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by Ye.F. Gurjanova

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VI. The Family DOGIELINOTIDAE

TITLE IN FOREIGN LANGUAGE (TRANSLITERATE FOREIGN CHARACTERS)
TITRE EN LANGUE ÉTRANGÈRE (TRANSCRIRE EN CARACTÈRES ROMAINS)

VI. Sem. DOGIELINOTIDAE

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(SCUD SHRIMPS OF THE NORTHERN PART OF THE PACIFIC OCEAN),
/BOKOPLAVY SEVERNOY CHASTI TIKHOGO OKEANA (Amphipoda - Gammaridea), Part 1

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VI. The Family DOGIELINOTIDAE*

Guryanova, 1953, Tr. Zool. Inst., Academy of Sciences of the U.S.S.R., XIII: 233.

The head has a small rostrum, well developed inter-antennal and lower-antennal lobes with notches between them. All coxal and epimeral plates are well developed. The lower margin of the anterior pairs of coxal plates fringed with setae. The urosome has three free segments. The antennae well developed, with enlarged peduncles and multisegmented flagella; pair 1 lacks accessory flagellum; segments of the peduncle of both pairs of the antennae armed with strong spines. Mandibles have no palp; they have a powerfrul cylindrical molar process armed with a crown of spines; maxilla 1 has well developed plates and a small 1-segmented palp reduced to a tubercle. Maxilla 2 has well developed plates. The maxilliped has a 4-segmented palp, small, reduced outer and well developed inner lobes. Both pairs of gnathopods have a subchela. Peraeopods 1 and 2 poorly specialized; the last three pairs of the peraeopods with a strongly broadened wing on the basal segment; in pairs 4 and 5, strongly broadened is also segment 4, which is armed with spines and setae. Peraeopod 5 longer than peraeopod 4. Uropods 1 and 2 are shortened, but strong, biramose; uropod 3 poorly developed, located on the ventral

* In SCUD SHRIMPS OF THE NORTHERN PART OF THE PACIFIC OCEAN /"BOKOPLAVY SEVERNOY CHASTI TIKHOGO OKEANA (Amphipoda-Gammaridea), Part 1, By Ye.F. Guryanova /also "Gurjanova"/, Academy of Sciences of the U.S.S.R. Publishing House, Moscow - Leningrad, 1962, pp. 428-431. Translated by Theodore Pidhayny

side of last segment; preserved is only one ramus, which is reduced to a tubercle. Telson broad, cleft at the apex.

Only 1 genus known.

1. The Genus DOGIELINOTUS Gurjanova, 1953

Guryanova, 1953, Tr. Zool. Inst. of the Academy of Sciences of the U.S.S.R., XIII: 235; Oldevig, 1958, Ark. Zool., 11, No. 18: 343 (Haustorioides).

Maxilla 1 with a very small 1-segmented palp; inner plate conical, with 2 setae at the apex. The cutting movable plate of the mandibles well developed; there are no less than 4 thick setae in the dental row. The outer plate of maxilla 2 slightly longer and narrower than the inner. The palp of the maxilliped has broadened 3rd and 2nd segments; the apical segment has a rounded apex and is not falcate. All coxal plates narrow and high; plate 1 only slightly smaller than the 2 following; epimeral plate 3 has a prominent hooked posterior angle bent backward and up. Last ventral segment has processes on the sides of the telson. The telson is cleft at the apex. Uropod 3 uniramose, with a very short ramus.

1 species known.

1. Dogielinotus moskvitini (Derzhavin, 1930) (Figure 143).

Derzhavin, 1930. Russian Hydrobiol. Journal, IX, No. 1 - 3: 5 (Allorchestes); 1937, Investigations of the Seas of the U.S.S.R., 23 : 94, Plate 5, Figure 1 (Allorchestes); Tr. Zool. Inst. of the Academy of Sciences of the U.S.S.R., XIII: 235, Figures 15 and 16; Oldevig, 1958, Ark. Zool., 11, No. 18: 343, f. 1-16 (Haustorioides munsternjelmi).

The body is smooth, without protuberances and combs. Eyes small, black. All 3 segments of the peduncle of antenna 1 on the distal end armed with strong spines, flagellum 7-segmented; antenna 2 as long as antenna 1, last segments of the peduncle also armed with clusters of long, strong spines; palp 8 - 10-segmented. Segment 6 of gnathopod 1 longer than segment 5, becomes wider distally; palmar margin transverse, almost as long as the posterior margin of the segment; segment 5 with a short rounded lobe located in the middle of posterior margin. Gnathopod 2 stronger than gnathopod 1; the structure of segment 6 same as in gnathopod 1; segment 5 with a rather longer spatulate lobe fringed with setae along the margin. Peraeopods 1 and 2 with enlarged distally broadened segment 4 and falcate last segment. Peraeopod 3 with strongly broadened segments, 4th and 5th, armed with spinules and long setae. Peraeopod 4 longer than peraeopod 3; basal segment with a broad rounded posterior lobe, wing-like; segment 4 broadened, armed with strong spines along the posterior margin; segment 5 poorly broadened, almost linear in form. Peraeopod 5 longer than peraeopods 4, their segments 3 -6 linear. The branchial vesicles normal, sac-like, without folds or invaginations. Pleopods normal. Epimeral plate 3 with a hooked process on the infero-posterior angle. Uropods 1 and 2 armed with long spines on the inner margin of the peduncle; rami almost equal in length, smooth. The peduncle of uropod 3 conical, strongly tapering distally; the ramus of segment 1 very short, with spines at the apex. Telson broad, its width greater than length, cleft less than $\frac{1}{4}$ at the apex. The animal is up to 9 mm long.

It inhabits the littoral zone in the desalinized parts of the sea coast, from the Korean Peninsula to the Sea of Okhotsk, inclusively, Aniwa Bay on south Sakhalin, and the southern Kuril Islands.

Figure 143 E. Dogielinotus moskvitini (Derzhavin). South Sakhalin.

Gurjanova (1962)

pp. 1-93

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Part 1

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SCUD SHRIMPS (Amphipoda - Gammaridea) OF THE NORTHERN PART OF THE PACIFIC OCEAN *

Part 1

By Ye.F. Guryanova

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** Transliterated from Russian. Translator.

P R E F A C E

In 1951, the Zoological Institute of the Academy of Sciences of the U.S.S.R. published our guide of the amphipods of Soviet seas (Guide to the Fauna of the U.S.S.R., published by the Zoological Institute of the Academy of Sciences of the U.S.S.R., 41, 1951). Originally this work was prepared as a guide to the amphipods of the seas in the North of the U.S.S.R.; later, however, due to the pressing need for supplying the scientist with some manual which would help him to understand the fauna of the Far East, this guide was supplemented also by all species that were registered by that time in the seas of the Far East and of the South, although enormous collections of the Far-East amphipods kept in storehouses of the Zoological Institute were not yet studied. The present guide is of the regional nature and encompasses the entire northern part of the Pacific Ocean, including the coast of North America and the areas of the open ocean north of the Tropic of Cancer. We do so because the Soveit flotilla went far beyong the boundaries of the waters washing the shores of our country, making voyages not only in the northern, but also Southern hemispheres. This circumstance compels the zoologists to produce such manuals for work with the materials brought in which would permit the reader, to a certain degree, to orient himself in the fauna of any area of the World Ocean. A much better solution would be, of course, to compile summaries of individual groups of marine animals on a world-wide scale; however, the material accumulated since Stebbing's world summary on the amphipods (1906) is so vast and its further accumulation is so rapid and proceeds on such a scale that many years will be required till it is thoroughly treated, revised, and monographs on individual families and genera in full volume prepared. As a first step in this direction, we present in this guide tables for determining all the presently known families of amphipods (Amphipoda-Gammaridea), all genera of each of the families treated, and, when the genus does not need a thorough revision, all the known species of the given genus. Descriptions and figures of the species accompanying them are provided for only those species which at present are registered in the northern part of the Pacific Ocean; in cases when the diagnosis of the family, the genus, or the species is found in the guide of 1951, the reader will be referred to the corresponding pages and figures of that work, and, in some instances, to brief remarks; for all species, for which, commencing with 1951, the notion regarding their geographical ranges and changed, general characteristic of the geographical range, which deviates from that of 1951, is given. A somewhat more detailed information is given for all species in regard to their location within the Pacific Ocean. In the identification keys for determining the families, the genera, and species which are not discovered in the northern part of the Pacific Ocean, but distributed in other areas of the World Ocean, are marked with an asterisk; for all families and genera marked with an asterisk, which were described after Stebbing's summary (1906), the tables are supplied with footnotes, referring the reader to the original source, and for species, also to the geographical range. Species whose presence in the northern part of the Pacific Ocean is quite probable, and species described in the text as new, but discovered beyond that area, are noted in the systematic guide, tables, and in the text, and with an asterisk, and a figure. Basic literary sources, which have something to do with the families included in the present volume, are given for each species; reports on amphipods of individual areas of the ocean and the seas and largest works for the period from 1906 to 1951 are given in our guide for 1951: 141 - 145; new papers, important when treating collections, the reference to which is not given during the diagnoses of the families, genera, and species, which were published from 1951 to 1958, are as follows:

Barnard J. Lourens. 1958. Index to the families, genera, and species of the Gammaridean _Amphipoda_ (_Crustacea_) Allan Hancock Foundation Publications, occasional paper, No. 19: 1-45.

Brunnel P. 1959. List taxonomique des invertobres marins des parages de la Gaspesie. Stat. Biolog. marine, Depart. Pecheries, Montrêal.

Reid D.M. 1951. Report on the _Amphipoda_ (_Grammaridae_ and _Caprellidae_) of the coast of tropical West Africa. Atlantic Rep., Copenhagen, 2: 189-291.

Ruffo S. a. W. Wieser. 1952. Untersuchung Uber die Algenbewohnende Mikrofauna mariner Hartboder. II. Osservaziones sistematiche es ecolegiche su alcuni Anfipodi della coste mediterranee italiane. Mus. Giv. Stor. Nat. Verona, Mem., 3: 11-30, 5 tables.

The guide contains all species registered in the northern part of the Pacific Ocean, to 1958, from literary sources and the collections of the Zoological Institute of the Academy of Sciences of the U.S.S.R.

We realize that our guide is far from containing all the North-

Pacific fauna of the amphipods, that in the near future the list of species which live there will be increased by always new species not only due to the investigations of the eastern part of the area whose fauna of the amphipods lately has been intensively studied by American researchers, but also as a result of continued investigations of our seas in the Far East. We are convinced, however, that our guide, as it is presented to the reader, will facilitate considerably the work with the faunistic material.

Collections of bethic amphipods, gathered in the northern part of the Pacific Ocean by our numerous expeditions, including richest material of the Kurile-Sakhalin expedition of the Zoological Institute of the Academy of Sciences and the Pacific Scientific-Research Institute of Fisheries and Oceanography of 1947 - 1949, and the complex oceanographic expedition to →/c "Vit'az", from 1949 to 1954, served as a basis of our work. I treated the collections obtained from the continental shoal and from depths not exceeding 2000 m; all abyssal and pelagic gammarids, gathered by "Vit'az", are being treated by Ya.A. Birstein and M.Ye. Vinogradov, whose published works also are included in our summary work.

During our studies we compared, as a rule, the species from collections from various areas of its geographical range. In a number of cases, cotypes of the species described from the northern part of the Atlantic Ocean were subscribed from museums abroad, or the needed information and supplements on details on morphology of a certain species were asked to be sent. This permitted us to establish the existence of subspecies and forms in species with a wide or a disrupted geographical range. In some cases, when the determination of a new species caused some doubts and was hampered by the lack of comparative material or necessary information in literature, we preferred to describe it as sp. nova. and not to assign it to the species established earlier; under such circumstances, it is always much easier to reduce the species described to the synonymy than to establish the specialist's mistake during his determination. When new forms were determined, the ecology of the form and peculiarities of the geographical range of the genus or the group of the species were, as a rule, taken into consideration.

We do not consider it necessary to preface the systematic part of the work with essays on morphology, biology, and economic role of the group and considerations of its systematic position and phylogeny, and refer the reader to the corresponding chapters of the guide for 1951. Here, since part 1 of our regional report comprises only 6 families, we restrict ourselves to some remarks in regard to generic relations of the genera in these families and to a brief consideration in regard to the evolution within the suborder.

The order of distribution and the sequence of the treatment of the families at the time when the guide is compiled are dictated by the role of the family in regard to the total volume of the Pacific fauna of the amphipods and the degree of the difficulty of the treatment of a definite family; hence, when presenting the material, we are forced to adhere not to the genetic sequence of the families, but to the sequence generally used in reports of the system, deviating from it only in some particular cases. For instance, we omit Ampeliscidae, which in these reports always follows the family Stegocephalidae, as the volume of our collections of the ampelicids is so extensive and each sample has so many specimens, which have to be carefully examined and compared, especially in connection with Barnard's report on the ampelicids of the east-Pacific fauna (Barnard J.L., 1954) which I recently received, that the treatment of this family would strongly delay the issue of part 1 of the present guide. It must be stressed that the table we compiled for this guide for families os unusual and contains in its couplets a brief diagnosis of each family. This was done intentionally, firstly, because it is necessary to enable the scientist using the guide during the initial treatment of the collected material to determine rather more accurately the affiliation of a certain specimen to a given family and then, using the reference on hand, to turn to the original source or to the corresponding report; secondly, because same features are constantly repeated in other families, and only definite combinations of a whole number of features permit us to characterize a certain family fully and to separate it from other families. Especially interesting in this regard is the family Gammaridea within which the differentiation into genera reflects many lines of the development of the suborder on the whole; thirdly, because part 1 of the published guide contains a summary on only 6 families of 61. This also explains the wording of the antithesis: "These features do not fit". The combinations of features which are characteristic of the given family are given at the beginning of the couplet; structural features accessory to the diagnosis are given at the end of it and are separated from it by a dash.

In conclusion, I would like to express my thanks to the collective body of artists, i.e. T.F. Belotsvetova, Ye.V. Blagoveshchenskaya, Ye.S. Gaskevich, G.V. Guseva, V.N. Lakhov, N.L. Orshanska, V.S. Rozhdestvenskaya, and O.P. Yakovleva for the preparation of the figures I made in pencil for printing, and the execution of a number of other figures, and to A.A. Strelkov, the Editor, for his valuable suggestions and the great task of editing the present volume of the small fauna.

SYSTEMATIC GUIDE TO FAMILIES, GENERA, AND SPECIES[1]

The Order AMPHIPODA

The Suborder Gammaridea

I. Family Lysianassidae

1. The Genus Acidostoma Lilljeborg

2. The Genus Opisa Boeck

3. The Genus Onisimus Boeck

4. The Genus Cyphocaris Boeck

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[1] The asterisk indicates the species as yet not discovered in the northern part of the Pacific Ocean whose presence, however, is quite probable.

11. The Genus *Nirondellea* Chevreux

12. The Genus *Pseudalibretus* Della-Valle

13. The Genus *Koroga* Holmes

14. The Genus *Hippomedon* Boeck

15. The Genus *Paronesimus* Stebbing

16. The Genus *Orchomene* Boeck

17. The Genus *Orchomenella* G. Sars

18. The Genus *Orchomenopsis* G. Sars

19. The Genus *Socarnoides* Stebbing

20. The Genus *Menigrates* Boeck

21. The Genus *Schisturella* Norman

22. The Genus *Aristias* Boeck

23. The Genus *Anonvx* Kröyer

24. The Genus *Aruga* Holmes

*38. The Genus Chevreuxiella Stephensen

II. The Family Hyperiopsidae

1. The Genus Hyperiopsis G. Sars

III. The Family Stegocephalidae

1. The Genus Stegocephalopsis Schellenberg

2. The Genus Stegocephalus Kr.

3. The Genus Phippsiella Schellenberg

4. The Genus Andaniexis Stebbing

*4. The Genus Amphiporeia Shoemaker

5. The Genus Pontoporeia Kr.

6. The Genus Urothoe Dana

VI. The Family Dogielinotidae

1. The Genus Dogielinotus Gurjanova

SOME CONSIDERATIONS REGARDING THE EVOLUTION OF THE AMPHIPODS

Our compendium on the amphipods found in the Soviet seas (Guide to the Fauna of the USSR, published by the Zoological Institute of the Academy of Sciences of the U.S.S.R., 41, 1951) contains a brief essay on the structure and the phylogeny of the group. The present guide contains some considerations regarding the evolution of the Amphipoda-Gammaridea, chiefly as applicable to the families listed in the systematic part of the guide, and to the families which we revised when the collections of the Zoological Institute were treated.

The plan of the structure of higher crustaceans with a stabilized number of segments and biramous appendages by itself alone restricts the possibilities of the appearance of principally new evolutionary ways of development and creates only their completely definite trends which may be traced in various orders, and within an order, in various families and genera, and which lead to the morphologically synonymous manifestations in the domain of the realization of these possibilities.

Processes by whose means changes leading to their divergence take place in the crustaceans are also limited by the structural plan - this is the increase in growth or, on the other hand, the reduction of individual parts of body and appendages, convergence or, on the other hand (considerably less frequently), secondary branching off of segments and their appendages, along with one and the same manifestation of general principles of the evolution of the arthropods-oligomerization (cephalization and pygidization), and consolidation of certain parts of body as integrated tegumenta differentiated in regard to their functions. Thus, the plan of structure not only calls forth the trend of the lines of development but also restricts their number, which explains the wide development of the convergence phenomenon in the crustaceans, in particular, in the amphipods.

Along with the stabilization of the number of body segments and the formation of the protocephalon (acron + oral segment 1), the general trend of the evolution which among the branchiate arthropods has led to the separation of the order Amphipoda was realized by: 1) further cephalization and separation of the 6-segmented head (of syncephalon) and the transformation of the first pair of thoracic appendages into an odd oral organ, i.e. maxillipeds; 2) differentiation of the ventral division and separation of a 3-segmented urosome accompanied by the specialization of the last three pairs of appendages and their transformation into uropods; 3) preservation of branchial appendages on thoracic appendages and loss of breathing on the part of ventral appendages; 4) preservation (appearance?) of direct development and acquisition of the body to orient itself on a vertical plane and, in this connection, necessity to form a thoracic lateral shield for the protection of the branches and the brood chamber from damaging agents of the external medium, and 5) differentiation of thoracic appendages, which remained free, into three groups, i.e. raptorial (gnathopods), ambulatory (peracopods 1 and 2), and peracopods 3 -5 whose segments (not only coxal, but basal, and sometimes segment 4 as well) take part in the formation of the lateral shield which is formed mainly at the expense of the four anterior pairs of thoracic appendages which increase in size and are produced into the plates of coxal segments. Against the general background of the evolutionary process, in connection with th conquest of various scenes of life and adaptation to various conditions of life, modes of locomotion and feeding habits, various parts of body changed, especially their appendages. Due to adaptation, the new organs typical of the amphipods (i.e. lateral shield, maxillipeds, urosome and its appendages, and thoracic legs which underwent further differentiation and specialization) which preserved their foliction, were subject to greatest and most diversified changes.

If we attempted to construct comparative-anatomic series from the changes of the body parts in the above-mentioned amphipods, we get a picture as if the rate of their change was different within one and the same family or even genus, that each part of the body and appendage in this regard behaves more or less independently; however, some features seem to excel others in their development, while others lag behind. While altering in a certain direction, displaying a tendency common for the family, one and the same features of various genera, and even species of one and the same genus, display various stages of the realization of the general trend. Moreover, if some features are correlated with one another (for instance, the degree of the growth of the coxal plates and the wing-shaped broadening of the basal segments of peraeopods 3 - 5, which form the lateral shield), then the changes do not reveal any other evident correlations. This lack of correlation is very clearly revealed between the general form and the body structure, which are due to the mode of life (abyssal, pelagic, burrowing) and the structure of the oral apparatus adapted to a specific type of feeding. Different are also the ways of the specialization of the thoracic appendages and the urosome; however, since the trends of the evolution are limited, their changes lead to the convergent formations in various families, and the same structure of certain body parts in various types of amphilpods in far from always bearing witness to their close genetic affiliation. During adaptation, one and the same problem is solved similarly only within one genus, as wihtin a family it frequently is attained by various means. This manifested especially clearly in the morphology of the appendages: various appendages in the species of various genera are subject to similar changes directed to one and the same end. For instance, in some genera of the family Stenothoidae (Proboloides, Metopoides, Metopa, Prostenothoe, Stenothoe, Prometopa, Stenothoides, Parametopa), the posterior part of the lateral shield is formed at the expense of the wing-shaped broadening of the basal segment of peraeopods 4 and 5, while in other (Mesoproboloides, Mesometopa, Mesostenothoides), only at the expense of peraeopod 5, and in some (Probolisca, Metopella, Metopelliodes, Parametopella) the basal segment is linear in all last three peraeopods and does not take part in the formation of the lateral shield. On the other hand, subject to similar changes, leading to one and the same result, are homological body parts of species belonging to different families. As an example of this, we have the change of coxal plate 4 of Kerguelenia (Lysianassidae) whose lower part, stronly increasing in size, forms a large lobe which underlies coxal plate 5, strengthening the lateral shield, and, in form accurately resembles plate 4 of the representatives of the family Stegosephalidae, and serves the same purpose. Another example of the covergent formation of a similar feature is observed in two quite remote families, i.e. Haustoriidae and Hadziidae; the telson of both (the genus Eohaustorius and the genus Hadzia) separates into 2 independent plates attached on the sides of the posterior margin of the last pleon segment; these plates are separated from one another by a large space.

Features of a genus or a species which progressed much in their evolution are frequently observed in combination with features still present in an early stage of the manifestation of the line of their development, while the extreme specialization is accompanied, almost as a rule, with preservation of primitive features of their structure, for instance, the thoracic legs and the urosome of the corophiids, strongly specialized in which are the antennae, thoracic legs, and urosome, while the lateral shield is primitive, very poorly developed, as these animals inhabit small tubes which they build, and there is no need for additional protection for the gills and the brood chamber.

All this strongly obscures the general lines of development which lead to the formation of families, and creates great difficulties during the identification of families and the structure of a natural system within an order.

Usually, each family is characterized by a certain combination of features which may also be found in other families, but in another combination, and sometimes it is impossible to isolate specific features of a number of families. In some instances the families, in the number accepted now, are vague, uncertain, and, apparently, heterogeneous, for instance Tironidae, Corophiidae; in others (for instance, the families Ampeliscidae, Pardaliscidae, Stenothoidae), they are well defined, compact, and appear to us to be natural groups, with a general line of their development.

Sometimes it is easy to note the general trend common to a number of families in regard to the change in the body, which points to a close affiliation between them, coincidence of the line of devolopment in regard to various features which allows us to unite these families into categories of a rather higher rank, for instance, the families Amphilochidae, Cressidae, Stenothoidae, and Thaumatelsonidae, which seem to present various stages of their development in one direction, forming a definite series which might be distinguished as the superfamily Amphilochini. A similar example may be observed in the families Prophliantidae, Phliantidae, and Eophliantidae, which, according to the same considerations, might be united into the superfamily Phliantini.

Very large families rich in genera and species - Lysianassidae, Gammaridae - reveal trends of numerous lines of their development, which are characteristic of not only Gammaridea, but also of the amphipods as such.

Pirlot (1929, Mem. Sco. Roy. Sci. Liège, ser. 3, XV, Facs. 2: 1932, Ann. Inst. Oceanogr., XII, Fasc. 1), while studying the pelagic amphipods Hyperiiden and comparing them with the Gammaridea, comes to the conclusion about the existence of 8 groups of the hyperiids which are not genetically connected with one another and which developed convergently. He stresses that all the features of the structure on the basis of which this suborder is determined as such from the amphipods are also found in other groups of this order, for instance, the loss of the accessory flagellum in antenna 1, the simplification of the telson and the loss of segment 2 in the rami of uropods; that common with the gammariids are the changes connected with the adaptation to commonsalism and parasitism (specialization of their maxillipeds, general reduction of oral parts, antennae, and especially flagellum, reduction or complete disappearance of the epimers, appearance of organs of attachment). Other common features during the adaptation to the pelagic mode of life are: reduction of interanl organs, development of strong eyes, transformation of the urosome into a swimming apparatus, None of the anatomical features, common to all Hyperiidae, accoridng to Pirlot, may be used as an index of the only one line of development; on the contrary, a thorough study of them (Stephensen et Pirlot, 1931, Arch. Zool. exper. et generale, 71) forces us to come to the conclusion that groups of the hyporiids (Physosomata with their two types of oral parts ÷ Sciniformata and Lanceoliformata, both groups Hyperiidae - Curvicornia and Filicornia, the families Vibiliidae, Paraphronimidae, Thaumatopsidae), in spite of the existence of both features, have such great differences that they should be regarded as the end of various lines of development which are of a different origin. Moreover, if Curvicornia displays one and a well-expressed line of development, then Filicornia shows at least two lines; thus, the suborder Hyperiidae reveals 8 independent lines of development which lead to the formation of 8 genetically independent groups united only by the similar adaptation to pelagic way of life. Adaptations to plankton mode of life similar with the Hyperiidae are also found in the amphipods; they led, for instance, to a convergent formation of such a form -Danaella Stephensen (the family Lysianassidae), which, by its external appearance, is difficult to distinguish from the hyperiid Mimonectes bovallius; the complete disappearance of the palp of the maxillipeds, typical of the Hyperiidae occurs convergently also in the Gammaridea (the family Ochlesidae). It is of interest to note that adaptive body changes of Danaella, similar to those of Mimonectes are realized not only by other means than those of Mimonectes, but they are accompanied by a completely different line of development of the maxillipeds which led to the appearance of a galeate form of this organ which is identical in appearance with the maxillipods of the two other representatives of the family Lysianassidae-Thoriella Stephensen and Chevreuxiella Stephensen (Figures 122 and 123, pp. 361 and 364). If the same body form of Danaella and Mimonectes is due to the changes of their non-homologeus body parts, then the similar structure of the maxillipeds of Danaella, Thoriella, and Chevreuxiella originates during similar changes of homological segments. When characteristic features of various forms develop convergently, the establishment of the homology of changed parts alone may serve as the index of their genetic affiliation.

Compared with the Hyperiidae, the Gammaridae form a much more compact natural group (in regard to the origin) with one original form from which, while developing in different directions, various families developed. Here, too, however, a convergent development of a number of characteristic features took place which led the taxonomists to an artificial merger of some genera, which may be determined only by a thorough comparative study of their structure. Appearance of convergently developed similar characteristic features in various groups of gammaridae and the uniformity of the methods, by means of which new organs originate, tarnish the general trends along which the families were formed to such an extent that it is very difficult to discover the main, leading features of a number of families (for instance, the families Pleustidae, Calliopiidae, Haustoriidae, Photidae, Corophiidae, and Tironidae); they have to be characterized only in accordance with certain combinations of the same features which are found in other families, but in a different combination. We believe that it is namely in these families that the artificial unification takes place, and that they should be revised. On the contrary, the families Lysianassidae, Stegocephalidae, Ampeliscidae, and Stenothoidae - in our opinion, a natural group only in regard to its origin, although one observes among them a convergent origin of some features which also are found in other families. These features are the result of the adaptation to a similar mode of life and feeding. For instance, Stephensenia (the family Lysianassidae) and Dogielinothus (the family Dogielinotidae), which live in burrows, become extremely close in appearance to the representatives of the family Haustoriidae whose line of development terminates in a highly perfected adaptation of all body parts and appendages to burrowing.

The form close to the representatives of the family Gammaridae should be regarded as initial for the amphipods; however, it should have a rather more oblong worm-like body and coxal segments of thoracic appendages which hardly began to transform themselves into plates, a form similar to Hellenis from the Lower-Miocene deposits of the Apsheron Peninsula. Primitive features of the gammarids, we believe, are the poorly developed coxal plates, separated by spaces between them, and a simple, without a notch, posterior margin of plate 4, long atennae with linear segments of the peduncle, multisegmented flagella and an accessory flagellum in pair 1, gnathopod with a tendency to the formation of, but not the formed, subchela, 3-segmented urosome with biramous appendages, linear basal segments of last three peracopods, six pairs of simple branchial vesicles (in pairs 2 - 3 of maxillipeds), a complete set of oral parts, in which, except for maxilla 2, there are: a sypmodid with one pair of lobes, a palp with a lobe on segment 1, and, finally, the cleft telson. The initial mode of life is benthic (i.e. creeping on the bottom). The adapations proceeded at least in 8 various directions - rather more perfected adaptations to benthic and circumbenthic mode of life, exit to plankton, changing to living on the bottom (burrowing), to semisedentary life in burrows and tube-like little cases, exit to the continent, and back again to water, but now fresh, to dwelling in wood (burrowing forms), change to commensalism and parasitism. Some families have one of these trends (for instance, Amphithoidae - living in tubes, Talitridae - living on land, Hyalellidae - living for the second time in water, Haustoriidae - burrowing, Cheluridae - burrowing of wood, Stenothoidae - commonsalism); while others, for instance, the Lysianassidae - have a few trends, including the change to parasitism.

As already mentioned, new organs - lateral shield, gnathopods, and urosome - specific of the amphipods are subject to greatest deviations from the average "Gammaridea" norm during the adaptation period in this direction; secondary simplifications of individual body parts, too, take place. The lysianassids (the family Lysianassidae) belong to the most-highly organized gammarids; their segmented lateral shield, formed by deep, closely adjacent first five coxal plates (their depth is greater than the depth of the corresponding segment); plate

4 has in its upper part of the posterior margin a special notch into which fits the upper part of the rather lower plate 5. Basal segments of peraeopods 3 - 5 attain wing-shaped broadenings which form the posterior part of the shield. The head also is well developed, has an interantennal lobe and upper and lower antennal notches, is provided with sensory organs, i.e. eyes, sensory setae, and calceoli on the antennae; antenna 1 with accessory flagellum, gnathopods with subchela (some specimens have a secondary simplification or, on the other hand, specialization and a transformation into a complex subchela, or even into a true claw), 3-segmented urosome (pygidization in some) with three biramous uropods (reduction is observed in some), and a cleft telson (entire telson is comparatively rare). The specifically "Lysianassid" specialization manifests itself in the shortening of both antennae, inflation of segment 1 of the peduncle, and elongation of segment 1 of the flagellum, which acquires sensory hairs, antenna 1, and in the formation of a special structure of gnathopod 2 - elongated segment 3, elongated, inflated on the distal margin, segment 5 covered with coarse short setae, and rather shorter segment 6, which also is covered with course hairs with a short palmar margin, attached to which is a small dactyl, which, together with segment 6, forms a subchela (Figure 1, 2, 3, etc.). Oral parts are varied: from a complete set of a gammarid type to strongly reduced and altered, depending upon the feeding habit, showing a reduction, or, on the other hand, a growth of their individual parts.

However, the divergence which led to the separation of the genera during their adaptation to various modes of life also applies to the features specific of this family.

The most primitive genus of the lysianassids is Valettiopsis, its lateral shield is not as perfected (the coxal plates are low, lower than segments, and the wing of basal segments of peraeopods 3 - 5 is underdeveloped). Segment 1 of the peduncle of antenna 1 is not inflated but only slightly elongated, more or less gammaridous, and its segments 2 and 3 are slightly longer than the usual lysianassidous; gnathopod 2 does not reveal a tendency to the formation of a specifically lysianassidous structure (segment 3 is elongated, segment 5 inflated and bears coarse setae, but segment 6 is typical); gnathopod 2 of the abyssal species V. macrodactyla Chevreux is not lysianassidous at all, but rather gammaridous; characteristic also is the rough cutting edge of the mandibles, as is the case in all lysianassids, but dentate; all other parts are similar to those of the Gammaridae.

Deviations of the lateral shield from that which is normal for the Lysianassidae are observed chiefly in plankton (especially bathypelagic), parasitic forms, and in the commensals. For isntance, coxal plate 1 of Crybelocephalus is small, not overlapped by the following ones; coxal plate 1 of Hirondellea is also reduced, sometimes plate 2 overlaps the posterior part of the first one; plates 1 and 2 of Metacyphocaris are very small and overlapped by plate 3 which is strongly increased in size; plates 1 and 2 of Crybelocephalus are small, plates 3 and 4 become enlarged, but plate 3 overlaps only plate

2 and the postoro-distal angle of plate 1, and plate 4 has a posterior notch; similar correlations are observed in Cyclocaris, increased in size plates 3 and 4 form a shield together with a strongly broadened basal segment of peraeopods 3 - 5; in Cyphocaris, we note the extreme change in this regard: the first three pairs of coxal plates become reduced and much smaller; plate 4, while broadening, overlaps them entirely and forms, together with the similarly enlarged plate 5 and the wings of peraeopods 3 - 5 the lateral shield. The reduction of coxal plate 1 is observed in the plankton Eurythenes (plate 2 covers it, the remaining ones are normal, in a similar way as do the wing-shaped broadenings of peraeopods 3 - 5), in Trischizostoma with the maximum grown plate 2, in Opisa with normally developed remaining plates; the same holds true in regard to the commensals Aristias and Perrierella. The benthic lysianassids of the genus Tryphosa reveal the initial stage of the reduction of coxal plate 1; it decreases and tapers distally; the same is observed also in the species of some other genera, for instance, in Orchomenella grönlandica. Plate 1 of Kerguelenia is normal, but the posterior lobe of plate 4 becomes expanded and very similar to that of the Stegocephalidae and underlies entirely plate 5. The lateral shield of parasitic forms is subject to a secondary reduction; all coxal plates of Thoriella (Figure 122) are small (plate 4 larger than the remaining ones, without posterior notch), open, with spaces between them, basal segments of peraeopods 3 - 5 thickened, but without the wing; the relations are completely different in

Chevreuxiella (Figure 123, page 364)*: coxal plates 1 and 2 are small, plate 2 partly overlaps plate 1; plates 3 and 4 (without the posterior notch) become enlarged, and so do the posterior lobes of plates 5 and 6; in addition, plate 7 becomes reduced and very low; the basal segment of peraeopod 3 has preserved only a rudiment of the wing in its upper part, and the wing of plates 4 and 5 is small. The shield of *Chevreuxiella* becomes fastened by the overlapping of the plates one upon another; plate 4 is on top and covers the posterior part of plate 3 and the anterior lobe of plate 5; plate 5 covers the anterior lobe of plate 6, and plate 6 covers the anterior part of plate 7 and the anterior part of the basal segment of last peraeopods.

Also peculiar are the deviations in the structure of the lateral shield in the remarkable form *Danaella*, which imitates the hyperiids: its plate 4 also becomes enlarged, and is above and covers a part of plates 3 and 5, similar to what we observe in *Chevreuxiella*; plate 1 is reduced, plate 2 slightly broader, but also small. It is of interest to note that plate 3 is extended-triangular, much lower and at least three times narrower than plate 4, but its convex anterior margin very accurately adheres to the posterior margin of the bent basal segment of gnathopod 2; in *Danaella*, as is the case in *Chevreuxiella*, the posterior part of the lateral shield is formed by the strongly grown posterior lobes of plates 5 and 6, and plate 7 is more reduced than that of *Chevreuxiella*; the basal

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* In the Russian text. Translator.

segments of peraeopods 3 - 5, on the other hand, do not take part in the formation of the lateral shield; however, the last two paraeopods have preserved the remmant of the wing in an even smaller degree than is the case in Chevreuxiella. Unlike in Chevreuxiella, the correlation of the size of the coxal plates and of the remaining part of the appendages of peraeopods 1 - 4 of Danaella is different: the depth of the plates is either equal in size or larger than the remaining part of the leg, or slightly smaller than the length of the free part of the leg, while peraeopod 2 is so small that it seems to be a simple appendage of coxal plate 4, although its structure is completely normal.

Peculiar is the strong enlargement of coxal plate 5, at the expense of which peraeopod 3 is reduced also in the genera Lepidepocreum and Orchomenella. The strengthening of the shield at the expense of the development of the posterior lobe of the coxal plate that overlaps the basal segment is observed in Lepidepocroella, and in some species of Orchomenella.

Enlargement of the coxal plates is correlated to the development of the wing on the basal segments of the last three peraeopods; this is weakly manifested in the Lysianassidae, but well-expressed in the Stegocephalidae and especially in the Stenothoidae (Guryanova, 1948, Symposium dedicated to the late Academician S.A. Zernov). Similar series of coordinated changes in the coxal plates and the basal segment of peraeopods 3 - 5, as is the case in the

Stenothoidae, is also found in the Stegocephalidae: depending upon the degree of the development of the part of the lateral shield formed by coxal plates becomes the linear basal segment in only pair 3 (Stegocephalus, Phippsiella, Andaniexis), or in pairs 3 and 4 (Phippsia, Stegocephaloides, Andaniella, Andaniopsis), or in all last three peraeopods (Stegocephalopsis). Similar correlations between the coxal plates and the basal segments of peraeopods are also found in other families, for instance, in the Phoxocephalidae. Of interest is a special means of change in the coxal plates of the Argissidae: the enlargement of plates 1 and 4, or only plate 4, with a strong decrease of plates 2 and 3 or only plate 3, with preservation of the wing in all last three peraeopods on basal segments. A large portion of the shield in the Tironidae is formed either at the expense of the increase in plate 3 (Syrrhoe), or, like in the Lysianassidae, at the expense of the coordinate development of coxal plates 1 - 5. The lateral shield of the Haustoriidae, Phoxocephalidae, Ampeliscidae which burrow holes in the ground obtains accessory protective devices - a fringe of simple or plumose setae on its lower margin. In some Paramphithoidae which roll into a ball (Epimera), there develop accessory ribs, keels and furrows on the margin of the shield and on the basal segments of the peraeopods for fitting and fastening of corresponding body parts when they are rolled up. The lateral shield of the Corophiidae and Podoceridae which live in tubes becomes reduced (or is preserved as a primitive one), it is formed by small coxal plates which are separated from one another by gaps; the gills are protected by the tube walls, and the shield would only hamper the ventilation of the water which washes them; their brood chamber is formed by narrow incubating plates with long marginal setae which form a net between the gaps and which adhere closely to one another. The Talitridae, which have a terrestrial way of life, have a dense close lateral shield although not as high as in the Lysianassidae, and the attachment of the brood chamber is reached through a development of special hooked processes at the ends of the marginal setae in the oostegites, which also provide for a possibility of the increase in the volume of the chamber as the young found in it increase in size during their growth. In the Phliantidae, there appears a new line of development in regard to the formation of the lateral shield - its transformation into a dorsal shield; anterior coxal plates acquire a horizontal position, like in _Isopida_, the entire thoracic division becomes strengthened by keels and tubercles; the first pairs of plates extend forward along the sides of the head, covering the latter, and the ventral division becomes weaker, degraded, and bent under the thorax, also being covered by the dorsal shield which is formed, as is the case in normal gammarids, from coxal plates 1 - 5 and wing-shaped broadenings of the basal segments of peraeopods 3 - 5, oriented in space, accordingly. Protection of the head from sides by coxal plates is also observed in _Danaella_, _Acontiostoma_, and _Stomacontion_, when the shield is on the side, in the Lysianassidae.

There also are two other lines of development of the lateral shield in the amphipods: 1) preservation of a primitive state, and 2) its secondary degradation.

A primitive lateral shield is preserved in the Bogidiellidae, Hadziidae, Hyperiopsidae, Vitjazianidae, Melphidippidae, and Pardaliscidae. The degradation in the Eophlianthidae is evidently secondary. However, it is very difficult to determine in each individual case whether one deals with primitivism or with the secondary degradation without the material on the development on hand; however, constant substantiation that the specialization in some features is usually accompanied by the primitivism of others gives us some information on this matter. We consider as the most primitive the lateral shield of the Bogidiellidae and the Hadziidae. The small coxal plates of the Bogidiellidae are approximately of same size, separated by gaps between them, plate 4 without the posterior notch, and the basal segments of peraeopods, including the last three ones, are linear; their pleopods which lost one ramus were subject to specialization, and so were their branchial vesicles which number only three pairs. The coxal plates of the Hadziidae also are poorly developed, small, plate 4 also without a notch on the posterior margin; however, the plates come in contact with one another, if even not closely, and the basal segments of peraeopods 3 - 5 have acquired a wing-shaped broadening; the telson in this family is specialized, split into two plates attached on both sides along the posterior margin of the last segment of the urosome and divided by a space between them.

In the family Hyperiopsidae (bathypelagic forms) we notice further progress - the coxal plates are developed rather more and touch upon one another, but they are small, their depth is smaller than the height of the segments, the size of the first four pairs is the same, and plate 4 lacks the notch on the posterior margin. The basal segments of peraeopods 3 - 5 have a wing-shaped broadening, but it is not uniformly developed in various species; subject to specialization are peraeopods 1 and 2, oral parts, and urosome; moreover, one observes a reduction of segment 3 in peraeopods 3 - 5, which is shortened to such an extent that it almost disappears and it is rather difficult to notice it.

Of greatest interest are the changes and the second degradation of the lateral shield in the very strongly specialized families Phliantidae, Prophliantidae, and Eophliantidae, which are closely related in regard to one another. The lines along which these changes went within their limits may be traced quite accurately.

The specialization within these families went in two various directions; we already mentioned one of these two lines of development - it is the formation of the dorsal shield which is accompanied by a degradation of the ventral division in the family Phliantidae. In the Prophliantidae, the specialization went in another direction: along with the preservation of the normal, well-developed lateral shield and a degradation (which was rather weaker than in the Phliantidae) of the abdomen, the head becomes specialized, and so do its appendages in such a way that a new head type for the amphipods developed which manifests itself most fully in the very strongly specialized family Eophliantidae; in the Eophliantidae, the lateral parts of the head tegument intergrow with the epistome and the sympodites of some of the oral parts, the interantennal lobe and the antennal notches become reduced, the entire head acquires a specific shape with a forehead depression at the place where the antennae become attached; the posterior part of the head extends and forms a neck. The head of some representatives of the family Prophliantidae, which is an intermediary between the Phliantidae and the Eophliantidae, is still more or less normal (Ceina), while in others (Prophlias, Majna) it is strongly changed in this direction.

We have revised the Phliantidae and the Prophliantidae whose systematics was to a considerable degree intricate, raised the earlier determined subfamily Eophliantidae to the rank of family, and determined rather more accurately the volume of each of these three families (Guryanova, 1958, Bull. Sov. Antarct. Exp., No. 3: 55-56). Brief diagnoses of these families are given in the key for the determination of families (pages 42 and 43)*. Since the publication in which the main results of our revision are given is not widely distributed, we give here the composition of each of the families, depending on the need for our further discussion in regard to the evolution of the amphipods. The order of the genera is arranged from the least specialized to the most progressed.

The family Phliantidae

1. The genus Phlias Guerlin, 1836.
2. The genus Palinnotus Stebbing, 1910.
3. The genus Pareinotus Bate et Westwood, 1862.
4. The genus Iphinotus Stebbing, 1890.
5. The genus Pariphinotus Kunkel, 1910.
6. The genus Heterophlias Shoemaker, 1933.
7. The genus Temnophlias K.H. Barnard, 1916.
8. The genus Quasimodia Sheard, 1936.
9. The genus Iphiplateia Stebbing, 1899.
10. The genus Plioplateia K.H. Barnard, 1916.
11. The genus Sancho Stebbing, 1897[1].
12. The genus Chosroës Stebbing, 1888.

The family Prophilantidae

1. The genus Prophlias Nichols[1], 1939
2. The genus Ceina Della-Valle, 1893.
3. The genus Kuria Walker et Scott, 1903.
4. The genus Najna Derzhavin, 1937.

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* In the Russian text. Translator.

1 Affiliation of the genera Sancho and Chosroes to the family Phliantidae is not very clear as both have long antennae anomalous for the Phliantidae and mandibles with a strong molar process and a 3-segmented palp.

The family Eophliantidae

1. The genus *Biancolina* Della-Valle, 1893
2. The genus *Amphitolina* S. Ruffo, 1953.
3. The genus *Eophliantis* Sheard, 1936.
4. The genus *Wandelia* Chevreux, 1906 (syn. *Ceinina* Stephensen, 1933).
5. The genus *Bircenna* Chilton, 1883.
6. The genus *Cylindryllioides* Nicholls, 1938.

If, as mentioned above, the change in the head in the representatives of the family Prophliantidae displays a stage intermediary between the Phliantidae and the Eophliantidae, then the same is also observed in regard to the changes in the lateral shield and the ventral division which in the Prophliantidae are more or less normal. We consider this family close to the initial forms which produce two other families that are characterized by two different directions in regard to the change of the lateral shield. Contrary to the Phliantidae which acquired the dorsal shield, the Eophliantidae went along the line of the degradation of the lateral shield; their body extends, because almost cylindrical, the joint between the spherical head and thoracic segment 1 extends and forms a "neck"; the urosome and the uropods degrade, but they are not bent under the thorax; the lateral shield degrades - the coxal plates decrease in size considerably, there appear gaps between them, the wing-shaped broadenings of the basal segments of peraeopods 3 - 5 disappear.

For instance, the coxal plates of the genus Biancolina are strongly degraded, the posterior notch in peraeopod 4 is wanting, but the gaps appear only between the lower ends of plates, while their proximal parts come in contact with one another; also the wing-shaped broadening of the basal segments of peraeopods 3 - 5 are preserved. The head is not yet quite spherical, the "neck" is absent, and there is a lower antennal notch. All coxal plates, and especially - the first four pairs of the genus Amphitolina, are even more degraded, smaller than those of Biancolina, the gaps between them are broader, plate 4 without the poserior notch; the last three peraeopods preserve a well-developed wing on basal segments, and coxal plates 5 - 7, the initial size and form (bilobed lower margin). The head of Amphitolina, however, is spherical, and one notices traces of the "neck"; both the interantennal lobe and the antennal notches are wanting, and the tegument of the head is intergrown with the sympodites of the oral parts.

The genus Wandelia has already a considerably more extended body and a disintegrated lateral shield - very small, reduced, with coxal plates having broad gaps between them, in connection with which the oostegites become very large, dense, with setae that have special small hooks connecting setae with one another. The basal segments of all last three peraeopods have preserved a well-developed wing. The head of Wandelia has a small interantennal lobe and antennal notches. The coxal plates of Eophliantis (the body is almost cylindrical) are small, open (with gaps between them), but the wing of the basal segments of peraeopods 3 - 5 is preserved; the head already is completely spherical, with a well-developed "neck". The degradation of the lateral shield is greatest in Cylindryllio-des - not only its coxal plates have been for the second time almost transformed into simple (although broad) segments of thoracic legs, but also the basal segments of peraeopods 3 and 4 lose their wing and become linear for the second time, and only peraeopod 5 preserves a weakly expressed wing; the body is cylindrical, almost worm-like, the head similar to that of Eophliantis, and the urosome attains a high degree of pygidization. In degradation of the lateral shield, the genus Bircenna is close to the preceding genus, only the wing is preserved on all basal segments of all last three peraeopods. The pygidization of the urosome went even further, and all peraeopods reveal a tendency to form a subchela. Moreover, the representatives of this genus heave new organs - a large trough-shaped process on the ventral side of peraeon segment 1, which underlies the head.

Thus, the changes in the structure of the lateral shield of the gammarids, although considerable, become realized only in three various directions: 1) regrouping of the current number of coxal plates at the expense of which the shield is formed; 2) its transformation into a dorsal shield[1], and 3) degradation.

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[1] The tendency of forming the dorsal shield is found, besides in the family Phliantidae, also in other families, for instance, in the family Calliopiidae (Amphitopsis).

Restricted also are the directions in which the head undergoes changes: 1) transformation of the normal head into a galiform one (Tironidae, Oedicerotidae), 2) into extended, narrow, with a loss of the interantennal lobe and antennal notches (Ampeliscidae, Phoxocephalidae), and 3) spherical, insect-like (Eophliantidae). The changes of the urosome also are great, but they are not as varied - this is a pygidization which is due to the merging of the segments with one another, accompanied by a reduction and a loss of appendages. The degradation during this merging of segments may affect not only the uropods, but also the pleopods, which fact may be well traced on the example of a comparative study of the group Amphilochini (Amphilochidae, Cressidae, Stenothoidae) and Phliantini (Phliantidae, Prophliantidae, Eophliantidae). The changes of oral parts, connected with the adaptation to feeding lead to the formation of various types, i.e. gnawing (normal structure and a complete set of all parts of oral appendages of the gnathocephalon) and pricking or sucking (extension of all appendages, loss of the palp and lobes, loss of armature), - as a result of the increase in growth of some and a degradation of other segments of the appendage.

The most varied, for the amphipods, are the changes of the new organs, i.e. the maxillipeds, both within the entire order and within its suborders, families, and even genera. While preserving the elasticity, they may change in various directions both in regard to the degree of their development or the degradation of their individual segments and lobes, and also in regard to their form and armature.

Varied also are the directions in regard to the specialization of the gnathopods - from normal with a subchela to a completely special structure, as, for instance, in the genera Scopelocheirus, Paracallisoma, and Paracallisomopsis in the family Lysianassidae /Figures 102, 103, 104 (Gp. 1) on pages 310, 217 - 321_/*, or to a secondary simplification and transformation into a simple walking appendage with linear segments 5 and 6 /Figures 122, 123 (Gp. 1) pages 361, 364/*. Gnathopod 1 of the family Lysianassidae of various genera is either simple or with a subchela or a true claw of various length and size; even the specialized "lysianassidic" gnathopod 2 changes in various genera and species. Other families reveal even more complex changes - the complex subchela or the true claw varying in size and form, in the shape of weak pincers (Kerguelenia), or, on the other hand, as strong pincers (Leucothoe), with segment 6 transformed into a special brush (Bathyporeia), or with a special form and armature the dactyle (some speices of Metopa, Pardalisca), or the structure of the posterior margin of the hand (in the species of the genus Stenothoe and others), etc. (Figure Gp. 1 and Gp. 2 of various species of the Lysianassidae and the figures of the same parts in our report for 1951 in other families). The change of the last segments in the gnathopods are so great and varied that they serve as excellent diagnostic features, chiefly pertaining to the

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* In the Russian text. Translator.

species; they are of little value in regard to the genera (especially in gnathopod 1) and almost useless for determining families.

