactyl short, hooked. Peraeopod 4 slightly longer than peraeopod 3; its coxal plate with a broad posterior lobe; basal segment larger than in the preceding peraeopod, broad-oval, segments 4 - 7 similar in form to those of peraeopod 3. Peraeopod 5 slightly shorter than peraeopod 4; its coxal plate broadens behind and is rounded; basal segment very broad, larger than that in preceding peraeopods; segment 4 broadens distally and is not as broad, its width equals the length of the anterior margin. Posterior margin of the basal segment of both last peraeopods distinctly notched (but not too deeply). Epimeral plate 3 with a right postero-distal angle; its lower angle forms a small round lobe. Branchial vesicles simple. Urosome with abbreviated biramous uropods devoid of spines and setae; ends of uropods 1 and 3 at the same level; uropod 2 shorter than uropod 1. The inner ramus of uropod 2 shorter than the outer. The peduncle of uropod 3 short; outer ramus 2-segmented, longer than the peduncle, its apical segment large, more than half the length of segment 1; the inner ramus slightly larger or as long as segment 1 of the outer ramus, lamelliform, with a broad base and pointed at the end. Telson rectangular, almost square, only slightly longer than broad; posterior margin straight, with rectangular notches at posterior angles in each of which there is 1 apical spine. The specimens in alcohol preserve a greyish-lilac marble pattern; the animal is up to 9 mm long.

Figure 116A. Pachynus chelatum Bulycheva. Sea of Japan, ♀.

Figure 116B. Pachynus chelatum Bulycheva. Sea of Japan, ♀.

Distributed in the Sea of Japan (Peter the Great Bay, Tatar Strait) on arenaceous and silty-arenaceous bottom; depth 88 - 125 m.

35. The Genus KERGUELENIA Stebbing, 1888

Guryanova, 1951: 289

Known are six species and two subspecies of this genus, including those described below: one species from the northern part of the Atlantic Ocean, one species and two subspecies of the Atlantic species from the northern part of the Pacific Ocean and four species from the Antarctic Ocean.

Except for the specialization of oral parts, gnathpod 1 and coxal plate 4, the species of this genus are characterized by the change in the structure of the urosome and its appendages. In all species, the urosome is abbreviated at the expense of the decrease in the length of urosome segment 2, and uropod 3 in subject to reduction and becomes underdeveloped both in regard to its size and the degree of the loss of its individual parts. Using this feature as a basis, we may construct 2 morphological rows corresponding to two groups of related species. The first group includes the North-Atlantic species K. borealis, its two Pacific subspecies (K. borealis japonica and K. borealis ochotica), and one species from the Pacific sector of the Antarctic (K. palpalis). These species are characterized by a great reduction in the size of uropod 3, while at the same time preserving their biramous nature. At this ventral appendage decreases, they form a row in the following sequence: K. borealis japonica - K. borealis ochotica - K. palpalis - K. borealis borealis. The last uropods are reduced most in the North-Atlantic representative. The Pacific forms are closest to the initial ancestral form, which has a normally developed uropod 3.

The second row, which went along not only in the decrease in the size of uropod 3, but also in the reduction of its rami, is formed by the Antarctic species and one North-Pacific species. The initial link of this genus is represented by the Antarctic species K. glacialis, while uropod 3 is reduced most in the Antarctic species K. compacta; in each of them, uropod 3 is produced into 1-segmented appendage, which is so small that it finds enough room under the small, also reduced, telson, and is not seen from the outside. It will not be possible to construct a morphological row of species in this group, as these species are not present in our collections, and the authors who described them did not present sufficient material pertaining the features of the structures. It is of interest to note that the new species here described (from the north-west of the Pacific Ocean) - K. eoa, is assigned to the second, the Antarctic group of species, just as the Antarctic species K. palpalis, using the same character, was ascribed to the group species belonging to the seas of the northern hemisphere. Using this same character (the structure of uropod 3), we have also tried to present a key for the identification of the species, as the differentiation of the genus went namely in these directions, which characterize the tendencies found within the genus that was formed before.

1 (8). Uropod 3 biramous.

2 (7). Segments of the palp of maxillipeds quite enlarged, almost linear; segments 1 and 2 are considerably longer than broad.

3 (6). The inner ramus of uropod 3 about half the length of the outer one, the end of which reaches the level of the middle part of the rami of uropod 2. Telson covers only the peduncle of uropod 3.

4 (5). Segment 4 of peraeopods 3 and 4 enlarged, gradually broadens, its greatest width less than its length and is located in the distal part of the segment..........1a. K. borealis japonica Gurjanova ssp.n.

5 (4). Segment 4 of peraeopods 3 and 4 almost square, its greatest width larger than its length and falls to the proximal part of the segment.........1 . K. borealis ochotica Gurjanova ssp.n.

6 (3). The inner ramus of uropod 3* less than half the length of the outer, which is abbreviated and scarcely reaches the level of the distal end of the peduncle of uropod 2; telson overlaps the peduncle on the side and covers a considerable part of the rami or uropod 3...............* _K. borealis borealis_ G. Sars, 1891.

(North of the Atlantic Ocean and the Barents Sea).

7 (2). Segments of the palp of the maxillipeds strongly enlarged; its segments 1 and 2 broader than long..............* _K. palpalis_ K.H. Barnard, 1932.

Discovery Rep., V: 28.

(South of the Atlantic Ocean, South Scottish Islands).

8 (1). Uropod 3 uniramous; only the outer ramus preserved, the inner one disappears completely.

9 (12). Basal segment of peraeopod 3 strongly broadens at the distal end, forming a large rounded lobe on the posterior margin.

10 (11). The only preserved outer ramus of uropod 3 2-segmented, but it is small and does not reach the peduncle of uropod 2; telson almost completely covers uropod 3...................* _K. glacialis_ Schellen-

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* Schellenberg, 1926: 241, makes a mistake by stating that _K. borealis_'s rami are uniramous; all the specimens of this species from the Barents Sea, which are at hand in our collection, have a small inner ramus; G. Sars, 1895 (drawings and description) also points out that uropod 3 of this species is biramous.

berg, 1926.

Deutsche Südpolar Exp., XVIII, Zool. X: 239, Figure 1.

(Antarctic).

11 (10). The only preserved outer ramus of uropod 3 1-segmented, but it is larger and extends beyond the middle part of the rami of uropod 2; telson covers the peduncle and only the base of the ramus of uropod 3.. ....2. K. eoa Gurjanova sp.n.

12 (9). Basal segment of peraeopod 3 enlarged, but linear and does not form a lobe at the distal end.

13 (14). Uropod 3 distinctly seen, reach slightly further than the end of the peduncle of uropod 2; telson does not entirely cover uropod 3, but only its proximal part. Segment 1 of the peduncle of antenna 1 with a large longitudinal keel, the rounded distal end of which overhangs the subsequent segment..............* K. antarctica K.H. Barnard, 1930.

Terra Nova-Exp., 8: 318.

(Antarctic).

14 (13). Uropod 3 very small and completely overlapped by a very small telson; its peduncle so small that it is hardly discernible; the only ramus (outer) forms a process bent inwards (located under telson). Segment 1 of the peduncle of antenna 1 without longitudinal keel and process; on the lower surface, it bears large plumose sensitive setae........ ....* K. compacta Stebbing, 1888.

(Kerguelen Island, depth 230 m).

1a. Kerguelenia borealis japonica Gurjanova ssp.n. (Figure 117).

More than twenty specimens of this species were obtained in the Sea of Japan; compared with the specimens from the Barents Sea (118), they reveal marked, stable differences in regard to the structure of coxal plate 1, segment 6 of gnathopod 2, the relative length of the segments of all last three peraeopods, uropod 2, and especially uropod 3, which were subject to a considerably less pronounced reduction, compared with the typical representatives of the species from the Barents Sea. The Pacific subspecies is noted for its rather larger size and, compared with the typical form, its more powerful gnathopods 1 and 2. If the coxal plate 1 of the Barents-Sea specimens tapers distally, has a strongly convex anterior margin, this plate in the Pacific subspecies broadens slightly distally, and its anterior margin is straight. Gnathopod 1 not as weak and thin; the length of the basal segment is only four times as large as its greatest width, while only five times as large in the Barents typical form (the same holds true in regard to Sars' drawing of Norwegian specimens); segments 3 and 4 also relatively thicker. In the Pacific subspecies, segment 6 of gnathopod 2 slightly greater than half the length of segment 5, while in the Barents specimen (and also according to Sars) considerably larger, about 2/3 the length of segment 5, and its form is different: if segment 6 of the typical form has almost parallel margins and slightly tapers distally, dactyl very small and shifted to the posterior margin of segment 6, and the palmar margin slightly drawn out forward, segment 6 of the Pacific subspecies broadens distinctly distally, dactyl much larger, located in the middle of the distal end of segment 6, and palmar angle drawn out into a lobe pointed at the end (together with the dactyl, this lobe forms a claw). In both subspecies, peraeopods 1 and 2 at the distal end of segment 6 bear at the base of the dactyl a short, powerful, hook-shaped spinule. In structure, peraeopods 3 - 5 of the Pacific form are similar to those of the typical form. Marked difference in both species is noted in the structure of uropod 3 and the degree of its reduction. If the biramous uropod 3 of the typical Atlantic species is extremely small (and it varies in length, too) and almost completely covered above with the telson and on sides with a broadened peduncle of uropod 2, the reduction of uropod 3 of the Pacific subspecies is not as marked; it also is biramous, the inner ramus also considerably shorter than the outer, but the peduncle reaches the distal end of the peduncle of uropod 2, and the outer ramus the middle of the rami of uropod 2; telson covers only the proximal part of the peduncle of uropod 3, not completely, as is the case in the typical form. Uropods 1 and 2 also better developed and armed with a greater number of spines, their peduncles relatively longer and narrower than those of the typical form in which the peduncles of uropods 1 and 2 abbreviated and broader, especially in uropod 2. Telson in both species similar in structure. Like in the typical form, urosome 1 lacks dorsal depression. The Pacific species is up to 7 mm long.

Captured in the Sea of Japan, Peter the Great Bya, and Tatar Strait, at a depth ranging between 105 and 785 m, from silty and sandy-rock bottom.

Figure 117. Kergualina borealis japonica Gurjanova ssp.n. Sea of Japan.

Figure 118. Kerguelina borealis borealis G. Sars. Barents Sea.

Figure 119. Kerguelina borealis ochotica Gurjanova ssp.n. Sea of Okhotsk.

1 . Kerguelina borealis ochotica Gurjanova ssp.n.
(Figure 119).

This species differs from the North-Atlantic form and the Sea-of-Japan subspecies in its stout body structure, rather deeper coxal plates 1 - 4, large eyes, which occupy a considerable part of the lateral head surface, abbreviated segments of thoracic appendages, and a very broadened basal segment and segment 4 of peraeopods 3 - 5. Of great interest is the fact that in its changes, the Sea-of-Okhotsk species went further than the Sea-of-Japan species, which is closer to the North-Atlantic typical form.

Lateral head lobes slightly drawn out forward and rounded at the end; eyes oblong-oval, occupy a considerable part of the lateral surface of the head, yellowish in alcohol, with a shiny horny layer of ommatidia. Segment 1 of the peduncle of antenna 1 large, inflated, with a powerful oblong keel, the rounded apex of which overhangs segment 2; segment 3 of the peduncle abbreviated, almost twice shorter than segment 2; flagellum 6-segmented, accessory flagellum 2-segmented. Antenna 2 similar to that of the typical and the Sea-of-Japan subspecies, flagellum 5-segmented. Segments of the palp of m maxillipeds linear. Coxal plate 1 strongly extended-oval, tapers distally, its anterior margin weakly convex (it is strongly convex in the typical and the Sea-of-Japan species); coxal plates 2 scarcely tapers distally, and its anterior and posterior margins, on the whole, are parallel in regard to one another (in two other subspecies it markedly broadens down). Gnathopod 1 with a strongly abbreviated basal and 4th segments and a long third segment. If the basal segment of the Atlantic and the Sea-of-Japan forms is more than $1\frac{1}{2}$ times longer than segment 3, the basal segment in ssp. ochotica is almost as long as segment 3; segment 4 in two other subspecies much more than half the length of segment 3, and in the Sea-of-Okhotsk species it almost equals half the length of segment 3; segments 5 and 6 of the North-Atlantic and the Sea-of-Japan species almost of same length, in the Sea-of-Okhotsk species segment 5 is shorter than segment 6. Gnathopod 2 also characterized by the rather more powerful segment 6 and the abbreviated segment 5, if compared with two other forms.

Depth of coxal plate 4 equals its width along the line transversing the lower lobe in the middle, while the depth of the plate in two other subspecies is less than its width.

Coxal plate 5, compared with the other two subspecies is noted for its shorter and broader posterior lobe. Basal segment of peraeopods 3 - 5 also relatively broader. Especially marked differences in the form of segment 4 of these appendaged, in the Sea-of-Okhotsk subspecies it is very broad, broader than long, and the greatest width is shifted to the proxiaml part of the segment, and in the two other subspecies the width of segment 4 smaller than its length, the greatest width being shifted toward the distal part of the segment. Urosome segment 2 relatively not as short as that of the typical and of the Sea-of-Japan forms. Uropod 2 has a narrower peduncle, compared with that of the typical subspecies, which lacks the broadened wing which covers uropod 3 (on the side). If it is small in the typical form, its length no longer than the peduncle of uropod 2 and attached at the level of the attachment to the segment of uropod 2, then in the Sea-of-Okhotsk form, and also in that of the Sea of Japan, uropod 3 is attached lower than uropod 2, and it protrudes beyond the boundaries of the end of the peduncle in uropod 2; moreover, the outer, 2-segmented ramus of the Sea-of-Okhotsk form is longer than the very small inner ramus, contrary to what we observe in the typical subspecies, in which also the outer ramus becomes abbreviated, so that both rami are very small and of same length. On the other hand, the Sea-of-Okhotsk form differs from the Sea of Japan subspecies in that the inner ramus of uropod 3 is only slightly shorter than segment 1 of the outer ramus, while the inner ramus of the ssp. japonica is more strongly reduced and its length measures only about half the length of segment 1 of the outer ramus. The peduncle and the rami of uropods 1 and 2 of the Sea-of-Okhotsk form are armed with less spines than those of other subspecies.

The animal is about 5 mm long, milky-white in alcohol.

A few specimens were captured at a depth of 160 m on a sandy bottom in the north-west of the Sea of Okhotsk.

2. Kergeulina eoa Gurjanova sp.n. (Figure 120).

The Pacific species is close to the North-Atlantic species K. borealis G. Sars, 1891*, but it sharply differs from the latter in the structure of both its gnathopods, the last three peraeopods, and also some details of the structure of other parts of its body. Externally, it resembles the Atlantic species K. borealis; eyes small, yellowish in alcohol, indistnct; segment 1 of the peduncle of antenna 1 with a low longitudinal keel which is enlarged and rounded at the distal end; segment 2 of the peduncle relatively longer than that of K. borealis, flagellum 6-segmented, accessory flagellum 3-segmented; antenna 2 similar to antenna 1, flagellum 4-segmented. The flagellum of antenna 1 of the male lacks the dense brush of long setae, which is

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* We had the opportunity to compare the Pacific specimens with those from the Barents Sea, which are quite identical with the description and drawings by Sars.

typical of the Atlantic species. Mandibles of the similar structure; palp of the maxillipeds with a very strongly lengthened segment 3 which is almost twice as large as segment 2. Gnathopod 1 with the basal segment broadened in the middle (the anterior margin of this segment bears a few setae); segment 3, unlike that of the Atlantic species, is short, 3.5 - 4 times as small as the basal segment, so that it is only slightly longer and thicker than segment 4; segment 4 almost two times as short as segment 5, while this same segment of _K. borealis_ is only slightly shorter than segment 5; the structure of segment 7 is quite different - its base is short and broad and bears 4 thick setae where the segment extends into a narrow dactylate distal part of the segment. Gnathopod 2 with abbreviated segment 4, segment 5 slightly longer than segment 3, and segment 5 itself is not linear, but broadens toward the middle; segment 6 does not taper, but strongly broadens toward the apex, so that its distal end is twice as broad as the base of the segment; palmar margin well developed, almost transverse and does not form a small claw, as is the case in _K. borealis_. Coxal plates 1 and 2 broaden distally, anterior margin of plate 1 convex. Basal segment of peraeopod 3 is not too strongly tapered at the proximal end, and its posterior margin becomes smoothly rounded and does not bear spinules; segment 4 not as strongly broadened and relatively longer; if the greatest width of segment 4 in _K. borealis_ equals the length of its anterior margin, the greatest width of the segment in the Pacific species is almost two times as small as the anterior margin, and the dactyl is stronger and longer. The basal segment of peraeopod 4 clearly tapers distally, with 2 - 3 indentations on the upper part of the posterior margin, segment 4 broadens distally strongly, but gradually. Basal segment of peraeopod 5 very broad, its greatest width in the lower part of the segment equals its length; posterior margin coarsely notched, lower margin smooth, weakly convex. Urosome segment 1 with a small depression on the dorsal side; segment 2 abbreviated; urosome segment 3 forms small narrow lobes, which are drawn out backwards on both sides of the telson, which is not observed in K. borealis. Uropod 2 not abbreviated, as is the case in K. borealis, but only slightly smaller than uropod 1, hence the ends of its rami extend back further than to the level of the distal end of uropod 1. Uropod 3 attached at the level of the end of the peduncle of uropod 2, monoramous; only the outer ramus preserved, which has lost its apical segment; its distal end falls slightly short of reaching the level of the end of the rami of uropod 2; telson small, located between uropod 3, hence does not at all cover the latter. Thus, the urosome and its appendages were subject to a smaller reduction than K. borealis, although the reduction in uropod 3 went further and both its inner ramus and the apical segment of the outer ramus disappeared completely. Contrary to K. borealis in which uropod 3 is attached on the side by a strongly broadened peduncle of uropod 2, the peduncle of uropod 3 in K. eoa on the side is covered by the processes of the last urosome segment which form lobes.

Figure 120. Kerguelenia eoa Guryanova sp.n.

Bering Sea.

The animal is 7 mm long.

Four specimens (♂♂ and ♀) come from the Bering Sea, north-west of the Cammander Islands, 60 m deep.

36. The Genus DERJUGIANA Gurjanova gen.n.

Along with the typically "lysianassid" appearance, it has interesting morphological features, viz. completely anomalous oral parts and the completely reduced rami of uropod 3 (the latter affiliated this genus with some genera of the family Lysianassidae inhabiting the seas of the southern hemisphere. The structure of these appendages is so striking that it serves as the basis for the identification of this genus as independent within the North-Atlantic genera with specialized oral parts - Trischizostoma, Hormanion, Acidostoma, Ambasia, Ambasiella, and Kerguclenia, which inhabit the southern regions of the Indian and the Atlantic oceans; the latter genera do not only have changed oral parts, but also strongly reduced (up to the complete disappearance of the rami) uropod 3. However, if the charactero of the change in the oral parts of Derjugiana may, to some degree, be regarded as the manifestation of the general line of the development of the lysianassids of the seas of the northern hemisphere, then the reduction in the rami of uropod 3, which is similar to that in the genera Stomacontion and Acontiostoma, which are closely interrelated, occured, no doubt, convergently, and there cannot be a genetic relation between the new described genus and the two genera mentioned above.

The following characteristic features are typical of the genus Derjugiana. Mandibles with a narrow expanded body; especially enlarged is its anterior part; incisor margin narrow, but notched; neither the molar process, nor the movable cutting plate, or the tooth row of setae present; palp well developed, powerful, 3-segmented. Maxilla 1 with an abbreviated 1-segmented palp, a strongly expanded outer plate armed at the apex with tooth spines, and a small plate devoid of setae. Plates of maxilla 2 narrow, quite enlarged, with setae at the apex; maxillipeds with large, well developed outer plates and long, narrow inner plates, which almost reach the apex of the outer plates; palp short, scarcely reaching the upper margin of the outer plates, 4-segmented; last segment of palp non-dactylate, small, simple, armed with setae; upper lip and epistome strongly extended, pointed at the end; lower lip with extended apices of the outer lobes, devoid of inner lobes and mandibular processes. Antenna 1 with a short, almost cylindrical first and enlarged second and third segments of the peduncle, with a short basic and well developed accessory flagellum. Antenna 2 normal. All coxal plates well developed; plate 4 with a shallow notch at the postero-distal end and a poorly developed short lobe on the lower posterior part of the plate. Basal segments of peraeopods 3 - 5 broadened. Gnathopod 1 with a large segment 6, which, along with the dactyl, forms a true claw. All three urosome segments free; uropod 1 and 2 biramous; uropod 3 greatly reduced, without rami, in the form of small, simple, leaf-like 1-segmented appendages; telson entire, with a concave surface and a strongly convex lower surfaces. Branchial vesicles long-sausage-shaped, simple, without folds and accessory lobes. The genus has been named in honour of Professor K.M. Der'ugin, one of the most prominent oceanologists, zoologists and faunists.

