

FURTHER NOTES ON CRUSTACEA DECAPODA IN THE INDIAN MUSEUM.

V ON *EUTRICHOCHELES MODESTUS* (HERBST): FAMILY AXIIDAE.

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(Plate VI.)

In 1875 Wood-Mason¹ exhibited before a meeting of the Asiatic Society of Bengal a rare Decapod Crustacean that had been described and figured by Herbst² over 80 years earlier under the name of *Cancer modestus*. Wood-Mason set up a new genus for the reception of this curious animal, and though he did not give any definition for his genus, he discussed briefly its relationships with other allied forms. According to Wood-Mason *Eutrichocheles*, as he designated his new genus, was a member of the family Astacidae (Nephropsidae of later writers), although he believed that it showed a close affinity to Thalassinidae also. In fact according to him *Eutrichocheles* afforded a connecting link between the two families.

Since Wood-Mason's brief announcement no reference to this animal appeared in the literature for over 40 years, till de Man³ referred to it in 1916 in his account of the Siboga Expedition Nephropsidae. Following Wood-Mason he too included *Eutrichocheles*, though without making any comments on it, in the family Nephropsidae.

A year later Bouvier⁴ also accepted the same position for *Eutrichocheles* and included it in the same family. Like Wood-Mason, Bouvier also recognised its close affinity to *Nephropsis*, and in fact referred to *Eutrichocheles* as "un *Nephropsis* à fortes pinces largement béantes et à pédoncules oculaires vraisemblablement terminés par des yeux"

Recently Professor Heinrich Balss of the Zoologische Sammlung des Bayerischen Staates, München, drew my attention in a letter to this interesting animal. In connection with some work that he was engaged on at the time he had occasion to examine critically Herbst's description and figure of this rare animal. This examination led him to the conclusion that *Eutrichocheles* had been wrongly included in the family Nephropsidae, but was beyond doubt a member of the Axiidae, and most probably of the genus *Axiopsis*. As the only example of *Eutrichocheles modestus*, probably in existence at the present time, is preserved in the Indian Museum, Dr. Balss asked me to examine it for him, and verify his views in the matter. As will be seen from the present note the views held by Dr. Balss are correct in so far as *Eutrichocheles* is undoubtedly a member of the family Axiidae, and not of the Nephropsidae, as has hitherto been believed.

¹ Wood-Mason, *Proc. As. Soc. Bengal*, 1875, p. 231; also *Ann. Mag. Nat. Hist.* (4) XVII, p. 264 (1876).

² Herbst, *Krabben II*, Heft 5, p. 173, pl. xliii, fig. 2 (1794).

³ de Man, *Siboga Exped. Rep. XXXIXa*², p. 96 (1916).

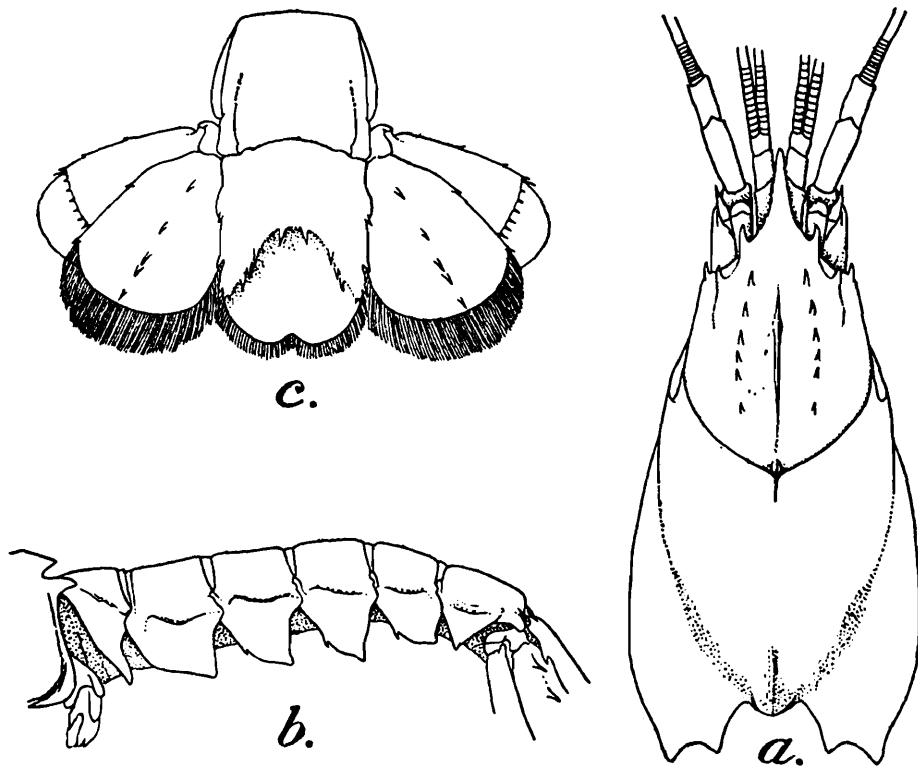
⁴ Bouvier, *Result. Campg. Sci. Albert Monaco L*, p. 14 (1917).