We showed the general trend in the change of the entire organism of the gammarids as a whole during their adaptation to various modes of life in the example with the Stenothoidae (Guryanova, 1948, Symposium in honour of the Academician S.A. Zernov: 287-325) and A.I. Bulycheva (Guide to the Fauna of the U.S.S.R., published by the Zoological Institute of the Academy of Sciences of the U.S.S.R., 65, 1957: 7 - 54) on the example of the sea flees. In this regard, we obtained interesting material during the analysis and the revision of the group Phliantini. We obtained good comparative-morphological series which at the same time are evolutionary series, since the changes in regard to all features within each of the three families of the group progressed in similar directions more or less parallel to one another. The most complete evolutionary series we obtained for the family Phliantidae which compared to the Prophliantidae and the Eophliantidae, has a larger number of series and a rather wider geographical distribution. Let us briefly examine this example.

The most striking new line of the evolution of the entire body as a whole organism, which led to the formation of the well differentiated family Phliantidae, is the transformation of the lateral shield into a dorsal one, the degradation of the ventral division, and a change of other features connected through correlations with these main changes. The first process - the transformation of the lateral shield into a dorsal one was examined above, and partly also for the Phliantidae. Let us examine briefly how the oral parts change, and especially the maxillipeds (Mxp) and the maxillae (Mx 1), since the mandibles (Md) and the maxillae (Mx 2) in all Phliantidae have already attained a certain stage of changes, and so have have those of the phliantids, which are similar to them. Characteristic of the phliantids is the turtle-like outer appearance, which is due to the well developed dorsal shield, the dorso-ventrally flattened body, and the abdominal region turned into the thorax. The coxal plates are bent upward, arranged in the horizontal area or at a very small angle to it; the ventral division degrades so strongly that uropod 3 of exteme forms are preserved only in the form of simple non-gengmented appendages, without rami, while the pleopods have rudimentary rami, or one of their rami is completely reduced and disappears. The oral parts also degrade, but to a different extent, depending on the genus; maxilla 1 with a 1-segmented palp or entirely without it, frequently also without the inner lobe, maxilla 2 frequently merges at the base, the mandibles wihtout palp and without molar process, in the place of which there is sometimes found either a fleshy or a transparent long process. Maxillipeds with 4, 3-, or 2-segmented palp and a normal sympodite; all thoracid legs (gnathopods and peraepods) are simple, similar in structure, with a strong bent, prehensile dactly; the segments of the last three peraeopods in various form, however, have either a wing, or the wing degrades, to a various extent, and the segment, for the second time, turns into a linear one; the urosome degrades and turns into the ventral side, while the uropods become reduced to complete disappearance of the rami of peraeopod 3; the telson is small, entire. Observed is a strong shortening of the antennae and the reduction of their flagellum, up to the point when it appears in the form of a monosegmented rudiment. We attempted to present the comparatively-morphological series in regard to the changes of the oral parts (of the maxillipeds and maxilla 1) and the change of the abdominal region (Table 1, p. 24)*.

Each of the cells of these series represents a certain stage in the change of the body parts and appendages in a certain direction. The series of the genera obtained for each of the given features do not coincide with one another; one and the same genus reveals that the change in some parts exceeds similar changes in other genera, while, on the other hand, other parts lag behind. Only the initial and the final links of these series coincide. The coincidence of the stages of the change in the oral parts and in uropods could also not be anticipated, as they belong to two different tegmina of the body - the head and the urosome, but there is no coincidence in regard to the rate of the change of parts also within one and the same tegmen. For instance, the representatives of the genera Quasimodia and Iphinotus, while the maxillipeds remained unchanged, have reached the ultimate stage of the reduction in maxilla 1 (the loss of not only the palp, but also of the inner lobe); in the genus Plioplateia, which has

* In the original. Translator.

normal maxillipeds, we observe the loss of segment 1 of the peduncle in maxilla 1, etc.

There is no coincidence in the stages of the transformation of the lateral shield in the dorsal stage and the degradation of the urosome, either; in this regard, various genera have different combinations. For instance, Phlias, Plioplateia, and Pariphinotus, which still possess a well developed lateral shield, uropod 3 loses one ramus (Phlias); in Plioplateia, segments 1 and 2 of the urosome merge; with the loss of both rami, uropod 3 is transformed into a 1-segmented appendage, and it is completely reduced in Pariphinotus. Nevertheless, discarding the details and considering only the general tendency and the degree of specialization of individual genera in a certain, specific direction for the Phliantidae, (it is their line of development which terminates in a perfected dorsal shield and a degraded abdomen turned under it), it is possible to construct one continuous series which would encompass all the genera of the family, as follows:

$$\left.\begin{matrix}\underline{\text{Chosroës}}\\ \underline{\text{Sancho}}\ (0)\end{matrix}\right\} \rightarrow \underline{\text{Quasimodia}} \rightarrow \left\{\begin{matrix}\underline{\text{Plioplateia}}\\ \underline{\text{Iphioplateia}}\\ \underline{\text{Heterophlias}}\\ \underline{\text{Phlias}}\ (0)\end{matrix}\right\} \rightarrow$$

$$\rightarrow \left\{\begin{matrix}\underline{\text{Pariphinotus}}\\ \underline{\text{Palinnotus}}\\ \underline{\text{Iphinotus}}\ (0)\end{matrix}\right\} \rightarrow \underline{\text{Pereinotus}}\ (0) \rightarrow \underline{\text{Temnophlias}}$$

Within this family, one may also construct another series, quite parallel to the first; in this second series, but in another direction, only a few genera progressed:

Sancho ⟶ Phlias ⟶ Iphinotus ⟶ Pereinotus.

The most primitive forms, present at the initial stage of their evolution, of the family Phliantidae, - Chosroës and Sancho - are so close to the family Calliopiidae that contemporary authors ascribe them to this same family; the antennae of both genera are long, with numerous flagelli; the mandibles have a three-segmented palp and a cylindrical molar process developed normally; normal, with a long palp, are the maxillipeds of the gnathopods of the family Calliopiidae; however, they already have a dorsal shield instead of the lateral; observed is also the degradation of the urosome which is manifested, first of all, in that it is always turned in in the direction of the ventral side, and, secondly, segment 2 of the female (Sancho) disappears completely, together with uropod 2. Observed here is not a pygidization, as is the case with other numerous families, but a degradation, as is the case in the Phliantidae some uropods of which become degraded while the three-segmented urosomes are preserved. However, Sancho and Chosroës (the genus Amphitopsis of the family Calliopiidae should be added) link the phliantids and the entire group Phliantini with the family Calliopiidae, which, to us, appear as an artificial unification of the genera and should be urgently revised. The second series of the genera of the Phliantidae, proceeding from the genus Sancho - which develops parallel to the first series that commences with the genus Chosroës - is, we believe, an accessory branch of the general line of the development of the phliantids.

The last link of the first series *Temnophlias* already has new qualitative features of its structure - the secondary reduction of the coxal plates, hence also of the dorsal shield, and, in exchange, the enlargement of their lateral parts of the peraeon segments, as well as the dorso-ventral flattening of the body and the degradation of the urosome turned in on the ventral side. It is quite probable that the continuation of this new line as independent evolutionary way may be traced; in such a case, then, we would have to exclude the genus *Temnophlias* from the family Phliantidae and unite with its close forms into a special family.

It is impossible to understand the functional role of changes leading to a very profound and clearly expressed specialization without the knowledge of the conditions and the mode of life of the animals. In regard to the phliantids, it is only known that they are shallow-water coastal species which inhabit the fields of algae. Their high degree of specialization bears witness to the old age of this group. In the Phliantidae, it also is substantiated by their contemporaneous distribution. The family Phliantidae is tropical in origin, and its contemporanceous representatives inhabit mainly the tropic and subtrobpic areas of the southern hemisphere. Most widely distributed are the genera *Phlias* (1 species) and *Palinmotus* (3 species); the former has a broken geographical range (in the southern part of the Pacific Ocean between the Falkland Islands and the eastern coast of Australia and in the Mediterranean Sea); the latter inhabits the coasts of Australia, South Africa, and the Sea of Japan - Peter the Great Bay; the remaining genera are connected with certain areas of the southern hemisphere, the tropical zone, and the Mediterranean Sea. The richest fauna of the phliantids is found at the coasts of Australia - discovered here are the representatives of 5 genera (*Sancho*, *Phlias*, *Quasimodia*, *Palinnotus*, and *Iphiplateia*), the most primitive ones (the first three genera) and the most specialized; 2 genera (*Phlias* and *Pereionotus*) are found in the Mediterranean Sea, 3 genera near southern Africa (*Palinnotus*, *Plioplateia*, and *Temnophlias*), 1 genus (*Heterophlias*) near the coast of Florida, 1 genus in the Bermuda Islands (*Pariphinotus*), 1 genus (*Iphinotus*) near New Zealand, and 1 genus (*Chosroës*) in the Strait of Magellan. The family Phliantidae, also inhabit only the Mediterranean Sea, the Indo-West-Pacific (at the eastern coast of Africa, the Malay Archipelago), near the south-western coast of Australia and New Zealand, and only *Najna* has been discovered, for the time being, in the Sea of Japan. Hence it is clear that the group *Phliantini* is very old and is connected with the tropical fauna of the Tethis Sea. The profound specialization of all three families points to the old age of the groups.

At present, we do not consider it possible to discuss here the problems of the zoogeography, since the main collection of the amphipods from the northern part of the Pacific Ocean has not been treated, and even more so since a large majority of new species discovered in the waters of the Far East, and at the sime time the extremely scanty data on the fauna of the Pacific coast of North America do not permit us to analyse this fauna as we should; hence we leave this work for later.

CONVENTIONAL SYMBOLS ON FIGURES

C -- cephalon, head

Ant I -- antenna 1

Ant II -- antenna 2

fl -- flagellum

ac, fl -- accessory flagellum

Epist -- epistome

1 -- upper lip

Md -- mandible

Mx I -- maxilla 1

Mx II -- maxilla 2

L -- lower lip

Mxp -- maxilliped

Gp I, II -- gnathopods 1, 2

Pp I - V -- peraeopods 1 - 5

Plp I - III -- pleopods 1 - 3

Us -- urosome

Us. s I -III -- urosomal segments 1 - 3

Up I - III -- uropods 1 - 3

Cox. pl I - VII -- coxal plates 1 - 7

Ep. pl I-III -- Epimeral platøs 1 - 3

Up I - III -- uropods 1 - 3

T -- telson

Sculpt -- sculpture of tegument

Calc -- calceoli

CHANGES OF ORAL PARTS AND ABDOMINAL REGION IN THE FAMILY Phliantidae*

ORAL PARTS	Mxp	Palp 4-segmented, last segment hooked (Chosroës, Sancho, Plioplateia, Quasimodia, Iphinotus, Pariphinotus)	Palp 4-segmented, last segment cylindrical (Hetercophlias, Iphiplateia).
	Mx I	Palp 2-segmented, inner lobe present (Chosroës, Sancho).	Segment 1-segmented, inner lobe present /Plioplateia, Phlias (?)/
ABDOMINAL REGION	Plp	All three pairs biramous, normal (Chosroës, Sancho, Phlias, Heterophlias, Pariphinotus, Iphinotus, Palinnotus, Temnophlias).	Pairs I and II biromous, normal; pairs III with 1 ramus, inner in process of reduction (Quasimodia).

* For the right-hand columns of this table, see next page. Translator.

CHANGES OF ORAL PARTS AND ABDOMINAL REGION IN THE FAMILY Phliantidae

ORAL PARTS	Mxp	Palp 3-segmented, last segment cylindrical (Phlias, Palinnotus, Pereinotus).	Segment 2-segmented, last segment cylindrical (Temnophlias).	
	Mx I	Palp disappeared, present only trace of its attachment, inner lobe disappearing (Palinnotus, Iphiplateia, Heterophlias).	Palp vanished, not even the trace of its attachment, inner lobe wanting (Quasimodia, Pereinotus, Iphinotus, Pariphinotus, Temnophlias).	
ABDOMINAL REGION	Plp	Pairs I and II with shortened inner ramus; in pair III, inner ramus disappearing almost completely (Iphiplateia).	Pairs I and II biramous, normal; in pair III both rami as 1-segmented rudiment (Phlioplateia).	Pair I biramous; pairs II and III lost inner ramus, monoramous (Pereinotus).

CHANGES OF ORAL PARTS AND ABDOMINAL REGION IN THE FAMILY Phliantidae

<table>
<tr><td rowspan="3">ABDOMINAL REGION</td><td>Us et Up I - III</td><td colspan="2">All 3 segments free; uropods I - III developed normally (Chosroës, Sancho ♂). Uropod II disappearing (Sancho ♀).</td><td>All 3 segments free; uropods I and II biramous; uropods III have rudiment of inner ramus or monoramous (Quasimödia).</td><td>All 3 segments free; uropods 1 biramous; uropod II of ♂ biramous, in ♀ disappear- completely; uropod III monoramous (Phlias, Pereinotus, Iphinotus).</td></tr>
<tr><td rowspan="2">Us et Up I - III</td><td colspan="4">Segments II and III merge*</td></tr>
<tr><td>Uropods I and II biramous; uropod II very small; uropod III without rami in form of 1-segmented appendage (Heterophlias, Plioplateia, Iphioplateia).</td><td>Uropods I & II biramous; uropod III disappearing (Pariphinotus).</td><td>Uropod I biramous; uropod II monoramous; uropod III without rami and covered with telson entirely (Palinnotus).</td><td>Uropod I monoramous uropod II with one rudimentary ramus, uropod III without rami, in form of monosegmented appendage (Temnophlias).</td></tr>
</table>

* This is the last 4 right-hand colums of Table 1 (see p. 24 of original text).

Translator.

The Order AMPHIPODA

The Suborder GAMMARIDEA

We consider it necessary to preface the systematic part of the work with the key for the determination of the families of the suborder Gammaridea, which already now, before the entire content is presented, may be of use for orientation when the faunistical material is treated by an average zoologist who is not a specialist-carcinologist. We attempted to include in this key all the families determined by 1958 the number of which has grown from 41 to 61 since Stebbing's world report (1906) was published.

The compilation of this key in such a way as to observe the genetical sequence in accordance with the families following one after another presents almost unsurmountable difficulties, as the line of the development and the appearance of new features within the entire suborder are repeated in individual families parallel and independently; hence the diagnostic difference of principally new peculiarities of their structure as in the difference of the combinations of one and the same features common to many families. Due to this fact, the sequence of the families in the key deliberately does not reflect their phylogentetic relations, and only in some cases closely-related families are found in the key close to one another (for instance, Amphilochidae, Cressidae, Stenothoidae, Thaurmatelsonidae, or Phliantidae, Eophliantidae, and Prophliantidae).

During determination, while selecting the most appropriate diagnostic features, we present in the couplets of the key, for each family, its accessory features, so that the person using this key might be more sure of the accuracy of his determination. For the families, which were described after Stebbing's report, the reader will find the author, year and publication in which the description was given.

KEY TO THE DETERMINATION OF THE FAMILIES OF THE SUBORDER GAMMARIDEA

1 (2). Antenna 1 always with accessory flagellum, segment 1 of peduncle inflated, frequently barrel-shaped; both antennae devoid of large spines and clusters of long plumose setae. Gnathopod 2 of completely different structure than gnathopod 1, its segment 5 strongly enlarged, inflated at the distal end, bearing coarse hairs and often a "pine-apple cushion"[1] on its lower surface; segment 6 shorter than segment 5, its entire surface densely covered with straight coarse hairs; at the apex of this segment, behind dactyl, there is a cluster of long setae which camouflage the small dactyl; segment 3 also elongated, usually longer than segment 4. Coxal plates deep, usually deeper than segments; plate 4 with notch in upper part of posterior margin. Body smooth, inflated, keels of processes may be present only on urosome. Head with well developed interantennal

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[1] Short scales covering the inflated part of the segment make it resemble a pine-apple.

lobe and lower and upper antennal notches. Segment 1 of main flagellum of antenna 1 usually enlarged, cone-shaped, with long dense hairs on lower surface. Basal segment of all lost three peraeopods always with wing-shaped broadening................... The Family Lysianassidae (p. 43).

2 (1). Structure of antennae and gnathopod 2 different. Coxal plate 4 may lack notch on the posterior margin.

3 (4). Maxilla 1 and maxillipeds almost always assymetrical; segment 2 of palp of maxilla 1 (usually on one side) strongly expands and bears a peculiar sculpture, different in various species, at the distal end of the inner side; both gnathopods weak, with a subchela. Peraeopods 1 and 2 more powerful than gnathopods, strongly specialized: usually, their segment 4 much broader and longer than basal segment, oblong-oval, segment 5 short, segment 6 thinner and longer than segment 5, with a tendency of forming a subchela, dactyl thin, pointed. Body smooth, without armature. Head inflated. Coxal plates small, their depth does not exceed half the depth of segment, plate 4 without notch on the posterior margin. Antenna 1 of main flagellum armed with transverse series of thin hairs or special papillae; accessory flagellum always present ....The family Hyperiopsidae (p. 365)*.

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* In the Russian text. Translator.

4 (3). Structure of maxilla 1, maxillipeds, and first two peraeopods different.

5 (6). Body inflated, especially in anterior part. Coxal plates deep, their depth exceeds half the height of segments. Coxal plate 4 with a deep notch in the upper part of the posterior margin and forms a large lobe which underlies small plate 5; coxal plate with convex anterior margin, tapers distally. Lower margin of coxal plates smooth, without setae, antenna 1 with accessory flagellum, and segment 1 of main flagellum frequently extended cone-shaped, with clusters of long hairs on the lower surface. Mandibles without a palp and without a molar process. Gnathopods 1 and 2 similar in structure, usually with an underdeveloped subchela. Maxillipeds with large lobes and weak palp; inner lobe of maxilla 2 much broader than the outer and densely fringed with plumose setae. Upper lip bilobed, lower lip without inner lobes..................................... The family Stegocephalidae (p. 370)*.

6 (5). Structure of body, coxal plates, antennae and mandibles different.

7 (8). Head with a broad peaked rostrum overlapping peduncles of antennae, without an upper-antennal notch and an interantennal lobe; its lower margin straight, sometimes with a small tooth-

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* In the Russian text. Translator.

shaped process at the base of antenna 2. Accessory flagellum of antenna 1 well developed, sometimes almost as long as the main flagellum; segments of the peduncle of antenna 2, especially the penultimate, armed, as a rule, with groups of spines and setae. Peraeopod 5 much shorter than peraeopod 4, its basal segment with a broad wing whose posterior margin is seldom smooth, usually dentate or with teeth or setae. Lower margin of deep aterior coxal plates usually fringed with simple plumose setae. Gnathopods 1 and 2 similar in structure, with a subchela. Coxal plate 4 with notch in upper part of posterior margin.........................
.....................The family Phoxocephalidae.

8 (7). Structure of head, antennae, and peraeopods different.

9 (12). Segments of peduncle of both antennae and strongly broadened segments of last three peraeopods armed with series of strong spines and long plumose setae. Gnathopods 1 and 2 similar in structure. Lower margin of anterior coxal plates bears setae. Uropod 2 usually shorter than uropods 1 and 3. Body usually inflated, coxal plates deep, plate 4 with notch in upper part of posterior margin.

10 (11). Mandibles with 3-segmented palp; antonna 1 with accessory flagellum; peraeopod 5 usually not longer than peraeopod

4.........The family Haustoriidae (p. 395)*.

11 (10). Mandibles without palp; antenna 1 lacks accessory flagellum; peraeopod 5 longer than peraeopod 4..............
..........The family Dogielinotidae (p. 428)*.

Guryanova, 1953, Tr. Zool. Inst. Academy of Sciences of the U.S.S.R., XIII: 232.

12 (9). Armature of antennae and peraeopods different.

13 (14). Head lengthened, tapers distally, usually without rostrum, interantennal lobe and lower anterior notch; if present they are very poorly developed. Antennae, gnathopods, and first two peraeopods thin, weak, armed with long setae; accessory flagellum wanting. Last peraeopod shorter and of a completely different structure than preceding ones; its basal segment strongly broadened, with lobe drawn out backward and down and fringed with setae. Eyes, if present, simple, frequently with horny lenses, one or two pairs. Telson cleft, anterior coxal plates deep, fringed with setae; anterior peraeopods with large glands. Construct flat silty tubes...................The family Ampeliscidae.

14 (13). Structure of head and peraeon appendages different.

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* In the Russian text. Translator.

15 (26). Coxal plate 2 always overlaps plate 1 which is rudimentary or lacking and not seen in lateral view; coxal plates 2 - 4 deep, strongly expand, and form a powerful lateral shield. Antennae with long peduncles and relatively short flagelli; accessory flagellum, as a rule, almost wanting.

16 (17). Gnathopod 1 strongly degraded and represents 1-segmented appendage (basal segment) with setae at the distal end, covered completely by coxal plate. Head with a large rostrum, antenna 1 without an accessory flagellum. Oral parts almost normal. Gnathopod 2 with a subchela, weak. Basal segment of peraeopod 3 linear, rounded, broadened in peraeopods 4 and 5. Uropod 3 biramous; telson deeply cleft.............The family Bateidae.

17 (16). Gnathopod 1 normal, 7-segmented, simple or with subchela, less frequently with a claw.

18 (19). Maxillae 1 and 2 wanting; gnathopod 2 bears complex subchela which is formed by segments 5 and 6. Maxillipeds without lobes, maxillae weak, telson entire..................... The family Anamixidae.

19 (18). Maxillae 1 and 2 present; gnathopod 2 with a simple subchela formed by segment 6 and dactyl (segment 7).

20 (21). Uropod 2 biramous. Mandibles with 3-segmented palp; all segments of urosome free; basal segment of all last three peraeopods broadened, with a wing; telson entire........... ......The family Amphilochidae.

21 (20). Uropod 3 monoramous.

22 (23). Basal segment of peraeopod 3 with a wing-shaped broadening. Mandibles with a 3-segmented palp; palp of maxilla 1 1-segmented; gnathopod 1 simple, gnathopod 2 with a sub-chela; telson merges with last urosomal segment.................. The family Cressidae.

23 (22). Basal segment of peraeopod 3 linear.

24 (25). All three segments of urosome free; telson much shorter than uropods. Basal segment of peraeopods 4 and 5 broadened or linear; oral parts subject to reduction varying in degree; gnathopod 1 simple, with a subchela or a special structure; gnathopod 2 always with a subchela.................................. ......The family Stenothoidae.

25 (24). Segments of urosome merge with one another. Telson large, usually covers, as if with a shield, the uropods from above. Oral parts become reduced to a various degree; in other re-

spects, similar to the Stenothoidae..........The family Thaumatelsonidae.

Guryanova, 1938, Tr. Hydrobiol. Exp. Zool. Inst. of the Academy of Sciences of the U.S.S.R., 1934, in the Sea of Japan, I: 275.

26 (15). Coxal plate 1 not overlapped by plate 2 and may freely be seen from side:[1] all coxal plates normal, large or small.

27 (32). Eyes, if present, in close contact with one another on the crown. Anterior part of head stretched out forward above the base of antennae and forms a blunt process, or rostrum, straight or bent, on which the eyes are found. Frequently accessory pair of eyes is found on the sides of the head. Upper-antennal notch very deep; interantennal lobe large, in the form of cheeks with vertical anterior and horizonatal posterior margins, without a lower antennal notch, hence head appears in the shape of a galea. Antenna 1 usually shorter than antenna 2. Peraeopod 5 always longer than peraeopod 4, and sometimes considerably. Oral parts normal, mandibles with a molar process and a three-segmented palp, maxilla 1 with a two-segmented palp, its inner lobe bears setae, maxillipeds with both well developed pairs of lobes and four-segmented palp.

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1. Except Leptocheirus from the Family Photidae.

28 (29). Antenna 1 without accessory flagellum, with normal short segment 1 of main flagellum in ♀♀ and spindle-shaped long in ♂♂. Telson entire, short, hardly covers the base of the long peduncles of uropod 3. Anterior coxal plates fringed with setae, plate 3 always smaller than plate 4. The postero-distal angle of epimeral plate 3 rounded, smooth. Outer ramus of uropod 3 monosegmented, pointed distally. Segment 3 of the palp of mandibles always larger than half of segment 2. Maxillipeds with dense armature of setae, last segment of their palp large, falcate. Gnathopod 1 with a subchela, gnathopod 2 with a subchela or claw. Peraeopods bearing dense setae, the latter being often plumose; peraeopods 3 and 4 with an oval basal segment. Peraeopod 5 very long, much larger than preceding ones, with a broadened basal and a long, straight, with spinules and setae segment 7. Ends of rami of uropods 1 - 3 on same level..The family Oedicerotidae.

29 (28). Antenna 1 with accessory flagellum. Segment 1 of their basic flagellum, at least in ♂♂, always long, spindle-shaped, with dense clusters of thin setae on its lower surface. Telson cleft, seldom entire, but then it is very long and reaches almost the end of the rami of uropod 3. As a rule, coxal plates almost without setae on lower margin, plate 3 frequently larger than plate 4. Segment 3 of the palp of maxillae always considerably smaller than half of segment 2, sometimes rudimentary. Post-

erior margin and lower angle of epimeral plate 3 never rouned, but forms angle or tooth-shaped processes and frequently deeply dentate. Outer ramus of uropod 3 two-segmented, with a small distal segment.

30 (31). Body smooth, its covers transparent. Segment 3 of plap in mandibles rudimentary, in form of a tubercle. Segment 1 of the basic flagellum of antenna 1 always large, spindle-shaped, densely fringed with thin setae; accessory flagellum long, multi-segmented. Peduncle of antenna 1 short, maxillipeds with a dense armature of setae, with short inner, narrow long outer lobes, and a very small segment 4 of palp. Gnathopod 1 with an imperfected subchela, gnathopod 2 weak, simple. Peraeopods 1 and 2 strong, with broadened segments 4 and 5; basal segment of peraeopods 3 - 5 with a wing-shaped broadening. Uropods 1 - 3 biramous, with rami of unequal size, uropod 3 extends much further than the level of ends of uropods 1 and 2. Telson cleft, short, covers short peduncles of last uropods....................The family Synopiidae.

31 (30). Body usually with keels, molar processes or dentate margins of posterior segments, plates coarse, non-transparent. Segment 3 of palp in mandibles short, but not rudimentary. Segment 1 of main flagellum in antenna 1 short, normal, and only in ♂♂ may be spindle-shaped, with dense setae; accessory flagellum usually short, two-segmented. Peduncle of antenna 1 with lengthened segments 2 and 3. Maxillipeds with small number of setae.

Gnathopods 1 and 2 weak, their segments 4 and 5 linear. Basal segment of peraeopods 3 - 5 broadened, usually with a wing. Uropods 1 and 2 with a shortened outer ramus, uropod 3 of equal length. Telson very long, tapers distally, reaches considerably further than the middle of rami of uropod 3, cleft, if entire, then almost reaches the end of rami in uropod 3.............The family Tironidae.

32 (27). Eyes, if present, always separated from one another, on the sides of head. Form of head and other features do not fit.

33 (88). Oral parts normal. Seldom maxilla 1 with one-segmented, but large palp. Maxillipeds always with a four-segmented palp, last segment of which falcate. Sometimes only inner lobes of maxillipeds subject to reduction to small cone-shaped processes with setae at the apex. Mandibles usually with a three-segmented palp.

34 (55). Coxal plate 4 with a notch in the upper part of posterior margin into which fits anterior part of plate 5. If in rare cases the notch is wanting in plate 4, then completely normal maxillipeds with well developed palps and both pairs of lobes, and ends of uropod 3 usually extend much further than the margins of ends in uropods 2 and 1; uropod 2 attached normally on both sides of segment. Telson cleft, seldom entire.

35 (38). Molar process of mandibles weak, conical, or want-

ing; telson cleft or with a deep notch reaching almost its middle at apex, seldom entire.

36 (37). Maxillipeds with strongly developed broad outer plates whose apices reach at least the middle of segment 3 of a relatively weakly developed palp. Antenna 1 with a rudimentary accessory flagellum; molar process of mandibles weak, conical; lower lip with broadly stretched outer and distinct small inner lobes. Coxal plate 1 broad, plates 2 and 3 narrower. Gnathopods with an underdeveloped subchela, dactyl with spinules on the inner margin. Telson cleft, seldom entire; uropod 3 biramous..........The family Astyridae.

Pirlot, 1934, Siboga-Exp., XXXIII, d: 175.

37 (36). Maxillipeds with weakly developed narrow outer plates which do not reach even the middle of segment 2 of the powerful palp. Antenna 1 with a well developed accessory flagellum. Molar process of mandibles very weak, in the shape of a ridge with setae at the apex; lower lip with normal outer and broad inner lobes which merge with the outer ones; coxal plate 1 usually with anterior lower part drawn out forward, and broadens distally. Gnathopods with a strong subchela, inner margin of their dactyl smooth or with serrate teeth. Telson cleft; uropod 3 biramous..........The family Lilljeborgiidae.

38 (35). Molar process of mandibles strong, cylindrical, with

a triturating surface; if weak, tuberculate, then telson entire.

39 (40). Three anterior pairs of coxal plates diminish in the order from plate 1 to plate 3; the latter always considerably smaller, narrower and lower than plates 1, 2, and especially plate 4; coxal plate 4 has a notch on the posterior margin; while strongly enlarging, it shrply increases in size, compared with all remaining; coxal plate 1 always larger than plates 2 and 3, sometimes strongly enlarged if compared with them. Antenna 1 with a short accessory flagellum; segment 1 of main flagellum in ♂♂ always strongly enlarged, cone-shaped, and bears long hairs. Basal segment of peraeopods 3 - 5 with a wing-shaped broadening, their segment 3 normal, short, but well developed; uropods biramous, telson short, slightly longer than the peduncle of uropod 3, cleft............The family Argissidae (p. 383)*

Walker, 1904, Rep. Ceylon Pearl Oyster Fish., Suppl., XVII: 246.

40 (39). Three anterior pairs of coxal plates uniformly increase in size, from plate 1 to plate 4, respectively.

41 (44). Antenna 1 with an accessory flagellum. Oral parts completely normal, each with a complete set of boundaries of the ends of uropods 1 and 2, telson cleft, seldom entire. Coxal plates 1 - 4

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* See the Russian text. Translator.

well developed, their depth is no less than half the segment; in the upper part of posterior margin of palte 4, there is usually a notch[1]; all the plates are usually in a close contact with one another. Inner plate of maxilla 1 usually bears a few, sometimes many plumose setae at its apex. Posterior margin of epimeral plate 3 always smooth, without indentation or molar processes, seldom with small teeth at its distal end. Head with well developed lower and upper antennal notches and an interantennal lobe. Gnathopods with a subchela; basal segment of peraeopods 3 - 5 moderately broadened. On the body, there are often combs, teeth, outgrowths, or groups of spinules.

42 (43). Inner plates of maxilla 2 have an oblique row of plumose setae or bear setae along the inner margin. Plates of maxillipeds large, but shorter than half the length of palp. Telson usually cleft..............The family Gammaridae.

43 (42). Inner plates of maxilla 2 with a smooth inner margin and without an oblique row of setae. Plates of maxillipeds shorter than half the length of strong palp. Telson entire.............The family Amathillopsidae.

Pirlot, 1934, Siboga-Exp.; XXXIII d: 201.

44 (41). In such combination, these features do not fit.

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1 If the notch is wanting, then uropod 3 extends far beyond the end of uropods 1 and 2.

45 (50). Telson entire, sometimes with a small notch at the end.

46 (47). Rostrum weak, poorly noticeable; antenna 1 usually shorter than antenna 2. Accessory flagellum rudimentary or wanting. Oral parts normal; lower lip with small inner lobes or without them. Palp of maxilla 1 sometimes very small; outer plates of maxillipeds large. Gnathopods weak, with a subchela. Uropod 3 biramous, inner ramus shorter than the outer. Posterior margin of telson with indentations or a notch.............The family Calliopiidae.

47 (46). Rostrum usually well developed and always well noticeable; if it is absent, then antenna 1 always longer than antenna 2.

48 (49). Coxal plates 1 - 3 with a straight lower margin and usually rounded lower angles. Antenna 1 longer than antenna 2, without an accessory flagellum, or else it is rudimentary and very poorly noticeable. Upper lip with a bilobed anterior margin, lower lip with inner lobes. Oral parts normal; inner plate of maxilla 1 with a subchela. Basal segment of peraeopods 3 - 5 with a well developed wing. Biramous uropods with rami of different size. Telson entire, seldom with teeth or a small notch at the apex. Frequently, there are teeth or a comb on the body.........The family Pleustidae.

49 (48). Coxal plates 1 - 3 taper distally. Antenna 1 shorter than antenna 2; accessory flagellum rudimentary or wanting. Upper lip without lobes, lower lip without inner lobes, or they merge with one another. Oral parts normal; outer plates of maxillipeds always extend beyong the apex of segment 1 of palp; inner plate of maxilla 1 with 5 - 7 or even more setae. Gnathopods weak, with narrow segments 5 and 6 and a small dactyl of subchela. Basal segment of peraeopods 3 - 5 weakly broadened, especially in peraeopod 3, frequently with ablong ribs, notches, or sharp processes on the posterior margin. Uropod 3 biramous, with large rami uniform in length. Telson entire, sometimes with a small notch at the apex. Usually, there are dorsal combs, teeth, and processes on the body...............The family Paramphithoidae.

50 (45). Telson cleft.

51 (54). All 3 segments of urosome free.

52 (53). Gnathopods 1 and 2 strong, similar in structure and size, with a subchela; often segment 6 is attached to the apex of the process of segment 5 and fits in the deep notch at its distal end. Lower lip with small inner lobes; inner plate of maxilla 1 with 1 - 2 setae. Antenna 1 with a rudimentary accessory flagellum. Posterior margin of epimeral plate 3 often dentate along its entire length. Head almost always with a rostrum (usually, the latter is small). Coxal plates have sometimes tooth-shaped processes, plate 1 for the most part

with its lower anterior part drawn out forward. Peraeopods 1 and 2 weak; peraeopod 5 longer than peraeopod 4; basal segment of peraeopods 3 - 5 broadened. Telson long, almost covers biramous uropod 3, entire or cleft; on the dorsal side of abdominal region, there is 1 or 3 oblong keels. Antennae usually with calceoli.........The family Eusiridae.

53 (52). Gnathopods weak, almost similar in structure, with a subchela (usually indistinct), articulation between segment 5 and 6 always normal. Lower lip with underdeveloped inner lobes or without them. Inner plate of maxilla 1 iwth plumose setae. Antenna 1 with a rudimentary accessory flagellum or without it. Posterior margin of epimeral plate 3 smooth, usually convex. Basal segment of peraeopods 3 - 5 with a well developed rounded wing-shaped broadening. Telson deeply cleft, sometimes the cleft or notch is only at its apex; uropod 3 covered by telson to the middle of rami and further. Body smooth, seldom with tooth-shaped processes or a medial keel. Antennae frequently with calceoli..............The family Pontogeneiidae.

54 (51). Last two segments of urosome merge with one another. Antenna 1 with a rudimentary one-segmented accessory flagellum or without it. Oral parts normal; inner plate of maxilla 1 with 5 or more plumose setae. Gnathopods quite weak, with a subchela. Basal segment of peraeopods 3 - 5 moderately broadened. Branchial vesicles frequently bifaced-plicated. Uropod 3 biramous, rami strong. Their ends extend

further than the ends of uropod 1. Body pressed on sides, usually with a medial dorsal comb, very frequently on the urosome. Telson deeply cleft; rostrum well developed.............The family Atylidae.

55 (34). Coxal plate 4 lacks special notch in the upper part of the posterior margin which is straight or weakly concave. Anterior coxal plates frequently low, with gaps between them; often all plates are very small, primitive.

56 (57). Pleopods monoramous; there is no more than three pairs of branchial vesicles. Coxal plates small, primitive, divided from one another by gaps, plate 4 without a notch on the posterior margin. Mandibles with three-segmented palp; palp of maxilla 1 two-segmented, maxillipeds and maxilla 2 normal; lower lip without inner plates. Antenna 1 with an accessory flagellum; gnathopods with a subchlea; basal segment in all peraeopods almost linear; uropod 3 biramous; telson entire.................The family Bogidiellidae.

Hertzog, 1936, Bull. Soc. Zool. France, 61: 356.

37 (56). Pleopods biramous, there are more than three pairs of branchial vesicles.

58 (59). Telson consists of 2 plates completely separated from one another, attached on the sides of the last pleon segment.

Coxal plates primitive, adjoining one another loosely, plate 4 without a notch on the posterior margin. Antenna 1 with a rudimentary accessory flagellum; oral parts normal; along the inner margin of the inner plate of maxilla 1, there are peculiar setae with a conical broadened base. Gnathopods with a subchela; peraeopods 3 - 5 with a broadened basal segment, peraeopod 4 longer than peraeopod 5. Uropod 3 biramous, outer ramus two-segmented...........The family Hadziidae.

Karaman, 1943. Orchid Collection, Book 1: 206.

59 (58). Telson consisting of one plate, cleft or entire.

60 (69). Telson lengthened, tapers distally, cleft or has a deep, at least to its middle, notch at its apex.

61 (62). Mandibles lacking palp. Last two segments or urosome merge with one another. Head with a narrow rostrum, body with a medial dorsal keel. Antenna 1 without an accessory flagellum. Coxal plates low. Maxilla 1 with two-segmented palp and 5 plumose setae on the inner plate. Basal segments of peraeopods 3 - 5 broadened and taper distally, dactyls short. Gnathopods with a subchela. Branchial vesicles simple. Uropod 3 with a short peduncle and and thick rami armed with spinules (the rami longer than the peduncle).......The family Anatylidae.

Bulycheva, 1955, Tr. Zool. Inst. of the Academy of Sciences of the U.S.S.R., XXI: 204.

62 (61). Mandibles have a three-segmented palp. All segments of urosome free.

63 (64). Mandibles lacking molar process. Cutting edge of mandibles broad, with large teeth, seldom smooth. Inner plates of maxillipeds strongly reduced, very small, cone-shaped, and bear setae at the apex. Palp of maxillipeds strong, four-segmented, with a strong claw-like last segment. Antenna 1 with a well developed accessory flagellum, segment 1 of which is often strongly lengthened. Inner lobes of lower lip merge with one another forming a rounded, entire plate between outer lobes, sometimes cleft in the middle. Gnathopods weak, less frequently with a subchela, more frequently specialized and have a specific form. Basal segment of peraeopod 3 - 5 weakly broadened. Telson deeply cleft. Uropod 3 large, extends far beyond the level of the ends of uropods 1 and 2, with long rami................. The family Pardaliscidae.

64 (63). Mandibles with a strong cylindrical molar process with a triturating surface.

65 (66). Segment 1 of the main flagellum of antenna 1 extended, cone-shaped, longer than peduncle and bears a dense cover of

thin long hairs on the lower suface. Coxal plates primitive, very small, uniform in size, separated from one another by broad gaps. Head without lower-antennal lobe. Antenna 2 thin, extemely long. Oral parts normal. Gnathopods strong, similar in structure, with an obvious tendence to forming a subchela, with a long and sharp bent dactyl. Peraeopods 3 - 5 with a short, almost linear basal segment and unusually long and thin segments 5 and 6. Telson with a deep notch or broad cleft almost to its middle.......The family Vitjazianidae.

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanol. Academy of Sciences of the U.S.S.R.,XII: 249.

66 (65). Segment 1 of main flagellum in antenna 1 normal, much shorter than peduncle and lacks the dense cover of the setae on the lower side. Coxal plates more or less developed, sometimes very deep, with gaps between them or closely adjacent to one another and differ from one another in the form and size. Head usually with a well developed interantennal lobe and upper and lower antennal notches.

67 (68). Peduncle of uropod 3 strong and extremely long, exceeds in length the peduncle of uropod 1 and uropod 2, so that sometimes its distal end extends even further than the ends of rami in uropods 1 and 2. Body enlarged, with long, sharp tooth-like dorsal processes and a deeply dentate posterior margin of pleon segments and epimeral plates. Gnathopods with a subchela, differ from

one another in the form of segment 6 and structure of segment 5. Basal segment of peraeopods 3 - 5 lengthened, linear; segments 4, 5, and 6 normal, each no longer than basal segment. Oral parts normal. Maxilla 1 with a two-segmented palp and broad inner plate with more than 5 setae. Cleft telson armed with marginal spinules and bears one-two pairs of sensory plumose setae on its dorsal side......... The family Melphidippidae.

68 (67). Peduncle of uropod 3 normal, shorter than peduncle of uropod 1 and uropod 2, and its distal end does not reach the level of the distal ends of the last ones, ever. Body strongly lengthened, with long tooth-shaped dorsal processes and a smooth posterior margin of peraeon and pleon segments. Head with a rostrum and a pointed interantennal lobe (sometimes, there are 2 such processes here) drawn out forward. Gnathopod similar in structure, weak, thin, with a subchela. Oral parts normal. Maxilla 1 with a two-segmented palp and a narrow inner plate with 2 setae. Basal segment of peraeopods 3 - 5 linear. Telson lacking plumose setae...............The family Lepechinellidae.

Schellenberg, 1925, Mitt. Zool. Mus. Berlin, 11: 205 (Dorbanellidae); 1926, Deutsche Südpolar Exp., XVIII, Zool., X: 344.

69 (60). Telson entire, sometimes transverse and has a

slit-like notch at the posterior end.

70 (73). Molar process of mandibles weak, in the form of a low tubercle or wanting.

71 (72). Mandibles without a molar process, cutting edge very broad, smooth; distal segment of their palp and outer plate of maxilla 1 strongly broaden distally. Gnathopods with a rudimentary subchela lacking the palmar margin, with transverse rows of setae. Antenna 1 without an accessory flagellum. Coxal plates deep, deeper than segments; plate 1 considerably broader than plates 2 and 3. Lower lip with broadly arranged outer lobes. Basal segment of peraeopods 3 - 5 with a wing-shaped broadening. Uropod 3 biramous. Entire telson with a notch at its apex...........The family Stilipedidae.

Holmes, 1909, Proc. U.S. Nat. Mus., XXXV: 535.

72 (71). Molar process of mandibles present, although it is weak, tubercular, without a triturating surface; cutting margin narrow, dentate. Monosegmented palp and outer plate of maxilla 1 taper distally. Gnathopods 1 and 2 with a true claw. Antenna 1 with an accessory flagellum; peduncles of both antennae long, with cylindrical segments, flagelli short. Coxal plates 1 - 4 deep. Upper lip bilobed. Outer plates of maxillipeds short, hardly reaching four-segmented palp with the apex of the distal end. Basal

segment of peraeopods 3 - 5 with a wing-shaped broadening; peraeopods 1 and 2 longer than peraeopod 3. Uropod 3 monoramous. Branchial vesicles simple..............The family Sebidae.

Walker, 1907, Nat. Antarct. Exp., III: 37.

73 (70). Molar process of mandibles strong, cylindrical, with a triturating surface.

74 (75). Both gnathopods and all five peraeopods with a well-developed subchela. Antenna 1 with an accessory flagellum; body smooth; segments of urosome free. Coxal plates deep. All three uropods biramous. Palp of maxilla 1 two-segmented, inner plate small, without setae. Peduncles of antennae long, with linear segments, flagelli short. Peraeopods 1 - 2 without glands..........
...The family Isaeidae.

75 (74). A tendency to forming a subchela may only be in peraeopods 3 - 5; first two peraeopods always simple.

76 (83). Urosome normal, pressed on sides, all its segments free, and all three uropods present. Urosome segment 1 no longer than vesntral segment 3.

77 (80). Uropod 3 always developed; its peduncle strong,

much longer than rami; one of the rami slightly bent in the form of a hook, often with teeth at the distal end of the inner margin or with two large hooked spines at the apex.

78 (79). Outer ramus of uropod 3 weakly bent, usually with teeth at the distal end of the inner margin. Segment 3 of peduncle of antenna 1 long, only slightly shorter than segment 2. Head drawn out, narrow; upper margin of a deep lower-antennal notch parallel to the lower margin of head, inter-antennal lobe distrinct, usually pointed at the very apex. Antenna 1 with a rudimentary accessory flagellum. Oral parts normal; lower lip with well developed inner lobes and a rounded apex of the outer lobes; upper lip with a pointed epistome. Gnathopods with a subchella. Peraeopods 1 and 2 considerably shorter than last three, their segment 4 usually broadens distally, while basal segment often weakly broadened, oblong-oval; basal segment of enlarged peraeopods 3 - 5 with a wing-shaped broadening. Peduncles of both antennae long, flagelli short. All three biramous..............The family Ischyroceridae.

Shoemaker, 1942, Smiths, Misc., Coll., 101, No. 11: 40 (Jassidae - nom. praeocupatum).

79 (78). Outer ramus of uropod 3 with 2 large hooked spines at the apex. Segment 3 of peduncle of antenna 1 short, less than half the length of segment 2. Head high, with broad and

shallow interantennal notch and an indistinct rounded interantennal lobe. Antenna 1 without an accessory flagellum; if it is present, it is rudimentary, one-segmented. Oral parts normal. Lower lip with narrow linner lobes, apices of outer lobes almost always cleft and form 2 linguliform accessory lobes, each varying in size. Upper lip with a rounded epistome. Gnathopods with a subchela, sometimes there is a clear tendency to forming a subchela also in peraeopods 3 - 5. Dactyl of peraeopod 3 (the latter usually bends backward and up) turned not forward, as is the case in peraeopods 4 and 5, but backward, like in peraeopods 1 and 2. Basal segment of peraeopods 3 - 5 broadened. All three uropods biramous. It builds little cases in the shape of tubes from plant remains..... ....The family Amphithoidae.

80 (77). Uropod 3 sometimes lacking; if present, its peduncle normal, always shorter or only slightly longer than rami.

81 (82). Gnathopod 1 larger than gnathopod 2, especially in the male. Coxal palte 5 with very short anterior lobe. Both gnathopods with a subchela, sometimes with a complex true claw or subchela. Last peraeopod considerably longer than the penultimate one. Antenna 1 usually with an accessory flagellum. Coxal plate 1 usually larger than plate 2 and drawn out forward. Uropod 3 present, its rami almost uniform in size..............The family Aoridae.

82 (81). Gnathopod 1 smaller and weaker than gnathopod 2, or almost of the same size. Coxal plate 5 usually with a large lobe drawn out downward the depth of which often exceeds considerably the depth of the plate itself. Both gnathopods with a subchela; last peraeopod as long or slightly longer than the penultimate one. Accessory flagellum of antenna 1 often wanting. Coxal plate 1 slightly smaller than coxal plate 2. One of the rami of uropod 3 shorter than the other or disappears, or both rami uniform in length ....The family Photidae.

83 (76). Urosome anomalous, oblate dorso-ventrally, its segments usually merge with one another, and uropods are subject to a reduction. Urosome segment 1 sometimes considerably longer than pleon segment 3.

84 (85). Body strongly drawn out, thin; urosomal segment 1 considerably longer than pleon segment 3: segments of urosome free, but segment 2 or segment 3, along with the corresponding pair of appendages lacking. Antennae long, thin, their peduncles considerably longer than flagelli and armed with a long setae. Peraeopods 1 and 2 without glands; basal segment of last three peraeopods linear or very little broadened..............The family Podoceridae.

85 (86). Body drawn out or, on the contrary, shortened; segments of urosome often merge together, but all three uropods

always present, although their individual parts subject to a reduction.

86 (87). Uropod 3 small, rudimentary, monoramous; segments of urosome free or, if they merge, usually with vivid traces of merging. Antennae long, with long peduncles, armed with long setae, antenna 2 often raptorial; distal end of antenna 2 always linear. Peraeopods 1 and 2 with strong glands. They build little cases in the shape of tubes..............The family Corophiidae.

87 (86). Uropod 3 strong, with strongly developed one and rudimentary another rami. All segments of urosome merge firmly with one another forming a monoplithic part of body. Antennae short, the distal end of antenna 2 inflated. They are teredoes..............The family Cheluridae.

88 (33). Oral parts deviate from the norm. Maxilla 1 without a palp or else the latter is one-segmented; if the palp two-segmanted, then it is either very small and hardly noticeable, or thin, weak, does not extend beyong the boundaries of the apex of the outer plates and both segments are uniformly long; if the palp of maxilla 1 normal, with a short first and large second segments, then the palp of maxillipeds three-segmented, without a dactyl. Mandibles most frequently without palp, and sometimes even without a molar process. Maxillipeds either with an incomplete

number of segments of palp or with outer lobes degraded to the degree of a simple molar process, or they have a very enlarged body which covers, from below, both maxillae and the base of mandibles.

89 (102). Mandibles have a three-segmented palp.

90 (91). Maxillipeds without palp, present are only both pairs of lobes of which the outer ones are strongly developed. Palp of mandibles attached to a special process of the body of mandible; maxilla 1 with very small two-segmented palp or without it. Antenna 1 without accessory flagellum and very short main flagellum consisting of 2 - 3 segments the first of which considerably larger than the subsequent ones. Gnathopod 2 with a complex true claw between process of segment 5 and linear segment 6; dactyle short, blunt..............The family Ochlesidae.

Stebbling, 1910, Sydney Mem. Austr. Mus., IV: 581.