1. Derjugiana insolita Gurjanova sp.n.
(Figure 121).

Body weakly inflated; head as large as peraeon segment 1; interantennal lobe well developed, protrudes forward, with a blunt apex which almost reaches the distal end of segment 1 of the peduncle of antenna 1; eyes moderate in size, elongated-oval, dark, dark-violet in alcohol. Pleon segment 3 with a small keel bent upwards; urosome segment 1 with a transverse depression on the dorsal side and a small tooth-shaped keel behind it; posterior margin of epimeral plates 2 and 3 serrate-dentate. Antennae of same length, short; segment 1 of the peduncle of antenna 1 short, almost cylindrical, segments 2 and 3 each about half the length of segment 1 and together slightly smaller in length than the latter, flagellum 5-segmented, its segment 1 conical, considerably longer than each consecutive one; accessory flagellum 3-segmented, segment 1 longer than the remaining two. Peduncle of antenna 2 longer than the 5-segmented flagellum, its last segment much thinner and shorter than the penultimate. Gnathopod 1 powerful, abbreviated, with a thick basal segment; segment 3 slightly longer than is the short segment 4; segment 5 cup-shaped, much shorter than segment 6; the short palmar margin extended forward and forms a claw with a prehondile thick dactyl. Gnathopod 2 weaker and shorter than gnathopod 1, its basal segment shorter than segment 5, segment 3 very short, segment 6 narrower and less than half the length of segment 5, with parallel margins, the width of its distal end similar to that at the middle of the segment; palmar margin very short, directed straight forward and forms a small claw with a short prehensile dactyl; behind the dactyl, at the apex of segment, there are four transverse rows of thick setae.

Figure 121A. *Derjugiana insolita* Gurjanova gen.n. sp.n. Terpeniya Bya (Sea of Okhotsk), ♀.

Figure 121B. *Derjugiana insolita* Gurjanova gen.n. sp.n. Terpeniya Bay (Sea of Okhotsk), ♀.

Figure 122. *Thoriella islandica* Stephensen. After Stephensen, 1915.

Segments of peraeopods weakly armed; segment 4 of peraeopods 1 and 2 enlarged, longer than segment 5; gradually broadens below, segment 6 as long as segment 4, dactyl about half the length of segment 6. Peraeopods 3 - 5 with deep coxal plates; coxal plate of peraeopod 3 large, slightly deeper than broad, deeper than segments 2, 3, and 4 together are long; there is a small lobe with a pointed apex at the postero-distal angle; basal segment tapers distally, segment 4 broadens distally, slightly shorter than segment 5. Peraeopod 4 also with a large coxal plate which forms a short broad lobe with a straight lower margin; basal segment tapers disally, relatively longer and narrower than that of peraeopod 3; segments 4 and 5 of same length, both broaden distally, each shorter than segment 6; basal segment of peraeopod 5 considerably broader than that of peraeopods 3 and 4, with a strongly developed wing, slightly broadens distally, lower margin of the wing oblique. All segments of peraeopods 1 - 5 weakly armed, each bear 1 - 2 spinules on the anterior margin and 1 spinule at the apex of the posterior lobe of segment 4 and 3; posterior margin of the basal segment of peraeopods 3 - 4 smooth, indistinctly notched in peraeopod 5. Posterior margin of epimeral plates 2 and 3 serrae-dentate, more so in plate 3. Rami of uropods 1 and 2 of same length. Uropod 3 1-segmented, leaf-shaped, without rami. Telson entire, with a few spinules on the posterior margin.

The animal is 10.5 mm long.

2 female specimens were captured in the Sea of Okhotsk, near the each coast of south Sakhalin (Terpeniya Bay), at a depth of 53 m, on a sandy bottom.

*37. The Genus THORIELLA Stephensen, 1915

Stephensen, 1915, Rep. Danish Oceanogr., II, Biol., D1: 39.

Coxal plates 1 and 2 small, especially plate 1, but both are free and not overlapped by the subsequent plate, which is only slightly larger and deeper than the first two; plate 4 also small, but it is deeper and broader than plate 3, its posterior margin lacks a notch. All coxal plates separated from one another by a gap. Head short and high, with lobes drawn out below, which are almost rectangular; antennae of same length, with large inflated segments of the flagella, especially in antenna 2, the flagellum of which is oblong-spindle-shaped; accessory flagellum absent. Mandibles with an underdeveloped molar process and without a palp, but with a well developed cutting margin. Epistome large, strongly protrudes above the upper lip. Maxilla 1 with a 2-segmented palp and five thick plumose setae on the inner plate.

Maxilla 2 with a narrow outer and broad inner lobes along the inner margin of which there are short thick plumose setae; lower lip without inner lobes. Maxillipeds of a special structure: they form a galea which covers the oral parts; their outer plates narrow, small, pointed at the apex, while the inner plates, on the other hand, are large, triangular, with a blunt apex; palp 1-segmented, in the shape of a broad plate, so that both palps form a large part of the galea. Gnathopod 2, on the other hand, very long, with enlarged segment 3. All peraeopods of a prehensile type, although their segment 6, on the whole, linear, but with locking spines, and segment 7 in the form of a dactyl. Uropod 3 underdeveloped, in the shape of small tubercles; telson completely reduced.

Only one species known.

*1. Thoriella islandica Stephensen, 1915

(Figure 122).

Stephensen, 1915, Rep. Danish Oceanogr. Exp., II, Biol., D1: 39, f. 23.

Head very short, shorter than segment 1, but high; interantennal lobe well devleoped, but the interantennal notch absent. Eyes small, black, with a small accessory eye at the lower end of eye. Antennae equal in length, slightly longer than head and the first two peraeon segments together. Segment 1 of the peduncle of antenna 1 with a deep depression on the upper surface, segments 2 and 3 equal; flagellum 12-segmented (unlike in other representatives of this family, its segment 1 shorter than the subsequent ones; accessory flagellum wanting. Antenna 2 consists of 12 segments, proximal segments being narrower while the middle ones broad and strongly inflated, so that the entire antenna looks like an extended spindle. Peraeon segments increase in size from segment 1 to segment 5; two last ones slightly shorter and not as high as the preceding; posterior margin of each segment leans against the edge of the subsequent one. Epimeral plates small, especially plate 1, but all free and, in addition, separated from one another by gaps. For the structure of thoracic appendages see figure. Body yellowish in alcohol, 19 mm long.

Only two specimens known; one comes from the north of the Atlantic, depth of 1800 m, another, from the northern part of the Indian Ocean, dpeth 2800 m. This species is bathypelagic, parasitic in its nature.

*38. The Genus CHEVREUXIELLA Stephensen, 1915

Stephensen, 1915, Rep. Danish Oceanogr. Epx., Biol. Dl: 40.

Head very short, about half the length of peraeon segment 1, without antennal notches, and its lateral parts merge with the epistome. Coxal plate 1 small, its postero-distal angle is overlapped by plate 2, which is slightly larger in size; coxal plate 3 large, deep, with a strongly convex anterior margin, which overlaps a considerable part of plate 2. Plate 4 very large, without a notch on the posterior margin; two subsequent plates with a strongly developed, drawn out backwards, posterior lobe, which covers the anterior lobe of the plate situated behind it; last coxal plate small. Both antennae short, antenna 1 slightly longer than antenna 2; accessory flagellum lacking. The large galeate epistome, merged with the head at the middle, has a lengthwise sinus. Mandibles without molar process and have a palp with an underdeveloped cutting margin. Maxillae 1 with a 2-segmented palp and 4 setae on the inner plate. The inner plate of maxilla 2 larger and broader than the outer. Maxillipeds with 2-segmented palps and greatly reduced outer plates, which are enclosed between broad lobes formed by the first segments and present themselves in the form of small conical processes; inner lobes form also conical processes which lie under lobes of the palp and directed forward; the "galea" of the maxillipeds is formed by strongly outgrown lobes of segment 1 of palps to which second segments of palp become attached. Gnathopod 1 simple, with a broadened basal segment; gnathopod 2 much longer and more powerful than gnathopod 1; peraeopods prehensile; their segment 6 linear, with a locking spine; dactyl powerful, bent. Urosome only of two segments; segment 3, uropod 3, and telson reduced completely; uropods 1 and 2 similar in structure, their outer rami long and broad, inner ramus small, smaller than half the length of the outer; pleopods normal in structure. Only 1 species known.

*1. Chevreuxiella metopoides Stephensen, 1915
(Figure 123).

Stephensen, 1915, Rep. Danish Oceanogr. Exp., II, Biol., D1: 40, f. 24, 25.

Head coalesces with the epistome, is very short, shorter than peraeon segment 1. Eyes small, round, black. Antennae short; antenna 1 slightly longer than antenna 2, segments 2 and 3 of the peduncle enlarged; segment 1 of the flagellum very large, inflated, with transverse rows of setae on the lower surface; accessory flagellum lacking. Flagelli of both antennae in o 25-segmented and bear calceoli. All body segments, except segment 1, with a well defined medial oblong keel and a small oblong groove on both sides of the keel; these grooves are most distinct in body segments 4 - 7. For the structure of the appendages, see the figure. Coxal plate 4 very strongly developed; like that of the family Stenothoidae, while increasing in size, in the front and at the back, it forms a galea which covers the adjacent part of plates 3 and 5. The inner side of segments 4, 5, and 6 in all peraeopods covered with very thin, pointed spinules, which increase the attrition during the seizure of prey; at the distal end of segment 6, near the base of the dactyl in all peraeopods (except the last peraeopod), there is a pair of movable locking spines, which turn inward, toward the dactyl. On the ventral side of ♂, between the legs of /"segment"? Translator/ 7, there is a very small capulet organ in the form of an appendage. The structure of urosome and its appendages is of generic significance and is given in the diagnosis of the genus. The outer ramus of uropod 3 terminates in a small hook turned up and aside. In alcohol, the animal is yellow. ♂ 24 mm long; ♀ unknown.

Only one specimen obtained in the northern part of the Atlantic Ocean, from a depth of 4000 - 4300 m. This species is bathypelagic, parasitic.

Figure 123. *Chevreuxiella metopoides* Stephensen. After Stephensen, 1915.

The Family HYPERIOPSIDAE

Guryanova, 1951: 1008, Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 232; 1958, Tr. Inst. Oceanol., XXVII: 230.

Contrary to Birstein and Vinogradov's opinion, 1955, 1958, we still regard the family Hyperiopsidae monotypic, encompassing only the genus Hyperiopsis, leaving the genus Parargissa Chevreux, 1908, in the family Argissidae on the strength of the structure of the first four coxal plates and the character of the specialization / of gnathopods and peraeopods. In this connection, we supplement the diagnosis of the family Hyperiopsidae with the following most essential characters from the viewpoint of the line of development typical of the amphipods - pp. 11 - 21), namely: 1) weak development of the first four coxal plates, which are almost of same length; 2) linear, without the wing-shaped broadening, basal segment of last three peraeopods; 3) strong specialization of peraeopods 1 - 5, which is accompanied by their even greater differentiation (if compared with other families), as the structure of the first two peraeopods differs completely from that in the palp three peraeopods; and 4) the assymetry of maxilla 1 and its palp (the latter has a device for chirring), stressed by Birstein and Vinogradov.

Represented by only one genus.

1. The Genus HYPERIOPSIS G. Sars, 1885

Stephensen, 1934, Troms. Mus. Arshefter Maturhist. ADV., 53, No. 3: 4; Guryanova, 1951: 1009.

Known are six species, all bathypelagic, with a pelagic way of life. Four species have been discovered in the northern part of the Pacific Ocean. They key for the identification of the species does not include H. australis Walker, 1906, Ann. Mag. Nat. Hist., (7), 7: 454; 1907, Nat. Antarct. Exp., III: 9, pl. 4, f. 3, the description and figure of which are quite insufficient in order to speak about the independence of this species.

1 (2). Telson deeply cleft at the apex..............1. _H. voringi_ G. Sars, 1885.

2 (1). Apex of telson entire, bears teeth or a small notch.

3 (6). Posterior margin or apex of telson forms 3 teeth.

4 (5). Median tooth at the apex of telson simple, triangular...............2. _H. tridentata_ K.H. Barnard, 1937.

5 (4). Median tooth at the apex of telson bi-apical, with a deep notch in the middle and 2 long pointed ones on sides...............3. _H. laticarpa_ Birstein et M. Vinogradov, 1955.

6 (3). On the posterior margin or apex of telson, there are only two teeth, or they are lacking completely.

7 (8). Telson with two teeth at the apex and a convex posterior margin between them..............* _H. gibbosa_ Pirlot, 1934.

Sibega-Exp., XXXIIId: 167

(Malay Archipelago, in a catch from 1000 m deep to the surface).

8 (7). On the posterior margin of telson, there is a s small median notch, without apical teeth..............4. _H. vitjazi_

Birstein et M. Vinogradov, 1958.

G. Sars, 1885, Norske Nordhavs-Exp., 6, Crust., 1: 231, pl. 20, f. 21; Stephensen, 1934, Troms. Mus. Arshefter Naturhist. AVD., 53, No. 3: 5, f. 1 - 4; Guryanova, 1951: 1009, Figure 705; Birstein and M. Vinogradov, 1958, Tr. Inst. Oceanol., XXVII: 237, Figure 9.

Figure 124. *Hyperiopsis tridentate* Barnard. After Shoemaker, 1945, and Birstein and M. Vinogradov, 1955.

According to Birstein and M. Vinogradov, 1958, and also our specimens from the Kurile-Sakhalin expedition of 1948, the Pacific specimens of the species do not essentially differ from the typical one described by G. Sars from the Scandia depths. Twice discovered in the Pacific Ocean east of the Kurile Islands and in the open part of the sea near 49° n.l.

2. *Hyperiopsis tridentata* K.H. Barnard, 1937
(Figure 124).

K.H. Barnard, 1937, John Murray Exp., IV, No. 6: 147, f. 4; Shoemaker, 1945, Sc. Contr. New York Zool. Soc., 30, p. 4: 203, f. 12, 13 (o); Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 232, Figure 13 (♀).

Head with a short, broadly triangular rostrum in ♀ (longer and sharper in ♂). Eyes lacking. Accessory flagellum of antenna 1 about half the length of segment 1 of main flagellum in ♀ and 2/3 its segment 1 very long, 2 terminal segments short. For the stucture of oral parts see figure. Basal segment of gnathopod 1 slightly longer than 3 - 6 segments together, segment 6 slightly shorter and somewhat narrower than segment 5, dactyl with nail at the base of which there are setae. Gnathopod 2 similar to that in H. vörigi, but relatively longer and narrower.

Segment 4 of peraeopod 1 with a rounded lobe at the distal end; segment 4 of peraeopod 2 broader and the lobe at its distal end smaller than that of peraeopod 1. Peraeopod 3 - 5 thin; basal segment of peraeopod 3 linear, slightly broadened in peraeopod 4. Peraeopod 5 shorter than peraeopod 4, its basal segment broadened and has an angular lobe at the postero-distal angle. The postero-distal angle of epimeral plates 2 and 3 almost straight. Telson oblong-triangular, entire; its posterior margin with three dents; between the terminal and median dents, there is one apical seta in each; there is also a pair of submarginal setae at the posterior end of telson. The animal is up to 19 mm long.

Known from a depth of about 2000 m (the area of the Bermuda Ialnds in the Atlantic Ocean, from the Indian Ocean - 1702 m, - and the northern part of the Pacific Ocean, the area of the Kurile-Kamchatka depression, from a depth of 300 - 500 m, the southern termination of Kamchatka in the catch of 660 to the surface, and near Petropavlosk, at a depth of 300 - 500 m.

3. Hyperiopsis laticarpa Birstein et M. Vinogradov, 1955 (Figure 125).

Birstein and M. Vinogradov, 1955. Tr. Inst. Oceanol., XII: 233, Figure 14 (♂).

Eyes lacking. Antenna 1 shorter than antenna 2; segment 1 of peduncle inflated, considerably longer than two subsequent, broader than long, flagellum multisegmented (more than 30), its segment 1 two times as long as the peduncle and 1½ times as short as the remaining part of flagellum. Numerous papillae with round openings at ends are arranged on its surface in the form of regular transverse rows; similar papillae found also on other segments of the flagellum; however, there they number less and they are not arranged as regularly; accessory flagellum 3-segmented, almost as long as segment 1 of the main flagellum; its segment 1 as long as the subsequent two together. Last segment of the peduncle of antenna 2 very short, flagellum multisegmented (about 85 segments). Mandibles with a cylindrical molar process with a flat triturating surface and long seta. The movable plate of the left maxilla bent, with small teeth at the end; the right plate has the form of a scoop; in the dental row of both mandibles, there are 2 setae; palp relatively shorter than it is in other species, its segment 3 only slightly shorter than segment 2. Maxilla 1 assymetrical; palp of the right maxilla almost as large as that of the left maxilla, its segment 2 slightly broadens toward the apex and bears 9 flat teeth (4 in small specimens). Outer plate of maxilla 2 broader, but as long as the inner one; its 9 outer setae (4 in small specimens) plumose and much longer than the others which are smooth, indented on one side and arranged in two rows. At the apex and on the inner margin of the inner plate, the setae are also arranged in two rows; two setae are noted for their size - they are considerably larger than the others. For the structure of the maxillipeds and lower lip, see the drawing. Coxal plates 1 and 2 with rounded lower margin, their anterior margin parallel to the posterior, two times as deep as broad. Segment 6 of gnathopod 1 longer than segment 5, linear, dactyl small. Segment 4 of peraeopod 1 broadens distally, with a rounded, downward directed lobe at the antero-distal angle; there are long setae along the posterior margin; segment 5 strongly broadens distally, slightly longer than broad. Epimeral plate 3 with a rectangular-round postero-distal angle. Telson similar to that in *H. tridentata*, but the median denticle at its posterior end forms two lobes at the apex; it is characteristic that on the inner side of each of the lateral denticles of the apex, there is one seta on each. The animal is up to 12 mm long.

Figure 125. *Hyperiopsis laticarpa* Birstein and M. Vinogradov. After Birstein and M. Vinogradov, 1955 and 1958.

Figure 126. *Hyperiopsis vitjazi* Birstein and M. Vinogradov. After Birstein and M. Vinogradov, 1958.

Birstein and M. Vinogradov, 1958. Tr. Inst. Oceanol., XXVII: 233, Figure 7.

This species is close to H. vöringi G. Sars. Rostrum small, eyes unnoticed. Antenna 1 with a short peduncle and a very long segment 1 of the basic flagellum, which more than twice exceeds the length of peduncle; accessory flagellum 3-segmented, slightly longer than half segment 1 of the main flagellum, with a very long segment 1; last two segments of the accessory flagellum together about half the length of segment 1. Antenna 2 with a very long peduncle that exceeds the length of peduncle and segment 1 of the flagellum of antenna 1 together; segment 4 very long, $4\frac{1}{2}$ times as long as segment 3. Gnathopod 2 and peraeopod 2 similar to those in H. vöringi, gnathopod 1 similar to that in other species of the genus. Last peraeopod very long, basal segment narrow, almost linear, with two bent denticles at the postero-distal angle; segment 3 very small, segment 4 as long as the basal, segment 5 four times as long as segment 4, linear, with spines on anterior and posterior margins, segment 6 as long as segment 4, dactyl falcate, almost as long as segment 6*. Postero-distal angle of epimeral plate 3 drawn out into a small denticle. Telson oblong, entire, weakly tapers distally; its posterior margin with a small sinus in the middle; on its sides, there is a protuberance on each, with a pair of apical setae at the apex; there is a pair of subapical setae on the dorsal side of telson. It differs from the species

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* Birstein and M. Vinogradov, 1958: 235, while correctly naming the basal segment of peraeopod 5 as segment 2, make a mistake when naming segment 4 as segment 3, segment 5 as segment 4, etc., omitting actually segment 3, small as it is.

typical of the genus in the structure of its telson, epimeral plate 3, relative length of the segments of peraeopods 2 and 5, the form of the first four coxal plàtes, a very strongly enlarged segment 4 of the peduncle of antenna 2, and segment 1 of the flagellum of antenna 1 and also in its rather narrower lower lip.

