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TWO RARE AND REMARKABLE FORMS OF MACRUROUS
CRUSTACEA FROM JAPAN

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TWO FIGURES

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Recently I had an opportunity to examine two very rare and interesting forms of macrurous Crustacea. Both of them are quite aberrant. One belongs to the Callinassidae, collected from the Japan Sea by Mr. Masao Nakamura, who sent it to me for identification, and the other belongs to the Cryptopodidae of the Penaeidea, collected by the author in the Kuroshiwo in May, 1924, between Kyushyu and the Ryukyu Archipelago.

Tribe THALASSINIDEA

Callianassidae

Ctenocheles n. g.

Rostrum small. First pair of pereiopoda asymmetrical and unequal, with well developed chela; second pair small and chelate. Podobranchiae and mastigobranchiae wanting. Second pair of pleopoda like the following pairs.

Ctenocheles balssi n. sp.

Carapace is nearly one fourth the total length of the body, not long enough to cover the whole length of the cephalothorax, leaving the segment of the last pereiopoda uncovered. It is more or less laterally compressed, and its margin ciliated. Rostrum very short, laterally compressed, and continues to a low median keel behind with a row of about ten minute teeth. Ophthalmopoda are horizontally compressed at the anterior end, and the visual organ lacking. They are nearly equal in length to the first joint of the first antennae. First antennae subequally biramous, flagellae

longer than the peduncle, and situated just below the ophthalmopoda. Second antennæ have neither scaphocerite, nor spine, being situated on the external side of the ophthalmopoda. Two proximal joints of the peduncle of the second antennæ are nearly equal in length to the peduncle of the first antennæ. Mandibles have a very sharp cutting edge, and carry a synnhipod of three joints, of which the ultimate one is the longest, and is furnished with stiff hairs. Second maxillipeds carry a pediform endopodite of five joints, the distal joint of which is armed with thick bristles. Third maxillipeds are pediform and long, consisting of six joints. Fourth joint is very thick with a sharp, serrated, inner edge.

First pair of pereopoda unequal in size and form, with well developed chelæ. Right chela is larger than the left, and resembles the right chela of *Thaumastocheles* more or less; but in this species the carpos is very short, and it seems as if fused to the propodus. Dactylus as well as the prolonged process of the propodus are armed with long, sharp teeth, alternating with some number of smaller teeth. Dactylus is turned outward. Merus is robust, having a rounded appearance at the proximal end. Ischium is nearly as long as the merus, but much more slender. Left chela is also well developed, but smaller, its dactylus being nearly half the length of that of the right chela. Inner side of the chela is serrated. Propodus is nearly the same in length with that of the right one, but about half in breadth. Carpus is longer, but both the merus and ischium are shorter, as compared with those of the right chela. First pair of pereopoda is very poorly haired, and its surface is nearly smooth.

Second pair of pereopoda is chelate and compressed, with long hairs on the trenchant edges of the dactylus, propodus and carpos, and on the inner margin of the merus and ischium. In the propodus and carpos we find some groups of a few short hairs.

Third pair of pereopoda is a little longer than the second. Propodus and the distal portion of the carpos are broad, and their trenchant sides are ciliated. In the carpos and merus we find small groups of a short hairs as in the preceding pair.

Fourth pair of pereopoda is a little longer and more slender than the preceding pair. Carpos is elongated and club-shaped. Ischium is rather short in the third to fifth pereopoda.

Fifth pair of pereopoda is not subchelate. Propodus is thickly haired at the posterior inner margin.

Coxal joint of pereopoda on both sides meet with each other at the ventral median line of the cephalothorax, except the last two pairs which are separated by the thelycum.

Abdomen is much elongated. Its segments are nearly smooth and the pleuron is little developed. Pleopoda are well developed. First pair of pleopoda, however, is small, narrow, and consists of two joints. Second to fifth pairs are quite similar to each other, consisting of two broad leaf-like plates at the end of a short basal joint. Inner margin of the endopodite is thickly ciliated, while the distal and outer margin of the exopodite is furnished with short hairs. Sixth pleopoda form the lateral plates of the rhipidura. Exopodite is broader than the endopodite, and is notched at the middle of the posterior margin. Telson is also broad nearly as broad as long, and has three radiating grooves from the middle of the anterior margin.

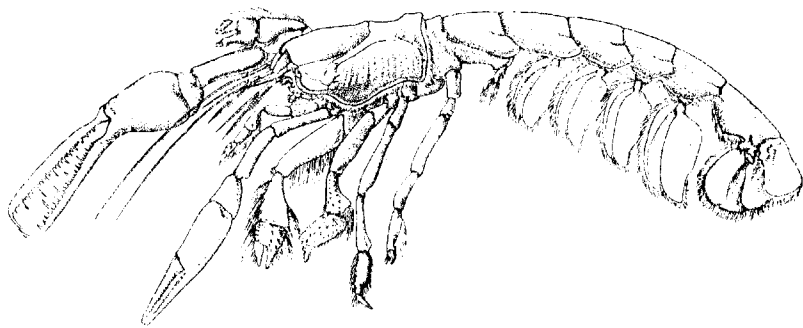


Fig. 1 *Ctenocheles balssi* ♂

Branchial system is very simple, arthrobranchiae only being developed. They are found two in every segment, from that of the third maxilliped to that of the fourth pereopoda.

