

TRICHURIS SPECIES FROM SOUTH AFRICAN RODENTS AND A HYRACOID

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To date three species of *Trichuris* have been described from rodents in Southern Africa, viz. *T. contorta* (Rudolphi, 1819), Hall, 1916; *T. vondwei* Ortlepp, 1938; and *T. parvispicularis* Clapham, 1945. It is impossible to assign specimens to *T. contorta* with any degree of certainty as the description is inadequate. *T. vondwei* and *T. parvispicularis* were both recovered from the cane rat, *Thyonomys swinderianus*. Only one species from a hyracoid has been described, viz. *T. hyracis* Ezzat, 1954 from *Dendrohyrax arboreus*.

A new species of *Trichuris* was obtained from each of the following hosts:—

- (1) *Mastomys natalensis* (Multimammate mouse) from Coopersdal, Komati-poort, Transvaal.
- (2) *Pedetes cafer* (Springhare) from Hammanskraal, Transvaal. This species was also present in three instances in a collection of helminths donated by Dr. F. Zumpt of the South African Institute for Medical Research, and were collected at Bloemhof, Transvaal and at Debeete, Bechuanaland Protectorate.
- (3) *Procavia capensis* (Rockdassie) from Grootfontein, Middelburg, Cape, collected by Dr. C. W. A. Belonje. Further specimens from this host were also collected at Leeukoppie, Hout Bay, Cape.

TRICHURIS VONDWEI Ortlepp, 1938.

Specimens of this species were recovered from *Thyonomys swinderianus* from Zululand. The material consisted of six females and twelve males, but only one male and two females had an intact anterior part. The measurements of this material were as follows:—

Male: Total body length 68·6 mm. Posterior part 15·7 to 26·0 mm. long, maximum width 490 to 805 microns. Spicule 1·63 to 2·10 mm. long. Spicular sheath 200 to 400 microns long, shape variable. Cloaca 1·9 to 3·38 mm. long, spicular diverticulum entering cloaca 1·2 to 2·17 mm. from rear end of body. Ejaculatory duct 7·54 to 12·98 mm. long, vas deferens 7·09 to 10·91 mm. long.

Female: Total body length 52·3 to 54·4 mm. Posterior part 11·02 to 20·68 mm., maximum width 770 to 1,095 microns. Vagina 2·4 to 4·8 mm. long. Eggs, including polar plugs, 49·5 microns long, 31·5 microns wide.

These measurements agree with the description of *T. vondwei*, but show greater variation in the length of the cloaca and the ejaculatory duct and in the length and the maximum width of the posterior part. The distal end of the spicule was not clearly visible in all the males, but in those instances in which its shape could be determined it agreed with that described by Ortlepp.

Remarks

T. vondwei Ortlepp, 1938, and *T. parvispicularis* Clapham, 1945, differ in the length and maximum width of the posterior part of the male.

Clapham does not state the length of the posterior part of the male, but says that it is about one-third of the total length (58–72 mm.); this length would then be 19 to 24 mm. The type material of *T. vondwei* showed very little variation in length (15 to 16 mm.). The present material varied from 15.7 to 26.0 mm. in length. The width of the posterior part of *T. vondwei* is given as 336 to 432 microns; that of *T. parvispicularis* as 700 microns. The present material was found to vary from 490 to 805 microns.

Moreover, in the description of *T. parvispicularis* it is stated: "the distance from the end of the body to the union of the ejaculatory duct with the spicular caecum varies from 0.93 mm. to 1.18 mm., while the distance from the end of the body to the union of the intestine with the vesicula seminalis varies from 1.17 mm. to 1.8 mm." From this description it would appear that the part referred to as the ejaculatory duct is in fact the distal part of the cloaca. The total length of the cloaca would therefore be 1.17 to 1.87 mm., which does not differ greatly from the length found in the type material of *T. vondwei* (1.8 to 2.27 mm.). However, in the present material the cloaca showed a greater variation in length (1.9 to 3.38 mm.).

T. parvispicularis Clapham, 1945 should therefore be considered a synonym of *T. vondwei* Ortlepp, 1938.

TRICHURIS MASTOMYSI *sp. nov.*

The material consisted of 28 males and 21 females recovered from two multimammate mice.