I am very thankful to Dr. Balss for directing my attention to this interesting animal. I have also had the benefit of his opinion and advice on this note, as the manuscript and some of the figures that illustrate it were sent to him in the first instance for any use that he cared to make of these. It is at his suggestion that the note, along with photographs of the animal and of some of the legs, is now being published. Though Herbst's excellent figure of the animal is on the whole correct, the rarity of his work has induced me to publish these photographs. My best thanks are due to Dr. Balss for all the help and suggestions that I have received from him.

A careful examination of Herbst's description and figure, as also of the fine example of *E. modestus* preserved in the collection of the Indian Museum, has made it clear that Wood-Mason, de Man and Bouvier were wrong in including *Eutrichocheles* in the family Nephropsidae of the Astacura section of Reptantia. In members of the family Nephropsidae, to mention only a few of the important characters, the carapace always overlaps the first abdominal somite, the abdominal terga overlap one another, and the first three legs are chelate. *Eutrichocheles*, on the other hand, unmistakably shows the characters of the Axiidae, which according to the present-day classification is included in the tribe Thalassinidea of the section Anomura. In *Eutrichocheles*, as in other members of the family Axiidae, the carapace does not overlap the first abdominal somite, the abdominal terga do not overlap one another, and only the first two pairs of legs end in chelae. Further, as is usual in the family, the last thoracic somite is movable, and the last thoracic sternum is separate. There can thus be no doubt that *Eutrichocheles* is a member of the family Axiidae, but its position and relationships within the family are not so clear.

Before discussing the relationship of *Eutrichocheles* with the other genera of the Axiidae, it may be useful to supplement briefly Herbst's original description of the species. This excellent and accurate description agrees in almost every particular with Wood-Mason's example of the species in the Indian Museum collection. The carapace (Plate VI, fig. 1, text-fig. 1a) is arched, and is distinctly keeled along the dorsal edge. The keel is very prominent in the anterior part, and though it becomes somewhat indistinct behind the cervical groove, it can again be clearly seen near the posterior extremity of the carapace. The four rows of forwardly-directed spines on the anterior part of the carapace, described by Herbst, are very distinctly seen in the Indian example. There are two rows on each side of the median keel. The outer row is short and consists of two comparatively large teeth, placed on the ridge that runs in continuation of the rostrum on the gastric region on each side of the carapace. The inner row consists of six small teeth, and only slightly falls short of the cervical groove. The rostrum is straight, with toothed sides, and ends in a bluntly-pointed tip. It extends up to the base of the ultimate segment of the antennular peduncle, or to about the middle of the long penultimate joint of the antennal peduncle. The antennal spines are considerably reduced, but both of them can be distinctly made out. Both the spines are somewhat pointed, but the inner, which is longer than the outer, is more sharply pointed. The

spines are very clearly seen in text-figure 1a, and one of them can be made out in the photograph also. The eye-peduncles are comparatively short, and the corneae are without pigment. The surface of the carapace, especially behind the cervical groove, is minutely punctate.



TEXT-FIG. 1.—*Eutrichocheles modestus* (Herbst).

a. Dorsal view of carapace, rostrum, etc. : $\times 2$.

b. Lateral view of abdominal somites : $\times 2$.

c. Dorsal view of last abdominal somite, telson and uropods : $\times 2$.

The abdominal segments (text-fig. 1b, plate VI, fig. 1) are as described and figured by Herbst. The first pleura are somewhat reduced, and are more or less acutely pointed; the 2nd-5th are angular, the 2nd being the largest, and the next three being provided with a small tooth each on the anterior margin. These teeth are not mentioned by Herbst in his description of the species, nor are they shown in his figure. The 6th pleura are triangular, and sharply pointed.

The telson (text-fig. 1c) is quadrangular in shape, and has the posterior margin broadly rounded, with a somewhat deep notch in the middle. The teeth, etc., on it are as shown in Herbst's figure. There is a distinct obliquely transverse suture, with spines on it, near the distal end of the exopod of the uropod, and a longitudinal ridge of spines on the endopod.

