

## A Summary of the Tasmanian Phreatoicids: A Contribution to the Biological Survey of Tasmania

By

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In a recently published account of the *Phreatoicoidea*, there was proposed a division of that sub-order into two families, the *Amphisopidae* and the *Phreatoicidae*. The former, which is marked by a more primitive condition of the mouth-parts (particularly the mandibles and the maxillulae) is represented to-day by about seventeen living species; in addition one extinct species is known. These Amphisopid forms are divisible into five sub-families and are widely distributed, occurring in South Africa and Australia, but—while on the Australian mainland they are recorded from the South-West, from the Northern Territory, from South Central Australia, from Gippsland, the Grampians and the Otways in Victoria—very few (only three) are known from Tasmania, and two of these are somewhat doubtfully assigned to this family.

Of the second family, the *Phreatoicidae*, which make up a much larger assemblage (about forty species and sub-species) more than half are Tasmanian. They are divided into three groups which are conveniently named as sub-families. Of these the first (*Phreatoicinae*) consists wholly of blind forms restricted to southern New Zealand and South Eastern Australia (the Dividing and Plenty Ranges in Victoria, and Barrington Tops in New South Wales); about a dozen species are known and they seem to furnish a link between the *Amphisopidae* and the *Phreatoicidae*. Of these latter, the great majority are included in the sub-family *Paraphreatoicinae*, almost exclusively Tasmanian, occurring widely scattered over the island. The few mainland forms which survive to-day are known only from isolated mountain tops in the Victorian Alps.

A third and smallest of these sub-families is the *Mesacanthotelsoninae*, which, except for one (an Australian) species, appears to be confined to the Great Lake and Arthur Lake. Its interest lies in the retention by some of its species of peculiarly primitive characters which have been lost by practically all other living forms—*Mesacanthotelson* itself retaining a remarkably close resemblance to that enigmatic fossil *Acanthotelson* from the Carboniferous of North America, while *Onchotelson* is almost unique among living Malacostraca in preserving a well-defined first thoracic segment.

In the following list of Tasmanian species reference is, for the sake of brevity, made only to the paper on 'The Phreatoicoidea' which has appeared in two parts (I and II) in the 'Papers and Proceedings of the Royal Society of Tasmania' for

the years 1942 and 1943 (published in 1943 and 1944 respectively); in that may be found a complete synonymy and list of literature. Species represented in the material brought together by the Tasmanian Biological Survey are indicated here by the abbreviation 'Biol. Surv.', those from the writer's collection, by the initials G.E.N. Types of new species are lodged in the collection of the Tasmanian Museum, Hobart. Only of *Hypsimetopus intrusor* Sayce and of *Colubotelson tattersalli* Sheppard are there no representatives in that collection, the types of these two species being preserved respectively in the National Museum, Melbourne, and the British Museum, London.

### Family 1. THE AMPHISOPIDAE

#### Sub-family 4. PHREATOICOPSINAE.

#### (1) URAMPHISOPUS PEARSONI Nicholls

1943, I, pp. 124-130.

The eyes, notwithstanding their size and prominence are probably undergoing reduction, there being but comparatively few facets; the species is outstanding on account of the large inner process of its uropod which gives to that appendage a tri-radiate appearance. It is restricted to the Great Lake, in the floor of which it probably leads a burrowing life; it has been obtained only from the stomach of trout: the female is unknown, the male may reach a length of 22 mm. and, in spirit-preserved material is of a dull brown colour. (Biol. Surv.)

#### Sub-family 5. HYPSIMETOPINAE

#### (2) HYPSIMETOPUS INTRUSOR Sayce

1943, I, pp. 131-2.

This is a blind, subterranean form, taken once only from burrows in the earthen dam of a mine 'near Zeehan, West Tasmania', 1901. Only the male is known. In life it is probably translucent, in spirit becoming an opaque creamy white.

#### (3) PHREATOICOIDES LONGICOLLIS Nicholls

1943, I, pp. 136-144.

Like the preceding, this is a blind subterranean form from Western Tasmania. In life, it is translucent, colourless except for small and variable patches of pale yellow: the intestine showing through as a dark thread. Alcohol-preserved material is dull white and opaque. It has been taken somewhat freely under logs on the old 'corduroy' trail from Queenstown to Zeehan, in muddy hollows on the slopes of Mt. Heemskirk and, in boggy country, about thirteen miles from Gormanston, on the Lyell Highway. The first of these is now (January, 1944) ruined, as a collecting ground, by the draining which has accompanied the making of new roads from Queenstown to Zeehan and Strahan. (G.E.N.)

