

ON SOME HELMINTH PARASITES OF AN EAST AFRICAN
ROCK RABBIT (*PROCAVIA* SP.).

BY MISS M. TURNER, M.Sc.,

Helminthological Department, London School of Tropical Medicine.

During his stay in German East Africa, Captain G. NORMAN HALL, M.R.C.V.S., of the Veterinary Department, Dar-es-Salaam, made an extensive collection of the helminth parasites of various animals. Through the kindness of Captain HALL and of Dr. BARTLETT, of the London Hospital, this collection was forwarded for diagnosis to the Helminthological Department of the London School of Tropical Medicine. Among the specimens were some parasites from Rock Rabbits which had been shot at Dodoma, near Mpapua.

Further examination showed that these included the following nematodes:—*Deletrocephalus brachylaimus*, VON LINSTOW, 1901, *Hoplodontophorus flagellum*, HEMPRICH & EHRENBERG, 1828, nov. gen., *Crossophorus collaris*, H. & E., 1828.

DELETROCEPHALUS BRACHYLAIMUS, VON LINSTOW, 1901.

Owing to the presence of a very long bursa in the male of this species the two sexes are almost equal in length, but the female is stouter than the male. The anterior end of the body is markedly tapering and the head is small in proportion to the rest of the body.

The cuticle is transversely striated at intervals of from 25μ to 30μ (VON LINSTOW gives 21μ).

The œsophagus is from 300μ to 375μ in length. It has a constriction at from 80μ to 125μ from its anterior end and where the nerve ring is situated; behind this the œsophagus dilates until it reaches a diameter of from 125μ to 200μ .

The position of the cervical papillæ is characteristic for they are from 800μ to 840μ from the anterior end of the body; this means that they

are situated almost one and a half times the length of the œsophagus behind the commencement of the intestine. The excretory pore opens in front of the cervical papillæ at about 650μ from the anterior end of the body.

The wall of the intestine, except at its commencement, is impregnated with a brownish pigment.

A mouth collar is present and is relatively high, being from 22μ to 30μ in height. At its base it is 104μ to 130μ wide, while at its anterior end it is from 80μ to 105μ wide: in optical section its lateral margins are trilobed.

The lateral head papillæ end anteriorly in the middle lobe of the mouth collar and do not project far. The submedian head papillæ project in front of the mouth collar, and each consists of a conical base, from which arises a narrow club-like process.

The mouth capsule is ellipsoidal in shape, with its longer axis dorso-ventral. In optical section the mouth capsule walls are from 15μ to 25μ in height, and vary from semi-circular to triangular in shape. The breadth of the mouth capsule is from 60μ to 65μ laterally and from 75μ to 80μ dorso-ventrally.

On the anterior end of the œsophagus is a rim of cuticle into which the mouth capsule fits. In optical section this rim appears as a small pointed projection on each side of the mouth capsule.

Arising from the level of the base of the mouth capsule is a corona of about thirty pointed leaves. Owing to its ellipsoidal shape, this corona appears wider in lateral view than in dorsal or ventral.

In his description of *D. brachylaimus*, VON LINSTOW has apparently mistaken the identity of the several parts of the head region: thus he speaks of "four large papillæ at the base of the head prominence, in the submedian lines." As far as can be made out from his figure these "papillæ" seem to be the optical sections of the mouth capsule. Also, he has evidently taken the fibres leading to the submedian papillæ for the optical section of the mouth capsule, and mistakes the leaves of the corona for rods in the wall of this "capsule."

Female.—VON LINSTOW gives the length of the female as 20mm. and its breadth as 880μ . In the material from German East Africa, the mature females measured from 11mm. to 15mm. in length and from 700μ to 725μ in breadth. The tail is rounded with a small point at its

DELETROCEPHALUS BRACHYLAIMUS
(V.L. 1901).

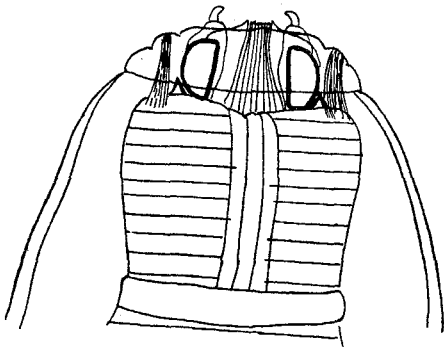


Fig. 1.
ANTERIOR REGION OF BODY.

