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A NEW SPECIES OF *BONELLIA* (ECHIUROIDEA) FROM NORTHERN TASMANIA

By

A. J. DARTNALL

Tasmanian Museum, Hobart, Tasmania

(With four text figures)

ABSTRACT

A new species of *Bonellia* is described from Northern Tasmania. The female differs markedly from the other Australian species in the form of the nephridium and the dwarf male has no clasper or sucker at the posterior end.

♀, length of body 34 mm, width of body 15mm, length of proboscis 43 mm. Dissected immature specimen not containing eggs or dwarf males. T.M. Reg. No. K227.

INTRODUCTION

There are no published records of *Bonellia* from Tasmanian waters. Nielsen (1963) summarised the information concerning the Australian species of *Bonellia* to that date. Edmonds (1966) recorded *Bonellia gigas* Nielsen and an undetermined species belonging to that genus from the collections of the Port Philip Survey.

Keys to the Australian genera of Echiuroidea are given by Edmonds (1960 and 1963).

Three species of *Bonellia* are now known from Australia, viz., *Bonellia haswelli* Johnston and Tiegs from Port Jackson, New South Wales; *Bonellia gigas* Nielsen from Flinders and Point Lonsdale, Victoria and the species described hereafter from Northern Tasmania.

To facilitate comparison the following account follows that of Nielsen (1963) as closely as possible. All measurements are given in millimetres from specimens preserved in 10% formalin.

TYPE LOCALITY AND HABITAT

Three specimens were collected from Jacobs Boat Harbour, Northern Tasmania on 31 August 1969 by Jean A. Dartnall. Jacobs Boat Harbour (40° 56' S, 145° 39' E) is designated the type locality of the new species. The animals were found at low tide level, on sand under rocks in the gullies of Precambrian quartzite which compose the beach.

TYPE MATERIAL

Holotype: ♀, length of body 73 mm, width of body 22 mm, length of proboscis 63 mm. Tasmanian Museum Reg. No. K224.

Allotype: ♂, T.M. Reg. No. K225.

Other paratypes: ♀, length of body 57 mm, width of body 18 mm, length of proboscis 82 mm. Dissected specimen. T.M. Reg. No. K226.

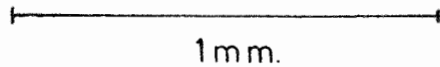
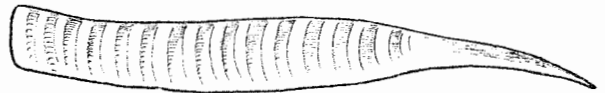


FIG. 1.—*Bonellia tasmanica* n. sp. Cheta of female.

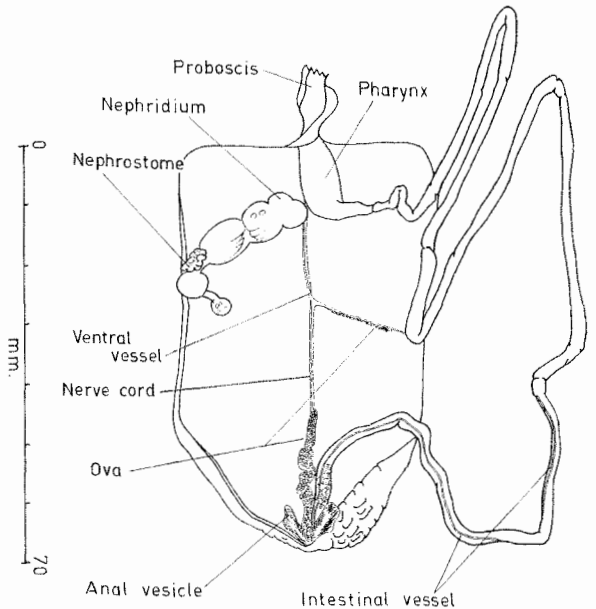


FIG. 2.—*Bonellia tasmanica* n. sp. Female dissected from dorsal side.

Phylum ECHIUROIDEA

Family BONELLIDAE

Genus BONELLIA Rolando

Bonellia tasmanica n. sp.

