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CONTENU.

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Crustacea caspia. Contributions to the knowledge of the carcinological Fauna of the Caspian Sea, by G. O. Sars, Prof. of Zoology at the University of Christiania, Norway. (Lu le 14 avril 1893).

Part I.

MYSIDÆ.

With 8 autographic plates.

GENERAL INTRODUCTION.

The Crustacea of the Caspian Sea are as yet but very imperfectly known, and, with the exception of the *Mysidæ*, the Caspian species of which have partly been studied by Mr. Czerniavsky, only a few scattered notes have hitherto been published about that part of the fauna. As, however, the Crustacea everywhere are found to represent a very essential bulk of the fauna, it cannot fail that a closer investigation of the several forms of that class occurring in the Caspian Sea, would give us important information about the general character of the fauna of that isolated marine basin, and thereby throw much light on the difficult questions about the supposed early connexion of the Caspian Sea with other parts of the Ocean.

Through the kind intervention of Mr. S. Herzenstein, a very interesting collection of Crustacea made by Mr. Warpachowsky during the past year in different places of the northern part of the Caspian Sea, has been placed in my hands for examination. The collection comprises numerous species belonging to 3 different orders, viz., *Schizopoda*, *Cumacea* and *Amphipoda*. Especially the occurrence in the Caspian Sea of Cumacea seems to me to be of very considerable interest, on account of the exclusive marine character of that order, and of the other 2 groups there are also several very interesting and apparently new forms. Subsequently I have also received some other specimens of Caspian Crustacea preserved from an earlier time in the Zoological Museum of St. Petersburgh, and quite recently the rich collections of Caspian Crustacea in the possession of Dr. Grimm have been entrusted to me for investigation.

It is thus a very considerable bulk of Caspian Crustacea, that will lie before me, and I hope that a careful investigation of this vast material will prove to be of considerable interest, both in systematic and biological respects, and that several fundamental conclusions relating to the early history of the Caspian Sea may be hence derived. I think, however, it may be convenient to delay such a general discussion until the completion of the systematic investigation of the several groups. On this occasion I only wish quite briefly to indicate the general suggestions to which a preliminary examination of the specimens has led me, and which I hope subsequently to be enabled to support by more reliable facts.

The fauna of the Caspian Sea is, I believe, derived from 3 very different sources. One part is of true arctic origin, and constitutes the remnant of the primitive fauna prevailing at the early time, when a connexion between the Caspian Sea and the Polar Sea may have existed. Another part of the fauna is of a more southern character, and may have immigrated, at a much later period from the Black Sea and the Mediterranean; a direct connexion being supposed to have existed at that time. A third part of the fauna, finally, constitutes a number of true fresh-water forms, which have adapted themselves to living in somewhat brakish water, at the estuaries of the great rivers debouching in the Caspian Sea. The abyssal region of the Caspian Sea remains still, I believe, nearly quite unexplored. I am, however, much inclined to believe that, on a closer investigation, the great depths of that basin will be found to contain a peculiar abyssal fauna exhibiting a purely arctic character.

On entering upon an investigation of the carcinological fauna of the Caspian Sea, I have thought it right to treat of each group separately. The present part comprises only a single family of the Schizopoda, viz., the *Mysidæ*. It will be shortly succeeded by 2 other parts, the one treating of the *Cumacea*, the other of the *Amphipoda*, and perhaps subsequently a 4th part will be added, treating of the lower Crustacea, the *Entomostraca*.

MYSIDÆ.

As is well known, the *Mysidæ* form a family of the lower stalk-eyed Crustacea, and belong to the subdivision generally termed *Schizopoda*, on account of the legs being biramous, or provided with greatly developed exopodites acting as powerful swimming organs. Of higher stalk-eyed Crustacea only 2 species of the genus *Astacus* have hitherto, according to a kind communication by Mr. Herzenstein, been recorded from the Caspian Sea, viz., *Astacus leptodactylus* and *A. pachypus*, both being evidently fresh-

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water forms, which have adapted themselses to living in somewhat brakish water. A species of *Thelphusa* is besides found in the rivers debouching into the southern part of the Caspian Sea, but this form cannot properly be referred to the fauna of the Caspian Sea itself. Unlike these 3 forms, the *Mysidæ* are generally regarded as being of true marine origin, though some species are also occasionally met with in pure fresh water lakes, as first stated with regard to the *Mysis relicta* of Lovén. But, as indicated by the specific name, this species is believed to be left from a remote time, when the lakes were in connexion with the Ocean, and this view, set forth by Prof. Lovén, has been subsequently fully confirmed by a closer comparison with the marine form, *Mysis oculata* Fabr., abounding in the arctic Ocean. The *Mysis relicta* of Lovén is indeed quite certainly a depauperated descendent of that species, exhibiting, as it does, a very close resemblance to immature specimens of the former[1]). A similar descent from true marine forms may in all probability also be attributed to the other Mysidæ found to inhabit pure fresh water.

The Mysidæ of the Caspian Sea are as far as is yet known all comprised within the subfamily *Mysinæ*, as defined by Mr. Czerniavsky, and belong to 4 different genera, one of which is now for the first time established. Of the 8 species enumerated in the following pages, 4 are as yet not known beyond the Caspian Sea, whereas the other 4 are stated to be common also to the Black Sea. As above stated, most of the Caspian species have already been described by Mr. Czerniavsky in his valuable work, «Monographia Mysidarum imprimis Imperii Rossici». But, as these species are treated of in connexion with species from other parts of the Ocean, it is somewhat difficult at once to get a view of those occurring in the Caspian Sea. As moreover some of the species have been rather imperfectly described, and good habitus-figures are not at all given, I have thought it right to re-describe all the species, which I have had myself an opportunity of examining, and to give both habitus- and detail-figures of all. The descriptions are made as short and concise as possible, and are chiefly confined to the real distinctive characteristics, the oral parts being, as a rule, only treated of in one species of every genus, as there are generally no appreciable differences to be found in these parts in species belonging to one and the same genus. Good figures will on the whole make a minutely detailed description superfluous. To the descriptions are added short critical remarks on the validity of the species and its relation to other nearly allied species, as also information as to occurrence and distribution.

1) See G. O. Sars, Histoire naturelle des Crustacées d'eau douce de Norvège I. p. 40.

The disintegration of the genus *Mysis*, as formerly defined, into several distinct genera, according to the different structure of the antennal scales, the telson, and the pleopoda in the male, was first proposed by Mr. Czerniavsky in his above cited work. In a subsequent paper on the British Mysidæ, the Rev. Mr. Norman has adopted a similar subdivision of the genus, but in some cases he disagrees with Mr. Czerniavsky, as regards the limitation of the genera. Under these circumstances it would seem to be appropriate to give an exhaustive diagnosis also of the genera, to which the Caspian Mysidae ought to be referred.

It may be added, that I have had an opportunity of examining some of the type specimens of Czerniavsky, which were kindly sent to me from the Zoological Museum in St. Petersburgh for comparison and identification.

All the plates have been prepared by the autographic method, which the author has applied in several of his other works, and which I think may answer the purpose very well. The figures have in every case been originally drawn by the aid of the *camera lucida*, and their correctness is thus guaranteed.

Gen. 1. **Paramysis,** Czerniavsky, 1882.

Generic characters. — Form of body (Pl. I, fig. 1, Pl. II, fig. 1) rather robust. Carapace well-developed, and but slightly emarginated posteriorly, its lateral lobes completely obtecting the sides of the mesosome (see Pl. II, fig. I), cephalic part well defined by a conspicuous cervical sulcus, and having the anterior edge evenly curved in the middle, frontal spine (see Pl. I, fig. 2) large, uncovered. Eyes (ibid.) comparatively short and thick. Superior antennæ (Pl. I, fig. 3) of the usual structure, male appendage (see Pl. II, fig. 1 & 2) well-developed and densely hirsute. Inferior antennæ (Pl. I, fig. 4) having the basal part considerably produced at the exterior corner, scale very large, with the outer edge quite smooth and produced at the end to a strong spiniform projection, tip of the scale transversely truncated, with the inner corner not at all produced, and the apical segment nearly obsolete (see Pl. I, fig. 5). Anterior and posterior lips (Pl. I, figs. 6 & 10), as also the mandibles (figs. 7 & 9) of normal structure. First pair of maxillæ (Pl. II, fig. 3) with the exognath less rudimentary than usual, having in front several strong plumose setæ wanting in other Mysidæ. Second pair of maxillæ (Pl. II, fig. 4) with the terminal joint of the palp oblong oval in form and carrying along the outer edge strong, partly ciliated setæ, exognath of a somewhat unusual form, its outer edge being strongly curved so as to form a broadly rounded lobe, marginal setæ very unequal, the proximal ones being extremely strong and elongated. Maxillipeds (Pl. II, fig. 5) with the

basal lobe scarcely larger than the outer masticatory lobe, otherwise of quite normal structure. Gnathopoda (Pl. II, fig. 6) comparatively strongly built, with the terminal joint lamellar, and armed along the exterior edge with a row of strong denticulated spines, the outermost of which, representing the dactylus, is much the largest (see Pl. II, fig. 7). Pereiopoda (Pl. II, fig. 8) of uniform structure and rather robust, with the ischial and meral joints somewhat expanded, tarsal part divided into 4 articulations, dactylar joint very small, with the terminal claw slender and well defined from the joint. Outer sexual appendages of male (Pl. II, fig. 9) of moderate size, and slightly bilobular at the tip. Third pair of pleopoda in male (Pl. II, fig. 10) biramous, with the outer ramus shorter than the inner and simple conical in form, terminating in a slender spine. Fourth pair of pleopoda in male (Pl. II, fig. 11) having the outer ramus much elongated, forming a slender cylindrical stem divided into 6 articulations, and terminating in 2 somewhat unequal flagella, the inner of which is the shorter and biarticulate, outer part of both densely spinulose. Telson (Pl. I, figs. 11 & 12, Pl. II, figs 13 & 14) much elongated and strongly attenuated distally, lateral edges spinulose, tip slightly incised, the incision being bordered by only a few scattered spiniform projections, terminal lobes each tipped by a strong spine. Uropoda (see Pl. I, fig. 11) of normal structure, outer lamella much larger than the inner.

Remarks. — The present genus, established by Mr. Czerniavsky, is very nearly allied to the genera *Mesomysis* and *Austromysis* of the same author, though differing from both in a few particulars, for instance in the comparatively more fully developed carapace, the rather different shape of the antennal scales and of the telson, and finally, in the peculiar development of the exognath of the 2 pairs of maxillæ. Mr. Czerniavsky refers to this genus 3 species, viz., *P. Baeri*, *P. armata* and *P. Ullskyi*, but the last-named form is unquestionably, as will be shown farther down, not a *Paramysis*, but a true *Mesomysis*. As far as yet known, the genus is not represented beyond the Caspian Sea.

1. Paramysis Baeri, Czerniavsky.

(Pl. I & II).