Right chela only of this species was collected by Dollein from our coast, and was described by Balss as ? *Pentacheles* nov. sp. ? with a figure in "Beiträge zur Naturgeschichte Ostasiens" (Ostasiatische Decapoden II), 1914.

This animal belongs without doubt to the family Callinassidae, and is closely allied to the genus *Callinassa*, from which the

present species differs in having the second pair of the pleopoda similar to the following pairs. It differs from the genus *Callianidae* in lacking the mastigobranchiae. Thus I have created a new genus and species for this animal, giving the specific name in honour of Dr. Heinrich Balss who first described the right chela of this animal. In the external appearance, especially in the shape of the right chela, this animal resembles *Thaemastocheltes* somehow, though quite dissimilar in the branchial arrangement and other characters.

The animal seems to have been caught from a deep water, as it is blind. It was collected at Ohsu, near Kasuwasaki, Niigata-ken. The only specimen is female, measuring 10 cm. in length, and being more or less mutilated.

Tribe PEXAEIDEA

Cryptopodidae

Cerataspis affinis n. sp.

Carapace is more or less pear-shaped, with many warts and short ridges. Branchial region is much swollen. Anterior portion of the carapace blunt and narrow. Rostrum is sharply pointed, but curved downward and backward toward the tip, and it is laterally compressed, serration wanting. Anterior lateral angle of the carapace is produced to a long curved process, turned a little downward and inward. Above the eye, there is a blunt edge, corresponding to the supraorbital tooth. Ventral margin of the carapace is raised and the space between the margins of both sides is very narrow, so that when the pleon is reflexed the space is almost entirely filled up by the pleon, hiding nearly all the appendages, except the antennary flagellae. Inferior posterior part of the carapace is produced backward to protect the side of the anterior portion of the pleon.

Behind the rostrum we find a slight keel, running to the median wart in the gastric region. Between the eyes the carapace is flattened and terminates with a broad tooth over the eye. Continuous to the outer edge of the supraorbital tooth and removed upward and backward, we find a prominent wart, which is followed behind by a little elevation. Exterior to the little elevation there is another wart, continuous to a ridge from the long process at the antero-

inferior corner of the carapace. This is probably homologous to the hepatic tooth of other penaeids. Below the hepatic wart a branchial wart is found. In the cardiac region there are three pairs of warts. Anterior pair is the largest, while the other pairs are nearly the same in size. At the posterior margin of the carapace another pair of small warts is found. Two longitudinal ridges are found near the boundary dorsal to the branchial region, on each side of the cardiac region. Thus the carapace has a grotesque appearance, differing greatly from that of the other macrurous crustaceans.

Eyes are short, stalked, and scarcely exposed outside the orbit.

First antennae are short, so that they are hidden under the carapace. Of the three joints of their peduncle, the proximal one is the longest. Two flagellae are nearly equal in thickness, but the inner is about half the length of the outer, and is dilated on the ventral side.

Second antennae are comparatively short, their length including the length of the flagellae being a little more than half the length of the dorsal median line of the carapace, without the rostrum. The scaphocerite is wide, rounded at the anterior margin, and destitute of tooth. Flagellum is rather short.

Mandibles are large, with a rather simple cutting edge, and carry a three-jointed synniphod. Proximal joint of the latter is very short, while the second joint is the longest.

First pair of maxillae is quite normal, exhibiting nothing peculiar to this species. Third proximal joint is very short, and its tip is placed far behind the tip of the second broad joint. Former is armed with three strong bristles at the tip and a slender one at the external side.

Second pair of maxillae consists as usual of four branches. Two proximal joints are broad and divided into two lobes, being fringed with bristles and hairs in many rows for mastication. Distal joint is slender, and armed with three terminal bristles and four pairs of long feather-like hairs at the inner margin. Epipodite is broad, ear-shaped, and reflexed downward.

First pair of maxilliped is composed of seven joints, of which two proximal joints are very broad. The endo- and exopodites are nearly equal in length. Endopodite consists of five joints, small

and slender, while the exopodite is multiarticulated. Epipodite, attached to the coxal joints, is very broad, rather stiff, and is bent upward at the posterior part. We find an arthrobranch at the root of this appendage.

Second pair of maxilliped is pediform, seven jointed, rather thick, and all the joints are haired at the inner side. Tongue-shaped mastigobranch is found in the coxal joint, which carries also a well developed podobranchia, besides a large arthrobranch near the attachment of the appendage. Exopodite is shorter than the endopodite, scarcely reaching the penultimate joint of the endopodite. Ischium is very short in this appendage. Merus is a little elongated, but the following three joints are short.