One species (♂) 9 mm long, captured in the northern part of the Pacific Ocean, 29°0'4 n.l., 131°47' e.long) in quantitative sample, from 6050 m to the surface.

III. The Family STECOCEPAHLIDAE

Gurjanova, 1951: 292.

Representatives of five genera occur in the northern part of the Pacific Ocean; two other genera might be discovered.

KEY FOR DETERMINING GENERA OF THE STECOCEPHALIDAE

1 (18). Telson cleft.

2 (13). Mandibular incisor serrated.

3 (4). Segment 2 of the palp of maxillipeds at the postero-distal angle produced into a clearly bounded lobe. Palp of maxilla 1 two-segmented..............* Phippsia Stebbing, 1906.

(Northern part of the Atlantic Ocean and Arctic).

4 (3). Segment 2 of the palp of maxillipeds simple, without a lobe.

5 (8). Palp of maxilla 1 two-segmented.

6 (7). Basal segment of peraeopod 4 linear................
....1. Stegocephalopsis Schellenberg, 1925 (p. 372)*.

7 (6). Basal segment of peraeopod 4 broadened.............
......3. Phippsiella Schellenberg, 1925** (page 377)

8 (5). Palp of maxilla 1 one-segmented.

9 (10). Basal segment of peraeopod 4 broadened............
...2. Stegocaphalus Kröyer, 1842 (page 374).

10 (9). Basal segment of peraeopod 4 linear.

11 (12). Postero-distal angle of basal segment of peraeo-

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* In the original. Translator.

** The key for the identification of the genera of the family Stegoocephalidae Schellenberg (1929, Bull. Mus. Comp. Zool., LXIX, 9: 196) contains incorrect data on the diagnostic features used for the differentiation of the genera Phippsiella and Stegocephalopsis. It is stated that the basal segment of peraeopod 6 in Phipsiella (peraeopod 4, in our Key) is not broadened, while it is so in Stegocephalopsis; actually, however, the broadened basal segment of peraeopod 4 is characteristic of Phipsiella, and the linear, not broadened, of Stegocephalopsis.

pod 5 pointed..............* Stegocaphaloides G. Sars, 1891.

(Northern part of the Atlantic Ocean and Kara Sea).

12 (11). Postero-distal angle of the basal segment of peraeopod 5 rounded..............* Stegocephalina Stephensen, 1935.

Ingolf-Exp., III, No. 9: 134.

(Norhtern part of Atlantic Ocean).

13 (12). Mandibular incisor smooth.

14 (17). Maxilla 2 with two plates.

15 (16). Last segment of urosome much enlarged..................* Andaniotes Stebbing, 1897.

(Southern part of Pacific Ocean).

16 (15). Last segment of urosome normal..............* Euandania Stebbing, 1899.

(Southern part of Pacific Ocean).

17 (14). Maxilla 2 with only one plate; outer plate lacking completely..................Bathystegocephalus Schellenberg, 1926.

Deutsche Tiefsee-Exp., 23: 221.

18 (1). Telson entire.

19 (20). Mandibular incisor serrated.

20 (23). Peraeopod 5 normal, 7-segmented.

21 (22). Inner plates of maxillipeds normal..............
....* Andaniopsis G. Sars, 1891.

(Northern part of Atlantic Ocean).

22 (21). Inner plates of maxillipeds very short..........
...* Andaniella G. Sars, 1891.

(Northern part of Atlantic Ocean and Atlantic sector of Arctic).

23 (20). Peraeopod 5 abnormal, 3-segmented...............
...* Tetradeion Stebbing, 1899.

(Southern part of Pacific Ocean).

24 (19). Mandibular incisor smooth.

25 (28). Palp of maxilla 1 two-segmented.

26 (27). Peraeopod 2 simple, similar to that of peraeopod 1; coxal plate 4 deeper than the segment corresponding to it; its lower margin transverse, perpendicular to the anterior margin.........
......4. Andaniexis Stebbing, 1906 (page 379).

27 (26). Peraeopod 2 not simple, like peraeopod 1, but with a subchela; depth of coxal palte 4 smaller than that of the segment corresponding to it, and its lower margin obliquely truncated at a sharp angle toward its anterior margin..............* Parandaniexis Schellenberg, 1929.

Bull. Mus. Comparat. Zool., LXIX, No. 9: 197.

28 (25). Palp of maxilla 1 one-segmented..................
.5. *Parandania* Stebbing, 1899 (page 381).

1. The Genus STEGOCEPHALOPSIS Schellenberg, 1925

Guryanova, 1951: 293.

Of the three known species, two species are found in the northern part of the Pacific Ocean, as to this genus also *Phippsia pacifica*, described by Bulycheva, A.I. (1952), should be assigned (its maxillipeds correspond to *Stegocaphalopsis*, and not *Phippsia*.

1. *Stegocephalopsis ampulla* (Phipps, 1774)

(Figure 127).

Guryanova, 1951: 294

The North-Pacific specimens differ from the Arctic ones in a somewhat more enlarged body and strongly developed posterior lobe of the coxal plate 4.

Figure 127. *Stegocaphalopsis ampulla* (Phipps). Aniva Bay (Sea of Okhotsk).

Figure 128. *Stegocephalopsis pacificus* Bulycheva. Sea of Japan.

Relatively rare form, circumpolar in the Arctic, tolerates, to some extent, fresh water (occurs in the southern part of the

Laptevykh Sea); occurs more frequently in the northern part of the Pacific Ocean and attains a length of 70 mm. About 30 specimens were captured in the Bering Sea at depths ranging between 40 and 60 m, at the entrance to the Anadyr Bay, at the northern coast of Lawrence Island, and near Geneva Cape; a few specimens come from the eastern side of the continental shoal of Paramushir Island (the Kuriles) and the Sea of Okhotsk, west of Paramushir Island (1 specimen), Terpeniya Bay (twenty specimens, two stations), and Aniva Bay (four specimens) at a depth of 59 to 90 m. In Aniva Bay, in September, one female, almost 70 mm long, has eggs in its incubating pouch; two others has the young.

2. Stegocephalopsis pacificus (Bulycheva, 1952)
(Figure 128).

Bulycheva, 1952, Tr. Zool. Inst. AS USSR, XII: 197, Figure 2 (Phippsia).

This species is close to the preceding; it is noted for the structure of its maxillipeds, typical of the genus, provided with a strongly reduced 3-segmented palp with dactyl being completely reduced; its segment 2 simple, devoid of lobe, and the distal end of palp and apex of the well developed lobes are on the same level. The palp of maxillipeds in representatives of the genus Phippsia four-segmented, as there is a dactyl; the palp itself is not abbreviated and protrudes far beyond the boundaries of the apex of the outer lobes, which reach only the level of the distal end of segment 2 of palp.

The species described by A.I. Bulycheva is close to St. ampulla (Phipps, 1774); yet, it definitely preserves its identity; it is noted for its size (egg-bearing females only 4 - 6 mm long), for the form of the basal segment of peraeopod 4, which lacks the small lobe-shaped process at the posterodistal angle, as is the case in St. ampulla, and for the structure of its telson.

Head with a small, scarcely noticeable rostrum, interantennal angles rounded; eyes lacking. Peraeon segment 1 considerably longer than the subsequent one and as long as 2nd and 3rd segments together; segments 2 and 3 of the peduncle of antenna 1 not as long as those in St. ampulla, and together as long as segment 1; flagellum not 3-, but 5-segmented; accessory segment underdeveloped, one-segmented. Gnathopods 1 and 2 similar in structure to those in St. ampulla, but segment 1 closely fringed with minute hairs. Basal segment of peraeopod 4 narrow, linear, without the lobe-shaped process at the postero-distal angle. Basal segment of peraeopod 5 greately broadened, with rounded smooth margins; its greatest length equals the length of segment along the anterior margin. Segment 6 in all peraeopods linear, considerably longer than segment 5; the lobe at the distal end of a wing-shaped broadening of the basal segment in last peraeopod large, round; its apex reaches the level of the middle part of segment 4 (in St. ampulla, this lobe is completely undeveloped). Posterior margin of epimeral plate 3 finely notched, almost straight (in *St. ampulla*, there is a blunt, quite strong denticle in the middle of the posterior margin), its postero-distal angle almost straight. Peduncle of uropod 3 long, tapers distally, rami narrow, pointed, shorter than peduncle; their margins smooth and without armature (in *St. ampulla*, the rami are broad, lanceolate, with margins serrated at the distal end; in addition, these margins bear short setae). Telson enlarged, tapers toward the apex, cleft considerably more than to the middle (in *St. ampulla*, telson short and broad, cleft only to the middle, while the lobe diverage). The animal is up to 6 mm long.

Three females with young were captured in the Sea of Japan, the area of Cape Povorotny (northern cape of Peter the Great Bay), at a depth of 68 m.

2. The Genus STEGOCEPHALUS Kröyer, 1842

Guryanova, 1951: 296.

A representative of this genus widely distributed in the Arctic is found in the northern part of the Pacific Ocean near the shores of Asia; a second species has been discovered near the coast of California.

1 (2). The lower posterior angle of epimeral plate 3 straight, slightly pointed, its lower margin notched; lower margin of the wing of basal segments of peraeopods 4 and 5 transverse, almost straight...............1. *St. inflatus* Kröyer, 1842.

2 (1). Postero-distal angle of epimeral plate 3 strongly drawn out backward, rounded and notched; lower margin of the wing of the basal segments of peraeopods 4 and 5 strongly convex and rounded, forms a lobe...............2. St. hancocki Hurley, 1956.

1. Stegocephalus inflatus Kröyer, 1842.

Guryanova, 1951: 297, Figure 162.

This is a circumpolar species, one of the most commonplace animals in the Arctic; it spreads into the norhtern part of the Atlantic Ocean along both coasts, keeps to the cooled areas. In the northern part of the Pacific Ocean, it is widely distributed near the coasts of Asia, where it avoids the areas affected by warm currents and shallow waters that are greatly warmed up during the summer period. It is found in cold areas of the Bering Sea, Sea of Okhotsk, and Sea of Japan at depths of 50 - 60 m (for instance, in the northern part of the Tatar Strait, in Mordvinov Bay, and Aniva Bay in the Sea of Okhotsk). In the regions washed by the warm waters of the Kuroshio Current* and its branches, on the other hand, it is found at depths of 200 - 300 m (for instance, in the Sea of Japan in the area of Moneron Island at a depth of 320 m; at the west coast of south Sakhalin, at depths of 235 - 250 m; on the Pacific Platform of the Small Kurile Range, at depths of 250 - 270 m). On the Pacific Platform of the islands Iturup, Paramushiro, in the Kurile straits, where

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* Known also as Japan Current. Translator.

the entire water body within the conteinental plateau is uniformly distributed and has low temperatures above zero, St. inflatus is one of the most commonplace forms inhabiting depths ranging from 90 - 100 to 300 - 400 m. In the open ocean for instance, east of the southern part of the east coast of Kamchatka, specimens were discovered which lost their pigmentation, are whitish (the depth being 524 and 2220 m), while in the northern, shallow-water part of the Bering Sea, normally pigmented specimens, with a beautiful greenish-brown pattern and dark spots, were found at a depth of 60 - 100 m. In the north-east of the Pacific Ocean, warmed up by the Kuroshio Current, it was not discovered.

The animal reached the greatest length in the Aniva Bay and at the coast of Paramushiro Island (39 - 40 mm).

2. Stegocephalus hancocki Hurley, 1956

(Figure 129).

Hurley, 1956, Bull. So. Californ. Acad. Sci., 55, 1: 28, pl. 9 - 11.

Body inflated, head small, eyes lacking, rostrum small. Peraeon segment 1 two times as long as head and as long as segments 2 and 3 together. Antenna 1 shorter than antenna 2, its flagellum cone-shaped, 1-segmented, shorter than segment 1 of the main flagellum. Flagellum of antenna 2 7-segmented, shorter than peduncle; last two segments of the peduncle almost equal in length. Coxal plate 1 triangular, pointed at the end. Gnathopod 1 like that in the preceding species, but segment 6 strongly tapers distally. Gnathopod 2 with enlarged segment 3 which is longer than segment 4. Basal segment of peraeopod 4 with an oval wing the lower margin of which is not transverse and straight, like that in S. inflatus, but convex and rounded. Basal segment of peraeopod 5 also with an oblong-oval wing, the margins of which are rounded and finely notched; lower margin of wing also not transverse, but drawn out in the form of a rounded lobe further than the middle of segment 4. Epimeral plate 3 with its lower posterior part strongly drawn out back, the angle of which is round and coarsely notched. Inner ramus of uropod 2 not straight but slightly longer than the outer; inner ramus of uropod 3 also longer than the outer. Telson strongly tapers distally, cleft further than to the middle. It has one pair of thin setae on the upper surface, one seta on each side of the end of cleft. Length 5.5 mm (♀).

It differs readily from St. inflatus in the form of coxal plate 1, basal segments of last two peraeopods, and epimeral plate 3, a rather weaker armature of the inner plate of maxilla 1 and the palp of maxillipeds, and rather longer, but smaller in number, segments of the flagella of both antenna.

Discovered in the area of San Pedro, south-west of New Port ($33^{o}27'$N, $118^{o}02'$W), at a depth of about 500 m (mud ground).

Figure 129. Stegocephalus hancocki Hurley.

After Hurley, 1956

3. The Genus PHIPPSIELLA Schellenberg, 1925

Guryanova, 1951: 298.

This genus is represented by six species, including the one presented below; one species in the northern part of the Pacific Ocean.

1 (10). Head without rostrum.

2 (3). Posterior margin of epimeral plate 3 notched along its entire length..............* P. similis G. Sars, 1891.

(Northern part of the Atlantic Ocean and Atlantic Section of the Arctic).

3 (2). Posterior margin of epimeral plate 3 smooth, and it is only on its lowest part that there may be 1 - 2 notches or a small sinus above the postero-distal angle.

4 (5). Posterior margin of epimeral plate 3 strongly convex in its distal part and forms a small sinus above the base of the posterio-distal angle..............* P. kerguelani Schellenberg, 1926.

Deutsche Tiefsse-Exp., 23: 220.

(Subarctic waters of the southern hemisphere).

5 (4). Posterior margin of epimeral plate 3 straight, not convex; its postero-distal angle round, without a sinus above its base.

6 (7). Segment 1 of the flagellum of antenna 1 as long as segment 2..............* P. minima Stephensen, 1925.

Ingolf-Exp., III, 9: 131.

(Davis Strait and north of the Paero Islands, 740 - 1322 m deep).

7 (6). Segment 1 of the flagellum of antenna 1 as long as the three subsequent ones, which are considerably shorter than its segments.

8 (9). Antenna 1 relatively short and as long as head and two subsequent peraeon segments together..............* P. abyssicola Oldevig, 1959.

Göteborgs Kungl. Vetenskaps-Vitarhets-Samh, Handl. (B.), 8, No. 2: 24.

(Northern Arctic Ocean, depth 2750 m).

9 (8). Antenna 1 unusually long, as long as head and five subsequent peraeon segments together...............1. P. longicornis Gurjanova sp.n.

10 (1). Head with a well developed rostrum................
* P. rostrata K.H. Barnard, 1932.

Discovery Rep., V: 76

(South Georgia, depth 401 - 411 m).

1. Phippsiella longicornis Gurjanova sp.n.
(Figure 130).

This species differs from other species in its enlarged antennae; antenna 2 considerably longer than antenna 1. Body smooth, without dorsal keels and processes; urosome 1, with a saddle-shaped dorsal depression and a small blunt protuberance behind it. Peraeon segment 1 long, as long as segments 2 and 3 together. Head without rostrum, bent below, but distinct laterally; its interantennal lobe forms a blunt angle, and the lower part is strongly drawn out below, pointed at the end, and is covered by coxal plate 1. Antennae with enlarged multisegmented flagelli, antenna 2 considerably longer than antenna 1; peduncle of antenna 1 with last segment greatly abbreviated; this last segment is two times as short as segment 2; flagellum 11-segmented, $2\frac{1}{2}$ times longer than the peduncle; its segment 1 very long, only 1/5 shorter than the peduncle, bears 8 transverse rows of closely arranged thin hair-like setae; segment 2 of the flagellum almost three times as short as segment 1; at the distal end of each of the segments of the flagellum, there is a cluster of setae; accessory flagellum 2-segmented, slightly longer than segment 1 of the main flagellum; its segment 1 short, segment 2 $2\frac{1}{2}$ times as long as segment 1, with a cluster of setae at the apex. Antenna 2 longer than antenna 1 almost by the length of its flagellum; last segment narrower and slightly shorter than the penultimate one, flagellum 10-segmented. Along the middle line of head, between the places where antenna 1 is attached, there is a shallow oblong groove with ridge-like edges. Coxal plate 1 triangular, with convex anterior and posterior margins and pointed apex. Gnathopod 1 with thickened basal segments; segment 5, but considerably narrower and tapers distally; its posterior margin bears setae, and in the distal part long needle-shaped spines. Gnathopod 2 thinner and longer, their segment 6 slightly narrower and longer than segment 5, bears in the distal part of its posterior margin, besides setae, long needle-shaped spines. Basal segment of peraeopod 3 linear, in peraeopod 4 broadened, narrowly oval, with needle-shaped setae along the anterior margin; its posterior margin smooth. Basal segment of last peraeopod 5 strongly broadened, with rounded lower margin which does not form a lobe, and the posterior margin indistinctly notched in its middle part. Epimeral plate 3 bears short setae on the lower margin; its posterior margin straight, postero-distal angle round. Telson cleft slightly further than to the middle, on the whole triangular, with uniformly rounded lateral margins and a pointed apex of lobes. The animal is 16 mm long.

Two specimens captured in the Bering Sea, at a depth of more than 2440 m.

Figure 130. *Phippsiella longicornis* Gurjanova sp.n. Bering Sea.

Closest to *P. minima* Stephens; differs from the latter in its completely smooth posterior margin, devoid of notches at the end, and in a rather more drawn back lower part of epimeral plate 3, in the relative length of segments 5 and 6 of gnathopods, and in the details of the structure of oral parts.

Segment 6 of gnathopod 1 in P. minima (Shoemaker, 1931, Proc. U.S. Nat. Mus., 79: 12) longer than segment 5, as is the case in gnathopod 2; setae on the posterior margin of segment 6 only along its distal half; inner plate of maxilla 1 not triangular, but round; inner plate of maxilla 2 not longer, but shorter than the outer plate, the apex of the outer lobes of the lower lip with a short, round, broad process, while in P. longicornis with a narrow finger-like process.

4. The Genus ANDANIEXIS Stebbing, 1906
Guryanova, 1951: 303.

Known five species; in the northern part of the Pacific Ocean, one species.

1 (8). Body smooth, without dorsal keels.

2 (7). Body enlarged, height of the first four peraeon segments not exceeding the depth of coxal plates; head not covered by peraeon segment 1 and well seen laterally.

3 (4). Posterior margin of basal segment of peraeopods 4 and 5 notched along the entire length..............* A. abyssi (Boeck, 1871).

(Atlantic Ocean and Arctic).

4 (3). Posterior margin of basal segment of peraeopods 4 and 5 smooth along its entire length.

5 (6). Basal segment of the last peraeopod uniformly broad, does not taper distally; dactyl of peraeopod 4 short, its length smaller than half the length of segment 6..............* _A. australis_ K.H. Barnard, 1932.

Discovery Rep., V: 76, f. 34.

(South-east of Atlantic Ocean and South Africa).