Paramysis Baeri, Czerniavsky, Monographia Mysidarum imprimis Imperii Rossici, fasc. 2 p. 56, Pl. XXVII, Pl. XXVIII, figs 1—16, Pl. XXIX, figs 1—15.

Specific Characters. — Body (see Pl. I, fig. 1, Pl. II, fig. 1) rather strongly built, with the anterior division but little attenuated in front. Carapace nearly obtecting the whole mesosome, leaving only the dorsal part of last segment uncovered, lateral lobes even advancing somewhat beyond the mesosome (see Pl. II, fig. 1); cephalic part fully as broad as the 1st segment

of metasome, and having the anterior edge considerably curved in the middle. Frontal spine (see Pl. I, fig. 2) rather large and freely projecting between the insertion of the eyes. The latter (ibid.) comparatively short, scarcely projecting beyond the sides of the carapace, corneal part somewhat dilated and distinctly emarginated on the dorsal face. Superior antennæ with the peduncle (Pl. I, fig. 3) of the usual somewhat club-shaped form, its last joint being rather dilated, and provided along the inner edge and the tip with a dense series of strong plumose setæ, inner flagellum nearly 3 times as long as the peduncle and about half the length of the outer; male appendage (see Pl. II, fig. 2) not fully as long as the peduncle and of the usual structure. Inferior antennæ (Pl. I, fig. 4) having the basal part produced at the outer corner to a strong triangular projection: scale very large, nearly twice the length of the peduncle of the superior antennæ, and oblong sublinear in form, fully 3 times as long as it is broad, outer edge perfectly straight and produced at the end to a strong spiniform projection, inner edge slightly arcuate in its proximal part, tip narrowly truncated and carrying about 14 of the marginal setæ, apical segment indicated by a slight suture cutting off a small part of the scale at the inner corner (see Pl. I, fig. 5). Pereiopoda (Pl. II, fig. 8) with the meral joint shorter than the ischial one and exhibiting interiorly several fascicles of strong setæ, tarsal part about the length of the meral joint and having the 2 middle articulations the largest, last articulation rather small. Outer ramus of 3rd pair of pleopoda in male (Pl. II, fig. 10) scarcely more than half the length of the inner: 4th pair (Pl. II, fig. 11) reaching nearly to the tip of the telson, and having the exterior flagellum of the outer ramus about half as long as the stem. Telson (Pl. I, fig. 11, Pl. II, fig. 13) very much prolonged, considerably longer than the last segment of metasome, and gradually tapering distally, lateral edges nearly straight, and each armed with about 20 spinules, the outermost of which is far removed from the tip, apical incision (see Pl. I, fig. 12, Pl. II, fig. 14) very small, narrowly rounded at the bottom, and armed with a small number (from 3 to 7) of dentiform projections, terminal lobes narrow conical and scarcely diverging, apical spine much stronger than the lateral ones. Inner lamella of uropoda (Pl. II, fig. 12) reaching but little beyond the telson, its base not very much tumefied and having the otolith comparatively small, inner edge armed, below the marginal setæ, with about 10 slender spines, the outer 2 of which are placed at some distance from the others. Dorsal face of body ornamented (see Pl. I, fig. 1, Pl. II, fig. 1) with dendritic ramifications, issuing from a number of pigmentary centres placed in the usual manner. Length of adult female (including the antennal scales and caudal appendages) reaching 26 mm; that of male somewhat less.

Remarks. — This form has been rather minutely described by Mr. Czerniavsky, but the peculiar development of the exognath of the 2 pairs of maxillæ would seem wholly to have escaped his attention. It is a very magnificent species, and easily recognizable from most of its allies, both by its comparatively large size and by the shape of the antennal scales and of the telson. Besides the typical form, Mr. Czerniavsky speaks of a variety „*littoralis*", observed in a single immature specimen, which, according to that author, distinguished itself by a somewhat larger cornea, and by the telson being less prolonged and attenuated, and having moreover the apical incision extremely shallow.

Occurrence. — The species has been observed in several places of the Caspian Sea. Mr. Czerniavsky quotes the following localities: Northern part of the Caspian Sea (Ullsky), Mangischlak (Ullsky), southern part of the Caspian Sea (Ullsky), the harbour of Astara (Goebel), the promontory of Zelenyi Bugor (Goebel), and for the variety, *littoralis*, Petrowsk or Baku (Goebel). — The species was also represented in the collection of Warpachowsky by a few beautifully preserved specimens, which occurred at Stat. 15 off the Tschistyi-Bank, lying at some distance south of the estuary of the Wolga.

2. **Paramysis armata**, Czerniavsky.

Paramysis armata, Czerniavsky, l. c. fasc. 2, p. 63, Pl. XXIX, figs 16—25.

Remarks. — I have only seen a fragment of this form, comprising the anterior part of the carapace with the eyes and antennæ, which was contained in the type collection of Caspian Mysidæ arranged by Mr. Czerniavsky. To judge from this fragment, the present species is very nearly allied to *P. Baeri*, scarcely differing except in the eyes being comparatively smaller, and having the corneal part far less expanded.

Occurrence. — According to Mr. Czerniavsky, a single female specimen of this form was collected by Lieutenant Ullsky of Mangischlak.

Gen. 2. **Mesomys**, Czerniavsky, 1882.

Generic Characters. — Form of body (see Pl. III, IV, V & VI, fig. 1) more or less slender. Carapace deeply emarginated posteriorly, and but imperfectly covering the posterior part of the mesosome, anterior edge not angularly produced in the middle; frontal spine uncovered. Eyes (see Pl. IV, V, VI, fig. 2) large, pyriform. Superior antennæ (Pl. III, fig. 2) of the usual structure. Inferior antennæ (Pl. III, IV, V, VI, fig. 3) less strongly produced at the outer corner of the basal part than in *Paramysis*, scale of moderate

size, with the outer edge smooth and produced at the end to a dentiform projection, tip more or less obliquely truncated, with the inner corner projecting beyond the spine of the outer, and having a small apical segment cut off by a transverse suture. Anterior and posterior lips, as also the mandibles (Pl. III, figs 5, 6) of the usual structure. First pair of maxillæ (Pl. III, fig. 7) with the exognate quite rudimentary, forming only a slight lamellar ridge finely ciliated on the edge, but without any trace of setæ. Second pair of maxillæ (Pl. III, fig. 8, Pl. IV, V, VI, fig. 5) with the terminal joint of the palp oval in form, and edged exteriorly by strong ciliated setae, exognath comparatively small and triangular in form, its outer edge but slightly curved, marginal setæ rather short and uniform in size. Maxillipeds (Pl. III, fig. 9) with the basal lobe rather large, outer masticatory lobe well-developed, though scarcely as large as the basal one. Gnathopoda (Pl. III, fig. 10) comparatively less robust than in *Paramysis*, otherwise of much the same structure. Pereiopoda (Pl. III, fig. 11, Pl. IV, V, VI, fig. 6) likewise rather similar to those in the said genus, though comparatively less robust, with the ischial and meral joints less expanded, tarsal part quadriarticulate, with the 1st articulation very short and obliquely truncated at the tip, dactylar joint small, with the terminal claw well defined from the joint and very slender (see Pl. III, fig. 12, Pl. V, VI, fig. 7). Outer sexual appendages of male as also the pleopoda (Pl. IV, figs 11, 12, Pl. V, VI, figs 12, 13) of a similar structure as in *Paramysis*. Telson (Pl. III, fig. 14, Pl. IV, fig. 7, Pl. V, VI, fig. 8) of moderate size, oblong quadrangular in form, and somewhat tapering distally, lateral edges densely spinulose, apical sinus very shallow or quite obsolete, its edge bordered by a dense series of spiniform projections, arranged in a regular comb-like manner. Uropoda of the usual structure.

Remarks. — This genus was characterised by Mr. Czerniavsky as being intermediate between *Mysis* s. str. and *Paramysis*. It comes, however, in fact still nearer to the genus *Austromysis* of the same author, the type of which is *M. Helleri* G. O. Sars. The latter genus was not adopted by the Rev. Mr. Norman, who referred its species to his genus *Schistomysis*, founded upon some of the species referred by Mr. Czerniavsky to his genus *Synmysis*. I fully agree with Mr. Norman, that the 3 species *M. spiritus*. *M. ornata* and *M. assimilis* cannot properly be placed in the same genus with *M. flexuosa* and *M. neglecta*, which, according to that author, belong to the genus *Macromysis* of White. On the other hand, I think that the genus *Austromysis* of Czerniavsky may be retained in the sense of that author, including probably also the British species *M. Parkeri*. From the last named genus the present one is chiefly distinguished by the less obliquely truncated

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antennal scales, the uniform structure of the pereiopoda, and by the very shallow apical sinus of the telson, and its peculiar comb-like armature. Mr. Czerniavsky refers to this genus 5 species, one of which, *M. Kröyeri*, should, however, perhaps more properly be placed within the genus *Austromysis*, whereas another form described by that author as a *Paramysis*, must find its place in the present genus. As far as yet known, the genus is not represented beyond the Caspian and Black Seas, one of the species, *M. lacustris*, having, however, been found in a lake among the mountains of Caucasus. In the Caspian Sea the genus is represented by 5 species, one of which is now for the first time established.

2. **Mesomysis Ullskyi** (Czerniavsky).

(Pl. III).

Paramysis Ullskyi [1]) Czerniavsky, l. c., fasc. 2. p. 65, Pl. XXVI, figs 13—23.

Specific Characters. — Body (see Pl. III, fig. 1) very slender and elongated, with the anterior division rather attenuated in front, and scarcely longer than the 4 anterior segments of metasome combined. Carapace deeply emarginated posteriorly, leaving the dorsal part of the last 2 segments of mesosome uncovered, cephalic part scarcely as broad as the 1st segment of metasome, and having the anterior edge nearly straight; frontal spine large, uncovered. Metasome very elongated, and gradually tapering posteriorly. Eyes of moderate size, projecting somewhat beyond the sides of the carapace, corneal part rather expanded and distinctly emarginated on the dorsal face. Peduncles of the superior antennæ (fig. 2) conspicuously club-shaped, the last joint being considerably dilated and having at the inner corner about 10 strong plumose setæ. Antennal scales (see fig. 3) of middle size, exceeding the peduncles of the superior antennæ by about $^1/_4$ of their length, form oblong linear, the breadth equalling $^1/_3$ of the length, terminal part projecting beyond the outer corner occupying about $^1/_7$ of the length of the scale, apical segment well defined, bearing 5 of the marginal setæ (see fig. 4). Pereiopoda (fig. 11) moderately slender, with the meral joint a little shorter than the ischial one, tarsal part somewhat longer than the former, with the 1st joint much shorter than the other 3, which are nearly equal-sized, dactylar joint (see fig. 12) very small, with the terminal claw nearly setiform. Telson (fig. 14) comparatively large, exceeding somewhat in length the last segment of metasome, and gradually tapering distally, lateral edges nearly straight, and armed each with from 18 to 22 spinules, the outermost of which is some-

1) It may be noted, that this species in other parts of the work has been termed *Paramysis Strauchi*, and that the type specimens are labelled in accordance therewith.

what remote from the tip, apical sinus (see fig. 15) rather shallow, though well-defined, and bordered by about 24 regular dentiform projections acute at the tip, terminal lobes slightly diverging, and each tipped by a rather strong spine. Inner lamella of the uropoda (fig. 13) moderately tumefied at the base, with the otolith well-developed; inner edge armed, below the marginal setæ, with about 9 spines, the outermost of which is placed at some distance from the others, not far from the tip. Body without any distinct dendritic ramifications, but having along the back the usual pigmentary centres. Length of adult female reaching 21 mm.