91 (90). Maxillipeds have palp, although the latter frequently lacks the complete number of segments, and is reduced, to some degree.

92 (97). Palp of maxillipeds two- or three-segmented, without dactyl; seldom it is four-segmented, but then it is weak and only slightly longer than the well developed outer plates.

93 (94). Gnathopod 1 with an underdeveloped subchela. Gnathopod 2 with well developed subchela. Head with a large rostrum. Mandibles with a toothed cutting margin; maxilla 1 with one-segmented, very small, tuberculate palp and large outer plate at the apex of which there are large strong spines. Maxillipeds with inner plates. Uropod 2 biramous. Telson entire.................... The family Lafystiidae.

94 (93). Gnathopod 1 built differently: it is either with a true claw or simple, but with a specialized dactyl bearing dents and setae on the inner margin.

95 (96). Both gnathopods with a strong claw. Rostrum wanting. Cutting margin of mandibles stiletto-shaped, pointed. Palp of maxilla 1 one-segmented, with 1 setum at the apex; outer plate without spines, with a rounded apex and 1 concentric setum. Maxillipeds without inner plates and with a strongly degraded two-segmented palp. Telson cleft. Uropod 3 monoramous................... The family Caspiellidae.

Derzhavin, 1944, Bull. Azerbaijanian Branch of the Academy of Sciences of the U.S.S.R., 8: 20.

96 (95). Gnathopod 1 with weak narrow small true claw or simple with specialized dactyl; ganthopod 2 with a subchela or

true claw. Head usually with a strongly developed rostrum, body with dorsal dents. Antenna 1 wanting the accessory flagellum, or the latter is rudimentary. Gnathopods weak, thin; gnathopod 1 simple, with a special dactyl or narrow claw. Uropod 3 biramous. Telson entire, with a notch on the posterior margin. Oral parts somewhat changed..............The family Acanthonotozomatidae.

97 (92). Palp of maxillipeds well developed, four-segmented, considerably longer than plates.

98 (99). Both gnathopods or only gnathopod 1 bear a true claw, complex of simple. Mandibles wanting the molar process; maxillipeds with almost underdeveloped outer plates in the form of small processes of basal segment of propodite; lower lip without inner lobes...............The family Leucothoidae.

99 (98). Neither of gnathopods has a true claw.

100 (101). Segments of urosome free; mandibles with a conical molar process. Maxilla 1 with a large one-segmented palp. Maxillipeds with small but clearly developed plates; lower lip with lobes. Gnathopods 1 and 2 simple; uropod 3 biramous; telson entire...................The family Laphystiopsidae.

101 (100). Last two segments of urosome merge with one

another; mandibles wanting the molar process. Maxilla 1 with a reduced palp; maxillipeds and lower lip without inner plates. Gnathopods with a subchela. Uropod 3 monoramous, telson entire.. ....The family Pagetinidae.

K.H. Barnard, 1931, Ann. Mag. Nat. Hist., (10), VII, No. 40: 427.

102 (89). Mandibles lacking palp.

103 (104). Gnathopod 1 often strongly degraded instead of normal dactyl-shaped segment 7, at the apex of segment 6, they usually bear a cluster of long setae one of which is spinulose and, apparently, represents segment 7; the division of last segment is frequently indistinct. Body cylindrical, with small coxal plates. Maxilla 1 without the inner lobe, palp one-segmented. Inner plates of maxillipeds merge completely with one another. Uropod 3 biramous, telson entire...................The family Colomastigidae.

104 (103). Gnathopod 1 with a normal dactyl-shaped segment 7.

105 (112). Molar process of mandibles powerful, cylindrical, with a triturating surface.

106 (111). All segments of urosome free.

107 (108). Palp of maxilla 1 always present and always two-segmented, although usually very small, considerably shorter than the outer plate, or even hardly noticeable. Maxillipeds with a three- or four-segmented palp; pleopods degraded to a various extent, from almost normal to completely reduced. Branchial vesicles small, irregular in form, with folds and tortuous depressions; there is always one pair on the segment bearing them. Body smooth, very seldom with a keel or processes. Peraeopods and uropods armed with strong spinules; last two peraeopods considerably longer than peraeopod 3. Oral parts strongly protrude forward and not covered with the margins of the main tegument. Gnathopod 2 of ♀♀ with a small true claw, posterior margin of hand strongly convex, palmar margin broadly rounded, palm vertical, dactyl very small, segment 5 enlarged. Gnathopod 2 of ♂♂ with a powerful subchela, segment 5 very short, never with a linguliform lobe. Telson short, entire, seldom with a cleft or notch at the apex, bears spinules, not only marginal, but also on the dorsal surface...... ....The family Talitridae.

Bulycheva, 1957, Guide to the Fuana of the U.S.S.R., Published by the Zoological Institute of the Academy of Sciences of the U.S.S.R.; 65: 33.

108 (107). Palp of maxilla 1 present, but one-segmented, or wanting.

109 (110). Telson cleft; maxillipeds with four-segmented palp, its last segment dactylate. Branchial vesicles large, sacculate, always one pair on the segment bearing them. Segment 5 of gnathopods with a linguliform lobe, cup-shaped. Head without rostrum, body smooth, without processes and teeth, antenna 1 and 2 frequently of same length; lower lip without inner lobes. Peraeopod 3 only slightly shorter than peraeopods 4 and 5. Gnathopods 1 and 2 in both sexes with a subchela, and segment 5 cup-like with a linguliform lobe; only sometimes gnathopod 2 of ♂♂ with a powerful subchela and a short segment 5 devoid of lingule........ ....The family Hyalidae.[1]

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1 The genera Najna Derzhavin, 1937, and Ceina Della-Valle, 1893, assigned by A. Bulycheva, 1957, to the family Hyalidae, are assigned by us on the strength of the revision of the Phliantids in a broad sense of meaning to the family Prophliantidae Nicholls, 1939, while the genus Ceinina Stephensen, 1933, which is considered as a synonym to the genus Wandelia Chevreux, 1906, is assigned by us to the subfamily Eophliantinae Sheard, 1956, raising it to the rank of one family, i.e. Eophliantidae (Guryanova, 1958, Bull. Sov. Antarct. Exp., No. 3: 55-56.

Bulycheva, 1957, Guide to the Fauna of the U.S.S.R., Zool. Inst. of the Academy of Sciences of the U.S.S.R. Publishing House, 65: 76.

110 (109). Telson entire; palp of maxillipeds four-segmented, but its last segment small, not hooked. Frequently, accessory pair of laminated branchial vesicles is found on branchia-bearing segments. Head sometimes with a rostrum, and spinous processes are found on the body. Last three peraeopods increase in length, from peraeopod 3 to peraeopod 5, respectively. Gnathopods 1 and 2 in both sexes with a subchella (seldom, gnathopod 2 of ♂♂ has a tendency to form a small claw).................The family Hyalellidae.

Bulycheva, 1957, Guide to the Fauna of the U.S.S.R., Zool. Inst. of the Academy of Sciences of the U.S.S.R. Publishing House, 65: 173.

111 (106). Last segments of urosome merge with one another. Palp of maxillipeds short, three-segmented or with a strongly reduced segment 4, inner plates of maxillipeds reach apex of segment 1 of palp. Branchial vesicles simple or with transverse folds. Antenna 1 without accessory flagellum. Inner plate of maxilla 1 with 1 or 2 setae. Gnathopods weak, with a subchela. Basal segment of peraeopods 3 - 5 broadened. Telson deeply cleft.

On the body, there are combs or tooth-shaped processes..............
.....The family Dexaminidae.

112 (105). Molar process of mandibles weak or completely lacking.

113 (116). Coxal plates deep, large, contiguous. Body often strengthened by combs, keels, or tubercles. Head normal in structure, usually with a well noticeable rostrum.

114 (115). Body pressed dorso-ventrally; thoracic division broad, coxal plates usually arranged to sides and lie in an almost horizontal plane; urosome degraded and turned under the thorax. Behind, head often covered with a process of peraeon segment 1 or placed between coxal plates of the first pair which protrude forward. Peraeopod 5 with a rather less developed wing of basal segment than is the case in peraeopods 3 and 4, or even this segment becomes in them secondarily-linear; differentiation of peraeon appendages weak; in structure, peraeopods resemble gnathopods lacking a subchela, simple; all peraeopods armed with a strong prechensile dactyl. Mandibles without palp and molar process, sometimes with a fleshy or transparent linguliform long processes in its place. Maxilla 1 usually without palp, one-segmented palp found seldom; inner lobe frequently absent. Maxillipeds with a four-, three-, or two-segmented palp and a normally developed sympodite and a basal part of

body. Pleopods and uropods subject to partial reduction. Telson entire...................The family Phliantidae.

115 (114). Body pressed on sides, usually with keels or a comb; head high, very seldom covered behind by peraeon segment 1. Coxal plates deep, vertical; urosome weakly degraded and does not turn under thorax. Sometimes articulation between segments 2 and 3 of urosome indistinct (these urosomes merge sometimes completely). Peraeopods 3 - 5 with a powerful wing on basal segment, their segment 4 also broadened. Gnathopods with a subchela, mandibles without palp, have sometimes a molar process or its distinct trace. Maxillipeds with an abnormally strongly developed body (sympodite and merged basal segments bearing inner plates), their palp four-segmented. Telson entire or with a very short cleft at the apex.. ....The family Prophliantidae.

Nicholls, 1939, Rec. South. Austral. Mus., VI, 3: 312, Guryanova, 1958, Bull. Sov. Antarct. Exp., No. 3: 55-56.

116 (113). Coxal plates very small, low, separated from one another by gaps. Body strongly enlarged, almost cylindrical; articulation between head and peraeon segment 1 oblong, forms a "neck", very often lacking the latter. Head almost spherical, without a rostrum; on the contrary, with a depression on the forehead, where the antennae are located. Antennae weak, with a poorly dif-

ferentiated peduncle and flagellum. Urosome and uropods degraded, but rostrum not turned to the abdominal side. Pleopods with a short broad peduncle and short few-segmented rami. Gnathopods with a subchela; peraeopods 1 - 5 with a clear tendency to forming a subchela, their segment 4 broadened; basal segment of peraeopods 3 - 5 with a well developed wing; brood plates of ♀♀, fringed with specialized prehensile setae, very large. Maxilla 1 sometimes with one-segmented palp. Sympodite and especially basal part of maxillipeds often strongly expand, large, palp four-segmented, it last segment non-dactylate. Telson short, cleft......................
.....The family Eophliantidae.

Guryanova, 1958, Bull. Sov. Antarct. Exp., No. 3: 55-56 (Subfam. Eophliantinae Sheard, 1936).

Translated by Th. Pidhayny

I. The Family LYSIANASSIDAE*

Guryanova, 1951: 152

Our guide (1951) lists the most characteristic features of the representatives of this family. However, there is a number of aberrant forms with considerable deviations in regard to the structure of oral parts which are subject to specialization and reduction. These deviations are given in the key for the determination of family genera. The only specific character of this family only which always allows us to separate its representatives from forms belonging to other families is the structure of gnathopod 2, which is characteristic to such a degree that it permits us to speak about the "lysianassid" structural type of this appendage.

The peculiarity of gnathopod 2 is that, while being usually thinner and longer than gnathopod 1, it has enlarged segments 3 and 5; at the apex of the latter, there is a dense cover of short coarse hairs, and sometimes there are fine scales, varying in form,

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* In "BOKOPLAVY SEVERNCY CHASTI TIKHOGO OKEANA" (AMPHIPODA - GAMMARIDEA), Part 1, Moscow - Leningrad, Academy of Sciences of the U.S.S.R. Publishing House, 1962, pages 43 - 365.

closely adherent to one another, which cover the inflated part of the segment (externally, the latter part resembles a pine-apple, hence it is called the "pine-apple cushion"); segment 6 rather shorter, also densely covered with short hairs, and rather longer setae are arranged in the form of a cluster at the apex of the segment; dactyl very small, scarcely visible in the cover of hairs and setae (see Figure Gp. II in various species), often forming a miniature claw.

This is the richest family comprising 106 genera and more than 400 species, widely represented in the seas of the cold and temperate regions of the northern hemisphere.

Recorded in the northern part of the Pacific Ocean are 35 genera, 111 species, and 7 subspecies. Most abundant in species are the genera Anonyx (25 species), Hippomedon (11 species), and Lepidepecreum (8 species).

The identification key of the family genera includes all the known genera, i.e.: the genus Microlysias Stebbing, 1918, whose description is inaccessible to us, has been included in the key temporarily, with corresponding reservations in foot-notes.

KEY FOR THE IDENTIFICATION OF THE GENERA OF THE FAMILY LYSIANASSIDAE

1 (197). Segment 3 of urosome present, free or accreting with segment 2; uropod 3 always present, although may be reduced to small 1-segmented tuberculate appendage; telson present.

2 (200). Uropod 3 always with one or two rami.

3 (14). Anterior coxal plates abnormal; 2 or 3 first small, while plate 3, or 4, while strongly expanding, covers anterior plates located in front of it.

4 (5). 3 anterior coxal plates small and covered by expanded plate 4.....4. Cyphocaris Boeck, 1871 (p. 64).

5 (4). Only 2 first coxal plates small and covered by expanded plate 3, either partly (only 2), or completely (1 and 2).

6 (9). Telson deeply cleft.

7 (8). Peraeopods 1 - 4 simple, their segment 6 linear ......10. Cyclocaris Stebbing, 1888 (p. 84).

8 (7). Peraceopods 1 - 4 with imperfect subchela, their segment 6 has a palmar margin to which dactyl is attached.....5. Paracyphocaris Chevreux, 1905 (p. 71).

9 (6). Telson entire or cleft only at the apex.

10 (13). Telson entire.

11 (12). Mandibles lack palp.....8. _Crybelocephalus_ Tattersal, 1906 (p. 81).

12 (11). Mandibles with palp.....* _Lepidepecrealla_ Schellenberg, 1926.

Deutsche Südpolar Exp., XVIII, Zool., X: 281 [syn. _Paracyclocaris_ K.H. Barnard, 1930, Brit. Antarct. ("Terra Nova") Exp. 1910, Nat. Hist. Rep. Zool., VIII, No. 4: 321].

13 (10). Telson cleft at the apex..........7. _Metacyphocaris_ Tattersall, 1906 (p. 78).

14 (3). Coxal plates 2 and 3 normal; plate 1 normal or poorly developed and covered behind by plate 2.

15 (44). Coxal plate 1 covered completely, or only its lower part, including the antero-distal angle, by plate 2.

16 (21). Gnathopod 1 bears true claw.

17 (18). Telson entire..........* _Trischizostoma_ Boeck, 1861.

18 (17). Telson cleft.

19 (20). Claw of gnathopod 1 narrow, enlarged; when closed, dactyl tightly adjoins the palmar margin, which is stretched forward, of segment 6......* Euonyx Norman, 1867.

20 (19). Claw of gnathopod 1 broad, rounded; when closed, forms broad oval opening between dactyl and palmar margin in segment 6 ....2. Opisa Boeck, 1876 (p. 57).

21 (16). Gnathopod 1 simple or with subchela.

22 (23). Peraeopods 1 - 4 bear subchela..........6. Metacyclocaris Birstein et M. Vinogradov 1955 (p. 76).

23 (22). Peraeopods 1 - 4 simple, with linear segment 6 and normal dactyl.

24 (29). Mandible 1 lacks palp.

25 (26). Antero-distal angle of coxal plate 4 drawn out forward into pointed tooth.....* Vijava Walker, 1904.

26 (25). Antero-distal angle of coxal plate 4 straight or rounded.

27 (28). Head without rostrum; segment 2 of peduncle in ant-

enna 1 short, equals length of 3rd and about half the length of segment 1.....* Amaryllus Haswell, 1880.

28 (27). Head with rostrum; segment 2 of peduncle in antenna 1 longer than 3rd and more than half of segment 1.....* Bathyamaryllus Pirlot, 1933.

Siboga-Exp., XXXIII c: 123.

29 (24). Maxilla 1 with palp.

30 (31). Plap of maxilliped 3-segmented and shorter than outer plates.....* Perierella Chevreux et Bouvier, 1892.

31 (30). Palp of maxillipeds 4-segmented, although its segment 4 may be very small; outer plates shorter than palp at least in its rudimentary segment 4.

32 (41). Apical segment 4 of palp of maxillipeds always falcate, even if it is small.

33 (34). Maxilla 1 without inner palte; dactyl of gnathopod 2 very large, more than two times as long as transverse palmar margin of segment 6.....* Adeliella Nicholls, 1938.

Australasian Antarctic, II, p. 4: 12

34 (33). Maxilla 1 with normal inner plate; dactyl of gnathopod 2 not longer than palmar margin of segment 6.

35 (36). Segment 4 of last three pairs of peraeopods narrow, lacks lobe drawn below at postero-distal angle.....21. Schisturella Norman, 1900 (p. 193).

36 (35). Segment 4 of last three pairs of peraeopods broadened and forms a lobe at the postero-distal angle.

37 (38). Inner place of maxilla 1 short and broad, with 5 or more setae.....22. Aristias Boeck, 1871)p. 197).

38. (37). Inner plate of maxilla 1 narrow, conical, with 1 or 2, seldom 3, setae at the apex.

39 (40). Gnathopod 1 simple; molar process of mandibles weak ....* Metambasia Stephensen, 1923.

Danish Ingolf-Exp., v. Ø III, No. 8, Grustacea Malacostraca, V (Amphipoda, I): 76.

40 (39). Gnathopod 1 with distinct subchela; molar process of mandibles powerful.....* Ambasiopsis K.H. Barnard, 1931.

Ann. Mag. Naut. Hist., (10), VII, No. 40: 425.

41 (32). Apical segment 4 of palp of maxillipeds not in form of dactyl, but reduced to rounded tubercle.

42 (43). Segments 2 and 3 of palp of maxillipeds thin, weak, enlarged; mandibles and both pairs of maxillae, on the other hand, strong.....* Ambasia Boeck, 1871.

43. (42). Segments 2 and 3 of palp of maxillipeds broad, short, strong; mandibles and both pairs of maxillae, on the other hand, weak, narrow, elongated, slender.....* Ambasiella Schellenberg, 1935.

Skr. Svalb., No. 66: 15.

44 (15). Coxal plate 2 overlaps, if it does, only small plate 1, so that the antero-distal angle of the latter is seen from above.

45 (46). Mandibles lack palp.....* Stephensenia Schellenberg, 1931.

Further zool. Res. Swedish Antarct. Exp. 1901-1903, II, No. 6: 11.

46 (45). Mandibles with palp.

47 (56). Gnathopod 1 special in structure; its segment 6 oblong, linear; at its apex, there is a rudimentary dactyl; surrounded by a crown of thin or coarse flattened setae.

48 (51). Coxal plates 1 - 4 deep, deeper than body segments corresponding to them; basal segment of peraeopods 3 - 5 strongly

broadened, uniformly along the entire length of the segment, and has a round wing.

49 (50). Palp of mandibles large, longer than their basal part; lower margin of coxal plates 1 - 4 smooth.....29. Scopelocheirus Bate, 1857 (p. 319).

50 (49). Palp of mandibles small, shorter than their basal part; lower margin of coxal plates 1 - 4 densely fringed with setae.....* Aroui Chevreux, 1910.

Mem. Soc. Zool. France, XXIII: 169.

51 (48). Coxal plates 1 - 4 considerably lower than body segments corresponding to them; basal segment of peraeopods 3 - 5 elongated, weakly and unevenly broadened along its length.

52 (53). Segment 4 of palp of maxillipeds rudimentary; peraeopods 1 - 4 have a tendency to form a subchela.....* Scopelocheiropsis Schellenberg, 1926.

Deutsche Südpolar Exp., XVIII, Zool., X: 260.

53 (52). Segment 4 of palp of maxillipeds well developed, falcate; segment 6 of paraeopods 1 - 4 linear, dactyl normal.

54 (55). Head with large ablong-triangular interantennal lobe; flagellum in antenna 2 well devleoped, multisegmented; maxillae 1 and 2 and maxillipeds abundantly armed with setae.....27. Paracallisoma Chevreux, 1903 (p. 308).

55 (54). Head lacking interantennal lobe; flagellum of antenna 2 rudimentary, 3-segmented; both pairs of maxillae and maxillipeds bear very few setae; the latter are simple, except for the plumose setae at the apex of the inner plate in maxilla 1.....28. Paracallisomopsis Gurjanova gen. n. (p. 311).

56 (47). Gnathopod 1 simple or forms true claw or subchela, which sometimes is not clearly defined.

57 (76). Coxal plate 1 tapers distally.

58 (59). Gnathopod 1 simple, with almost linear segment 6, devoid of palmar margin; along lower margin of anterior coxal plates, there are setae.....* Alicella Chevreux, 1889.

59 (58). Gnathopod 1 bears subchela which sometimes is not clearly defined.

60 (73). Telson cleft.

61 (72). Mandibular incisor edentate.

62 (63). Telson cleft less than to the middle.....11. Hirondellea Chevreux, 1889 (p. 88).

(Syn. Tetronychia Stephensen, 1923).

63 (62). Telson cleft beyond the middle.

64 (65). Epimeral plate 3 at the postero-distal angle bears large, acute process curved back and up.....* Centromedon G. Sars, 1891.

65 (64). Pointed bent backward and up process lacking at the postero-distal angle of epimeral plate 3.

66 (69). Segment 6 of gnathopod 1 shorter or as long as 5th.

67 (68). Inner plates in maxilla 2 only slightly shorter than outer; inner plates of maxillipeds extend beyong the apex in segment 2 of palp.....30. Tryphosa Boeck, 1871 (p. 322).

(Syn. Lepidepecreopsis Stephensen, 1925).

68 (67). Inner plates of maxilla 2 considerably shorter than outer; outer plates of maxillipeds do not reach the apex in segment 2 of palp.....* Uristoides Schellenberg, 1931.

Swedish Antarct. Exp., II, No. 6: 27.

69 (66). Segment 6 of gnathopod 1 longer than 5th.

70 (71). Segment 6 of gnathopod 1 almost two times as long as 5th; segment 1 of flagellum of antenna 1 very long, longer than segment 1 of peduncle.....* Tryphosella Bonnier, 1893.

71 (70). Segment 6 of gnathopod 1 only slightly longer than 5th; segment 1 of flagellum in antenna 1 small, considerably shorter than segment 1 of peduncle.....* Uristes Dana, 1849.

72 (61). Mandibular incisors deeply dentate.....33. Vallettiopsis Holmes, 1909 (p. 343).

73 (60). Telson entire.

74 (75). Segments 2 and 3 of peduncle of antenna 1 short, equal in size; segment 1 of flagellum specialized, conicla, equals the length of next 5 segments together and bears sensory hairs on the lower surface.....* Onesimoides Stebbing, 1888.

75 (74). Segment 2 of peduncle of antenna 1 enlarged, and segment 3 very short, less than half the length of 2nd; segment 1 of flagellum unspecialized, short, almost same in form and size as the subsequent segment and lacks sensory setae on the lower surface.....* Paronesimoides Pirlot, 1933.

Siboga-Exp., XXXIII c: 139.

76 (57). Coxal plate 1 broadens distally of with parallel anterior and posterior margins; plate 1 itself may be small[1].

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[1] In all Orchomenella, coxal plate 1 broadens distally or has parallel margins, but in O. grönlandica (Hansen), it tapers distally.

77 (122). Gnathopod 1 simple; its segment 6 almost linear and lacks palmar margin to which dactyl might be attached[2].

78 (79). Mandibular lacking incisors margin, palp attached right to the apex of the body of mandible.....35. Kerguelenia Stebbing, 1888 (p. 349).

79 (78). Mandibular incisors with well developed margin.

80 (99). Telson entire or with a shallow notch at its very apex.

81 (84). Mandibles lack molar process.

82 (83). Peraeopods 1 - 3 bear subchela; inner ramus of uropod 3 very small.....* 9. Crybelocephocaris Shoemaker, 1945 (p. 83).

83 (82). Peraeopods 1 - 3 simple, with linear segment 6; inner ramus of uropod 3 slightly smaller than outer.....* Socarnella Walker, 1904.

84 (81). Mandibles with molar process.

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[2] Chevreux et Fage, 1925, write that gnathopods in Paracentromedon are simple. However, the illustration of gnathopods in Figure 44 (page 58) shows that this extremity bears a subchela, although this is not clearly defined.

85 (94). Branchial vesicles with transverse folds.

86 (87). Transverse folds present only on one side of branchial vesicles.....* Lysianassa Milne-Edwards, 1830.

87 (86). Transverse folds present on both sides of branchial vesicles.

88 (91). Inner plate of maxilla 1 has setae at the apex.

89 (90). Molar process of mandibles small, oval, without triturating surface.....* Lysianopsis Holmes, 1903.

90 (89). Molar process of mandibles large, with triturating surface.....24. Aruga Holmes, 1909 (p. 292).

91 (88). Inner plate of maxilla 1 lacks setae at the apex.

92 (93). Maxilla 1 with 1 type of spines on the outer plate.....* Shoemakerella Pirlot, 1936.

Siboga-Exp., XXXIII e: 264.

93 (92). Maxilla 1 with two types of spines on outer plate.. ....Arugella Pirlot, 1936.

Siboga-Exp., XXXIII e: 259.

94 (85). Branchial vesicles simple, without transverse folds.

95 (96). Antenna 1 specialized; segment 1 of peduncle large, inflated, segments 2 and 3 short; segment 1 of flagellum conical, two times larger than the 2nd and bears sensory setae on the lower surface .....* Paralibrotus Stephensen, 1923.

Ingolf-Exp., III, No. 8: 61.

96 (95). Antenna 1 unspecialized; segments 2 and 3 of peduncle enlarged; in form and size, segment 1 of flagellum differs poorly from the 2nd and lacks sensory setae on the lower surface.

97 (98). Outer plates of maxillipeds narrow, long, reach the end of segment 3 in palp.....* Pronannonyx Schellenberg, 1953.

Mitt. Zool. Mus. Berlin, 29, H. 1: 107.

98 (97). Outer plates of maxillipeds broad and do not reach the apex of segment of palp.....* Parambasia Walker et Scott, 1903.

99 (80). Telson cleft at the apex or almost to the base.

100 (101). Palp of maxilla 1 reduced to a tubercle.....1. Acidostoma Lilljeborg, 1865 (p. 55).

101 (100). Palp of maxilla 1 well developed, 2-segmented.

102 (103). Posterior margin of basal segment of peraeopod 3 with powerful sharp teeth.....* Glycerina Haswell, 1882.

103 (102). Posterior margin of basal segment of peraeopod 3 smooth or weakly dentate.

104 (107). Segment 4 in palp of maxillipeds rudimentary, in the form of a little nodulous tooth.

105 (106). Inner plate in maxilla 1 with 7 setae; upper lip strongly protruding in front of epistome.....* Phoxostoma K.H. Barnard, 1925.

Ann. S. Afr. Mus., XX, p. V: 323.

106 (105). Inner plate in mandible 1 with 2 setae; upper lip does not protrude beyond epistome.....* Parawaldeckia Stebbing, 1910.

Sydney Mem. Austral. Mus., IV: 571.

107 (104). Segment 4 in maxillipeds normal, falcate.

108 (113). Branchial vesicles with transverse folds.

109 (112). Folds on both sides of branchial vesicles.

110. (111). Peroeopod 5 considerably longer than peraeopod 4; palp of mandibles attached in front of (slightly above) molar process.....* Ichnopus A. Costa, 1853.

111 (110). Peraeopod 5 as long as peraeopod 4; palp of mandibles fused behind (or below) dental process.....* Socarnopsis Chevreux, 1910.

Mem. Soc. Zool. France, XXIII: 164.

112 (109). Folds only on one side of branchial vesicles........26. Socarnes Boeck, 1871 (p. 303).

113 (108). Branchial vesicles do not bear transverse folds; sometimes 1 - 2 accessory lobules present at the base of vesicles.

114 (119). Branchial vesicles simple and lack the accessory lobule at their base.

115 (116). Lower margin of basal segment in peroepod 5 rounded.....20. Menigrates Boeck, 1871 (p. 188).

116 (115). Lower margin of basal segment in peraeopod 5 straight, transverse, or oblique.

117 (118). Mandibles with a very weak ridge-like molar process; palp attached behind and below molar process; plates of maxillipeds narrow and long; outer plates reach the middle of segment 4 of palp.....19. Socarnoides Stebbing, 1888 (p. 185).

(Syn. Acidostomella Schellenberg, 1926).

118 (117). Mandibles with strong blunt molar process; palp attached above and in front of molar process; plates of maxillipeds relatively broad and narrow; outer plates reach only the base of segment 3 of palp.....* Menigratopsis Dahl, 1945.

119 (114). Branchial vesicles with 1 - 2 accessory lobules each at their base.

120 (121). Coxal plate 4 forms enormous posterior lobe which is extended backward and underlies plate 5 along the entire length of the lower margin..... Waldeckia Chevreux, 1906.

Exp. Antarct. Française (1903 - 1905): 13 (syn. Charcotia Chevreux, 1905, Bull. Soc. Zool. France, XXX: 163).

121 (120). Coxal plate 4 has a small posterior lobe which does not reach even the middle of lower margin of plate 5.....* Shackletonia K.H. Barnard, 1931.

Ann. Mag. Mat. Hist., (10), VII, No. 40: 425.

122 (77). Gnathopod 1 with true claw or subchela, sometimes not distinctly expressed[1].

123 (126). Antenna 1 unusually thick and short; in thickness, its peduncle almost equals the height of head.

124 (125). Maxilla 1 lacks palp.* Pachychelium Stephensen, 1925.

Ingolf-Exp., III, No. 0: 121.

125 (124). Maxilla 1 with a well-developed, 2-segmented palp..........34. Pachynus Bulycheva, 1955 (p. 345).

126 (123). Antenna 1 normal, its peduncle considerably thinner than the height of head.

127 (128). Epostome forms long acute process directed forward.........* Tryphosites G. Sars, 1871.

128 (127). Epostome rounded and lacks projecting acute process.

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1 K.H. Barnard, 1916, writes that gnathopod 1 of Parawalettia chelata (genotype) forms a claw; we believe that this is a typical subchela, since the palmar margin of segment 6 is horizontal and not extended forward, as is the case in the claw.

129 (152). Molar process of mandibles strong; it is cylindrical or with a truncated apex, but always with a well-developed triturating surface.

130 (141). Telson entire or cleft less than to the middle.

131 (132). Mandibular incisors with large teeth..........
....* Valettia Stebbing, 1888.

132 (131). Mandibular incisor smooth.

133 (134). Segment 1 of palp of antenna 1 unspecialized and does not differ from the next either in size, form, or armature........
,,,,,,,* Pseudambasia Stephensen, 1927.

134 (133). Segment 1 of palp of antenna 1 specialized; it is conical, larger than the next segment, and densely armed with sensory setae along the lower margin.

135 (136). Inner plates of maxilla 1 with 3 setae at the apex..........* Pseudonesimus Chevreux, 1926.

Bull. Inst. Oceanogr., Monaco, No. 475: 3.

136 (135). Inner plate of maxilla 1 with 2 apical setae at the apex.

137 (138). At the apex of outer plates of maxillipeds, there is from 1 to several bent spines..........3. Onesimus, Boeck, 1871 (p. 58).

138 (137). No bent spines present at the apex of outer plates of maxillipeds.

139 (140). Uropod 2 does not extend beyond the lower apices of uropod 3 and always shorter than the latter; inner ramus in uropod 2 with a constriction; posterior lobe of coxal plate 4 weakly developed and does not extend under margin of plate 5..........12. Pseudalibrotus Della-Valle, 1893 (p. 93).

140 (139). Apices of uropod 2 extend beyong the end of uropod 3, longer than the latter; inner ramus of uropod 2 simple, without a constriction; posterior lower lobe of coxal plate 4 strongly developed and extends under lower margin of plate 5.........* Allogaussia Schellenberg, 1926.

Deutsche Südpolar Exp., XVIII, Zool., X: 245.

141 (130). Telson cleft deeply, more than to the middle[1].

142 (143). Coxal plate 1 small, considerably shorter than

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[1] Except for Hippomedon abyssi (Goës) in which the telson is cleft only to the middle.

the next, and its postero-distal angle is overlapped by plate 2; inner plate of maxilla 1 with 5 or more simple setae..........32. Eurythenes Smith, 1882, (p. 340).

143 (142). Coxal plate 1 larger, of same height or slightly shorter, than the next, and its postero-distal angle is readily seen; inner plate of mandible 1 has, in most cases, 2 apical, sometimes up to 6, setae.

144 (145). Inner ramus of uropod 3 1-segmented lacks apical segment..........* Tryphosoides Schellenberg, 1931.

Swed. Antarct. Exp., II, No. 6: 38.

145 (144). Outer ramus of uropod 3 with apical segment, 2-segmented.

146 (149). Epimeral plate 3 with pointed hooked process, bent backward and up, at the postero-distal angle.

147 (148). Segment 3 of the palp of mandibles long, as long as or longer than segment 2..........14. Hippomedon Boeck, 1871 (p. 93).

148 (147). Segment 3 of the palp of mandibles short, considerably shorter than segment 2.........* Paracentromedon

Chevreux et Fage, 1925.

Faune de France, 9: 57.

149 (146). Postero-distal angle of epimeral plate 3 lacks hooked process, rounded, straight or slightly pointed.

150 (151). Palp of maxillipeds normal, with last segment falcate; outer plates large, almost reach the apex of segment 2 of palp; inner lobes do not reach even the middle of the outer..........
.........* Tmetonyx Stebbing, 1891.

151 (150). Palp of maxillipeds very long and strong, its last segment has a rounded apex bearing a dense cluster of setae; outer lobes small, hardly reach the apex of segment 1; inner lobes thin and long, pointed, longer than outer.........* Gainella Chevreux, 1911.

Paris C.R. Acad. Sci., 153: 1167; 1912, Bull. Mus. Nat. Hist. Nat. [Sic! Translator], 18, No. 4: 208.

152 (129). Molar process of mandibles lacking or weak, conical or ridge-like, without a distinct triturating surface.

153 (168). Telson entire or with a small notch at the apex.

154 (157). Palp of maxillipeds 3-segmented, shorter than

outer plates.

155 (156). Posterior margin of basal segment of peraeopods 3 - 5 deeply serrate; gnathopod 1 with a real claw..........* Podoprionella G. Sars, 1895.

156 (155). Posterior margin of basal segment in peraeopods 3 - 5 almost smooth; gnathopod 1 with subchela..........* Normanion Bonnier, 1893.

157 (154). Palp of maxillipeds 4-segmented, longer than outer plates.

158 (167). Outer plates of maxillipeds do not reach the apex of segment 3 of palp.

159 (160). Upper lip forms an acute process directed forward...........* Paralysianopsis Schellenberg, 1931.

Swed. Antarct. Exp., II, No. 6: 7.

160 (159). Upper lip rounded and lacks the forward-projecting acture process or it forms a lobe rounded at the end.

161 (162). Penultimate segment of peduncle in antenna 1 strongly broadened, at least 3 times as broad as the last segment.....

.....* Lysianella G. Sars., 1882.

162 (161). Penultimate segment of peduncle of antenna 1 not wider than the last.

163 (164). Coxal plate 1 strongly broadened distally; inner ramus of uropod 3 simple..........13. Koroga Holmes, 1909 (p. 93).

164 (163). Coxal plate 1 with parallel anterior and posterior margins; inner ramus of uropod 2 simple or with a constriction.

165 (166). Inner ramus of uropod 2 with a constriction; uropod 2 biramose, with inner ramus..........* Pseudokoroga Shellenberg, 1931.

Swed. Antarct. Exp., II, No. 6: 16.

166 (165). Inner ramus of uropod 2 simple; uropod 3 monoramose, lacks inner ramus..........* Paravalettia K.H. Barnard, 1916.

Ann. S. Afr. Mus., XV, p. III: 112.

167 (158). Outer plates of maxillipeds reach the apex of segment 3 of palp..........* Nannonys G. Sars, 1890.

168 (153). Telson cleft at least to the middle or has a deep notch on the posterior margin.

169 (172). Gnathopod 1 bears real claw.

170 (171). Coxal plate 1 slightly smaller than 2nd......... ......*. Podoprion Chevreux, 1891.

171 (170). Coxal plate 1 as large as the 2nd..............* Podoprionides Walker, 1907.

Ann. Mag. Nat. Hist., XVII: 475, 1907, Nat. Antarct. Exp., III: 16, pl. 5, f. 8.

172 (169). Gnathopod 1 bears a subchela.

173 (176). Mandibles lack molar process.

174 (175). Inner plates of maxilla 1 with 1 apical seta; maxillipeds with very small inner plates..........* Sophrosyne Stebbing, 1888.

175 (174). Inner plate of maxilla 1 with 14 setae; maxillipeds with large, broad inner plates..........* Paralicella Chevreux, 1908.

Bull. Mus. Oceanogr., Monaco, No. 117: 3.

176 (173). Mandibles have molar process[1].

177 (180). All branchial vesicles, or some of them, have transverse folds, invaginations, or accessory lobules.

178 (179). Folds on branchial vesicles only on one side. Postero-distal angle of epimeral plate 3 forms a tooth-like process ....23. Anonyx Kröyer, 1838 (p. 207).

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[1] Temporarily, we include in this group the genus Microlysias, although the mandibular structure in the species of this genus has remained unknown to us, because we could not obtain Stebbing's work, 1918. When this Key was compiled, we used the description of Microlysias indica K.H. Barnard, 1937 (The John Murray Expedition 1933 - 1934. Sci. Rep., IV, No. 6: 144), although this author does not give footnotes in regard to the nature of the mandibles of the species he describes. The complex structure of branchial vesicles, if assumed that the mandibles have a molar process, allows us to put Microlysias in the Key near Anonyx : K.H. Barnard, 1937, points out that the strongly broadened penultimate segment of the peduncle of antenna 2 brings Microlysias closer to Lysianella; however, characteristic of Lysianella is the entire telson, while in Microlysias it is deeply cleft.

179 (178). Folds on branchial vesicles on both sides. Postero-distal angle of epimeral plate 3 rounded...............* Microlysias Stebbing, 1918[1].

Ann. Durban Mus., II: 63.

180 (177). Branchial vesicles simple, without folds.

181 (184). Telson cleft less than to the middle or has a deep notch on the posterior margin.

182 (183). Palp of mandibles attached in front of or above molar process; posterior margin of epimeral plate 3 smooth................15. Paronesimus Stebbing, 1894 (p. 143).

183 (182). Palp of mandibles attached behind or below molar process; posterior margin of epimeral plate 3 with small teeth, especially in its lower part.........16. Orchomene Boeck, 1871 (p. 145).

184 (181). Telson cleft deeply, beyond the middle.

185 (190). Palp of mandibles attached at the level of molar process or slightly above it.

186 (187). Segment 6 of gnathopod 1 strongly broadens dis-

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1 See footnote on page 129.

tally..........* Cheirimedon Stebbing, 1888.

187 (186). Segment 6 of gnathopod 1 with parallel anterior and posterior margins or broadens distally very weakly.

188 (189). Palmar margin of segment 6 of gnathopod 1 transverse........25. Lakota Holmes, 1909 (p. 301).

189 (188). Palmar margin of segment 6 of gnathopod 1 oblique ....* Lepidepecreoides K.H. Barnard, 1931.

Ann. Mag. Nat. Hist. (10), VII, No. 40: 426.

190 (185). Palp of mandibles attached behind or below the level of molar process.

191 (192). Segment 1 of peduncle of antenna 1 has longitudinal keel which forms a process or ridge at the antero-distal angle of segment; the body cover is strongly calcified, brittle, and has a specific sculpture..........31. Lepidepecreum Bate et Westwood, 1868 (p. 232).

192 (191). Segment 1 of peduncle of antenna 1 simple, lacks either the elongated keel and process of the ridge-like expansion at the anterio-distal angle of segment; body plate elastic.

193 (194). Segment 5 of gnathopod 1 narrow and long........ ....* Pseudorchomene Schellenberg, 1926.

Deutsche Südpolar Exp., XVIII, Zool., X: 925.

194 (193). Segment 5 of gnathopod 1 short, cup-like.

195 (196). Coxal plate 1 directed straight down; plate 2 covers the entire posterior margin of plate 1[1].

196 (195). Broadening distally, coxal plate 1 is directed obliquely forward; there is a gap between its posterior and anterior margins of plate 2..........18. Orchomenopsis G. Sars, 1891 (p. 184).

197 (1). Segment 3 of urosome of uropod 3 lacking or reduced so that it is hardly visible; telson completely reduced, lacking.

198 (199). Body globular, because of the strongly expanded and inflated thoracid segments 3 - 6 and the coxal plates corresponding to them; antenna 1 non-differentiated; segments of peduncle simple cylindrical, while segment 1 of flagellum almost same in size and shape as the following segment..........* Danaella Stephensen, 1925.

Vidensk. Medd. Dansk. Naturh. Foren, 80: 423.

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[1] Characters taken for the designation of the genera Orchomenella and Orchomenopsis are important only for the identification of the species of the genera which inhabit the northern and the Far-East seas of the Soviet Union.

199 (198). Body elongated, weakly inflated, with peraeon segment 1 gradually increasing in size to pleon segment 3; antenna 1 specialized: segment 1 of flagellum very large, spindle-like, with dense transverse series of sensory setae characteristic of the family, and calceoli on other segments of flagellum.........*38. Chevreuxiella Stephensen, 1915 (p. 362).

200 (2). Uropod 3 without rami, forms simple 1-segmented appendages or has one rudimentary ramus - in the form of a tubercle - at the distal end of this appendage.

201 (208). Telson present.

202 (205). Pair 1 of coxal plates does not cover the head on sides; gnathopod 1 bears true claw.

203 (204). Palp of maxillipeds slightly shorter than outer plates; basal segment of peraeopods 3 - 5 strongly broadened and has a normal wing..........36. Derjugiana Gurjanova gen. n. (p. 357).

204 (203). Palp of maxillipeds considerably longer than outer plates; basal segment of peraeopods 2 and 4 linear; in peraeopod 5, this segment weakly broadens proximally, but does not form a wing ....* Didymochelia K.H. Barnard, 1931.

Ann. Mag. Nat. Hist., (10), VII, No. 40: 429.

205 (202). Pair 1 of coxal plates covers the head on sides completely or its greater part; gnathopod 1 simple, with vestigial subchela.

206 (207). Palp of mailla 1 1-segmented.........* Acontiostoma Stebbing, 1888.

207 (206). Palp of maxilla 1 2-segmented.........* Stomacontion Stebbing, 1899.

208 (201). Telson reduced completely, no traces of it left ....* Thoriella Stephensen, 1915 (p. 360).

1. The Genus ACIDOSTOMA Lilljeborg, 1865.

Guryanova, 1951: 157.

Represented in the northern part of the Pacific Ocean by one new species; 3 other earlier known species distributed in the northern Atlantic and Arctic.

1 (6). Telson cleft.

2 (5). Eyes present; upper margin of peduncle in uropod 2 smooth.

3 (4). Segment 1 of urosome smooth, without keel.........*

A. obesum (Bate, 1862).

(Northern part of the Atlantic Ocean).

4 (3). Segment 1 of urosome with well-developed short rounded dorsal keel..........* A. nodiferum Stephensen, 1923.

Ingold-Exp., III, No. 8: 40.

(Northern part of the Atlantic Ocean).

5 (2). Eyes lacking; upper margin of peduncle of uropod 2 with regular rounded teeth and setae between them..........1. A. pectinata Gurjanova sp.n.

6 (1). Telson entire and has only a small broad notch at the posterior end; eyes lacking..........* A. laticorne Sars G.m 1879.

/Greenland Sea (800 - 1200 m) and Kara Sea (53 - 119 m)/

1. Acidostoma pectinata Gurjanova sp.n. (Figure 1).

Body strongly inflated; eyes lacking; dorsal side smooth. Antenna 1 slightly shorter than antenna 2; segment 1 of peduncle with small keel on distal anterior margin; flagellum in ♂ short, no more than 10 segments; segment 1 of flagellum of ♀ short, of ♂ elongated, with dense clusters of hairs on lower surface; accessory flagellum 5-segmented. Flagellum of antenna 2 with 7 - 8 segments. Anterior margin of coxal plate 1 rounded, strongly convex. Oral parts specialized.

Maxilla 1 has a very small 1-segmented palp with 1 large seta at the apex, outer plates narrow, elongated, with hooked spines along the inner margin; inner plate narrow, long, with 2 plumose setae. Maxilla 2 with narrow plates differing in size and simple setae at the upper part of the inner margin and at the apex; inner margin of inner plate densely covered with thin hairs. Mandibles lacking molar process, with long thin body and strong 3-segmented palp; its last segment slightly shorter than segment 2. Maxillipeds with 4-segmented weak palp whose last segment is dactylate, straight; inner plates strongly reduced, form only small pointed processes at the bases of large outer plates. Lower lip narrow, with long linguliform mandibular processes. Gnathopods and peraeopods like those of A. laticorne G. Sars A. obesum (Bate).

Gnathopod 1 with dense clusters of long setae along the posterior margin of segments; segment 6, inflated at the base, sharply tapers distally; posterior margin concave, with a long series of simple setae. Coxal plate of peraeopod 3 with posterior lower lobe shorter than in both species mentioned above; basal segment and segment 4 strongly broadened, with indistinctly dentate posterior margin; lower lobe of the wing-shaped expansion of basal segments 3 - 5 of peraeopods with rounded apex, slightly drawn out downward, like in A. obesum (Bate), while segment 4 relatively broader. Posterior lobe of coxal plate of peraeopod 4 consideraly shorter and broader than that of A. obesum; basal, 4th and 5th segments are as strongly broadened. Structure of peraeopod 5 similar to that of A. obesum. Epimeral plate

3 with acute process, drawn backward, at postero-distal angle. Ends of rami in uropods 1 and 2 at same level, uropod 3 hardly reaching distal end of peduncle in uropod 2. On upper margin of basal segment in uropod 2, there is a comb of rounded teeth with short setae between them (a sign which indicates the name of the species). Telson short, cleft to the middle, twice as broad as long. In alcohol, the animal is milk-white, up to 12 mm long. It differs more from the Arctic species *A. laticorne* G. Sars (Figure 2) than from the North-Atlantic *A. obesum*, viz: in the lack of longitudinal medial dorsal keels on 3rd pleon segment and of tubercles on urosomal segment 1, presence of a process at postero-distal angle of epimeral plate 3 and a comb on peduncle in uropod 3, as well as in rounded lower margins of basal segment in paraeopods 3 - 5, which in *A. laticorne* are straight (Figure 2).

6 specimens have been captured (♀♀ with ova and ♂♂) in the Sea of Okhotsk at the entrance of Penzhina Bay, at a depth of 196 - 230 m, and in the Pacific Ocean, north-east of Shikotan Island, at a depth of 291 m.

Figure 1A. *Acidostoma pectinata* Gurjanova sp.n., Sea of Okhotsk, ♀.

Figure 1B. *Acidostoma pectinata* Gurjanova sp.n., Sea of Okhotsk, ♀.

2. The Genus OPISA Boeck, 1876.

Guryanova, 1951: 160.

Only 1 species has been known.

1. *Opisa eschrichti* (Kröyer, 1842).

Guryanova, 1951: 160, Figure 35.

The Far-East species do not differ from those of the North-Atlantic and reveal only greater stability in regard to the structure of species characters and a slight variability. While widely distributed in the northern part of the Atlantic Ocean, it is discovered in the Pacific Ocean in the Sea of Japan (Peter the Great Bay and Tatarsky Strait), at depths ranging from 30 to 220 m (Bulycheva, 1956), in the Sea of Okhotsk (Aniva Bay, depth 24 m), near the eastern coast of Iturup Island (the southern Kuril Islands), at a depth of 33 and 36 m, and near the Californian coast.

Figure 2. *Acidostoma laticorne* G. Sars, Kara Sea.

3. The Genus ONISIMUS Boeck, 1871.

Guryanova, 1951: 161.

In the Pacific Ocean, this Arctic genus is representated by

6 species one of which has been described for the first time.

1 (4). Eyes lacking.

2 (3). Palmar margin of segment 6 of gnathopod 2 deeply concave; interantennal lobe of head triangular, with acute apex.......
...* O. sextonae Chevreux, 1926.

Full. Inst. Oceanogr., Monaco, No. 475: 1.

(Norwegian Sea, depth 1095 m).

3 (2). Palmar margin of segment 6 of gnathopod 2 straight; interantennal lobe of head triangular, but with rounded apex..........*
O. abyssi Oldevig, 1959.

Goteborgs Kungl. Ventenskaps. Vitterhits-Samh. Handl., (B), 81, No. 2: 8.

4 (1). Eyes present.

5 (6). Eyes developed poorly, milk-white..........* O. leucopis (G. Sars, 1979).

(Greenland Sea and fjords of Norway, depth of 1472 - 1667 m).

6 (5). Eyes well developed, red, yellowish in alcohol.

7 (20). Telson cleft or has a deep notch on its posterior margin.

8 (13). Segment 4 of peraeopod 5 strongly thickened and broadened, compared with segment 5.

9 (12). Dark-pigmented spots on entire body.

10 (11). Segment 1 of antenna 1 with keel distally rounded and overhanging segments 2 and 3; rami of uropod 3 almost equal in length..........6. O. simus Guryanova sp.n.

11 (10). Segment 1 of peduncle of antenna 1 without keel overhanging two other segments; rami of uropod 3 unequal in length, inner shorter than outer..........* O. sibiricus Brüggen, 1909.

Transactions of the Academy of Sciences, (VIII), XVIII, No. 16: 8.

