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XXXV.—Crossophorus collaris, Hemprich & Ehrenberg, a little-known Nematode parasite of the hyrax

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twice as long as broad and two and a half times as long as the prothorax, parallel-sided in the basal third, then gradually narrowed to the apex, before which there is a shallow constriction; the basal margin gently sinuate, with the external angles rounded, the apex truncate; the striæ shallow on the disk, but deeper behind and on the inflexed margins, and containing closely set deep punctures; the intervals about as broad as the striæ, slightly convex, and with a few very minute punctures, the junction of intervals 2 and 10 at the apex distinctly swollen. *Legs* comparatively long and slender; the femora minutely coriaceous and with very sparse fine punctures throughout; the tibiæ gently sinuate externally, the inner edge deeply bisinuate and armed with strong setigerous teeth in the apical half, and the external apical spine long and distinctly curved; the tarsi unusually long and slender, the second joint of the front pair being nearly twice as long as broad.

Length 7 mm., breadth 2.2 mm.

PORTUGUESE E. AFRICA: Beira, vii. 1903 (*P. A. Sheppard*).

Type in the British Museum.

The slender tarsi and very fine lateral punctation of the prothorax distinguish this insect from all the other species of the genus.

8. *Aorus piceus*, Fst.

Leptobaris picea, Faust, Stett. ent. Zeit. 1894, pp. 148 & 149.

SIERRA LEONE.

I have not succeeded in identifying this species, which, so far as can be judged from Faust's very brief description, must resemble a dwarfed specimen of *A. anthracinus*, Brancs.

XXXV.—*Crossophorus collaris*, Hemprich & Ehrenberg, a little-known Nematode Parasite of the Hyrax. By H. A. BAYLIS, M.A.

(Published by permission of the Trustees of the British Museum.)

AN opportunity having recently occurred of examining specimens of this very curious and highly specialized Ascarid from the hyrax (*Procavia* sp.), it seems desirable to describe the species in somewhat fuller detail than has hitherto been done. The existing descriptions (Hemprich and Ehrenberg,

1828; Schneider, 1866; Hall, 1916) are not only incomplete, but in some respects incorrect. The only recent account—that of Hall—is not based on a re-examination of the animal, but embodies, in an English version, the original

Fig. 1.

Crossophorus collaris. Dorsal view of the anterior end.

C., "combs" of teeth representing the dentigerous ridge on the lip; Ch., Ch.', different portions of the chitinous apparatus of the "gizzard"; D., dorsal lip; F., fimbriae; M.Oes., muscular wall of oesophagus; P., paired papilla of dorsal lip; T., base of dorsal tooth of the "gizzard"; V., ventro-lateral lip.

Latin characterization of Hemprich and Ehrenberg and the German description of Schneider. The only figures existing appear to be those of Schneider (1866, text-fig., p. 40, and pl. ii. figs. 1 & 2). Copies of these are reproduced by Hall.

*Crossophorus** *collaris*, Hemprich & Ehrenberg, 1828.

Syn. *Ascaris ferox*, Schneider, 1866.

The general dimensions of the worm are:—length, male, up to 65 mm., female 55 to 90 mm. Maximum thickness 1·3 mm. in the male, about 2 mm. in the largest female.

The head measures 0·44–0·5 mm. across at the widest part of the lips. The latter (fig. 1, *D.*, *V.*) are large, semicircular in general outline, with an indentation in the anterior margin, and with projecting posterior angles. The dorsal lip (fig. 1, *D.*) has two fairly conspicuous bilaterally symmetrical papillæ (fig. 1, *P.*). Each ventro-lateral lip has also two papillæ, but these are arranged asymmetrically with regard to each

Fig. 2.

Crossophorus collaris. Diagrammatic representation of the arrangement of the row of fimbriæ (dotted line) as it would be seen in a front view of the head.

other, as is indicated in Schneider's figure (1866, pl. ii. fig. 2), *i. e.*, one papilla is situated a little to the ventral side of the middle of the outer surface of the lip, while the other occupies a more forward position at the tip of the more dorsal of the two anterior horns of the "pulp." The latter papilla is very small.

There is a very distinct constriction behind the lips, occupied by a "collar" consisting of an apparently double row of

* Not *Crossophorus*, Brady, 1880 [Crustacean], Voy. H.M.S. 'Challenger,' Zoology, i. 3, Ostracoda.

cuticular fimbriæ. The arrangement of these fimbriæ is very curious. They form, in reality, a single endless chain, which doubles on itself at the base of each lip, externally, and passes round the base of the lip on to its inner surface. Running across the lip, it emerges again at the next interlabial space on to the outer surface, where it forms another

Fig. 3.