6 (5). Basal segment of last peraeopods strongly tapers distally; dactyl of peraeopod 4 long, more than half the length of segment 6..............1. _P. subabyssi_ Birstein et M. Vinogradov, 1955.

Figure 131. _Andaniexis subabyssi_ Birstein et M. Vinogradov, 1955.

7 (2). Head covered above with peraeon segment 1 and laterally almost unnoticed; height of the first four peraeon segments considerably greater than that of the coxal plates corresponding to them; body disc-shaped..............* _A. spongicola_ Pirlot, 1933.

Siboga-Exp., XXXIII c: 148, f. 51 - 53.

(Tropical part of the Pacific Ocean near Kaye* Island).

8 (1). On the first four pleon segments, there are pointed dorsal keels..............* A. spinescens (Alcokc, 1894).

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* Russian "bay" Translator.

(Indian Ocean, Bay of Bengal).

1. Andaniexis subabyssi Birstein et M. Vinogradov, 1955 (Figure 131).

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 240, Figure 16.

Body smooth, eyes absent; antennae short, equal in length. Peduncle of antenna 1 inflated, its segment 1 longer than two subsequent together; postero-distal angles of segments drawn out forward, forming notches; flagellum two times as long as peduncle, 4-segmented, its segment 1 as long as segment 1 of peduncle; accessory flagellum 1-segmented, slightly longer than segment 1 of the main flagellum. Last segment of the peduncle in antenna 2 almost two times as long as the penultimate, flagellum 6-segmented. Coxal plate 1 triangular, slightly deeper than broad; lower margin of plates 2 and 3 round. Plate 4 with a short and shallow notch on the posterior margin. Segment 6 of gnathopod 2 with slightly concave distal part of the posterior margin and bears two locking spines. Peraeopod 4 considerably longer than peraeopod 5. Basal segment of peraeopod 4 broadened, with a narrow, but distinct wing-shaped broadening, with a small rounded lobe at the distal end. Basal segment of last peraeopod with a broad wing, but strongly tapers distally, with a smooth posterior margin and a small distal lobe, which reaches only the base of segment 4; dactyl two times as short as that of peraeopod 2, Posterior margin of epimeral plate 3 concave, postero-distal angle sharp; there are three spinules near the anterior end of the lower margin. Outer rami of uropods 1 - 3 slightly longer than the inner. Telson short, rounded-triangular; it is almost as broad as it is long; there are two apical setae. The animal is 3 mm long.

This is one of the frequently occurring species of the northern part of the Pacific Ocean; distributed north of 43°n.l.; also discovered in the Kurile-Sakhalin depression in a catch at a depth of 6400 to 9000 m.

5. The Genus PARANDANIA Stebbing, 1899

Stebbing, 1899, Ann. Mag. Nat. Hist., (7), 4: 206.

Head very short; peraeon segment 1 equals the length of the subsequent two segments together. Mandibular incisor broad, straight, smooth. Palp of maxilla 1 one-segmented, there is a small bent process at its base. Basal segment of peraeopods 4 and 5 broadened; antennae with long multisegmented flagella. Peduncle of peraeopod 1 short, inflated, segment 1 of the main flagellum strong, conical, inflated at its base, is more than three times as long as peduncle; accessory flagellum very long, two-segmented, its segment 1 short, apical segment much longer than segment 1. Both gnathopods similar in structure; telson short, entire. The narrow outer plate of maxilla 2 relatively short, as long as the broad inner plate; at the outer angle of the upper margin of the outer lobes of the lower lip, there is a hooked process.

One species known, discovered in the northern part of the Pacific Ocean.

1. *Parandania boecki* (Stebbing, 1888).
(Figure 132).

Stebbing, 1888, Rep. Voy. Challenger, 29: 735, pl. XXXVI (*Andania*); 1906, Tierreich, Berlin, 21: 95; Schellenberg, 1929, Bull. Mus. Comparat. Zool., LXIX: 197; K.H. Barnard, 1932, Discovery Rep., V: 77, f. 35; Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 239.

Figure 132. *Parandania boecki* (Stebbing).
After Stebbing, 1888.

Body smooth, without dorsal keels, the sculpture of plates alveolar and finely-punctate. Antenna 2 considerably longer than antenna 1, the end of which reaches only the distal end of the peduncle of antenna 1. Last segment of the peduncle of antenna 2 more than two times longer than the penultimate. Segment 6 in both gnathopods oval, narrower than segment 5 which broadens distally, and as long; posterior margin of segment 6 armed with plumose setae almost along its entire length; there are oblique rows of close setae on the surface of segment 5 and 6 of both peraeopods. Basal segment of peraeopod 3 oval (acc. to Stebbing) or with right lower angles (Barnard);

basal segment of peraeopod 5 broader, its distal end forms a pointed lobe drawn out below to the level of the middle part of segment 4; segment 6 of peraeopod 4 extremely long and narrow, $1\frac{1}{2}$ times as long as segment 5, dactyl short; segment 6 of peraeopod 5 as long as segment 4 and as broad, armed with spinules. The postero-distal angle of epimeral plate 3 drawn out backward into a blunt triangular process, the lower margin bears short setae. Uropods with a thick long peduncle and short rami. Telson short, entire, oval, slightly longer than broad. Eyes lacking, also absent are the optical nerve and ganglia (K.H. Barnard). The colour of the animal is dark-brown or brown. 26 mm long.

Known from the Indian Ocean and the northern and southern parts of the Atlantic Ocean; in the Pacific distributed chiefly north of 43°n.l., but along the coasts of Japan descends far to the south. It is an abyssal bathypelagic form, captured at depths ranging from 550 to 6000 m.

IV. The Family ARGISSIDAE

Guryanova, 1951: 327

Because the volume of the family remains unsolved and the scientists' opinions regarding it differ, we consider it necessary to state our point of view in regard to this question and substantiate it, after having analyzed the following three families: Argissidae, Tironidae, and Hyperirpsidae, to which various authors assign the genera *Argissa* Boeck, *Parargissa* Chevreux, and *Phylluropus* Barnard. On the other hand, like some other carcinologists, we also combine them into one family, viz. Argissidae.

The family Argissidae was identified by Walker (1904, Rep. Ceylon Pearl Oyster Fish., Suppl., XVII: 246) for the genus *Argissa*; Walker ascribed to this also the genus *Platyischnopus* Stebbing, which actually belongs to the family Haustoriidae (in the structure of its head and its appendages, coxal plates and thoracic appendages). In the extremely brief diagnosis of the family he identified, however, he mentions only three characters: 1) antenna 1 in the male has a longer and thinner flagellum than in the female; 2) the gnathopods are almost equal and similar; 3) last one or two peraeopods considerably stronger than are other appendages. We believe that these characters cannot serve as the criterion for the indentification of not only the families, but also the genera, as essentially they are important in regard to species.

This is why, apparently, Stebbing (1906) in his world summary does not recognize the family Argissidae as being independent and includes the genus *Argissa* in the family Tironidae (the genus *Platyischnopus* is ascribed by him to the family Haustoriidae). Chevreux (1908, Bull. Int. Oceanogr., Monato, No. 129: 9), while describing the new genus *Parargissa*, also includes it in the family Tirondiae. K.H. Barnard (1932, Discovery Rep., V: 145), while describing the new genus *Phylluropus* and including it in the family Argissidae, discusses Walker's opinion and considers that if the genus Platyischopsus should be left in the family Haustoriidae, then the family Argissidae could be regarded either as independent, or both genera examined by him - Argissa and Phylluropsis - may be included in the family Tironidae. Birstein and M. Vinogradov (1958, Tr. Inst. Oceanol., XXVII: 232) consider the inclusion of the genus Parargissa Chevreux in the family Tironidae or the Argissidae inaccurate and unfounded; and on the strength of the structure of antenna 1, maxilla 1 and mandibles, coxal plates 1 - 3, and telson, they ascribe this genus to the family Hyperiopsidae. On page 384 /in the original. Translator/, we present the comparative key of the characters for the families Argissidae, Tironidae, and Hyperiopsidae (Table 5).

On the strength of this table and our ideas regarding the basic lines of development in the group of the amphipods (pp. 11 - 25), we consider that the most important characters which differentiate the families under investigation are as follows: the structure of head, the structure and the degree of the development of tha lateral shield (i.e. coxal plates and basal segments of last three peraeopods), specialization of oral part and differentiation of thoracic appendages, and the degree of their development of their individual parts.

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE Table 5.*

Character	Argissida		
	Argissa Boeck	Parargissa Chevreux	Phylluropus K. Barnard
Head (Cephalon)	Enlarged, slightly shorter than peareon segments 1 - 3 together; tapers distally, has interantennal lobe (?) and lower-antennal sinus; rostrum small.	Enlarged, slightly shorter than peraeon segments 1 - 3 together; rostrum small.	Rostrum small.
Antenna 1	Shorter than antenna 2, in ♂ even shorter than the enlarged peduncle of antenna 2. Segments of peduncle simple, linear; segment 1 of flagellum in ♂ of a lysianassid type, simple in ♀; accessory flagellum short, 2-segmented.	Shorter than in antenna 2. Peduncle in ♂ with thickened segments; segment 1 of flagellum of a lysianassid type, unknown in ♀. Accessory segment present.	Thin, simple, segment 1 of flagellum in ♂ unknown, simple in ♀. Accessory flagellum 2-segmented.

* The even numbers of this translation dealing with this table indicate the right-hand columns of it. Translator.

Table 5*

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE

Tironidae				Hyperiopsidae
Tiron Lilljeborg	*Syrrhoe* Goës	*Bruzelia* Boeck	*Surrhoites* G. Sars	*Hyperiopsis* G. Sars
Galeate, with a large, bent below rostrum, as long as peraeon segments 1 – 3 together; without interantennal 1 lobe and lower-antennal sinus.	Similar to that in *Tiron*.	Similar to that in *Tiron*.	Similar to that in *Tiron*.	Inflated, almost globular, large, with a small rostrum.
Shorter than antenna 2, simple; segment 1 of flagellum in ♂ lysianassid, normal in ♀. Accessory flagellum present.	Shorter than antenna 2, simple; segment 1 of flagellum in ♂ lysianassid simple in ♀. Accessory flagellum present.	Shorter than antenna 2, simple; segment 1 of flagellum in ♂ lysianassid, simple. Accessory flagellum present.	Shorter than antenna 2, simple; segment 1 of flagellum in ♂ lysianassid, simple. Accessory flagellum present.	Shorter than antenna 2; peducnel inflated; segment 1 of flagellum lysianassid, much enlarged, conical, with sensitive setae or papillae; accessory flagellum shorter than segment 1 of main flagellum

* Right-hand columns of the original. Translator.

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Character	Argissidae		
	Argissa Boeck	*Parargissa* Chevreux	*Phylluropus* K. Barnard
Maxilla 1	Normal; palp simple, 2-segmented.	Assymetrical; palp on one maxilla larger than on the other, its apical enlarged segment bent at right angle and has a deep sinus on the inner surface, but without special sculpture for stirring.	Normal; palp simple, 2-segmented.
Maxilla 2	Normal; inner plate slightly broader than the outer, with oblique row of setae.	Normal; inner plate slightly broader than the outer, with oblique row of setae.	Normal; inner plate slightly broader than the outer, with oblique row of setae.
Mandibles	Normal; molar process large, clyindrical, with triturating surface. Palp 3-segmented, but weak and short, much shorter than body, its segment 3 as long as segment 2.	Normal; molar process cylindrical, with triturating surface. Palp normal, 2-times as long as body, its segment 3 half the length of segment 2; movable plate on one mandible may be absent, as is the case in some species of other families.	Normal; molar process cylindrical, with triturating surface. Palp normal, longer than body; its segment 3 slightly larger than half the length of segment 2.

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Tironidae				Hyperiopsidae
Tiron Lilljeborg	*Syrrhoe* Goës	*Bruzelia* Boeck	*Syrrhoites* G. Sars	
Normal; palp simple, 2-segmented.	Normal; palp simple, 2-segmented.	Normal; palp simple, 2-segmented.	Normal; palp simple, 2-segmented.	Assymetrical; palp specialized, considerably larger on one maxilla, with a special sculpture for chirring on the apical segment.
Normal; inner plate slightly broader than the outer, with an oblique row of setae.	Similar to that in *Tiron*.	Similar to that in *Tiron*.	Similar to that in *Tiron*.	Normal, but the inner plate considerably narrower than the outer, and without oblique row of setae.
Normal; molar process large, cylindrical, with triturating surface; palp 3-segmented, but weak and	Like those in *Tiron*, but palp longer than body of mandible; its segment 3 very small, reduced.	Body abbreviated and broadened, molar process also short and broad, triturating surface; 3-	Like those of *Bruzelia*, but palp weaker yet, with a very small reduced segment 3.	Assymetry only in the size of movable plates; molar process small, but cylindrical, w. triturating surface; palp, on the contrary,

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Character	Argissidae		
	Argissa Boeck	Parargissa Chevreux	Phylluropus K. Barnard
Lower lip	Normal, with inner lobes.	Normal, but without inner lobes.	Normal, with inner lobes.
Maxillipeds	Normal; outer plates extend beyond the middle of segment 2 of palp.	One half may be larger than the other; outer plates extend beyond the middle of the short segment 2 of palp.	Normal; outer plates reach the distal end of segment 2 of the abbreviated palp.
Coxal plates 1 - 3	Sharply decreases in size from 1st to 3rd; plate 1 well developed, much deeper than the height of segment; depth of 2nd about 2/3 the depth of 1st, plate 3 smallest, less than half the depth of plate 1.	Decrease from 1st to 3rd; plate 1 small, its depth less than height of segment, plate 2 slightly smaller than 1st, plate 3 somewhat smaller than plate 2.	Like those in Argissa.
Coxal plate 4	Becomes much enlarged, considerably larger than plate 1, and more so than 2nd and 3rd, its depth much larger than width and than height	Like that in Argissa, becomes much enlarged, larger than the first three, and is 2 times as deep as broad; there is a notch on its posterior margin.	Like that in Argissa, however, it tapers down and does not become broader.

Table 5

CAHRACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Tironidae				Hyperiopsidae
Tiron Lilljeborg	Syrrhoe Goës	Bruzelia Boeck	Syrrhoites G. Sars.	Hyperiopsis G. Sars
short, shorter than the body of mandible; its segment 3 small, much smaller than half the length of segment 2.		segmented palp weak, although longer than body; its segment 3 less than half segment 2.		strong, more than 3 times longer than body, its segments 3 more than half or as long as segment 2.
Normal, with inner lobes.	Like that in Tiron.	Like that of Tiron.	Like that of Tiron, but apex of outer lobes bilobed.	Normal, but without inner lobes.
Normal; outer plates extend beyong the middle of segment 2 of palp.	Like those in Tiron.	Like those in Tiron.	Palp weak, with thin segments; outer plates extend beyond the middle of segment 2 of palp and armed with lanceolate spines.	Symetrical; palp much enlarged, especially its segment 3, outer plates broad and short, do not reach middle of segment 2 of palp.

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Character	Argissidae		
	Argissa Boeck	Parargissa Chevreux	Phylluropus K. Barnard
	of segment. On posterior margin, there is a deep sinus; broadens below.		
Gnathopods 1 and 2	Equal and similar in structure, with an indisticnt subchela; segment 5 enlarged.	Gnathopod 1 shorter and weaker than gnathopod 2, both with indistinct subchela and enlarged segment 5; differ, however, in the form of segment 6.	Gnathopod 1 slightly shorter and stronger than gnathopod 2; both with an indistinct subchela, but differ in the form of segments 5 and 6.
Peraeopods 1 and 2	Equal in size and structure, simple, unspecialized. Dactyls very short.	Both with a subchela, specialized - with segment 5 thickened and segment 6 oval, and a long falcate dactyl.	Weakly specialized - with segment 4 enlarged; dactyl slightly shorter than the length of the simple linear segment 6.
Peraeopods 3 - 5	Basal segment with a large wing-shaped broadening, remaining segments normal,	Basal segment with a large wing-shaped broadening, remaining segments normal.	Basal segment with a large wing-shaped broadening; segment 3 normal, segment

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Tironidae				Hyperopsidae
Tiron Lilljeborg	Syrrhoe Goës	Bruzelia Boeck	Syrrhoites G. Sars	Hyperiopsis G. Sars.
Increase in size from first to 3rd; depth of each larger than the height of segment.	Increase from 1st to 3rd, but their depth less than the height of s segments; plate 3 very broadened, with deep notch on posterior margin, which is not observed in other families.	Like those in Tiron, but depth of plates equals the height of segments, and plates 3 not broadened and without a notch on the posterior margin.	Like those in Bruzelia.	Small, all equal; their depth less the height of segments; plates 3 without a notch on the posterior margin.
Smaller than plates 1 - 3, and not as deep as plate 3; there is a sinus on its posterior margin.	Very small, about half the depth of plate 3 and can be fitted into the sinus of its posterior margin; however, there is a notch on the posterior margin.	Like that in Tiron.	Like that in Tiron.	Small, primitive, as deep as plate 3; there is no sinus on its posterior margin.

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Character	Argissidae		
	Argissa Boeck	*Parargissa* Chevreux	*Phylluropus* K. Barnard
	linear, dactyl very short, in the last peraeopod segments 4 and 5 enlarged in thickness.	linear, segment 3 normal, dactyls long, pointed.	4 enlarged and thickened, dactyls less than half the length of segment 6.
Uropods 1 - 2	Normal, biramous, with rami almost equal in length.	Normal, biramous; in uropod 3 inner ramus shorter than the outer.	Uropods 1 and 2 normal; uropod 3 rami equal, very broad, in the form of plates oriented on the vertical plane.
Telson	Short, slightly longer than peduncle of uropod 3, cleft.	Short, slightly longer than peduncle of uropod 3, cleft.	Unknown

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Tironidae			Hyperiopsidae	
Tiron Lilljeborg	Syrrhoe Goës	Bruzelia Boeck	Syrrhoites G. Sars	Hyperiopsis G. Sars.
Gnathopod 1 slightly shorter and stronger than gnathopod 2; segment 5 much enlarged and spindle-shaped, but segment 6 linear, claw bent, sharp.	Gnathopod 1 shorter and stronger than gnathopod 2; both with a well developed subchela, segment 5 much enlarged.	Like those in Tiron.	Like those in Tiron.	Gnathopod 1 shorter than gnathopod 2; both with an indistict subchela and differ from one another in the form of segment 5.
Simple, unspecialized.	Like those in Tiron.	Like those in Tiron.	Like those in Tiron.	Highly specialized, with a tendency of forming a subchela segment 4 more than $1\frac{1}{2}$ times longer than basal segment and strongly broadened, segment 5 short, broadens distally, dactyl long, bent.

Table 5

CHARACTERS OF THE FAMILIES ARGISSIDAE, TIRONIDAE, AND HYPERIOPSIDAE (Cont.)

Tironidae				Hyperiopsidae
Tiron Lilljeborg	*Syrrhoe* Goës	*Bruzelia* Boeck	*Syrrhoites* G. Sars	*Hyperiopsis* G. Sars
Basal segment with a large wing-shaped broadening; remaining segments normal, dactyl short, segment 3 normal.	Like those in *Tiron*.	Basal segment broadened, in last peraeopod stronger than in peraeopods 3 and 4; remaining segments normal, dactyl about half the length of segment 6.	Like those in *Bruzelia*.	Basal segment primitive, linear, only sometimes broadened in peraeopod 5; segment 3 very small, almost indiscernible; remaining segments very long and thin.
Normal outer ramus 1 of uropods 2 and 2 shorter than the inner: uropod 3 with lanceolate rami equal in length.	Like those in *Tiron*, but the inner ramus of uropod 3 slightly longer than the outer.	Uropods 1 and 2 with abbreviated ramus; inner ramus of uropod 2 extremely large, broadened uropod 3 abbreviated, its outer ramus shorter than the inner.	Like those in *Tiron*.	Biramous, very long and thin; apparently, not of the same length in the first two uropods.
Very long, reaching the end of the rami of uropod 3, cleft.	Very long, extends beyond the middle of the rami of uropod 3, cleft.	Very long, almost reaching the end of rami of uropod 3, entire.	Very long, extends further than to the middle of the rami of uropod 3, cleft.	Short, much shorter than peduncle of uropod 3, entire or slightly cleft.