Remarks. — As above stated, this form was referred by Mr. Czerniavsky to his genus *Paramysis*. This is evidently quite erroneous, for it is in all characteristics a true *Mesomysis*, as seen both from the above description and the appended figures. In order to decide the question with full certainty, I have felt justified to dissect one of the type specimens in the collection of Czerniavsky. From the other species belonging to the present genus, this form may at once be distinguished by its unusually slender and elongated body, and the comparatively large telson. Besides the typical form, Mr. Czerniavsky also records a variety „*forma occidentalis*", which, however, most probably is only founded upon an immature specimen of the typical form.

Occurrence. — According to Mr. Czerniavsky, 4 adult female specimens of this form were collected by Lieutenant Ullsky in the mouth of the Wolga, and thus probably in nearly pure fresh water. Another specimen was, according to the same author, captured in the northern part of the Caspian Sea, and a third immature specimen, that upon which the variety „*occidentalis*" was founded, was apparently from Petrowsk or Baku. In the collection of Warpachowsky this species was not represented. Except in the Caspian Sea it has not yet been recorded.

3. **Mesomysis Kowalevskyi**, Czern.

(Pl. IV).

Mesomysis Kowalevskyi, Czerniavsky, l. c. fasc. 2, p. 50, Pl. XXI, Pl. XXII, figs 1—13.

Specific Characters. — Body (Pl. IV, fig. 1) not nearly so slender as in the preceding species, and having the metasome much less prolonged. Carapace evenly emarginated posteriorly, cephalic part fully as broad as the 1st segment of metasome, its anterior edge (see fig. 2) somewhat arched in the middle, without, however, obtecting the frontal spine, which projects freely beyond the edge. Eyes (ibid.) rather large, pyriform, projecting somewhat beyond the sides of the carapace, corneal part well-developed, and, as usual, emarginated on the dorsal face. Antennal scales (fig. 3) resembling in shape

those in the preceding species, though being perhaps a little smaller and somewhat more obliquely truncated at the tip, terminal part (fig. 4) in front of the outer corner occupying about $^1/_6$ of the length of the scale, apical segment well-defined. Pereiopoda (fig. 6) of a similar structure as in *M. Ullskyi*, but having the meral joint comparatively shorter, and the tarsal part much longer than the latter. Outer ramus of the 3rd pair of pleopoda in male (fig. 11) exceeding half the length of the inner; 4th pair (figs. 10 and 12) reaching beyond the tip of the telson, and having the exterior flagellum nearly of same length as the stem of the ramus. Telson (fig. 7) scarcely longer than the last segment of metasome, and having the outer part slightly attenuated, lateral edges somewhat flexuous and armed each with from 18 to 20 spinules, the outermost of which is not far remote from the tip, apical sinus (see fig. 9) well-defined, though not very deep, and bordered with about 22 regular dentiform projections, terminal lobes, as usual, tipped by a somewhat larger spine. Inner lamella of the uropoda (fig. 8) moderately tumefied at the base, with the otolith rather large, inner edge armed, below the marginal setæ, with about 9 slender spines, the outer 2 of which are placed at some distance from the others. Body everywhere ornamented with finely dendritic ramifications issuing from a dorsal row of pigmentary centres, arranged in the usual manner. Length of adult female reaching 18 mm.

Remarks. — Although I have not had an opportunity of examining the type specimens of Czerniavsky, which were wanting in the collection sent to me, I cannot doubt that the above described species is that so named by the said author, as it agrees rather well with his description and figures. It is easily distinguishable from the preceding species by its much shorter and stouter form of body, and the richly dendritic pigmentary ornament of the dorsal face, as also by the comparatively shorter telson.

Occurrence. — Three specimens of this form, 2 females and 1 male, were contained in the collection of Warpachowsky, and occurred at Stat. 28, north of the peninsula Mangischlak[1]). To judge from their size, they would seem to belong to the „*varietas major*" of Czerniavsky, which has not yet been recorded from the Caspian Sea. — According to Mr. Czerniavsky, numerous specimens of the smaller form (forma typica) were collected by Prof. Kowalevsky at Petrowsk or Baku, close to the shores.

Distribution. — According to Mr. Czerniavsky, the larger form of this species (var. major) has been recorded from 2 different localities of the

1) In a subsequent collection by the same naturalist this species was rather abundantly represented in 2 other places, viz., at Stat. 49, between the island of Kulaly and that of Morskoj, and 52, at the northern extremity of the island Swjatoj.

Black Sea, viz., Odessa and Oczakow, being in the first-named place extracted from the ventricle of Perca fluviatilis, together with M. *intermedia*.

4. Mesomysis Czerniavskyi, G. O. Sars, n. sp.

(Pl. V.)

Specific Characters. — Very like the last species, though perhaps a little more slender in form (see Pl. V, fig. 1). Carapace having the cephalic part scarcely narrower that the 1st segment of metasome, its anterior edge evenly curved in the middle, frontal spine uncovered. Eyes (see fig. 2) pyriform, reaching somewhat beyond the sides of the carapace, corneal part well-developed and distinctly emarginated on the dorsal face. Antennal scales (see fig. 3) exceeding the peduncles of the superior antennæ by about $^1/_3$ of their length, and oblong linear in form, but very little attenuated distally, terminal part in front of the outer corner (fig. 4) occupying about $^1/_7$ of the length of the scale, apical segment well-defined. Pereiopoda (fig. 6) and pleopoda (figs. 12, 13) in both sexes of much the same structure as in *M. Kowalevskyi*. Telson (fig. 8) scarcely longer than the last segment of metasome, and about twice as long as it is broad at the base, outer part somewhat attenuated, lateral edges but very slightly flexuous, and armed each with about 18 spinules, apical sinus (see fig. 9) extremely shallow, nearly obsolete, its edge bordered with 16—18 regular dentiform projections, spines of the outher corners not very strong. Inner lamella of the uropoda (fig. 10) not much tumefied at the base, and having the otolith very small, inner edge armed, below the marginal setæ, with about 7 spines, the 3 outer ones being somewhat wider apart than the 4 inner. Body without any distinct dendritic ramifications, though having the usual dorsal pigmentary centres. Length of adult female reaching 18 mm.

Remarks. — The present new species, which I have named in honour of the distinguished Russian naturalist Mr. Czerniavsky, is very nearly allied to *M. Kowalevskyi*, though apparently distinct, differing, as it does, rather conspicuously in the want of the rich dendritic ramifications ornamenting the body of the former species, and also by the apical sinus of the telson being so very shallow as nearly to be obsolete.

Occurrence. — Some specimens, females and males, of this form were contained in the collection of Warpachowsky, and occurred at Stat. 27, lying at the southern point of the Island of Kulaly, north of the peninsula Mangischlak.

5. Mesomysis intermedia, Czern.

(Pl. VI).

Mesomysis intermedia. Czerniavsky, l. c. fasc. 2, p. 52, Pl. XXII, figs. 14—20, Pl. XXIII, figs. 1—15.

Specific Characters. — Form of body (see Pl. VI, fig. 1) nearly as in *M. Czerniavskyi.* Carapace having the cephalic part about as broad as the 1st segment of metasome, anterior edge evenly arched in the middle, frontal spine uncovered (see fig. 2). Eyes (ibid.) of the usual pyriform shape and projecting laterally somewhat beyond the sides of the carapace, corneal part, as seen from above, reniform in shape. Antennal scales (see fig. 3) exceeding the peduncles of the superior antennæ by considerably more than $^1/_3$ of their length, and oblong rhomboidal in form, the apex being rather obliquely truncated, with the terminal part in front of the outer corner (see fig. 4) occupying more than $^1/_4$ of the length of the scale, apical segment well defined. Pereiopoda (fig. 6) rather slender, with the ischial and meral joints comparatively less dilated than in the other species, tarsal part scarcely longer than the meral joint, dactylar joint (fig. 7) of the usual structure. Pleopoda (fig. 12, 13) scarcely differing from those in the other species, except that the outer ramus of the 3rd pair in male (fig. 12) appears somewhat smaller, scarcely exceeding half the length of the inner. Telson (fig. 8) about the length of the last segment of metasome, and rather attenuated distally, lateral edges nearly straight, and armed each with from 16 to 19 spinules, the outmost of which is not far remote from the tip, apical sinus (see fig. 9) quite obsolete, the terminal edge being transversely truncated and bordered with a regular series of 14 acute dentiform projections, spines of the outer corners not very strong. Inner lamella of the uropoda (fig. 10) considerably tumefied at the base, with the otolith very large, inner edge armed, below the marginal setæ, with 4 spines only, the outmost of which is rather remote from the apex. Body without any distinct dendritic ramifications, though having the usual dorsal pigmentary centres. Length of adult female scarcely exceeding 12 mm.

Remarks. — The present species has been rather imperfectly described and figured by Mr. Czerniavsky, and as I moreover have not had an opportunity of examining his type specimens, I should have been in considerable doubt about the identity of the species here described, if there were not a single very prominent feature, in which both forms would seem perfectly to agree, viz., the peculiar want of any true apical sinus on the telson, its apex being transversely truncated, though exhibiting the usual comblike armature of the edge. Besides this characteristic, the present species is easily distinguishable from the 3 preceding ones by the much more obliquely trun-

cated antennal scales, and by the comparatively more slender pereiopoda. It is also of rather inferior size. Mr. Czerniavsky records also of this species 2 forms or varieties; the one, *„forma typica"* is said to have the apical sinus of the telson very shallow or scarcely distinct, the other, *„forma truncata"*, to have the telson nearly transversely truncated at the tip. In the figures, however, the telson is everywhere represented as quite transversely truncated, without any trace of an insinuation of the apical edge.

Occurrence. — A few specimens, males and females, of this species were contained in the collection of Mr. Warpachowsky, and occurred at Stat. 15, together with *Paramysis Baeri*. According to Mr. Czerniavsky, 5 specimens of the typical form were collected by Prof. Kowalevsky at Petrowsk (?).

Distribution. — Black Sea: a single specimen of the *„forma truncata"*, extracted from the ventricle of a *Perca fluviatilis*, caught at Odessa (Czerniavsky).