(Arctic Ocean, shelf).

12 (9). Dark pigment on body lacking. 1. O. plautus (Krøyer, 1845).

13 (8). Segment 4 of peraeopod 5 normal, not broadened.

14 (15). Telson with deep notch, rounded margins at the apex..........* O. edwardsi (Krøyer, 1846).

(Arctic and northern part of Atlantic Ocean, shelf).

15 (14). Telson cleft one-third.

16 (17). Antero-distal angle of epimeral plate 1 elongated and bent in form of a hook..........2. O. normani (G. Sars, 1895).

17 (16). Antero-distal angle of epimeral plate 1 normal, does not form a hook.

18 (19). Interantennal lobe of head acute; telson short and broad, cleft less than 1/3..........* O. turgidus (G. Sars, 1879). (Arctic Ocean).

19 (18). Interantennal head lobe rounded; telson elongated, tapers distally, cleft 1/3..........5. O. krassini Guryanova, 1951.

20 (7). Telson entire, without a deep notch at the apex.

21 (22). Postero-distal angle of epimeral plate 3 rounded.. ....4. O. botkini Birula, 1897.

22 (21), Postero-distal angle of epimeral plate 3 elongated and acute.

23 (24). Segment 6 of gnathopod 2 strongly broadens distally, dactyl does not reach the end of palmar margin..........* O. caricus

Hanse, 1886.

(Arctic Ocean, shelf).

24 (23). Distal end of segment 6 of gnathopod 2 not wider than its middle; dactyl reaching end of palmar margin.

25 (26). Telson short and broad, its posterior margin straight.........* O. brevicaudatus Hansen, 1886.

(Arctic Ocean, shelf).

26 (25). Telson elongated, tapers apically, its posterior margin slightly notched at the apex.

27 (28). Palmar margin of segment 6 of gnathopod 2 transverse and completely straight; palmar angle of gnathopod 2 bears 2 large spines similar in size. 3. O. derjugini Guryanova, 1929.

28 (27). Palmar margin of segment 6 of gnathopod 2 slightly elongated forward and up; palmar angle of segment 6 of gnathopod 1 bears setae or 2 weak spines.

29 (30). Posterior margin of telson slightly concave in the middle; palmar angle of segment y in gnathopod 1 bears setae.........* O. affinis Hansen, 1886.

(Arctic Ocean, shelf).

30 (29). Posterior margin of telson slightly notched; palmar angle of segment 6 in gnathopod 1 bears 2 weak spines..........* _O. dubius_ Schellenberg, 1935.

Skr. Svalb., No. 66: 12.

(Arctic Ocean, shelf).

1. _Onisimus platus_ (Kröyer, 1845) Figure 3).

Guryanova, 1951: 163, Figure 37 (after G. Sars).

Circumpolar Arctic species spread in deep waters of Skagerrak and St. Lawrence Gulf. In the Pacific Ocean, only 1 specimen ♀ (with ova), measuring 7 mm in length, in the western part of Bering Strait, at a depth of 45 m. Does not differ in anything from Siberian specimens

2. _Onisimus normani_ (G. Sars, 1895).

Guryanova, 1951: 165, Figure 39; Shoemaker, 1930. Proc. U.S. Nat. Mus., 77: y, f. 2, 3.

Circumpolar Arctic species; it spreads along deep troughs and in the area of cold currents into the North Atlantic Ocean in Europe, to Oslo-fjord and Skagerrak; in America, to the Gulfl of St. Lawrence (at a depth of 400 m). Obtained in the Pacific Ocean 1 ♀ with ova in the Tatarsky Strait, at its western coast of south Sakhalin

(Antonova), at a depth of 165 m (1 specimen); and in the sea of Okhotsk (10 specimens), at 580 - 670 m deep; maximum length 16 mm; does not differ in anything essential from Arctic and Atlantic specimens.

3. Onisimus derjugini Gurjanova, 1929.

Guryanova, 1951: 170, Figure 44.

High-Arctic species, widely distributed in the Siberian Arctic; especially frequent in the Chuckchee Sea; in the Pacific Ocean, found in the Bering Sea, south of Dezhneva Cape, at a depth of 45 m, 8 specimens; north of Lawrence Island, more than 10 specimens; in the Sea of Okhotsk - Sakhalin Gulf, at a depth of 25 m, 12 specimens; in Kuegda[1] Bay at depts of 12 - 15 m, 8 specimens. Maximum length of Pacific specimens 18 mm.

Figure 3. Onisimus platus (Kr.) Bering Strait, ♀.

4. Onisimus botkini Birula, 1897.

Guryanova, 1951: 174, Figure 48.

Widely distributed in estuaries of Siberian rivers; in our collections from the Pacific Ocean, discovered only in samples from the Anadyr Lagoon under conditions of a very strong desalinization. Earlier was mentioned by A.N. Derzhavin, 1929, for the Bering Sea, without

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[1] Transliterated from Russian. Translator

more accurate designation of the location. Some authors /Stephensen, 1937, Rep. Fifth Thule Exp., II, No. 9: 18; Dunbar, 1954, J. Fish. Res. Bd. Canada, 11 (6): 712/ are prone to regard this species as a young form of O. affinis Hansen; however, considerable material of both species in our collections prevent us from assigning it to these species as quite identical.

Age series of both species show that differences in the form of epimeral plate 3, the interantennal lobe, the basal segment of peraeopod 5, and the telson are stable and present both in young and large specimens reaching 18 - 19 mm in length. Moreover, despite the fact that O. affinis and O. botkini frequently inhabit one and the same region, there is always a hiatus, and they have never been found in one and the same sample. For instance, in the mouth of the Ob' river, where, like in all other large Siberian rivers, the distribution of salinity is zonal (gradual increase in the salinity from the mouth toward the sea and formation of zones, which are characterized by various salinity and which alternate as the distance from the shore increases), the habitat of both species vary and is divided by sections of salinity intermediate in degree: the habitat of O. affinis is the most marine zone where the salinity does not drop below 20 - 25%, while the zone inhabited by O. botkini, which is the most widely distributed, is in the very mouth of the river where the salinity does not exceed 5 - 7%. Both forms are either very close species or subspecies of one speices, O. affinis. Since such a division of geographical ranges in various salt zones takes place in all studied estuaries of the Siberian Arctic, we consider both forms as different species. All specimens in the Anadyr Lagoon are represented by only O. botkini, and there is neither O. affinis nor transitory forms in regard to the latter species.

5. Onisimus krassini Gurjanova, 1951.

Guryanova, 1951: 49.

Widely distributed in the Chuckchee and Bering seas, where it occurs chiefly on the northern shelf at a depth of up to 110 m, reaching 9 mm in length; during August - September captured females with ova, where the development reaches the stage of a well-developed embryo. Not yet discovered in the Sea of Okhotsk. It is interesting to note that in 1932, 1 specimen of this species was discovered in the Seas of Japan in the area of the mouth of the Tyumen'-Ula river, at the border with Korea, a depth of 75 m, and a few specimens in Peter the Great Bay, at a depth of 100 - 103 m. Maximum length of specimens 11.5 mm.

Figure 4. Onisimus simus Gurjanova sp.n.

The Sea of Okhotsk, ♀.

6. _Onisimus simus_ Gurjanova sp.n. (Figure 4).

In the structure of its body parts, the sculpture of tegument, and the development of grains of black pigment concentrated on coxal plates in slates, the basal segments of peraeopods 3 - 5, and the telson, this species is closest to _O. sibiricus_ Brüggen; however, it differs considerably from the latter species.

The entire body is not as strongly inflated, rather more slender and thinner, and when mounted does not curl into a high arch, but remains stretched out; only the urosome is drawn in under the thoracic part of the body. Like also in _O. sibiricus_, large sparse punctate depressions on the surface of the integument have microscopic spinules at the center. Eyes relatively smaller than in _O. sibiricus_, in which they occupy almost the entire lateral head surface, while interantennal lobe is larger and of an equilateral triangular shape. Segment 1 of peduncle of antenna 1 iwth a large keel-like protuberance at the distal end which overhangs two other segments of the peduncle; these segments are rather longer than those of other speices of the genus; at the lower distal angle of segment 1, there are 3 brush-like sensory setae. On the other hand, segment 1 of the peduncle is short, not longer than 2nd or 3rd segments of the peduncle; flagellum 10 - 12 segmented, accessory flagellum 6-segmented. Antenna 2 longer than antenna 1, flagellum of o 14-segmented. Gnathopods rather more slender and elongated; segment 6 of pair 1 is 1.5 times longer than segment 5 (in *O. sibiricus* only slightly longer than segment 5), with straight parallel margins and a short oblique palmar margin with 2 locking spines. Segment 6 of strongly enlarged gnathopod 2 almost 2 times shorter than 5th, with almost straight parallel lateral margins and short transverse palmar margin (segment 6 of *O. sibiricus* no more than 1.5 times shorter than segment 5 and is rounded in outline; palmar margin oblique, since the palmar angle is drawn up and forms with dactyl a small claw). Basal segment and segment 4 of peraeopods 3 - 5 broadened, considerably weaker than those of *O. sibiricus*, especially in peraeopod 4, whose basal segment is elongated-oval.

The structure of epimeral plate 3 and of telson same as in *O. sibiricus*, and the rami of uropod 3 almost identical in length, contrary to *O. sibiricus* whose inner ramus is shorter than the outer.

3 specimens discovered (2 o and 1 6) in the Sea of Okhotsk, eastward of Terpeniya Bay, at a depth of 125 m. Maximum length of 10.5 mm.

4. The Genus *CYPHOCARIS* Boeck, 1871

Guryanova, 1951: 176.

Abyssal genus, represented by 7 bathypelagic species; 5 species found in the Pacific Ocean.

The analysis of the material of this genus shows that the form of the main hood in all species varies greatly depending on individual development and age, hence it cannot be used as a reliable characteristic feature, as it was shown by Schellenberg back in 1926. The form of the basal segment of the last three pairs of peraeopods, and especially peraeopod 3, should be regarded as the most appropriate and sufficiently stable character. Hence we decided to present a key for the identification of the species of this genera, which differs from the one we compiled earlier, having supplemented Schellenberg's key.

1 (10). Postero-distal angle of basal segment of peraeopod 3 forms a long sword-shaped process, directed backward and sideways.

2 (7). Margins of the sword-shaped process smooth.

3 (4). Sword-shaped process very long, almost as long as the remaining, distal part of peraeopod 3.........1. C. challengeri Stebbing, 1888.

4 (3). Sword-shaped process relatively short, shorter than the remaining distal part of paraeopod 3.

5 (6). Distal end of sword-shaped process of peraeopod 3 does not reach posterior margin of coxal palte 5.....2. C. faurei

K.H. Barnard, 1916.

6 (5). Distal end of sword-shaped process of peraeopod 3 protrudes back far beyond posterior margin of coxal plate 5..........3. *C. bouvieri* Chevreux, 1910.

7 (2). At least the upper margin of the sword-shaped process of basal segment of peraeopod 3 dentate.

8 (9). Sword-shaped process of peraeopod 3 very long, much longer than distal part of peraeopod 3, its lower margin smooth.......
...* 4. *C. johnsoni* Shoemaker, 1934.

9 (8). Sword-shaped process of peraeopod 3 short, hardly reaches the level of the middle of segment 4; its lower margin coarsely dentate..........5. *C. anonyx* Boeck, 1871.

10 (1). Postero-distal angle of basal segment of peraeopod 3 lacks long sword-shaped process, forming only a small lobe.

11 (12). Lower margin of the lobe of a wing-shaped broadening of basal segment of peraeopod 3 deeply dentate in distal part.....
.....6. *C. richardi* Chevreux, 1905.

12 (11). Lower margin of the lobe of a wing-shaped broaden-

ing of basal segment of peraeopod 3 smooth, without teeth..........7.
C. polaris Gurjanova, 1951.

1. Cyphocaris challengeri Stebbing, 1888 (Figure 5).

Stebbing, 1888, Rep. Vey. Challenger, 29: 661, t. 17 (juv.); Chevreux, 1905, Bull. Mus. Oceanogr., Monaco, No. 5: 1, f. 1, 2 (C. alicei); 1916, Bull, Inst. Oceanogr., Monaco, No. 919: 2; f. 1; Schellenberg, 1926, Wiss. Erg. Deutsch. Tiefsee-Exp. Dampfer "Valdivia" 1898 - 1899, Bd. 23, H. 5: 212, f. (in the text) 2 d, 6a - c, 7, 8, 9, 10; Thorsteinsen, 1941, Univ. Washington Publ. Oceanogr., 4, No. 2: 57, pl. 2, f. 21 - 24; ditto, 58, pl. 3, f. 25 - 30 (C. kincaidi); Birstein and M. Vinogradov, 1958, Tr. Inst. Oceanogr., XXVII: 220.

Peraeon segment 1 forms a hood which covers head; its form changes with age: in young, it forms a cone-shaped process, directly upward; in adults, the anterior margin of the hood forms a right angle with the upper margin (it becomes rounded in sexually mature specimens, not extending beyond the anterior head margin). Eyes large, reniform, yellowish in alcohol. Coxal palte 4 large, with a strongly convex anterior margin overlapping the first three small plates and a deep notch on the posterior margin. Coxal plate 5 long, large, higher than long; at the antero-distal angle, it forms a small lingulate lobe bent downwards and backwards. Last two coxal plates considerably smaller than the preceding, rounded in shape. Postero-distal angle of all three pairs of epimeral plates drawn out backward and acute. There is a small dorsal saddle-shaped depression.

Figure 5. *Cyphocaris challengeri* Stebbing. After Schellenberg, 1926. Variation of the form of the anterior end of body.

Antenna 1 considerably shorter than antenna 2; segments of peduncle short, segment 1 slightly longer than 2 subsequent ones together; segment 1 of 20 - 25-segmented flagellum almost as long as peduncle and bears transverse series of long thin setae; ♂♂ have calceoli; accessory flagellum 6-segmented, slightly longer than segment 1 of the main flagellum. Antenna 2 very long, in ♂♂ longer than the body; flagellum multisegmented; segment 4 of peduncle broadened in the middle and tapers distally; last segment of peduncle narrower and shorter than penultimate one; segments of flagellum in ♂♂ with calceoli; in ♀♀, both antennae without calceoli, and penultimate segment of peduncle in pair 2 weakly broadened. Gnathopod 1 with long basal segment simple; segment 5 slightly shorter than segment 6, becomes broader distally; segment 6 tapers distally and bears setae and a thin crenulatin along the inner margin; dactyl measures about half the length of segment 6, has accessory tooth in inner margin. Gnathopd 2 with strongly enlarged segment 3; segment 6 2-times shorter than segment 5, with almost parallel margins and short oblique palmar margin which terminates in a small tooth and is armed with notched setae; dactyl as long as palm, short, with accessory tooth on inner margin.

Peraeopod 3 with long acute sword-shaped process at posterior angle of basal segment; this process is almost as long as the distal part of leg, its margins are smooth; on the posterior margin of wing-shaped broadening of basal segment 2, there are 3 teeth; the number of teeth increases with age. When the animal is quiescent, sword-shaped processes lie along the body, when it swims, they are directed outwards. Basal segments of last two peraeopods have a wing-shaped broadening (narrower in peraeopod 5 than in peraeopod 4) whose posterior margin is coarsely serrate-dentate. Basal segment of uropod 1 almost 2 times as long as rami; rami in uropod 2 slightly shorter than peduncle. Rami of uropod 3 considerably longer than peduncle, lamelliform; outer 2-segmented ramus slightly shorter but broader than inner; peduncle and both rami armed with setae. Telson elongated-triangular, it is four times as long as broad, cleft 3/4; apices of lobes acute, with accessory tooth on sides. The animal is up to 14 mm long.

Bathypelagic species spread in the Atlantic, Indian and Pacific oceans; obtained from plankton samples, at a depth ranging from 6580 to 0 m. No accurate data on depth of its habitat. In the Pacific Ocean found only north of 30° n. lat.

2. Cyphocaris faurei K.H. Barnard, 1916 (Figure 6).

Strauss, 1909, Wissensch. Ergebn. Deutsch, Tiefsec-Exp., XX, 1: 67 (C. alicai); K.H. Barnard, 1916 Ann. S. Afr. Mus., XV, p. III: 117, pl. XXVI, f. 4; Schellenberg, 1926, Wissensch. Ergebn. Deutsch.

Tiefsae-Exp., XXIII, H. 5: 215, f. 11, 12.

Peraeon segment 1 inflated, slightly adjoins the posterior part of head, but does not form a hood, is as long as segments 2 and 3 together. Eyes pear-shaped, broaden downward; first 3 coxal plates small; plate 4 narrow, but with a very strongly convex anterior margin and deep notch on posterior margin which terminates in a tooth, overlaps only plates 2 and 3, leaving plate 1 free. Coxal plate 5 very large, considerably longer than high; there is a small, bent downwards and up, lingulate lobe at the antero-distal angle. Last 2 coxal plates small, plate 6 almost rectilinear, plate 7 semi-circular.

Postero-distal angle in all 3 spimeral plates drawn back and acute; there is a saddle-shaped depression on the dorsal side of urosome segment 1. Antenna 1 shorter than antenna 2, which in both sexes is longer than the body; in ♂, which calceoli. Penultimate segment of peduncle in antenna 2 broadened, with strongly convex posterior margin both in ♂ and ♀. Flagella of both antennae multisegmented, accessory flagellum 7-segmented. Gnathopod 1 with a very long basal segment which is as long as the remaining segments together; segments 5 and 6 equal, but segment 5 slightly broader than segment 6; inner margin of segment 6 smooth; dactyl dentate along inner margin. Basal segment of gnathopod 2 two times as long as 3rd, bent; segment 3 as long as 5th; segment 4 and 6 of same length, each shorter than either segment 5 or segment 3; inner margin of segment 6 smooth, bears simple setae. Basal segmemt of peraeopod 3 with smooth posterior margin and a short pointed sword-shaped process at the postero-distal angle which does not reach posterior margin of coxal plate 5; margins of this process smooth Basal segment of peraeopods 4 and 5 oval, narrower and shorter in pair 4 than in pair 5; its posterior margin in both pairs with fine teeth; in younger specimens, these teeth larger.

Uropods 1 and 2 with narrow lanceolate rami of same length, peduncle in both pairs bears setae and is slightly longer than rami; inner margin of both rami with densely covered spinules.

Uropod 3 with short peduncle, outer ramus slightly longer than inner, both rami oval-lanceolate, with long plumose setae along inner margin. Telson deeply cleft, its distal end at the level with the end of the rami of uropod 3. In alcohol, the body is yellowish; the animal is up to 30 mm long.

Found in the southern tip of Africa (500 - 1500 m), in the eastern region of the northern part of the Pacific Ocean, in samples from a depth ranging from 550 to 0 and from 183 to 0 m, and in the Indian Ocean.

Figure 6. Cyphocaris faurei Barnard. After Schellenberg, 1926.

3. <u>Cyphocaris bouvieri</u> Chevreux, 1916 (Figure 7).

Guryanova, 1951: 178, Figure 51, E; Chevreux, 1916, Bull. Inst. Oceanogr., Maonaco, No. 319: 4, F. 2; Birshtein and M. Vinogradov, 1958, Tr. Inst. Oceanogr., XXVII: 221, Figure 1.

1 specimen, snow-white in colour, measuring 10.5 mm in length, has been discovered in the Pacific Ocean in the latitude of nearly 30° n. lat., in a plankton sample, from the surface to a depth of 4990 m; has also been known in the Atlantic Ocean, from a depth of 0 - 3000 m (also in the plankton sample) and also from the Norwegian Sea (887 m).

* 4. <u>Cyphocaris johnsoni</u> Shoemaker, 1934 (Figure 8).

Shoemaker, 1934, Smithson. Miscell. Coll. 91, No. 12: 1, f. 1.

Peraeon segment 1 in the ♂♂ forms a hood, with a long pointed process directed forward whose end reaches far beyond the anterior margin of head; segment 1 in ♀♀ inflated, rounded at the anterior end and slightly leans against the posterior part of head. Eyes long, narrow, with long facets obliquely cut toward the middle line of the eye. Antenna 1 much shorter than antenna 2, which in ♂ longer than the body. First three coxal plates small, plate 4 narrow, with very strongly convex anterior margin and deep notch on posterior, overlaps only coxal plate 3 and lower part of plate 2, leaving plate 1 free. Coxal plate 5 very large, two times as long as high. Basal segment of peraeopod 3 with extremely long sword-shaped process at the postero-distal angle whose length exceeds considerably the length of the distal part of the leg and is more than two times larger than the length of coxal plate 5; distal end of this process, elongated along the body at rest, reaches the middle of pleon segment 3; lower margin of process smooth, upper bears large sparse teeth almost along the entire length of process. Peraeopod 4 slightly shorter than peraeopod 5, basal segment slightly broadened and drawn downward, forming a small pointed lobe; its posterior margin has a few teeth. Basal segment of peraeopod 5 narrower and longer than that of peraeopod 4, also forms a pointed lobe at the postero-distal angle; its posterior margin dentate; dactyl of pair 4 about $\frac{1}{4}$ the length of the level of distal end of uropods 2 and 3. Uropod 3 does not reach the level of the distal end in uropod 2; rami longer than peduncle, both bear setae on margins, inner ramus shorter than the outer. Telson very long and narrow, deeply cleft, it distal end reaches far beyond the end of rami of uropods, its lobes strongly pointed, bare. The animal is up to 19 mm long.

Figure 6. *Cyphocaris faurei* Barnard. After Schellenberg, 1926.

Figure 7. *Cyphocaris bouvieri* Chevreux. After Chevreux, 1935.

Figure 8. *Cyphocaris johnsoni* Shoemaker. After Shoemaker, 1934.

Discovered only in the tropical region of the Atlantic Ocean at a depth of 600 - 800 m, near the Puerto-Rico basin.

Not yet discovered in the Pacific Ocean.

5. <u>Cyphocaris anonyx</u> Boeck, 1871 (Figure 9).

Guryanova, 1951: 177, Figure 51, B; Birshtein and M. Vinogradov, 1958, Tr. Inst. Oceanogr., XXVII: 220.

Widely distributed in the Atlantic, Indian, and Pacific oceans, penetrates also the sub-Atlantic Arctic. Widely distributed in the Pacific Ocean south of parallel 43° n. lat. and in its tropical and southern parts; discovered in plankton quantitative samples from a depth ranging from 7250 m to the surface; inhabits a depth of no less than 500 m.

6. <u>Cyphocaris richardi</u> Chevreux, 1905 (Figure 10).

Schellenberg, 1926, Deutsch. Tiefsee-Exp., 23, H. 5: 206, Text. Fig. 2a, 3, 4; Taf. V, f. 1; Birshtein and M. Vinogradov, 1958, Tr. Inst. Oceanogr., XXVII: 221.

The form of peraeon segment 1, which forms a hood, changes with age: in young specimens it forms a short point; in adult, it is either long, directed anteriorly, far beyond the head, or is not at all expressed and terminates in a short cone with rounded apex. First

3 coxal plates small; plate 4 large, with strongly convex anterior margin. Coxal plate 5 large, with concave lower margin, its length is larger than height; last 2 coxal plates smaller in size, with rounded margins. Postero-distal angle of epimeral plate 3 slightly drawn back, almost straight, weakly pointed. Urosome segment 1 with a shallow saddle-shaped dorsal depression. Eyes small, oval, reddish-orange in alcohol. Both antennae in ♂♂ with calceoli. Antenna 1 shorter than antenna 2, which is shorter than the body; segment 1 of peduncle longer than segments 2 and 3 together; segment 1 of flagellum much longer than peduncle, with numerous setae on lower surface; flagellum 16-segmented, almost as long as segment 1 of main flagellum. Penultimate segment of peduncle in antenna 2 broader and longer than the ultimate. Basal segment of gnathopod 2 longer than all subsequent segments together, broadens distally; segments 3 and 4 short, segments 5 and 6 of same length; segment 5 broadens distally and armed with setae on inner margin; dactyl with accessory tooth. Gnathopod 2 with strongly elongated segment 3; segment 6 shorter than 5th, amygdaloidal, with long setae and dentate acicular spines on inner margin. Basal segment of peraeopod 3 lacks sword-shaped process; postero-distal angle of its wing-like broadening forms a short lobe; posterior margin of segment and margins of its lobe deeply serrate-dentate; the number of teeth varies. Basal segment 4 and 5 of peraeopods also with dentate margin (basal segment of the last pair relatively narrower and longer than in peraeopod 4). Uropod 1 with a long peduncle, outer ramus slightly shorter than the inner. In uropod 2 rami longer than peduncle, and also outer ramus

slightly shorter than the inner. Rami of uropod 3 almost of same length, much longer than peduncle, lanceolate, and bear long plumose setae on inner margin. Telson narrowly triangular, deeply cleft, its

does not reach the level of the distal and of uropod 3; each lobe on margin bears 3 small spinules the last of which is located in a small notch at the apex of the lobe. The animal is up to 40 mm long.

Figure 9. Cyphocaris ananyx Boeck. After Schellenberg, 1926. Change of the anterior end of body.

Figure 10. Cyphocaris richardi Chevreux. After Schellenberg, 1926.

A - variation of basal segment of peraeopod 3;

G - -"- -"- anterior end of body.

Distributed in the Atlantic and Indian oceans; found in the Pacific Ocean in the southern and northern parts and in samples ranging from 2600 and 7400 to 0 m.

No accurate data on depth of habitation.

7. Cyphocaris polaris Gurjanova, 1951.

Guryanova, 1951: 179, p. 52*.

* In our work of 1951, errors occurred in the designation of individual parts, namely, Pp III is marked PpV, and PpV, as PpIII; GpI is marked GpII, and Cox. pl. IV, Cox. pl. V.

Known only from depths of the Greenland Sea and the northern part of the Pacific Ocean, where it has been detected near the southern extremity of Kamchatka, at a depth of 4200 m.

5. The Genus PARACYPHOCARIS Chevreux, 1905.

Chevreux, 1905, Bull. Mus. Oceanogr., Monaco, No. 32: 1.

Peraeon segment 1 overlaps the short but high head; coxal plates 1 and 2 small, overlapped by enlarged plate 3 which is extended forward; coxal plate 4 is large, with a deep notch on the posterior margin; plate 5 has 2 lobes along the lower margin. Antenna 1 short, shorter than the peduncle of antenna 2; the flagella of both pairs short, few-segmented, with a long setae at the apex of the last segment. Accessory flagellum rudimentary, 1-segmented.

The oral parts freely open on sides, the epistome protrudes slightly above the upper lip. The mandibles have a short strong body and a well-developed cutting edge; the molar process not developed, palp 3-segmented but short, shorter than the body of mandibles; the distal segment of palp considerably shorter than segment 2. Maxilla 1 has a 2-segmented palp and a short inner plate at the apex of which there are 3 thick plumose setae. Maxilla 2 with a short inner plate shorter than the outer; in the upper third of the inner margin of both plates, there are marginal plumose setae. Maxillipeds have strongly developed plates and a relatively weak 4-segmented palp. Gnathopod 1 small, weak, simple. Gnathopod 2 two times longer than gnathopod 1, with a strongly elongated segment 3. Peraeopods 1 - 4 strong, with a subchela. Basal segments 3 - 5 of peraeopods with a wing-shaped broadening; peraeopod 4 simple, with linear segment 6, but hooked segment 7. Uropod 3 biramose; telson deeply cleft.

Two species have been known.

Genotype: _P. praedator_ Chevreux, 1905.

1 (2). Antenna 1 shorter than antenna 2; inner ramus of uropod 3 shorter than segment 1 of outer ramus.........* _P. praedator_ Chevreux, 1905.

2 (1). Antenna 1 longer than antenna 2; inner ramus of uropod 3 longer than segment 1 of outer ramus..........2. _P. brevicornia_ Birstein et Vinogradov, 1955.

*1. _Paracyphocaris praedator_ Chevreux, 1905.

(figure 11).

Chevreux, 1905, Bull. Mus. Oceanogr., Monaco, No. 32 L 1, f. 1, 2, 3.

Eyes lacking. Interantennal and postantennal lobes rounded.

Anterior lobe of coxal plate 5 smaller than the posterior. Postero-distal angle of epimeral plate 3 slightly drawn back and rounded. Antenna 1 shorter than peduncle of antenna 2; segment 1 of peduncle cylindrical, longer than 2nd; segment 3 slightly shorter than segment 2; flagellum slightly longer than peduncle, 5-segmented; its segments are thin and long. Last segment of peduncle of antenna 2 longer than the penultimate, flagellum slightly shorter than peduncle, 5-segmented. Segment 5 of gnathopod 1 slightly longer or as long as 6th, but wider, broadens distally; segment 3 elongated, segment 6 almost linear in form and bears setae along the inner margin. Segment 3 of gnathopod 2 almost equals $\frac{1}{2}$ length the basal segment; segment 6 2-times as short as 5th, oval, dactyl very small; gnathopod 2 considerably longer and stronger than gnathopod 1.

Peraeopod 1 with thick bent basal segment; segment 6 large, oblong-oval, considerably longer and thicker than segment 5; palmar margin of segment 6 and 7 strong blunt spines; peraeopods 2 - 4 of a similar structure, but in pairs 3, on the palmar margin of segment 6, the spines are arranged in groups of 2 - 3 spines.

Figure 11A. *Paracyphocaris praedator*. After Chevreux, 1905.

Figure 11B. *Paracyphocaris praedator* Chevreux, After Shoemaker, 1945.

Posterior margin of the wing-shaped broadening in the basal segment of peraeopod 5 finely dentate; segment 6 linear in form, there is a tendency to form a subchela only in the hooked segment 7.

Rami of uropod 3 lanceolate, inner ramus shorter than the outer; long setae found along inner margin of both rami. Telson elongated-triangular, cleft further than to the middle; at the apex, its lobes armed with a pair of long lateral setae and 1 apical spine and an apical seta at the end of each lobe. The animal is coral-red, even in alcohol; the length 11 mm.

Bathypelagic species, known from depths of 1900 - 3250 m in the Atlantic Ocean. Not discovered, yet, in the Pacific Ocean.

Apparently, a parasite.

2. _Paracyphocaris brevicornis_ Birstein et M. Vinogradov, 1955 (Figure 12).

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanogr., XII: 214.

Body smooth; eyes lacking. Antennae very short and arranged above head; antenna 1 slightly longer than antenna 2; segment 1 of its peduncle as long as 2nd and 3rd segments together, segment 2 longer than segment 3; upper and lower margins of first two segments of peduncle form short teeth; flagellum 6-segmented, segment 1 as long as the two subsequent; accessory flagellum 1-segmented, shorter than half of segment 1 of main flagellum. Last segment of peduncle of antenna 2 shorter and narrower than the penultimate, flagellum almost as long as last segment of peduncle, 3-segmented. Mandibles without molar process; segment 1 of palp short, segment 2 two times longer than segment 3, at the apex of which is one thick seta. Outer plate of maxilla 1 with 9 tridentate spines and thin setae along inner margin; inner plate with 1 thick plumose and 1 thin short seta; segment 2 of palp almost 4 times as long as segment 1, with 3 short teeth, 1 seta at the apex, and 1 plumose seta on inner margin.

Inner plate of maxilla 2 with 8 plumose setae, considerably broader and shorter than the outer; outer plates with 8 - 9 long plumose apical setae. Maxillipeds with large inner and relatively short and broad outer paltes; inner plates reach slighlty beyond distal margin of segment 2 of palp and bear 3 plumose setae and 2 small teeth at the apex and 1 plumose seta on the lateral side of plate, near distal margin; outer plates with 4 plumose setae at the apex, short setae along the outer, and rounded tubercles along inner margin, and oblique series of setae along inner margin; palp short and thin; its segment 2 slightly longer than segment 3, segment 4 about 1/3 the length of segment 3.

Coxal plate 1 small, semicircular; coxal plate 2 two times as large, with convex anterior and concave posterior margins. Plate 3 trapezoidal, broadens distally, and covers both preceding coxal plates.

Figure 12A. *Paracyphocaris brevicornis* Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1955.

Figure 12B. *Paracyphocaris brevicornis* et M. Vinogradov. After Birstein and M. Vinogradov, 1955.

Gnathopod 1 simple; segment 6 narrower and 1.5 times shorter than gnathopod 5, tapers weakly distally, with straight margins, armed with setae; dactyl two times shorter than segment 6. Gnathopod 2 considerably longer and stronger than gnathopod 1; segment 6 two-times shorter than segment 5, narrowly oval, with short transverse palmar margin; dactyl much longer than palm, curved and leans against the posterior margin of hand. Peraeopods 1 - 3 with a well-developed subchela with locking spines, segment 6 of last two peraeopods simple, linear. Basal segments of peraeopods 3 - 5 with broad wing-shaped broadening with small lobe at distal end; basal segment of peraeopod 4 longest, its width is almost 1.5 times larger than its length. Peraeopod 4 shorter than peraeopod 5. Postero-distal angle of epimeral plate 3 straight, blunt at the apex. Uropods 2 and 3 terminate at one level, uropod 1 does not reach this level; outer rami i and 2 of uropods slightly longer than the inner; ends of both rami with a constriction, armed with a large spine at the apex of rounded lobe of the broader part of ramus; inner margin of both rami in both pairs of uropods densely covered with spinules which do not reach the end of ramus.

Rami of uropod 3 lanceolate, inner shorter than the outer, inner margin of both rami with plumose setae, outer margin of the outer ramus bears 2 spinules; tip of inner ramus bears fine setae. Telson broadened to 2/3 the length, elongated, with rounded margins, its width 1.5 times smaller than its length; apex of lobes with a notch, each of which has 1 spine and 1 seta. Carmine-red when alive. Up to 9 mm long.

Obtained from the Kuril-Kamchatka depression in the northern part of the Pacific Ocean in samples from 0 to 5500 m and from 0 to 7000 m deep. The accurate depth of habitat unknown.

Judging by the structure of peraeopods 1 - 3, it leads a parasitic way of life.

6. The Genus METACYCLOCARIS Birstein et M. Vinogradov, 1955.

Birstein and M. Vinogradov, 1955. Tr. Inst. Oceanogr. XII: 217.

Coxal plate 1 small and covered above with plate 2. Accessory flagellum of antenna 1 thin, 3-segmented. Flagellum of both antennae with calceoli. Mandibles lacking molar process, with long

3-segmented palp armed with numerous setae. Inner plate of maxilla 1 with 5 plumose setae. Inner plate of maxilla 2 shorter but broader than the outer, both armed distally with spines dentate on one side. Outer plates of maxillipeds broad, armed with setae and teeth. Gnathopod 2 considerably longer than gnathopod 1; segment 6 strongly elongated, linear, more than half the length of segment 5 and longer than both segment 3 and segment 4; dactyl short and thick. Peraeopods 1 - 5 with subchela; basal segment of peraeopods 3 - 5 broadened, with a rounded lobe at the postero-distal angle of wing. Outer ramus of uropods 1 and 2 shorter than the inner. Inner ramus of uropod 3 shorter than the outer. Telson triangular, elongated, deeply cleft; at the apex of lobes is a notch with 1 apical seta in it. 1 species known.

1. *Metacyclocaris polycheles* Birstein et M. Vinogradov, 1955 (Figure 13).

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanogr., XII: 218, Figure 6 and 7.

Body smooth, with strongly inflated metasome; urosomal segment 2 with a tooth directed backward; eyes lacking. Antenna 1 1.5 times shorter than antenna 2; segment 1 of peduncle almost square, longer than segments 2 and 3 together; flagellum much longer than peduncle; its segment 1 very long, longer than peduncle and longer than remaining 8 segments together, and, contrary to majority of other species of the family, armed with thin setae not on the lower but the upper margin; accessory flagellum thin, 3-segmented, shortern than segment 1 of main flagellum; it is characteristic that also segment 1 of accessory flagellum bears thin setae on upper margin. Segment 1 of antenna 2 with a broad round lobe, segments 2 and 3 short, segment 5 considerably longer than segment 4 and equals the length of the first four segments together; flagellum long multisegmented (in adult ♀♀ 24-segmented). Coxal plate 2 much larger than small plate 1, its depth more than 2 times higher than the latter. Depth of plates 3 and 4 exceeds their width. Posterior margin of plate 4 with a weak notch, plates 5 - 7 rectangular. Gnathopod 1 small, with imperfect subchela; segment 6 tapers distally, its length more than 2 times its width; segment 5 slightly longer than segment 6; dactyl short, thick, finely dentate along inner margin and with 1 accessory tooth; gnathopod 2 long, almost two times as long as gnathopod 1; segments 5 and 6 linear; segment 6 almost 1.5 times shorter than segment 5; there are groups of long setae along posterior margin of both segments, 4 groups in segment 5 and 5 groups in segment 6. All 5 peraeopods have a subchela with shortened segment 5, an enlarged amygdaloidal segment 6, and a long thin bent dactyl, which adjoins the strongly oblique convex palmar margin armed with groups of spines; dactyl of peraeopod 5 relatively shorter than in the preceding, while segment 6 approximates linear form. Basal segment of peraeopods 3 - 5 with a wing-shaped broadening and small distal lobe; posterior margin of head smooth. Postero-distal angle of epimere rounded. Outer ramus of uropods 1 - 2 shorter than the inner; outer margin of both rami and inner margin of inner ramus with deep notches which contain spines; moreover, outer margin of inner ramus and inner margin of outer ramus densely covered with spinules. Rami of uropod 3 lanceolate; inner ramus as long as segment 1 of outer ramus; apical segment of outer ramus about one half the length of segment 1; margins of inner ramus and inner margin of outer ramus fringed with minute spinules. Telson elongated-triangular, cleft more than 3/4; pointed lobes with a notch at the apex, which contains 1 apical seta; there are 2 pairs of marginal spines. The animal is greenish in formalin. Maximum length 13 mm (sexually mature ♀).

Found in the Kuryl-Kamchatka depression in the sample from 0 - 6200 m.

Figure 13. *Metacyclocaris polycheles* Birstein et M. Vinogradov. After Birstein and M. Vinogradov, 1955.

7. The Genus *METACYPHOCARIS* Tattersall, 1906.

Tattersall, 1906, Fish., Ireland, Sci. Invest. 1905, No. IV: 29.

Close to the preceding genus, *Paracyphocaris* Chevreux, since, contrary to Tattersall's description, mandibles have a small, rudimentary 2-segmented palp (K.H. Barnard, 1932). Peraeon segment 1 normal, but the very small head forms a frontal process to the lower part of which is attached antenna 1. Two anterior coxal plates are very small and covered by the large expanding coxal plate 3. Mandibles lacking molar process, with a very strongly reduced 2-segmented palp, which sometimes disappears or is preserved only in the form of a tubercle. Palp of maxilla 1 two-segmented, with acicular spines at the apex, their inner plates are small, with 2 plumose setae at the apex of each. Plates of maxilla 2 with plumose setae on inner margin, inner ramus slightly shorter than the outer. Maxillipeds with a 4-segmented palp and large broad outer plates along the inner margin of which, at the distal end, there are 2 strong setae; inner plates small, at the apex of each of them are found 2 teeth. Antenna 1 with reduced, very small 1-segmented accessory flagellum; both antennae with a short 4-segmented flagellum, at the end of which there is 1 long apical seta. Gnathopod 1 weak, simple, considerably weaker and shorter than gnathopod 2. Peraeopods 1 - 3 with a well-developed subchela. Uropods biramose, but inner ramus in uropod 3 rudimentary, very small. Telson cleft only at the apex.

Only 1 species known.

1. *Metacyphocaris helgae* Tattersall, 1906 (Figure 14).

Tattersall, 1906, Fish., Ireland. Sci. Invest. 1905, No. IV: 29, pl. III, f. 1, pl. IV; Schellenberg, 1926, Deutsch. Tiefsee-Exp., XXIII: 216, f. 26c, 27; 1927, Nord. Plankton, 20: 666, f. 60; K.H. Barnard, 1932, Discovery Rep., V: 37, f. 5; Thorsteinson, 1941, Univ. Washington Publ. Oceanogr., 4, No. 2: pl. 3, f. 31 - 39;

Birstein and M. Vinogradov, 1958, Tr. Inst. Oceanogr.,XXVII: 222.

Head very short, with a frontal process and a shallow, but elongated below, upper-antennal notch; interantennal lobe small, lower-antennal notch large, lateral head lobes strongly drawn downwards and rounded. Eyes lacking. Antennae short; antenna 1 attached to the lower surface of the frontal head process, shorter than antenna 2, segment 1 of peduncle as long as segments 2 and 3 together, flagellum shorter than peduncle, 4-segmented; at its end is a long seta; accessory flagellum 11-segmented, scarcely visible. Peduncle of antenna 2 longer than entire antenna 1, its last segment as long as the penultimate, flagellum 4-segmented, considerably shorter than peduncle and also bears a long apical seta. On urosome segment 1, there is a dorsal process, directed backwards. Coxal plates 3 and 4 large; first of them with frontal part drawn forward which overlaps preceding plates; notch on posterior margin of plate 4 small, only in upper part of posterior margin. Gnathopod 1 simple, its segment 6 slightly shorter and narrower than segment 5; gnathopod 2 almost two times as long as gnathopod 1; its segment 6 oval, two times shorter than segment 5, dactyl very small. Peraeopods 1 - 3 with a well-developed subchela; their segment 6 broadened and armed with an oblong series of strong spines along inner margin, dactyl long and falcate. Basal segment of peraeopods 3 - 5 with a well-developed wing-shaped broadening; its segment 6 long, linear, dactyl long, straight. Both rami of uropods 1 and 2 of same length, each with a small spinule near distal pointed end. Uropod 3 with a short peduncle; its inner ramus very short, rudimentary; outer ramus long, reaches the level of the end of rami in uropod 2, two-segmented, armed with plumose setae along the inner and with spinules along the outer margins. Telson elongated, cleft only at the very end; at the apex of each lobe, there are 2 setae and 1 spine. In alcohol, the body is coral-red; plates are thin; the animal is up to 17 mm long; apparently, a parasitic form, a blood-sucker (Barnard, 1932).

Figure 14. *Metacyphocaris helgae* Tattersall. After Tattersall, 1906.

Has been known in the Davis Strait and the North Atlantic Ocean (depths 1200 - 400 m), near the shores of western and southern Greenland, from the region of Madeira Island, Bermuda Islands, Gulf of Guinea, southern part of the Atlantic Ocean and Indian Ocean. In the Pacific Ocean found in its tropical part and in the Alaska Strait, at a depth of 1000 m, and also in the area between 30 and 44° n. lat. in plankton samples in the layer from 0 - 200 and 246 - 675 m and in the quantitative sample from 4990 to the surface.

This is a bathypelagic, parasitic species.

8. The Genus CRYBELOCEPHALUS Tattersall, 1906.

Tattersall, 1906, Fish., Ireland, Sci. Invest. 1905, No. IV: 32.

Head with a frontal process; upper antennae attached to the lower surface of the latter. 2 anterior coxal plates small, plates 3 and 4 strongly developed, very large. Coxal plate 3 overlaps only coxal plate 2 and the postero-distal angle of plate 1; plate 4 with a deep notch on posterior margin and large libe in posterior lower half of the plate. Antenna 1 without accessory flagellum. Mandibles devoid of maolar process and palp. Maxilla 1 with 1 plumose seta on inner plates two-segmented palp with 2 spines at the apex. Maxilla 2 with inner plate which is slightly shorter than the outer. Inner plate of maxillipeds very small, hardly reaching base of palp, outer plates well-developed, palp 4-segmented. Gnathopod 1 very weak, thin, short, simple; gnathopod 2 large, stronger and larger than in other representatives of the family. Peraeopods 1 and 2 with a strong, well-developed subchela. Peraeopods 4 - 5 normal, with a broadened basal segment, but in peraeopod 3 basal segment almost linear. All three uropods well developed, biramose; both rami of uropod 3 two-segmented. Telson large, entire. Body plate thin.

Only 1 species known.

1. <u>Crybelocephalus</u> <u>megalurus</u> Tattersall, 1906

(Figure 15)

Tattersall, 1906, Fish., Ireland. Sci. Invest. 1905, No. IV: 33, pl. III, f. 2, pl. V; Schellenberg, 1927, Nord. Plankton, 20: 669, f. 62; Shoemaker, 1945, Zoologica, Sci. Contr. New York Zool. Soc., 30, p. 4: 189, f. 3; Birstein and M. Vinogradov, 1958, Tr. Inst. Oceanogr., XXVII: 223, Figure 2.

Eyes lacking. Antennae very short; head with obliquely truncate lower margin, without lobes. Segments unequal in size, peraeon segment 3 larger than any remaining. Postero-distal angle of all three pairs of epimeral plates rounded. Segment 1 of peduncle in anntenna 1 shorter than segments 2 and 3 together, flagellum 4-segmented, shorter than peduncle. Antenna 2 slightly longer than antenna 1, peduncle longer than 4-segmented flagellum. Outer plates of maxilla 1 with 6 - 8 spines at the apex and setae along inner margin. Maxillipeds have broad plates with strong plumose setae on outer margin, inner plates with 2 setae at the apex. Gnathopod 1 small, simple, very weak; segment 6 as long as segment 5. Gnathopod 2 two times as long as gnathopod 1; segment 5 strongly elongated, segment 6 two times shorter than segment 5, bent along inner margin and tapers distally, dactyl small, scarcely discernible among long setae. Peraeopods 2 and 3 with large basal segment broadening distally, as long as segments 3, 4, and 5 together, segment 4 relatively short, inflated at the end, segment 5 very short, cup-like; segment 6 longer than segments 4 and 5 together, with convex anterior and straight posterior margins, armed with strong inflated raptorial spines at the distal end; dactyl small, curved, with dentate inner margin. Last three peraeopods longer but weaker than peraeopods 1 and 2; basal segment of peraeopod 3 enlarged, but almost linear, weakly broadened in peraeopods 4 and 5; segment 6 of all last three peraeopods linear, dactyl weakly bent. Rami of uropod 2 almost same in structure, there are 2 spines in the middle of the outer margin of ramus; inner margin of rami in both uropods with spinules. Rami of uropod 3 also almost equal in length, both two-segmented and reach the level of the end of rami in uropods 1 and 2. Telson very large, triangular, with rounded apex. Its width at the base equals the length, at the apex is found a pair of apical setae. The animal is up to 11 mm long. The plates are thin, semi-transparent, the colour is whitish or carmine-red. Bathypelagic species, parasitic.

Distributed in the northern part of the Atlantic Ocean at depths of about 2000 m, near the Bermuda Islands (600 - 900 m). In the Pacific Ocean discovered south of 43° n. lat. in samples from 7250 to 5700 m. to the surface.

*9. The Genus CRYBELOCYPHOCARIS Shoemaker, 1945

Shoemaker, 1945, Zoologica, Sci. Contr. New York Zool. Soc., 30, p. 4: 189.

Head very short and high, with a conical frontal process and lateral lobes strongly elongated downwards. Coxal plate 1 much smaller than subsequent ones, but not overlapped by plate 2 and seen freely laterally. Antenna 1 without accessory flagellum. Palp of mandibles 3-segmented, but reducing, lacks molar process. Both plates of maxillipeds well developed, palp four-segmented; there are long setae along the outer margin of the outer plates, and plumose setae along the inner margin of the inner plates. At the apex of outer lobes of lower lip, there are clusters of thick setae; inner lobes lacking. Palp of maxilla 1 two-segmented, inner lobe with 2 setae. Inner plate of maxilla 2 shorter and broader than the outer; its inner margin with plumose setae. Gnathopod 1 short, weak, simple. Gnathopod 2 considerably longer and stronger, normal in structure. First three peraeopods with a well-developed subchela, two last ones normal in structure, considerably longer than the three preceding ones. Two last urosome segments merge with one another. Uropods 1 and 2 normal, biramose. Uropod 3 biramose, its inner ramus small, reduced. Telson inflated, entire.

Only 1 species known.

*1. *Crybelocyphocaris tattersalli* Shoemaker, 1945 (Figure 16).

Shoemaker, 1945, Zoologica, Sci. Contr. New York Zool. Soc., 30, 0.4: 191c f. 4, 5.

Body with thin plates, semitransparent. Head free, but, apparently, may be drawn in peraeon segment 1; eyes lacking. Antenna 1 with a short four-segmented flagellum, equal in length to segments 2 and 3 of peduncle, which at the end bears a long apical seta. Last segment of peduncle in antenna 2 longer than the penultimate, flagellum three-segmented, shorter than last segment of peduncle, with a long apical seta.

Segment 3 of palp in mandibles very small, poorly visible, and bears a thin seta at the apex.

Figure 15. *Crybelocephalus megalurus* Tattersall. After Tattersall /"1906" ? (See the original, p. 82. Translator)/

Figure 16. *Crybelocyphocaris tattersalli* Shoemaker. After Shoemaker, 1945.

Segment 6 of simple and weak gnathopod 1 shorter than segment 5, tapers distally, segment 7 curved. Segment 6 of gnathopod 2 much shorter than segment 5, dactyl considerably longer than the short oblique palmar margin. Segment 6 in raptorial peraeopods 1 and 2 strong, elongated-oval; its palmar margin armed with a series of short strong spines, dactyl strong, curved, closely closing upon spines of segment 6 when capturing prey. Peraeopod 3 slightly shorter than peraeopod 2 and resembles in structure both preceding peraeopods, but the spines on segment 6 weaker. Peraeopod 4 longer than peraeopod 3, but shorter than peraeopod 5; dactyl in both last peraeopods long, weakly bent, distal segments of leg linear, armed with pointed spines, basal segments with a wing-shaped broadening.