Third pair of maxilliped is the largest appendage in this species. Basis is the longest and thickest joint. Ischium is nearly as long as the merus, and the three terminal joints are also fairly long. In the coxal joint we find a small podobranch and a mastigobranch. Exopodite is shorter than the endopodite.

Pereiopods are feeble and remarkably shorter than the maxillipeds. They become shorter, thinner, and at the same time more poorly haired backward. In these appendages the exopodite or the swimming branch is much longer than the endopodite. Swimming

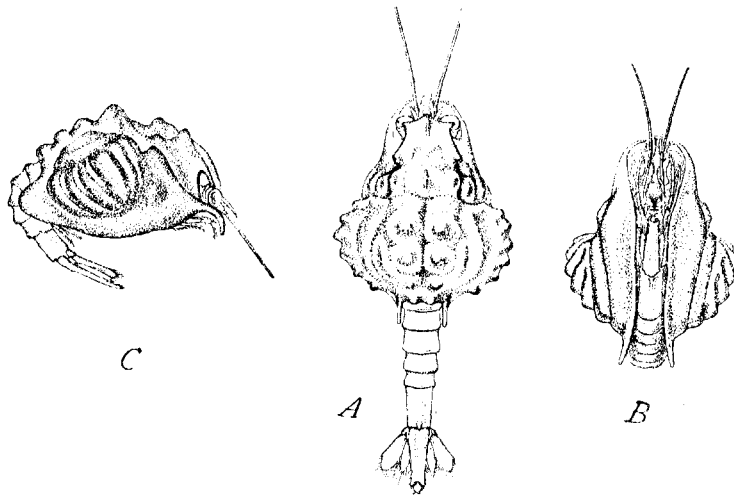


Fig. 2. *Cerataspis affinis* 1 1/2. A, dorsal view. B, ventral view. C, profile.

branch is best developed in the first two pereopods. Basal joint is conspicuously large in all the pereopods. First three pereopods are chelate. In the coxal joint of the first three pairs, we find a podobranchia and a mastigobranchia, and in the fourth pereopoda a mastigobranchia only. Three anterior mastigobranchiae are simple, tongue-shaped and turned at the tip. Three posterior mastigobranchiae are bent twice, and in the last two pereopods we find a short branch at the first bend.

Branchiae are dendritic, very well developed, and the pleurobranchiae, arthrobranchiae, podobranchiae, and mastigobranchiae are present. Of these the arthrobranchiae are especially well developed. Both the pleurobranchiae and arthrobranchiae have numerous branches and secondary branches too, but the secondary branches are usually lacking in podobranchiae.

Branchial formula of this species is as follows:—

	Mastigobr.	Podobr.	Arthrobr.	Pleurobr.
1 maxilliped	0	0	1	0
2 „	1	0	2	0
3 „	1	1	2	1
1 pereopod	1	1	2	1
2 „	1	1	2	1
3 „	1	1	2	?
4 „	1	0	2	1
5 „	0	0	0	1

Pleon is slender, and its segments are nearly equal in length, except the sixth, which is about twice as long as the others. Breadth of these segments gradually diminishes backward. Telson is long, a little longer than the last two segments, and nearly equal in length to that of the sixth pleopoda. It is armed with three small teeth and one long spine on each side. Distal end of the telson is furcate, and the long paired spines are found at the external corner. Between these spines at the posterior margin of the telson, there are five pairs of minute teeth. Lateral sides of the telson are more or less thickened. Sixth segment of the pleon is laterally compressed, and we find the dorsal median keel.

Pleopods are not well developed. They diminish in size posteriorly. Endopodite appears from the second pair, and it is a little shorter than half the length of the basal joint of the exopodite of that pair. In the third pair, the endopodite is a little shorter than the basal joint, while in the fourth pair it is a little longer than the basal joint. In the fifth pair the endopodite is much longer than the basal joint, and is a little shorter than the exopodite. The basal joints of the exopodites grade in length, the last one being shortest. Exopodite is multiarticulated, and rounded in cross-section. Articulated portion is fringed with very short hairs. These pleopods seem to be not much effective in swimming, which is done chiefly by the exopodites of the maxillipeds and pereopods.

Colour of the animal is beautifully bluish. It was especially bright at the tip of the warts and ridges. Ground colour of the cardiac region was reddish in the freshly preserved specimen, probably due to the colour of the underlying viscera.

Total length of the animal is 24 mm., the pleon being 13 mm. long.

This species is very closely allied to *Cerataspis monstrosa* Gray, described with figures by Dohrn in "Zeitschrift für wissenschaftliche Zoologie," vol. 21, 1872. It differs, however, from latter in having the longer pleon, armed telson, shorter exopodite of the second maxilliped, etc. According to Giard and Bonnier, *Cerataspis petiti* Guerin (Compt. rend. soc. biol. Paris, 30, 1892) has a large spine at the middle of the branchial region, but the present species lacks such a large spine.