

NILOCOTYLE HEPATICAE N. SP. FROM HIPPOPOTAMUS AMPHIBIUS

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Opportunity was afforded of examining the carcass of a hippo shot in the Transvaal. The material from this host consisted of—

- (1) *Gigantocotyle gigantocotyle* (Brandes, 1896) Näsmark, 1937;
- (2) *Gigantocotyle duplicitestorum* Näsmark, 1937;
- (3) *Nilocotyle hepaticae* n. sp.

No. 1 and 2 were collected from the stomach and No. 3 from the liver.

NILOCOTYLE HEPATICAE N. SP.

Host: *Hippopotamus amphibius*—liver.

Distribution: Transvaal, South Africa.

Length 2.4 mm. (2.3–2.6 mm.); dorso-ventral width 1.1–1.2 mm. conical in shape, dorsal and ventral lines curved (Fig. 1).

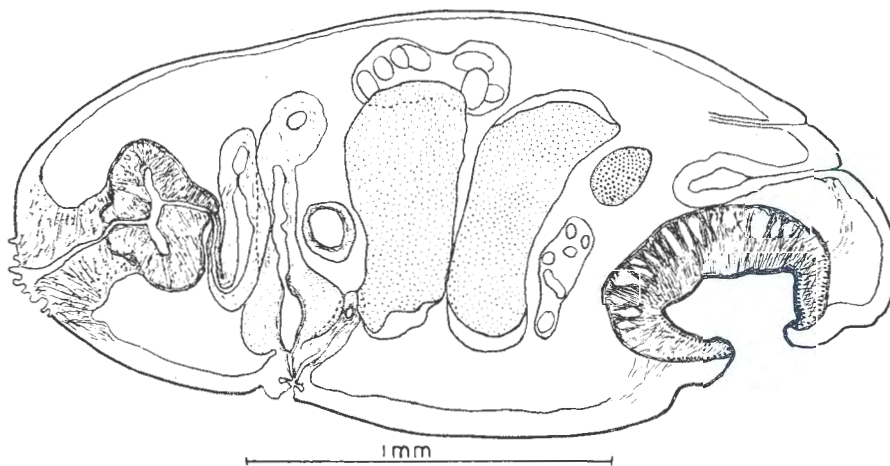


FIG. 1.—A median sagittal section of *Nilocotyle hepaticae* n. sp.

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The acetabulum (Fig. 2) is elliptic in shape with its aperture directed antero-ventrally; the maximum width measured dorso-ventrally is 0.36–0.43 mm. with the maximum length 0.73–0.68 mm. measured antero-postero; the ratio of maximum length to body length being 1:3.6–1:3.4. The acetabulum conforms to Näsmark's



FIG. 2.—A median sagittal section of the acetabulum of *Nilocotyle hepatica* n. sp.

Nilocotyle type, a division of the musculature into dorsal external 1 circular and dorsal external 2 circular being absent. The dorsal external and ventral external circular muscle units are of uniform length throughout. The dorsal internal and ventral internal circular muscle units are better developed than the dorsal external and ventral external circular; a difference exists in the size of the units. The number of units in the various circular muscle series is as follows: dorsal external circular 17, dorsal internal circular 24, ventral internal circular 19 and ventral external circular 17. The radial muscle fibres are typical for the nilocotyle paramphistomes, as described by Näsmark.

The pharynx conforms to Näsmark's *Dicranocoelium* type. Two very prominent, horse-shoe shaped lip-sphincters are present, situated on each side of the oral opening (Fig. 3, 4 and 5); these lip-sphincters extend the full width of the pharynx, and are discontinued in the median dorsal and ventral sagittal planes with their convex sides directed anteriorly and the lumen of the pharynx extending into the concave posterior sides. Although according to Näsmark's system this concentration of muscular fibres is called a lip-sphincter (the term as such is retained in this article), the author is of the opinion that it does not play the role of a lip-sphincter at all. It is more in the nature of a functional adaptation used as a means to circulate the contents of the pharynx. The walls of the oral opening are very strongly developed being more massive than the walls of the pharynx. This massive development of the