The following structrue is characteristic of the family Argissidae. Head enlarged in length, longer than high, there is an interantennal lobe and a lower-antennal sinus. Lateral shield is formed at the expense of strong growth of coxal plate and wing-shaped broadenings of the basal segment in peraeopods 3 - 5; coxal plate 3 is the smallest, its height is less than that of plates 1 and 2 and at least two times smaller than that of plate 4. Oral parts normal, non-specialized, with a normal correlation of all their parts; however, the palp of mandibles in Argissa is weak and short, and in Parargissa we note the assymetry of maxilla 1 and the disappearance of the inner lobes of the lower lip; gnathopods with a weak differentiation in regard to their function, i.e. as prehensile organs - their segment 6 does not have a palm (palmar margin). Peraeopods 1 and 2 simple, but in Parargissa they are specialized, prehensile, with an imperfect subchela; peraeopods 3 - 5 with a well developed wing-shaped broadening of the basal segment, normal segment 3, and simple linear segments 4 - 6; their dactyl in Argissa being very short, in the representatives of the two other genera enlarged, normal. Uropods 1 - 2 with equal rami, uropod 3 differs in structure in all three genera; telson short, no longer than the peduncle of uropod 3, cleft (its structure in Phylluropus unknown).

The species of the genus Parargissa stand by themselves and reveal features similar to those of Hyperiopsidae (specialization of peraeopods 1 and 2, marked assymetry of maxilla 1, and lack of inner lobes in lower lip); however, the development of the lateral shield and normal size of segment 3 of peraeopods 3 - 5 prevent us from assigning this genus to the family Hyperiopsidae, and, on the other hand hand, they allow us to regard the characters of the structure of *Parargissa*, which are common with this family, as developed convergently in connection with adaptations to a bathypelagic way of life. As regards the similarity of the structure of antenna 1 in the species *Parargissa* with the antenna of the lysianassids, and in particular the structure of segment 1 of flagellum, this takes place in the males of the species which belong to different families (in *Argissaidae*, Tironidae, Stegocephalidae, Pardaliscidae), the structure of the females of the same speices being normal.

Characteristic of the family Tironidae are: the galeate head, which is considerably higher than long and lacks the interantennal lobe and lower-antennal sinus; lateral shield, which is formed at the expense of all four anterior coxal plates and basal segments of peraeopods 3 - 5 (coxal plate 4 being not larger, but smaller than plate 3); gnathopods prehensile, with a well formed subchela; nonspecialized simple peraeopods 1 and 2, normal segment 3 of peraeopods 3 - 5; abbreviation of outer rami in uropods 1 and 2; greatly enlarged telson which overlaps the last uropod; deviation from the norm of the form of mandibles, the body of which is powerful, and the palp, on the other hand, weak, with a tendency of reducing its segment 3. In this family, the genus *Syrrhoe* deviates from the average norm due to the great increase in width of coxal plate 3, which in other representatives is only slightly larger than plates 1, 2, and 4.

A completely different evolution is observed in the Hyperiopsidae, which lead a planktonic way of life in deep layers of the water and which externally resemble the representatives of pelagic lysianassids (Cyclocaris, Cyphocaris) and the amphipods of the suborder Hyperiidea inflated head, lack of the lateral shield because of the retention of primitive coxal plates and basal segments in peraeopods. The specialization of the Hyperiopsidae went along the line of the appearance of the chirring organs, specialization of peraeopods 1 and 2 (enlargement of segment 4), and great enlargement in length of peraeopods 3 - 5, segment 3 being reduced.

Thus, we assign to the family Argissidae three genera, two of which are represented in the fauna of the northern part of the Pacific Ocean.

KEY FOR DETERMINING GENERA OF THE ARGISSIDAE

1 (4). Coxal plate 1 large, well developed, deeper than the height of segment and almost two times larger than depth of the small plate 3.

2 (3). Coxal plate 2 considerably smaller, narrower, and shorter than plate 1; rami of uropod 3 lanceolate, normally oriented. ....1. Argissa Boeck, 1871 (page 392).

3 (2). Coxal plate 2 almost as large as plate 1 and even slightly broader and deeper than the latter; rami of uropod 3 enormous,

in the form of broad plates oriented in a vertical plane.............
..* Phylluropus K.H. Barnard, 1932.

Discovery Rep., V: 145.

(Near the south Coast of Africa).

4 (1). Coxal plate 1 small, its depth smaller than the height of segment, and only slightly larger than the depth of plate 3..............2. Parargissa Chevreux, 1908 (page 393).

1. The Genus ARGISSA Boeck, 1871

Guryanova, 1951: 327.

The Pacific specimens of the amphiboreal species do not differ esstentially from the North-Atlantic specimens. In the Pacific Ocean captured in the northern shallow part of the Bering Sea, near the east coast of Kamchatka, at depths varying between 7 and 30 m; in the Sea of Japan, nead the coast of Primorye, from Tator Bay to Peter the Great Bay inclusively, at depths varyong between 30 and 200 m, near the east coast of Iturup Island, at a depth of 75 m. It spreads northward into the southern part of the Chuckchee Sea; in the south, pointed out near the coast of Ceylon.

2. The Genus PARARGISSA Chevreux, 1908

Chevreux, 1908, Bull. Inst. Oceanogr., Monaco, No. 129: 9; 1935, Res. camp. sci. Albert I, fasc. 90: 94: Birstein and M.

Vinogradov, 1955, Tr. Inst. Oceanol., XII: 236 (*Protohyperiopsis*); 1958, Tr. Inst. Oceanol., XXVII: 231.

First three coxal plates small, their depth being less than the height of segments, the size decreases from plate 1 to plate 3; plate 4 very large, deep, and broad, much deeper than first three plates and height of segment. Gnathopod 1 shorter and weaker than gnathopod 3; segment 6 in both pairs lacking the palm, although the structure of all last three segments bears witness to the formation of a subchela; it is possible that the linear nature of segment 6 is a secondary simplification. Peraeopods 1 and 2 prehensile, with a subchela, indistinct palmar margin, and a long falcate dactyl. Peraeopods 3 - 5 with a wing-shaped broadening of the basal segment, enlarged linear segments 4, 5, and 6, and a normally developed segment 3. Oral parts with traces of assymetry that is revealed in the structure of maxillae and maxillipeds. Uropods 1 - 3 with uneven rami; telson deeply cleft.

Genotype: *P. nasuta* Chevreux, 1908.

Two species are known. One species caught in the northern part of the Pacific Ocean.

1 (2). Segment 2 of the peduncle of antenna 1 with an enormous peaked process overhanging first segments of flagellum.............* *P. nasuta* Chevreux, 1908.

Bull. Inst. Oceanogr., Monaco, No. 129: 9.

(Atlantic Ocean, Axores, depth 1919 m).

2 (1). Segment 2 of the peduncle of antenna 1 with a small process, scarcely reaching the base of segment 1 of flagellum.............1. P. arcuata Birstein et M. Vinogradov, 1955.

1. Parargissa arcuat (Birstein et M. Vinogradov, 1955) (Figure 133).

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol., XII: 237, Figure 15 (Ptorohyperiopsis - Sic! Probably "Protohyperiopsis". Translator - arquata); 1958, Tr. Inst. Oceanol., XXVII: 231, Figure 6 (P. arcuata).

Body smooth, with a weakly expressed dorsal keel on pleon segments; first three coxal plates small, slightly decreasing in size from plate 1 to the smallest plate 3; coxal plate 4 much enlarged, broader below, with rounded lower margin and a sinus on the posterior margin; contrary to plates 1 - 4, its depth not smaller but considerably larger than the height of segments. Antenna 1 shorter than antenna 2; their peduncle slightly inflated, with very short segments 2 and 3; segment 1 of flatellum much enlarged, cone-shaped, lysianassid*, with long, close hairs on its upper surface; accessory flagellum 3-

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* Unfortunately, the sex of the specimens of the species is not mentioned, hence it is not clear whether or not this is the character of the species or just a manifestation of sexual dimorphism; the lysianassid type of flagellum of the male discovered in a number of families.

segmented, shorter than segment 1 of the main flagellum; its segment 1 considerably longer than the last two. Oral parts reveal assymetry in the structure of maxilla 1 and maxillipeds; left maxilla with enlarged apical segment of palp, bent at right angle and bearing a notch on the inner side into which, no doubt, the outer plate fits; palp of the right maxilla 1 normal. The left half of the maxillipeds larger than the right, their palp normal, outer lobes almost reach the upper margin of segment 2 of palp. Mandibles with a weakly developed, small, but cylindrical, molar process, palp well developed, two times as long as the body, segment 3 large, with a transverse row of setae; movable plate only on the left mandible. Maxilla 2 with an oblique row of setae on the inner plate, outer plate narrower than the inner. Gnathopod 1 shorter than gnathopod 2, with an underdeveloped subchela; segment 5 broadens distally, while segment 6 lacks palmar margin, tapers distally. Gnathopod 2 simple, with linear segments 5 and 6, and a long dactyl.

Peraeopods 1 and 2 with a subchela; their segment 4 enlarged, almost as long as the basal, linear, not broadened; segment 5 short, broadens distally, armed with spines along the posterior margin, segment 6 narrowly oval, dacty sharp, longer than segment 6. Last three peraeopods with broadened basal segments forming a wing, which participate only in the formation of the lateral shield (together with coxal plate 4); lower part of the wing drawn out below and forms a lobe with a serrated lower margin; basal segment of peraeopod 5, like that in Argissa, considerably longer and somewhat narrower than that in peraeopods 4 and 5; segment 3 in last three peraeopods normal; segments 4 - 6 long, linear, dactyl simple, pointed. Uropods 1 and 2 long, thin, with abbreviated outer rami; in uropod 3, on the other hand, the inner ramus shorter than the outer. Telson deeply cleft, scarcely reaching the end of the inner ramus of uropod 3. The animal is 13 mm long.

Bathypelagic species. Three specimens were captured in the Kurile-Kamchatka depression and the depression of Japan, in catches from 4190 to 8050 m and from 6000 and 8000 m to the surface.

Figure 133. *Parargissa arcuata* (Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1955.

ADDENDA

After our manuscript was submitted for publication, there appeared two papers on the amphipods (chiefly bathypelagic) of the Pacific Ocean. In them we find the description of new genera and species which belong to the families treated in our Key; there are given speices of these families which earlier were unknown to exist in the Pacific Ocean - 1) Dahl, E., 1957 - 1959, Sci. Res. of Danish Deep-Sea Expedition round the world 1950 - 1952. Galathea Report, 1: 211 - 212; 2) Birstein and M. Vinogradov, 1960, Tr. Inst. Oceanol., XXXIV: 165 - 241. Moreover, we obtained Chilton's work (1921, Commonwealth of Australia, Fisheries, V, part 2: 33 - 92) in which is described a new species that is not included in our Key of the genera of the family Lysianassidae.

NEW GENERA

The Family LYSIANASSIDAE

1. The Genus Endevoura Chilton, 1921: 44, f. 4a-q.*

Antenna 1 and 2 very short, equal in size, with reduced 2-4-segmented flagella. Coxal plates well developed, deeper than the height of segments; mandibles with a 3-segmented palp and a cylindrical molar process with a triturating surface; both maxillae and maxilipeds normal, lower lip with small inner lobes. Gnathopod 1 with a

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* Omission in the Key for the determination of the genus.

simple, distally tapering segment 6, small dactyl, and enlarged segment 3; gnathopod 2 typically lysianassid with round segment 6, shifted toward the middle of its distal margin by a small dactyl and a short palmar margin. Basal segment of peraeopods 3 - 5 with a well developed wing, segment 4 broadens distally, especially in peraeopod 3. All three segments of urosome free, telson entire, uropod 3 biamous, abbreviated, inner ramus shorter than the 2-segmented outer. The most characteristic of the genus is the great specialization of peraeopod 1, which have a strong subchela, the length of which along the posterior margin almost equals the length of segments 2 - 5 together, the width being about 3/4 the length.

Genotype E. mirabilis Chilton, 1921; Bass Strait (Australia).

2. The genus Mesocyphocaris Birstein et M. Vinogradov, 1960: 171. Genotype M. longicaudatus Birstein et M. Vinogradov, 1960.

3. The genus Neoambasia Dahl, 1957 - 1959: 218. Genotype N. tenuicornis (Nicholls, 1939), (Ambasiopsis).

NEW SPECIES AND THE SPECIES FOR THE FIRST TIME RECORDED FOR THE PACIFIC OCEAN

The Family LYSIANASSIDAE

1. Paracyphocaris praedator Chevreux, 1905. The kyukyu/

Transliterated, Translator/ Depression, in the catch from 4050 to 1020 m (Birstein and M. Vinogradov, 1960).

2. Mesocyphocaris longicaudatus Birstein et M. Vinogradov, 1960: 172, Figure 2 and 3. South-west of Hawaii, quantitative sample of 3500 to 0 m.

3. Crybelocephalus crassipes Birstein et M. Vinogradov, 1960: 174, Figure 4.

Tropical region of the Pacific Ocean in the catch from 6300 to 0 m.

4. Hirondellea antarctica (Schellenberg, 1926). Kermadeic Deep, in the catch of 5500 to 0 m (Birstein et M. Vinogradov, 1960).

5. Hiondellea dubia Dahl, 1957 - 1959: 212, f. 1. Kermadek Deep, depth 7640 - 7680 (Dahl, 1957 - 1959) and in sample catches within the depth of 9400 to 0 m (Birstein and M Vinogradov, 1960).

6. Pseudalibrotus zenkevitch Mednikov, 1960, "Nquchn. Doklady Vysshey Shkoly". Biol. Sciences, No. 3: 10, Figure 1 - 3. Anadyr Gulf.

7. Orchomenella distincta Birstein et M. Vinogradov, 1960 - 191, Figure 10. South of Palau Island in the catch of 2000 to 0 m.

8. Orchomenella pelagica Birstein et M. Vinogradov, 1960: 189, Figure 9.

Tonga Deep, in catches of 4300 to 2020 m.

9. Orchomenella abyssorum (Stebbing, 1888). Kermadec Deep and near New Zealand, in catches of 9120 to 0 m and 3000 to 0 m.

10. Schisturella galathea Dahl, 1957 - 1959: 219, f. 4 and 5. Kermadec Deep, depth of 7000 to 6960 m.

11. Socarnes longicornis Birstein et M. Vinogradov, 1960: 185, Figure 7. The New Hebrides Depression, in cathces of 8000 to 0 m, east of the Maraianas Islands, in the catch of 106 to 57 m and north of the Tokelau Islands, in catches of 61 - 0 m and 113 - 55 m.

12. Bathycallisoma schellenbergi (Birstein et M. Vinogradov, 1958). In addition to the previous places of occurrence, discovered in Kermadc Deep at depths of 7000 - 6960 m (Dahl, 1957 - 1959), in the depressions of the New Hebrides (8000 - 0 m) and Tonga, in a catch of 8000 to 0 m (Birstein and M. Vinogradov, 1960).

13. Bathycallisoma pacifica Dahl, 1957 - 1959: 222, f. 6 - 8. Kermadec Deep, at a depth of 6960 - 7000 m.

14. Paralicella tenuipes Chevreux, 1908*. The Philippine

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* Birstein and M. Vinogradov, 1960, consider Eurythemea fusiformis they described in 1955 as a synonym of Chevreux' species. However, the presence of a greatly concial molar process of mandibles and another structure of the lower lip do not correspond to the genus Paralicella. The authors also do not indicate the presence of E. obesus (Chevreux, 1905) in the Pacific Ocean (it was considered to a synonym of E. gryllus (Licht).

Sea, in catches of 4400 to 0 m and in Tonga Deep, 7300 to 0 m (Birstein and M. Vinogradov, 1960).

15. Paralicella similis Birstein et M. Vinogradov, 1960: 180, Figure 6. Near New Zealand, 3000 to 0 m.

16. Tryphosa bruuni Dahl, 1957 - 1959: 223, f. 9. Kermadec Deep, 6960 - 7000 m.

The Family HYPERIOPSIDAE

1. Hyperiopsis anomala Birstein et M. Vinogradov, 1960: 204, Figur3 20.

Tonga Deep, 6900 to 0 m.

The Family STEGOCEPHALIDAE

1. Bathystegocephalus globosus (Walker, 1909). Philippine Sea, 8500 to 0 m; Tonga Deep, 7300 to 0 m and 5500 to 0 m; Kermadec Deep, from 9400 to 0 m, 9100 to 0 m, 1000 to 500 m, and 518 to 200 m (Birstein and M. Vinogradov, 1960).

2. Euandania gigantea (Stebbing, 1899). Kermadec Deep, 9400 to 0 m (Birstein and M. Vinogradov, 1960).

3. Andaniexis stilifer Birstein et M. Vinogradov, 1960: 207, Figures 21, 22. Bougainville Depression, 8500 and 6500 to 0 m.

The Family ARGISSIDAE

1. *Parargissa affinis* Birstein et M. Vinogradov, 1960: 193, Figures 11, 12.

Bougainvilla Depression, 8500 and 8150 to 0 m.

2. *Paragissa longipes* Birstein et M. Vinogradov, 1960: 196, Figures 13 - 15.

Bougainville Depression, 8500 to 0 m.

3. *Parargissa curticornis* Birstein et M. Vinogradov, 1960: 199, Figures 16, 17.

New Hebrides Deep, 800 to 0 m.

Index of Latin Terms

Italic type indicates synonyms; semibold type, systematic categories (generic and of higher rank); semibold figures, the pate /_/ 2. general description (diagnosis); asterisk, the page on which the drawing of the given form is shown.

CONTENTS

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* The whole work was translated according to Dr. Bousfield's instructions, depending on what material he needed first, hense the inconsistency in figures.

Translator

Dr. E.L. Bousfield, North. Affs. & Natl. Res., Canada
Translated by Th. Pidhayay

V. The Family HAUSTORIIDAE*

Guryanova, 1951: 328

This family includes 12 genera; the genus Euxina described by Tucolesco (1933) should be abolished, since S. Carousu (1943, Amphipodes de Roumanie, Inst. de Cercetari Piscicole al Romaniei, Monographia, No. 1: 108), who had the type *E. fagei* Tucolesco, 1933, showed that this species is a synonym of *Pontogammarus maeoticus* (Sovinsky, 1896); the genus *Haustoriella* K.H. Barnard, 1931, is a synonym of the genus *Phoxocephalopsis* Schellenberg, 1931. Barnard included this genus in the family Haustoriidae, while Schelling includes it in the family Phoxocephalidae. In the structure of its head (presence of a small rostrum which overlaps the antennae) and antennae, this genus is very close to the Phoxocephalidae; however, in the structure of maxilla 1, gnathopods and peraeopods, and especially the last three pairs, we are inclined to assign it to the family Haustoriidae. The mandibles of *Phoxocephalopsis* have a weak palp, (and there is a tendency to reduce it), weak, enlarged gnathopods whose segment 6 is especially reduced and lacks a clearly defined palmar margin and locking spines and is considerably shorter than segment 5;

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* In "BOKOPLAVY SEVERNOY CHASTI TIKHOGO OKEANA" (AMPHIPODA - GAMMARIDEA), Part 1, Moscow - Leningrad, Academy of Sciences of the USSR Publishing House, 1962, pp. 395 - 428.

last pair of peraeopods is similar in structure to the two preceding pairs, and longer than pair 4 (this is most characteristic of the Haustoriidae). The gnathopods of the representatives of the Phoxocephalidae have a strong segment 6, which in size exceeds segment 5 and has a distinctly defined palm and locking spines; the last pair of peraeopods is much shorter than pair 4, their basal segment is strongly broadened, and the distal part of the leg is only slightly so, and sometimes is equals or is shorter than the basal segment.

In the northern part of the Pacific Ocean are found four genera.

THE IDENTIFICATION KEY TO THE GENERA OF
THE FAMILY HAUSTORIIDAE

1 (23). All 3 urosomal segments are free; mandibles with a large 3-segmented palp.

2 (24). Coxal plate 3 slightly larger than 2 and 1; and it does not overlap plate 2 which can be freely seen fron one side.

