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Note on *Anthobothrium hickmani*, a new cestode from the Tasmanian electric ray (*Narcine tasmaniensis* Richardson)

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(5 TEXT FIGURES)

The presence of Tetraphyllid cestode in the spiral valve of *Narcine tasmaniensis* was pointed out to me by Professor V. V. Hickman, who kindly made available a mount of a scolex and a number of proglottides collected by him some years ago. In April, 1945, two rays were examined for parasites. One contained one worm and the other two worms. The first specimen also yielded a single mobile free proglottid. No gravid proglottides were found. Three small specimens of the same ray examined in June, 1945, appeared free from the cestode.

The tape worm proves to be a hitherto undescribed species of the genus *Anthobothrium* van Ben., 1850. There does not appear to be any previous record of a species of this genus in Australian waters.

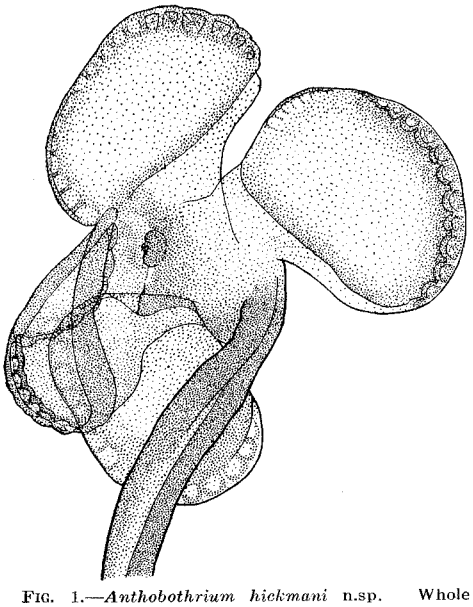

FIG. 1.—*Anthobothrium hickmani* n.sp. Whole mount of a mature scolex (1·5 mm. across).

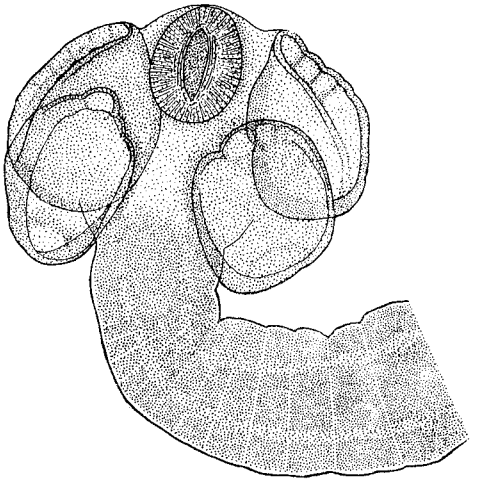

FIG. 2.—Whole mount of a less mature scolex than Fig. 1 (0·6 mm.).

EXTERNAL FEATURES: SCOLEX

The scolex bears four simple pedunculate bothridia, two of which are dorsal and two ventral in position. Each bothridium has the form of a shallow cup, the outer edge of which is formed into a single row of shallow loculi. The form and proportions of the scolex vary with its age and with the degree of contraction of the bothridia. A mature expanded scolex is reminiscent in form of a four-leafed clover. The loculi are more readily seen in the living condition than in mounted material. They may extend completely around the margin of the bothridium or may be lacking from the proximal margin. In the youngest scolex collected, loculi are not in evidence (fig. 3). At the apex of the scolex there is a blunt elevated myzorhynchus which contains a well-developed sucker. In the young specimens whose bothridia do not possess well-developed loculi, this is quite similar to a typical Trematode acetabulum, but the mature scolex possesses a less distinctive structure. This would seem to indicate that a degeneration of the sucker accompanies the expansion and development of the bothridia.

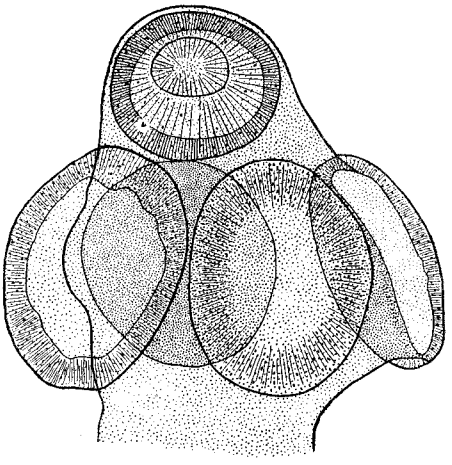

FIG. 3.—Whole mount of a very young scolex (approx. 0·5 mm. across).

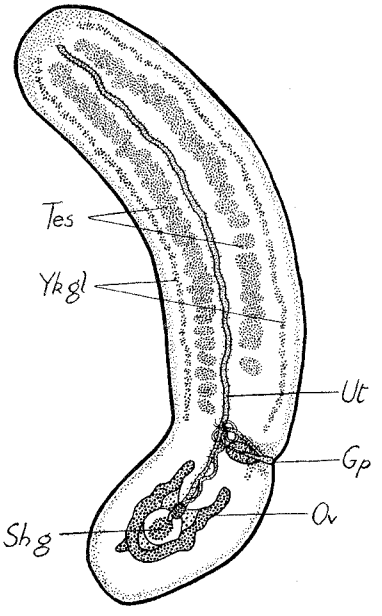

FIG. 4.—Whole mount of a free mobile proglottid.