6. **Mesomysis aberrans**, Czern.

Mesomysis aberrans, Czerniavsky, l. c. fasc. 2, p. 54, Pl. XXIII, figs. 16—21.

Remarks. — I have not myself had an opportunity of examining this form, but it may be here mentioned, as it is stated to occur in the Caspian Sea. To judge from the description and figures given by Mr. Czerniavsky, this species is very nearly allied to *M. intermedia*, differing, however, by the anterior edge of the carapace being so much produced in the middle as to nearly quite obtect the frontal spine, and by the apical edge of the telson being not transversely truncated but even somewhat convex, though armed in the usual manner.

Occurrence. — The specimens examined by Mr. Czerniavsky, were collected by Prof. Kowalevsky at Petrowsk (?).

Gen. 3. **Katamysis**, G. O. Sars, n.

Generic Characters. — Form of body (see Pl. VII, figs 1 and 21) short and stout. Carapace imperfectly obtecting the posterior part of mesosome, and having the cephalic part rather short, with the anterior edge angularly produced in the middle; frontal spine present. Eyes (see fig. 2) scarcely expanded distally. Superior antennæ (fig. 3) of the usual structure, male appendage very large and densely hirsute (see fig. 21). Inferior antennæ (fig. 4) with the basal part scarcely at all produced at the outer corner, scale very short, rhomboidal in form, with the outer edge smooth and terminating in a dentiform projection, inner corner much produced and exhibiting a distinct apical segment (fig. 5). Anterior lip (fig. 6) armed in front

with a strong spiniform projection; posterior lip (fig. 7) of the usual shape. Mandibles (fig. 8 & 9) comparatively large, with the palp well-developed and edged with ciliated setae. First pair of maxillæ (fig. 10) having the masticatory lobe very narrow and attenuated, exognath forming only a small laminar expansion ciliated at the edge. Second pair of maxillæ (fig. 11) with the terminal joint of the palp oval in form, and having only a very restricted number of setæ on the outer edge, exognath not very large, and triangular in form, with comparatively few marginal setæ. Maxillipeds (fig. 12) with the basal and masticatory lobes well-developed. Gnathopoda (fig. 13) extremely robust, with the joints very much dilated, the meral and tarsal ones being much the largest, terminal joint (fig. 14) scarcely lamellar, and having at the tip several very strong and claw-like spines. Pereiopoda short and stout, the 2 anterior pairs (fig. 15) with the tarsal part well defined, and composed of 3 articulations; the 4 posterior pairs (fig. 17) having the tarsal part quite rudimentary, and armed with strong, claw-like, incurved spines, dactylar joint in the former (fig. 16) normal, in the latter (fig. 18) nearly obsolete. Pleopoda of male (fig. 22, 23) modified in a similar manner as in the 2 preceding genera. Telson (fig. 20) not very large, and triangular in form, tapering to an obtuse point bearing 2 strong spines, lateral edges spinulose. Uropoda (fig. 19) with the inner lamella but little shorter than the outer.

Remarks. — The present new genus is chiefly distinguished by the very remarkable reduction of the terminal part in the 4 posterior pairs of pereiopoda, which thereby look as if they were mutilated. The structure of the antennal scales somewhat resembles that in the genus *Austromysis*, but the telson is constructed upon a totally different type, not being incised posteriorly, but terminating in an obtuse point. Also in the structure of the oral parts and that of the gnathopoda, the genus exhibits several well-marked differences from its nearest allies. The genus is as yet only represented by a single species, to be described below.

7 Katamysis Warpachowskyi, G. O. Sars, n. sp.

(Pl. VII.)

Specific Characters. — Body (see Pl. VII, fig. 1 and 21) of rather robust form, and having the anterior division somewhat tumefied. Carapace deeply emarginated posteriorly, leaving the dorsal part of the last 2 segments of mesosome quite uncovered, cephalic part fully as broad as the 1st segment of metasome, and having the anterior edge (see fig. 2) rather produced in the middle, forming a distinct, nearly right angle, which, however, does not quite obtect the frontal spine. Metasome not much prolonged, and rather

attenuated distally, with its last segment, as usual, the longest. Eyes (see fig. 2) not very large, and but little projecting laterally beyond the sides of the carapace, form nearly cylindrical, the corneal part being scarcely at all expanded and but very slightly emarginated on the dorsal face. Superior antennæ with the last joint of the peduncle (fig. 3) having only a few ciliated setæ at the inner corner, male appendage (see fig. 21) fully as long as the peduncle. Inferior antennæ (fig. 4) with the basal part rather thick, and forming at the outer corner only a very slight obtuse expansion, scale but very little exceeding the peduncle of the superior antennæ, form pronounced rhomboidal, the outer part in front of the exterior corner occupying nearly half the length of the scale, apical segment (fig. 5) very distinct and bearing 5 of the marginal setæ. Gnathopoda (see fig. 14) having at the tip 5 spines, the 3 outer of which are not ciliated and claw-like, the 2 inner ones ciliated in the middle and terminating in a setiform lash. The 2 anterior pairs of pereiopoda (fig. 15) having the ischial and meral joints rather expanded and nearly of equal length, the latter edged interiorly with several short spines in addition to the setæ, tarsal part much shorter than the meral joint, with the 1st articulation rather broad and armed interiorly with several strong spines, dactylar joint (see fig. 16) small, with the terminal claw well defined from the joint and setiform. The 4 posterior pairs of pereiopoda (fig. 17) having the meral joint strongly incurved, forming a genicular bend with the ischial one, tarsal part represented by a single very short and thick articulation firmly connected with the meral joint, and having in front 4 strong claw-like spines disposed in pairs (see fig. 18), dactylar joint forming only a very minute and pellucid lobe, mostly hidden between the spines and setæ issuing from the tarsal joint. Third pair of pleopoda in male (fig. 22) having the outer ramus a little longer than the inner; outer ramus of 4th pair (fig. 23) reaching beyond the tip of the telson, outer flagellum nearly twice the length of the inner. Telson (fig. 20) much shorter than the last segment of metasome, and not nearly twice as long as it is broad at the base, outer part considerably tapering, lateral edges nearly straight and converging, being each armed with about 12 spinules, of which the 3 proximal ones are somewhat larger than the 4 or 5 succeeding ones, which are placed somewhat more apart, the outer 4 spinules on each side successively increasing in length distally, apical spines much stronger than the others, and having between them a very small dentiform projection, which sometimes is minutely bidentate at the tip (see fig. 24). Inner lamella of the uropoda (see fig. 19) considerably projecting beyond the telson, and moderately tumefied at the base, with the otolith of middle size, inner edge armed, below the marginal setæ, in its whole length, with about 13 spines, successively

increasing in length, the outmost issuing from the tip itself. Body exhibiting dorsally the usual row of pigmentary centres, which only show a slight attempt to a dendritic ramification. Length of adult female 8 mm.

Remarks. — The present peculiar Mysidian, which I have much pleasure in dedicating to its discoverer, Mr. Warpachowsky, cannot be confounded with any of the other known forms. In its outer appearance it bears a certain resemblance to some of the species of the genus *Mysidopsis*, for example *Mysidopsis didelphys*, and the telson is also of a rather similar aspect to that of the said species; but the rhomboidal shape of the antennal scales at once distinguishes this form from any of the species of *Mysidopsis*. The peculiar, as it were, mutilated appearance of the posterior pairs of pereiopoda may also, without dissection, be easily observed.

Occurrence. — Of this form 4 specimens were contained in the collection of Warpachowsky. They occurred at Stat. 27, together with *Mesomysis Czerniavskyi* and *Limnomysis Benedeni* [1]).

Gen. 4. **Limnomysis,** Czern., 1882.

Generic Characters. — Form of body (see Pl. VIII, figs. 1 and 18) comparatively slender. Carapace imperfectly obtecting the posterior part of mesosome, cephalic part well-defined, and having the infero-lateral corners acutely produced and the anterior edge considerably arched in the middle, frontal spine wanting. Eyes (see fig. 2) elongate and narrow, and separated in the middle by a rather wide interval. Superior antennæ with the peduncle (fig. 3) but little dilated at the tip, male appendage (figs. 19, 20) small and simple of structure, not hirsute, but only finely ciliated. Inferior antennæ (figs. 4 and 21) with the basal part considerably produced at the outer corner, scale narrow lanceolate, bearing on both edges strong ciliated setæ, apical segment rather large and peculiarly modified in the male (see fig. 21, 21*). Anterior and posterior lips (figs. 5, 7) of the usual structure. Mandibles (fig. 6) of moderate size, palp having the terminal joint comparatively short. First pair of maxillæ (fig. 8) of normal structure; 2nd pair (fig. 9) having the terminal joint of the palp oblong oval in form, with the outer edge minutely serrated and setiferous, exognath comparatively large, oblong triangular in form, with numerous rather short marginal setæ. Maxillipeds (fig. 10) with the basal lobe unusually large, masticatory lobes, on the other hand, very small. Gnathopoda (fig. 11) rather slender, with the terminal joint (fig. 12) lamellar, and edged roundabout with numerous slender spines, each terminating in a setiform lash. Pereio-

1) Some additional specimens of this Mysidian were contained in a subsequent collection, and occurred at Stat. 52.

poda (fig. 13) of uniform structure and comparatively slender, with the ischial and meral joints but little expanded, tarsal part divided into 3 articulations, the 1st of which is much the largest, dactylar joint (see fig. 14) having the terminal claw rather strong and not defined from the joint. Outer sexual appendages of male (fig. 22) comparatively small. Third pair of pleopoda in male (fig. 23) simple, not biramous, but having the proximal part considerably tumefied; 4th pair (fig. 24) distinctly biramous, inner ramus of the usual structure, outer one not much prolonged, and forming a somewhat irregular stem, not being divided into any articulations, and terminating in a single spiniform flagellum, smooth at the edges. Telson (fig. 16) not very large, with the outer part considerably attenuated, lateral edges spinulose, tip insinuated in the middle, the sinus (fig. 17) being bordered with a number of small dentiform projections, terminal lobes each armed with a strong apical spine. Uropoda (fig. 15) with the inner lamella much shorter than the outer and considerably tumefied at the base.

Remarks. — The present genus, established by Mr. Czerniavsky, is nearly allied to the genus *Diamysis* of the same author, the type of which is *Mysis bahirensis* G. O. Sars. It distinguishes itself, however, by the more slender form of the body, the much fuller development of the apical segment of the antennal scales and the peculiar modification of this segment in the male, moreover by a somewhat different form and armature of the terminal joint of the palp in the 2nd pair of maxillæ, as also by the uniform structure of the pereiopoda and the structure of their dactylar joint, and finally, by the somewhat different structure of the 4th pair of pleopoda in the male. The 3 genera *Potamomysis*, *Euxinomysis* and *Onychomysis* of the same author, would likewise seem to come rather near to the present one, though being apparently distinct. Mr. Czerniavsky refers to this genus 3 species, viz., *L. Brandtii*, *L. Benedeni*, and *L. Schmankewiczi*, the last 2 of which, however, are only founded upon the 2 sexes of one and the same species, that described below, whereas the first named would seem to be distinct. The genus has not yet been known from the Caspian Sea.