3 (6). Antenna 1 bent downwards at a right angle at the junction of segments 1 and 2 of the peduncle (Genicolate).

4 (5). Gnathopod 2 lacks the dactyl; the apex of its segment 6 is oblique and bears a brush of long thin setae. Peraeopod 5 almost equal in size to peraeopod 4. There is a sinus on the urosomal segment below; behind the latter, there is a rounded tubercle

with 1 - 2 short setae at the apex..............* Bathyporeia Lindström, 1855.

(Northern part of the Atlantic Ocean).

5 (4). Gnathopod 2 has a dactyl which, together with segment 6, forms a subchela; peraeopod 4 longer than peraeopod 5; dorsal side of urosomal segment smooth...............*4. Amphiporeia Shoemaker, 1929 (page 417).

6 (3). Articulation between segments 1 and 2 of the peduncle of antenna 1 normal; its distal part does not form straight angle with segment 1 of the peduncle.

7 (12). Segments 4 and 5 of peraeopods 4 and 5 become very broad; their width almost equals that of the basal segment or is even larger.

8 (11). Penultimate segment of the peduncle of antenna 2 strongly broadened, with a wing-like hind margin covered with long plumose setae.

9 (10). Peraeopods 1 and 2 of the same structure; telson in the form of plate 1, cleft at the apex..............*1. Haustorius Müller in Slabber, 1775, (page 397).

10 (9). Peraeopods 1 and 2 differ in their structure; telson not in the form of plate 1 but formed by 2 lobes attached on each side of last ventral segment...............2. Eohaustorius J.L.

Barnard, 1957 (page 400).

11 (8). Penultimate segment of the peduncle of antenna 2 cylindrical, with sparse setae on margins..............* Platyischnopus Stebbing, 1888.

(The Antarctic)

12 (7). Segments 4 and 5 of peraeopods 4 and 5 linear or broadened, but always noticeably narrower than basal segment.

13 (14). Coxal plate 1 very small, overlapped by plate 2 and is not seen from one side; segment 7 of gnathopod 2 dactylate, very long, with plumose setae on margins and at the apex................* Cardenio Stebbing, 1888.

(Kerguelen Island).

14 (13). Coxal plate 1 well developed, does not overlap the next and is seen from one side; segment 7 of gnathopod 2 short, falacate.

15 (18). Coxal plate 1 strongly tapering distally, oblong-triangular in form.

16 (17). Coxal plate 2 becomes broader distally, its lower margin almost straight, poorly convex; rami of uropod 3 equal in length..............* Phoxocephalopsis Schenllenberg, 1931.

Swed. Antarct. Exp., II, No. 6: 69. (Syn. Hausotriella K.H. Barnard, 1931).

(The Antarctic)

17 (16). All 3 anterior coxal plates taper distally and become apically blunt-pointed, bearing a cluster of long plumose setae ....3. Priscillina Stebbing, 1888 (page 413).

18 (15). Coxal plate 1 becomes poorly broadened distally, with a uniformly rounding lower margin.

19 (20). Gnathopods 1 and 2 not equal in structure; segment 5 of gnathopod 1 is short, cup-like, and only slightly longer than the 6th..............5. Pontoporia Kröyer, 1842 (page 420).

20 (19). Gnathopods 1 and 2 equal in structure; segment 5 of pair 1 elongated, uniformly broadened and considerably longer than 6th segment.

21 (22). Peraeopod 4 with poorly broadened segments 4 and 5 almost linear in form..............6. Urothoe Dana, 1852, (page 420).

22 (21). Segments 4 and 5 of peraeopod 4 strongly broadened, only slighlty narrower than basal segment ....* Urothoides Stebbing, 1891.

(Kerguelen Island).

23 (1). Segments 2 and 3 of urosome merge with one another; mandibles lack palp..............* Haustoriopsis Schnellenberg, 1938.

Kung. vetensk. Akad. Handl., 16, No. 6: 12.

(Tropical part of the Pacific Ocean).

24 (2). Coxal plates 1 and 2 very small and are not seen from one side, as they are overlapped by the strongly expanded coxal plate 3, which is larger than the 4th..............* Urohaustorius Sheard, 1936.

Rec. South Austral. Mus., V, No. 4: 445.

(South Australia).

*1. The Genus HAUSTORIUS Müller in Slabber, 1775.

Guryanova, 1951: 329.

Previously to this genus were ascribed 5 species, 2 of them from the Atlantic Ocean (one is in the northern part, another, in the tropical - Gulf of Mexico) and 3 species from the northern part of the Pacific Ocean. Of extreme importance is the fact that within the boundaries of this amphiboreal group of species, only two lines of development became prominent, which led to the formation of two genera, i.e. the Atlantic (Haustorius arenarius and H. americanus), and the Pacific (Euhaustorius washingtonianus, E. eous, and E. cheliferus); such a differentiation indicates that the exchange of the faunas between the two oceans, which caused the emergence of amphiboreal geographical ranges, is connected in this case with a rather older period than is the case for the majority of other amphiboreal forms; and it is possible that it took place through the Panama passage. The outline differentiation within the genus Haustorius as it was understood before has progressed so far that 2 genera were formed, on encompasses both Atlantic species (Haustorius), the other, 3 species of the Pacific (Eohaustorius). For instance, peraeopods 1 and 2 in the Atlantic species are of a similar structure, and pair 2 is only slightly weaker than 1. The Pacific species, on the other hand, were subject to a further differentiation of these extremities; they sharply differ from one another in the general structure, and pair 2 is considerably shorter and weaker than pair 1. Even more remarkable is that both groups differ sharply also in regard to the structure of the telson; the Atlantic species have preserved a rather more primitive structure of their telson plate; their telson presents itself as an entire plate on the posterior margin of which there is only a shallow notch which separates the marked lobes, while the telson of the Pacific species is divided into two parts, its lobes are attached to the outer angles of the last ventral segment completely independently and are separated from one another by a large space. Characteristic of the Pacific species is also the further specialization of the penultimate segment of the peduncle of antenna 2, i.e. the appearance of a strong long spine on the lower margin of a wing-like broadening of the segment (this characteristic feature is lacking in the Atlantic species), reduction of urosomal segments, development of the posterior part of ventral segment 3, which overlaps the urosome. The reduction of segment 6 of the last three pairs of peraeopods in the Pacific species has progressed further than in the Atlantic; consequently, the Pacific representatives of the genus are even more specialized than the Atlantic. The Pacific species were subject to a marked specialization especially in the structure of their thoracic legs of segments 3 and 4: for instance, if peraeopods 1 and 2 in the Atlantic representatives of the genus Haustorius are of the same structure, peraeopod 2 in the Pacific genus Eohaustorius differs sharply in structure from peraeopod 1. However, since in their external appearance the species Haustorius and Eohaustorius can hardly be distinguished, appendages of the body should be isolated and studied thoroughly.

1 (2). Segment 5 of peraeopod 4 does not taper distally; the outer ramus of uropod 3 is 2-segmented; posterior margin of telson almost straight, cleft less than to the middle by a narrow notch; its lateral posterior angles, armed with spines, are straight......... ...... H. arenarius (Slabber) 1769.

(Northern part of the Atlantic Ocean).

2 (1). Segment 5 of peraeopod 4 tapers distally, hence segment 6 when retracted passes forward considerably further than is the anterior margin of segment 5; outer ramus of uropos 3 1-segmented; posterior margin of telson forms 2 broad, rounded lobes, fringed with very long setae and divided by a broad and shallow notch............. ...* 1. H. americanus Pearse, 1908.

*1. Haustorius americanus Pearse, 1908 (Figure 134).
Pearse, 1908, Proc. U.S. Mus., 34: 28, f. 2.

We give the description of this tropical /Sic! Translator/ because it is lacking in our guide of 1951; at the same time, a close form may be found in a little known fauna of the Amphipoda of the American coast of the Pacific Ocean on the western side of the Isthmus of Panama and further west. This species is close to the North-Atlantic H. arenarius (Slabber) and differs sharply from the Pacific species of the genus Eohaustorius in the structure of the telson, peraeopods 1, 2, and 4, and uropod 3.

The body is inflated; antenna 1 with a 7-segmented flagellum whose segment 6 bears a calceole at the end; segment 1 of the peduncle tapers distally and bears setae on the proximal margin; segment 2 slightly shorter than segment 1, with clusters of long setae on the anterior margin and the postero-distal angle; accessory flagellum 1-segmented and is attached to the last segment of the peduncle sub-apically. Antenna 2 slightly longer than antenna 1; segment 4 of the peduncle is broadened, fringed with long setae; as is the case in H. arenarius, the lobe of the segment is weakly drawn out below and lacks a long spine at the base; flagellum is 7-segmented. The palp of the mandibles, contrary to the Atlantic species, has a relatively short apical segment, which is shorter than segment 2. Peraeopods 1 and 2, similar to those in H. arenarius, are of a similar structure; segment 3 very short, apparently, poorly discerible (not give in Pearse's drawings); segment 5 with a lobe, which is wide and produced behind, blunt-pointed; this lobe is armed with 2 transverse series of spinules on the lateral surface and with setae on the margin; in pair

1, these lobes are developed more than in pair 2; segment 6 is longer than 5, becomes broader distally and is rounded at the end, armed with 1 transverse series of spinules and spinous setae along the lower margin; in pair 1, segment 6 is wider and longer than in 2. Gnathopod 1 with 5th segment more inflated than in gnathopod 2; segment 7 with an appendage at the distal margin and considerably longer than in *H. arenarius*, reaches (according to the drawing) one half the length of segment 6. Gnathopod 2 with a small subchela; segment 5 bears calceoles on the distal end of the posterior margin. Coxal plate 3 is blunt-pointed distally, similar to that in *H. arenarius*, but plate 4 (in peraeopod 2) has a different form, with an obliquely cut and shallower notch in the upper part of this margin. Peraeopod 3 with relatively broader segments than in *H. arenarius*; the width of the basal, 4th and 5th segments, is considerably larger than the length, and segment 6 is shorter than is the width of the 5th, while the length of the basal segment in *H. arenarius* is larger than is its width, and segment 6 is larger and its length equals the width of segment 5. Peraeopod 4 with a short basal segment whose length is slightly larger than one half (about 2/3) of segment 4; segment 5 tapers distally considerably, and segment 6, when retracted, protrudes almost to one half beyond the boundaries of segment 5 of the lower margin. Uropod 3 and telson are of a different structure than those of *H. arenarius*; rami of uropod 3 rather shorter and wider, inner ramus shorter than the outer, and the outer is not 2-, but 1-segmented. Like in *H. arenarius*, telson forms 1 plate, but it is not quadrangular, and its posterior margin forms 2 broad, rounded lobes, fringed with very long setae, and bears a pair of dorsal lateral spines. The length is 8.2 mm.

Obtained in the Gulf of Mexico.

Figure 134. *Haustorius americanus* Pearse. After Pearse, 1908.

2. The Genus EOHAUSTORIUS J.L. Barnard, 1957.

J.L. Barnard, 1957, Bull. So. Calif. Acad. Sci., 56, p. 2: 81.

This genus differs from the genus *Haustorius* in very distinct characteristic features in regard to the structure of the appendages of segments, in spite of its great external resemblance to it. The different plan of the structure of peraeopods 1 and 2, division of telson's lobes which are attached to the last ventral segment and fully separated from one another through a considerable distance, and short segment 3 in gnathopods 1 and 2 are the most striking characters of this genus. Antenna 1 lacks the janiculation, accessory flagellum weakly developed; segments 4 and 5 of peraeopods 4 and 5 strongly broadened as those in the species *Haustorius*. Inner plates of maxilla 1 small; plates of maxilla of same length and form; 3-segmented palp of maxillipeds oriented normally in regard to plates.

3 species are known, all in the Pacific Ocean.

<u>Genotype</u>: <u>E</u>. <u>washingtonianus</u> (Thorsteinson, 1941).

1 (2). A sharp tooth-like protuberance directed upwards with its sharp apex is found in the upper part of the posterior margin of the basal segment in peraeopods 4 and 5; on the distal margin of segment 2 of the flagellum of antenna 2, there is a long plumose seta which reaches the end of the setae of the apical segment; segment 6 of peraeopod 2 considerably narrower and longer than the 5th... ....1. <u>E</u>. <u>washingtonianus</u> (Thorsteinson, 1941).

2 (1). Lower margin of the basal segment in peraeopods 4 and 5 is uniformly rounded and lacks a tooth-like protuberance; none of the segments of the flagellum of antenna 2 has a sharp plumose setae, distinct in size; segment 6 of peraeopod 2 narrower, but equal or shorter than 5th.

3 (4). The lobe of segment 5 of peraeopod 2 is very long and narrow; its apex reaches the distal margin of segment 6; at the posterior margin of segment 5 of gnathopod 2 in its upper part, there is a longitudinal series of sensory setae, whose upper half, separated from the lower by a constriction, is regularly notched on both margins. Telson's lobes are narrowly lanceolate, with a blunt-pointed apex and bear simple, very long setae in the distal third of the outer margin and at the apex..............3. <u>E</u>. <u>cheliferus</u> (Bulycheva, 1952).

<u>Figure 135A</u>. <u>Eohaustorius washingtonianus</u> (Thorsteinson). California. After J. Barnard, 1957.

Figure 135b. *Eohaustorius wasingtonianus* (Thorsteinson). Western Sakhalin (the Sea of Japan), ♀.

Figure 135B. *Eohaustorius washingtonianus* (Thorsteinson). Western Sakhalin (the Sea of Japan), ♀.

4 (3). Lobe of segment 5 in peraeopod 2 short, hardly reaching the middle of segment 6; there is a group of spatulate setae on the posterior margin of segment 5 in gnathopod 2. Telson's lobes with rounded apex, and simple or plumose setae...............2. *E. eous* (Gurjanova, 1951).

5 (6). With its spex, segment 6 of peraeopod 4, when retracted, reaches the base of the outgrowth on the antero-distal angle of segment 5; the width of the basal segment of peraeopod 5 slightly greater than its length; plumose setae on segments of antennae and peraeopods thin, their plumes of their shaft is short and tender...............2a. *E. eous eous* (Gurjanova, 1951).

6 (5). With its apex, segment 6 of peraeopod 4, when retracted, does not reach the base of the process on the antero-distal angle of segment 5; the width of the basal segment of peraeopod 5 considerably larger than its length; plumose setae on segments of antennae and peraeopods thick, coarse, with pencil-like shafts and coarse plumes...................2. *E. eous robustus* (Gurjanova, 1953).

1. Eohaustorius washingtonianus (Thorsteinson, 1941).
(Figure 135).

Thorsteinson, 1941, Univ. Washingt. Publ. Oceanogr., 4, No. 2: 61, pl. 4, f. 39 - 51 (Haustorius); J.L. Barnard, 1957, Bull. So. Ciliforn. /Sic! Probably "Californ." Translator/ x Acad. Sci., 56, p. 2: 82, pl. 16.

It sharply differs from Atlantic species in the structure of its telson whose lobes are completely separated from one another; its peraeopods 1 and 2 are of a different structure. The author describes the species from the females.

Antenna 1 with an accessory 2-segmented flagellum attached not to the apex of the last segment of the peducnle but to a distance of 2/3 its length from the base; the main flagellum is 5-segmented. Antenna 2 with coarse plumose setae; broadened segment 4 of the peduncle with a tapered down narrow lobe at the base of which, on the lower margin of the segment, is a long spine, which is lacking in Atlantic species; flagellum 5-segmented; on the distal margin of its segment 1, there is a long thick plumose seta whose length is larger than the length of the entire flagellum. Mandibles normal, segment 2 of the palp slightly longer than the apical. Gnathopod 1 with inflated segment 5, dactyl blunt, finger-like, with a large spine at its apex.

Gnathopod 2 with rather narrower and more enlarged segment

5 on the posterior margin of which 2 calceoles are found. Peraeopod 1 considerably stronger and longer than peraeopod 2; its basal segment thick, 3rd very short, 6th segment shorter than 5th, scoop-like, with a rounded apex and fringed with thick spines; segment 5 broad distally, it is as long as wide, on its posterior margin are 2 oblong series of spines on the sides of the depression into which, obviously, fits the end of peraeopod 2. Peraeopod 2 weak, short; its basal segment broad distally; segment 3 very short, almost invisible; segment 4 broadened, armed with spines; segment 6 forms a short broad lobe which is very weakly produced behind; on the lower margin of the latter, there are 2 notches whose spines are strong; a similar series of spines is found on the lower margin of the lobe, and at the anterior margin of the segment on its upper surface, there is an oblique series of strong spines.

Peraeopod 3 more slender than in the species of the Atlantic genus; the length of segments 4 and 5 larger than their width, segment 6 longer than 5th (according to the drawing); all segments, except 6th, bear long plumose setae and are armed with a series of spines. In the upper part of the posterior margin of the basal segment in peraeopods 4 and 5, there is an acute tooth-like protuberance which forms a spur; segment 5 in peraeopod 4 is poorly broadened distally; segment 6 is shorter than the lower margin of segment 5, and when it is retracted, its tip reaches only the base of the protuberance on the antero-distal angle of segment 5. Posterior margin of segment 6 bears strong spines, and there is a group of stronger and longer spines at its apex. Peraeopod 5 thinner and weaker than peraeopod 4; its segment 4 is strongly drawn out backward, bears plumose setae on the posterior margin, and on the anterior margin, transverse series of spines; segment 6 much narrower, but as long as 5th. All spines on segments 4 - 6 of pairs 3 - 5 of peraeopods strong, long, and sharp. Epimeral plate 3 with thick plumose setae on the lower margin and a long hooked and pointed protuberance on the postero-ventral angle.

The peduncle of uropod 2 short, inner 1-segmented ramus thicker and slightly shorter than outer, with 7 thick plumose setae sessile in notches; outer ramus 2-segmented, its apical segment shorter than basal; the peduncle and each segment of outer ramus, judging by the drawing, are armed with clusters of long setae; in the text, however, the author writes that each of the segments of the ramus is armed with 1 apical seta. The telson does not form entire plate as is the case in the Atlantic species; its lobes are separated completely from one another, and are attached directly to each of the outer angles of the segment; they are oval, with spines at the apex and with an inner margin. The length is 7 mm.

It has been discovered on the Pacific coast of Washington State, on the shore of Center bay (2 ♀♀) and in Southern California a at depths of about 15 - 18 m. Our material contains 8 specimens (♂♂ and ♀♀) obtained from the western coast of southern Sakhalin in the Sea of Japan on sand, from a depth of 19 m. They differ from the description and drawings typical of the species of the Sea of Japan in the presence of a toothed process on the posterior margin of the basal segment not only in peraeopods 4 and 5, but also in peraeopod 3, which is shortened and rounded, and not pointed, protuberance of the basal segment in peraeopod 5, the details of the armament of the segments of the last three pairs of peraeopods and the form of telson's lobe which are not narrowly oval but broadened distally, with an almost straight posterior margin, and are armed with spines but thick plumose setae, especially long on the tips of lobes; on segment 5 of gnathopod 2, there are not two calceoles but 1 oblong series of calceoles (sensory setae?). The females of the Sea of Japan are also 7 mm long.

Thus, this species has a broken amphi-Pacific geographical range and, perhaps, forms a pair of twin-species.

2. _Eohaustorius eous_ (Gurjanova, 1951).

Guryanova, 1951, Figure 195 A,B, and B (_Haustorius_)

Described from the eastern coast of Kamchatka and later discovered in the north-western part of the Sea of Okhotsk, this species is very close to the American _E. washingtonianus_. The lack of a tooth-like protuberance on the posterior margin of the peraeopods in pairs 3 - 5 in _E. eous_ is the most important difference which is of a diagnostic significance. Strongly specialized antennae, gnathopods, and peraeopods differ only in the relative length of their segments and armament; however, these characters, too, are quite stable (more than twenty specimens were examined) in order that they might be considered as diagnostic. We believe that it is necessary to add more drawings of this type and a comparative description, pointing only to its differences from E. washingtonianus.