THE STROBILA

The scolex is followed by a short neck region in which no strobilation is visible. The length of the neck varies with the age and degree of contraction. The proximal proglottides are extremely short (fig. 2), but they become progressively more elongate until at the posterior end they measure 1·2 mm. long and 0·5 mm. wide. The longest worm collected comprised 105 distinguishable proglottides. The strobila is slightly flattened in transverse section and each proglottid is slightly constricted at the level of the genital pore, which is approximately ¼ of its length in front of the posterior end. The genital pores are marginal and alternate irregularly. The proglottides may become free before fertilisation.

GENITAL SYSTEM

Male: There are approximately 60 testes arranged in two single or double rows, lying on either side of the mid-line in the anterior two-thirds of the proglottid. They are somewhat compressed in the mounted specimens measuring approximately 0·6 mm. in diameter. The vas deferens describes several coils before entering the base of the cirrus sac. Within the sac it expands immediately into an unarmed muscular cirrus which runs directly through the sac to the genital atrium. The cirrus is composed of outer longitudinal and inner circular fibres. The sac is ovoid and measures 0·1 mm. long and 0·06 mm. in diameter. In sections of apparently fully-developed proglottides the wall of the sac is membranous and contains no distinct muscle fibres. The space within the sac not occupied by the cirrus is filled by the prostate gland. No distinct cells are visible the gland consisting of a matrix containing numerous small spherical nuclei. The genital atrium is a deep tubular depression 0·76 mm. long and 0·36 mm. in diameter which extends directly inwards from the genital pore to the outer end of the cirrus sac.

Female: The ovary is a U-shaped body which occupies the proglottid posterior to the genital pore. In transverse section the lateral arms of the U, which are directed forwards, are seen to be expanded dorsally and ventrally and constricted medially. Mid-way along their length the two lateral arms taper and come together into oviducts which fuse in the mid-line and pass into a fertilisation chamber. A

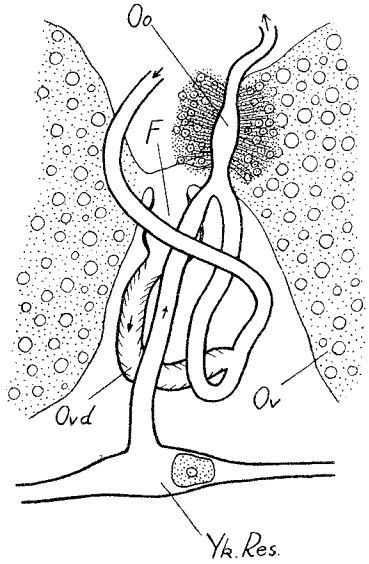

FIG. 5.—Diagram of female complex drawn from transverse sections.

transverse section through this region shows the dorsal and ventral lobes of the arms arranged in the form of an "X." The female duct runs directly ventrally from the fertilisation chamber as a wide ciliated tube. It fuses with the vagina, loses its ciliated lining, and runs dorsally to the level of its origin. Here it fuses with the central yolk duct and enters the shell gland. This is a compact ovoid mass containing numerous small nuclei, arranged radially about the ootype. Beyond

the shell gland the female duct passes into the uterus, which runs forward between the two rows of testes as a wide tube, and extends almost to the anterior end of the proglottid. The vitellaria are very numerous small follicles closely packed into two lateral rows, which extend from the anterior end of the proglottid to just in front of the genital pore. The yolk-collecting ducts from each side unite into a transverse reservoir below the central female complex. The central yolk duct runs directly dorsally from the reservoir to join the female duct. The terminal portion of the vagina lies beside the cirrus sac. It describes a convoluted path backwards between the ovary lobes and descends to enter the oviduct. Throughout its length it is surrounded by very numerous nuclei.

As no gravid specimens were obtained the eggs are not described. The gravid proglottides in the mount supplied by Professor Hickman show the usual shrinkage and distortion of the eggs. These specimens exhibit break-down of the organs of reproduction and expansion of the uterus into a large irregularly lobed sac occupying the whole of the proglottid in front of the genital pore.

AFFINITIES

Anthobothrium hickmani differs from most species of the genus in the relatively simple form of the scolex. It seems most related to *Anthobothrium (Echeinobothrium) simplex* Shipley and Hornell from which it differs in the possession of a distinct myzorhynchus.

REFERENCES

SOUTHWELL, T., 1925.—A monograph on the *Tetraphylidea*. *Liverpool School Trop. Med. Mem. N.S.* no. 2, 1925.

ABBREVIATIONS USED IN TEXT FIGURES.

F, fertilisation chamber; *Gp*, genital pore; *Oo*, ootype; *Ov*, ovary; *Ovd*, oviduct; *Shg*, shell gland; *Tes*, testes; *Ut*, uterus; *Ykgl*, yolk glands; *YkRes*, yolk reservoir.