### Family 2. PHREATOICIDAE

#### Sub-family 7. MESACANTHOTELSONINAE

All of the members of this sub-family have large, prominent, many-faceted eyes, in this respect resembling the condition of most of the Amphisopidae.

## MESACANTHOTELSON Nicholls

1944, II, p. 61.

Members of this genus are readily distinguished by two conspicuous features— (i) the body is raised into a series of transverse ridges set with spines or strong setae, and (ii) the telson is produced backwardly into a stout sub-cylindrical process; the uropods are relatively long. Four species are known which, with one exception, are restricted to the Great Lake.

## (4) MESACANTHOTELSON SETOSUS Nicholls

1944, II, pp. 62-67.

There are a pair of tubercles on the head between the eyes; the transverse ridges on the segments for the most part bear stiff setae rather than spines; the telsonic process is slightly upturned and somewhat flattened, and is shorter than that of *tasmaniae*. Males reach a length of about 19 mm., females are known only in an immature condition. The colour, in spirit, is a more or less uniform dull grey; it was first taken by Miss Spargo, dredging along the old shoreline at the north end of the Great Lake, but has since been found sparingly in the stomach of trout. (Biol. Surv.; G.E.N.)

Some material, apparently referable to this species, has been taken quite recently and, being preserved in formalin, has retained, what may be assumed to be, more nearly the coloration in life. As a whole the specimens appear to be of a dull brown tint, but examined with the aid of a lens that effect is found to be due to a combination of two distinct colours. Upon each segment there is developed a narrow transverse stripe of a brown so dark as to be nearly black, followed by a more variable transverse band of dull yellow—posteriorly this yellow band increases in width as the segments increase in length. There is here, without doubt, a coloration which would render inconspicuous an animal living, as this does, amongst the slender vertical stems of the water-reed so widespread over the floor of the Great Lake. It may account for the fact that this species is one which has been taken relatively rarely from the stomach of trout.

From Arthur Lake there are a few specimens which came under my notice too late for inclusion in Part II of the Phreatoicoidea. They form part of the Tasmanian Biological Survey collection and were secured by J. V. Tanner (14.3.39). A superficial examination suggests that they should be assigned to this species and it would be extremely interesting to know whether there has been, in recent years, any transference of material from the Great Lake.

## (5) MESACANTHOTELSON TASMANIAE (G. M. Thomson)

1944, II, pp. 67-77.

A large, rather slender, spinous form with telsonic process long, projecting directly backwardly and set with spines along its length and, also, terminally; colour in life greyish to dark-brown, generally relieved on antennae and legs by brilliant bars of orange or reddish-brown, length about 24 mm.; found beneath stones or on the floor of the Great Lake and taken not infrequently from the stomach of trout (Biol. Surv.; G.E.N.).

## (6) MESACANTHOTELSON DECIPIENS Nicholls

1944, II, pp. 77-82.

Rather like *tasmaniae*, but a much smaller form with the transverse ridges much less developed and bearing setae; the telsonic process is shorter and distinctly

upturned and armed terminally with two pairs of stout spines, and with numerous setae. Its colour in spirit is grey to greyish-brown; in life it probably lacked the reddish bands on the appendages: it is known only from a few specimens taken from the stomach of trout. (Biol. Surv.)

(7) MESACANTHOTELSON FALLAX Nicholls

1944, II, pp. 82-86.

A small, rather rare, species in which the transverse ridges, though reduced, are armed with spines, although these, as compared with *tasmaniae*, are relatively few. It differs from the other species of *Mesacanthotelson* in that the terminal process is distinctly flattened and tapers into a sub-triangular process armed with two spines laterally and two terminally. Like the preceding, it is known only from material obtained from the stomach of trout. (Biol. Surv.)

ONCHOTELSON Nicholls

1944, II, pp. 86-87.

This genus differs from the preceding in that the telsonic process is notably flattened and so sharply turned up as to give to the end of the body a hook-like form. The transverse dorsal ridges on the body are well developed and bear numerous fine setae: on the sides the body is strongly sculptured; the uropods are short.

(8) ONCHOTELSON BREVICAUDATUS (G. M. Smith)

1944, II, pp. 87-96.

Body strongly ridged, these ridges bearing setae dorsally. The animal occurs plentifully on the floor of the Great Lake (1), is straw-yellow in colour and reaches a maximum length of about 15 mm. (Biol. Surv.; G.E.N.)

(9) ONCHOTELSON SPATULATUS Nicholls

1944, II, pp. 96-99.