Male: Total length of body 16.9 to 21.7 mm.; posterior part 7.0 to 9.4 mm. long, anterior part 9.2 to 13.3 mm. long, the ratio being 1:1.3 to 1:1.4. Width of head 11.25 to 13 microns, increasing to 100 to 110 microns in the centre of the anterior part and finally attaining a width of 190 to 240 microns at the junction of the oesophagus and intestine. Maximum width of posterior part 330 to 440 microns. Spicule well chitinized, 580 to 750 microns long; width immediately behind the "flare", 16 to 36 microns; in middle of shaft, 13.5 to 18.9 microns, terminating in a blunt tip 9 microns in width. Spicular sheath covered with spines, 58 to 112.5 microns long when extruded. Cloaca 1.4 to 2.2 mm. long, spicular diverticulum entering cloaca 350 to 580 microns from rear end of body. Ejaculatory duct 1.4 to 2.1 mm. long; vas deferens 2.3 to 4.6 mm. long. Testes originate at proximal end of cloaca, 18 to 23 lobulations (Fig. 1).

Female: Total length of body 17.7 to 26 mm.; posterior part 7.7 to 13.3 mm. long, anterior part 10.5 to 14.7 mm. long, the ratio being 1:1.3 to 1:1.36. Maximum width of posterior part 390–510 microns. The vulva situated just posterior to end of oesophagus, round and without prominent structures. Vagina straight, 350 to 560 microns long. Anus subterminal (30 to 40 microns from rear extremity). Eggs, including polar plugs, 51 to 60 microns long by 27 to 31 microns wide.

Host: *Mastomys natalensis*.

Location: Caecum.

Locality: Coopersdal, Komatipoort, Transvaal.

Types in Helminthological Collection, Onderstepoort.

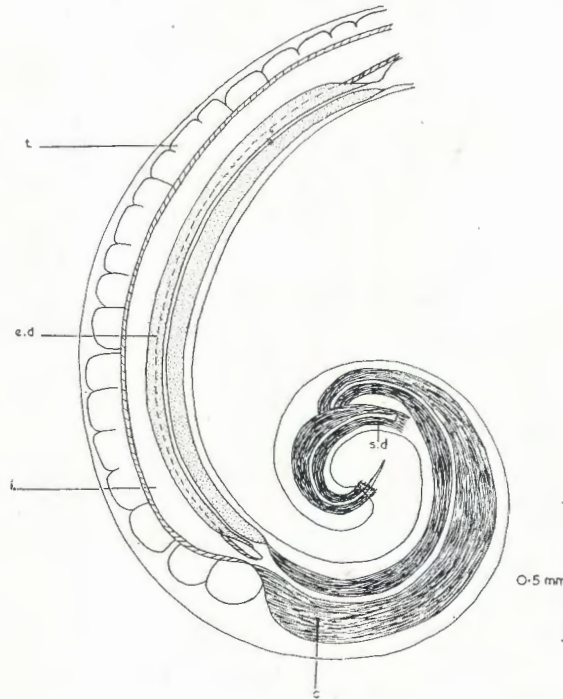


FIG. 1.—Hind end of male *T. mastomysi*.
Abbreviations: c—cloaca; e.d.—ejaculatory duct; i—intestine; s.d.—spicular diverticulum;
t—testes.

Remarks

This species closely resembles *T. muris*, but differs from it in the following:—

- (1) the spicules are shorter (580–750 microns) than in *T. muris* (769 to 887 microns);
- (2) the cloaca is about the same length as the ejaculatory duct, while in *T. muris* it is only a third as long as the ejaculatory duct (Chandler, 1946);
- (3) the vagina is shorter (350 to 560 microns) than in *T. muris* (982 to 1,083 microns).

TRICHURIS PEDETEI *sp. nov.*

Fourteen males and 42 females were obtained from four springhares, *Pedetes cafer*, collected at Hammanskraal (type material) and Bloemhof, Transvaal and at Debeete, Bechuanaland Protectorate.