Pleon segments enlarged; postero-distal angle of epimeral plates rounded. Outer rami of uropods 1 and 2 armed with spinules along inner margin, peduncle in both pairs longer than rami. Peduncle of uropod 3 thick, considerably shorter than in preceding uropods, outer ramus slightly longer than peduncle, with 4 curved spines along inner margin; inner ramus about half the length of segment 1 of outer ramus, pointed distally and armed with long plumose setae along inner margin. Telson fleshy, broadly triangular, with rounded apex reaching the level of the middle of outer ramus in uropod 3. The animal is up to 12 mm long.

Bathypelagic parasitic species found near the Bermuda Islands in the Atlantic Ocean (1200 m deep). Not yet discovered in the Pacific Ocean.

10. The Genus <u>CYCLOCARIS</u> Stebbing, 1888

Guryanova, 1951: 181.

Two species known. Both species discovered in the Pacific Ocean.

1 (2). Height of coxal plate 1 larger than its width; inner ramus of uropod 3 considerably shorter than the outer; apex of each of the lobes in telson extended into a tooth along the inner margin; lower margin of wing of basal segment of peraeopod 5 at the level of distal end of segment 3.....1. *C. tahitensis* Stebbing, 1888.

2 (1). Depth of coxal plate 1 smaller than its width; rami of uropod 3 of equal length; apices of telson's lobes become simply pointed distally; lower margin of wing in basal segment of peraeopod 5 below the level of the distal end of segment 3.....2. *C. guilelmi* Chevreux, 1899.

1. *Cyclocaris tahitensis* Stebbing, 1888 (Figure 17).

Stebbing, 1888, Rep. Vey. Challenger, 29: 664, pl. XVIII.

Eyes lacking (?). Head short and high, with weak antennal lobe. Coxal plate 1 tapers distally. Antenna 1 considerably shorter than antenna 2, last two segments of peduncle short, together shorter than segment 1; segment 1 of flagellum powerful, longer than peduncle, accessory flagellum 6-segmented, longer than segment 1 of main flagellum. Last segment of peduncle of antenna 2 slightly longer than the penultimate, flagellum with up to 25 segments. Mandible in its distal third of body dentate. Gnathopod 1 simple;

segment 6 narrow, linear, slightly tapering distally, equals the length of, but narrower than segment 5, armed with setae along margins; dactyl short, weak, pointed. Gnathopod 2 with pointed segment 3, which is only slightly shorter than segment 5, slightly tapers distally. Coxal plate 3 with strongly convex anterior margin, covers plate 2 and posterior part of plate 1, in the distal third of its posterior margin are spines. Coxal plate 4 considerably broader than the preceding, with a deep notch on posterior margin, and with rounded angles. Basal segments of peraeopods 3 - 5 with spinules along anterior margin and dentate posterior margin; in peraeopod 3, basal segment with seimicircular wing, in peraeopod 4 the wing with oblique postero-distal angle, in last peraeopod the wing oblong-oval. Urosome segment 1 with a saddle-shaped depression, segment 3 with a pair of lateral oblong keels overhanging the base of telson. Rami of uropod 3 longer than peduncle, narrowly lanceolate; outer two-segmented ramus longer than inner. Telson tapers distally, cleft almost to the base, bearing on margins lateral spines at the base of apical tip; at the apex of each lobe, a small notch and setae. Length about 10 m.

Figure 17. *Cyclocaris tahitensis* Stebbing. After Stebbing, 1888.

Figure 18. *Cyclocaris guilelmi*. Arctic basin.

Captured with a plankton net in the Pacific Ocean in the area of the Tahiti Islands from a depth of about 800 m. A bathypelagic species.

2. Cyclocaris guilelmi Chevreux, 1899 (Figure 18).

Norman, 1900, Ann. Mag. Nat. Hist., (7), V: 197, t. 6, f. 5 - 15 (Faroënsis) Guryanova, 1951: 181, Figure 53; Birstein and M. Vinogradov, 1955. Tr. Inst. Oceanogr., XII: 222, Figure 8.

Earlier known only in high Arctic regions of the Arctic basin, this pecies has been discovered in the northern part of the Pacific Ocean, in the Kuril-Kamchatka depression, at depths ranging from 500 to 4000 m, in the open part of the ocean north of 40° n. lat. in samples at depths of 500 to 400 m. and in quantitative samples of 4500 - 8000 m to the surface.

11. The Genus HIRONDELLEA Chevreux, 1889

Chevreux, 1889, Bull. Soc. Zool. France, XIV: 285; 1900, Res. Camp. Sci., Monace. XVI: 20; 1910, Bull. Inst. Oceanogr., Monaco, No. 156: 1; Stebbing, 1906, Tierreich, Berlin, 21: 16; Stephensen, 1923, Ingolf-Exp., III, No. 8: 63 (Tetronychia); Schellenberg, 1926, Deutsche Südpolar-Exp., XVIII, Zool., X: 251 (Tetronychia); K.H. Barnard, 1930, Terra-Nova Exp., VIII, No. 4: 319, Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanogr., XII: 228 (Tetronychia), 1958, Tr. Inst. Oceanogr., XXVII: 230.

Chevreux assigned 2 bathypelagic series from the Atlantic Ocean to this genus; later Stephensen described a third one, also from the Atlantic Ocean, and also bathypelagic species, having defined it as a type of the new genus Tetronychia. The most important characters of this latter genus Stephensen considered the following: 1) relatively broad inner plate of maxilla 1, armed with 2 setae, of which the lateral has a very broad base; 2) an almost triangular coxal plate 1 whose height is almost two times smaller than the depth of plate 2; 3) broad segment 6 of gnathopod 1 which forms a subchela; 4) a long curved dactyl of gnathopod 1 which has 4 - 3 accessory teeth on inner margin (this feature served as a basis for the designation of this genus). In 1926, Schellenberg described one more species from the Antarctic, which was assigned to Stephensen's genus Tetronychia and, after having specified the diagnosis of this genus, he pointed out the following features: 1) short antennae of equal length; 2) long accessory flagellum of antenna 1; 3) high concave epistome; 4) mandibular incisor toothed; 5) attachment of the palp of mandibles across the molar process; 6) segment 1 of the palp of mandibles considerably shorter than segment 2; 7) blunt inner plate of maxilla 1 with 2 apical setae the outer of which has a very thick base; 8) broad palp of mandible 1; 9) bearing setae along the inner margin, inner plate of mandible 2 shorter, but much broader than the outer; 10) low coxal plates; 11) coxal plate tapers distally; 12) concave transverse palmar margin of segment 6 in gnathopod 1; 13) narrow metacarpus of gnathopod 2; 14) strongly broadened basal segment of peraeopods 3 - 5; 15) narrow straight segment 7 of peraeopods; 16) rami of uropod 3 of equal length; of these, segment 1 of the outer ramus has a tooth at the inner lower angle, and 17) short, partly cleft telson. Barnard, who has this species in his collection (it was described by Schellenberg), gives a supplementary description and drawings of oral parts and other appendages of this species and comes to the conclusion that the genus *Tetronychia* established by Stephensen is synonymous with the genus *Hirondellea* Chevreux. In 1955, Ya. Birstein and M. Vinogradov described a new species from the abyssal zone of the north-western part of the Pacific Ocean and assigned it to the genus *Tetronychia*. A thorough comparison using the description and figures of both Chevreux' species (*Hirondellea triocülata* and *H. bravicaudata*) with 3 species of *Tetronychia* (*T. abyssalis* Stephensen, *T. antarctica* Schellenberg and *T. gigas* Birstein et M. Vinogradov), gives us grounds to share Barnard's opinion and to join both genera in one. The reason for this is the almost identical structure of the oral parts in all 5 species and the general plan of the structure of gnathopods and appendages of the urosome. The characters - 1, 2, 6, 12, 13, 14, 15 and 16-pointed out by Schellenberg, do not have a generic value within the family Lysianassidae and serve merely as good diagnostic characteristic features, similar to character 4 given in Stephensen's diagnosis. All other characters, of truly generic significance, quoted in Stephensens's and Schellenberg's diagnoses of the genus *Tetronychia*, coincide fully with the characters of both species of Hirondellea Chevreux.

A more accurate diagnosis of this genus is as follows: the oral parts strongly project downward; the spistome high, convex, but does not protrude strongly beyond the upper lip. Head with broad, rounded, short interantennal lobes. Coxal plate 1 small, its height almost half the height of the following plate. Coxal plates 2 and 3 developed normally, plate 2 sometimes covers the postero-distal angle of the first plate; plate 4 with relatively weak development of the posterior lobe, plate 5 with two lobes along the lower margin. Accessory flagellum of antenna 1 well developed, longer than segment 1 of main flagellum. Antenna 2 as long or slightly longer than antenna 1. Mandibular incisors well-developed, 3-segmented long and relatively thin palp and large conical molar process bearing hairs and devoid of triturating surface. Maxilla 1 with two-segmented, well-developed large palp whose apical segment broad and armed with tooth-like spines along upper margin; along inner margin of strongly oblique outer plate, there is a dense series of hairs, apex armed with dentate spines; inner plate with 2 plumose setae the outer of which is longer than the inner, has a strongly broadened base and is densely covered with hairs along the inner margin. Maxilla 2 with plates of unequal size, inner shorter but considerably broader than outer. Maxillipeds with well-developed four-segmented palp; its last segment falcate; outer plates broad, oval, their apex does not reach the level of the end of segment 2 of palp; inner plates large with rounded apex and a dense series of plumose setae along inner margin. Gnathopod 1 with well-developed subchela; gnathopod 2 of the structure typical of this family. Basal segment of peraeopods 3 - 5 broadened, weaker than in other genera, tapers distally. All three pairs of uropods biramose, uropod 2 slightly shorter than uropod 1, its inner ramus frequently with a constriction at the distal end. Rami of uropod 3 well developed, their tips hardly attaining the distal end of uropod 3, outer ramus 2-segmented. Telson relatively short, cleft less than to the middle.

Genotype: H. trioculata Chevreux, 1889, Soc. Zool. France, XIV: 285 (Text Figure).

5 species of this genus known, all bathypelagic; 3 species in the Atlantic Ocean, 1 species in the Antarctic, and 1 species in the Pacific Ocean. 1 species in the northern part of the Pacific Ocean.

1 (2). There is a low medial dorsal keel along the body .....* H. Trioculata Chevreux, 1899.

(Atlantic Ocean, Azore Ilsnads region, 1236 m deep).

2 (1). Dorsal side smooth, lacking oblong medial keel.

3 (8). Dactyl of gnathopod 1 as long or longer than palmar margin of segment 6.

4 (5). Inner ramus of uropod 2 simple, without constriction, tapers distally uniformly.....* H. brevicaudata Chevreux, 1910.

Bull. Inst. Oceanogr., Monaco, No. 156: 1.

(Atlantic Ocean, subtropical latitudes, 5940 m deep).

5 (4). Inner ramus of uropod 2 with constriction at distal end.

6 (7). Dactyl of gnathopod 1 with 3 - 4 accessory teeth on inner margin.....* H. abyssalis (Stephensen, 1923).

Ingolf-Exp., III, No. 8: 63.

(Northern part of Atlantic Ocean, 1484 m deep).

7 (6). Dactyl of gnathopod 1 with smooth inner margin devoid of teeth or spinules.....* H. antarctica (Schellenberg, 1926).

Deutsche Südpolar-Exp., XVIII, Zool, X: 251.

(Antarctic, 170 366 m).

8 (3). Dactyl of gnathopod 1 at least two times as long as palmar margin of segment 6......1. H. gigas (Birstein et M. Vinorgradov, 1955).

1. <u>Hirondellea gigas</u> (Birstein et M. Vinogradov, 1955 (Figure 19).

Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanogr., XII: 228, Figure 11, 12 (<u>Tetronychia</u>); 1958, Tr. Inst. Oceanogr., XXVII: 230.

Body compact, lacking keel and spines, with hard plates. Antenna 1 shorter than antenna 2; segment 1 of their peduncle twice as long as two subsequent segments together, its width equals its length; flagellum 28-segmented (in young ♂); its segment 1 slightly shorter than the length of segment 1 of peduncle, but much longer than each of the subsequent segments of flagellum; accessory flagellum 8-segmented, considerably longer than segment 1 of main flagellum; segment 1 of accessory flagellum as long as segment 1 of main flagellum and bears setae along upper margin. 2 last segments of peduncle of antenna 2 of same length, bearing dense clusters of short setae; flagellum multisegmented. Coxal plate 1 very small, quadrangular, with slightly drawn forward antero-distal angle rounded at the apex. Plate 2 larger, also quadrangular and overlaps almost completely plate 1. Plates 3 and 4 very large, slightly broader distally. Last three coxal plates elongated- with lobes beginning to show on lower margin.

<u>Figure 19A</u>. <u>Hirondellea gigas</u> (Birstein et M. Vinogradov).

Figure 19B. Hirondellea gigas (Birstein et M. Vinogradov) juv. After Birstein and M. Vinogradov, 1955.

Gnathopod 1 small but strong, with broadened segments and weakly expressed subchela; segment 6 narrower and slightly shorter than segment 5, slightly tapers distally; palmar margin short, slightly oblique and weakly concave; palmar angle wanting locking spines, armed only with setae; basal segment with oblong rib which terminates in the form of a small lobe at the anterior angle of the distal end of segment; on distal margin of segment, there is a large spine bent backward; dactyl thick, considerably longer than palmar margin; on lower margin 5 accessory teeth and 4 setae in front of them. Gnathopod 2 long and thin; basal segment bears setae on anterior margin; segment 3 strongly elongated, longer than segment 4 and as long as segment 5; segment 6 almost twice as short as segment 5, elongated, with almost parallel margins; its palmar angle forms rounded lobe directed forward; dactyl, approximating palm, slightly extends beyond the palmar angle, strong and armed with setae on inner and outer sides.

Basal segment of peraeopods 1 and 2 broadens distally; segment 4 also heavy, broadens distally, it is almost as long as basal segment; dactyl strong, weakly bent, almost 3 times shorter than segment 6. Basal segment of last three peraeopods with well-developed wing-shaped broadening, but without lobe at postero-distal angle; remaining segments linear; only postero-distal angle of segment 4 drawn out in a small tooth-like lobe. Peraeopod 4 longer than peraeopod 5; basal segment of last peraeopod distainctly tapers distally, its posterior margin dentate. Epimeral plate 3 with straight rounded postero-distal angle. Uropod 1 with powerful peduncle considerably exceeding in length and width each ramus; its margins and both rami armed with spinules. Peduncle of uropod 2 relatively shorter; rami armed with spinules on margins (their ends broken off). Uropod 3 symmetrical, inner ramus shorter than the outer, equals its basal segment, its margins armed with spinules; outer ramus bears spinules only on outer margin, and is finely notched on inner side; its apical segment ½ segment 1, separated by oblique suture. Telson broad, cleft 1/3 the length, with 3 pairs of small thin dorsal setae. Live animals have lemon-yellow eye spots, which disappear when mounted. Up to 46 mm long.

The authors of the species described consider this species transitory between the genera of Tetronychia (Hirondellea) and Shisturella /Sic! Translator/ and are prone to unite these genera. However, we do not advise to do this, as the complex structure of branchial vesicles (in gnathopod 2 and peraeopods 1 and 2 they have transverse folds on both sides, and in the last three peraeopods, a sausage-like lobe) is characteristic of the only representative of the genus Schisturella: the structure of branchial vesicles in two described species Tetronychia, on the other hand (similar to Chevreux' species - Hirondellea), remains unknown, while the branchial visicles of T. antarctica have an accessory lobule, and not folds. Moreover, the males of Schisturella bear calceoli on their antenna, which, apparently, is not the case in Tetronychia (Hirondellea).

H. gigas were obtained from the north-western part of the Pacific Ocean, in the Kuril-Sakhalin depression, at depths of from 6400 to 9000 m and in the Japanese depression, at a depth of 7200 m.

90 - 140

Gurjanova (1962)

pp. 93 - 125

12. The Genus PSEUDALIBROTUS Della-Valle, 1893.

Guryanova, 1951: 183.

2 species of this genus have been obtained in the Pacific Ocean.

1. *Pseudalibrotus biralai* Gurjanova, 1929.

Guryanova, 1951: 186, Figure 56.

The species is widley distributed in the desalinized regions of Siberian seas; a few specimens have been found in the Pacific Ocean, Bering Sea, Gulf of Anadyr.

2. *Pseudalibrotus nanseni* G. Sars, 1900.

Guryanova, 1951: 189, Figure 59.

High arctic pelagic species, distributed circumpolarly in high latitudes of the Arctic; in the sub-Atlantic sector of the Arctic it spreads to the south, the northern coast of Iceland; a few specimens have been obtained at the eastern coast of Kamchatka, in the Bering Sea.

13. The Genus KOROGA Holmes, 1909.

Guryanova, 1951: 191.

Only 1 species known.

1. Koroga megalops Holmes, 1909 (Figure 20).

Guryanova, 1951: 192, Figure 62.

Amphiboreal species, distributed in the northern Atlantic Ocean. Known from the Indian Ocean (at the coasts of Arabia). Discovered in the Pacific Ocean northwards of 40° n. lat.: at the western coast of North America (Alaska Strait) at a depth of about 700 m, in the western abyssal part of the Bering Sea, and in the Kurile-Kanchatka depression. Obtained also from plankton are samples in the open part of the ocean and in the Sea of Okhotsk, near Terpeniya Peninsula, south Sakhalin (500-0 m), in plankton sample of 200 to 0 m at the fourth Kurile Strait.

14. The Genus HIPPOMEDON Boeck, 1871.

Boeck, 1871, Forh. Selsk. Christian., 1870: 102; Stebbing, 1899, Ann. Mag. Nat. Hist., (7), 4: 206 (Paratryphosites).

According to the carcinologists of the end of the 19th century - G. Sars, in particular - this genus, established by A. Boeck for the Atlantic species, and first of all for Anonyx holbölli Kröyer, 1846, included 7 species, viz.: H. holbölli (Kr.), H. denticulatus (Sp. Bate), E. propinquus G. Sars, H. robustus G. Sars, H. abyssi (Goës), H. kergueleni Stebbing, H. geelongi Stebbing.

However, in 1899, Stebbing transferred H. abyssi (Goës) to an independent genus, Paratryphosites Stebbing, 1899, having specified its diagnosis in his world summary on the amphipods (Stebbing, 1906, Tierreich, Berlin, 23: 42) and at that time included his species Platamon longimanus, described in 1888, in the genus Hippomedon. New species of the genus Hippomedon were described after 1906, from the Sea of Japan, which we described in 1938, was assigned to the genus Paratryphosites (P. minusculus Gurjanova, 1938). Having analyzed all the known species of the genus Hippomedon and both species of the genus Paratryphosites, we have come to the conclusion that there are no reasons whatsoever for the designation of the genus Paratryphosites as independent and that with the specification of the diagnosis of the genus Hippomedon, P. abyssi and P. minusculus should be included in the genus Hippomedon. In 1906, Stebbing considered the following as characteristic features of the genus Paratryphosites: 1) the presence of an acute tooth-like process at the postero-distal angle of epimeral plate 3; 2) large, protruding forward molar process of mandibles; 3) attachment of the palp of mandibles above the level of the molar process; 4) long segments 2 and 3 of the palp of mandibles; 5) 5 setae on the inner plate of maxilla 1 6) outer plates of maxillipeds, with tooth-like spines along their inner margin, extending beyond the distal end of segment 2 of the palp; 7) peraeopod 4 exceeding the length of last peraeopod. All the other characters introduced by Stebbing in the diagnosis of the genus Paratryphosites (i.e. the relative size of segment 1 of the flagellum of antenna 1, the relative length of segments 4 and 5 of the peduncle of antenna 2, and segments 5 and 6 of gnathopods 1 and 2, the broad basal segments 3 - 5 of peraeopods, the broadened segment 4 of peraeopods 3 and 4, the spinules on the rami of uropod 3 and the relative length of their rami, the size of cleft, and the number of apical spinules of telson) do not play any generic role in the family Lysianassidae and remain only as reliable characters of the genus. Tazonomically, all these characters are of only diagnostic value, and a number of them varies even in the specimens of one and the same species, depending especially on the age. While diagnosing Hippomedon, Stebbing makes the same mistakes by using as generic the features of only specific importance. Moreover, the diagnosis of the genus Hippomedon made by Stebbing duplicates almost completely the diagnosis of the genus Paratryphosites. According to Sars' diagnosis, 1895, the characteristic features introduced by Stebbing in the diagnosis of the genus Hippomedon, new as compared with the diagnosis of Paratryphosites, are the presence of calceoli on antennae in the male and the complex structure of branchial vesicles. This, namely, should be regarded as the sole true distinguishing features between the genera of Paratryphosites and Hippomedon, according to Stebbing. The study of P. abyssi from abundant material from the Chuckchee Sea and the seas from the Far East revealed that both these characters, i.e. the calceoli in ♂ and the structure of branchial vesicles, are also present in both species of the genus Paratryphosite - P. Abyssi and P. minusculus. Thus, the genus Paratryphosites Stebbing should be reduced to the synonym of the genus Hippomedon. A careful study of 14 species from collections and of the remaining specimens from the literary sources caused us to review the old diagnosis of this genus and make a new one. The most accurate diagnosis of the genus Hippomedon is found in Sars.

Figure 20. Koroga megalops Holmes. Southern part of the Sea of Okhotsk, ♀.

Body elongated, somewhat compressed on sides, with deep coxal plates; abdominal region relatively strong; head narrow, almost cylindrical, with an underdeveloped, for the most part lacking, lower-antennal sinus; eyes imperfect, sometimes provided with horny lenses, for the most part lacking. At the distal end of segment 1, and often on segment 2 of the peduncle of antenna 1, there is a carinate process or a peaked shield, overlapping the base of the next segment. Calceoli usually present in the male. Mandibles short, powerful, with a strong palp and a powerful cylindrical molar process with a triturating surface; palp attached in front and above the level of the molar process; segment 3 of palp long, as long as or longer than segment 2. Palp of maxilla 1 with a broad distal segment whose upper margin bears a fringed row of densely arranged tooth-like spinules; inner plate bears plumose apical setae (from 2 to 8). Plates of maxilla 2 short and broad, inner slightly shorter than the outer, and along its inner margin, there are plumose setae. Maxillipeds short and powerful, with a well-developed 4-segmented palp; outer plates broad and long, their apex reaches beyong the distal end of segment 2 of the palp; inner margin of outer plates bears short tooth-shaped spines; inner plates also large, their apex reaches the level of the middle of segment 2 of the palp; along the inner margin, there are long plumose setae. Gnathopod 1 with underdeveloped subchela, palmar margin not always delimited from the inner end of the hand; locking spines often lacking. Gnathopod 2 long, thin, with elarged segment 3, which frequently is longer than segment 4. Peraeopod 4 longer than peraeopod 5; first two peraeopods have long thin dactyls; last three ones with a well developed wing-shaped expansion. Epimeral plate 3 with a sharp tooth-shaped expansion. Epimeral plate 3 with a sharp tooth-shaped process at the postero-distal angle. Branchial vesicles complex; usually, gnathopod 2 and peraeopods 1 and 2 have simple branchial vesicles; peraeopods 3 and 4 have 1 - 2 sausage-shaped accessory lobes and invaginations and folds on the surface of the main vesicle; the branchial vesicle of peraeopod 5 usually either very small, or it disappears completely. Uropod 2 usually shorter than uropod 1; as a rule, the ends of the rami of uropod 3 extend beyond the level of the ends of the rami of the first two uropods. Outer ramus of uropod 3, except for one species (_H._ _umbiguus_ Ruffo), has apical segment (2nd). Telson always cleft, bears apical spinules and frequently either marginal or dorsal spines. Almost as a rule, tegument has specific sculpture - reticulation or striation, microscopic spinules or hairs. Most characteristic of the genus is the structure of mandibles, maxillipeds, branchial vesicles, and the presence of the sculpture in the tegument.

Figure 21. Hippomedon (?) coecus (Holmes). After Holmes, 1909. /Sic! Translator/

Genotype: H. hobölli (Kröyer, 1846).

Known are 35 species, 1 subspecies, and 2 forms, including also the new forms here described from the same of the Far East; it is possible that Tryphosa coeca Holmes, 1909 (Figure 21) belongs to this same genus, since the structure of the mandibles, maxillipeds, coxal plate 1 (the anterior margin strongly convex), and epimeral plate 3, as well as that of gnathopods 1 and 2, and of peraeopods corresponds to the genus Hippomedon, and not to Tryphosa; unfortunately, the description here is inaccurate, the number of the figures insufficient, the structure of the branchial vesicles and the sculpture of the tegument not mentioned, which fact prevents us from assigning this Holmes' species to the genus Hippomedon. At any rate, there is no doubt that it is not a Tryphosa.

Our collections contain specimens of H. serratus Holmes from the northern part of the Atlantic Ocean, the description of which and rather more accurate figures we decided to present here in connection with a new diagnosis of the genus. Moreover, there is a new speices of the genus from the Greenland Sea, which also is described here, as we examined this genus in its entirety.

1 (6). Eyes provided with a shiny horny lens.

2 (3). Urosome sugement 1 with a dorsal keel terminating in a blunt angle at the posterior end; surface of the tegument on the head and on the dorsal surface of the body segments covered with thin oblong striae, especially distinct on the head and on the first three pleon segments.....1. H. Holbölli (Kröyer, 1846).

3 (2). Urosome segment 1 has either a low keel rounded at the distal end, or it lacks the oblong dorsal keel completely; tegument lacks the striated sculpture.

4 (5). Urosome segment 1 with a low dorsal keel rounded at the end; tegument smooth, lacks specific sculpture, palmar margin of segment 6 of gnathopod 1 without locking spines.....* H. rylovi Gurjanova, 1933.

Zool. Anz., 103, H. 5/6: 119, Abb. 1.

(Arctic Ocean).

5 (4). Urosome segment 1 lacks oblong dorsal keel; tegument covered with alveolar sculpture; palmar margin of segment 6 of gnathopod 1 with 2 locking spines.....* H. gorbunovi Gurjanova, 1930.

Zool. Anz. 86, H. 9/10: 247, Abb. 1.

(Arctic Ocean).

6 (1). Shiny horny eye lenses lacking.

7 (30). Eyes present; in live specimens, they are orange or reddish; in fixed, colourless, sometimes with traces of yellowish pigment.

8 (9). Eyes well developed, small, rounded, set on inter-antennal lobes. The antero-distal angle of epimeral plate 1 drawn out forward and forms a small tooth; the postero-distal angle of epimeral plate 2 drawn out, and also forms a pointed tooth; the postero-distal angle of epimeral plate 3 forms a large sharp tooth, without a sinus above its base.....* _H. oculatus_ Chevreux et Fage, 1925.

Faune de France, 9: 52, f. 35, 36.

(Mediterranean Sea).

9 (8). Eyes underdeveloped, with poorly differentiated facets, strongly enlarged along the vertical, set behind the inter-antennal lobes, on the sides of head.

10 (17). There is a deep slit-shaped sinus or notch above the base of a large tooth-shaped process of the postero-distal angle

of epimeral plate 3.

11 (12). On the upper surface, the peduncle of uropod 2 bears an oblong keel which, becoming rather higher at the distal end, overhangs the base of the rami; the apices of the telson's lobes truncated and bear three apical spines each on the straight posterior margin. Segment 6 of gnathopod 1 slightly longer than segment 5; basal segments of peraeopods 3 - 5 oval, with a slightly toothed hind margin.....* H. incisus K.H. Barnard, 1930.

Terra-Nova esp., VIII, No. 4: 325, f. 5.

(New Zealand, depth: 10m).

12 (11). The dorsal surface of the peduncle of uropod 2 without a keel; apices of telson pointed, with 1 apical spine on each.

13 (16). Tegument elastic, semitransparent, with a thin punctate sculpture; segment 1 of the flagellum in antenna 1 bears only clusters of thin sensitive setae on the lower surface; segment 1 of the peduncle of antenna 1 with a keel-shaped process overhanging the subsequent segment; accessory flagellum shorter or as long as segment 1 of the main flagellum.

14 (15). Basal segment of peraeopod 5 uniform in width; rami of uropod 3 long and narrow.....* H. denticulatus denticulatus

(Bate, 1857).

(Northern part of the Atlantic Ocean and the sub-Atlantic sector of the Arctic).

15 (14). The basal segment of peraeopod 5 distinctly tapering; the rami of uropod 3 relatively shorter, broad, lanceolate... ..2. H. denticulatus orientalis Gurjanova ssp.n.

16 (13). Tegument brittle, strongly calcified, lacks specific sculpture; segment 1 of the flagellum in antenna 1 bears a long thin spine on its distal margin, in addition to the sensory setae on its lower surface; the anterior margin of the distal end of segment 1 of the main flagellum.....* H. mercatoris Pirlot, 1939.

Mem. Mus. Hist. Nat. Belg., (2), 15: 48, f. 1, 2, 3.

(Atlantic Ocean, near the west of Africa).

17 (10). The tooth-shaped process of the postero-distal angle of epimeral plate 3 simple, without a sinus above its base.

18 (21). Basal segment of peraeopod 5 tapers distinctly distally.

19 (20). Segment 6 of gnathopod 1 narrow, linear; its palmar margin is so short that it is hardly visible; tegument lacks specific sculpture.....* 12. H. serratus Holmes, 1905.

20 (19). Segment 6 of gnathopod 1 clearly broadens distally; its palmar margin well developed, oblique, with 2 locking spines; tegument with alveolar sculpture; in each cell, in the centre, there is a conical microscopic spinule.....4. H. pacificus Gurjanova sp.n.

21 (18). Basal segment of peraeopod 5 on the distal end as broad as at the base.

22 (29). Tooth-shaped process of the postero-distal angle of epimeral plate 3 large, long, sharp; tegument smooth or with an alveolar sculpture.

23 (28). Segment 1 of the flagellum of antenna 1 very long especially in the male; it is always larger than one half the length of segment 1 of the peduncle; tegument has a fine alveolar sculpture.

24 (25). Palmar margin of segment 6 in gnathopod 1 longer than the posterior margin of hand; the palmar margin of segment 6 of gnathopod 2 short; dactyl, when closed reaches the end of palm.....3a. H. propinquus propinquus G. Sars, 1890.

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

25 (24). Palmar margin of segment 6 in gnathopod 1 short-

er than the posterior margin of hand; palmar margin of segment 6 of gnathopod 2 occupies about half the width of the distal end of segment; when closed, the dactyl does not reach the end of palm.

26 (27). Palmar margin of segment 6 of gnathopod 2 conves; segment 6 of gnathopod 1 almond-shaped, distinctly tapers distally.....3 o. H. propinquus sibiricus Gurjanova ssp. n.

27 (26). Palmar margin of segment 6 in gnathopod 2 concave; segment 6 of ganthopod 1 broadens distally.....3B. H. propinquus eous Gurjanova ssp. n.

28 (23). Segment 1 of the flagellum of antenna 1 short, shorter than half of segment 1 of peduncle; tegument lacks specific sculpture.....7. H. minusculus (Gurjanova, 1938).

29 (22). The tooth-shaped process of the postero-distal angle of epimeral plate 3 short and blunt; segment 1 of the flagellum of antenna 1 of both the male and the female almost twice as short as the peduncle; tegument covered with fine, short, thin striae intersecting each other.....* H. robustus G. Sars, 1895.

(Northern part of the Atlantic Ocean ans western part of the Barents Sea).

30 (7). Even traces of eyes lacking, specimens blind.

31 (72). The postero-distal angle of the first three coxal plates simple and lacks a large tooth; lower margin of plates without a notch in its posterior part.

32 (33). Besides the main tooth, there is an accessory one at the postero-distal angle of epimeral plate 3; segment 1 of the peduncle of antenna 1 with a keel-shaped process; dactyl of peraeopods 1 and 2 longer than segment 6; the postero-distal angle of epimeral plate 2 forms a sharp tooth.....* H. bidentatus Chevreux, 1907.

Complete description and figures: Chevreux, 1935, Res. Camp. Sci., Monaco, XC: 37, pl. VII, f. 2a - r.

(Mediterranean Sea, depth: 1500 - 2368 m).

33 (32). The postero-distal angle of epimeral plate 3 with a tooth, accessory tooth lacking.

34 (35). Outer ramus of uropod 3 one-segmented, lacks apical segment; the antero-distal angle of epimeral plate 1 sharp; the tooth-shaped process at the postero-distal angle of epimeral plate 3 long, bent up and separated from the posterior margin of plate with a deep slit-shped sinus.....* H. ambiquus Ruffo, 1946.

Bull. Soc. Entom., Ital., 76, No. 7 - 8: 53.

(Mediterranean Sea).

35 (34). Outer ramus of uropod 3 always 2-segmented, al-

though its apical segment may be small.

36 (37). The tooth-shaped process of epimeral plate 3 shifted to the middle of the posterior margin of plate, while its postero-distal angle rounded. The sculpture of tegument consists of thin parallel striae, like in H. holbölli Kr., but even nore distinct. .....* H. striolatus Stephensen, 1923.

Ingolf-Exp., III, No. 8: 95, f. 22.

(Northern part of the Atlantic Ocean).

37 (36) The tooth-shaped process of epimeral plate 3 at the postero-distal angle; this is normal for the representatives of this genus.

38 (39). The tooth-shaped process at the postero-distal angle of epimeral plate 3 small, in the form of a simple short tooth. Head with triangular interantennal lobes and a well-developed lower-antennal notch; segment 1 of the peduncle of antenna 1 with long peaked process at the distal end, almost completely overlapping segment 2; segment 1 of flagellum bears on lower surface, except for clusters of sensitive setae, a thin long acicular spine on the distal margin... ..* H. bandae Pirlot, 1933.

Siboga-Exp., XXXIIIc: 144, f. 49, 50.

(Indian Ocean, depth: 1570 m).

39 (38). The tooth-shaped process at the postero-distal angle of epimeral plate 3 large.

40 (41). A large, keel-shaped process, rounded at the end and directed forward, parts from the middle of the anterior surface of segment 1 of the peduncle of antenna 1. Posterior margin of the basal segment of peraeopod 4 depressed in the upper part; tegument lacks specific sculpture.....* H. nasutus Stephensen, 1923.

Ingolf-Exp., III, No. 8: 93, f. 20.

(Northern part of the Atlantic Ocean, depth: 320 m).

41 (40). On the anterior surface of segment 1 of the peduncle of antenna 1, there is sometimes a low oblong keel which forms, at the distal end of segment, either a peaked process that is closely adjacent to segment 2, or a small process, but always directed straight down.

42 (43). The postero-distal angle of epimeral plate 2 with a bent, sharp tooth. Segment 1 of the flagellum of antenna 1 with a short spine on the distal margin; accessory segment 2 of flagellum shorter than segment 1 of the main flagellum. Palmar margin of segment 6 of gnathopod 1 separated from posterior margin of hand with a strong locking spine. Tegument lacks specific sculpture.....* H. similis Schellenberg, 1925.

Beitr. Kennt. Moeresfauna Westafr., III, Lief. 4: 117.

(Congo, incl. Brazzaville, the capital, at the Nianga[1] River, in salt water, depth: 12 m).

43 (42). The postero-distal angle of epimeral plate 2 does not form a curved sharp tooth.

44 (57). Basal segment of peraeopod 5 uniformly broad along its length and hardly tapers distally.

45 (46). Telson cleft not further than to the middle; apices of lobes with a straight posterior margin armed with several (up to 5 - 7) long bent spines.....9. H. abyssi (Goës, 1866).

46 (45). Telson cleft further than to the middle, often to the base; apices of its lobes either rounded or pointed, armed with 1 or several straight short spines.

47 (50). Gnathopod 1 thin and only slightly shorter than gnathopod 2; its basal segment long and thin, almost as thick as that of gnathopod 2.

48 (49). Segment 6 of gnathopod 2 narrow, considerably narrower than the distal margin of segment 5, tapers distally; seg-

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[1] Transliterated from Russian "Nyanja"? Translator.

ment 6 of gnathopod 1 enlarged, with parallel margins, its length almost three times the size of its width; the sculpture of the tegument distinctly alveolar, each cell has a microscopic spinule.....5. H. wirketis Gurjanova, sp. n.

49 (48). Segment 6 of gnathopod 2 relatively broad and short, strongly broadens distally; it is as wide as the distal margin of segment 5; segment 6 of gnathopod 1 almond-shaped, more than two times as wide; the sculpture of the tegument alveolar, with granules and conical microscopic spinules in cells.....8. H. granulosus Bulytcheva, 1955.

50 (47). Gnathopod 1 considerably stronger and shorter than gnathopod 2; its basal segment relatively shorter and thicker than that of gnathopod 2.

51 (52). Tegument covered with short coarse hairs on the dorsal side. Urosome segment 1 with a saddle-shaped dorsal depression; segments of peduncle of antenna 1 simple, cylindrical, without peaks or processes on the distal margin; accessory flagellum of antenna 1 longer than segment 1 of the main flagellum, which is considerably shorter than segment 1 of the peduncle, segment 6 of gnathopod 1 almost as long as the 5th; posterior margin of the basal segment of peraeopods 3 - 5 distinctly dentate, especially in the last peraeopod; inner plate of mandible 1 with 2 plumose setae at the apex and

with hairs along the inner margin.....* H. kergueleni Stebbing, 1888.

(At the coast of Kerguelen Island, depth 40 m).

52 (51). Hairs lacking on the dorsal part of tegument.

53 (54). Segment 6 of gnathopod 2 distainctly tapers distally, its width almost two times smaller than its length; on the dorsal side of the telson, below the base of the first pair of dorsal spines, there are 2 thick plumose setae on each side; besides a spinule in the centre, the cells of the sculpture of tegument have a very fine punctation.....6 H. boreopacificus Gurjanova sp.n.

54 (53). Segment 6 of gnathopod 2 on the distal margin as broad as at the base; only slightly longer than wide; plumose setae on the dorsal side of the telson wanting.

55 (56). Segment 6 of gnathopod 1 narrowly amygdaloid in shape; its palmar margin considerably longer than the posterior margin of the hand and bears 1 locking spine; segment 1 of the main flagellum of antenna 1 long, longer than all the three segments of the peduncle together. The tegument densely covered with thin short striae and with small sparsely scattered bilobed scales, a short bristle in the centre, which form oblong rows on coxal plates; at the

pointed end of the dactyl of gnathopod 1 and of peraeopods 1 and 2, there is a transparent chitinous hood; segment 6 of gnathopod 2 enlarged, weakly broadens distally; almost 2 times as long as wide; the apices of the lobes of telson taper at the end and bear 1 apical spine each; along the anterior margin of segments 4 and 5 of the peduncle of antenna 2, there is an oblong row of clusters of short setae; accessory flagellum of antenna 1 as long or shorter than segment 1 of the main flagellum; on the distal margin of segments 1 and 2 of the main flagellum of antenna 1, there is 1 thin long spine on each.....* H. squamosus Stebbing, 1894.

Bijdr. Dierkunde, "Natura Artis Magistra" 17: 4, pl. 1*.

(Barents Sea, Finmarken's area, depth 300 m).

56 (55). Segment 6 of gnathopod 1 with almost parallel margins, weakly broadens distally; palmer margin almost 2 times shorter than the posterior margin of the hand, with 2 locking spines; segment 1 of the main flagellum of antenna 1 short, slightly larger than 1/3 the length of segment 1 of peduncle.......10. H. kurilicus Gurjanova sp.n..

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* Thomas Stebbing, one of the most prominent carcinologists who in his summary of 1906 described this species (Amphipoda. I. Gammarides, Tierreich, Berlin, 21: 59), himself considers it as the species H. propinquus G. Sars, 1890. Although our collections lack the representatives of the species H. squamosus, Stebbing's excellent drawings and a very thorough description permit us to consider this species real, in as much as the complete analysis of the genus reveals that the sculpture of the tegument, the structure of its antennae, segment 6 of gnathopods 1 and 2, and the dactyl of peraeopods 1 and 2 play the most important role in regard to the taxonomy of this genus.

57 (44). Basal segment of peraeopod 5 distinctly tapers distally.

58 (59). There is a small sinus above the base of a tooth-shaped process of the postero-distal angle of epimeral plate 3. The tegument with a distinct alveolar sculpture and a thin oblique striation on the surface of each cell; segment 6 of gnathopod 1 on the distal margin as broad as at the base, its width $1\frac{1}{2}$ times smaller than its length; rami of uropod 3 broadly lanceolate; telson lacks dorsal spines.....* H. reticulatus Stephensen, 1923.

Ingolf-Exp., III, No. 8: 94, f. 21.

(Northern part of the Atlantic Ocean).

59 (58). The tooth-shaped process at the postero-distal angle of epimeral plate 3 simple, without a sinus above its base.

60 (65). On the distal margin of segment 1 of the flagellum of antenna 1, there is a thin long or thick short spine.

61 (64). At the end of the dactyl of gnathopod 1, there is a hood overhanging its point.

62 (63). On the distal margin of segment 3 of the peduncle of antenna 1, there is a large long spine; segment 6 of gnathopod 2 strongly broadens distally, its palmar margin deeply concave...

.....*H. longimanus* (Stebbing, 1888).

(Abyssal species of the northern part of the Atlantic Ocean and the Greenland Sea).

63 (62). On the distal margin of segment 3 of the peduncle of antenna 1, the spine lacking; segment 6 of gnathopod 2 weakly broadens distally, its palmar margin weakly convex *13. *H. angustimanus* Gurjanova sp. n.

64 (61). The pointed end of the dactyl of gnathopod 1 simple, without the hood. Urosome segment 1 with a low longitudinal dorsal keel; dactyls of peraeopods 1 and 2 as long as segment 6; tegument lacks specific sculpture; basal segment of peraeopod 3 strongly tapers distally; segment 6 of gnathopod 1 narrow, with almost parallel margins.....* *H. tunisiacus* Stephensen, 1915.

Rep. Danish Oceanogr. Exp., II, Biol., D. 1: 36, f. 20.

(Mediterranena Sea, 190 m).

65 (60). On the distal margin of segment 1 of the main flagellum of antenna 1, either the long or the short spine lacking.

66 (67). Segment 6 of gnathopod 1 as long as segment 5. Urosome segment 1 with a saddle-shaped dorsal depression; accessory flagellum of antenna 1 shorter than segment 1 of the main flagellum which is considerably longer than half the length of

segment 1 of the peduncle; segment 4 of the peduncle of antenna 2 as long as the 5th; branchial vesicles of peraeopods 3 and 4 with transverse folds; segments 6 and 5 of gnathopod 1 of equal length; anterior margin of the basal segment of peraeópod 3 strongly oblique, hence the segment strongly tapers distally; rami of uropod 3 uniformly tapers, armed with spines and plumose setae; inner plate of maxilla 1 with 7 plumose setae at the apex and with hairs on the inner-margin; telson has three pairs of lateral spines.... ..* H. geolongi Stebbing, 1888.

(South coast of Australia, depth: 60m).

67 (66). Segment 6 of gnathopod 1 shorter than segment 5.

68 (69). Tegument smooth, lacking specific sculpture. Accessory flagellum of antenna 1 as long as segment 1 of the main flagellum; segment 4 of the peduncle of antenna 2 as long as segment 5; rami of uropod 3 broadly lanceolate, almost of the same length, armed with sparse spinules; the tooth at the postero-distal angle of epimeral plate 3 broad and short, with a blunt apex.....* H. serratipes Stephensen, 1923.

Ingolf-Exp., III, No. 8: 91, f. 18.

(Abyssal species of the northern part of the Atlanctic Ocean).

69 (68). Tegument with a specific sculpture.

70 (71). The surface of the tegument has an indistinct sculpture of fine short anastomozing striae; accessory flagellum of antenna 1 longer than segment 1 of the main flagellum; segment 4 of the peduncle of antenna 2 $1\frac{1}{2}$ times shorter than segment 5; broadly lanceolate rami of uropod 3 almost of same length, without marginal spines; dactyl of peraeopods 1 and 2 shorter than segment 6.....* H. frigidus Stephensen, 1923.

Ingolf-Exp., III, No. 8: 91, f. 19.

(Depths of the Norwegian Sea).

71 (70). Tegument with a coarse-punctate sculpture and indistinct striae on pleon segments; accessory flagellum of antenna 1 shorter than segment 1 of the main flagellum; broadly lanceolate rami of uropod 3 unequal, armed with powerful marginal spines; dactyl of peraeopods 1 and 2 as long as segment 6....... 11. H. punctatus Gurjanova sp.n.

72 (31). Lower margin of the first three coxal plates has a notch in its posterior part, hence the postero-distal angle forms a powerful tooth. Segments 4 and 5 of peraeopod 3 strongly broadened, almost as wide as long; basal segment distinctly tapers distally, and its posterior margin has 5 large notches, segment 6 longer and much narrower than segment 5 which is rouneded.....* H. multidentatus Schellenberg, 1925.

Boitr. Kennt. Meeresfauna Westafr., III, Lief. 4: 116, f.

2 (Westa Africa, Ghana, depth 12 m).

1. Hippomedon holböli (Kröyer, 1846).

Kröyer, 1846, Nat. Tibbskr. (2), 2: 8, 38 (Anonyx); Guryanova, 1951: 229, Figure 93.

We consider it necessary to present the data on the structure of the branchial vesicles of this species and maxilla 1 which are wanting in the descriptions by former authors.

The inner plate of maxilla 1 with 2 unequal plumose setae. Branchial vesicles of gnathopod 2 simple, without lobules but with enlarged margins in the proximal part; the vesicles of peraeopods 1 and 2 of a similar structure; the main branchial vesicle of peraeopod 3 simple, without invaginations and folds, but with 1 sausage-shaped accessory lobe; peraeopod 4 has one large sausage-shaped lobe on the inner side of the vesicle and a trilobed second accessory lobule at the proximal end of the vesicle; peraeopod 5 has a small vesicle, which is greatly reduced, without folds but with fleshy walls at the proximal end.

It is a widely-distributed circumpolar species; in the Pacific Ocean, found only in the Bering Strait and in the northwest extremity of Lawrence Island, in the northern part of the Bering Sea. This species has not yet been discovered either in the Sea of Okhotsk or in the Sea of Japan.

2. Hippomedon denticulatus orientalis Gurjanova ssp. n. (Figure 22).

It differs from Atlantic representatives in a considerably stouter body, rather larger eyes well ntoiced in alcohol, broader rami of uropod 3, and in other features characteristic of all the specimens represented in our collections from the Pacific Ocean. Urosome segment 1 has a saddle-shaped depression in front of a low medial keel; on its sides, there is one longitudinal dorsal keel on each; this keel is well defined in large specimens and rather more poorly developed in young ones; lateral keels do not extend to the posterior margin of the segment. The tegument is covered with a coarsely alveolar sculpture, and each cell has 1 - 2 microscopic spinules with a broadened base (noticeable only under the microscope). Antenna 1 differs considerably fron antenna 1 of the main subspecies; segments of the peduncle broader and shorter, the keels at their distal ends less developed; segment 1 of the main flagellum considerably shorter than segment 1 of the segment of the peduncle, while in the Atlantic species segment 1 of the main flagellum longer than all 3 segments of the peduncle together (Figure 23). Branchial vesicles of gnathopod 2 and peraeopods 1 and 2 simple, but with fleshy margins; the branchial vesicles in peraeopod 3 have 2 accessory sausage-shaped lobes, a strongly fleshy proximal part, with 1 invagination and 1 - 2 transverse folds; on the gills of peraeopod 4, there is one sausage-shaped lobulet on each, the main vesicle has 2 - 3 invaginations and transverse folds; the branchial vesicle of peraeopod 5 small, yet with 2 accessory lobulets and a fleshy anterior margin.

Figure 22. Hippomedon denticulatus orientalis Gurjanova ssp. n. The Northern Kuriles straits.

Coxal plate 1 broadens strongly distally at the postero-distal angle with a small tooth; the basal segment considerably thicker and shorter than in gnathopod 2, and bears dense setae along the anterior margin; segment 3 shorter than segment 4, segment 5 is $1\frac{1}{2}$ times longer than segment 6; segment 6 broadens slightly distally, has a well defined oblique convex palmar margin, which is finely dentate and terminates in 1 strong locking spine; the inner margin of the hand considerably longer than the palm. Segment 3 of gnathopod 2 strongly enlarged, and its length larger than the length of segment 4; the basal segment thin and long, broadens distally; segment 6 almost 2 times as short as segment 5, has a narrow base and a rather broader distal margin; the palmar margin very short, transverse, the dactyl attached to the middle part of the distal end of the segment. The structure of peraeopods resembles the base of North-Atlantic subspecies; coxal plate 3 is, however, rather higher and narrow; if the height of plates of the North-Atlantic specimens of the species is smaller than its width and its lower lobes are hardly defined, the depth of the plate of the Pacific subspecies almost of the same size as its width and the posterior lower lobe well defined, as there is a depression in the middle part of the lower margin of the plate; the basal segment of peraeopod 5 has a less depressed anterior margin than in the main form, and the wing distinctly tapers distally. The molar process of epimeral plate 3 less bent upward, and the sinus at this base shallower than in the Atlantic specimens. Uropod 2 considerably shorter than in uropod 1, the ends of the rami of uropod 3 protrude slightly beyond the level of the ends of the rami of uropod 1, the telson reaches the level of the upper third of the rami of uropod 3. The basal segment of uropod 3 has clusters of thick short spines at the distal end; the rami broadly lanceolate, taper only at the very end and armed with spinules. Telson has almost straight inner margins of lobes and bears two pairs of marginal spines, while the Atlantic subspecies has only one pair of marginal spines and the inner margins of the lobes in the middle bent outwards, forming a blunt angle. The maximum length of the Pacific specimens of the subspecies 21 mm. The colour pale yellow - rose - coloured in specimens preserved in alcohol and bright-rose in live ones.