The lobe of the wing-like broadening of segment 4 of the peduncle of antenna 2 is rather wider and shorter; along the margin of the wing, there also are 27 - 28 setae, but they are thinner, and their plumosity is so thin and tender that it is difficult to notice it; segment 1 of the flagellum lacks the strong plumose setae which exceeds the length of the entire flagellum whose segments at the apex bear clusters of setae. Segment 2 of the palp of the mandibles is not as thick, tapers distally and equals the length of apical segment 3. The postero-distal angle of the coxal plate 1 of peraeopod is not drawn out backward but is straight; the basal segment lacks the setae on its anterior and posterior margins, segment 6 is not shorter but is as long as 5th; on the posterior margin of segment 4, the thick plumose setae are either lacking or there are only 2 - 3 thin setae there. The lobe of segment 5 in peraeopod 2 is broad and very short, not drawn out below, its posterior margin lacks notches, and spines fringe it in one series, and there is no group of spines on the short lower margin of this lobe; in length, segment 6 is no longer than but equal to segment 5. The posterior margin in basal peraeopods 3 - 5 is uniformly rounded and it lacks the tooth-like protuberance. Segment 4 in peraeopod 4 is weakly armed and lacks long transverse series of thick spines on the lateral surface which are replaces only by groups of 2 - 3 spines. Segments 5 and 6 in peraeopod 5 are more slender, and their armament with spines and setae is weaker. Posterior margin 3 of the epimeral plate is not straight but strongly conves, the protuberance on the postero-distal angle is thinner, more stronly bent backwards, and it has at its base a deep sinus, which is lacking in E. washingtonianus. The peduncle of uropod 2 bears only simple setae and lacks two thick plumose setae, as is the case in the E. washingtonianus of the Sea-of-Japan species. The telson's lobes taper distally, have a narrowly rounded apex and thin simple setae on the distal margin. The Far-East species E. eous is represented in our waters by two forms - the typical, which inhabits the western coast of the Bering Sea (eastern coast of Kamchatka) and the northern part of the Sea of Okhotsk, and the stout form robusta with a coarse armament which inhabits the Pacific coast of Kurile Islands.

2a. Eohaustorius eous eous (Gurjanova)
(Figure 136).

Guryanova, 1951: 331, Figure 195 A,Б, and B (Haustorius).

It inhabits the sublittoral zone, a depth of 10 - 50 m with sandy bottom near the eastern coast of Kamchatka (Avacha Bay and Kronotski Cape) and the sublittoral zone of the northern part of the Sea of Okhotsk. Because this species is very close to the American E. washingtonianus, it is necessary to give a comparative description and supplementary drawings of the Kamchatka specimens.

The body is less inflated and somewhat more slender than that of E. washingtonianus; the 2-segmented accessory flagellum also is attached at a distance of 2/3 the length of the last segment of the peduncle; however, it is shorter and does not reach even the middle of segment 2 of the main flagellum. The setae on segment 2 of the peduncle in antenna 1 have such thin and fine plumosity that it is seen only under a very powerful microscope. All setae of the flagellum in antenna 2 are thin (except those which fringe the wing of the 4th and the posterior margins of the last segment of the peduncle) with a minute plumosity hardly discernible under the microscope; both ♀♀ and ♂♂ lack the heavy, coarse plumose seta (which in length equals the entire flagellum), which is characteristic of ♀♀ in E. washingtonianus. The middle segment of the flagellum of the mandibles is as long as the apical. Closer to the proximal end of the segment, on the convex posterior margin of segment 5 in gnathopod 2, there is an oblong series of long spatulate sensory setae. Segment 5 in peraeopod 1 is rather narrower, it is longer than broad; segment 6 is not scoop-like, but with a flattened posterior surface surrounded by strong long spines, as in the Atlantic H. americanus. Peraeopod 2 is much shorter and weaker than peraeopod 1; the basal segment, too, broadens distally; segment 3 is very short, and segment 5 has a short and broad lobe on the posterior margin. However, the posterior margin of this lobe is smooth, lacks notches and accessory groups of spines; the spines fringe only the posterior margin of the lobe; the anterior margin in segment 5 has the same oblique series of sharp spines as E.

washingtonianus; however, on the lower margin of its lobe, there are no accessory clusters of spines; segment 6 is only slightly longer than or as long as the 5th, while segment 6 in *E. washingtonianus* is strongly elongated and almost as long as segments 5 and 4 together. Segment 6 in peraeopod 3 only slightly longer than 5th, and its posterior margin has only 2 notches, where groups of spines are found, while segment 6 (according to Figure 135A) in *E. washingtonianus* is almost $1\frac{1}{2}$ times longer than the 5th, and on its posterior margin are 3 notches, which have no spines but long setae.

Figure 136A. *Eohaustorius eous eous* (Gurjanova). Kronostki Cape (eastern Kamchatka), ♀.

The posterior margin of the basal segment in peraeopods 4 and 5 is smooth, armed only with setae and lacks the pointed spur-like process curved up. Segment 5 in pair 4 is rather shorter; there are only 2 notches with groups of spines on its anterior margin, while in *E. washingtonianus* judging by Figure 135A, there are 3 such notches, and the segment itself is relatively larger and heavier.

The anterior margin of segment 5 in peraeopod 5 has not 2 but only 1 notch with a group of strong spines; the posterior margin of the basal segment rounds smoothly, has sparse short coarse setae, while the anterior margin has thin-plumose setae. The uropods are of a similar structure; judging from Figure 135A, however, the rami in pair 1 in *E. washingtonianus* are armed with long setae, while in *E. eous*, in addition to this, they are armed with long spines; as far as the telson is concerned, we find in the description of E. washingtonianus that its lobes are armed with spines at the apex and on inner margins, while the telson in E. eous bears not spines but thin setae. The maximum length of sexually mature females is 6 mm.

Figure 136B. Eohaustorius eous eous (Gurjanova).

1 - Kronotski Cape (eastern Kamchatka); 2 - the Sea of Okhotsk.

Obtained from Avacha Bay and Kronotski Cape, at depths of 20 - 40 m; ♂♂ and ♀♀ abundant.

2B. Eohaustorius eous robustus Gurjanova, 1953.
(Figure 137).

Guryanova, 1953. Tr. Zool. Inst. Academy of Sciences of the USSR, XIII: 216, Figures 1 and 2 (Haustorius).

The type has been described from the specimens taken from the Pacific coast of Iturup Island at depths of 30 - 40 m. This species is noted for its stout body and a considerably more powerful armament of all parts of the body, and especially its appendages, thick coarse spines, and heavy plumose setae; in this regard, it becomes closer to E. washingtonianus; however, the posterior margin of the basal segments in peraeopods 3 - 5 is uniformly rounded and lacks the tooth-like process closer to the base of the segment. Antenna 1 with a shortened 5-segmented palp, thick coarse-plumose setae on the segments of the peduncle; the accessory flagellum is attached to the last segment of the peduncle at a distance of 2/3 its length from the base of the segment.

The wing of segment 4 of the peduncle of antenna 2 is narrower and longer than in the typical form, and along the margins, it bears up to 35 coarse thick plumose setae; however, segment 1 of the flagellum lacks the individual plumose seta which is extremely thick and extends the length of the flagellum itself. On the posterior margin of segment 5 in gnathopod 2, spatulate sensory setae form not one oblong series but a cluster and segment 6 in peraeopod 1 in ♂ and ♀ is scoop-like, fringed with coarse spines. The coxal plates in peraeopod 2 have a straight postero-ventral angle, as is the case in the typical species; segment 6 in peraeopod 2 is strongly shortened, equal to or shorter than segment 5; the lobe in segment 5 varies, but it never has notches on the posterior margin and bears 1 series of spines and 2 accessory spines, slightly subapically in regard to the main series; no spines are found on the lower margin of the lobe. The segments in peraeopods 3 - 5 are armed with a great number of spines and very thick coarse-plumose setae; often the spines on the segments are not pointed but have notched, sometimes funnel-shaped apices. Segment 2 of the palp in the mandibles is longer than the last segment, tapers distally, and the last segment is armed with lanceolate setae curved at the apex, and one thick spine twice as thick. The rami of the uropods are relatively thicker than those in the typical species; the spines at the apex of the rami in uropod 1 have notched margins; besides thin simple setae, the peduncle in uropod 2 bears a cluster of 4 thick plumose setae; the inner ramus in uropod 3 is longer than the outer; each segment of the outer ramus bears 1 thick plumose seta. The telson's lobes are elongated-oval, with a rounded apex; at the apex, there is 1 long spinose seta, and along the inner margin, there are stong thin and long setae. In form, epimeral plate 3 is similar to that in typical specimens, but the setae are rather thicker and coarser and their arrangement is different. It is characteristic that segment 6 in peraeopod 4, when retracted, extends only slightly further than the middle of the lower free margin in segment 5, and, although the base of the process on the antero-distal angle in segment 5. This form has many things in common with the appearance of the specimens of E. washingtonianus; however, according to the principal characteristic features, we assign it to E. eous.

The length is 10 mm, ♀♀ sexually mature, 7 mm.

Figure 137A. Eohaustorius eous robustus (Gurjanova). Iturup Island, ♀.

Figure 137B. Eohaustorius eous robustus (Gurjanova). Eastern coast of Paramushiru Island, ♀.

Many specimens have been obtained from the Pacific coast of the Grand Kuril Range (Paramushir Island, Iturup Island) and from the sublittoral zone of the north-western part of the Sea of Okhotsk, at a depths of 10 - 40 m.

<u>Figure 137A</u>. <u>Eohaustorius eous robustus</u> (Gurjanova). Iturup Island, ♀.

<u>Figure 137Б</u>. <u>Eohaustorius eous robustus</u> (Guryanova). Eastern coast of Paramushir Island, ♀.

3. <u>Eohaustorius heliferus</u> (Bulycheva, 1952)
(Figure 138).

Bulycheva, 1952, Tr. Zool. Inst. Academy of Sciences of the USSR, XII: 198, Figure 3 (<u>Haustorius</u>).

Like in <u>E. eous</u>, the sharp tooth-like process is lacking on the margin of the basal segment in peraeopods 3 - 5. On the lower concave margin of the wing of segment 4 of antenna 1, there is a long spine; the posterior margin is fringed by plumose setae (more than 35), on the first 2 segments of the flagellum, there is a cluster of plumose setae on each. The spine at the apex of the blunt finger-like segment 7 in gnathopod 1 is considerably longer than the segment itself. The sensory setae on the posterior margin of segment 5 in gnathopod 2 are not spatulate but divided at the middle by a constriction, and the margins of their distal part are notched. Segment 6 in peraeopod 1 is scoop-like, fringed with long spines, its length is $1\frac{1}{2}$ times smaller than the length of segment 5. Segment 5 in peraeopod 2 has a long lobe, drawn below, which reaches almost the end of segment 6; the lobe is armed with 4 transverse series of spines along the posterior margin and with 3 - 4 large spines at the apex; at the anterior margin of segment 5, there is an oblique margin of spines; segment 6 is shorter than 5th. The last three pairs of peraeopods are almost similar to those of E. washingtonianus and E. eous; segment 6 in pair 4, when contracted, reaches only the middle of the lower margin of segment 5 with its apex. The telson's lobes are strongly enlarged, narrowly oval in shape, with long setae along the inner margin. Uropod 3 is same as in E. washingtonianus, but it has 9, and not 7 setae along the margin of the inner lobe. The posterior margin of epimeral plate 3 is weakly convex, the process on the postero-distal angle is long, pointed; there are plumose setae along the lower margin of the plate. The animal is 7 mm long.

Figure 138A. Eohaustorius heliferus (Bulycheva). After Bulycheva, 1952.

Figure 138Б. Eohaustorius heliferus (Bulycheva). South-Kuril Strait, ♀.

Figure 139A. Priscillina armata (Boeck). Kronotski Bay (eastern Kamchatka), ♀.

Figure 139Б. Priscillina armata (Boeck). Kronotski Bay (eastern Kamchatka), ♂.

Figure 139B. Priscillina armata (Boeck). Kronotski Bay (eastern Kamchatka), ♀.

It inhabits the sea of Japan, depths of 0.75 - 13 m. It has been discovered in Peter the First Bay and in the northern part of the sea at the coasts of the Primorye Territory, as well as in the Sea of

Okhotsk (in the Amur Lagoon and in Aniva Bay), and in the South-Kuril Strait, at depths of from 6 to 40 m.

3. The Genus PRISCILLINA Stebbing, 1888

Guryanova, 1951: 334.

This genus is of Arctic origin, monotypic; the only representative of the genus is also found in the northern part of the Pacific Ocean.

1. *Priscillina armata* (Boeck, 1861)[1]

(Figure 139).

Guryanova, 1951: 235, Figure 196.

The Pacific specimens differ from those of Greenland (see Sars' description and drawings, 1891, Crust. Norw., I: 126, pl. 42) in the structure of the basal segment in peraeopod 4, which lacks the spur-like process on the posterior margin near the base of the segment. None of the specimens from the Bering Sea possess this characteristic feature. We have examined all the specimens of the Zoological Institute (♂♂ and ♀♀) from the south-east of the Barents Sea, White Sea, Kara Sea, East-Siberian and Chuckchee seas, and they all, similar to those of the Bering Sea, lack the spur-like pointed process on the basal segment in peraeopod 4 which

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1 If the direct observation of the specimens which inhabit western Greenland with those of the White Sea and Siberia confirm the differences in the structure of their basal segment in peraeopod 4, the our form should be distinguished as an independent subspecies.

has been illustrated by Sars. None of the authors mentions the differences found in their specimens from Sars' original description and description and drawings, made from the typical specimen, which came, apparently from the western coast of Greenland. Hansen (1887, 1895), too, has in his hands specimens of this type from the same area; in his work, however, we do not find any instructions regarding their differences from Boeck's original description. In the material from the area of Greenland and Norway, Stephensen does not mention a single location and in his composite work on the amphipods of the sub-Atlantic sector of the Arctic (The Amphipoda of N. Norway and Spitzbergen with adjacent waters, Fasc., 2, 1936: 143) in regard to the geographical distribution of P. armata, he only refers to the literary data. This species was also found at the Atlantic coast of North America (Shoemaker, 1930) and near the Arctic coasts of Canada (Shoemaker, 1920); however, even in Shoemaker's work the instruction is lacking regarding the differences of his specimens from the typical form in regard to the structure of the basal segment in peraeopod 4.

Thus, besides our specimens, this species was present only in the collections studied by Boeck, Hansen, and Shoemaker; however, since none of them speaks about the differences of their specimens from typical one, it may be considered that these specimens have a spur-like process on the basal segment in the last pairs of peraeopods.

None of the specimens of our collections have this characteristic feature, and it may be assumed that we are dealing here either with a special form which inhabits the Siberian Arctic, eastern part of the

Barents Sea, White Sea, and the northern part of the Bering Sea, or - and it is difficult to imagine - that Sars made an error which has remained unnoticed by other authors. Besides peraeopod 4, our specimens have also other deviations from Sars' drawings; however, not having the type in our hands, we do not dare to judge it. While presenting the drawings of the specimens from the northern part of the Bering Sea, we hope that in the future the question regarding the existence of one or two forms of this species will be made more exact.

This is a high-Arctic shallow-water species. It inhabits the coastal sands of the White Sea (the Tersky coast), the south-east of the Barents Sea, the Kara Sea (south and north shelf), the eastern part of the East-Siberian Sea, the Chuckchee Sea, and the northern part of the Bering Sea at depths of 12 - 50 m. According to the literary data, the typical form is present near the coasts of Greenland, in the area of Davis Strait, near the Canadian Arctic coast, and in the north-western part of the Atlantic Ocean at depths of from 20 - 80 m (Gulf of Saint Lawrence, Magdalen Islands and Cheticamp and the coast of Newfoundland). While inhabiting the Arctic Ocean, this species has a break in the geographical range from Greenland to Novaya Zemla and in the sub-Atlantic sector of the Arctic; it penetrates from the Kara Sea into the south-eastern part of the Barents Sea; in the White Sea, apparently, it is present as a relic, since it is lacking in Voronka* and in Gorlo*; along the Atlantic coast of Canada, it spreads from her Arctic regions; G. Sars doubts the presence of this species near the Norwegian coast.

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* See next page.

The animal is up to 13 mm long.

*4. The Genus AMPHIPOREIA Shoemaker, 1929[1]

Shoemaker, 1929. Proc. Biol. Cox. Washington, 42: 167; 1930, Contr. Canad. Biol. a. Fisher. Studies from the Biol. Stations of Canada (N.S.), V No. 10: 30.

Head lacks rostrum; antenna 1 shorter than antenna 2; segment 1 of the peduncle with a broad process above the base of segment 2; like in Bathyporeia, antenna 1 bent backwards at right angle at the junction of segments 1 and 2 in the peduncle; accessory segment small, 2-segmented; both pairs of antennae in ♂♂ have calceoles. Dorsal side of urosomal segment 1 smooth, lacking the protuberance and a sinus in front of it. Mandibles have a powerful 3-segmented palp, large cylindrical tooth protuberance, a well-developed dental row of spines, and a serrate cutting edge. Maxilla 1 with a 2-segmented palp; inner plate broad, with 10 - 12 plumose setae at the oblique apex and hairs on the inner margin. The plates of maxilla 2 almost equal, the inner only slightly shorter and narrower than

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* Transliterated from Russian ("Funnel" and "Throat", respectively). Translator.

1 We include here this north-Atlantic genus since it was omitted in the Identification Key (Guryanova, 1951: 329); at the same time, representatives of this genus may be expected to be found in the northern part of the Pacific Ocean.

the outer, with a well developed oblique series of plumose setae, besides the setae along the inner margin and at the apex. Maxillipeds normal, with a strong 4-segmented palp and well-developed plates; the last segment of the palp falcate; outer plates armed with strong bent spines along the inner margin, inner plates with large plumose setae. Lower lip with well developed inner plates. Both pairs of gnathopods have a subchela; coxal plates normally developed, increasing in size from 1 to 4; their lower margin is fringed with setae. Peraeopods 1 and 2 of a similar structure; their segment 4 as long as basal, armed with plumose setae; segments 5 and 6 armed with long thin spines, dactyl small, pointed, hidden between spines of segment 6. Basal segment in peraeopods 3 - 5 strongly broadened; segment 4 in peraeopods 3 obliquely oval, broadened, with plumose setae along outer margin. Peraeopod 4 considerably longer than peraeopod 5; segment 7 (dactyl) in all three last pairs of peraeopods small, hidden between long spines at the apex of segment 6. Uropod 3 biramose, with a short peduncle armed with spines; outer ramus 2-segmented; inner two times shorter than the outer. Telson cleft almost to the base.

Genotype _A_. _Lawrenciana_ Shoemaker, 1929.

2 species have been known, both North-Atlantic.

*1. _Amphiporeia lawrenciana_ Shoemaker, 1929
(Figure 140).

Shoemaker, 1929, Proc. Biol. Soc. Washington, 42: 167; 1930, Contr. Canad. Biol. a. Fisher. Studies from Biol. Stations of Canada (N.S.), V, No. 10: 30, f. 11 - 14.

Body compressed; head lacking rostrum; eyes oval, small, of 12 ommatidia; interantennal angles rounded. Antenna 1 short, not reaching end of peduncle in pair 2; segment 1 of peduncle strong, twice as long as 2nd and 3rd segments together; its apex forms a thick protuberance directed forward; attached to its lower surface is segment 2, forming a "knee-joint"; flagellum 5-segmented, and ♂ bears one calceole; accessory flagellum 2-segmented, with a very small apical segment. Two last segments of the peduncle in antenna 2 equal in length, flagellum 6-segmented, shorter than peduncle, in ♂ bears several calceoles on plumose segments. Gnathopods 1 shorter than gnathopod 2, segment 5 as long and as wide as segment 6; palmar margin slightly concave, shorter than the posterior margin of hand, armed with locking spine 1. Segment 6 in gnathopod 2 rather narrower and oblong, segment 5 longer than segment 6; palmar margin short, weakly truncated, convex, with spinules and setae and 1 locking spine; segment 7 falcate, as long as palm. Segments 4 and 5 in peraeopods 1 and 2 strong; segment 6 longer than segment 5, dactyl small; basal segment with 1 large plumose seta on the distal margin; 2 similar setae on segment 3; setae plumose in upper and simple in lower part, along the posterior margin of segment 4; segment 5 with long, forked apically, spinose setae on the lower half of the posterior margin, segment 6 with coarse spinose setae in the lower half. Peraeopod 3 with strongly broadened basal and 4th segments; anterior margin of segments 3 and 4 has long plumose, while the straight and short segments 5 and 6 have simple, elastic setae and spinose setae at the apex; peraeopod 3 usually curved between segments 3 and 4 and 5 and is completely overlapped by the large basal segment, like in *Bathyporia*, and peraeopod 5 shorter than peraeopods 3 and 4 and in structure resembles peraeopod 5 in *Pontopreia*; there are plumose setae on the surface of a wing-like broadening of their basal segment. Dactyl of peraeopods 3 - 5 small and weak, surrounded by long spinose setae at the end of segment 6 (these setae cover it).