The chelipeds are massive and unequal on the two sides—in the Indian Museum example the one on the left side is bigger than that on the right. The arm (Pl. VI, fig. 2) on both sides is short, and is only sparsely tuberculate near its distal extremity, but the wrist and the palm are densely so. There are four short recurved spines on the upper border of the arm, and some similar spines are present on the lower border also. The wrist is short and globular. The hand has the palm

compressed, and its height somewhat exceeds its length along the upper border. It is densely covered with tubercles, and along its upper border there is a low crest of short, blunt spines, some of which appear to be only sharply-pointed tubercles. The fingers are also compressed, are sharply hooked at the tips, and leave a gap when they meet. The dactylus has a number of small tubercles near the base, and has a carina of granules or small tubercles along its upper border. It has three large teeth on the proximal part—two of these are placed near the base, while the third is almost on the middle of the cutting edge—and a row of small ones, extending from about the middle to the tip of the finger. The fixed finger is almost straight, and has a raised ridge on its side, and a row of granules on the lower border, similar to the one on the upper border of the movable finger. The large blunt tooth near the base has a number of small teeth on it, and there is another large tooth placed a little beyond the middle of the cutting edge. Between these two teeth there are four smaller teeth, and in addition to these there is a row of almost minute teeth extending distally from the large tooth on the middle, but not quite reaching up to the tip. The right cheliped differs from the other chiefly in the smaller palm, in having two and somewhat smaller teeth on the dactylus—the one about the middle of the finger in the other chela being absent here—and in having only one large, pointed, spine-like tooth on the fixed finger.

The walking legs are somewhat slender, only those of the first pair (2nd peraeopods) are chelate, the others being monodactylous. The merus of the first walking leg has two or three spines on the lower border, besides being profusely hairy; the carpus has also a cluster of long hairs on the distal part of the upper margin; the palm and the fingers are more or less smooth, the former being considerably shorter than the latter. The third peraeopods (2nd walking legs) are the longest. The merus is long and cylindrical, and has no spines or hairs on its lower border; the other segments are also smooth, and the dactylus, which is rather short, is sharply pointed.

The pleopods of the first pair in the single female example that I have seen are very much reduced, and are represented by short, uniramous, stumpy structures.

From the foregoing description it seems clear that within the family Axiidae *Eutrichocheles* finds a place in the group in which, according to Borradaile¹ and de Man,² *Axiopsis* Borradaile and *Calocaris* Bell are included. The presence of a distinct suture on the exopod of the uropod excludes it from the group in which *Axius* and certain other genera are placed. In the former group *Eutrichocheles* shows a greater resemblance to *Calocaris* than to any other genus. The presence of an arched back, with a distinct keel running along its dorsal edge, and of eyes without pigment indicates an unmistakable affinity to *Calocaris*, and, further, the reduced antennal spines to the subgenus *Calocaris* s. s. In *Axiopsis* the back is flat, and the posterior part of the carapace is rounded and not carinate. The only other genus in this group is *Oxyrhynchaxius*

¹ Borradaile, *Ann. Mag. Nat. Hist.* (7) XII, pp. 534-551 (1903).

² de Man, *Siboga Exped. Rep.* XXXIXa⁵, pp. 1, 2 (1925).

Parisi,¹ but according to de Man² this genus is probably identical with the sub-genus *Calastacus* Faxon, of the genus *Calocaris*. In *Oxyrhyncharius*, though a keel is present along the mid-dorsal line of the carapace, the eye-peduncles are very long and the antennal spines are also large.

The question whether Wood-Mason's *Eutrichocheles* is identical with *Calocaris* Bell or not requires careful consideration. If only the characters given by Alcock,³ Borradaile and de Man for the definition of *Calocaris* are taken into account, Herbst's species should also be included in this genus, but a careful examination of the species of *Calocaris* in the collection of the Indian Museum and of the available descriptions and figures of the other species leaves no doubt in my mind that *Eutrichocheles* and *Calocaris* are distinct from one another, or at best, the former can perhaps be regarded as a separate sub-genus of the latter. I am, however, of the opinion that the two genera are quite distinct. *Eutrichocheles* can be easily distinguished from *Calocaris*, among other characters, by its large size, the presence of four longitudinal rows of spines on the anterior part of the carapace, the very massive, strongly tuberculate and dis-similar claws, and by the fact that the pleura of the abdominal somites are angular and not rounded, and are each provided with a spine on the anterior margin. In *Calocaris* the pleura appear to be always rounded.

Eutrichocheles modestus appears to be a very rare species. Herbst's example, on which the original description is based, is said to have come from the East Indies ; the only other known specimen, on which Wood-Mason based the generic name, is preserved in the Indian Museum. The exact provenance of this example also is not known, but it was collected somewhere off the Arakan coast of Burma. In the books of the Museum it is registered under No. 1405, and is said to have been received in exchange from some unspecified institution. The specimen is in a fairly good state of preservation, and is about 73 mm. from the tip of the rostrum to the posterior extremity of the telson. At the present time it is almost uniformly white in colour, the red pigment mentioned by Herbst in his specimen, and also shown in his figure, is nowhere visible in the Indian example now.

In the end I have to express my thanks to Mr. K. N. Das, M. Sc., Assistant, Zoological Survey of India, for the help he has given me in the preparation of this note.

¹ Parisi, *Atti Soc. Ital. Sci. Nat. Pavia* LVI, pp. 17-23 (1917).

² de Man, *Siboga Exped. Rep.* XXXIX a⁵, p. 2, foot-note (1925).

³ Alcock, *Cat. Indian Deep-Sea Crust. Decapoda*, pp. 187, 188 (Calcutta : 1901).