All the specimens obtained in the Far East belong to the Pacific subspecies; they are found in large numbers in the

Chuckchee Sea and Bering Strait at depth of 30-45 m, in the northern part of the Bering Sea, at the Pacific coast of the islands of the Kurile range (Paramushiro Island), at depths of 35-40 m. It was found in the Sea of Okhotsk at a depth of about 30 m in Terpeniya Bay; detected also at a depth of 35 m on sandy bottom in the South-Kurile Strait. One specimen was found in the Sea of Japan; in Peter the Great Strait also at the shallow bottom of the sublittoral.

Figure 23. Hippomedon denticulatus (Bate). Northern part of the Atlantic Ocean (specimen from the Zoological Institute, Copenhagen).

*3a. Hippomedon propinquus propinquus G. Sars, 1890 (Figure 24).

G. Sars, 1890, Crust. Norw., I: 57, pl. 21, f. 1; Guryonova, 1951: 235, Figure 98.

Comparison of specimens of this species from various areas of its geographical range (from the northern part of the Atlantic Ocean, the western part of the Baltic Sea, from the Barents Sea, Kara Sea, Laptevyk Sea, Chuckchee Sea, and the seas in the Far East) revealed that within the boundaries of the species, 3 independent subspecies should be singled out whose geographical ranges are more or less disconnected. The structure and the relative size of the head, the presence of underdeveloped vertically elongate eyes, the narrow coxal plate 1 which is almost as broad as that in pair 2, and which does not broaden distally, the structure of both antennae, peraeopods, uropods, branchial vesicles, and the telson in all the studied specimens are, on the whole, the same, and the differences in regard to these characteristic features do not extend beyond individual and age changes. Stable differences from the Atlantic specimens, in regard to the structure of both gnathopods, uropod 3, the last pair of epimeral plates, some details of the armature of basal segments of the last three peraeopods, and other body parts, however, characterize in various ways the Siberian, on the one hand, and the Pacific species and the population of the Chuckchee Sea, on the other.

Specimens from the western part of the Baltic and the Barents seas fully correspond to Sars' description and figures and should be assigned to the typical form. In addition to this description, we should point out, first of all, the specific sculpture of the tegument. Sars indicates and presents graphically the alveolar sculpture characteristic of this species; however, he does not mention that each cell has a small spine with a conical base. This sculpture is especially distinctly defined in the Pacific specimens. Moreover, characteristic of all the specimens are the structure of the branchial vesicles (they are described by Sars), the relative length of uropods, and the correlation of the lengths of segments 3 and 4 of gnathopods 1 and 2. Branchial vesicles present in gnathopod 2 and in all peraeopods; the first three pairs of gills have the form of simple enlarged vesicles devoid of transverse folds and invaginations; the branchial vesicles of peraeopod 3 are relatively broader, with a few transverse folds, a fleshy neck, and one long sausage-shaped accessory lobe; the branchial vesicles of peraeopod 4 have a similar in length sausage-shaped accessory lobe on the inner side and a small two- and three-lobed short accessory lobe at the base of the neck; the gills of the last peraeopod are very small, strongly reduced, in the form of a short vesicle with fleshy margins and a neck. Segment 3 of gnathopod 1 shorter than segment 4, while in ganthopod 2 it is considerably longer ($1\frac{1}{2}$ times) than segment 4. The ends of uropods 1 and 3 at the same level, while uropod 2 shorter and does not reach the level of the distal end of uropods 1 and 3. In addition, characteristic of all the specimens of the species is the sexual dimorphism in regard to the structure of antenna 1: segment 1 of the main flagellum of ♂♂ very long, as long as all three segments of the peduncle togerher, and the accessory flagellum shorter than segment 1 of the basic flagellum, while the accessory flagellum of ♀♀ longer than segment 1 of the basic flagellum, and the latter shorter than the peduncle, approximately as long as only segment 1 of the peduncle.

Contrary to Siberian and Pacific specimens, segment 6 of gnathopod 1 of the typical form considerably longer than half the length of segment 5, almond-shaped, its palmar margin not restricted from the hind margin of the hand and lacking the locking spines; the dactyl very thin and long; when retracted, it reaches almost the middle of the hind margin of the segment. Segment 6 of gnathopod 2 rounded, its greatest width found in the middle of the segment; the palmar margin straight, very short, the palmar angle slightly drawn out forward, The tooth at the postero-distal angle of epimeral plate 3 long, broad at the base, and pointed at the end, directed straight forward and slighlty upward. The dactyl of peraeopods 1 and 2 thin, almost as long as segment 6. The hind margin of the basal segment of peraeopods 3 - 5 distinctly notched; however, the crenulation wanting on the distal margin, so that the margins of the lower lobe of the wing-shaped broadening are smooth. The inner plate of maxilla 1 has 2 plumose setae at the apex. The anterior margin of coxal plate 1 that broadens very weakly is slightly convex. In other respects, the west-Baltic and Barents specimens correspond to the Sars' description and figures.

Figure 24. Hippomedon propinquus propinquus G. Sars. Barents Sea, ♀.

Thus, the typical form, H. Propinquus propinquus G. Sars, is characteristic of the northern part of the Atlantic Ocean; it spreads sourth wards, along the European coast, to Skagerrak when it passes into the western part of the Baltic Sea; along the North-American coast, it reaches Newfoundland. From the northern Atlantic, it also spreads into the Barents Sea (it is also present in the Kola Bay, at eastern Murman) and into the northern part of the Kara Sea.

Under conditions of the Atlantic Ocean and the Barents Sea, it reaches a length of 22 mm; in the northern part of the Kara Sea, up to 18 mm; in the western part of the Baltic Sea, 10 mm. In addition the specimens are noted for their strongly extended weak body with fine semitransparent plates.

3σ'. Hippomedon propinquus sibiricus Gurjanova ssp. n. (Figure 25).

Specimens of Siberian subspecies differ from the typical form in that the inner plate of maxilla 1 bears 3 plumose setae differring in size; segment 6 of gnathopod 1 only slightly larger than half the length of segment 5; the strongly oblique palmar margin as long as the posterior margin of the hand, distinctly restricted from it and bears 2 long straight locking spines varying in size; the dactyl powerful, pointed, when closed reaches beyond the palmar angle and is slightly short of reaching the level of the base of segment 6; segment 6 of gnathopod 2 weakly broadens distally, its greatest width found on the distal margin; palmar margin constitutes about half the width of the segment, weakly oblique, convex; when retracted, the dactyl is far from reaching the palmar angle. The dactyl of peraeopods 1 and 2 as long as segment 6, relatively coarser and heavier than that of the typical form. The basal segment of peraeopod 3 with a rather more developed lobe whose margins also are smooth; the crenulation in peraeopod 5 reaches the end of the posterior margin of the basal segment; only the lower margin of the distal lobe smooth.

Especially characteristic is the structure of uropod 3; the peduncle of the latter cylindrical, like that of the typical form, but shorter than half the length of the inner ramus (its length in the Barents Sea specimens being 2/3 the length of the inner ramus); rami very long, with parallel margins, and taper only at the very distal end, while both rami of the typical form taper distally gradually; the apical segment of the outer ramus measures only about 1/5 the length of segment 1, while in Norwegian and Barents Sea specimens it is relatively longer and reaches half the length segment 1. The molar process at the postero-distal angle of epimeral plate 3 relatively longer, with a rather narrower base and directed obliquely upward. The body of the Siberian specimens rather coarser, stouter, the segments of the extremities relatively thicker ans somewhat shortened; the maximum length of the specimens is 16 mm (♀♀).

Figure 25 Figure 25. Hippomedon propinquus sibiricus Gurjanova ssp. n. Laptev Sea, ♀.

It is discovered in the Laptev Sea and in the northwestern part of the East-Siberian Sea.

3B. Hippomedon propinquus eous Gurjanova ssp. N. (Figure 26).

It differs from the typical and the Siberian specimens in its peculiar features, revealing close resemblance to the Siberian subspecies and not to the typical form. Body also less slender, stouter, with opaque plates and a very distinct sculpture of the tegument. Gnathopod 1 with a well-developed subchela; segment 6 broadens distally, palmar margin shortened, considerably shorter than the posterior margin of hand, less oblique and distinctly restricted by 2 strong locking spines; dactyl strong, thick at the base, and when closed, it perfectly attains the palmar angle, not extending beyond its margins. Segment 5 only slightly longer than segment 6. Segment 6 of gnathopod 2 broadens noticeably distally, its palmar margin larger than half the width of the distal end of segment, deeply concave; dactyl reaches only the middle of the palm when retracted. The dactyl of peraeopods 1 and 2 also stronger and shortened, considerably shorter than segment 6. The anterior margin of the basal segment of peraeopod 3 less oblique; the posterior margin of the wing-shaped broadening bears a crenulation to the very distal end, which is especially distinct in peraeopod 5. Segment 4 of peraeopod 3 relatively short and broad, like in the typical form, its width equals the length, while in the Siberian forms the width of segment 4 of this extremity $1\frac{1}{2}$ times smaller than its length. The molar process of epimeral plate 3 similar to that of the typical form, but shorter. The peduncle of uropod 3 non-cylindrical, as is the case in both preceding subspecies, but it broadens distally considerably and armed with clusters of strong spines; its length equals the length of segment 1 of the outer ramus; the rami are relatively shorter, especially as compared with the Siberian subspecies, taper distally gradually; the apical segment of the outer ramus large, about half the length of segment 1. Segment 4 and 5 of antenna 2 of the same length, while in the Siberian subspecies segment 4 considerably, and in the typical one slightly shorter than segment 5. The inner plate of maxilla 1 bears 4 plumose setae at the apex. Coxal plate 1 narrow, does not broaden distally, but its anterior margin strongly convex, forms a sharp bend from the middle to the distal end. The number of the alteral spines of the telson varies from four to two pairs. Body compact, dense; eyes well noticeable, even in alcohol; the maximum length 18 mm (♀).

The subspecies inhabits the Chuckchee and Bering seas (the depth of 40-30 m); it was found on the shelf of Iturup Island, on the Pacific side, at depths of up to 291 m, and in the Sea of Okhotsk, in Terpeniya Bay, at a depth of 38 m.

4. Hippomedon pacificus Gurjanova sp. n. (Figure 27).

It belongs to the group of subspecies with eyes and a basal segment in peraeopod 5 narrowing distally.

In the sculpture of its tegument, the relative length of segment 1 of the flagellum of antenna 1 (shorter than the peduncle), the structure of gnathopod 2, the form of epimeral plate 3, the form and relative length of the ramus of uropod 3, it is close to the north-Atlantic species H. robustus G. Sars, differring from it considerably in a rather stronger and stouter body structure, long last segment of the peduncle of antenna 2 exceding the length of segment 4, coxal plate 1, strongly broadening distally in the structure of segment 6 of gnathopod 1, with a distinctly defined palmar margin restricted by locking spines, strongly broadened segment 4 of peraeopod 3, basal segment of peraeopod 5 tapering distally, and the relative length of segments 3, 4, 5, and 6 of gnathopod 1. The stout body and the distinctly expressed subchela of gnathopod 1 bring this species closer to the Siberian and the Far-Eastern subspecies H. propinquus.

Figure 26. Hippomedon propinquus eous Gurjanova ssp. n. Bering Sea, ♀.

Figure 27. Hippomedon pacificus Gurjanova sp. n. Eastern coast of Iturup Island, ♀.

Body enlarged, slender. Head slightly shorter than the first two peraeon segments; interantennal lobes triangular, drawn out forward and rounded at the apex; eyes prolonged, underdeveloped, behind the interantennal lobes. Segments 1 and 2 of the peduncle of antenna 1 with a beak-shaped process at the distal end; from above, this process overlaps the base of the subsequent segment. Segment 1 of the flagellum in the female considerably shorter than segment 1 of the peduncle; flagellum 11-15-segmented, accessory flagellum 3-segmented, as long as segment 1 of the main flagellu. The last segment of the peduncle of antenna 2 longer than the penultimate one, flagellum multi-segmented, especially long in ♂♂. The inner plate of maxilla 1 bears from 2 to 6 setae. 2/3 the inner margin of the inner plate of maxilla 2 fringed with plumose setae. Coxal plate 1 very strongly broadened distally, considerably broader than coxal plate 2; at the postero-distal angle, there is a distinct tooth. Both gnathopods have a strongly enlarged segment 3; in gnathopod 1, segment 3 slightly, and in gnathopod 2 considerably longer than segment 4. The basal segment of gnathopod 1 only slightly longer than twice segment 3 and slightly shorter than segments 5 and 6 together; segment 6 slightly shorter than segment 5, clearly broadens distally; palmar margin well restricted from the inner margin, shorter and bears 2 locking spines; dactyl slightly longer than the palm. Segment 6 of gnathopod 2 two times shorter than segment 5, broadens slightly distally, has a transverse weakly concave palmar margin; at the postero-distal angle of segment 5, the inflated surface is covered with scales ("pine-apple cushion"). The dactyls of peraeopods thin, long, sharp; segment 4 of peraeopod 3 broadened, its width equals its length, basal segment slightly tapers distally, has a well-developed rounded (lower) lobe of the wing which reaches the level of the lower margin of segment 3.

The basal segment of peraeopod 4 hardly narrows distally, the wing lobe underdeveloped, segment 4 broad-oblong, considerably longer than wide; the basal segment of peraeopod 5 strongly broadens distally, while segment 4 weakly broadens distally. The posterior margin of the wing in peraopods 3-5 clearly dentate; the branchial vesicles of gnathopod 2 and peraeopods 1 and 2 simple, in peraeopod 3 with 1 long sausage-shaped accessory lobe and transverse folds, peraeopod 4 with 2 accessory lobes; the vesicle of peraeopod 5 well developed but small and lacks accessory lobes. The tooth of epimeral plate 3 large, broad and sharp. The dorsal side of urosome segment with a small saddle-shaped depression and a low rounded almond-shaped keel. The distal margin of the rami of uropods 1 and 2 at the same lelvel; the distal margin of the rami of uropod 3 protrudes half its length beyond the level of the distal end of uropods 1 and 2. The rami of uropod 3 not very narrow and long, the inner shorter than the outer one, but longer than segment 1 of the outer ramus; the apical segment of the outer ramus $3\frac{1}{2}$ times shorter than segment 1, both rami have marginal spines. Telson tapers distally, deeply cleft; the apices of the lobes taper strongly but are rounded at the end and bear 1 apical spine and 1 seta each; there are three pairs of thin marginal spines. The sculpture of the tegument alveolar; 1 short conical spinule located at the centre of each irregularly pentagonal cell. The animal is 14 (♀) - 16 (♂) mm long. The females caught in September had 6-8 recently hatched young.

12 specimens were caught on the Pacific platform of Iturup Island, east of Zeleny Island (the southern islands of the Kurile range), at depths of 126-241 m, and at the eastern coast of the northern Kuriles (Paramushiro), at depths of 146-210 m.

5. Hippomedon wirketis Gurjanova sp. n. (Fig. 28).

In the sculpture of the tegument, the relatively short segment 1 of the flagellum of antenna 1, the flagellum of antenna 1, the broadened coxal plate 1, the structure of uropod 3, the form and armature of the telson, it is close to H. pacificus sp. n.; it differs readily from the latter in the absence of eyes, a narrow and long segment 6 of gnathopod 2, the form of a non-tapering distally basal segment of peraeopod 5 and a rather shorter segment of the peduncle of antenna 2, which equals or is slightly longer than segment 4.

Body strong, elongate; head slightly shorter than peraeon segments 1 and 2 together; there is not even a trace of eyes. Interantennal lobes stretched out forward and pointed. Contrary to the majority of species, there is a lower-antennal notch and a small lowerantennal lobe. Segment 1 of the peduncle of antenna 1 has a low oblong, sometimes very weakly expressed, almost unnoticeable keel which forms, on the distal margin, a small, rounded at the end, process closely contacting the upper surface of segment 2; segment 1 of the flagellum very short, does not reach even the half the length of segment 1 of the peduncle; the flagellum of large specimens 12-segmented, accessory flagellum 5-segmented, considerably longer than segment 1 of the main flagellum. The last segment of the peduncle of antenna 2 slightly longer or as long as the penultimate one. The inner plate of maxilla enlarged, with parallel margins, 4-5 plumose setae at the apex; the surface of the outer plate densely covered with short thin hairs, its spines at the apex arranged in two rows - the spines of the outer margin thick, broad, the spines of the inner margin rather thinner, pectinate. The outer surface of the outer, longer plate of maxilla 2 also covered densely with thin haris, the inner margin of the inner plate, which is shortened, bears plumose setae in the upper half, its lower half densely fringed with thin hairs. Lower lip protrudes forward beyond the epistome. Coxal plate 1 broadens distally and tapers at the end, so that its anterior margin is strongly convex; there is a distinct tooth and a small seta at the postero-distal angle. Coxal plate 2 narrower and longer than coxal plate 1. The basal segment of gnathopod 1 has a dense row of setae at the anterior end; segment 3 shorter than segment 4; segment 6 only slightly shorter than segment 5, with almost parallel margins, its width almost three times smaller than its length; palmar margin oblique and short, 3 times shorter than the inner margin of the hand, restricted by 2 enlarged locking spines; dactyl as long as the palmar margin with the accessory tooth at the distal end. Segment 3 of gnathopod 2 strongly enlarged, almost 2 times longer than segment 4; segment 5 broadens strongly distally, has an inflated "pineapple cushion"; segment 6 narrow, considerably narrower than segment 5, with convex anterior and almost straight posterior margin; its length 2 times smaller than the length of segment 5, palmar margin very short, protrudes forward, forming a miniature chela with a small dactyl; on the outer surface, segment 6 covered with dense transverse rows (10-12) of long coarse setae. The branchial vesicles of gnathopod 2 and of peraeopods 1 and 2 lack the folds and invaginations; the gills of peraeopod 3 have 2 accessory lobes - a long sausage-shaped lobe on the outer side of the vesicle and a small lobe at the base of the neck of the vesicle; the gills of peraeopod 4 also have 2 accessory lobes, but the upper lobe large, although shorter than the main vesicle and has 2 sausage-shaped lobes; the gill of peraeopod 5 small, but it also has 2 small accessory lobules. The dactyl of peracopods 1 and 2 short, slightly larger than half the length of segment 6. The basal segments of peraeopods 2-5 have a wide wing-shaped broadening and a well-developed crenulation of the posterior margin, especially in peraeopod 5, and on the anterior margin, there are acicular spines. The basal segment of peraeopod 3 tapers distally, segment 4 broadens distally, its greatest width $1\frac{1}{2}$ times smaller than the length; the anterior margin of segments 3-6 with acicular setae, dactyl considerably larger than half the length of segment 6. The basal segment of peraeopod 4 of a uniform width at the base and at the distal end, segment 4 broadened, its width about 3/4 the length, while the length equals that of segment 5, dactyl measures about half the length of segment 6. The basal segment of peraeopod 5 has a weakly concave anterior margin, does not taper distally, the lobe of the wing has an almost straight lower margin, segment 4 narrow, dactyl slightly larger than half the length of segment 6. The tooth of epimeral plate 3 large, pointed. Urosome segment 1 has a saddle-shaped depression and a low medial keel. The ends of uropods 1 and 2 almost at the same level; the outer ramus of uropod 2 slightly shorter than the inner one; the end of uropod 3 extends slightly beyond the level of the end of the rami of uropods 1 and 2. The peduncle of uropod 3 considerably longer than half of segment 1 of the outer ramus, its lower margin on the outer side bears a row of short spines (5-6); inner ramus slightly longer than segment 1 of the outer ramus, with marginal spinules in ♀ and setae in ♂, outer ramus with groups of marginal spines, 2 spines in each, the apical segment small; the outer ramus of ♂ bears, besides spinules, long setae. Telson broad, deeply cleft; the apices of the lobes broad, rounded, with 2 apical spines, the number of pairs of the marginal spines varies from one to three. The sculpture of the tegument alveolar; there is a small conical spinule in each almost pentagonal cell, at the centre. ♂♂ lack calceoli. The animal is up to 18 mm long.

<u>Figure 28A</u>. <u>Hippomedon</u> <u>wirketis</u> Gurjanova sp.n. Bering Sea, ♂.

<u>Figure 28</u> . <u>Hippomedon</u> <u>wirketis</u> Gurjanova sp.n. Bering Sea, ♂.

More than 30 specimens were captured in the northern part of the Bering Sea at a depth of 45-80 m; in the Sea of Okhotsk, at a depth of 100-115 m, at the gate to the Bay of Penzhina (1 specimen), and east of Cape Terpeniya (3 specimens), at a depth of about 125 m; 1 specimen in the Sea of Japan, between Sakhalin and Moneron Island, at a depth of 110 m. Specimens from the Sea of Okhotsk vary strongly in regard to the shape and the armature of their telson.

The species was named in honour of M.A. Wirketis, a well-known investigator of our seas.

6. <u>Hippomedon</u> <u>Boreopacificus</u> Gurjanova sp.n. (Figure 29).

The sculpture reticulate; the eyes wanting; noted for the structure of antenna 1, whose segment 1 of the flagellum is short and segment 1 of the peduncle long, cylindrical; the last segment of the peduncle of antenna 2 enlarged; the form of the basal segment of peraeopod 5; narrow, elongated, with parallel anterior and posterior margins and a short hand, segment 6 of gnathopod 1, - all this affiliates the new species with the preceding species, <u>A</u>. <u>wirketis</u> sp.n. It differs sharply from the species in the shape of its head, the shape of the narrow, expanded-oval basal segment of peraeopod 4, the indistinctly defined hand of segment 6 in gnathopod 1, and the lack of locking spines, the form of segment 6 of gnathopod 2, and the shape and armature of telson.

The head as long as segment 1 and half the length of segment 2 together; eyes wanting; interantennal lobes drawn out forward and pointed lowerantennal notch and lobes lacking. Segment 1 of the peduncle of antenna 1 narrow, weakly inflated, cylindrical, its length slightly smaller than the length of head, the distal end has a short beak-shaped process which is difficult to notice; segment 1 of the flagellum very short, almost 4 times shorter than segment 1 of the peduncle; accessory flagellum 4-segmented, two times longer than segment 1 of the main flagellum. The last segment of the peduncle of antenna 2 as long as the last one which broadens distally. The inner plate of maxilla 1 conical, with 2 plumose setae of uneven size at the apex; the spines at the apex of the outer plate thick, pectinate at the end. In the upper third of the outer margin of the plate of maxilla 2, there are 4-5 short spinules; the inner narrower and slightly shorter than the outer, the upper third of its inner margin fringed with plumose setae, and its lower two thirds fringed with thin hairs.

Coxal plate 1 broadens distally very weakly, its anterior margin weakly convex, there is a small tooth at the postero-distal angle; coxal plate 2 almost as broad, with parallel margins. Gnathopod 1 considerably stronger and shorter than gnathopod 2; segment 3 normal, shorter than segment 4; segment 6 almost as long as segment 5, narrow, does not broaden distally; palmar margin oblique, short, its length almost $2\frac{1}{2}$ times smaller than the length of the inner margin of the hand; 2 locking spines weak, thin; dactyl slightly longer than palm. Gnathopod 2 with a strongly enlarged segment 3, whose length $1\frac{1}{2}$ times larger than the length of segment 4; segment 5 broadens, but the "pine-apple cushion" on its upper posterior margin almost undeveloped and hardly noticeable; in its stead, here are found clusters of thick setae whose apex is plumose on one side. Similar setae are found at the apex of segment 6. Segment 6 narrower than the width of segment 5, clearly tapers distally and weakly broadens toward the middle; its length twice its width; palmar margin very short, transverse, almost straight; on the convex anterior surface of the segment, the setae arranged in transverse rows. The branchial vesicles of gnathopod 2 and peraeopods 1 and 2 simple, without transverse folds and accessory lobes; in peraopod 3, they are with 1, and in peraeopod 4 with 3 accessory sausage-shaped lobes; the fill of peraeopod 5 small, with 1 accessory lobule. The dactyls of peraeopods 1 and 2 longer than half the length of segment 6. The basal segment of peraeopod 3 tapers distally, with a well-developed lobe whose apex extends beyond the level of the lower margin of segment 3, its anterior margin convex, with spinules, the posterior margin distinctly notched; segment 4 short and broad, its width equals or slightly larger than its length. Segment 5 narrower and slightly longer than segment 4; dactyl sharp, its length slightly smaller than the length of segment 6. The basal segment of peraeopod 4 narrower than in peraeopod 3, does not taper distally, segment 4 enlarged, almost linear, slightly shorter than segment 5; dactyl longer than half the length of segment 6, thin, sharp. The basal segment of peraeopod 5 broad, does not taper distally, but lacks the lobes; its anterior margin weakly concave, while the posterior one notched. The tooth of epimeral plate 3 large, narrow, sharp. Urosome segment 1 has a saddle-shaped depression, but without the keel. Uropod 2 falls short of reaching the end of the rami of uropod 1; the rami of uropods 1 and 2 equal. Uropod 3 short, does not reach the end of the ramus of the first pair. The rami of uropod 2 narrow, pointed, of unequal length, with marginal spinules and setae; the apical segment of the outer ramus about 1/3 the length of segment 1; the peduncle almost two times as short as the outer ramus and bears groups of spinules at the distal end.

Figure 29A. Hippomedon boreopacificus Gurjanova sp.n. Northern Kuriles, ♀.

Figure 29Б. Hippomedon boreopacificus Gurjanova sp.n. Northern Kuriles, ♀.

Telson tapers weakly distally, deeply cleft, the apices of its lobes rounded along the inner margin and bear 1-2 apical spines each; there are two paris of marginal spines; in addition, there are 2 thick plumose setae on each side of the dorsal side of the telson, between the pairs 1 and 2 of the marginal spines.

The sculpture of the tegument alveolar, with small scattered spinules; the surface of each cell densely covered with minute punctate depressions. The animal is up to 17 mm long.

8 specimens were obtained from the Bering Strait, 14 specimens in the area of the southern Kurile straits, at the sandy bottom, and a

depths of 30-40 m, and 4 specimens come from the Seas of Okhotsk (Penzhina Bay), from a depth of 90 m.

7. Hippomedon minusculus (Gurjanova, 1938) (Figure 30).

Guryanova, 1951: 196, Figure 65 (Paratryphosites).

Because of the suppression of the genus Paratryphosites Stebbing, 1894 and the inclusion of the species of this genus in the genus Hippomedon, I consider it necessary to give a rather fuller description of this species in accordance with the type from the Sea of Japan, which is preserved in the Zoological Institute, and rather older specimens obtained later in other areas.

This species belongs to the group of the species whose eyes are underdeveloped and the basal segment of peraeopod 5 is broad and non-tapering. The head is narrow, almost cylindrical, almost as long as peraeon segments 1 and 2 together; interantennal lobes almost rectangular, protrude slightly forward, lowerantennal notch and lobe wanting. Segment 1 of the peduncle of antenna 1 long, cylindrical, almost as long as the head, without the beak-shaped process at the distal end; segments 2 and 3 of the peduncle relatively long, uniform in length; segment 1 of the flagellum short, about 1/3 the length of segment 1 of the peduncle, devoid of the sensory setae on the lower surface; accessory flagellum 3-segmented, longer than segment 1 of the main flagellum.

The last segment of the peduncle of antenna 2 slightly shorter and narrower than the penultimate one, flagellum few-segmented (6-10 segments). The inner plate of maxilla 1 conical, with 2 plumose setae uneven in size at the apex. The outer plate of maxilla 2 almost 2 times broader than the inner one, with a broad, oblique, almost transverse apex bearing setae; inner plate slightly shorter, in the upper third of its margin and at the apex, there are plumose setae, the lower part fringed with thin hairs. The mandibles have a poorly developed triturating surface on the abbreviated molar process. At the apex of the lobes of the lower lip, there is a small horn-shaped process; maxillipeds have long inner plates on whose apices and along the inner margin plumose setae are found; inner plates reach with their apices beyond the distal end of a 2-segmented palp and bear blunt tooth-shaped spines along the inner margin. Coxal plate 1 broadens distally, has a weakly convex anterior margin and a tooth at the postero-distal angle. Coxal plate 2 also broadens distally, slightly narrower than coxal plate 1. The basal segment of gnathopod 1 has sparse setae on the anterior margin; segment 3 normal, shorter than segment 4; segment 6 almost as long as segment 5, weakly broadens distally, palmar margin oblique, two times shorter than the inner margin of the hand, with 2 strong locking spines; dactyl as long as the palm with the accessory tooth at the distal end. Gnathopod 2 only slightly longer and thinner than gnathopod 1; segment 3 strongly enlarged $1\frac{1}{2}$ times larger than segment 4; segment 5 broadens distally, has a well-developed "pine-apple cushion". Segment 6 has almost parallel margins, enlarged, its width $1\frac{1}{2}$ times smaller than its length; palmar margin short, drawn out forward and forms, together with the dactyl, a small chela. The branchial vesicles simple, in gnathopod 2 and peraeopods 1 and 2 without folds and accessory lobes; in gnathopod 3, with a sausage-shaped accessory lobe, in gnathopod 4 with 1 long lobe on the outer side and a bifid lobule at the upper part of the neck (the size of the animal very small and could be lost during the mounting). The dactyls of peraeopods 1 and 2 thin and long, more than 2/3 the length of segment 6. The basal segments of the last three peraeopods broad, do not taper distally, with a large notch-like crenulation of the posterior margin and spines along the anterior margin, the lobes of a wing-shaped expansion broad, with an almost straight lower margin; segment 4 of peraeopod 2 strongly broadened, its width equals its length; segment 5 as long as segment 4. Segment 4 of peraeopod 4 broadens distally, but its width almost $1\frac{1}{2}$ times smaller than its length, and its length larger than the length of segment 5. Segment 4 of peraeopod 5 weakly broadens distally, its length slightly larger than the length of segment 5. The dactyls of all three peraeopods longer than the length of segment 6.

Urosome segment 1 lacks the saddle-shaped depression and the keel. The ends of uropod 1 do not reach the end of uropod 2, their rami of equal length; the inner ramus of uropod 2 slightly shorter than the outer one. Uropod 3 extends slightly beyond the ends of uropod 2, inner ramus shorter than the outer; peduncle as long as segment 1 of the outer ramus with long strong spines at both lower angles; the apical segment of the outer ramus long, longer than half the length of segment 1; both rami armed with strong large spines. The tooth of epimeral plate 3 very large and sharp. Telson tapers weakly distally, deeply cleft, the lobes with blunt apices each of which has 1 large thick spine; there are two pairs of dorsal spines and one pair of thick plumose setae between them. The sculpture of the tegument very indistict, almost lacking, a weak oblique striation found only on the epimera. The animal reaches 6 mm in length.

This is a shallow-water species which inhabits the Phyllospadix-fields and common eelgrass in the Sea of Japan (Peter the Great Bay and Pertrov Island), at depths of 0-25 m; discovered also in the coastal fields of algae and wrackgrass in Avacha Bay, at the eastern coast of Kamchatka, and at depths of from 20-75 m at the Pacific coast of Iturup in the area of Kasatka Bay.

8. Hippomedon granulosus Bulycheva, 1955 (Figure 31)[1].

Bulycheva, 1955. Tr. Zool. Inst. Academy of Sciences of the USSR, XXI: 195, Figure 2.

The relatively thin and slender body, the reticular sculpture of the tegument, the long last segment of the peduncle of antenna 2, the long and thin dactyls of peraeopods, the shape of epimeral plate 3, the long and narrow rami of uropod 3, and especially the indistinctly expressed subchela of gnathopod 1, affiliate this species with the North-Atlantic species, in particular, H. propinquus G. Sars. The lack of eyes, the well-developed, triangular interantennal lobe protruding forward, the abbreviated segment 1 of the flagellum of antenna 1 whose length is smaller than that of segment 1 of the peduncle, the strongly enlarged segment 3 of gnathopod 1, the broad and short segment 6 of gnathopod 2, on the other hand, affiliate this species with the two preceding species. The shape and armature of the telson of H. granulosus Bulycheva differ this

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[1] Description and figures according to the type specimens preserved in the Zoological Institute of the Academy of Sciences of the USSR.

species from both the North-Atlantic and other Pacific species.

Figure 30. Hippomedon minusculus (Gurjanova). Holotype. Sea of Japan (Petrov Island).

Figure 31. Hippomedon granulosus Bulycheva. Holotype. Sea of Japan.

Body quite thin, slender, weakly inflated; head as long or longer than peraeon segments 1 and 2 together. Even traces of eyes lacking; interantennal lobes triangular, drawn out forward and bluntly pointed; lower-antennal notch and lobe wanting. The segment of the peduncle of antenna 1 have beak-shaped processes which overlap the subsequent segment; segment 1 has a lateral keel along the entire segment; segment 1 of the flagellum shorter than segment 1 of the peduncle, about 2/3 its length, with transverse rows of sensory cylindrical setae on the lower surface; segment 10-12 segmented; accessory flagellum slightly longer than segment 1 of the main flagellum, 3-segmented; segment 1 of it slightly longer than segment 2, the latter considerably shorter than segment 1. The last segment of the peduncle of antenna 2 considerably longer than the penultimate one, flagellum multi-segmented, in ♂ bears calceoli. The inner plate of maxilla 1 conical, with 3 thick plumose setae at the apex; these setae decrease gradually in size from the outer to the inner; the inner plate has 6 thick broad serrated spines at the apex. The outer plate of maxilla 2 broader and slightly longer than the inner one; the inner margin of the inner plate 2/3 fringed with plumose setae, the lower third of this margin smooth, without hairs.

Gnathopods 1 and 2 almost of same length and thickness; coxal plate 1 weakly broadens distally, has a tooth at the postero-distal angle and a weakly convex anterior margin; coxal plate 2 slightly narrower than coxal plate 1. Gnathopod 1 long, thin, segment 3 strongly enlarged, only slightly shorter than segment 4; segment 6 slightly shorter than segment 5, does not braoden distally; palmar margin oblique and relatively short, its length $1\frac{1}{2}$ times smaller than that of the inner margin of the hand; there are 2 locking spines at the border between the palm and the inner margin of the hand; dactyl slightly longer than palm. Segment 3 of gnathopod 2 strongly enlarged, longer than segment 4; segment 5 has an inflated distal margin and a well-developed "pine-apple cushion"; segment 6 short, almost 2 times shorter than segment 5, broadens strongly distally, palmar margin transverse, long, concave, dactyl considerably shorter than palm. Segments 4-6 densely covered with coarse hairs and setae. The branchial vesicles of gnathopod 2 and peraeopods 1 and 2 simple, in peraeopod 3 with 1 and in peraeopod 4 with 2 accessory sausage-shaped lobes; the gill of peraeopod 5 very small, hardly noticeable, but with a small accessory lobule on the hind side of the neck of the reduced main vesicle. The dactyl of peraeopods 1 and 2 long, thin, sharp, as long as segment 6. The basal segment of peraeopod 3 broad, tapers distally; anterior margin convex, with spinules, the hind margin distinctly notched, with small setae at the base of each tooth; the lower lobe of the wing extends slightly lower than the distal end of segment 3; segment 4 as long as segment 5, broadened, its greatest width equals its length; segment 5 also broadened, but considerably weaker than segment 4, its width slightly larger than half the length, segment 6 linear, narrow, slightly longer than segment 5, dactyls measure about 2/3 the length of segment 6. The basal segment of peraeopod 4 weakly tapers distally, its hind margin indistinctly notched, with short setae at the base of the almost unnoticeable spines; segment 4 broadens distally, enlarged, its length $1\frac{1}{2}$ times greater than its width. The basal segment of peraeopod 5 does not taper distally, the wing-shaped broadening does not form a lobe drawn out below but becomes uniformly rounded at the end; segment 4 weakly broadens distally. The tooth of epimeral plate 3 large and sharp. Urosome segment 1 with a saddle-shaped depression and a small low lateral keel rounded at the end. The ends of the rami of uropods 1 and 2 almost at the same level, the rami of each uropod uniform in length; uropod 3 strongly protrudes backward; uropods 1 and 2 reach only the end of the first third of the rami of uropod 3. The inner ramus of uropod 3 slightly shorter than the outer; peduncle shorter than segment 1 of the outer ramus, with 2-3 spines at the distal angles; the apical segment of the outer ramus enlarged, about half the length of segment 1; both rami smooth; only at the distal end of segment 1 of the outer ramus, there is a pair of apical spines. Telson strongly enlarged, deeply cleft, the lobes diverage laterally, strongly taper distally, with a blunt apex armed with 2 apical spines uneven in size; there are from 3 to 5 pairs of marginal spines [A.I. Bulycheva states that there are up to 10 pairs of them (!)].

The outer plates of the head and of the appendages are rich in skin glands; the tegument has an indistinctly alveolar sculpture, granules, and small conical spinules within the cells. The animal is up to

10 mm long.

This species is distributed in the Sea of Japan (Peter the Great Bay, Tatar Strait), at a depth of 60-100 m; discovered at the eastern coast of southern Sakhalin in the Sea of Okhotsk, at a depth of 134 m, in Terpeniya Bay.

9. Hippomedon abyssi (Goës, 1866) (Figure 32 and 33).

Goës, 1866, Öfv. Ak. Förh., 22: 519, t. 37, f. 5 (Lysianassa); Boeck, 1870, Forh. Selsk. Christian: 103; G. Sars, 1890, Crust. Norw., I: 56; Stebbing, 1899, Ann. Mag. Nat. Hist., (7), 4: 206 (Paratryphosites); 1906, Tierreich, Berlin, 21: 43, (Paratryphosites); Guryanova, 1951: 194, Figure 4 (Paratryphosites).

We consider it necessary to give a rather more complete description of this species as its affiliation with the genus Hippomedon was questioned by such an important specialist as Stebbing who considered this species as a type of the new genus established by him. We have studied large collections pertaining to this species from Siberian and Far-East seas, having compared them with specimens from Greenland which were sent to us by the Swedish Museum from collections of 1873, and we have come to the conclusion that this is a typical Hippomedon; the only characteristic feature which differentiates it from all the other species of the genus is the cleft of the telson which does not reach the middle; in the specimens from the Far East, however, the telson is cleft much further than to the middle (Figure 34), so that even this feature has to be discarded. Moreover, this species has also a specific sculpture of the tegument, the branchial vesicles have accessory sausage-shaped lobules, the flagella of antennae in oo have calceoli. We shall describe the Greenland cotype (Figure 32A, 32B) first, as the representatives from the Far East have some deviations in regard to the details of the structure of individual body parts.

The Female With Eggs. The brood chamber has 18 eggs; body length 13.5 mm. Head relatively broader than in other species, its length slightly shorter than peraeon segments 1 and 2 together; even traces of eyes lacking; the interantennal lobe drawn out forward, pointed at the end, lowerantennal notch and lobe wanting. Antenna 1 with a cylindrical peduncle and a short segment 1 of the flagellum; segment 1 of the peduncle slightly shorter than the head, has a large beak-shaped process at the distal end (this process covers the upper part of segment 2); segments 2 and 3 enlarged, together larger than half the length of segment 1; flagellum 11-segmented. Segment 1 of the flagellum shorter than segments 2 and 3 of the peduncle together and considerably smaller than half the length of segment 1; accessory flagellum 4-segmented, two times longer than segment 1 of the main flagellum. The last segment of the peduncle of antenna 2 narrower and slightly longer than the penultimate one, the flagellum 22-segmented. The inner plate of maxilla 1 conical, with a truncated apex bearing 5 plumose setae with a thick base, its inner margin fringed with hairs; the obliquiely truncated apex of the outer plate has 6 thick main and 3 thinner pectinate spines. The inner plate of maxilla 2 considerably shorter and narrower than the outer, the upper third of its inner margin has 3-4 plumose setae, the lower part with thin hairs. Maxillipeds have long plates; the outer plates reach the distal end of segment 3 of the palp bear short tooth-shaped spines along the inner margin, the inner plates reach the middle of segment 2 of the palp and fringed with plumose setae (8) along the entire inner margin. Coxal plate 1 has a convex anterior margin, broader than coxal plate 2, broadens distally, and lacks a tooth at the postero-distal angle.

Gnathopod 1 shorter and stronger than gnathopod 2; the basal segment bears setae along the anterior margin; segment 3 slightly enlarged, but shorter than segment 4; segment 5 as long as segments 3 and 4 together, weakly broadens distally; segment 6 slightly shorter than segment 5, narrow, almond-shaped, with a strongly oblique palmar margin and 2 long locking spines; palm shorter than the inner margin of hand, dactyl slightly longer than palm. Gnathopod 2 with a strongly enlongated segment 3, its length exceeds that of segment 4 at least $1\frac{1}{2}$ times. segment 5 shortened, with a strongly inflated distal end and a well-developed "pine-apple cushion"; segment 6 two times shorter than segment 5, tapered at the base and with parallel margins; the palmar margin transverse, weakly convex, dactyl as long as plam. The branchial vesicles of gnathopod 2 and peraeopods 1 and 2 simple, large, with a fleshy inner margin, but without accessory lobes and folds; gills 3 of peraeopod have a fleshy margin, one broad transverse fold (invagination), and a long sausage-shaped accessory lobe on the outer side; the gills of peraeopod 4 have 2 accessory sausage-shaped lobes and transverse invaginations; the branchial vesicle of peraeopod 5 very small, but with 2 sausage-shaped accessory lobules. The dactyls of peraeopods 1 and 2 long, about 2/3 the length of segment 6, strong, pointed.

The basal segments of the last three peraeopods broad, do not taper distally, with a coarsely notched posterior margin and spinules on the anterior margin produced into needle-shaped setae in the lower part of the segment, the lobe of the wing-shaped broadening of peraeopod 3 rounded, well pronounced, its apex does not reach the end of segment 3; segment 4 broadened, its width slightly smaller than its length, while the length corresponds to the length of segment 5, which also is slightly broadened; segment 6 linear, the dactyls slightly shorter than segment 6, segment 4 of peraeopod 4 weakly broadened, its length shorter than the length of segment 5, segment 6 shorter than segment 5, the dactyl larger than half of segment 6. The lobe of the wing of peraeopod 5 weakly developed, does not reach the end of segment 3; segment 4 almost linear. Along the anterior margin of segments 3-6 of last three peraeopods, there are long acicular setae; in addition, segments 5 and 6 have small spinules. The tooth of epimeral plate 3 large and sharp, bent upward. Urosome segment 1 has a small saddle-shaped depression and a low oblong keel with a blunt angle. Uropods 2 and 3 shortened; the end of uropod 1 extends slightly further than the ends of uropods 2 and 3 which are found at the same level. The peduncle of uropod 3 braodens distally and bears long spines at the end, up to 8 spines at the anterior and 2-3 spines at the inner angle. Outer ramus only $1\frac{1}{2}$ times longer than peduncle, armed with spines at the distal end; both rami extended-triangular, with a broad base. Telson short and broad, cleft less than to the middle (1/3);

its width at the base equals the length; at the end, telson tapers weakly; the lobes have a straingt posterior margin, each bearing 7 long bent apical spines; there are two pairs of marginal spines. The sculpture of the tegument distinctly alveolar, cells irregular in form and devoid of small spinules in the middle. 13.5 mm long.

The telson of all specimens from the Chuckchee Sea (Figure 33A) is deeply cleft, almost to the middle; at the apex of each lobe, there are 8 - 9 apical spines; the inner margin of the peduncle and both rami of uropods 1 and 2 are densely covered with long needle-shaped spines; ends of all three uropods at the same level; head rather narrower and longer than in Greenland specimens; coxal plate 1 narrower, deeper, and with a more convex anterior margin; segment 1 of the peduncle of antenna 1 bears, besides the beak-shaped process, a distinct longitudinal keel along almost the entire length of the segment; the inner ramus of uropod 3 almost as long as the outer, the tooth of epimeral plate 3 smaller and less bent upward.

Figure 32A. Hippomedon abyssi (Goës). Western Greenland, ♀ (cotype).

Figure 32B. Hippomedon abyssi (Goës). Western Greenland, ♀ (Cotype).

Figure 33A. Hippomedon abyssi (Goës). The Chuckchee Sea, ♀.

Figure 33 . Hippomedon abyssi (Goës). Terpeniya Bay (Sea of Okhotsk), ♀.

However, the difference in the characteristic features between the Greenland and the Far-East species which begins to show is yet so insignificant /we had at our disposal so few (only 3) Greenland specimens/ that we consider it impossible to separate the Far-East form as independent and hence present only the drawings (Figure 33).

As stated in our summary (Guryanova, 1951: 195), H. Abyssi has a typical amphiboreal geographical range [1]. Described for the first time from the collections from the area of western Greenland at depths of 150 - 500 m, it was later discovered on the shelf of the Atlantic coast of North America (Labrador, Nova Scotia) where it spreads southward to 46° n. lat. (Shoemaker, 1930). The richest collections of numerous Soviet Arctic expeditions which conducted research in the northern seas of our country from the Barents Sea eastward to the Chuckchee Sea did not encounter this species even once, either in the shallow waters of the Siberian seas and the Arctic archipelagos or in the depths of high latitudes. H. abyssi appears only in the Chuckchee Sea and spreads in the entire sea at depths ranging from 20 to 100 m, where it attains a large size of up to 20 mm in length; it also was discovered further east, in the area of Barrow Point at depths reaching 528 m (Shoemaker, 1955). In the northern part of the Pacific Ocean, it inhabits the coasts of Asia and is not discovered at the eastern coasts of North America. Our

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[1] The note to Figure 64 H. abyssi that this specimen is from the Kara Sea is erroneous; the drawing was made from a specimen from the Chuckchee Sea.

Far-East collections have it from the northern shallow waters of the Bering Sea and eastern Kamchatka at depths of 7 to 85 m (Anadyr and Avacha gulfs, the coast of Chukotski* Peninsula, and the St. Lawrence Island area), from the Sea of Okhotsk where it concentrates in the north-western and northern shallow-water areas, and in the Penzhina Bay region at depths of 40 - 200 m; it also is discovered in the southern part of the Sea of Okhotsk in the eastern part of La Perouse Strait (126 m), and in Terpeniya and Aniva bays at depths less than 100 m.

It also occurs in the Sea of Japan, but seldom, in Tatar Strait at the Primorye coast, at depths of 125 - 500 m, and at the coast of Sakhalin, south of Cape Kostromsky*, at depths of 19 - 30 m; all specimens from the Sea of Japan are thin, transparent, no more than 10 - 12 m long.

According to Shoemaker (1955, Smithson. Mus. Coll., 128: 4), H. stephenseni, described by Frost (1936, Faunist. series, No. 1, Dept. Nat. Resources, Dov. Fisher. Research, Newfoundland), it is synonymous with H. abyssi.

Occurrences of H. abyssi indicate that this is a cold-water species confined to the northern parts of the Atlantic and the Pacific oceans and the western coasts which are cooled by the Labrador, East-Kamchatka, and Primorye currents, a species that definitely avoids the

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* "Chuckchee". Translator

* Probably from "Kostroma". Translator

areas washed by the warm waters of the Gulf Stream and Kuroshio currents; on this strength, one may suppose that H. abyssi might not have a disrupted but a continuous geographical range, from western Greenland, west along the Arctic coast of North America and the Canadian archipelago, to Barrow Point, whence it spreads into the Chuckchee Sea and furthern south, into the Far East, and from the Canadian Arctic to Labrador and Newfoundland. A comparison of Greenland specimens with those of the North-Atlantic, on the one hand, and, of the latter specimens with those from the Far East, on the other, could clarify this question.

10. Hippomedon kurilicus Gurjanova sp.n. (Figure 34).

This species is very close to H. abyssi as may well be seen from the comparison of both species; however, the essential structure of the tegument, the structure of gnathopod 1, peraeopod 3 - 5, uropod 3, the telson and the branchial vesicles allow us to regard H. kurilicus as an independent species with a well defined geographical range, rather narrower than in H. abyssi. The species we are describing differs from H. abyssi in a distinctly defined structure of the tegument, with regular pentagonal cells and 1 - 2 spinules in the middle of each; coxal plates 1 - 4 deeper and narrower; coxal plate 1 not only narrower and deeper than that of H. abyssi, but also tapers distally, has a strongly convex anterior margin and a tooth at the postero-distal angle, which features are not observed in H. abyssi. In shape, segment 6 of gnathopod 1 is completely different from that of H. abyssi; it is not almond-shaped, tapering distally, but broadens distally, its parmal margin 2 times shorter than the posterior margin of the hand, with 2 weak and short locking spines, while the palmar margin in H. abyssi is long, more oblique, only slightly shorter than the posterior margin of the hand and restricted by 2 locking spines. Segment 6 of gnathopod 2 also differs in shape - it is rather broader and short, uniform in width along its entire length. The basal segments and the relative length of segments 4 - 6 of peraeopods 3 - 5 are different from those in H. abyssi; the basal segments of H. kurilicus relatively narrower than in H. abyssi, and with a well-developed lower wing lobe, segment 4 broadened, longer than segment 5, and segment 6, too, longer than segment 5; segment 4 of H. abyssi longer and segment 6 shorter than segment 5. In these features, H. kurilicus resembles the Chuckchee specimens. The rami of uropod 3 of ♂♂ in H. kurilicus are uniform in length, the inner ramus of ♀♀ longer than segment 1 of the outer ramus, the inner ramus of ♀♀ H. abyssi considerably shorter, and in ♂♂ as long as segment 1 of the outer ramus. The apical segment of the outer ramus of H. kurilicus larger than in H. abyssi. Considerable are also the differences between both specimens in regard to the form and the armature of the telson: it is elongated in H. kurilicus (its width is considerably shorter than its length), does not taper distally, deeply cleft, has from 3 to 5 spines at the apex of the lobes, and it has 2 pairs of marginal spines; in H. abyssi, the telson short and broad (its width at the base equals its length), slightly tapers distally, cleft only to the middle, and armed with two pairs of marginal spines and 7 - 8 spines at the apex of each lobe. The differences are found also in the number of the branchial vesicles: gnathopod 2 and peraeopod

5 of H. kurilicus are devoid of them, while in H. abyssi they are present, the branchial vesicle of peraeopod 4 in H. kurilicus has 3 accessory sausage-shaped lobes, while in H. abyssi there are only 2 such lobes. There are also differences in the structure of the oral parts: the inner plate of maxilla 1 in H. kurilicus bears 2, and in H. abyssi is shorter and thicker, with a large peak-shaped process at the distal end and without the longitudinal keel, while in H. kurilicus it is expanded, of a regular cylindrical shape, without the peak, but with a longitudinal keel. In the structure of peraeopods 3 - 5, H. kurilicus resembles the Chuckchee species H. abyssi.