8. **Limnomysis Benedeni**, Czern.

(Pl. VIII).

Limnomysis Benedeni, Czerniavsky, l. c. fasc. 1, p. 124, Pl. X, figs. 13—24, Pl. XI.

Syn.: Limnomysis Schmankewiczi, Czern. (male).

» Mysis relicta, var. pontica, Grebnitzki (according to Czern.)

Specific Characters. — Body (see Pl. VIII, figs 1 & 18) slender and elegant in form, with the anterior division but little tumefied, and the posterior one evenly attenuated. Carapace deeply emarginated posteriorly, leav-

ing the dorsal part of the last 2 segments of mesosome quite uncovered, lateral lobes not even obtecting the sides of the last segment (see fig. 18), cephalic part about as broad as the 1st segment of metasome, and having the infero-lateral corners produced to acute anteriorly curving projections, rather conspicuous also in the dorsal view of the animal (see fig. 1 & 2), anterior edge considerably produced in the middle, though evenly rounded at the tip. Eyes (see fig. 2) rather narrow, nearly cylindrical in form, and considerably projecting laterally beyond the sides of the carapace, corneal part but slightly expanded, and occupying dorsally only $^1/_3$ of the length of the eye, its inner edge nearly straight. Superior antennæ with the peduncle (fig. 3) but little longer than the eyes, last joint having in female only a single plumose seta at the inner corner, the latter being in male (see fig. 19) produced to a narrow digitiform process, male appendage (fig. 20) scarcely more than half the length of the peduncle and very narrow. Inferior antennæ (figs. 4 & 21) with the outer corner of the basal part produced to a very strong anteriorly curving spiniform projection, scale in female (fig. 4) about twice the length of the peduncle of the superior antennæ, and regularly lanceolate in form, about 4 times as long as it is broad, with the inner edge somewhat arched in its proximal part, apical segment occupying about $^1/_4$ of the length of the scale and bearing 12 of the marginal setæ, 3 issuing from the tip; apical segment in male (see fig. 21) freely movable upon the remaining part of the scale, by the aid of a strong muscle quite wanting in female, its tip (fig. 21) produced to a spiniform or nearly hook-shaped point curved downwards. Gnathopoda (fig. 11) with the basal part very large and fringed interiorly with strong plumose setae, apical spines (see fig. 12) about 13 in number, all of same appearance, though the median one (the dactylus) appears a little stronger than the others. Pereiopoda (fig. 13) with the ischial and meral joints nearly equal-sized, and having on the inner edge numerous fascicles of slender setæ, tarsal part about same length, with the 1st joint somewhat longer than the other 2 combined, 3rd joint (see fig. 14) forming at the end interiorly a slight nodular projection armed with 2 short spines, dactylar joint (ibid.) very small and having at the base of the terminal claw 2 somewhat unequal spines. Outer sexual appendages of male (fig. 22) distinctly bilobular at the tip, the anterior lobe more projecting and fringed with long stiff bristles. Fourth pair of pleopoda in male (fig. 24) reaching scarcely to the end of the last segment of metasome, basal part produced at the outer corner to a triangular projection, outer ramus somewhat irregularly twisted, having the inner edge biangular on the middle and armed, at the base of the flagellar part, with a small hooked projection. Telson (fig. 16) much shorter than the last segment of metasome, and rather broad

at the base, its outer part being abruptly constricted and slightly attenuated distally, lateral edges somewhat concaved, and armed each with about 10 spinules, the 6 proximal ones being separated by a longer interval from the three or four outer ones, which are placed somewhat more apart, apical sinus (see fig. 17) rather shallow and rounded at the bottom, its edge exhibiting about 5 dentiform projections, terminal lobes scarcely diverging and tipped each with a rather strong spine. Inner lamella of the uropoda (fig. 15) considerably projecting beyond the telson, and having its basal part very much tumefied, with the otolith rather large, inner edge armed, below the marginal setæ, with only a single spine, which has its place just behind the auditory apparatus. Body without any distinct pigmentary ornament, the usual dorsal pigmentary centres being even quite wanting, with the exception of a single somewhat ramified pigmentary spot located on the basal part of the telson. Length of adult female 10 mm.

Remarks. — The very peculiar sexual difference in the structure of the antennal scales in this form has misled Mr. Czerniavsky to describe the 2 sexes as 2 different species. For his *L. Schmankewiczi* is without any doubt only the male of his *L. Benedeni*. From *L. Brandti* the present species would seem to differ by a somewhat different shape of the antennal scales, but otherwise both forms seem to be very nearly allied, and their specific difference may thus perhaps be questioned. M. Czerniavsky records of his species *L. Benedeni* 3 forms or varieties, viz., *forma aestuarica*, *f. intermedia*, and *f. similis*, chiefly distinguished only by small differences in the form and armature of the apical sinus of the telson. The form here described would seem to agree most nearly with the *forma aestuarica*, which may be regarded as the typical form.

Occurrence. — Several specimens of this species were contained in the collection of Warpachowsky, and occurred in 3 different stations, viz., St. 15, 27 and 28. In the 2 first-named Stations, however, only solitary specimens were collected, whereas in Stat. 28 the species would seem to have occurred rather plentifully [1]).

Distribution. — Black Sea. According to Mr. Czerniavsky a few specimens of the typical form (aestuarica) were collected by Mr. Grebnitzki at the mouth of the river Dniester, and were recorded by that author as *Mysis relicta*, var. *pontica;* the 2 other varieties were collected by Prof. Mecznicow at Liman Berezan (near Oczakow).

1) This form was also abundantly represented in a subsequent collection, and occurred in 4 different Stations, viz., St. 49, 50 (off Tschistyi Bank), 51 (at the island of Kulaly), 52.

Explanation of the Plates.

Pl. I.

Paramysis Baeri, Czern.

Fig. 1. Adult female, viewed from the dorsal face.
» 2. Front part of the body, with the eyes, superior antennæ (with the bases of the flagella) and right antennal scale, somewhat more strongly magnified; dorsal view.
» 3. Peduncle of the right superior antenna, with the bases of the flagella; viewed from above.
» 4. Basal part of the left inferior antenna, with the scale (without the marginal setae) and the base of the flagellum; dorsal view.
» 5. Outer part of the scale, more strongly magnified, showing the rudimentary apical segment at the inner corner.
» 6. Anterior lip, viewed from below.
» 7. Mandibles, anterior and posterior lips *in situ*, ventral view.
» 8. Mandibular palp, somewhat more strongly magnified.
» 9. Masticatory parts of the mandibles.
» 10. Posterior lip.
» 11. Extremity of the tail, with the telson and the right uropod (without the marginal setæ); dorsal view.
» 12. Tip of the telson, more highly magnified.

Pl. II.

Paramysis Baeri, Czern.

(Continued).

Fig. 1. Adult male, viewed from left side.
» 2. Peduncle of left superior antenna in male, viewed from below, exhibiting the male appendage, the hairs of which have been removed in order to show the band-like insertion of the latter.
» 3. First maxilla.
» 4. Second maxilla.
» 5. Maxilliped with exopodite and epipodite.
» 6. Gnathopod.
» 7. Terminal joint of the latter, more highly magnified.
» 8. Pereiopod of 2nd pair.
» 9. One of the outer sexual appendages of male.
» 10. Third pleopod of male.
» 11. Fourth pleopod of male.
» 12. Inner lamella of left uropod (without the marginal setæ).
» 13. Telson viewed from the dorsal face.
» 14. Tip of telson of another specimen, with only 3 dentiform projections at the botto · of the apical incision.

Pl. III.

Mesomysis Ullskyi, (Czern.

Fig. 1. Adult female, dorsal view.
» 2. Peduncle of right superior antenna, with the bases of the flagella, viewed from above.
» 3. Basal part of left inferior antenna, with the scale (without the marginal setæ) and the base of the flagellum, dorsal view.

Fig. 4. Extremity of the scale, more highly magnified.
» 5. Right mandible with palp.
» 6. Masticatory part of left mandible.
» 7. First maxilla.
» 8. Second maxilla.
» 9. Maxilliped with exopodite and epipodite.
» 10. Gnathopod.
» 11. Pereiopod of 2nd pair.
» 12. Extremity of the latter, more highly magnified, showing the structure of the dactylar joint.
» 13. Inner lamella of right uropod (without the marginal setæ).
» 14. Telson, viewed from the dorsal face.
» 15. Tip of the telson, more highly magnified.

Pl. IV.

Mesomysis Kowalevskyi, Czern.

Fig. 1. Adult female, dorsal view.
» 2. Front part of the body, with the eyes and antennæ, dorsal face.
» 3. Basal part of left inferior antenna, with the scale (without the marginal setæ) and the base of the flagellum, dorsal view.
» 4. Extremity of the scale, more highly magnified.
» 5. Second maxilla.
» 6. Pereiopod of 2nd pair.
» 7. Telson, viewed from the dorsal face.
» 8. Inner lamella of left uropod (without the marginal setæ).
» 9. Extremity of the telson more highly magnified.
» 10. Outer part of the tail of an adult male, viewed from left side, exhibiting the pleopoda and caudal appendages.
» 11. Third pleopod of male.
» 12. Fourth pleopod of same.

Pl. V.

Mesomysis Czerniavskyi, G. O. Sars.

Fig. 1. Adult female, dorsal view.
» 2. Front part of the body, with the eyes and antennæ; dorsal view.
» 3. Basal part of left inferior antenna, with the scale (without the marginal setæ) and the base of the flagellum.
» 4. Extremity of the scale, more highly magnified.
» 5. Second maxilla.
» 6. Pereiopod of 2nd pair.
» 7. Extremity of the latter, more highly magnified.
» 8. Telson, viewed from the dorsal face.
» 9. Extremity of the latter, more highly magnified.
» 10. Inner lamella of left uropod (without the marginal setæ).
» 11. Male appendage of the superior antennæ.
» 12. Third pleopod of male.
» 13. Fourth pleopod of male.

Pl. VI.

Mesomysis intermedia, Czern.

Fig. 1. Adult female dorsal view.
» 2. Front part of the body, with the eyes and antennæ; dorsal view.
» 3. Basal part of left inferior antenna, with the scale (without the marginal setæ) and the base of the flagellum.

Fig. 4. Extremity of the scale, more highly magnified.
» 5. Second maxilla.
» 6. Pereiopod of 2nd pair.
» 7. Extremity of the latter more highly magnified.
» 8. Telson, viewed from the dorsal face.
» 9. Extremity of the latter, more highly magnified.
» 10. Inner lamella of left uropod (without the marginal setæ).
» 11. Tail of an adult male, viewed from left side, showing the pleopoda and caudal appendages.
» 12. Third pleopod of male.
» 13. Fourth pleopod of male.