Description of Female

The body of the female is sac-like with a long proboscis, bifurcate at the end. The shape of the living animal is very plastic as it is in almost constant movement.

The epidermis of the body is the deep grey-green usually recorded for these animals. The proboscis is a slightly paler green and the edges of the bifurcated tip are coloured off-white. The epidermis is covered with transverse rows of flattened papillae which are more prominent towards the extremities of the body than on the median portion.

A ciliated groove runs along the dorsal side of the proboscis to the mouth at its base. The anus is surrounded by flattened papillae.

Two chetae project on the ventral side of the animal just posterior to the external opening of the nephridium. The chetae are about 1.3 mm long and have a maximum width of about 0.12 mm (fig. 1). About 0.3 mm of each cheta projects through the skin, the remaining broader portion, which is not flattened, being embedded in muscle. The protruding portion of the cheta is pointed, smooth and highly refractive. The basal portion is encircled by alternating light and dark brown bands. One immature cheta was found embedded in the skin of one specimen near the mature chetae. It was about 0.8 mm in length and identical to the mature chetae in form except that the basal portion was shorter.

The external opening of the nephridium lies just posterior to the chetae. The opening is raised on a small protuberance and surrounded by blunt papillae.

The general anatomy of the female (fig. 2) differs little from that described by Nielsen in *Bonellia gigas*. The mouth opens into a wide pharynx about 13 mm long which leads into a narrow oesophagus about 15 mm long. The oesophagus opens into a thin-walled intestine some 200 mm in length which is coiled within the body and held in place by numerous mesenteric strands which pass from the body wall to the intestine. There is no intestinal siphon and no portion of the intestine is conspicuously coloured.

A pair of anal vesicles arise from the hind gut close to the anus. They are large, thin-walled vesicles into which open about twenty tubules. The tubules then branch three or four times forming a compact mass. Each terminal tubule bears a ciliated funnel at its extremity. The anal vesicles are attached to the body wall by numerous mesenteric strands which also invest the rectal portion of the intestine.

The vascular system consists of a ventral vessel which divides at the pharynx to produce two vessels which run up either side of the proboscis. An intestinal blood vessel, which runs dorsally along the wall of the intestine for about the posterior two-thirds of its length, leaves the gut to join the ventral vessel. The nervous system consists of a pharyngeal ring and a ventral nerve cord.

The ovary is spread along the posterior half of the ventral blood vessel and a few ova were observed spread along the free length of intestinal vessel. The ovary wall is transparent. Pale yellow developing ova can be seen through the wall. The body fluid of one specimen contained about forty pale yellow ova.

The segmental organ, nephridium or uterus (fig. 3) is on the left side of the animal and opens to the exterior just left of the ventral vessel through the pore described above. The nephridium is an off-white or transparent sac depending upon the thickness of the muscles of the nephridial wall. It is about 24 mm in length and consists of a number of distended sacs separated by sphincters of muscle from which muscle strands radiate over the surface of the organ especially on the ventral side. The nephrostome, situated about two-thirds of the way from the anterior end, is transparent and strongly crenate. The nephridium posterior to the nephrostome consists of two sacs connected by a thick walled tubule. The anterior sac of the nephridium is heavily muscular and consists of a lobed and a smooth portion. Eggs were noted in the first thin walled sac and within the posterior sac. Dwarf males were taken from the former. A total of seventy-two eggs and two dwarf males were removed from the nephridium of the gravid paratype female (Reg. No. K226). There were no eggs in the nephrostome. The eggs are rounded, between 0.4 and 0.5 mm in diameter and crowded with yolk granules.

Description of Male

The male of *Bonellia tasmanica* n. sp. is some 7 mm in length, about 0.8 mm wide at the anterior end and, at the posterior end, has a distinct, tapered tail about 0.7 mm in length.