Differs from *brevicaudatus* (and indeed from all known Phreatoicids) in bearing conspicuous, paired lateral spatulate outgrowths, arising from the coxae at the junction of the thoracic limbs with the body: colour, in alcohol, a greyish-yellow. Only once taken (in April, 1939) by Dr. Pearson from under stones on the shore at a point which is now some score of yards out in the lake due to the continued elevation of the water-level of the lake. (Biol. Surv.)

Sub-family 8. PARAPHREATOICINAE

**Paraphreatoicus** Nicholls

1944, II, p. 104.

(10) PARAPHREATOICUS RELICTUS Nicholls

1944, II, pp. 105-108.

Has been taken abundantly under stones in Stringy-Bark Creek near the railway station at Woodbury. The animal differs from all other members of this sub-family in that the endopodite as well as the exopodite of the first pleodod retains

(1) Some specimens undoubtedly referable to this species, accompanied by a few *chiltoni*, were found in the stomach of a 'box fish' caught in the Derwent Estuary, that is, in salt water. Since this species is known only from the Great Lake, it is probable that these were specimens washed down by way of the Shannon and picked up (probably dead) by the ground-feeding fish.

a heavy fringe of setae. The largest male specimens are about 12 mm. in length; of the female only immature examples have been seen. The colour in life is dark-brownish grey, matching the mud of the creek bed. Specimens have also been taken in the tiny creek running down through St. Peter's Pass, but these seem to differ in the condition of the first pleopod and may have eventually to take rank as a new sub-species. (Biol. Surv.; G.E.N.)

## COLUBOTELSON Nicholls

1944, II, p. 108

Members of this genus are found widely distributed over much of Tasmania, the species being rather difficult to distinguish. In all of them the telsonic process is reduced to a short stump which is sharply upturned and bears four terminal spines (except, perhaps, *tattersalli*); on the first pleopod the endopodite has no setal fringe.

## (11) COLUBOTELSON THOMSONI Nicholls

1944, II, pp. 111-113

About 12 mm. long, this species is found abundantly on the summit of Mt. Wellington and may be found also in the overflow from the Ridgeway Reservoir. Its colour (in spirit) is light-brown with darker brown marblings over much of the surface. (Biol. Surv., G.E.N.)

## (12) COLUBOTELSON EVANSI Nicholls

1944, II, pp. 114-115

A small species (about 10 mm.) of dull yellow-brown colour, taken in 1929, at Waratah in West Tasmania in ditches near the hotel. (G.E.N.)

## (13) COLUBOTELSON CAMPESTRIS Nicholls

1944, II, pp. 116-118

Another small species (about 10.5 mm. in length) known only from a waterhole and a creek at Huntingfield, near the Derwent Estuary. Brownish, with darker marblings. (G.E.N.)

## (14) COLUBOTELSON HUONENSIS Nicholls

1944, II, pp. 118-121

A light-brown Phreatoicid about 14 mm. long, taken in ditches at little above sea-level at Kermadie near Port Huon. (G.E.N.)

## (15) COLUBOTELSON HUONENSIS sub-species FLYNNI Nicholls

1944, II, p. 121

This is known only from juveniles taken in January, 1928, by Professor Flynn from a roadside puddle at Eaglehawk Neck. It differs from other species in the unusual degree of development of the toothed spine at the end of the peduncle of the uropods.

## (16) COLUBOTELSON GESMITHI Nicholls

1944, II, pp. 122-124

A pale greyish-brown species taken in January, 1928, from under water plants in small creeks crossing the trail up Mt. Field, the largest male not reaching 11 mm., one female measured 9 mm. The eyes are small, almost obsolete, obviously far gone in degeneration. (G.E.N.)

## (17) COLUBOTELSON CHILTONI Sheppard

1944, II, pp. 124-126

Originally regarded by G. Smith as a sub-species of *australis*, it is abundant in the Great Lake. Dark-brown with marblings and markings of lighter colour, about 14 mm. long. It occurs also in the Shannon Lagoon. The profile of the tailpiece shows an angular projection immediately beneath the telsonic projection. (Biol. Surv.; G.E.N.)

Specimens taken recently near Bronte (Marlborough) in a small moorland creek seem to be indistinguishable from *chiltoni*. Others, also taken recently from a 'billa-bong' alongside the Lake St. Clair-road, are very near akin and with still others (sent by Mr. A. Bingham of Gormanston and taken from the stomach of trout caught in Lake St. Clair), are probably to be referred to a sub-species only of *chiltoni*.

## (18) COLUBOTELSON CHILTONI sub-species MINOR Nicholls

1944, II, pp. 126-127

A smaller form, differing little from *chiltoni*, which it resembles in colour. Taken by Miss Hutchinson in February, 1928, from Pine Lake. (G.E.N.)