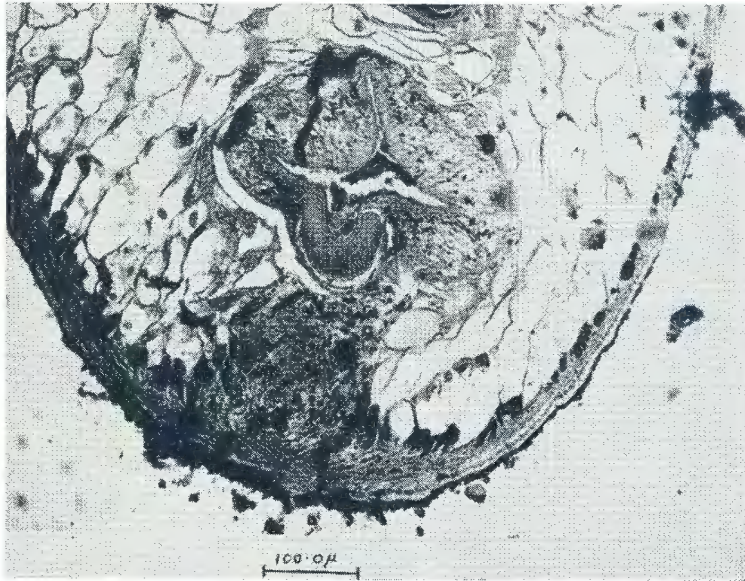


FIG. 3.—A sagittal section of *Nilocotyle hepaticae* n. sp. showing the lip-sphincter.

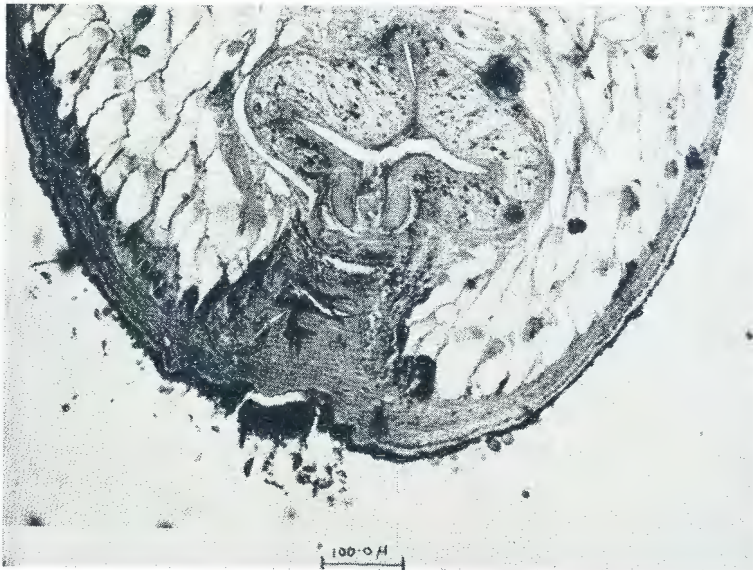


FIG. 4.—A more median sagittal section of *Nilocotyle hepaticae* n. sp. showing the lip-sphincter divided into dorsal and ventral portions.

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walls of the oral opening could easily be confused as being an extension anteriorly of the pharynx, especially in a median-sagittal plane (Fig. 5), but as this portion is clearly delimited from the pharynx proper by the lip sphincters, it must be a separate development. No special attention is given by Näsmark to the form of the lumen of the pharynx in his three newly created species (i.e., *Nilocotyle pygmaeum*, *N. microatrium* and *N. praesphinctris*) which are the nearest related to *Nilocotyle hepaticae* n. sp. When Näsmark's Fig. 101, page 520 (*Nilocotyle gigantatrium*) and Fig. 56, page 382 (*Ceylonocotyle scoliocoelium*) are compared with Fig. 3 to 5 of *Nilocotyle hepaticae* n. sp. it is at once apparent that the form of the lumen of the pharynx differs radically. In *Nilocotyle hepaticae* n. sp. the form of the lumen of the pharynx is a narrow slit running dorso-ventrally in a median sagittal section whereas in the others the lumen is a longitudinal slit. When a frontal reconstruction is made of the pharynx of *N. hepaticae* n. sp. it is also apparent that the lumen of the pharynx is continued as a slit laterally and that viewed frontally the lumen is circular following the contour of the pharynx. The pharynx length, measured antero-postero, is 0.24–0.26 mm., giving a ratio to body length of 1: 9.7–1: 9.9. Pharynx width, measured dorso-ventrally, is 0.45–0.46 mm., giving a ratio to pharynx length of 1.9: 1–1.7: 1.