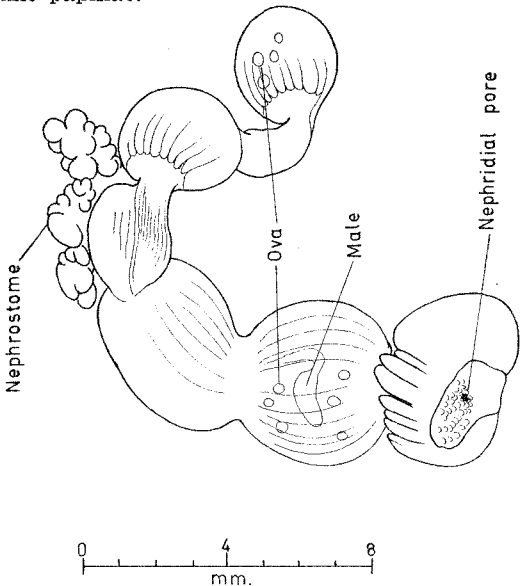
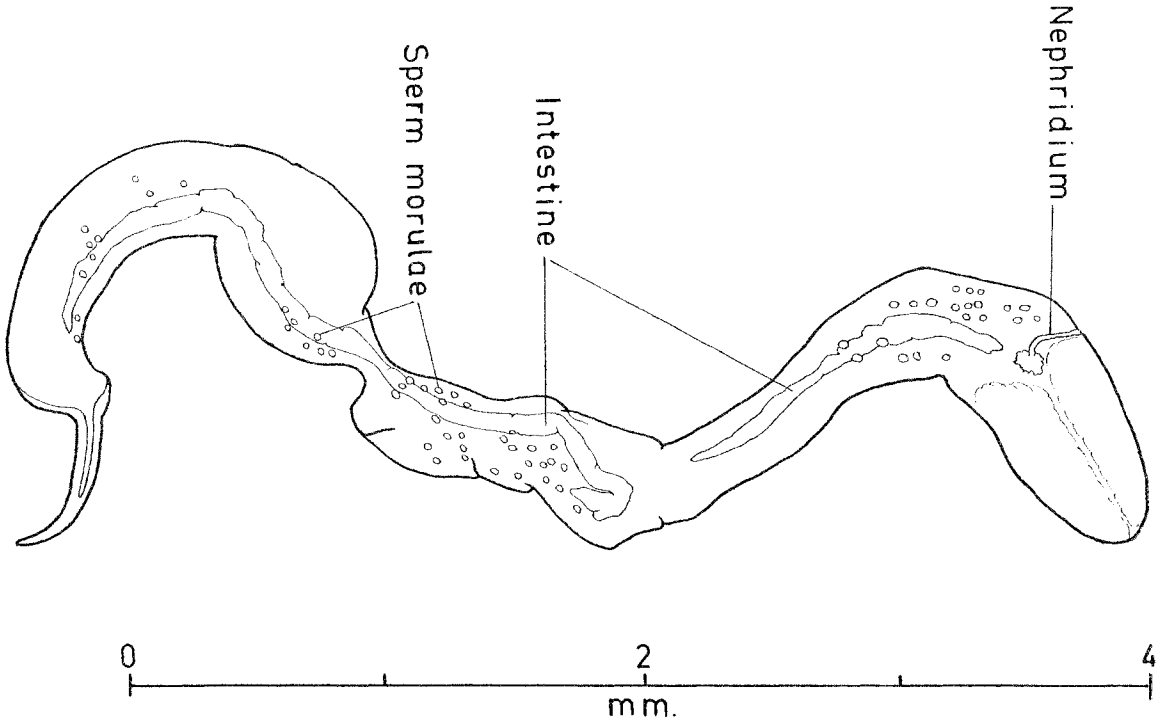


FIG. 3.—*Bonellia tasmanica* n. sp. Nephridium of female from ventral side.

FIG. 4.—*Bonellia tasmanica* n. sp. Male.

The male has no chetae and no clasper or sucker at the posterior end. The general anatomy of the male is illustrated in figure 4.

COMMENTS

The female of *Bonellia tasmanica* n. sp. can be distinguished from that of *Bonellia haswelli* by the absence of an intestinal siphon and from both that species and *Bonellia gigas* by the multisacculate structure of the nephridium.

The male of *B. haswelli* is not known and that of *B. gigas* possesses an anal clasper, a characteristic not shown by the male of *B. tasmanica*.

ACKNOWLEDGMENTS

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