Pl. VII.

Katamysis Warpachowskyi, G. O. Sars.

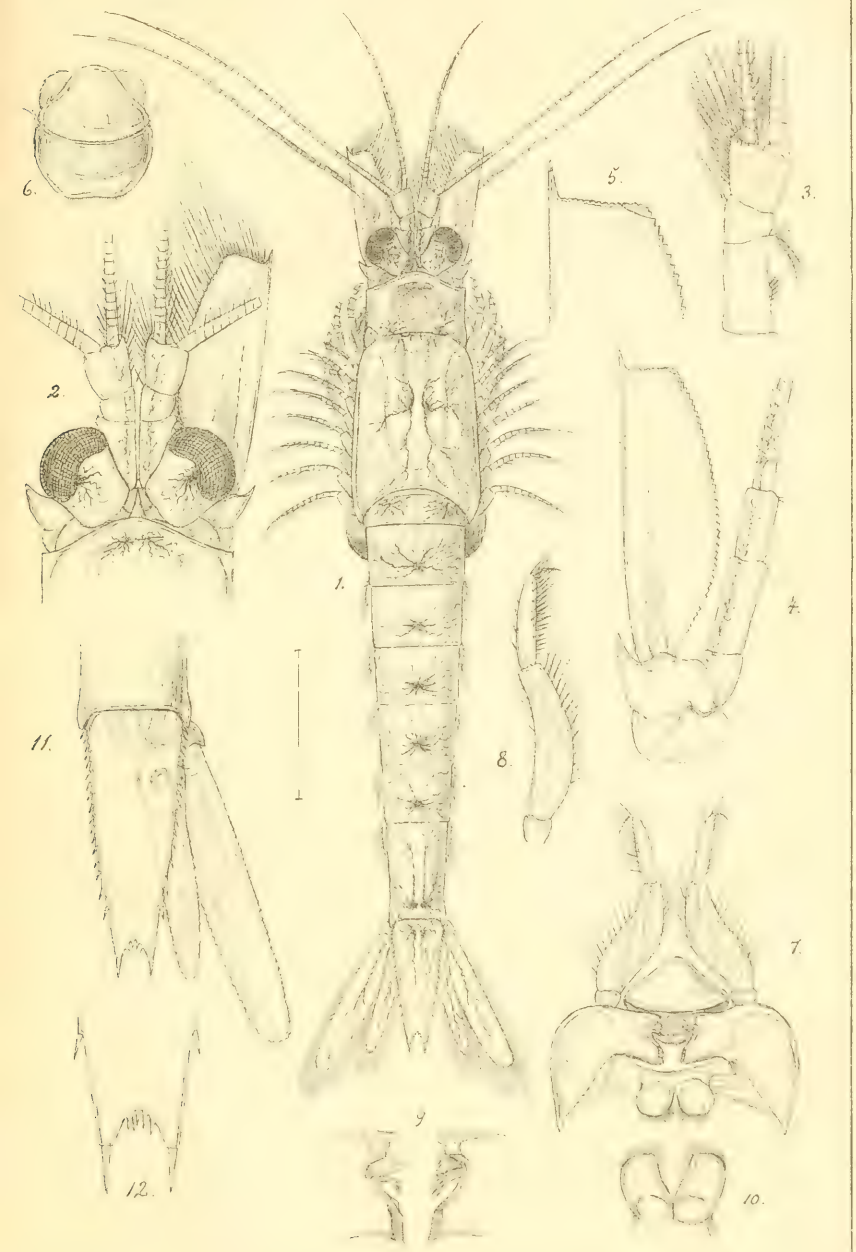
Fig. 1. Adult female, dorsal view.
» 2. Front part of the body, with the eyes and antennæ, dorsal view.
» 3. Peduncle of right superior antenna, with the bases of the flagella.
» 4. Basal part of left inferior antenna, with the scale (without the marginal setæ) and the base of the flagellum.
» 5. Extremity of the scale, more highly magnified, exhibiting the apical segment.
» 6. Anterior lip, from below.
» 7. Posterior lip.
» 8. Right mandible with palp.
» 9. Masticatory part of left mandible.
» 10. First maxilla.
» 11. Second maxilla.
» 12. Maxilliped with exopodite and epipodite.
» 13. Gnathopod.
» 14. Terminal joint of the latter, more highly magnified.
» 15. Pereiopod of 2nd pair.
» 16. Extremity of same, more highly magnified.
» 17. Pereiopod of 3rd pair.
» 18. Extremity of same, more highly magnified.
» 19. Right uropod (without the marginal setæ).
» 20. Telson, viewed from the dorsal face.
» 21. Adult male, viewed from left side.
» 22. Third pleopod of same.
» 23. Fourth pleopod of same.
» 24. Tip of the telson of same.

Pl. VIII.

Limnomysis Benedeni, Czern.

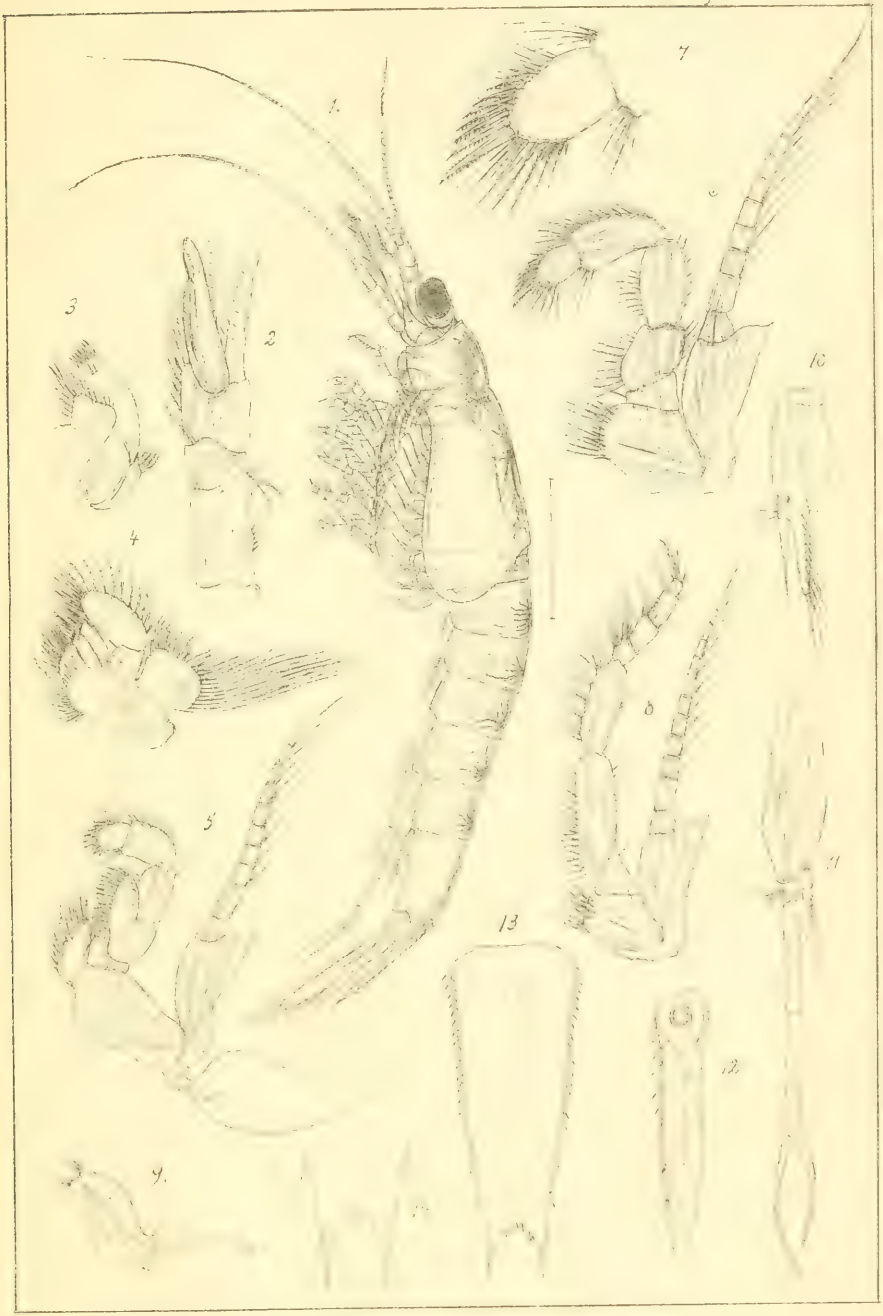
Fig. 1. Adult female, dorsal view.
» 2. Front part of the body, with the eyes and antennæ, dorsal view.
» 3. Peduncle of right superior antenna, with the bases of the flagella.
» 4. Basal part of left inferior antenna, with the scale (without the marginal setæ) and the base of the flagellum.
» 5. Anterior lip, from below.
» 6. Left mandible with palp, and masticatory part of the right one.
» 7. Posterior lip.
» 8. First maxilla.
» 9. Second maxilla.
» 10. Maxilliped with exopodite and epipodite.
» 11. Gnathopod.
» 12. Terminal joint of the latter, more highly magnified.

Fig. 13. Pereiopod of 2nd pair.
» 14. Extremity of same, more highly magnified, showing the structure of the dactylar joint.
» 15. Right uropod (without the marginal setæ).
» 16. Telson, viewed from the dorsal face.
» 17. Extremity of same, more highly magnified.
» 18. Adult male, viewed from left side.
» 19. Peduncle of left superior antenna of male, viewed from below.
» 20. Male appendage of same, more highly magnified.
» 21. Basal part of left inferior antenna of male, with the scale and base of the flagellum.
» 21* Tip of the scale, more highly magnified.
» 22. One of the outer sexual appendages of male.
» 23. Third pleopod of male.
» 24. Fourth pleopod of male.



G.O.Sars autogr.

Paramysis Baeri, Czern.



G.O.Sars autogr.