HOPLODONTOPHORUS FLAGELLUM
(H. & E. 1828).

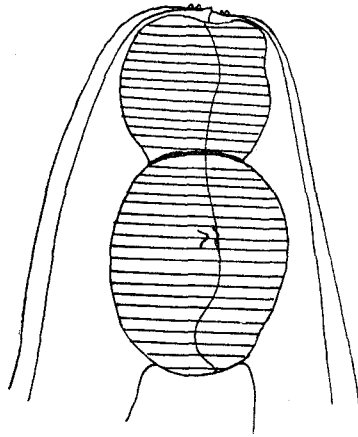
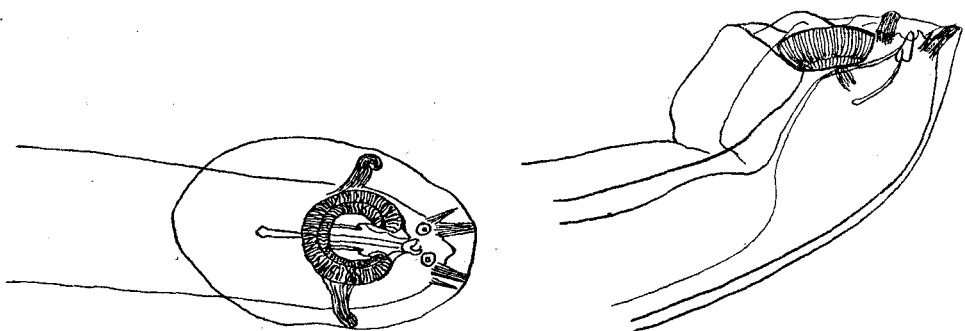


Fig. 5.
ANTERIOR END OF BODY.

HOPLODONTOPHORUS FLAGELLUM (H. & E. 1828).

Fig. 6.
POSTERIOR REGION OF MALE.



VENTRAL VIEW.

LATERAL VIEW.

DELETROCEPHALUS BRACHYLAIMUS (V.L. 1901).

POSTERIOR REGION OF FEMALE.