Body slender, elongated, weakly inflated; head shorter than peraeon segments 1 and 2 together; eyes wanting, interantennal lobe drawn out forward and pointed, lowerantennal lobe and notch not distinct. Segment 1 of the peduncle of antenna 1 long, as long as the head, cylindrical, without the peak at the distal end; segments 2 and 3 also elongated and in this regard, resemble H. minusculus; segment 1 of the flagellum relatively short, less than half the length of segment 1 of the peduncle; flagellum multisegmented (♂ has up to 21 segments), its segments at the antero-distal angle bear clusters of short setae, in ♂, besides these clusters, there are long setae; accessory flagellum long, 7-segmented, considerably longer than segment 1 of main flagellum. Last segment of peduncle of antenna 2 slightly longer than penultimate, flagellum multisegmented, in the male bearing calceoli. The inner plate of maxilla 1 conical, with 2 plumose setae of uneven size at the apex; the outer plate has 6 thick pectinate teeth at the apex and hairs on the outer surface.

The outer plate of maxilla 2 broader and longer than the inner one; at the distal end of its outer margin, there are 2 spinules and a few thin setae, inner margin fringed with hairs; inner plate conical, as its apex is obliquely truncate and bears plumose setae; inner margin fringed with thin hairs.

Coxal plate 1 narrow, with a strongly conves anterior margin, broadened at the middle and tapering distally; its width slightly larger than the width of plate 2; at the postero-distal angle, there is a distinct tooth. Gnathopod 1 shorter than gnathopod 2, segment 3 normal in length, considerably shorter than segment 4; segment 5 broadens distally, segment 6 has almost parallel margins and a shortened oblique palmar margin whose length is two times shorter than the inner margin of hand and bears 2 locking spines of uneven size; segment 6 considerably shorter than segment 5; dactyl slightly longer than palm. Segment 3 of gnathopod 2 strongly elongated, its length greater than half the length of the basal segment and more than the length of segment 4; segment 5 inflated at the distal end, with a well-developed "pine-apple cushion", segment 6 smaller than half the length of segment 5, almost square, its width slightly smaller than its length, palmar margin very short, transverse, dactyl reaching its outer angle; gnathopod 2 and peraeopod 5 lack branchial vesicles; peraeopods 1 and 2 have large simple vesicles, peraeopod 3 has a long sausage-shaped accessory lobe on the outer side, peraeopod 4 has 3 sausage-shaped accessory lobes, the first on the outer side reaches the distal end of the main vesicles, the 2nd is slightly shorter at the base of its neck. The dactyls of peraeopods 1 and 2 are slightly larger than half the length of segment 6. The basal segment of peraeopod 3 tapers distally, strongly oblique, its anterior margin begins considerably higher than the upper wing which forms a broadly rounded lower lobe that reaches the middle of segment 4; along the anterior margin, there are clusters (2 - 3) of acicular setae, the hind margin strongly notched; segment 4 broadens strongly distally, its width slightly larger than its length; segment 5 slightly shorter and narrower than segment 4, although it also is as broadened, segment 6 linear, longer than segment 4, dactyl slightly shorter than segment 6; the anterior and posterior margins of segments 4 and 5 and the anterior margin of segments 3 and 6 bear long setae. The basal segment of peraeopod 4 uniform in width both at its base and distal end; its anterior margin has long acicular setae, the posterior one coarsely notched, the lobe rounded, reaching the middle of segment 3. Segment 4 strongly elongated, broadens distally, longer than segment 5, which also is broadened; the anterior margin of segments 3 - 6 and the posterior margin of segment 4 have long setae. The basal segment of peraeopod 5 does not taper distally; the lower margin of its lobe, which reaches the middle of segment 3, transverse, weakly convex; anterior margin has spinules in the upper part and long setae in the lower part, posterior margin coarsely notched; segment 4 weakly broadens distally, segment 5 and 6 linear. The postero-distal angle of epimeral plate 2 drawn out backward, pointed, with a diagonal keel; the tooth of epimeral plate 3 broad, sharp. Urosome segment has a small saddle-shaped depression, smooth, wanting the keel. The ends of uropod 2 reach almost the end of the rami of uropod 1; the rami of each of them are almost uniform in length; there are long acicular setae along the inner margin of the peduncle and the inner ramus. Uropod 3 shortened, the ends of its rami reach the level of the ends of uropod 1; peduncle strongly broadens distally, its length smaller than the length of the proximal segment of the outer ramus, there are long bent spines at distal angles; rami of same length, bear marginal spines and setae; the apical segment of the outer ramus measures about 1/4 the length of segment 1. Telson long, hardly tapers distally, deeply cleft; the lobes at the apex truncated, form a straight posterior margin which bears 5 (in ♂♂) or 3 (in ♀♀) apical spines; there are three-four pairs of marginal spines in ♂♂ and two paris in ♀♀. The sculpture of the tegument consists of pentagonal cells at the middle of which there are 1 - 2 conical spinules. The animal is up to 17 mm long.

It is widely distribuited in the area of the Kurile straits at depths of 30 - 40 m and is abundant in this area; many specimens have been discovered on the Pacific platform of Lake Iturup, at depths ranging from 12 to 116 m, in Yekaterina Strait, and South-Kurile Strait (depths 27 - 30 m). In the Sea of Okhotsk, this species is found in collections from depths varying from 12 to 34 m at the eastern coast of south Sakhalin (Terpeniya Bay and Mordvinov Bay); in the Seas of Japan, at the western coast of South Sakhalin, in Tatar segment 5, the lack of a sinus above the base of the tooth of epimeral plate 3, a deeply cleft telson with large armature and the sculpture of tegument, which is considerably more complex than the sculpture of H. denticulatus orientalis. Body stout, weakly inflated; head slightly shorter than peraeon segments 1 and 2 together; not even traces of eyes left; the interantennal lobe of head protruded forward, has a rounded top; there is a small lowerantennal notch and a small lowerantennal lobe. Antenna 1 has a short segment 1 of the peduncle, (the former is more inflated than in other species) which has a low oblong keel rounded at the distal end; segments 2 and 3 abbreviated, segment 2 has a keel similar to that in segment 1; segment 1 of the flagellum elongated, slightly shorter than segment 1 of the peduncle, with cylindrical sensory setae on the lower surface; accessory flagellum shorter than segment 1 of the main flagullum, 3-segmented. The last segment of the peduncle of antenna 2 is $1\frac{1}{2}$ times longer than the penultimate, has 2 oblong series of short coarse setae on the upper surface, flagellum multisegmented. The inner plate of maxilla 1 oval, with 6 - 7 plumose setae and thin hairs along the inner margin. The spines at the apex of the outer plate (7) are coarse, broad, with a pectinate margin. The inner plate of maxilla 2 has plumose setae along the entire inner margin. Gnathopod 1 shorter and stronger than gnathopod 2. Coxal plate 1 broadens distally, has a rounded lower end which lacks a tooth, plate 2 narrower than plate 1, with parallel margins. The anterior margin of the basal segment of gnathopod 1 is fringed with setae, segment 3 elongated, slightly shorter than segment 4; segment 6 strong, broadens strongly distally, slightly shorter than segment 5. Palmar margin oblique, convex, distinctly restricted by locking spines and slightly shorter than the inner margin of hand, dactyl longer than palm. Segment 3 of gnathopod 2 long, slightly longer than segment 4, which, contrary to that in other species, is almost linear; segment 5 also almost linear, without the "pine-apple cushion" and coarse hairs at the distal end; segment 6 slightly shorter than segment 5, broadens slightly distally; tapering at the base, the palmar margin occupies about half the distal margin of the segment, concave, dactyl as long as palm, and the entire segment, as is the case in all other species, is densely covered with coarse hairs. The branchial vesicles of gnathopod 2 and peraeopod 1 lack accessory lobes but have a few transverse folds; peraeopod 2 has a broad, leaf-shaped accessory lobe on the inner side of the main vesicle, only slightly smaller than the main vesicle; peraeopod 3 has a long sausage-shaped lobe on the outer side of the vesicle whose margins at the neck are fleshy; the branchial vesicle of peraeopod 4 also has fleshy margins at the base, transverse folds, and a sausage-shaped accessory lobe; the branchial vesicle of peraeopod 5 small, with 1 accessory lobule at the neck and fleshy upper margins. Peraeopods 1 and 2 have dactyls, as long as segment 6, with a broad base and pointed at the end. The basal segment of peraeopod 3 broad, almost lacking the lobe, tapers distally, with a fine-toothed posterior and devoid of spinules anterior margins; segment 4 strongly broadened, its width only slightly smaller than the length; segment 5 also broadened, but rather narrower than segment 4, and its length larger than that of segment 4. The basal segment of peraeopod 4 does not taper distally, but is with a finely notched posterior margin and a small, blunt, wing-shaped lobe; segment 4 weakly broadens distally. The basal segment of peraeopod 5 has a deeply concave anterior margin and a finely notched posterior one, strongly tapers distally, broadens from the base to the middle. The tooth of epimeral plate 3 large and sharp. Urosome segment 1 has a saddle-shaped depression and an oblong keel with a blunt apex; uropod 1 extends slightly further than uropod 2; each uropod has rami similar in length which reach the level of the middle of uropod 3; the peduncle of uropods 1 and 2 have long thin spines on the inner margin. Uropod 3 with a short peduncle and long broadly lanceolate rami which become pointed only at the very end; there are 2 groups of strong spines on the distal margin of peduncle; both rami have marginal spines; the apical segment of the outer ramus is small. Telson relatively short and broad, deeply cleft, with slightly diverging lobes; the apices of the lobes become bluntly pointed, with 1 - 2 apical spines; there are from two to five pairs of marginal spines.

Figure 35A. *Hippomedon punctatus* Gurjanova sp.n. Sea of Okhotsk, ♂.

Figure 35B. *Hippomedon punctatus* Gurjanova sp.n. Sea of Okhotsk, ♂.

The sculpture of the tegument is complex; except for the reticulum of the cells with small conical spinules at the middle of each of them, there is a sparse coarse punctation, especially on coxal plates and head, and indistinct oblique striae, similar to the striation of the tegument of H. holbölli on the pleon segments. The animal is up to 23 mm long.

This species was encountered in the Pacific coast of Lake Iturup, at a depth of 88, 129, and 151 m (in August-September ♀♀ with eggs), east of Lake Zeleny (the Small Kurile Range) at a depth of 146 m, and in the northern part of the Sea of Okhotsk, at depths ranging from 90 to 388 m (the Bay of Penzhina area).

* 12. Hippemedon sarratus Holmes, 1903 (Figure 36).

Holmes, 1903, Amer. Nat., 37: 278; 1905, Bull. U.S. Bureau Fish., 24: 473, t. 4, f. 2, and Text Figure.

Because of the newly established size of the genus, we consider it necessary to describe this species, as Holme's original description is too brief, lacks the features which play a very important role within the boundaries of this genus. The description is made from the specimens we received from the Washington Museum.

Body thin, slender, weakly inflated, head slightly shorter, almost as long as peraeon segments 1 and 2 together; interantennal lobes not stretched out forward, bluntly-triangular, lowerantennal notch and lobe wanting; eyes narrow, extended vertically behind the interantennal lobe. Segment 1 of the peduncle of antenna 1 with a long wing overhanging segments 2 and 3, segment 2 has a small keel; the last two segments of the peduncle shortened; segment 1 of the peduncle strong, slightly longer than peduncle (the measurements taken along the lower margin of the peduncle), with dense rows of sensroy setae and a short strong spinule at the distal end; a similar spine, but rather longer, also found on segment 2; flagellum has up to 14 segments, with calceoli; accessory flagellum 4-segmented, the last segment thin and short. The last segment of the peduncle of antenna 2 considerably longer than the penultimate, with small clusters of short coarse hairs on the anterior margin; flagellum multisegmented, with calceoli. The inner plate of maxilla 1 small, conical, with 2 plumose setae at the apex; at the apex of the outer plates are 6 thick blunt teeth with denticles at their apex and the second row consists of 3 (?) thinner pectinate spines. The inner plate of maxilla 2 narrower and slightly shorter, plumose setae located on the upper half of its margin, lower part smooth, without hairs. The outer plates of the maxillipods reach the middle of the segment of the palp, the inner ones reach the middle of segment 2 of the palp and bear plumose setae along the inner margin. Coxal plate 1 broadens greatly distally, has a small tooth at the postero-distal angle; coxal plate 2 narrow, with parallel margins. Gnathopod 1 long, narrow, even slightly longer than gnathopod 2; segment 3 slightly extended, somewhat shorter than segment 4, both segments, 5 and 6, narrow, linear; segment 6 is $1\frac{1}{2}$ times shorter than segment 5, almost linear, weakly broadens toward the base, with a short oblong thinly notched palm and 1 locking spine in the middle of the notched margin; inner margin of segment weakly concave, the outer convex; dactyl long, thin, more than half the length of segment 6. Segment 3 of gnathopod 2 strongly elongated, longer than segment 4; segment 5 lacks the "pine-apple cushion", segment 6 slightly broadened distally, two times shorter than segment 5, palmar margin transverse, weakly concave, dactyl small, shorter than palm. The dactyl of peraeopods 1 and 2 slightly shorter than segment 6. The branchial vesicles of ganthopod 2 and of peraeopods 1 and 2 simple, in peraeopod 3 with fleshy margins at the neck, transverse folds, and 1 sausage-shaped lobule on the outer side; in peraeopod 4 also with transverse folds and 2 sausage-shaped accessory lobules; the branchial vesicle of peraeopod 5 small, without accessory lobes, but with fleshy margins.

Figure 36. Hippomedon serratus Holmes, Cape Cod, ♂ (specimen from the Washington Museum).

The basal segment of the last three peraeopods has a notched posterior margin, especially sharply expressed are the notches in peraeopod 5. The basal segment of peraeopod 3 tapers distinctly distally, the lobe reaches the end of segment 3 and is rounded; segment 4 weakly broadens distally. The basal segment of peraeopod 4 has almost parallel margins and a weakly developed lobe; in the form;

segment 4 is similar to that in peraeopod 3; the basal segment of peraeopod 5 broadens to the middle and tapers distally, its anterior margin is concave, the lobe very short, without teeth, segments 4 - 6 linear. The posterior margin of epimeral plate 3 convex in the middle, tooth thin, sharp, large. Urosome segment 1 has a small saddle-shaped depression and an oblong keel, with a blunt angle at the end. Uropod 2 shorter than uropod 1, the ends of uropods 1 and 3 at the same level. The rami of all three uropods equal; the inner margin of the peduncle and the inner ramus of peraeopods 1 and 2 have thin acicular spines. The rami of uropod 3 also are of same size, broadly lanceolate, with marginal spinules; the epical segment of the outer ramus small, triangular, the peduncle two times as short as the rami, armed with strong short spines at the lower margin. Telson oblong-triangular, cleft further than to the middle, lobes pointed, with an apical spinule at the apex; there is one pair of marginal spines and one pair of plumose setae near the base of telson. The sculpture of the tegument is coarsely-alveolar, with granules. The animal is 11 m long.

This is a North-American species discovered at a depth of 70 m near the American coast in the area of Cape Cod.

*13. Hippomedon angustimanus Gurjanova sp.n. (Figure 37).

Like the two preceding species (H. punctatus and H. serratus Holmes), it belongs to the group of the species with an oblong, tapering distally, basal segment of peraeopod 5 and broadly lanceolate rami of uropod 3. However, contrary to the first *H. angustimanus*, it has a strongly elongated segment 1 of the flagellum of antenna 1, as long as segment 1 of the peduncle, a narrow almond-shaped indistinctly subchelate segment 6 of gnathopod 1, thin long and sharp dactyls of the peraeopods, and a reticulate sculpture of the tegument. All these features are characteristic of the North-Atlantic group of the species, while segment 1 of the flagellum of antenna 1 in all North-Pacific species, including the Pacific subspecies of the Atlantic species, is abbreviated, shorter than segment 1 of the peduncle; gnathopod 1 with a distinct subchela, peraeopods with relatively shorter and thicker dactyls, and the sculpture of the tegument considerably more complex.

This species is closest to *H. frigidus* Stephensen, but it differs from the latter in the structure of its antennae, gnathopods 1 and 2, epimeral plate 3, and the sculpture of the tegument. Head smaller than peraeon segments 1 and 2 together; body narrow, thin, semitransparent, even the traces of eyes lacking; the interantennal lobe slightly drawn out forward, with a blunt apex. Segment 1 of the peduncle of antenna 1 with a distinct oblong keel along the entire length of the segment which terminates in a rounded process that overlaps the next segment; segments 2 and 3 of the peduncle also have processes at the distal end; segment 1 of the flagellum narrow, long, as long as segment 1 of the peduncle; on the inner side of the distal end of segment 1 of the flagellum, there is a sharp spine; a similar spine, but very long, is at the distal end of segment 2 of the flagellum, its apex reaches the level of the lower end of segment 5 of the flagellum; the segments of the flagellum of ♂ have calceoli; accessory flagellum broken off. Antenna 2 with a long peduncle, but antenna 1 not even, similar to that in H. frigidus, longer than the peduncle of antenna 2; the last segment of the peduncle of antenna 2 almost twice as long as the penultimate, thin, multisegmented, in ♂ with calceoli. Maxilla 1 with 2 thin plumose setae at the apex and thin short hairs along the inner margin of the inner plate; outer plates have 6 thick coarse spines at the apex and 2 thinner and weaker accessory spines on the second row; the outer side of the broadened segment 2 of the palp has hairs. Maxilla 2 with plates of almost equal size; the inner margin of the inner plate has an oblong row of plumose setae and simple setae at the apex; along the inner margin of the outer plate, on its upper third, there are thin hairs. Maxillipeds normal for the structure of the genus. Coxal plate 1 broadens weakly distally, with a convex anterior margin and a tooth at the postero-distal angle. Gnathopod 1 elongated, but shorter and slightly thicker than gnathopod 2; segments 3 and 4 of same length; segment 6 slightly shorter but narrower than segment 5, narrow, with a strongly oblique palmar margin, restricted from the posterior hand by a cluster of setae. Gnathopod 2 thin and long, segment 6 broadens weakly distally, with a short weak convex transverse palmar margin; segment 5 almost two times as long as segment 6, lacks the "pine-apple cushion" at the distal end; segment 3 greatly elongated, considerably longer than s segment 4, and bears setae on the anterior margin. The branchial vesicles of peraeopods 1 and 2 elongated, with well-developed transverse folds; the vesicles of peraeopod 3 simple, strongly elongated, with 1 short accessory leaf-shaped lobe; the branchial vesicles of peraeopod 4 have 3 short leaf-shaped accessory lobes, while the branchial vesicles in peraeopod 5 lacking completely. The dactyl of peraeopods 1 and 2 almost as long as segment 6. The basal segment of peraeopod 3 broadened, with weakly convex margins and a rounded, short lobe, reaching the level of the distal end of segment 3; segment 4 broadens distally, longer than segment 3 and considerably shorter than segment 5. The basal segment of peraeopod 4 lengthened narrower than that of peraeopod 3, with almost parallel margins and a short lobe. The basal segment of peraeopod 5 strongly tapers distally, with a concave anterior and a convex posterior margin; the remaining segments linear. The posterior margin of the basal segment of all three peraeopods distinctly notched. The tooth of epimeral plate 3 relatively short and sharp. Urosome segment 1 has a saddle-shaped depression in front of a well-developed longitudinal keel which forms a blunt angle at the posterior end. Uropod 2 slightly shorter than uropods 1 and 3, its rami uniform in size; uropod 3 extends slightly further than the end of uropod 1; rami broadly lanceolate, peduncle two times shorter than rami, the inner ramus slightly shorter than the outer; the apical segment of the outer ramus short, elongated-triangular. Telson broken off. The sculpture of the tegument fine-meshed, each cell has a microscopic spinule; there is a distinct transverse striation along the sides of the body. Plates colourless, semitransparent. The animal is 16.5 mm long.

1 specimen, ♂, obtained at a depth of 2000 m in the Greenland Sea.

15. The Genus PARONESIMUS Stebbing, 1894
Guryanova, 1951: 196.

1. Paronasimus barontsi Stebbing, 1894 (Figure 38).
Guryanova, 1951: 198, Figure 66.

Pacific specimens do not differ essentially in anything from those of the Arctic Ocean and from Stebbing's description and drawings. It is known from the Barents Sea and the northern part of the Kara Sea; discovered in the Pacific Ocean in the Bering Strait and Dezhnev Cape (2 specimens, 10 mm long), in the Sea of Okhotsk at the eastern coast of southern Sakhalin in the area of Cape Levenorn* at a depth of 110 m (2 specimens, length 7 mm), and in the Sea of Japan, at the Western coast of Tatar Strait (north of the Primorye Territory), 50° n. lat., at a depth of 43 m (1 specimen, the length 12 mm).

Figure 37. Hippomedon angustimanus Gurjanova sp. m. Greenland Sea, ♂.

Figure 38A. Paronesimus barentsi Stebbing, Bering Sea, ♀.

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* Transcribed from Russian. Translator.

Figure 38 . Paronesimus barentsi Stebbing. Bering Sea, ♀.

16. The Genus ORCHOMENE Boeck, 1871

Guryanova, 1951: 199.

Of the 18 species known from the northern Pacific, 4 are represented; one species was described recently.

1 (34). Telson cleft or with a notch at the posterior end.

2 (5). Epistome pointed at the apex.

3 (4). Pointed apex of epistome bent forward and up.......
....* O. similis Chevreux, 1912.

Bull. Soc. Zool. France, 37: 283, figures.

(Northern part of Atlantic).

4 (3). Pointed apex of epistome directed forward..........
..* O. oxystoma Stephensen, 1923.

Ingolf-Exp., III, No. 8: 67, f. 10.

(Davis Strait, depth 2258 m).

5 (2). Epistome rounded at the apex.

6 (11). Outer distal angle of segment 5 of gnathopod 1 forms a well-developed lobe stretched out upwards.

7 (8). Eyes light-brown, almost yellow; epistome does not extend beyond upper lip; telson cleft to the middle.........* O. sibirjakova Gurjanova, 1951.

Guide to the Fauna of the USSR, Zool. Institute of the Academy of Sciences of the USSR, 41: 202, Figure 69.

(Greenland and Kara seas, depths 140 - 820 m).

8 (7). Eyes black, epistome protrudes forward beyond upper lip; telson with a deep notch at the end.

9 (10). Epistome broadly rounded and only slightly protrudes forward beyond upper lip..........* 3. _O._ _tschornyschevi_ Brüggen, 1909.

10 (9). Epistome narrow, linguliform, strongly protrudes forward beyond upper lip..........4. _O._ _macroserrata_ Shoemaker, 1930.

11 (6). Outer distal angle of segment 5 of gnathopod 1 rounded and lacks lobe.

12 (21). Epistome does not protrude forward beyond upper lip.

13 (16). Eyes pigmented, distinctly visible.

14 (15). Eyes very large, black; telson cleft only ¼ its length..........* _O._ _hanseni_ Meinert, 1890.

(Northern part of Atlantic).

15 (14). Eyes moderate in size, light-yellow; telson cleft to the middle..........* _O._ _depressa_ Shoemaker, 1930.

Proc. U.S. Nat. Mus., 77, Art. 4: 6, f. 6, 7.

(Northern part of Atlantic, Bay of Fundy).

16 (13). Eyes lacking or colourless, indistinct.

17 (20). Posterior margin of peraeopod 5 notched.

18 (19). Eyes lacking; posterior margin of epimeral plate 3 coarsely serrate-dentate along its entire length; telson cleft almost to the middle..........* O. thorii Stephensen, 1923.

Ingolf-Exp., III, No. 8: 68, f. 11.

(Northern part of Atlantic Ocean, depth 835 m).

19 (18). Optical elements disorderly scattered on lateral surface of head; posterior margin of epimeral plate 3 indistinctly notched in its lower part; telson with a deep notch at its end.......... 2. O. minor Bulycheva, 1952.

20 (17). Posterior margin of basal segment of peraeopod 5 smooth, telson cleft almost to the middle..........* O. laevipes Stephensen, 1923.

Ingolf-Exp., III, No. 8: 69, f. 12.

(Northern part of Atlantic Ocean, depth 1318 m).

21 (12). Epistome stretched forward and protrudes beyond upper lip.

22 (25). Urosome segment 1 slightly inflated, without keel, its dorsal side smooth, uniformly rounded.

23 (24). Interantennal head lobe strongly drawn below and pointed at the apex. Telson with a deep notch at the end..........* O. crispata (Goës, 1866).

(Northern part of Pacific Ocean and Barents Sea).

24 (23). Interantánnal head lobe slightly extended forward and broadly rounded at the apex; telson with a shallow notch at the end..........* O. humilis (A. Costa, 1853).

Rend. Soc. Borbon., (n. ser.), 2: 172.

(Mediterranean and Black seas).

25 (22). Urosome segment 1 with oblong dorsal keel which is rounded or forms angle at its apex.

26 (29). Dorsal keel of urosome segment 1 rounded at the end.

27 (28). Posterior margin of epimeral plate 3 very indistinctly notched; telson cleft $\frac{1}{4}$ its length..........* O. batei G. Sars, 1882.

(Northern part of Atlantic Ocean).

28 (27). Posterior margin of epimeral plate 3 deeply serrate-dentate; telson cleft to the middle..........* O. serrata (Boeck, 1861).

(Northern part of the Atlantic Ocean and sub-Atlantic sector of the Arctir).

29 (26). Dorsal keel of urosome segment 1 forms a sharp or blunt angle at the end.

30 (31). Eyes well noticeable, light-orange in alcohol, L-shaped; telson cleft almost to the middle..........* O. amblyons G. Sars, 1890 - 1891.

(Northern part of the Atlantic Ocean and Greenland and Norwegian seas, at depths ranging from 200 to 1000 m).

31 (30). Eyes lacking completely or scarcely disceribile.

32 (33). Eyes lacking completely; basal segment of peraeopod 5 tapers distally; posterior margin of epimeral plate 3 serrate-dentate; telson cleft almost to the middle, with 4 pairs of marginal spines..........* O. foeroensis Stephensen, 1923.

Ingolf-Exp., III, No. 8 : 70, f. 13.

(Northern part of Atlantic Ocean, depth 900 m).

33 (32). Eyes present, L-shaped, but very weakly pigmented and scarcely discernible; epimeral plate 3 with coarsely and deeply serrate-dentate posterior margin; telson with a deep notch at the end and 2 pairs of martinal spines..........1. O. pectinata G. Sars, 1882.

34 (1). Telson entire, its posterior margin straight and only slightly concave; posterior margin of epimeral plate 3 shallowly and indistinctly toothed; segment 5 of gnathopod 1 with rounded postero-distal angle, without lobe..........* O. goniops Walker, 1906.

For full description and figures see: Walker, 1907, Nat. Antarct. Exp., III: 12, pl. 3, f. 6.

(Antarctic).

1. Orchomene pectinata G. Sars, 1882.

Guryanova, 1951: 205, Figure 74.

This is a circumpolar Arctic species (depth 80 - 120 m); Pacific specimens do not differ essentially in anything from Arctic specimens; discovered in the Pacific Ocean only in the southern part of the Sea of Okhotsk, in the area adjacent to La Percuso Strait, at a depth of 150 - 263 m (3 specimens, length 10 mm).

2. Orchomene minor Bulytscheva, 1952 (Figure 39).

Bulycheva, 1952, Tr. Zool. Inst. of the Academy of Sciences of the USSR, XII: 195, Figure 1.

It belongs to the group of species which lack the lobe at the distal end of segment 5 of ganthopod 1. Body weakly inflated; urosome segment 1 has a saddle-shaped depression on the dorsal side, which is especially deep in the male. Head with a well-developed triangular interantennal lobe and a lowerantennal notch; eyes underdeveloped, with optical elements disorderly scattered on the eye surface of head in the female, and with optical elements that form compact oval eyes in the male. The inflated segment 1 of the peduncle of antenna 1 at the distal end forms a beak-shaped process which overlaps the subsequent segment; flagellum 6 - 7 segmented, accessory flagellum 5-segmented; segment 5 of the peduncle of antenna 2 slightly shorter than segment 4, both bear long setae (2 - 3), at the distal end, flagellum in ♀ short, with 5 - 6 segments, in ♂ multisegmented, very long; segment 6 of gnathopod 1 slightly longer than segment 5; palmar margin ninutely notched, transverse, with 2 locking spines; dactyl with an accessory tooth; with the dactyl, segment 6 of gnathopod 2 forms a small claw, segment 5 is inflated at the distal end, has a "pine-apple cushion", segment 3 as long as segment 5 and 2 times longer than segment 4. The last three peraeopods have an unusually large wing-shaped broadening of the basal segment, especially in peraeopod 5; its posterior margin is indistinctly notched in the last and bears a distinct dentation in peraeopods 3 and 4. Epimeral plate 3 has a slightly backward drawn out postero-distal angle and an indistinctly notched posterior margin. Uropod 3 has short rami (according to Bulycheva, the rami in the male are longer); at the outer distal angle of the peduncle and at the distal end of segment 1 of the outer ramus, there are large spines. Telson has a deep triangular notch at the end, the apices of the lobes each bear 1 large spine and 1 apical seta; on the dorsal side of the telson, there is one pair of lateral spines (according to Bulycheva) and a pair of thick plumose setae. The animal is yellowish, the maximum length 4 mm. The females with eggs were found in August and in September.

Known from the Sea of Japan (Peter the Great Bay, depths 50 - 80 m, at Cape Peverotny, depth 159 m, in Tatar Strait at depths ranging from 4 to 160 m). Also detected in the Sea of Okhotsk (Terpeniya Bay, on silty bottom, depth 50 - 60 m).

Figure 39. *Orchomena minor* Bulycheva. Sea of Okhotsk, ♀.

3. *Orchomene tschernyschevi* Brüggen, 1909.

Guryanova, 1951: 201, Figure 68.

This is a shallow-water Arctic species; it is known from the Sea of Japan (the area of Petrov Island, depths 70 -90 m, and Peter the Great Bay, depths 98 - 101 m, on silty bottom).

4. *Orchomene macroserrata* Shoemaker, 1930 (Figure 40).

Shoemaker, 1930, Proc. U.S. Nat. Mus., 77, Art. 4: 13, f. 8, 9.

The species was known only from the northern part of the Atlantic Ocean (Bay of Fundy, the Grand Manan area, and Ungava Bay, depth not indicated). Collections of the Zoological Institute contain 30 specimens of this species obtained in the Sea of Okhotsk which differ from North-Atlantic species (Shoemaker's description and figures) in considerably insignificant features.

Body dense, compact; eyes pear-shaped, black; interantennal head lobes strongly stretched out forward and broadly rounded at the apex. Quite characteristic of the species is the narrow linguliform epistome that extends forward beyond the anterior margin of the upper lip. Urosome segment 1 has a saddle-shaped depression in front of a short rounded dorsal keel. Gnathopod 1 very strong and short; segment 6 twice as long as segment 5, elongated, its width 2 times shorter than its length; palmar end transverse, with an irregular fine crenulation and 2 thick locking spines, one on each side of the palmar angle; at about the middle of the posterior margin, there are also 2 such spines, one higher and the other at a certain distance from the first, closer to the base of the segment; segment 5 with well-developed linguliform lobe. Gnathopod 2 with strongly extended segment 3 which is as long as segment 5 and considerably larger than that of segment 4; the distal margin of segment 5 strongly inflated; on its posterior strongly convex surface, there is a "pine-apple cushion" almost along its entire length; segment 6 considerably narrower than segment 5, elongated, broadens slightly distally; together with the palmar angle drawn out forward, the dactyl forms a distinct small claw. Peraeopod 3 and 5 have a strongly broadened basal segment; in peraeopods 3 and 4, also segment 4 broadened. The posterior margin of epimeral plate 2 almost smooth, with a very indistinct crenulation; the posterior margin of epimeral plate 3 weakly convex and bears, in the distal part, 4 teeth, which are rather larger than the teeth of other species. Uropod 3 short, with abbreviated rami uneven in length. Télson extended-triangular, with straight lateral margins and a narrow deep arch-shaped notch at the posterior end; at the apices of the lobes, there is 1 very large apical spine in each; two pairs of similar large and thick spines are located on the margins of the telson. The maximum length of the animal is 9 mm. Approximating in the structure of gnathopods O. sibiriakova, it sharply differs from the latter in the structure of the epistome, epimeral plate 3, and in the interantennal head lobes.

It was discovered in the Sea of Okhotsk at depths of 30 - 35 m on sandy bottom, in Terpeniya Bay, in its northern part which during the summer is strongly heated; in the northern part of the Atlantic Ocean - Hudson Bay, and in Bay of Fundy.

Figure 40. Orchomene macroserrata Shoemaker. Terpeniya Bay (Sea of Okhotsk).

17. The Genus ORCHOMENELLA G. Sars, 1890
Guryanova, 1951: 280.

The genus should be revised in regard to its relation to the very close genera Orchomenopsis and Orchemene; we could not solve this problem as our collections contain only the species which inhabit the Arctic Ocean and the seas of the Far East. It should be added to the diagnosis that the branchial vesicles are not always simple, and some of the species have several folds and infrequently short accessory lobes, and the telson is sometimes cleft not further than to the middle; segment 5 of gnathopod 1 in some of the species has a small linguliform lobe at the distal angle; the epistome in a number of species strongly protrudes forward beyond the upper lip, while the posterior margin of epimeral plate 3 is more or less toothed. All these features climinate the boundary between the genera

Orchomonella, Orchomenopsis, and <u>Orchomene</u>, and greatly hamper the determination; greatly impeded also is the determination of the <u>Orchomenella</u> species. We carefully compared the specimens from our collections with the Norwegian specimens which were sent to us from Oslo and determined by G. Sars and Loven*. To facilitate the determination, the key contains, besides the distinguishing characters, also the most characteristic accessory features of the species which are especially difficult to identify.

1 (4). Eyes lacking.

2 (3). Urosome segment 1 with a small sharp medial keel; postero-distal angle of epimeral plate 3 rounded.........* <u>O. abyssalis</u> Stephensen, 1925.

Ingolf-Exp., III, No. 9: 24.

(Davis Strait, depth 2258 m. Abyssal species of the Arctic Ocean).

3 (2). Urosome segment 1 with a deep depression on dorsal side and lacks medial keel; postero-distal angle of epimeral plate 3 produced posteriorly as a small tooth.........* <u>O. lobata</u> Chevreux, 1907.

Bull. Inst. Oceanogr., No. 96: 1.

(West coast of Greenland).

4 (1). Eyes present.

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* Transliterated from Russian. Translator.

5 (28). Segment 1 of main flagellum of antenna 1 considerably longer (at least twice) and thicker than the next.

6 (27). Eyes light-brown or red when alive and scarcely discernible in alcohol, light-yellow; the telson cleft almost to the base.

7 (20). Epistome strongly convex, protrudes forward beyong upper lip.

8 (15). Urosome segment 1 lacks well-developed dorsal keel.

9 (14). Postero-distal angle of epimeral plate 3 straight; inner ramus of uropod 2 simple, without constriction, gradually tapers distally.

10 (11). Oblique row of short setae lacking on the outer surface of coxal plate 1. Coxal plate 1 distinctly tapers distally or has almost parallel margins; coxal plate of peraeopod 3 with drawn out downward the postero-distal angle which resembles obtuse triangular lobe; coxal plate of peraeopod 4 forms, at a postero-disal angle, extended broad lobe that overlaps the upper part of the wing-shaped broadening of basal segment. Segment 5 of peraeopod 1 shorter than segment 6, lacks lobes at the postero-distal angle; the postero-distal angle of epimeral plate 3 straight, its posterior margin smooth or only slightly notched; the palmar margin of segment 6 of gnathopod 1 transverse, finely-dentate, with 2 locking spines un-

even in length; tegument has a coarse-punctate sculpture. Dactyls of peraeopods strong, short, about half the length of segment 6.... ......1. O. minuta (Kröyer, 1846).

11 (10). There is an oblique row of 4 - 5 short setae on the upper surface of coxal plate 1.

12 (13). Palmar margin of segment 6 of gnathopod 1 oblique and sparated from the posterior margin of the hand by 2 strong locking spines. Coxal plate 1 with parallel anterior and posterior margins; posterior lobe on the lower margin of the oblique coxal plate of peraeopod 3 strongly drawn out below, its apex blunter than that of the preceding species and shifted slightly forward; the posterior lobe of the coxal plate of peraeopod 4 shorter. The postero-distal angle of epimeral plate 3 straight, its posterior margin smooth. The palmar margin of segment 6 of gnathopod 1 not transverse but oblique, with 1 long locking spine; dactyls of peraeopods powerful, short, less than half the length of segment 6..........2. O. lepidula Gurjanova sp. n.

13 (12). The palmar margin of segment 6 of gnathopod 1 transverse and lacks locking spines...........3. O. intermedia Gurjanova sp. n.

14 (9). The posterio-distal angle of epimeral plate 3 forms a small tooth turned backward and upward; inner ramus of uropod 2 with a constriction - it 2/3 terminates in a rounded lobe at the

apex of which there is a long spine which is almost as long as the narrow pointed distal end of the ramus. Eyes with reduced optical elements; coxal plate 1 strongly tapers distally; the coxal plate of peraeopod 3 with 2 equally short rounded lobes on the lower margin; its width slightly larger than its height; the inner ramus of uropod 3 longer than segment 1 of the outer ramus; segment 6 of gnathopod 1 slightly longer than segment 5, its palmar margin transverse........ ..* O. grönlandica Hansen, 1887.

(Northern part of the Atlantic and Arctic oceans).

15 (8). Urosome segment 1 with a well-developed dorsal keel directed backward and overhanging the next segment.

16 (19). Segments 5 and 6 of gnathopod 1 relatively narrow, equal, with parallel anterior and posterior margins; segment 5 lacks the lobe at the postero-distal angle.

17 (18). Basal segment of peraeopod 4 noticeably broadens distally; there is a depressed notch in the lower part of the posterior margin of the basal segment of peraeopod 5; telson with 2 pairs of dorsal spines..........8. O. pacifica Gurjanova, 1938.

18 (17). Basal segment of peraeopod 4 oval, slightly tapers distally; posterior margin of the basal segment of peraeopod 5 becomes gently rounded and lacks the notch in its lower part; telson bears 1 pair of dorsal spines and at the base of each of these, there are 2 plumose setae..........10. O. magdalenensis Shoemaker, 1942.

19 (16). Segment 5 of gnathopod 1 shorter than segment 6; at its postero-distal angle, there is a short linguliform lobe. The posterior margin of segment 6 concave at the middle, the base of the segment enlarged.........9. O. japonica Gurjanova sp. n.

20 (7). Epistome weakly convex, does not protrude forward beyond the upper lip.

21 (22). Segment 1 of the accessory flagellum in antenna 1 thicker and much longer than the remaining ones, considerably longer than segment 1 of the main flagellum and densely covered with setae on the lower margin. Coxal plate 1 with an almost parallel anterior and a posterior margins; the lobes on the lower margin of the coxal plate of peraeopod 3 short, of same length; the lobe of the coxal plate of peraeopod 4 completely underdeveloped. The postero-distal angle of epimeral plate 3 rounded, its posterior margin smooth. The palmar margin of segment 6 of gnathopod 1 slightly oblique, with 2 locking spines. Dactyls of peraeopods very short, condiserably shorter than half the length of segment 6. The inner ramus or uropod 3 shorter than segment 1 of the outer ramus.........* O. nann (Kröyer, 1846).

(Northern part of the Atlantic Ocean, from Senegal, along the coast of Eurasia to the East-Siberian Sea, inclusively; Ceylon)[1].

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[1] Bulycheva's note (A.I. Bulycheva, 1957, Investigations of the Seas in the Far East, IV: 89) in regard to the wide distribution of this species in the sea of Japan is erroneous. All specimens from the collections of the Zoological Institute, determined by her as O. nana Kr., belong to other species of Orchomenella, and the data on their occurrence have been considered by me in regard to the distribution of the Orchemonella species to which they belong.

22 (21). Segment 1 of the accessory flagellum of antenna 1 as thick or slightly thicker than the subsequent ones, shorter or as long as segment 1 of the main flagellum and lacks the setae on the lower margin.

23 (26). Coxal plate 1 broadened distally; segment 5 of gnathopod 1 short, cup-shaped, with a small narrow linguliform lobe at the postero-distal angle; segment 6 at least 2 times longer than segment 5.

24 (25). Eyes moderate in size, widely separated dorsally. The postero-distal angle of epimeral plate 3 straight, its posterior margin distainctly notched. The lobe of the coxal plate in peraeopod 4 long, longer than in O. minuta and O. lepidula; the lobes of the coxal plate of peraeopod 3 short, rounded, uniform in length, the width of the plate smaller than its height. The basal segment of peraeopod 3 short and broad, its width greater than its length; segment 4 also greatly broadened. The palmar margin of segment 6 of gnathopod 1 transverse; segment 5 of gnathopod 2 strongly inflated. The inner ramus of uropod 3 shorter than segment 1 of the outer ramus..........5. O. pinguis (Boeck, 1861).

25 (24). Eyes very large, almost contiguous dorsally; the posterior margin of epimeral plate 3 smooth, the postero-distal angle rounded.........6. O. affinis (Holmes, 1909).

26 (23). Coxal plate 1 with almost parallel margins, does

not broaden distally. Segment 5 of gnathopod 1 extended, cup-shaped without the lobe at the distal posterior angle, and only slightly shorter than segment 6..........4. _O. minuscula_ Gurjanova sp.n.

27 (6). Eyes black both in live specimens and when in alcohol; telson cleft less than to the middle. Epistome does not protrude forward beyond the upper lip. Segment 5 of gnathopod 1 slightly larger than half the length of segment 6, with a distinct linguliform lobule at the postero-distal angle. The postero-distal angle of epimeral plate 3 drawn out backward and forms a short blunt tooth. The palmar margin of segment 6 of gnathopod 1 transverse.... ......7. _O. melanophthalma_ Gurjanova sp. n.

28 (5). Segment 1 of the main flagellum of antenna 1 unusually short, only slightly longer than the subsequent. Coxal plate 1 with a parallel anterior and posterior margins; segment 6 of gnathopod 1 almost 2 times longer than segment 5; its palmar margin transverse, with 2 locking spines; telson cleft to the base. The postero-distal angle of epimeral plate 3 straight..........11. _O. nugax_ (Holmes, 1904).

1. _Orchomenella minuta_ (Kröyer, 1846) (Figures 41-43).
Guryanova, 1951: 284, Figure 151.

A thorough comparison of our specimens with the Norwegian, as determined by G. Sars, and with those from Spitzbergen, as determined by Loven, revealed that the North-Pacific specimens do essentially not differ in anything and resemble accurately Sars' specimens, description, and figures; compared with the Spitzbergen specimens, our specimens and Sars' specimens are noted for their rather more compact body and more broadened segments of last peraeopods, especially peraeopod 4, chiefly in the South-Kurile specimens. The specimens from Aniva Bay resemble those from Spitzbergen; on the other hand, specimens from the Sea of Japan correspond fully to the Norwegian specimens. Noted are some sex differences in secondary features of the male and the female, and some individual deviations. For instance, the flagella of both antennae are longer in the male than in the female, more stretched forward is also the interantennal head lobe, the eyes are somewhat larger and so is the saddle-shaped depression on the dorsal side of urosome segment 1; the individual variability is revealed chiefly in the number of pairs of dorsal spines of the telson (1 - 2 pairs) and on the rami of uropod 3, in the depth and the number of the notches of the posterior margin of the basal segments of peraeopods 3 - 5, in the degree of the armature of the setae of the appendages and the antennae with the setae.

For comparison, we present figures of the species from Spitzbergen (Figure 41), Aniva (Figure 42), and Sea of Japan (Figure 43). Many Pacific specimens reveal clearly the coarse-punctate sculpture of the tegument, which is not mentioned by Sars and not seen in the Norwegian and Spitzbergen specimens preserved for many years in alcohol; however, a similar sculpture is noticed in rather younger Murmansk specimens, which in all other features correspond accurately to the Spitzbergen specimens, Sars' description and figures. The Aniva specimens preserved in alcohol have retained the blood-red colour of their plates. The species is widely distributed in the seas of the northern hemisphere. In the Atlantic Ocean, it spreads from the western part of Norway and Bay of Fundy into the Arctic, where it is circumpolar.

Figure 41. Orchemenella minuta (Kr.) Spitzbergen, ♂ (specimen determined by Loven).

Figure 42. Orchemenella minuta (Kr). Aniva Bay (Sea of Okhotsk), ♀.

Figure 43. Orchomenella minuta (Kr.) Western coast of south Sakhalin (Sea of Japan), ♀.

It is discovered in the Pacific Ocean, for the time being only at the Asian coasts; it occurs in a large number in the southern part of the Chuckchee Sea and in the northern shallow-water region of the Bering Sea (depths 6 - 81 m); present also in the collections of the Kurile-Sakhalin expedition at the western and eastern coasts of southern Sakhalin (depths 42 - 180 m) on sandy and silty-sandy bottom, in Aniva Bay (23 - 42 m), in bays of Shikotan Island, in the South-Kurile Strait at a depth of 7 - 8 m, among the laminarian growths, and on the sandy bottom. It does not inhabit, apparently, the Sea of Japan, near the Primorye coast, as may be seen from the absence of this species in the rich collections from Peter the Great Bay and the western coast of the Tatar Strait[1].

2. Orchomenella lepidula Gurjanova sp. n. (Figure 44).

This species is close to O. minuta Kröyer, but it has a number of essential differences in the form of the epistome, gnathopod 1, the presence of an oblique row of setae on the upper surface of coxal plate 1, the form of the coxal plate of peraeopod 4, the relatively shorter segment 6 of gnathopod 2, the armature of uropod 3, the broader and short coxal plate of peraeopod 3, and the sculpture of the tegument; the sex differences are also well pronounced in secondary features.

The head of ♀ is as long, and in ♂ shorter than peraeon segment 1; interantennal lobe drawn out forward, triangular, with a blunt apex, narrower and longer in ♂ than in ♀; eyes light-yellow in alcohol, with large commatidia, moderate in size, larger and strongly broadening below in ♂. Urosome segment 1 has a saddle-shaped depression. Epistome strongly convex, protrudes far forward beyond the upper lip in the lower part, overhanging the latter; the convexity of the epistome much steeper than in O. minuta. Segment 1 of antenna 1 in the female inflated more than in the male, bears in both sexes 8 - 10 sensory setae on the upper surface; 1 - 3 similar setae in ♂ are also present on the anterior margin of both segment 1

1 Bulycheva's note that this species was gathered in Peter the Great Bay in large numbers is erroneous; all specimens of this sample I studied turned out to be O. pinguis Boeck.

and segment 2; segment 1 of the main flagellum cylindrical, tapers distally, in the female as long as segments 2 and 3 of the peduncle together, considerably longer in the male; the flagellum of ♀ 9 - 10-segmented, in o 12-segmented and bears calceoli. Antenna 2 similar to that in O. minuta; the segments of the flagellum in ♂ have calceoli and sensory setae. Coxal plate 1 slightly tapers distally and bears an oblique row of 4 - 5 short setae on the upper surface; segment 5 shorter than segment 6, without a linguliform lobe; segment 6 has not a transverse, as is the case of O. minuta, but an oblique margin. Segment 6 of gnathopod 2 measures about one third the length of segment 5, its width larger than half its length, while in O. minuta segment 6 equals one half the length of segment 5 and its width equals half its length; the palmar margin shorter, drawn out forward and forms with the dactyl, a small claw.

Figure 44A. Orchemenella lepidula Gurjanova sp.n. Sea of Okhotsk, ♂.

Figure 44Б. Orchemenella lepidula Gurjanova sp. n. Sea of Okhotsk, ♀.

The scales on the distally inflated surface of segment 5 of gnathopod 2 are tridentate, while in O. minuta they are simple, pointed. The depth of the coxal plate of peraeopod 3 smaller than its largest width and as long as the length of the basal segment and segment 3 together, while in O. minuta the largest width of the plate is smaller than its depth, which is as long as basal segment 3, and the entire segment 4 together. The coxal plate of peraeopod 4 has a shorter and broader lobe than in O. minuta; segment 5 of peraeopod 2 in O. lepidula slightly shorter than segment 6; and in O. minuta they are of same length. The postero-distal angle of epimeral plate 3 straight, the posterior margin smooth. The inner ramus of uropod 2 simple, without a constriction; the inner ramus of uropod 3 considerably longer than segment 1 of the outer ramus, and falls only slightly short of reaching its distal end.