Paramysis Baeri, Czern.
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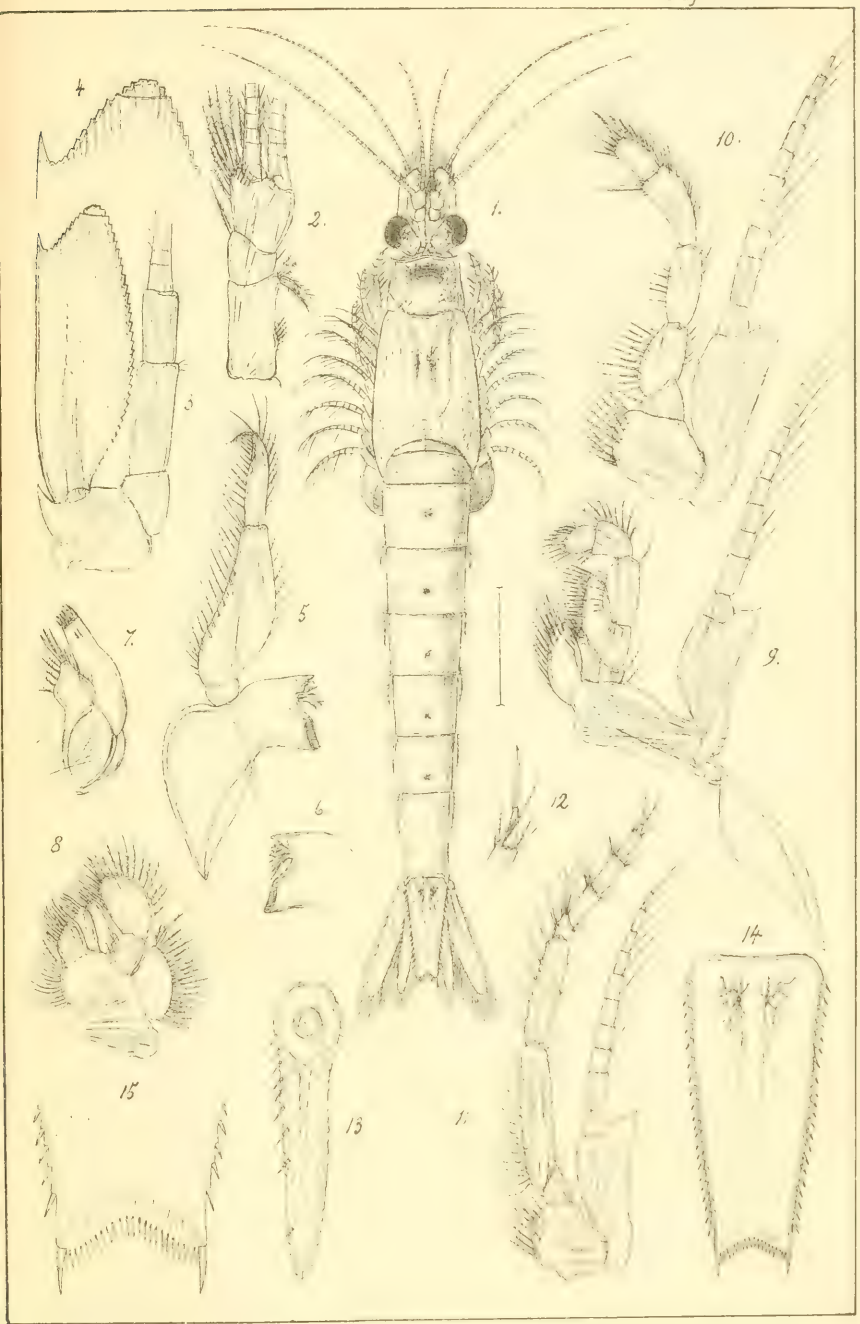
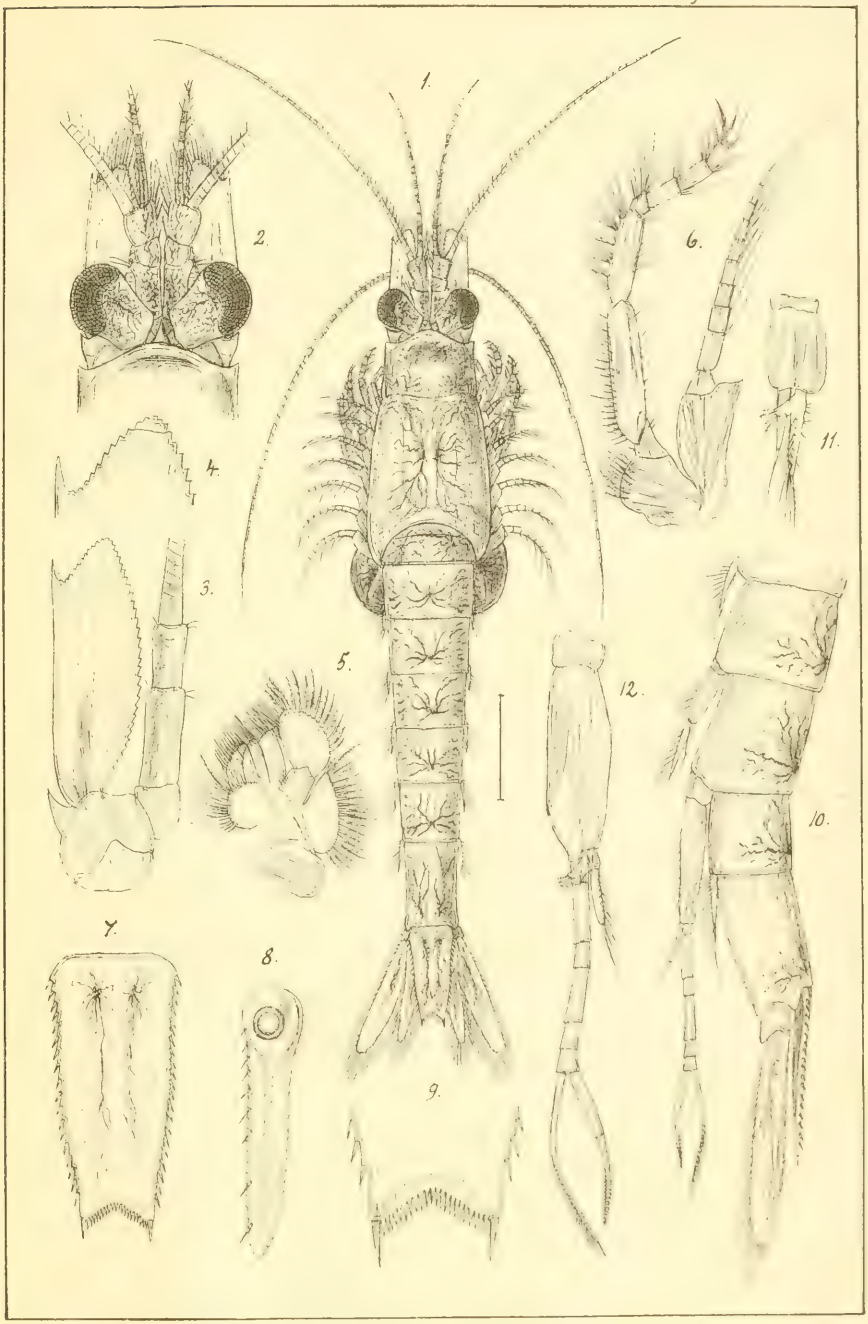


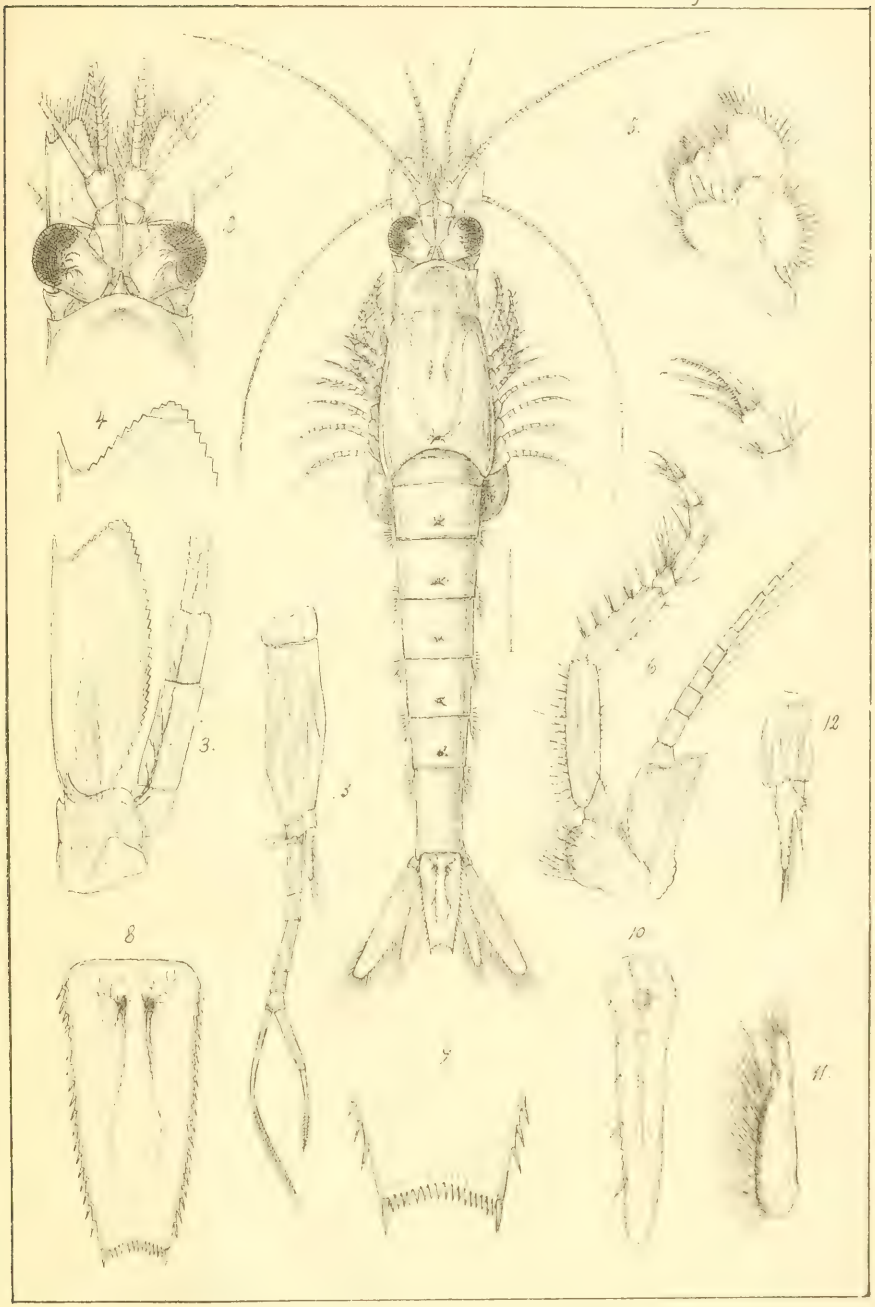
G.O.Sars autogr.

Mesomysis Ullskyi, (Czern.)