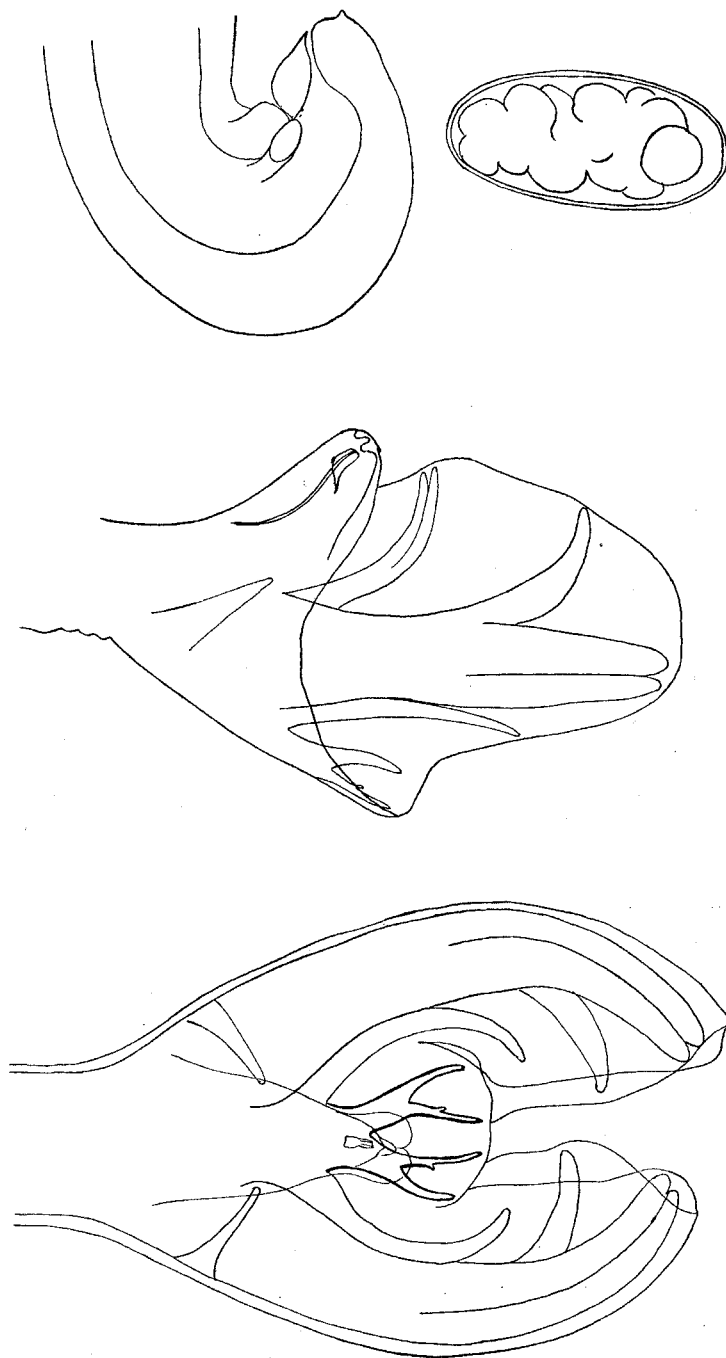


Fig. 2.

DORSAL VIEW OF BURSA.

Fig. 3.

LATERAL VIEW OF BURSA.

Fig. 4.

EGG $\times 220$.

extremity; it is variable in appearance, for in some specimens a large ventral prominence is seen just in front of the anus, while in others the tail is bent ventrally. In some females an outstanding cuff of cuticle, about 900μ in length, is present in this region.

The anus is from 75μ to 100μ in front of the terminal point; while the vulva, which sometimes opens at the apex of a prominence, is about 200μ in front of the anus.

The eggs are oval and thin shelled: they measure from 150μ in length by 65μ in breadth to 152μ in length by 72μ in breadth.

Male.—The total length of the male is from 9.5mm. to 13mm. and of this 1.25mm. to 1.55mm. is accounted for by the bursa. The breadth of the body at its widest part is from 450μ to 550μ .

The genital cone is very long, with a well developed dorsal collar. The pre-bursal rays are thick and pointed.

A gubernaculum is present.

The two spicules are thin and are from 3.1mm. to 3.5mm. in length (VON LINSTOW gives 2.96mm); each has a simple point at its distal end.

The bursa has two large lateral lobes, which are from 1.25mm. to 1.55mm. long, and a smaller median lobe which is about 0.9mm in length. The dorsal ray is bifid, each part dividing into two branches, of which the internal bears a small process on its outer side. In my material this internal branch is only slightly longer than the external one, but VON LINSTOW figures it as over twice as long as the latter. VON LINSTOW also states that the externo-dorsal and dorsal rays apparently arise separately, but in my material they arise together, and the externo-dorsal ray curves away from the dorsal just before the latter bifurcates.

VON LINSTOW figures the cleft between the internal lateral and the median lateral rays as about twice as long as that between the latter and the externo-dorsal. In my material these clefts are of equal length. The ventral rays are not separated throughout the proximal half of their length.

HALL says that it is not certain that *D. brachylainus*, VON LINSTOW, 1901, is congeneric with *D. dimidiatus*, DIESING, 1851, which is the type species of the genus *Deletrocephalus*. The fact that in the latter there are six projections from the base of the mouth capsule, which are

absent in the former, is an important point of difference between the two forms.

HOPLODONTOPHORUS FLAGELLUM (HEMPRICH AND EHRENBERG, 1828).

NOV. GEN.

HEMPRICH and EHRENBERG first described the female of this nematode from *Hyrax syriacus*, and called it *Oxyuris flagellum*. However, on the discovery of the male in my material, it was decided to remove it from the genus *Oxyuris* and place it in a new genus *Hoplodontophorus*, on account of the presence of a ventral sucker in the male.

Definition of *Genus Hoplodontophorus*: Male with peculiarly sculptured horseshoe-shaped sucker on the ventral surface anterior to the cloaca. Well developed bursa present. Œsophagus as in *Oxyuris curvula*, short and with an œsophageal bulb. Mouth surrounded by six pointed inconspicuous lips.