FIG. 5.—A median sagittal section of *Nilocotyle hepaticae* n. sp. with the lip-sphincter absent.

A strongly developed oesophageal bulb is present (Fig. 5), length 0.31 mm., width 0.15 mm. The oesophagus (length 0.69 mm.) at first turns ventrally, then dorsally to form the strongly developed oesophageal bulb, which is dorsally joined by the two lateral running intestinal caeca.

The genital atrium (Fig. 6) without genital sphincter, but with the sphincter papillae present, conforms to Näsmark's *minutum* type. A muscular, convoluted pars musculosa is present with a very prominently developed pars prostatica.



FIG. 6.—A sagittal section of *Nilocotyle hepaticae* n. sp. showing the genital atrium.

The testes (Fig. 1) are unlobed, more or less wedge-shaped lying one behind the other, elongated dorso-ventrally, and measuring 0.26 mm. in length and 0.73 mm. in a dorso-ventral direction.

The ovary is oval in shape and lies between the posterior testis and the acetabulum, slightly dorsal to the middle of the body. Mehli's gland lies ventral to the ovary on the right side. Measurements of the ovary are 0.21×0.14 mm. and those of Mehli's gland 0.24×0.11 mm.

The opening of Laurer's canal lies 0.13 mm. anterior to the opening of the excretory bladder, these two canals are not crossed. The excretory pore is situated in a line with the anterior border of the acetabulum.

The eggs are 0.137×0.062 mm. (*in utero*).

DISCUSSION

Of the three nearest related species, i.e. *Nilocotyle pygmaeum* Näsmark, 1937, *N. microatrium* Näsmark, 1937, and *N. praesphinctris* Näsmark, 1937, Näsmark had mature specimens of *N. pygmaeum* only at his disposal for study. A table to compare

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the measurements of the four species is given below, but the only comparison that can serve any purpose is that between *Nilocotyle hepatica* n. sp. and *N. pygmaeum* Näsmark, 1937.

	<i>N. hepatica</i> n. sp.	<i>N. pygmaeum</i> Näsmark 1937	<i>N. microatrium</i> Näsmark 1937	<i>N. praesphinctris</i> Näsmark 1937
Body length (mm.)	2·4 (2·3–3·6)	1·53	2·24	2·56
Dorso - ventral meas. (mm.)	1·1–1·2	0·9	0·96	1·1
Acetabulum length (mm.)	0·68–0·73	0·49 diam	0·46	0·61 diam
Ratio of Acet. length to body length	1:3·4–1:3·6	1:2·8	1:4·9	1:4·2
Pharynx length (mm.) .	0·24–0·26	0·32	0·35	0·53
Ratio of pharynx length to body length	1:9·7–1:9·9	1:4·25	1:6·4	1:4·8
Oesophagus length (mm.)	0·69	0·27	0·16	0·3
Testes length (mm.) . .	0·26	0·17	—	—
Dorso-ventral measure- ment (testes) (mm.)	0·73	0·40	—	—
Eggs (mm.)	0·137 × 0·062	0·09 × 0·062	—	—

Striking differences do exist in the measurements given for the four species, but no great importance was attached to this; the main deciding factor in creating a new species, was the difference existing in the structure of the pharynx as described in the text.

REFERENCE

NÄSMARK, K. E. (1937). A Revision of the Trematode Family Paramphistomidae. *Zool. Bidrag from Uppsala*. Vol. 16, pp. 301–565.