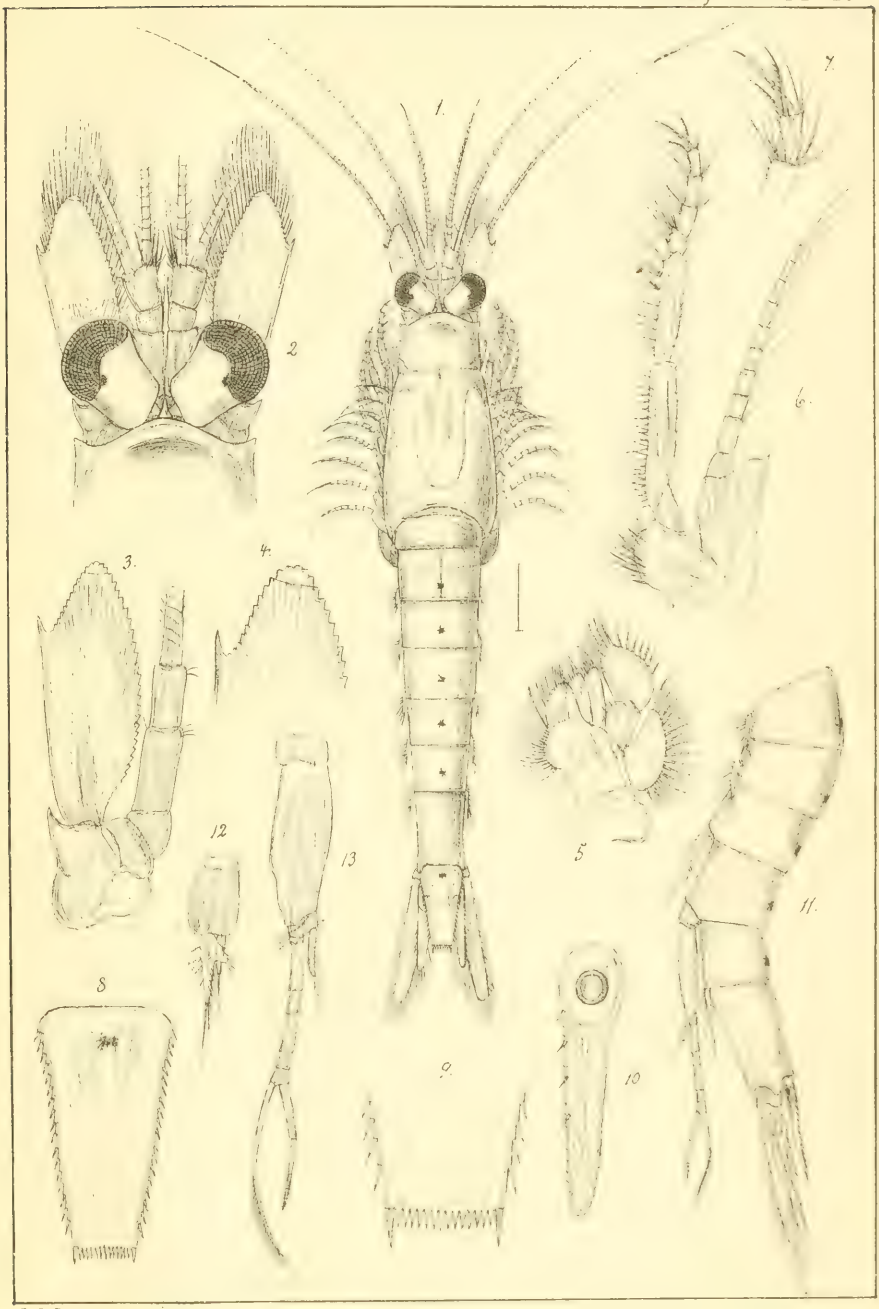
G.O.Sars autogr.

Mesomysis Kowalevskyi, Czern.



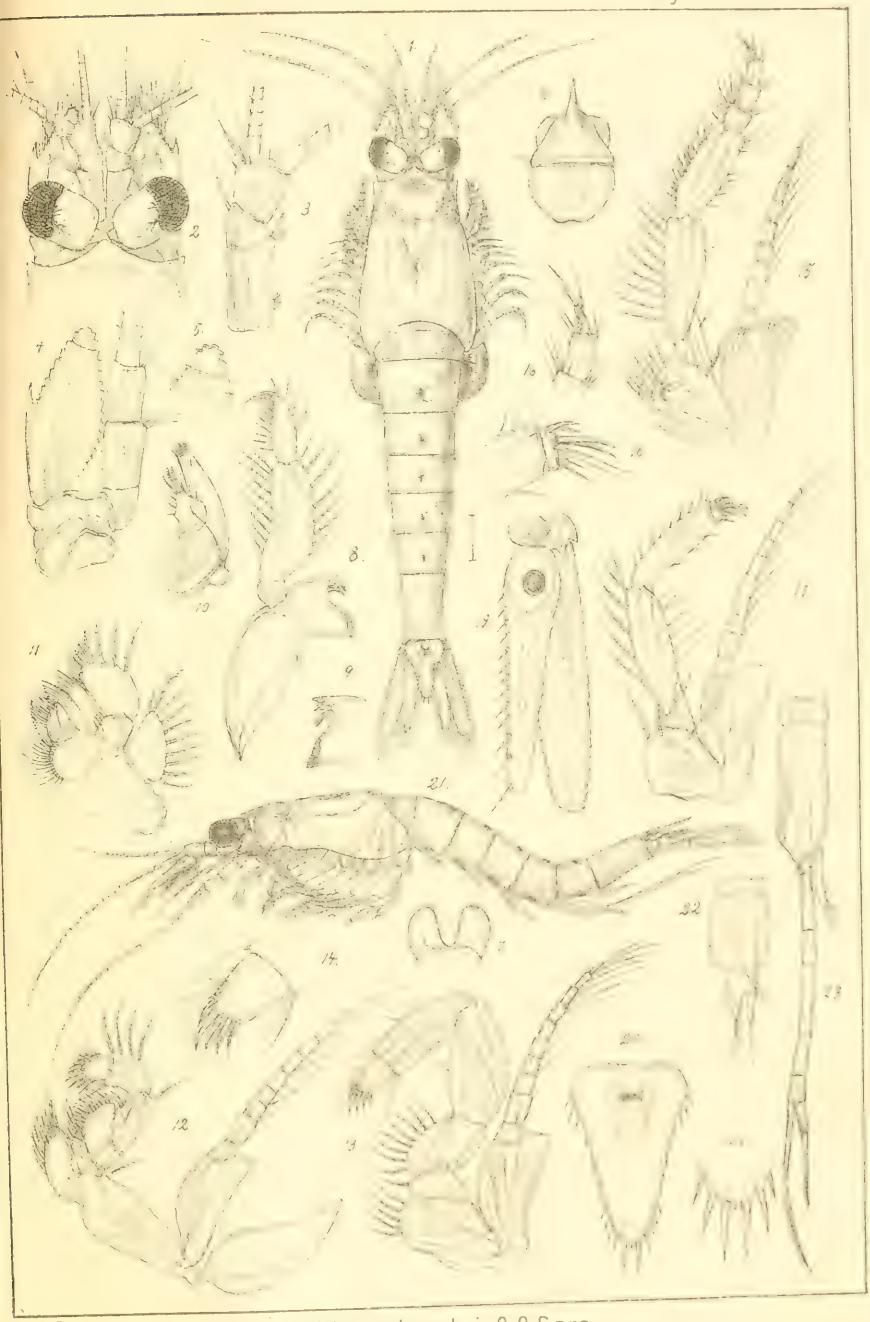
G.O.Sars autogr.

Mesomysis Czerniavskyi, G.O.Sars.
n. sp.

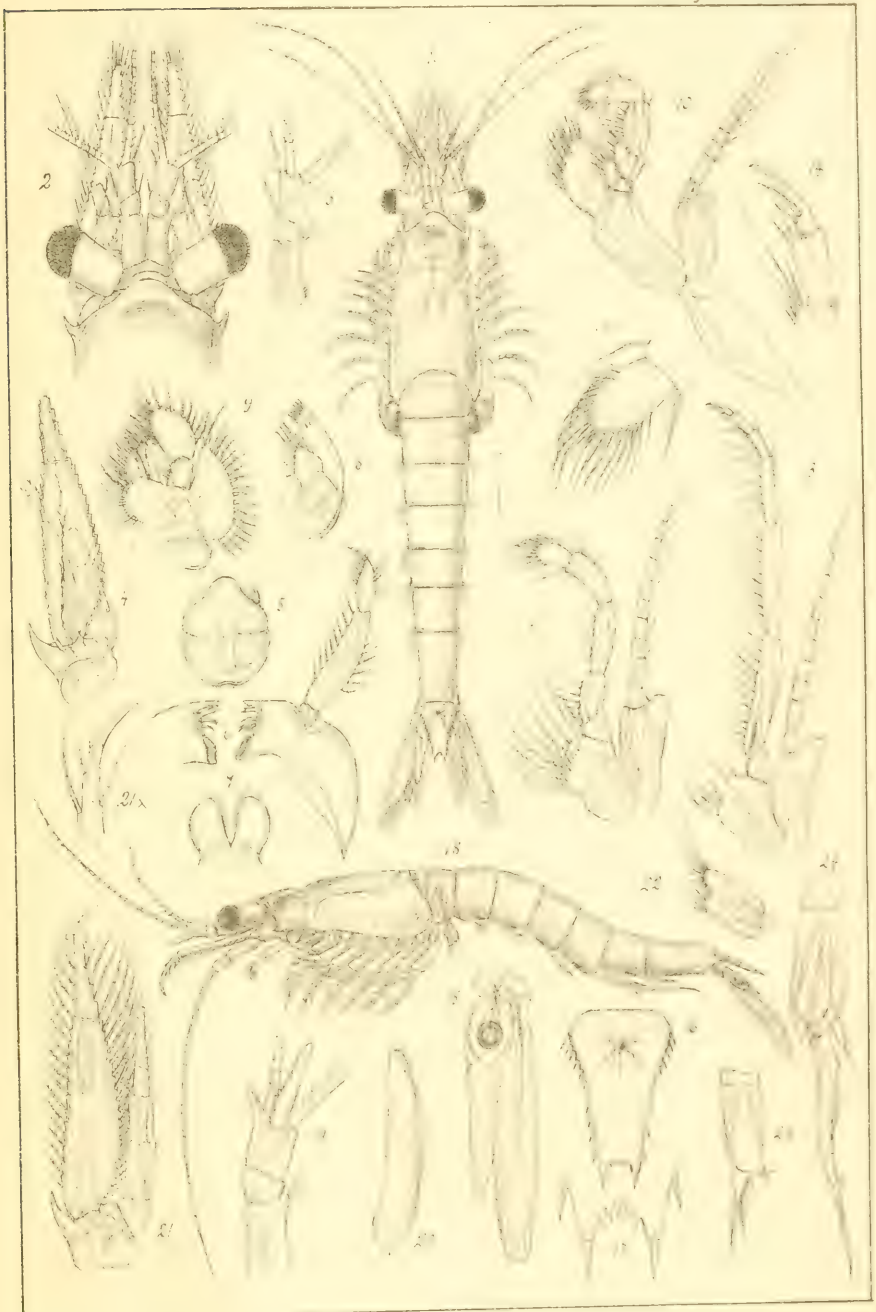


G.O.Sars autogr.

Mesomysis intermedia, Czern.



G.O.Sars autogr. Katamysis Warpachowskyi, G.O.Sars.
n. gen. & sp.



G.O.Sars autogr.

Limnomysis Benedeni, Czern.