Figure 140A. *Amphiporeia lawrenciana* Shoemaker. After Shoemaker, 1929.

Figure 140B. *Amphiporeia lawrenciana* Shoemaker. After Shoemaker, 1929.

Epimeral plate 1 with plumose setae on the anterior and lower margins; plumose setae on epimere 2 are arranged semircularly in the anterior part of the upper surface; epimeral plate 3 has spinules on its posterior and lower margins. Uropod 3 protrudes far beyond uropods 1 and 2, rami of a different size; the short peduncle becomes broader distally and is armed with strong long spines along the lower margin; the outer ramus is more than twice as long as the peduncle, 2-segmented, armed with 3 clusters of spines along the outer and with plumose setae along the inner margin; the apical segment measures a about $\frac{1}{4}$ the length of segment 1, armed with setae at the apex; the inner ramus measures about one half the length the outer, has spinules on the inner margin and long setae at the apex. The telson is cleft almost to the base; the apices of the lobes form blunt triangular processes at the base of which, on the side, there are 1 - 2 apical spines; on the dorsal side of the lobes, there is 1 large spine on each; ♂♂ also have sensory plumose setae.

The length is up to 7 mm (♂).

Found in the Atlantic Ocean, near the shores of North America, at a depth of 40 m, between Cape Breton and Magdalen Islands. Presence of close forms in the northern part of the Pacific Ocean is not excluded.

5. The Genus PONTOPOREIA Kröyer, 1842.

Guryanova, 1951: 345 - 352. Segerstråle, 1937, Soc. Scint. Fennica. Comment. Biol., VII, 1: 8 - 30; Lomakina, 1950, theis; 1952, Transactions of the Karelo-Finnish Institute, IV, 3: 110 - 123.

Investigations by the Finnish scientist Segerstråle, who studied the biology and morphology of the species of this genus, and by N. Lomakina who revised the genus and studied the variability of it representatives, reveal that this genus has only 2 species; all other species described by various authors from different parts of the geographical range of these species turned out to be either synonyms or special forms of basic species of P. femorata and P. affinis. The identification key to the species of the genus Pantoporeia, given in the Guide for 1951, should be radically changed in accordance with the latest data in regard to the taxonomy of the genus. Both Segestråle and especially Lomakina stress the considerably individual variability in both species, sex dimorphism, and presence of transitory characters in some populations, which point to the very close affinity of both species.

The only reliable diagnostic characteristic feature which can be used in the classification of the species in the identification key is the structure of urosomal segment 1.

1 (4). On the dorsal surface of urosomal segment 1 is a hump at the tip of which there is either a large process forked at the tip or 2 spinules, usually uneven in size.

2 (3). Urosomal segment 1 bears a fork at the apex of the dorsal hump; this fork may be subject to some reduction, but it is always in the form of a process of the segment..............1a. P. femorata femorata Kröyer, 1842.

3 (2). Urosomal segment 1 bears on the tip of the dorsal hump not a process but 2 spinules..............1 . P. femorata ekmani Bulycheva, 1936.

4 (1). On the dorsal side of urosomal segment 1, there are hairs or short coarse setae; however, there is never either a process of spinules.

5 (6). The hump on the dorsal side of urosomal segment 1 is hardly visible, the eyes are oval, medium-sized..............2. P. affinis affinis Lindstrom, 1885.

6 (5). The hump on the dorsal side of urosomal segment 1 is clearly visible, the eyes are round, very small..............* P. affinis microphthalma G. Sars, 1896.

(The Caspian Sea).

Both species are present in the northern part of the Pacific Ocean.

1a. Pontoporeia femorata femorata Kröyer, 1842.

Kröyer, 1842, Naturh. Tidskr., 4: 153; 1846, Voy, Nord. Crust., t. 23, f. 2 a - y; Bruzelius, 1859, Svenska Ak. Handl. (n. ser.), 3, No. 16: 49, t. 2, f. 8 (P. furcigera); Boeck, 1876, Skand. Arkt. Amphipoda, 4: 187, (P. femorata furcigera); G. Sars, 1891, Crust. Norw., I: 123, pl. 41, f. 1; Ekman, 1913, Ark. Zool., 8, No. 8: 3; Segerstråle, 1937, Soc. Scient. Fennica, Comment. Biol. VII, 1: 8; 1938, Soc. Scient. Fennica, Comment. Biol., VII, 5: 3 - 22 (P. sinuata); Guryanova, 1951: 346; Figure 205 (P. sinuata); Lomakina, 1952, Transactions of the Karelo-Finnish University, IV, 3: 119.

This species is the initial form of the estuarine and fresh-water representatives of the genus. It reveals quite interesting deviations under various conditions of salinity, in regard to the body size and the form of the forked process of urosomal segment 1. The large forked process has 2 protuberances almost equal in size at the apex; it is found in specimens inhabiting the sea region with high salinity which is close to normal oceanic; in bays and relic lakes and gulfs (for instance, in Novaya Zemlya, in Kandalaksha Bay of the White Sea) of a scoop-like* type semi-isolated from the sea with a decreased salinity of 24 - 16% $_{oo}$, the fork is subject to a reduction of various degree, it becomes sharply asymmetrical, and the dorsal hump decreases in size; the same phenomenon is also observed in specimens from the Baltic Sea. These changes in the dorsal process are accompanied by the decrease in the size of specimens (instead of 10 - 16 mm in sea specimens, only 7 - 10 mm in estuarine) and a certain deviation in the form of last segments in gnathopods, the armament of telson, uropod 3, and epimeral plate 3. N. Lomakina (1950, thesis) is prone to regard these estuarine populations as a special form (P. femorata morpha gurjanovae). However, the transition is so gradual, even with one population, that one may speak of only a tendency to the reduction of the fork, which, as yet, has not become prominent enough within the species and has not led to a designation of a certain small inter-species toxonomic unit.

The species has a wide geographical distribution and inhabits the area of the continental shelf, occurring chiefly in shallow depths, of an order of 10 - 15 mm, on strongly silted bottoms. In the Arctic, it is circumpolar; it is also discovered in the Baltic Sea and in the Northern Atlantic Ocean, near the coasts of Norway and Iceland.

In the northern part of the Pacific Ocean, it forms mass

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* Literal translation from Russian.

aggregations in the Chuckchee Sea (up to 21 thousand species per one square meter) and in the northern part of the Bering Sea; it is also found near the western coast of Kamchatka, in Terpeniya Bay and Aniva Bay in the Sea of Okhotsk, in the northern part of the Sea of Japan (desalinized, northern-most part of Tatarsky Strait and near the western coast of southern Sakhalin), and in the bays of Shikotan Island in the South-Kuril Strait.

1 . *Pontoporeia femorata ekmani* Bulycheva, 1936.

Guryanova, 1951: 349, Figure 207 Bulycheva, 1936, Ann. Mag. Nat. Hist., XVIII: 246, f. 7 - 11; Lomakina, 1950, thesis: 101 - 104.

This shallow-water species differs from the typical in the smaller body size and the armament of a strongly developed protuberance of urosomal segment 1; according to Lomakina's studies, it reveals a number of transitions to the typical and hence may be regarded as a subspecies of the main form, which inhabits rather deeper areas (60 - 150 m). It also is found at depths of from 0 to 40 m, chiefly near the shore, in places of an unstable hydrological regime; it has been discovered in the Sea of Japan (Posyet* Bay and Soviet Harbour).

2. *Pontoporeia affinis* Lindström, 1855.

Lindström, 1855, Oft. Ak. Fork., 12: 63; Smith, 1874,

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* Transliterated from Russian. Translator.

Rep. U.S. Fish.

Comm.: 647, pl. II, f. 5 (P. hovi); 1874, ibid.: 643 (P. filicornis); G. Sars, 1891, Crust. Norw., I: 124, pl. 41, f. 2; Weckel, 1907, Proc. U.S. Nat. Mus., 32: 26, f. 1 (P. hovi); Norton, 1909, Proc. Port. Soc. Nat. Hist., II, 8: 247 (P. kendalli); Ekman, 1913, Ark. Zool., VIII, 8: 29 (P. weltneri); Segerstråle, 1937, Soc. Scient. Fennica, Comment. Biol., VII, No. 3: 1 - 17; Birul'a, 1937, Tr. Zool. Inst. of the Academy of Sciences of the U.S.S.R. (New Series), LXVIII, 6: 1125 - 1127 (P. filicornis); Guryanova, 1951: 351, Figure 209 (P. filicornis); Lomakina, 1952, Transactions of the Karelo-Finnish University, IV, 3: 119.

Like the previous species, this varies strongly and, originating from the marine species P. femorata, appears in various forms depending on the degree of salinity. It inhabits very low salinities, less than $10^{o}/_{oo}$, and also fresh-water lakes of northern Europe and North America. The population inhabiting desalinized coastal waters of the Baltic Sea should be regarded as a typical form, since Lindström described this species from Stockholm's stack region; A. Birul'a (1937) distinguished as independent subspecies P. affinis gurjanovae, the form which inhabits the estuaries of the Siberian rivers, contrary to fresh-water specimens inhabiting the ice lakes of Fennoscandia and North America. N. Lomakina (1950, 1952), on the strength of a revision of the genus and a comparison of the Siberian subspecies with forms from other parts of the geographical range, considers that Baltic specimens are very close to *P. affinis gurjanovae* and differ considerably, like the latter, from the lacustrine form, which she calls basic. Like Segestråle, Lomakina considers *P. affinis* from the Caspian Sea as nothing else but a subspecies of the basic form. According to the rule of priority, it is the Baltic form which is typical (basic), as Linström described the species from the Baltic specimens; hence the subspecies *P. affinis gurjanovae* should be considered as *P. affinis affinis*, and the new name should be given to the lacustrine subspecies. Thus, the widely distributed species *P. affinis* has three forms: the estuarine from the Baltic Sea and the mouths of the Siberian rivers (*P. affinis affinis*), the lacustrine fresh-water (*P.* affinis ssp.), and the Capian (*P. affinis microphathalma*). Populations from the estuaries of the Bering Sea and the Sea of Okhotsk present a form which differs to some extend from these three species in a number of characteristic features; according to Lomakina (1950), these populations reveal some resemblance with estuarine Siberian and Baltic populations. The question regarding the taxonomic role of various forms within this quite heterogeneous species has not been solved completely, although much has been done in this regard by Segestråle and Lomakina.

In the northern part of the Pacific Ocean, this species has been discovered in the littoral zone of Commander Islands, in desalinized sections and relic lakes of the western part of the Bering Sea (the mouth of the Kamchatka river, the Anadyr Lagoon, the relic lakes near Ust'-Kamchatsk), and in the Amur Lagoon.

6. The Genus UROTHOE Dana, 1852.

Guryanova, 1951: 352.

Of 20 species described, 4 are found in the Pacific Ocean (its northern part)[1].

1 (10). Postero-distal angle of epimeral plate 3 straight or rounded, lacks curved upward process; antero-distal angle of head almost straight, without process.

2 (9). Gnathopod 1 with well developed subchela; segment 6 broadens distally, palmar margin long, strongly oblique; gnathopod 3 (Sic! E.L.B.) similar in structure.

3 (6). Segment 5 in peraeopod 3 strongly broadened distally, considerably broader than segment 4, segment 6 broadens toward the middle; both these segments have long rransverse series of strong spines.

4 (5). Basal segment in peraeopod 3 strongly broadened distally; segment 7 lacks spines, only its anterior margin notched...............* U. pulchella (A. Costa, 1853).

(Northern half of the Atlantic Ocean and Mediterranean Sea).

5 (4). Basal segment in peraeopod 3 tapers distally, seg-

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* Besides the North-Pacific species, the identification key includes 3 other species which are closest to them.

ment armed with strong spines along the anterior margin..............
...* U. spindigitus Walker, 1904.

(The Indian Ocean).

6 (3). Segment 5 in peraeopod 3 does not broaden distally, its width equals that of segment 4; segment 6 linear in form; both these segments bear groups of spines.

7 (8). Segment 6 in gnathopods 1 and 2 without locking spines; coxal plate 1 with a cluster of long thin setae at the apex; basal segment in peraeopod 3 does not broaden distally...............
...1. U. elegans Bate, 1857.

8 (7). Segment 6 in gnathopods 1 and 2 with one strong and thick locking spines; coxal plate 1 with a group of thick long spines at the apex; basal segment in peraeopod 3 distinctly broadens distally...............2. U. varvarini Gurjanova, 1953.

9 (2). Gnathopod 1 simple, its segment 6 linear, lacks the palm; gnathopod 2 with a subchela, palmar margin short, transverse...
............3. U. orientalis Gurjanova, 1938.

10 (1). Postero-distal angle in epimeral plate 3 forms a long process curved up; antero-distal nagle of head forms a pointed process.

11 (12). Eyes present; the pointed process on the antero-distal angle of head serves as a direct continuation of the anterior

head margin which uniformly continues into the point of the process; the process on the postero-distal angle of epimeral plate 3 is bent back and up at an angle to the posterior margin of the plate; gnathopods 1 and 2 similar in structure, with a well-developed subchela.... ....4. U. denticulata Gurjanova, 1951.

12 (11). Eyes absent; process on the antero-distal angle bent forward at a right angle to the anterior margin of the head; the process on the postero-distal angle of epimeral plate 3 curved straight up, almost parallel to the posterior margin of the plate; gnathopod 1 simple, with linear segment 6 lacking the palm; gnathopod 2 with a subcheal and a short weakly oblique palmar margin............. ....* U. falcata Schellenberg, 1931.

Swedish Antarct. Exp., II, No. 6: 61, f. 32.
(Southern part of the Atlantic Ocean, at the coasts of South America).

1. Urothoe elegans Bate, 1857
(Figure 141).

Guryanvoa, 1951: 353, Figure 210.

Specimens from the northern part of the Pacific Ocean differ from those of the North Atlantic in the very narrow coxal plate 1 which is almost two times narrower than plate 2; the dactyl of uropod 1 longer than the palm; on the antero-distal angle of segment 5 in peraeopods 1 and 2, there is a very strong, thick spine (as long as segment 6), which is located between lateral spines of segment 6; besides apical, the telson has also one pair of lateral setae. Everything else is identical to Sars' description and drawings of Atlantic specimens.

A few specimens have been obtained from the southern part of the Sea of Okhotsk (eastern part of La Perouse Strait) at depths of 146 - 150 m; in September, ♀♀ have ova (from 6 to 12 in each).

Figure 141A. Urothoe elegans Bate. Southern part of the Sea of Okhotsk, ♀.

Figure 141Б. Urothoe elegans Bate. Southern part of the Sea of Okhotsk, ♀.

Figure 142A. Urothoe varvarini Gurjanova. The Sea of Japan, ♀.

Figure 142Б. Urothoe varvarini. The Sea of Japan, ♀.

2. Urothoe varvarini Gurjanova, 1953 (Figure 142).

Guryanova, 1953, Tr. Zool. Institute of the Academy of Sciences of the U.S.S.R., XIII: 219, Figures 3 and 4.

It belongs to the group of species which posses a well-developed subchela in gnathopods 1 and 2, it is closest to Urothoe elegans Bate. The body is inflated, with a long and inflated head and a broad, arched back, especially in the metasome. The head is as long as the first three thoracic segments, with a clearly noticeable short rostrum; interantennal angles of the head in female underdeveloped; lower antennal angle forms a large broad plate, like in _U. elegans_, but with a more convex anterior margin. Coxal plate 1 considerably narrower than 2nd and armed with 4 thick long spines, its lower anterior angle oblique and rounded (_Sic_! "Sharply rounded"? E.L.B.); coxal plate 2 almost two times broader, bears 5 simple setae along the lower margin; coxal plate 3 two times broader than the 2nd, with 6 simple long setae in the posterior third of the lower margin; plate 4 is shorter than the preceding ones, with a broadly rounded antero-distal angle, which unnoticeably continues into the concave anterior margin of the plate, bears a few short coarse setae along the lower margin. The posterior margin in epimeral plate 3 is strongly convex, its postero-distal angle is straight. The eyes of the females are small, dark-violet in colour, round, considerably larger in the males. Both pairs of the antennae in the female are short, pair 1 longer than pair 2 and twice as long as the head; antenna 2 slightly longer than the peduncle of antenna 1. Segment 1 of the peduncle of antenna 1 is $1\frac{1}{2}$ times longer than segment 2, segment 3 is shorter than segment 2; flagellum as long as segment 2 of peduncle, 5-segmented in female; accessory flagellum 3-segmented. Both last segments of the peduncle in antenna 2 armed with long strong spines along the anterior and with thick setae along the posterior margins; last segment slightly shorter than penultimate; flagellum in female very short, 3-segmented. Gnathopods 1 and 2 like those of U. elegans. Peraeopods 1 and 2 with strongly shortened segments 5 and 6 armed with long thick spines; dactyl of both pairs poorly visible, as it is surrounded by spines almost as long as dactyl; the inner margin of dactyl is serrate-dentate (in U. elegans has 3 - 4 tubercles, lacks serration). Three last pairs of peraeopod like in U. elegans, but armed with rather coarser spines. Segment 4 in peraeopod 3 broader and longer than 3rd, segment 5 as long and as wide as 4th, segment 7 long, straight, pointed, serrate-dentate on the anterior margin (U. elegans has 6 - 7 tubercles); the base of segment 7 is surrounded with plumose setae and long thick spines whose length is less than half of length of the segment itself. The anterior margin of the dactyl is similarly serrate-dentate, surrounded by spines and plumose setae, in peraeopods 4 and 5. On the surface of the wing-like broadening of the basal segment in peraeopod 4, along its posterior margin, there are arranged, in the form of a fan, thick plumose setae, similar to those in U. elegans; however, when U. elegans has only about 10 setae, and they are found at equal intervals from one another, in U. varvarini, besides them, close to one another, are found rather shorter plumose setae in the distal part of the wing. The structure of uropods 1 and 2 like that in U. elegans. Uropod 3 with relatively shorter and more inflated peduncle, but its rami and the latter's armament are similar to those in U. elegans; Not only the outer, but also the inner margins of the narrowly-oval ramus bear setae (up to 7 and 3 - 4, respectively). The telson at apex of each lobe bears only one apical spine and lacks the setae characteristic of U. elegans. The animal is 5 mm long. The colour is deep-violet with dark spots.

5 specimens of females with ova were found in the Sea of Okhotsk, in the area of the eastern coast of Southern Sakhalin (at the traverse* of Tonin Cape), at a depth of about 150 m, from a silty-sand bottom; and at the western coast of southern Sakhalin in the Sea of Japan and in the Fourth Kuril Strait, at a depth of 12 m.

3. *Urothoe orientalis* Gurjanova, 1938.

Guryanova, 1951: 354, Figure 211.

Discovered in the Sea of Japan (the Primorye Territory, the area of Petrov Island) at a depth of 15 m; abundant number of specimens on the Pacific coast of Iturup Island (the Grand Kuril Rnage) in Crab Bay and Sikhotan on Shikoton Island (the Small Kuril Range), and the Terpeniye Bay in the Sea of Okhotsk, on sandy bottom, depth varying from 6 to 75 m.

4. *Urothoe denticulata* Gurjanova, 1951.

Guryanova, 1953: 356, Figure 212.

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* "Profile"? Trnaslator.

Discovered in the north-west of the Bering Sea, on the Pacific coast of Iturup Island (the Grand Kuril Range), and in the Sea of Okhotsk (open part of Terpeniye Bay and eastern part of La Perouse Strait), at depths from 150 to 300 m, with silted bottom.