This is a widely distributed abundant species of cooler shoals of the Sea of Okhotsk (the north-western and northern parts of the continental shoal, continental shoal of the eastern coast of Sakhalin, at depths of 20 - 60 m, on sandy bottom); it inhabits especially abundantly the sandy shoals of Aniva Bay and Terpeniya and Mordvinov bays in the regions covered with water with temperatures below zero; found also in the eastern part of La Perouse Strait at a depth of 125 m. This is one of the most commonplace species of the Pacific shoal of Iturup (depth of from 12 to 160 m, sand), on a gravel underwater bar which extends north-east of Shikotan Island at depths of 150 - 230 m and at Paramuchiro Island, at depths of 40 - 65 m; distributed in the Bering Sea in the shoaly part and in the eastern coast of Kamchatka; in the Sea of Japan found only in Tatar Strait at Primorye and the west coast of sakhalin at depths of 50 - 65 m. In Peter the Great Bay and South-Kurile Strait was not found even once, although individual specimens were discovered in Krabov* Bay on Shiketan Island and in Ekaterina Strait.

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* "Krabovaya"? Translator.

3. Orchcmenella intermedia Gurjanova sp. n. (Figures 45, 46)

This species is an intermediary between the widely distributed species O. minuta (Kr.) and the species O. lepidula Gurjanova described above; in the structure of segment 6 of gnathopod 1, the epistome and uropod 3, as well as in the sculpture of the tegument, it is close to the former species, but in the presence of the oblique row of the setae on the lateral surface of coxal plate 1, the form of the head, and the structure of uropods 3 - 5, to the latter species.

Figure 45A. Orchomenella intermedia Gurjanova sp. n. Peter the Great Bay (Sea of Japan), ♂.

Figure 45b. Orchomenella intermedia Gurjanova sp n. Peter the Great Bay (Sea of Japan), ♀.

Figure 46. Orchomenella intermedia Gurjanova sp.n. South-Kurile Strait, ♂.

Head longer than peraeon segment 1; interantennal lobe oblong-triangular, with pointed apes; eyes large, light-yellow in alcohol, broaden below and occupy about 4/5 the height of head. Epistome convex, rounded, separated from the upper lip by a deep sinus, but does not protrude forward beyond the level of the lip. Antenna 1 has a keel on the upper surface of segment 1 of the peduncle; segment 1 of the flagellum thick and long, longer than segments 2 and 3 of the peduncle together and many times as long as any of the remaining segments of the flagellum; accessory flagellum considerably larger than flagellum. Coxal plate 1 has parallel anterior and posterior margins, the antero-distal angle broadly rounded; on the upper surface of the plate, there is an oblique row of 4 - 5 short setae; segment 6 of gnathopod 1 slightly longer than segment 5, the palmar margin almost transverse, finely dentate and lacking the locking spines; there are 2 - 3 thin spines on the posterior margin of the hand. Segment 6 of gnathopod 2 slightly longer than half of segment 5; its palmar margin short, extended forward and forms, together with the dactyl, a true small claw; on the inflated surface of the distal end of segment 5, there is a cushion with small pointed scales; the dactyls of peraeopods 1 - 5 thin, long, sharp, considerably longer than half the length of segment 6. Coxal plate of peraeopod 3 has a strong lobe, strongly drawn out below at the postero-distal angle. The posterior margin of epimeral plate 3 weakly convex smooth in Japanese and finely dentate in South-Kurile specimens; the postero-distal angle straight.

Urosome segment of ♂♂ has a deep, and of ♀♀ fine saddle-shaped depression on the dorsal side. The inner ramus of uropod 3 longer than segment 1 of the outer ramus and reaches about the middle of segment 2; segment 2 (apical) of the outer ramus long, only slightly smaller than half of segment 1. Telson strongly expanded, cleft almost to the base, distinctly tapers distally, bears one pair of lateral and 1 - 2 apical spines; in addition, there are two pairs of sensory setae near the apex of each lobe. The sculpture of the tegument is coarsely-punctate. The specimens from South-Kurile Strait (Krabov Bay), differ noticeably from those from the Sea of Japan not only in the form of epimeral plate 3 and the crenulation of the latter's posterior margin, but also in the strongly convex epistome which protrudes beyond the upper lip, the form of the basal segment of peraeopods 3 - 5, the concave anterior margin of coxal plate 1, and other details (Figure 46).

The typical form was discovered in various points of Peter the Great Bay (depth 8 - 12 m) and Aniva Bay (8 - 40 m). It is possible that there is an endemic form of this species which was discovered at a depth of 6 m.

4. Orchomenella minuscula Gurjanova sp. n. (Figure 47).

This is a species close to O. minuta Kröyer, but it is noted for the structure of its epistome, the distinct crenulation of the posterior margin of epimeral plate 3, the short segment 1 of the main flagellum in antenna 1, wht structure of coxal plates 3 and 4, and the telson.

Body inflated, compact; head as long as peraeon segment 1; urosome segment 1 has a saddle-shaped depression only in the male, while the dorsal surface in the female of this segment is even, smooth, without a depression; the coxal plates are deep and broad, especially in 4 and 5. The interantennal lobe of head drawn out forward to the middle of segment 1 of the peduncle of antenna 1, triangular, with a blunt apex. Eyes large, with large ommatidia, light-yellow in alcohol, broaden cosiderably below.

Antenna 1 short; segment 1 inflated and bears sensory setae on the upper surface; flagellum 7 - 8-segmented; its segment 1 relatively short, only 2 times longer than the subsequent one and considerably shorter than accessory flagellum; accessory flagellum 3-segmented, reaches the apex of segment 4 of flagellum. Antenna 2 of the female slightly, and in the male considerably longer than antenna 1, the flagellum of the female 7-segmented, and in the male multisegmented; the last segment of the peduncle thinner and shorter than the penultimate. The epistome weakly convex, does not protrude forward beyond the apex of the upper lip, closer in this regard to _O. pinguis_.

Coxal plate 1 does not taper distally but has parallel margins; segment 5 of gnathopod 1 cup-shaped, does not form a linguliform lobe at the postero-distal angle. Segment 6 longer than segment 5, has a parallel anterior and a posterior margins and a short transverse finely dentate palmar margin armed with two locking spines uneven in size; there are 4 - 5 long setae on the posterior margin of hand. Segment 5 of gnathopod 2 not inflated and does not become broad distally; segment 6 about half the length of segment 5, very weakly broadens distally, has a very short palmar margin which, together with the dactyl, forms a small claw.

Coxal plate 4 (in peraeopod 2) has an unusually short (for the species of the genus) notch in the upper part of the posterior margin, so that its lower posterior lobe is unusually short and broad; segments 5 and 6 of peraeopod 2 uniform in length. The coxal plate of peraeopod 3 has a well-developed postero-distal lobe which overlaps the upper part of the wing of the basal segment; its greatest width equals its length; basal segment rounded, with a distinctly notched posterior margin, and a small setae in each notch; segment 4 with a very short and broad postero-distal lobe; basal segment narrower than that of peraeopod 3, extended-oval, and segment 4 broadens rather more weakly. The basal segment of peraeopod 5 as broad as that of peraeopod 3, not rounded, but distinctly broadens distally, segment 4 broadens weakly distally. The posterior margin of both last peraeopods bears notches and short sparse setae; dactyls short, about half the length of segment 6. The postero-distal angle of epimeral plate 3 almost straight, its posterior margin slightly oblique, straight, and distainctly notched; notches very shallow and rounded. The inner ramus of uropod 2 as long as the outer, simple, without a constriction; uropod 3 with a thick, distally-expanding peduncle armed with spines at the distal angles; rami only slightly longer than peduncle, inner ramus slightly longer than segment 1 of the outer ramus, without spines and setae; the outer ramus has a large apical segment which reaches half the length of segment 1, armed only with 2 spines at the distal end.

Telson cleft slightly further than to the middle, tapers distally, its lobes converge distally; at the apex of each lobe, there is one large apical spine and a long seta; there is one pair of dordal spines. The animal is porcelain-white, pinkish when alive, the maximum length of a sexually-mature female is 5 mm.

About twenty specimens were discovered in the Sea of Japan in the area of Petrov Island and at the western coast of southern Sakhalin in the area of the Antonovo Settlement, in the rootstock of eelgrass of the sub-coastal lagoon at a depth of 0.5 – 1 m, in the littoral among the rockweeds at the village of Nod, and 6 specimens come from the sea of Okhotsk, the east coast of south Sakhalin at a depth of 29 m, in the area north of Mordivinov Bay.

Figure 47. Orchomenella minuscula Gurjanova sp. n. West coast of south Sakhalin (Sea of Japan), ♀.

5. Orchomenella pinguis Boeck, 1861 (Figure 48, 49).
Guryanova, 1951: 282, Figure 150.

Pacific specimens differ from Atlantic in considerably more expanded basal segments 4 and 5 in peraeopod 3, a rather narrower short linguliform lobe in segment 5 of gnathopod 1, an even more inflated posterior surface of segment 5 of gnathopod 2 which is densely covered with short sharp scales and a very dense and fine dentate crenulation of the posterior margin of epimeral plate 3; the latter feature brings the Pacific population closer to the Norwegian, which also has a very small crenulation, contrary to the northern specimens in which the crenulation of the posterior margin of epimeral plate 3 is considerably coarser and the notches are rounded and not sharp. Moreover, the Pacific specimens have a shorter and broader interantennal lobe, than is the case in the Norwegian and Arctic specimens, and a rather more noticeable broadening of coxal plate 1 toward the distal end. Specimens obtained from the east coast of Iturup Island (the Kurile Islands) are characterized by a very strongly developed armature of spines, especially in all three uropods and telson, and in a somewhat different form of basal segments of all last three peraeopods and coxal plate 5 which forms a well-developed triangular lobe at the postero-distal angle; the Kurile specimens could be singled out as an independent subspecies if sufficient material was at hand for the clarification of the stability of these deviations; hence we limit ourselves to the presentation of the figures of the normal Pacific (Figure 48) and Kurile forms (Figure 49) (the latter deviates from the former). Among 11 specimens from the area of Iturup, there is one female with 20 eggs in the brood pouch (obtained in September).

This is a widely distributed species at the shoals of the Arctic Ocean and the northern part of the Atlantic, to Hatteras Cape at the coasts of America and to the Mediterranian along the European coasts, inclusively. In the Pacific Ocean, it inhabits all three seas of the Far East. Great numbers of this species inhabit Peter the Great Bay at a depth of 1 to 85 m, sandy bottom; in winter it approaches the shore line, and also appears on the sea surface. At the west coast of shouth Sakhalin, in summer, it stays at a depth ranging from 60 to 80 m. In the Sea of Okhotsk, it is abundantly distributed at the east coasts of south Sakhalin (depth of 20 - 30 m), in La Perouse Strait (20 - 60 m), and in the shallow-water northern part of the sea. Typical specimens were also discovered at the east coast of Paramushiro. At the east coast of Iturup Island, at a depth of 27, several specimens were obtained which deviated from the normal form; similar are the specimens from the northern part of South-Kurile Strait.

Figure 48. *Orchomenella pinguis* Boeck. Sea of Japan, ♀.

Figure 49. *Orchomenella pinguis* Boeck. East coast of Iturup Island, ♀.

6. *Orchomenella affinis* Holmes, 1909 (Figure 50).

Holmes, 1909, Proc. U.S. Nat. Mus., 35: 492, f. 3, 4; Birstein and M. Vinogradov, 1955, Tr. Inst. Oceanog., XII: 223, Figure 9.

The body is less inflated and less compact than it is in other species. Urosome segment 1 with a saddle-shaped depression and a low, indistinct medial rounded keel behind it. Head as long as peraeon segment 1, eyes very large, reniform, broaden slightly below, brownish in alcohol; interantennal lobe short, broad, rounded; epistome weakly convex in the lower part and concave in the middle, does not protrude forward beyond the upper lip. Antenna 1 short; segment 1 of peduncle weakly inflated, almost cylindrical, segments

2 and 3 enlarged; flagellum 10- 11-segmented, its segment 1 large, several times longer than the subsequent one; accessory flagellum 5-segmented, its segment 1 slightly thicker and considerably longer than the subsequent.

Antenna 2 considerably longer than antenna 1, with a very long multisegmented flagellum, especially in the male; last segment of the peduncle smaller and considerably shorter than the penultimate one. Coxal plate 1 broadens strongly distally; segment 5 of gnathopod 1 short, cup-shaped, with a narrow short linguliform lobe at the postero-distal angle; segment 6 considerably longer than segment 5, weakly tapers distally, with a transverse notched palmar margin armed with 2 similar locking spines; dactyl, contrary to Holmes' description and drawing, short, its distal end reaches only the middle of the palm and does not reach the locking spines. Segment 6 of gnathopod 2 slightly broadens distally, shorter than half the length of segment 5 which is inflated along the posterior margin that in the distal part is covered with sharp scales. Coxal plate or peraeopod 3 broadens distally, its greatest width equals its depth, the lower margin has a shallow notch in the middle; the basal segment is broad and relatively short, its greatest width in the proximal part is greater than its height, the anterior margin, strongly convex at the base of the segment, becomes oblique distally, densely covered with small spines; segment 4 weakly broadens distally. Coxal plate of peraeopod 4 without a lobe, but with a rounded lower and concave anterior margins; basal segment narrower than that of peraeopod 3, oblong-oval, with anterior margin bearing spinules a strongly convex above and a concave in the middle.

The basal segment of peraeopod 5 is broader and longer than that of peraeopod 4, slightly tapers distally, its anterior margin concave, bears spinules, segment 4 weakly broadens distally.

Figure 50. Orchomenella affinis Holmes. Bering Sea, ♂.

The postero-distal angle of epimeral plate 3 straight, the lower margin convex, the posterior margin very finely serrate-dentate. Branchial vesicles simple in the anterior pair of thoracic legs, rather larger, with invaginations and processes at the outer and with setae at the inner distal angles; outer ramus 1½ times longer than the peduncle, its segment 1 has almost parallel margins, bears 8 spinules along the outer and plumose setae along the inner margins and 2 spines at the distal end; inner ramus tapers distally, shorter than segment 1 of the outer ramus (both in our specimens and Holmes' specimens), or is slightly longer (in the specimens from the depths of the Kurile-Kamchatka depression); the inner margin bears setae, 1 to 4 spinules along the outer margin. Telson extended, cleft at least to the middle or deeper, lateral sides convex, with three pairs of lateral spines; there is 1 apical spinule at the apex of each lobe. In alcohol, the specimens are whitish-yellowish; live abyssal specimens olive-green, eyes light. The animal is up to 15 mm long.

Found in Monterey Bay at a depth of 530 - 650 m (Holmes, 1909), in the Kurile-Hamchatka depression /caught at depths exceeding 2000 m (Birstein and M. Vinogradov, 1955) and in our collections from the eastern part of La Perouse Strait (depths 151 - 263 m), and at the west coast of Bering Island (the Comander Islands) at a depth of 134 m/.

Of considerable interest is the comparison of the specimens captured in the area of the geographical range of the species and at various depths (hence the specimens live under various conditions).

These differences are presented in Table 2.

As the depth range of the species increases, one usually notices the increase in the body length in regard to its height, the appendages become longer and the oramentation weaker; the development of the spines and setae is correlated to its way of life: pelagic forms develop strong setae, benthic develop spines, etc. In this particular case, judging by the correlation of the width and the depth of the first coxal plates (see coxal plate 2) the increase in the body length in regard to the height seems to take place; the basal segment and segment 4, - in pair 5, for instance - also are relatively longest and narrowest in the abyssal Kurile-Kamchatka form than those in the Californian and our specimens; however, if we examine antenna 2, we notice a completely different picture. The latter holds also true in regard to the structure and the armature of uropod 3 in our specimens which were caught within the boundaries of the continental shoal; the setae on the rami are more abundant than in the abyssal forms, the outer ramus is relatively longer.

In order to establish general trends in regard to this species, the material at our disposal is far from being adequate; the presentation of the comparative data, nevertheless, is of some interest. The oral parts of our specimens correspond to the description and figures of Birstein and M. Vinogradov. Of a particular interest is the rise of this, apparently abyssal species to the continental shoal of the Commander Islands, the fact which has been noted repeatedly by various authors in regard to a number of invertebrates and fish, which, as a rule, takes place at the coasts of ocean islands with very steep underwater slopes.

7. Orchomenella melanophtalma Gurjanova sp. n. (Figure 51)

It easily differs from other northern and Far-East species in the black colour of its eyes, resembling in this regard O. pacifica the eyes of which, however, are dark-brown.

This species is close to O. affinis Holmes and O. pinguis (Boeck), which possesses, if compared with other segments, a strongly increased size of segment 1 of the flagellum of antenna 1, a weakly convex epistome which does not extend beyond the upper lip, a small linguliform lobe on segment 5 of gnathopod 1, and coxal plate 1 which broadens distally.

It differs from O. affinis in a rather longer, anteriorly projecting triangular head lobe, a greatly inflated keg-shaped segment 1 of the peduncle of antenna 1, and short segments 2 and 3, short antenna 2 which is as long as antenna 1 even in ♂♂ which is almost as long as segments 4 and 5 of the peduncle of antenna 2, a smooth, and not toothed palmar margin, and 1, and not 2, locking spine of gnathopod 1, a strongly broadened segment 4 in peraeopod 3, the presence of a small tooth at the postero-distal angle of epimeral plate 3, and the form of the telson. It differs from O. pinguis in the black colour of its eyes, a rather more enlarged linguliform lobe of segment 5 of gnathopod 1, the form of the basal segments of peraeopods 3 - 5 of the coxal plate, the form and armature of the telson, and a smooth and not finely notched posterior margin in epimeral plate 3.

Figure 51A. Orchomenella melanophthalma Gurjanova sp.n. East coast of Iturup Island, ♀.

Figure 51B. Orchomenella melanophthalma Gurjanova sp.n. East coast of Iturup Island, ♂.

Body strongly inflated, dense, with deep coxal plates. Head short, slightly longer than half its height; the interantennal lobe greatly drawn out forward and with its rounded apex almost reaching the distal end of segment 2 of the peduncle in antenna 1. Eyes small, oval, black. Epistome rounded in its lower part, but does not protrude forward beyond the upper lip which is separated from the epistome by a deep sinus. The peduncle of antenna 1 is strongly inflated; its segment 1 bears sensory setae on the upper surface; flagellum shorter than peduncle, 7-segmented; accessory flagellum 4-segmented, its segment 1 broader than the 3 remaining ones and as long as segment 1 of the main flagellum. Antenna 2 slightly longer than antenna 1; last segment of the peduncle slightly shorter than the penultimate, both armed with long setae at the postero-distal angle, flagellum 6-segmented. Coxal plate 1 relatively short, its width slightly larger than half its height, the antero-distal angle rounded. Gnathopod 1 short and strong; basal segment, armed with setae along the anterior end, as long as the remaining segments together; segment 5 cup-shaped, considerably shorter than segment 6, armed with a linguliform lobe at the postero-distal angle segment 6 tapers distally, has a convex palmar margin, armed with a short locking spine and a long sharp spine and 2 - 3 setae on the posterior margin of the hand. Coxal plate 2 considerably narrower and deeper than coxal plate 1. Gnathopod 2 much thinner and longer than gnathopod 1; segment 5 inflated on the distal margin and has a "cushion" covered with minute hairs or scales; segment 6 slightly larger than half of segment 5, but narrower than its distal inflated part; segment 6, narrow at the base, broadens distally, its short palmar margin extended forward and forms, together with the dactyl, a small claw. Peraeopods have short powerful dactyls which measure less than half the length of segment 6. The coxal plate of peraeopod 3 broad, the posterior lobe on its lower margin drawn out below, anterior lobe underdeveloped; the plate on the anterior margin broader than deep; basal segment and segment 4 strongly broadened, broader than long. The coxal plate of peraeopod 4 has a drawn downward rounded posterior part, but it does not form a lobe, basal segment and segment 4 also greatly broadened, but the width of the basal segment shorter and that of segment 4 equals its length. The basal segment of peraeopod 5 slightly broadens distally, its greatest width less than its length; segment 4 weakly broadens downward. The posterior margin of the basal segment of the last three peraeopods shallowly and sparsely toothed and bears a short seta in each notch. Branchial vesicles have 2 - 3 folds and a short accessory lobule. Epimeral plate 3 forms a blunt short tooth at the postero-distal angle, its posterior margin smooth. Urosome segment 1 of the female has a shallow saddle-shaped depression, and that of the male has a small sinus. The rami of uropod 2 as long as the peduncle, armed with spines; the peduncle of uropod 3 short, with spines at the lower angles; inner ramus as long as segment 1 of the outer ramus, bears several setae on the inner and the outer margins; segment 1 of the outer ramus has 2 spines on the outer ans several on the inner margins.

Telson enlarged, with lobes diverging aside, cleft only to the middle, armed with a pair of large apical and one pair of dorsal spines. The animal is 5 mm long. In the structure of the telson and segment 5 of gnathopod 1, as well as in the development of the black pigment of the eyes, this species resemble more the species of the genus Orchomene; the structure of the oral parts, however, resembles that of Orchemenella.

Table 2

COMPARISON OF SPECIMENS *O. affinis* Holmes FROM DIFFERENT AREAS OF THE GEOGRAPHICAL RANGE*

Location	Antenna 2	Gnathopod 1	Coxal plate 2	Telson
Monterey Bay, depths 530-650 m. According to Holmes' description and figures, 1909 (3 specimens, length 13 mm).	Twice as long as antenna 1.	Dactyl reaching end of palm.	Width of distal end at least twice smaller than the depth of plate.	Cleft almost to the base.
Kurile-Kamchatka depression, depths over 2000 m. According to Birstein + Vinogradov's description and figures 1955 (3 speimens, length 13 mm).	Slightly longer than antenna 1 in both sexes.	Dactyl reaching end of palm.	Width of distal end $2\frac{1}{2}$ times smaller than the depth of plate.	Cleft slightly short of the middle.
The Commander Islands and La Perouse Strait depths 134-263 m (our 2 specimens, length 15 mm).	In ♀ twice and in ♂ $2\frac{1}{2}$ times longer than antenna 1.	Dactyl reaching only the middle of palm.	Width of distal end only $1\frac{1}{2}$ times smaller than depth.	Cleft slightly further than to the middle.

* For the right side of this table, see next page. Translator

Table 2 (cond).

COMPARISON OF SPECIMENS O. *affinis* Holmes FROM DIFFERENT AREAS OF THE GEOGRAPHICAL RANGE

Peraeopod 5	Segment 6 of gnathopod 2	Uropod 3
Weight of basal segment along anterior margin equals its greatest width; segments 4 and 5 of same length.	Palmar angle drawn out forward and forms a small claw with dactyl.	Inner ramus shorter than segment 1 of outer ramus; on its outer margin are 3 spines, on the inner, plumose setae; outer ramus with 8 spines.
Weight of basal segment along anterior margin almost 1½ times larger than its greatest width; segment 4 longer than segment 5.	Palmar angle rounded, width of distal margin 1 1/3 times smaller than length; does not form a claw.	Inner ramus longer than segment 1 of outer ramus; on its inner margin are plumose setae; along the inner margin of outer ramus; there are 5 pairs of setae; along the outer, there is 1 spinule.
Weight of basal segment almost equals its greatest width; segment 4 slightly shorter than segment 5	Palmar angle almost straight, width of distal end of segment 1 2/3 times smaller than length; does not form a claw.	Inner ramus shorter than segment 1 of outer ramus; along outer margin of outer ramus, there are 8, and along the inner 7 spines.

A few specimens of ♂♂ and ♀♀ were caught at the east coast of Iturup Island in sand at a depth of 75 m.

8. Orchomenella pacifica Gurjanova, 1938 (Figure 52,53).
Guryanova, 1951: 287, Figure 155.

Since our material contains not only ♀♀, from which our species is described, but also ♂♂, this species has a well-developed dimorphism; however, due to the fact that there is a new species in the Sea of Japan which in a number of features is close to O. pacifica, we consider it necessary to describe the latter species and to present additional drawings both for the male and the female.

Head slightly longer than peraeon segment 1; interantennal lobes strongly drawn out forward and their blunt apex extending beyong the distal end of segment 1 of the peduncle in antenna 1. Eyes large, oval, relatively broader in ♂ than in the female, dark-brown. Epistome rounded, protrudes in front of the upper lip, considerably more so in ♂ than in ♀. Urosome segment 1 in ♀ has a weak depression on the dorsal side and a well-developed oblong keel with a blunt apex which overhangs the subsequent segment; urosome segment 1 of ♂ has a very deep sinus and a shorter and rounded keel behind this sinus, and abdominal segment 3 forms a small hump on the posterior margin. Antenna 1 in ♂ slightly longer than in ♀; the median keel on the front surface of segment 1 of the peduncle considerably stronger than in ♀; segment 1 of the basic flagellum of considerably longer than in ♀, exceeds more than twice the length of segment 3 of the peduncle, and the accessory flagellum shorter than segment 1 of main flagellum, while segment 1 of the main flagellum of ♀ shorter than segment 3 of the peduncle, and the 3-segmented accessory flagellum slightly longer than the main flagellum.

Antenna 2 of the female only slightly, and that of ♂ considerably longer than antenna 1; segment 4 of the peduncle shorter than segment 3, segment 5 considerably longer than segment 4, and in ♂, moreover, thicker; the flagellum of ♀ shorter than the peduncle, 8-segmented, and in ♂ very long, whip-like, bending under the coxal plates and almost reaching the end of body. Both antennae of ♂ bear calceoli. The gnathopods and peraeopods of ♂♂ and ♀♀ similar in structure. Peraeopods 1 and 2 each bear 2 and 3 short hooked locking spines at the distal end at the base of the main dactyl, which is not observed in other species of the genus inhabiting our seas; coxal plate 1 broadens distally uniformly; segment 6 of gnathopod 1 narrow, with parallel margins, as long as segment 5, palmar margin oblique, with two locking spinules; segment 5 of gnathopod 2 inflated at the distal end and bears a cushion of pointed scales; segment 6 as long as half the length of segment 5, weakly broadens distally, its width only slightly smaller than the length; together with the palmar margin which is drawn out forward, and dactyl forms a small claw.

Figure 52. Orchomenella pacifica Gurjanova. Sea of Okhotsk, ♀.

Peraeopod 3 of ♀ has a broad coxal plate the width of which exceeds the depth, the basal segment rounded, as broad as long, the anterior margin bears spinules, and its posterior margin dentate; segment 4 strongly broadened, its lower hand lobe drawn out downward almost to the distal end of segment 5. The basal segment of peraeopod 4 of the female distinctly broadens distally, has spines in the lower part of the anterior margin and notches on the posterior margin; segment 4 broadened, its posterior lower lobe drawn out downward to the middle of segment 5. The basal segment of peraeopod 5 of female broad but enlarged in length and only slightly broadens distally, anterior margin has spines, while the posterior margin has a few notches and a sinus where it is produced into the lower margin; segment 4 strongly broadened, wider than long, posterior lower lobe drawn out doward slightly further than to the middle of segment 5. The coxal plate of peraeopod 3 of the male slightly narrower, its width slightly smaller than its depth, basal segment also lengthened more than in ♀, while segment 4 broadened less and its lobe slightly shorter. The basal segment of peraeopod 4 of the male weaker, broadens distally, and segment 4 broadened relatively less than in ♀. The basal segment and segment 4 of peraeopod 5 of the male similar to those of ♀, epimeral plate 3 with the postero-distal angle produced into a small tooth both in ♂ and in ♀; telson cleft scarcely to the middle, lengthened, with straight lateral margins, tapers distally, bears two pairs of dorsal spines and 1 apical spine at the apex of each lobe and in its structure it resembles the telson of the representatives of the genus Orchomene. Uropod 2 of ♂ and ♀ has even rami each of which bears 2 spines on the inner margin. Uropod 3 has a short peduncle and rami of uneven size; inner ramus slightly shorter than the outer, in the female with 2 spinules on the inner margin, and with 4 spines in the male; the outer ramus of the female armed with only 2 spines at the distal end of segment 1, the male, moreover, has 4 thick plumose setae on the inner margin. The body plates greately calcified, brittle, in alcohol the animal is milky-white, the male pinkish, the length 9 mm.

Figure 53A. Orchomenella pacifica Gurjanova. Sea of Okhotsk, ♂.

Figure 53Б. Orchomenella pacifica Gurjanova. Sea of Okhotsk, ♂.

Discovered (only ♀♀) in the Sea of Japan in the area of Preobrazheniye Bay; more than 10 specimens (both ♀♀ and ♂♂) found in the Sea of Okhotsk at the east coast of south Sakhalin at a depth of 29 m and quite a few specimens come from the Pacific Ocean, the continental shoal of the east coast of Iturup Island (the Kuriles), from depths ranging from 29 to 129 m.

9. Orchomenella japonica Gurjanova sp. n. (Figures 54, 55).

In appearance, this species is close to O. pacifica, but its eyes are rather larger, the plates less calcified, it has a straight postero-distal angle of epimeral plate 3, and a more developed keel on urosome segment 1. The new species has also well expressed secondary sexual features in head structure, urosome segment 1; and especially antenna 1, antenna 2, uropod 3, and telson; there are considerably persistant differences between both species in regard to the structure of the epistome, all peraeopods, and both gnathopods.

Figure 54. Orchomenella japonica Gurjanova sp. n. Sea of Japan, ♂.

Figure 55. Orchomenella japonica Gurjanova sp. n. Sea of Japan, ♂ and ♀.

Head longer than peraeon segment 1, eyes large, light-brown, reddish in alcohol, relatively larger in ♂ than in ♀, and, dorsally, the distance between them almost twice shorter in ♂ than in ♀; the interantennal lobe of ♂ broad, equilateral, with a sharp apex, slightly narrower in ♀, hence it seems to be more elongated forward, and its apex blunt. The epistome with anterior surface strongly concave, while its lower part convex, rounded, and slightly projects forward beyond the upper lip in both sexes. Antenna 1 in both sexes has on the segment of the peduncle a well-expressed medial keel which overhangs the subsequent segment; segment 1 of the flagellum in ♀ as long only as the subsequent 4, and that of ♂ considerably longer and at least as long as the 6 subsequent segments together; mature ovigerous female has 8, and ♂ 9 segments; accessory flagellum in ♂♂ and ♀♀ 5-segmented. Antenna 2 of ♀♀ short, as long as antenna 1, much longer in ♂♂; its long whip-like flagellum reaches almost the length of body; both pairs in ♂♂ bear calceoli, while the last segment of the peduncle of antenna 2 strongly broadened and flattened, and sharply differs in its form from the corresponding segment of the female (see figures).

Coxal plate 1 has an almost straight posterior margin, but its anterior margin is strongly convex in the lower part so that the entire plate sharply broadens distally. All theracic legs are similar in structure in both sexes. The basal segment of gnathopod 1 has sparse short setae along the anterior margin; segment 3 with 2 setae of same length on the posterior margin; segment 5 cup-shaped, with a small short and narrow linguliform lobe; segment 6 considerably longer than segment 5, weakly tapers distally, its posterior margin is concave in the middle and armed with setae, palmar margin is not oblique but transverse, concave, armed with short, thick spinules at the distal end and setae in its middle part; dactyl short, thick, hooked, as long as the palm. Gnathopod 2 with strongly lengthened segment 3; segment 5 broadens distally considerably, with inflated posterior margin which in its upper part bears small pointed scales; segment 6 longer than half segment 5, narrow, weakly broadens distally; short palmar margin drawn out forward and forms, together with the dactyl, a small claw. Segment 6 of peraeopods 1 and 2 considerably longer than segment 5, armed with strong spines, but lacks hooked ones, similar to those of _O. pacifica_, at the apex, at the base of the dactyl; it only bears 2 straight short, equal, simple spinules directed straight down and approximating the base of the dactyl. Coxal plate 5 with 2 lobes along the lower margin, broadens distally, wider than long, as long as the basal segment; the basal segment of peraeopod 3 broad, rounded; along the entrie anterior margin, it bears spinules, posterior margin dentate, segment 4 broadens distally, its greatest width equals its length, bears acicular setae along both margins; segment 5 as long as, but slightly narrower than segment 4, armed with strong spinules along the anterior margin; segment 6 slightly longer than segment 5, dactyl about half segment 6, strongly bent. The coxal plate of peraeopod 4 with a short posterior lobe, basal segment lengthened, oval, weakly tapers distally with spines on anterior and weak notches on posterior margins; segment 4 weakly broadened, less wide than long, bears spinules on the posterior margin and setae on the anterior. The basal segment of peraeopod 5 broad, does not taper distally, its nothched posterior margin has a slightly oblique lower part, there are spinules along the anterior margin; segment 4 almost linear, very weakly broadened, sharply differs in this regard from the corresponding segment of _O. pacifica_. Epimeral plate 3 has a straight postero-distal angle and a convex posterior margin. Uropod 2 of the female has even rami each of which is armed with 2 spinules along the inner margin; the inner ramus of the male slightly shorter than the outer one and bears up to 7 hooked spinules along the inner margin. Uropod 3 of the female with a distally broadening short peduncle armed with spines at distal angles;

inner ramus unarmed, pointed, considerably shorter than the outer which bears only 3 spines on the outer margin and lacks setae; the peduncle of the male almost cylindrical, the outer ramus with 4 spines on the outer and long setae on the inner margins; inner ramus slightly shorter than the outer and bears long setae on both sides. Telson cleft almost to the base, has two-three pairs of dorsal and one pair of apical spines. Urosome segment 1 resembles that of _O. pacifica_, has a medial keel which overhangs segment 2 of the urosome; in front of the keel, there is a saddle-shaped depression which is deeper in the male and shallower in the female. The plates are poorly calcified, covered with a fine reticulate sculpture and microscopic spinules which are well discernible especially on coxal plates; in alcohol, the specimen is pinkish. The ovigerous female has 15 - 16 eggs in the brood pouch; the animal is 6 - 7 mm long.

Figure 56. _Orchomenella magdalenensis_ Shoemaker. After Shoemaker, 1942.

A few dozen animals were captured in the Sea of Japan in Peter the Great Bay (Patrokl Bay, Sobol, Ussuri Bay) in the fields of eelgrass and Phyllospadix at depths ranging from 0 to 2.5 m.

10. _Orchomenella magdalenensis_ Shoemaker, 1942 (Figure 56).
Shoemaker, 1942, Smithson. Miscell., 101, No. 11: 4, f. 1.

Only one female described; this species is close to _O. pacifica_ Gurjanova.

Described according to Shoemaker. Lateral head lobes strongly elongated distally, with a narrow rounded apex. Eyes large, oval, weakly coloured. Flagellum of antenna 1 5-segmented, accessory flagellum 2-segmented. Antenna 2 slightly longer than antenna 1, segment 3 of peduncle as long as segment 4 and half the length of segment 5 together, segment 5 slightly larger than half segment 4; flagellum almost as long as segments 4 and 5 of the peduncle together, 6-segmented. Epistome strongly protrudes beyond upper lip and forms a rounded blunt triangular apex. Mandibles with a protruding molar process, cutting edge with tooth at the inner angle; 3 spines in tooth row; segment 1 of palp about 2/3 length segment 2 and longer than segment 3; segment 2 almost 2 times longer than segment 3. Maxilla 1: inner plates about half the length of outer, narrow, bear 2 plumose setae at the apex; outer plates with 11 notched spiniform teeth, palp distally armed with 5 short blunt spiniform teeth and a plumose seta. Inner plates of maxilla 2 shorter and narrower than the outer. Inner plates of maxillipeds reach the middle of outer and distally armed with 3 blunt teeth; outer plates reach almost the middle of segment 3 of palp, armed with short blunt teeth at the apex and the upper part of inner margin; there is an oblique row of short spines, which terminates in 2 strong spines on the inner margin, on their outer surface; palp short and thin, segment 3 almost as long as segment 2; segment 4 (dactyl) more than half the length segment 3, bent and bears small accessory dactyl at the apex. Coxal plates 1 - 4 located above the segments that correspond to them; plate 1 broadens noticeably downward, plates 2 and 3 with almost parallel margins; plates 4 deeply truncated on the posterior margin, with a well-developed posterior lower lobe with obliquely truncated posterior margin. Gnathopod 1 thin, basal segment slightly broader but as long as segment 6; segment 6 with parallel margins, more than 4 times larger than its width; palmar margin transverse, dactyl as long as palm with 1 tooth on lower margin. Gnathopod 2 very thin and much longer than gnathopod 1; basal segment almost 2 times longer than 3rd which is as long as the 5th; segment 6 measures half the length of segment 5, dactyl very short and weak. Peraeopods 1 and 2 thin and uniform in length. Peraeopods 3 - 5 with strongly broadened basal segment; width of basal segment of peraeopod 3 larger than its length; segment 4 with the postero-distal angle drawn out downward. The postero-distal angle of epimeral plate 1 rounded, and almost rectangular in plates 2 and 3. Urosome segment 1 with medial dorsal keel overhanging subsequent segment. Uropod 1 reaches the level of end of uropod 3. Uropod 3 has a thin, bent lobe on the upper margin of peduncle; outer ramus bears only 2 short spines at the base of segment 2; inner ramus with 3 short spines on the outer margin. Telson long and narrow, cleft almost to the base; at the apex of the lobes, there is 1 apical spine on each; on the upper surface of the telson, there is one spine and 2 plumose setae on each side from the middle line at the level of the end of the cleft.

The animal is about 6 mm long.

6 specimens discovered at the entrance to Magdalena Bay (lower California) at a depth of 18 - 25 m.

The distinguishing features of this species are the unusually long segment 1 of the palp of mandibles, which is longer than segment 3, and the fact that segment 3 of the peduncle of antenna 2 is longer than either segment 4 or segment 5.

11. Orchomenell (?) nugax (Holmes, 1904) (Figure 57).

Holmes, 1904, Smithson. Inst., Harriman Alaska Exp., X: 234, f. 119, 120 (Tryphosa).

External appearance - deep coxal plates, strongly developed coxal plate 5 whose depth is larger than the length of the basal segment of peraeopod 3, structure of oral parts and gnathopods, well developed coxal plate 1 which does not taper - forces us to assign this Holmes' species to the genus Orchomenella rather than to Tryphosa. Lack of this species in our collections prevents us from establishing this more accurately and presenting both the description and the fiugres of the author, with some additional description and supplements.

Figure 57. Orchomenella (?) nugax Holmes. After Holmes, 1904.

Body inflated and compact; eyes oval, dark; lateral angles of head drawn out forward and rounded. Coxal plate 1 does not taper distally, which is characteristic of the genus Tryphosa, but with parallel margins; its distal margin at the level of the lower margins of the plates of pair 2, depth twice as large as width. Width of coxal plate 5 almost equals its depth. Postero-distal angle of epimeral plate 3 almost straight, its posterior margin smooth and straight. Urosome segment 1 slightly concave on dorsal side. Segment 1 of the peduncle of antenna 1 very thick and slightly drawn out distally above segment 2, flagellum almost as long as peduncle, 6- 7-segmented, its segment 1 only slightly longer than the subsequent; accessory flagellum short and powerful, 4-segmented, at least 2 times as long as segment 1 of main flagellum; its segment 1 almost as long as remaining 3 segments. Antenna 2 slightly longer than antenna 1; flagellum not longer than peduncle. Molar process of mandibles almost in the middle of the cutting edge and the place of the attachment of palp. Inner plates of maxillipeds almost reaching the level of the apex of segment 2 of palp, armed distally with a few short teeth; outer plates reach the middle of segment 3 of palp and armed distally, and also along inner margin, with short teeth. Gnathopod 1 with rectangular segment 6 not tapering distally; palmar margin transverse, almost straight and armed with 2 locking spines, dactyl as long as palm. Gnathopod 2 with broad and distally strongly inflated segment 5 on posterior margin; segment 6 slightly broadening distally; its short palmar margin drawn out forward and forms a small claw together with dactyl. Three posterior peraeopods short, their basal segments very broad and almost as long as the remaining part of hand; their posterior margin smooth and bears a few very short setae. Rami of uropod 1 shorter than peduncle; rami of uropod 2 almost as long as peduncle. Inner ramus of uropod 3 devoid of spines and setae and reaching the apex of segment 1 of outer ramus; outer ramus without spines, except for the apex of segment 1. Telson enlarged in length, slightly longer than wide, cleft to the base, lobes diverge to apices, armed with 1 apical spine. There is one pair of dorsal spines near the middle part of telson. The animal is 3 mm long.

It differs from other species of the genus in a very short segment 1 of the main flagellum of antenna 1. 1 specimen known from the northern part of the Bering Sea, obtained near the Pribylov Islands.

18. The Genus ORCHOMENOPSIS G. Sars, 1891.

G. Sars, 1891, Crust. Norw. I: 73, Stebbing, 1906, Tierreich, Berlin, 21: 83.

While determining this genus, G. Sars pointed out that it is close to the genus Orchomene, although it differs essentially from the latter in that the epistome does not at all protrude forward, that gnathopod 1 is rather shorter and strong, that uropod 3 and the telson are more developed, and that epimeral plate 3 is unarmed (its posterior margin smooth); Sars also points out that the structure of the oral part of *Orchomenopsis* is closer to that of *Orchomenella* and not to that of *Orchomene*. In his diagnosis, Sars notes a rather more complex body structure than in *Orchomenella* and in *Orchomene*, the roundness of the interantennal lobe of the head, the moderately broadened basal segments of the last three peraeopods.

Stebbing introduces in the diagnosis of this genus such features which, in our opinion, are unimportant, i.e.: the form of coxal plates 1 and 4, the relative length of antennae 1 and 2, the relative length of segments 5 and 6 of gnathopods 1 and 2. The peculiarities of the structure of oral parts, which within the family Lysianassidae play an important role during the determination of the genus, according to Sars' and Stebbing's descriptions and figures, are very close to those of *Orchomenella*. The structure of the epistome, which was the most important feature Sars used for determining the genus *Orchomenopsis*, now is losing its importance, since our study of this feature in all species of *Orchomenella*, which we had at our disposal, shows that the degree of its development in *Orchomenella* differs, and in some species the epistome strongly protrudes forward beyond the upper lip, while in others, on the other hand, the upper lip protrudes much further than the epistome, as is the case in *O. obtusa* G. Sars, a typical species of the genus *Orchomenopsis*.

Since our collections lack all the representatives assigned to this genus, we are forced, for now, to preserve the genus Orchomenopsis, subjecting it, of course, to a serious doubt in regard to its independence.

The diagnosis of this genus is given in accordance with Stebbing.

Lateral head angles rounded. Coxal plate 1 broadens downward; plate 4 has a relatively short broadening. The postero-disal angle of epimeral plate 3 not extended backward. Peduncle of antenna 1 thick, segments 2 and 3 very short, accessory flagellum well developed. Antenna 2 considerably longer than antenna 1. Epistome does not protrude forward, Mandibles strong, molar process weak, bears setae; palp attached below the molar process, its segment 1 short. Inner plate of maxilla 1 narrow, with 2 setae, outer plate truncated obliquely, with 11 dentate spines; upper margin of apical segment of palp fringed with tooth-shaped spines. Plates of maxilla 2 enlarged in length, taper distally, Outer plates of maxillipeds oval, with little nodulous teeth on the inner margin, the length of the plates in regard to the segments of the palp varies; gnathopod 1 powerful, with a subchela; segment 6 considerably longer than segment 5; palm transverse, well defined. Segment 5 of gnathopod 2 broadens distally, segment 6 narrower and about half the length of segment 5. Peraeopods powerful; basal segment of last three peraeopods moderately broadened, tapers distally. Rami of uropod 3 extended beyond the level of uropod 2, bear setae. Telson more or less deeply cleft.

Genotype: O. obtusa G. Sars, 1890 - 1895, Norw., I: 74, lp. 26, f. 2.

1 species known from the northern part of the Pacific Ocean.

1. Orchomenopsis musculosa (Stebbing, 1888) (Figure 58).

Stebbing, 1888, Rep. Challenger, 29: 673, pl. XX (Orchomene musculosus).

Description according to Stebbing, 1906: "Lower lobe of coxal plate 5 larger than frontal lobe. The postero-distal angle of epimeral plate 3 strongly rounded; the flagellum of antenna 1 11-segmented, its segment 1 large, accessory flagellum 4-segmented, its segment 1 long. Last segment of peduncle of antenna 2 as long as penultimate, flagellum 13-segmented. Palp of maxilla 1 in one with 11, and in another with 8 tooth-shaped spines. Inner plates of maxillipeds with concave upper margin, outer plates extend beyond segment 2 of palp and bear 2 spinules at the apex. Basal segment of gnathopod 1 short and massive, not longer than segments 5 and 6 together; segment 5 short, cup-shaped (with narrow linguliform lobe (Bu. Guryanova), segment 6 oblong, thickened at the base, its posterior margin slightly concave, palm transverse; dactyl as long as palm; segment 6 of gnathopod 2 slightly drawn out toward apex. Rami of uropod 3 uniform in length. Telson twice as long as broad; there is one pair of dorsal and one pair of apical spinules, cleft less than to the middle, lobes slightly diverge distally. Length about 12 mm."

Given by Stebbing for the Pacific Ocean and southern Japan (sea surface).

19. The Genus SOCARNOIDES Stebbing, 1888.

Guryanova, 1951: 208

Of the 3 known species of the northern part of the Pacific Ocean, 1 species known which differs from the typical northern species in some structural details.

1. Socarnoides eugonovi Gurjanova, 1934 (Figure 59, 60).

Guryanova, 1951: 209, Figure 76.

Specimens obtained in the North Pacific (Figure 59 and 60, B) differ from those obtained in the northern part of the Kara Sea, and the specimens obtained in the eastern part of the Arctic basin (Figure 60, A) in a rather more slender body and appendages, a somewhat smaller size of their eyes, elongated, interantennal lobe strongly drawn out forward, and the form of epimeral plate 3; the posterior margin of the plate of Pacific specimens forms a uniform convex line which is produced directly into the line of the straight postero-distal angle of the plate, while the posterior margin of the plate of Arctic specimens is strongly convex in the middle and forms a small sinus above the straight postero-distal angle of the plate; the differences is also observed in the structure of gnathopod 2: segment 6 of the Pacific specimens rather narrower and the entire extremity thinner and more slender than in the Arctic specimens; its segment 6 as long as the broadened part of segment 5, while segment 6 of the Arctic specimens slightly shorter than the inflated part of segment 5; the length of segment 6 in the Pacific specimen more than twice the greatest width, while its length in the Arctic specimens exactly twice the width. These differences, however, although constant, are insignificant to such a degree that they do not play any taxonomic role, more so since the degree of the stoutness of the body and the appendages of the crustaceans, and of the amphipods, in particular, are often the result of some difference in the ecological habitat of the populations which inhabit various parts of one and the same region. The maximum length of the animal is 6 mm.

Discovered earlier in the northern part of the Kara Sea (type), this species is also found in our collections from the eastern part of the Arctic basin at a depth of 130 m, about 30 specimens (Figure 60, A); in the Pacific Ocean, it is found near the eastern coast of Paramushiro Island (the Kuriles) at depths ranging from 60 to 107 m, about 70 specimens (Figure 60, Б), as well as in the deep basin in the drainage zone of Shikotan Island among the fields of brown algae (1 specimen), in the Sea of Okhotsk near Tauya Bay (Figure 59Б) at a depth of 92 m (2 specimens), and in the Sea of Japan, in Tatar Straight in Northern Bay (2 specimens) (Figure 59A).

Figure 58. Orchomenopsis musculosa Stebbing. After Stebbing, 1888.

Figure 59A. Socaroides eugenovi Gurjanova. Sea of Japan.

Figure 59b. Socarnoides eugenovi. Sea of Okhotsk.

20. The Genus MENIGRATES Boeck, 1871

Guryanova, 1951: 210.

Of 3 known specimens in the Pacific Ocean, 2 representatives of this genus are described below.

1 (2). Telson cleft 1/3; ends of rami of uropod 3 smooth, without spines..........* M. obtusifrons (Boeck, 1861).

(Northern part of the Atlantic and Arctic oceans).

2 (1). Telson entire, has a small notch at the apex, ends of rami of uropod 3 bear spinules.

3 (6). Segment 4 of peraeopods 3 - 5 strongly broadened, wider than long.

4 (5). Segment 6 of gnathopod 1 much longer than segment 5; lobe of wing-shaped broadening of basal segment of peraeopods 3 - 5 short, hardly reaching the end of segment 3.........* M. spinirami spinirami Gurjanova, 1936.

(Zool. Anz., 113, H. 9/10: 246, Abb.1. Kara Sea).

5 (4). Segment 6 of gnathopod 1 as long as segment 5; lobe of wing-shaped broadening of basal segment of peraeopods 3 - 5 long, extends considerably lower than the distal end of segment 4. ....2. M. spinirami japonica Gurjanova ssp.n.

6 (3). Segment 4 of peraeopods 3 - 5 weakly broadening distally, almost linear; the segment's width is at least twice smaller than its length..........1. M. angustipes Gurjanova sp.n.

Figure 60. Socarnoides eugenovi. Gurjanova. A- eastern part of Arctic basin; Б-coast of Paramushiro Island.

1. Menigrates angustipes Gurjanova sp.n. (Figure 61).

This species was named after the unusually narrow basal segment and segments 4 and 5 in the last three peraeopods; moreover, coxal plate 1, which overlaps the lower head part and its interantennal lobe, the different shape of upper lip and segment 6 of gnathopod 2, the correlation of the length of segment 5 and segment 6 of gnathopod 1 (segment 6 not longer but shorter than segment 5), the lack of the molar process at the psotero-distal angle of epimeral plate 3, the elongated telson whose width is not equal to but smaller than its length, - all these characteristics features permit us easily to distinguish this species from the earlier two species known.

Figure 61A. Menigrates angustipes Gurjanova sp.n. Sea of Okhotsk, ♀.