Male: Total length of body 18.4 to 31.31 mm.; posterior part 6.95 to 12.01 mm. long, anterior part 11.4 to 19.3 mm. long, the ratio being 1: 1.64 to 1: 1.61. Maximum width of posterior part 380 to 550 microns; width of anterior part increases gradually from 15 to 30 microns behind the head, to 180 to 270 microns at the junction of the oesophagus and intestine. Paired conelike papillae on rear

TRICHURIS SPECIES FROM SOUTH AFRICAN RODENTS AND A HYRACOID

extremity, only visible in specimens in which the spicular sheath is retracted. Spicule 1.69 to 2.19 mm. long, 31.5 to 50 microns wide behind the flare and tapering gradually to a blunt point 9 to 13.5 microns in width. Spicular sheath varies greatly in shape; 85.5 to 750 microns in length, proximal diameter 24.3 to 70 microns, distal diameter 29.7 to 220 microns. Sheath covered with spines. Cloaca 3.47 to 5.02 mm. long; spicular diverticulum enters cloaca 0.915 to 1.725 mm. from posterior extremity. Ejaculatory duct 1.37 to 2.38 mm. long; vas deferens 2.035 to 4.07 mm. long. Testes loosely coiled. (Fig. 2).

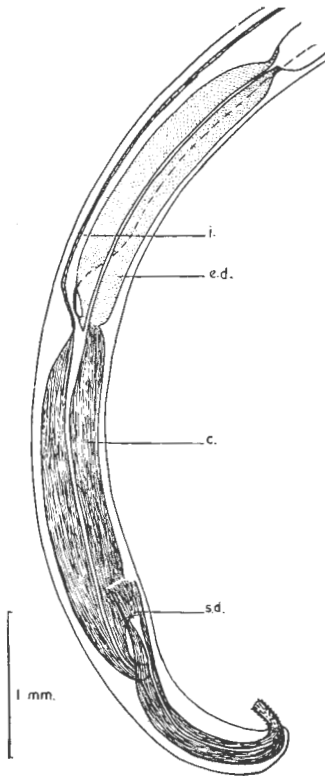


FIG. 2.—Hind end of male *T. pedetei*.

Abbreviations: c—cloaca; e.d.—ejaculatory duct; i—intestine; s.d.—spicular diverticulum.

Female: Total length of body 23.6 to 50.5 mm.; posterior part 8.7 to 20.46 mm. long; anterior part 14.9 to 30.01 mm. long, the ratio being 1: 1.71 to 1: 1.46. Maximum width of posterior part 430 to 750 microns; width of anterior part increases from 20 to 27 microns behind the head, to 103.5 to 300 microns at junction of oesophagus and intestine. Vulva in usual position and appears to have small projections on inner surface. Vagina 1.27 to 1.96 mm. long, slightly wavy and may have straight portions. Anus subterminal; rectum about 300 to 320 microns long. Eggs, including polar plugs, 36–49 microns long and 22.5 to 27 microns wide.

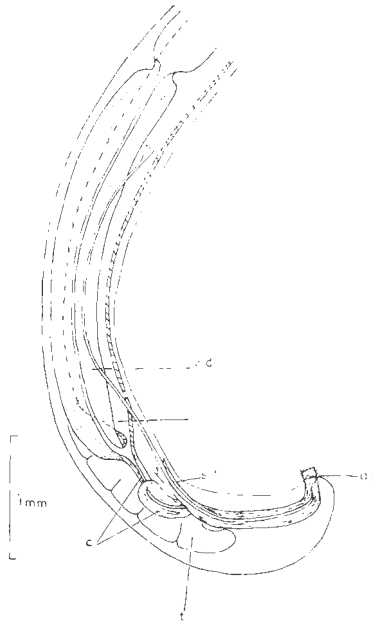


FIG. 3.—Hind end of male *T. procaviae*.

Abbreviations: a.p.—anal papilla; c—cloaca; e.d.—ejaculatory duct; i—intestine; s.d.—spicular diverticulum; t—testes.

Host: *Pedetes cafer*.

Location: Caecum.

Locality: Hammanskraal, Transvaal.

Types in Helminthological Collection, Onderstepoort.