Description of *Hoplodontophorus flagellum*. The male is only from one quarter to one half as long as the female, and about half as broad.

The œsophagus is short, and approximately equal in length with the œsophageal bulb. The nerve ring is situated about the middle of the œsophagus.

HEMPRICH and EHRENBERG probably mistook the small points of the lips for papillæ.

Female.—The female is from 17mm. to 32mm. long and from 1mm. to 1·2mm. broad in the region of the vulva. Just behind this the body becomes slightly broader and then gradually tapers to the anus. A short distance behind the anus the body narrows abruptly to form the long, thin tail, the distal end of which is rounded and ends in a very small point.

The œsophagus is 0·3mm. in length by 0·25mm. to 0·3mm. in width. The œsophageal bulb is from 0·35mm. to 0·45mm. long by from 0·3mm. to 0·35mm. wide.

The vulva is from one-fifth to one-third the length of the body, from the anterior end: its lips are swollen and project from the body wall. The ovaries are found in the region of the vulva. Their ducts pass backwards to a point just in front of the anus, where the large uterus commences. This passes forwards to a level anterior of the vulva, where it turns backwards as the short vagina.

The anus is from one-fifth to one-third of the length of the body from the extremity of the tail.

The eggs are flattened on one side and measure from 110μ by 42μ to 115μ by 45μ .

HEMPRICH and EHRENBERG note two "varieties" of their *Oxyuris flagellum*: (a) "obtusa," which is yellow in colour, and has a curved tail that is more than one-third of the length of the body, and (b) "acuta," which is white in colour and has a straight tail which does not exceed one-third the body length.

In the material from German East Africa, both white and yellow forms are present. The latter are packed with eggs while the former contain very few. This seems to account for the difference in colour. In my material, as HEMPRICH and EHRENBERG noted in *Oxyuris flagellum*, the tail of a yellow specimen seems to be longer in proportion to the rest of the body than that of a white one. This, however, is not a specific difference.

Male.—Measures from 7.7mm. to 8.4mm. in length and from 0.5mm. to 0.7mm. in breadth.

The œsophagus is 0.18mm. long by 0.15mm. broad and the œsophageal bulb is 0.25mm. long by 0.2mm. broad so that it is just over half as long as that of the female.

The posterior end of the male for a distance of 0.6mm. is surrounded by a large bursa. This is supported by three pairs of papillæ. The most anterior pair is large and is situated from 0.25mm. to 0.27mm. from the posterior extremity. The papillæ of the other two pairs arise close together at the sides of the tail point. One pair of ventral papillæ are present at the sides of the cloaca.

The tail ends in a short blunt point.

The centre of the sucker is about 0.25mm. from the posterior end. This sucker is quite large with a diameter of 200μ , and is incompletely annular in shape. Its walls are striated, and at one level the striæ are broken which gives the sucker an appearance like that of two horseshoes, placed one inside the other. The gap in the walls is situated caudad. In the central gap of the sucker lie two teeth, symmetrically placed at each side with their points directed posteriorly. At the sides of the gap in the sucker wall are two pointed flaps of transparent cuticle which

reach to the cloaca which is about 50μ caudad of the sucker. The cloaca is two lipped.

The single spicule is about 340μ long and 15μ wide. Its proximal end is knob-like.

A gubernaculum is present. In lateral view it is shaped like a long arrow head.

REFERENCES.

- DIESING, K. M., 1851. *Systema Helminthum*. Vol. II., p. 298.
- HALL, M. C., 1915. *Nematode Parasites of the Mammals of the Orders Rodentia, Lagomorpha and Hyracoidea*. Pp. 42, 77 and 121.
- HEMPRICH, F. G., and EHRENBERG, C. G., 1828. *Symbolæ Physicæ seu icones, etc.—studio annis 1829-1835 redierunt. Pars. zoologica. Decas prima (unp). Pls. fol. Berolini*.
- VON LINSTOW, O. F. B., 1901. *Helminthum von der Ufern des Nyassa—Secs. Jenaische Ztschs, f. Naturw. Jena.* Vol. XXXV., n. F., Vol. XXVIII. (4). 20th Apr. P. 410. Plate XIII. Figs. 1 and 2.