## (19) COLUBOTELSON CHILTONI sub-species SAYCEI Nicholls

1944, II, pp. 127-130

In spirit, pale yellow with dendroid marking of chocolate-brown. Taken by Professor Spencer in Lake Petrarch about 1900. The types are preserved in the National Museum, Melbourne.

## (20) COLUBOTELSON FONTINALIS Nicholls

1944, II, pp. 131-132

Resembling *chiltoni* in size, slightly paler in colour. Occurs freely in surface waters around Lemana Junction and Deloraine. This species is tending to become blind, many specimens showing an advanced stage of degeneration of the eyes. (G.E.N.)

## (21) COLUBOTELSON TATTERSALLI Sheppard

1944, II, pp. 133-135

Recorded by Miss Sheppard from 'under stones along the shore of the Great Lake at Todd's Corner'. It is small (10 mm. in length) and, as described, differs from all other recorded species of this genus in having but two spines on the end of the telsonic projection. The colour (spirit material) is described as dark-brown. The telsonic pleura curve away smoothly from the telsonic process to the uropod, in this resembling *C. intermedius*.

## (22) COLUBOTELSON TATTERSALLI sub-species DUBIUS Nicholls

1944, II, pp. 135-139

The specimens recorded under this name were taken recently (Dec., 1943) from beneath stones in the bed of Todd's Creek at the point where it discharges into the Great Lake. With the damming of the Great Lake a large area, once swampy ground, has been submerged and the old shoreline is now some distance out in the lake. Along the present shoreline no stones were found, nor were any Phreatoicids taken by dredging in shallow water in this area, but in the creek itself specimens were fairly abundant. Agreeing in colour with Miss Sheppard's description of *tattersalli*, but differing in that the apex of the telsonic process was armed, as is usual in this genus, with four spines. The antennary flagellum did not show the features recorded by Miss Sheppard for *tattersalli*. The largest specimen—a male—was nearly 14 mm. in length. (G.E.N.)

## (23) COLUBOTELSON INTERMEDIUS Nicholls

1944, II, pp. 139-142

Probably the commonest of the Great Lake forms; large specimens may reach a length of 14 mm. In life the colour is brownish or greyish-brown, the pigment upon the bases of the peraeopods distributed only in fine veinings, whereas in *chiltoni* it is in solid splashes; after prolonged preservation in spirit, the colour fades to a pale yellowish-brown. This species agrees with *tattersalli*, and differs from *chiltoni* in its telsonic profile, which is smoothly convex beneath the telsonic projection. (Biol. Surv.; G.E.N.)

## (24) COLUBOTELSON SETIFERUS Nicholls

1944, II, pp. 142-144

A very slender, almost vermiform, animal, the male about 11 mm. long. In spirit, specimens had a pale creamy tint. Collected once only from a damaged part of the pipeline leading from the local reservoir to Scottsdale. (G.E.N.)

From Mt. Arthur, which lies on the far side of the watershed from that which supplies the reservoir at Scottsdale, a small number of Phreatoicids has been sent me by Miss L. van Gooch of the Queen Victoria Museum, Launceston. These have not yet been carefully studied, but the preliminary examination suggests they are probably distinct from *setiferus*. The body is rather more robust and quite distinctly pigmented.

Yet another species, as yet unnamed, must be referred to the genus *Colubotelson*. This has recently been collected from a weed-grown ditch near the top of the Golden Valley, some twenty odd miles south from Deloraine. The country here is recently-cleared beech forest land, some tree ferns still standing. The half dozen examples are all immature, but agree with *setiferus* in that the body has very little pigment. (G.E.N.)

## METAPHREATOICUS Nicholls

1944, II, p. 144

This genus differs from *Colubotelson* in the possession of six terminal spines upon the apex of the telsonic projection. The Australian representative is *M. australis* from Kosciusko. Two Tasmanian species are known.

## (25) METAPHREATOICUS MAGISTRI Nicholls

1944, II, pp. 149-151

Large males reach 15 mm. in length; the species has been taken in a small swamp (and ditch draining therefrom) on the sandspit that joins the northern and southern parts of Bruny Island. In colour it is practically indistinguishable from *australis*. (G.E.N.)

## (26) METAPHREATOICUS AFFINIS Nicholls

1944, II, pp. 151-154

Known only from a very few specimens taken by Miss Spargo on Wombat Moor. The largest measured 13 mm., and the colour in spirit is a light-brown. It is unusually difficult to classify this species, for it shows relationships with several other Tasmanian forms and is perhaps intermediate between *Metaphreatoicus* and *Colubotelson*. (G.E.N.)