Remarks

T. pedetei differs from *T. vondwei* in the following respects:—

- (1) the spicule tapers evenly, while that of *T. vondwei* is cut out on the one side before ending in a blunt point;
- (2) the cloaca is longer than the ejaculatory duct (3.4 to 5.08 mm. and 1.375 to 2.38 mm., respectively), while in *T. vondwei* it is shorter than the ejaculatory duct (1.17 to 2.27 mm. and 6.8 to 12.98 mm.) (Table 1). In all the species of *Trichuris* described from rodents, except in *T. dipodomis* Read, 1956, the ejaculatory duct is longer than the cloaca;
- (3) the vagina is 1.41 to 1.96 mm. long, while in *T. vondwei* it is 2.4 to 7.1 mm. long;
- (4) the eggs are smaller (36 to 49 by 25.5 to 27 microns) than in *T. vondwei* (60 to 66 by 32 to 33 microns).

TRICHURIS PROCAVIAE *sp. nov.*

The type material consists of two incomplete females and one male collected from the rock dassie, *Procavia capensis*, from Grootfontein, Middelburg, Cape. Seven females of this species were collected from the same host at Leeukoppie, Hout Bay, Cape. One of the latter females had a complete anterior part.

TRICHURIS SPECIES FROM SOUTH AFRICAN RODENTS AND A HYRACOID

Male: Total body length 30·43 mm.; posterior part 10·18 mm. long, anterior part 20·25 mm. long, the ratio being 1:2. Maximum width of posterior part 805 microns; width of anterior part increases from 30 microns behind the head to 245 microns at junction of oesophagus and intestine. Paired cone-like papillae on rear extremity. Spicule 4·88 mm. long, 40 microns wide behind "flare", and tapering gradually to 13·5 microns before ending in a sharp point. Spicular sheath covered with spines, only slightly extruded. Cloaca 1·79 mm. long, looped in form of S before it is joined by the spicular diverticulum. Viewed laterally the proximal part of the cloaca appears as a straight tube, but the proximal loop is at a lower level than the distal loop and the lumen of the proximal loop is visible in optical section where it enters distal loop. Spicular diverticulum enters the cloaca 1·16 mm. from the posterior extremity. The ejaculatory duct 3·79 mm. long; vas deferens 4·28 mm. long. Testes lobed (Fig. 3).

Female: Total body length 43·36 mm. Posterior part 10·25 to 14·92 mm. long, anterior part of complete female 29·42 mm., the ratio being 1:2·1. Maximum width of posterior part 770 to 1,270 microns; maximum width of anterior part increases from 36 microns behind the head to 210 microns at junction of oesophagus and intestine. Vagina 2·45 to 3·44 mm. long, portion behind vulva closely coiled, straightens out before entering uterus. Anus subterminal, rectum 216 to 420 microns long. Eggs, including polar plugs, 67·5 to 72 microns long and 36 to 45 microns wide.

Host: *Procavia capensis*.

Location: Caecum.

Locality: Middelburg, Cape.

Types in Helminthological Collection, Onderstepoort.

Remarks

The only species of this genus that has been described from the Hyracoidea is *Trichuris hyracis* Ezzat, 1954, from *Dendrohyrax arboreus adolfi-friederici* from Kisenyi, Ruanda, Belgian Congo. Only the female is described, and this has a cuticular fold which covers the anus ventrally. This fold is absent in *T. procaviae*.

SUMMARY

1. *Trichuris vondwei* Ortlepp, 1938, and *Trichuris parvispicularis* Clapham, 1943, are considered to be synonymous.
2. Three new species of *Trichuris* are described: *T. mastomysi* from *Mastomys natalensis*; *T. pedetei* from *Pedestes cafer*; *T. procaviae* from *Procavia capensis*.

TABLE I.—Showing length of cloaca, ejaculatory duct and spicules in *Trichurid* species discussed

	<i>T. vondwei</i>	<i>T. mastomysi</i>	<i>T. pedetei</i>	<i>T. procaviae</i>
Length of cloaca (mm.)	1·9 – 3·3	1·4 – 2·2	3·47–5·02	1·79
Ejaculatory duct (mm.)	7·54– 12·98	1·4 – 2·1	1·37–2·38	3·79
Spicules (mm.).....	1·98– 2·58	0·58–0·75	1·69–2·19	4·88

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