

NICHOLLSIDAE, A NEW FAMILY OF PHREATOICOIDEA (CRUSTACEA : ISOPODA)

By KRISHNA KANT TIWARI, M.Sc., Ph.D., Zoological Survey of
India, Calcutta.

The suborder Phreatoicoidea of isopod crustaceans is mostly represented in Australia, Tasmania, and New Zealand, and occurs outside this area in South Africa (3 species belonging to the genus *Mesamphisopus* Nicholls¹) and India (monotypic genus *Nichollisia* Chopra and Tiwari²). Chopra and Tiwari placed *Nichollisia* in a new subfamily Nichollsinae under the family Amphisopidae with which it agrees in having lacinia mobilis on both the mandibles. The authors had, however, taken account of the many acute differences that the Indian genus shows when compared with other members of this suborder.

About two years back, Prof. G. E. Nicholls made the following remarks in a personal communication to me :

"I entirely agree with you—after reading the paper³ that you were justified in separating it⁴ from the Hypsometopinae. Indeed on account of the structure of the uropods (in adult) of which I was ignorant, I think it might even warrant a separate family—*there is nothing like it in living or fossil forms!* It clearly represents a very early departure from the main line." (Italics mine.)

A re-examination of the material of *Nichollisia kashiense*, preserved in the Zoological Survey of India, Calcutta, in the light of the remarks made by Prof. Nicholls has convinced me that there are many marked differences between this species and its relatives in South Africa and Australian region, and these should serve justify establishment of a new family to accommodate the Indian form.

Order ISOPODA

Suborder PHREATOICOIDEA

Family NICHOLLSIDAE, nov.

The characters of this family are as follows :

Body long, subcylindrical, vermiform ; head relatively short, cervical groove incomplete.

Peraeon segments longer than deep, with well marked mesial sternal ridges, first segment free from head ; pleon segments with pleura feebly expanded downwards ; tail-piece long, smooth, without a suture between the sixth pleon segment and telson ; posterodorsal edge of telson emarginate with corresponding lateral margins crenulate.

¹ Nicholls, G. E., *Pap. & Proc. Roy. Soc. Tasmania* 1942 (issued Aug. 1943) ; and *ibid.*, 1943 (issued Dec. 1944).

² Chopra, B. N., and Tiwari, K. K., *Rec. Indian Mus.* XLVII, pp. 277-290 pl. xvii-xx (1950).

³ It refers to the paper by Chopra and Tiwari (1950), cited above.

⁴ The genus *Nichollisia* Chopra & Tiwari.

Both mandibles with lacinia mobilis; maxillula with numerous setose spines on the proximal endite; coxae of peraeopods not fused with pleura of related segments, nor their bases expanded; pleopods without coupling hooks or epipodites, almost free from setae or spines, endopodite mesially cleft, exopodite bilobed with the second lobe lateral in position; uropods long, smooth, distomesial edge of the peduncle armed with three blunt tubercles; outer ramus of the uropod longer than the inner, lamella with a tuft of stiff setae at the apex; the inner ramus short, stout, shaped like the blade of a sickle.

Penial stylet free from endopod, curved, with a complex musculature.

Type genus.—*Nichollsia* Chopra & Tiwari, 1950.

Remarks.—Family Nichollsidae contains characters peculiar to itself and also those occurring in other phreatoicoid families.

With Amphisopidae this family agrees in the general structure of mouth parts. They are clearly amphisopine. The presence of lacinia mobilis on both the mandibles is a distinctive feature of Amphisopidae which it shares with the Indian family. Again the condition of cervical groove, multi-jointed filament of antennule, presence of several plumose setae on the proximal endite of maxillula and the structure of maxilla link Nichollsidae with Amphisopidae.

The general facies of *Nichollsia* is, however, more phreatoicine, than amphisopine. As in Phreatoicidae, the first peraeon segment in Nichollsidae is free from the head, the coxae of peraeopods are not fused with pleura of related segments and the bases of peraeopoda are not flattened.

The similarity of Nichollsidae with Amphisopidae and Phreatoicidae seem to end here. It has many unique features of its own, new to the suborder. The most important characters, however, relate to the pleontelson.

As pointed out by Prof. Nicholls the telson and uropods of *Nichollsia* are very peculiar and "have nothing like it in living or fossil forms". Without any exception the tail-piece and uropods in all phreatoicoid isopods are armed with several spines and there is a distinct suture marking the boundary between the sixth pleon segment and telson. In Nichollsidae this suture is absent and by way of armature there are only three spines on each side on the antero-inferior pleural margin of tail-piece. The uropods, with the outer rami much longer than the inner, show a condition very much like that in syncarida and reverse of that met with in all members of Phreatoicoidea. The emarginate postero-dorsal edge and the crenulate postero-lateral margin of telson of *Nichollsia* is, similarly, without parallel in the suborder.

The sexual dimorphism in the outer ramus of uropods is an interesting feature of *Nichollsia*. In the females the outer ramus, although longer than the inner, is never very long. In the males, although the young ones resemble females, as growth proceeds the size of the outer ramus increases at a faster rate and in the large specimens it may be one and a quarter times as long as the tail-piece.

The pleopods of Nichollsidae agree with those in other families in the structure of the exopodite of the first pair. But the endopodites of all, and exopodites of remaining four pairs, are typically nichollsine. The

mesially cleft endopodite of pleopod is not met with in Amphisopidae and Phreatoicidae and probably it represents a condition unique in whole of the order Isopoda. The exopods of second to fifth pleopods, though bilobed as in other Phreatoicoids, have the lobes laterally placed unlike others where the general condition is that these lobes are terminal. The tendency towards lateral displacement of these lobes is present in the subterranean amphisopid genera *Hyperoedesipus* and *Phreatoicoidea*. There are no coupling hooks on the sympodites of pleopods in Nichollsidae, and there is a general absence of setae or hairs from the entire pleopods. As in *Hyperoedesipus* and *Phreatoicoidea* there are no epipodites on pleopods. All other members of Phreatoicoidea have epipodites on the posterior three or four pleopods.

Judged from the behaviour of live animals of this family in the laboratory, the pleopods seem to be exclusively respiratory in function and do not appear to have any active role in propulsion. In fact, the members of this family are no good swimmers at all, and when compelled to do so the movements very much resemble those of a caterpillar disturbed in his rambles.

The distinctive characters of Nichollsidae are no doubt, due to its isolation from the parent stem at a very early period in the geological history. Hardly any of these characters can be classed as primitive except perhaps the sternal ridges on the peraeon segments. The subterranean habitat of this family has led to specialisation of many features. On the other hand the ancient characters of Nichollsidae are those that it shares with Amphisopidae and Phreatoicidae. These are not many and are easily outnumbered by its distinctive features. It is, therefore, quite reasonable to separate the Indian genus from Amphisopidae, where it was placed by its authors, and to keep it in a new family.

The addition of Nichollsidae raises the number of families in the suborder Phreatoicoidea to three, which can be distinguished from each other as follows :

I. *Lacinia mobilis* on both mandibles.

- A. Endopodite of pleopods mesially cleft ; outer ramus of uropod longer than the inner.]

NICHOLLSIDAE.

(Monotypic : India.)

- B. Endopodite of pleopods entire ; outer ramus of uropod shorter than the inner.

AMPHISOPIDAE.

(South Africa ; Australia ; Tasmania.)

II. *Lacinia mobilis* only on the left mandible.

PHREATOICIDAE.

(Bassian region of Australia ; New Zealand.)