Crossophorus collaris. Part of the alimentary canal, as displayed by dissection.

C., C., caeca; Int., anterior part of intestine; Oes., posterior part of oesophagus.

loop before passing on to the next lip. The accompanying diagram (fig. 2) may help to make this arrangement clear. The fimbriæ of the "collar" are of somewhat discoid shape, flattened from side to side, and embedded in the cuticle in such a way that their thin edges are seen in a view such as is

represented in fig. 1. Their projecting portions are slightly bifid. The fimbriæ on the inner surfaces of the lips are of quite a different shape, being drawn out to a much greater length, and branching dichotomously, so that their free anterior ends form a series of little points or teeth. In addition to these, each lip also bears, near the outer edges of its inner aspect, seven or eight groups or "combs" of pointed teeth (fig. 1, *C.*), forming an interrupted dentigerous ridge. The number of teeth in each group varies from two to seven or eight, without any appearance of symmetry.

The cuticle of the body is marked by transverse striations from 6μ to 7μ apart.

The œsophagus (fig. 3, *Oes.*) is very long and slender, measuring 15–20 mm. in length, and ends in a bulbous expansion posteriorly. This is merely a muscular enlargement of similar structure to the rest of the œsophagus, and not a specialized glandular swelling. Immediately behind this two very long anteriorly directed cæca (fig. 3, *C.*, *C.*) spring from the intestine. They have slightly swollen ends, and in a large specimen measure about 15 mm. in length. The anterior portion of the œsophagus, extending to a distance of 0.5–0.6 mm. from the anterior extremity, is specialized to form a gizzard, containing an elaborate chitinous apparatus. This consists of a chitinous lining within the muscular wall, strengthened by three wing-like processes (fig. 1, *Ch.*) of chitin embedded in the muscles, and produced internally into three serrated triangular teeth (fig. 1, *T.*) which meet in the middle of the lumen. The wing-like processes are continued posteriorly as three long narrow strips of chitin (fig. 1, *Ch.*') embedded in the thickness of the muscular wall, and connected near their origin by a transverse ring of chitin. The nerve-ring crosses the œsophagus at 0.9–1.1 mm. from the anterior end.

In the male the posterior end is curled towards the ventral side. The tail is very blunt and measures only 0.32 mm. in length. There are two equal spicules (fig. 4, *S.*), and not a single spicule as stated in the earlier descriptions. They measure 1.5 mm. in a straight line from base to tip, have a tubular mid-rib and broad alæ, and are of a granular and transversely striated appearance. There is also an accessory piece (fig. 4, *A.P.*) 0.32 mm. in length. The caudal papillæ are arranged, behind and for some little distance in front of the anus, in two parallel rows on either side. There are on either side nine postanal papillæ in each row. In front of the anus the inner or more ventral row contains a continuous series of about forty papillæ at regular intervals;

the outer row extends only a short distance and contains only five papillæ.

In the female the tail is conically pointed and measures 0.5 mm. in length. The vulva is situated in the middle

Fig. 4.

Crossophorus collaris. Posterior end of the male, seen from the right side.

A.P., accessory piece; *S.*, spicule of right side. The papillæ of the right side only are shown.

third of the body, dividing the total body-length in the proportion of 2 : 3. The vagina runs forward for about 8 mm., then doubles back upon itself to a point opposite the vulva, where it gives off two uterine branches, which run in

opposite directions, one forward, the other backward. The coils of the ovaries extend about as far as the middle of the oesophagus anteriorly and the beginning of the last third of the body posteriorly.

The eggs are of an elegant oval shape, measuring about $150\ \mu \times 113\ \mu$. They have a moderately thick smooth shell.

The material described above formed part of a collection of parasites made by Lieut. A. Loveridge during or after the recent campaign in German East Africa. Locality, Dodoma.

Note on the Systematic Position of Crossophorus.

Although Railliet and Henry (1912) included this genus in the subfamily Heterocheilinae, which was intended to contain provisionally all Ascarids having oesophageal or intestinal caeca, it does not seem to possess many features in common with any of the other forms answering to this description. In the possession of a "gizzard," with chitinous armature, and of an accessory piece in addition to the two spicules in the male, it appears to stand quite alone. It should, in fact, probably be regarded as an extremely specialized offshoot of the Ascarid stock (using the term in a wide sense). The presence of *two* intestinal caeca does not, as it seems to the writer, necessarily imply close relationship with those forms in which *one* such appendage is present, but may with equal, if not greater, probability be considered in the light of an independently developed feature. If the subfamily Heterocheilinae (or family Heterocheilidae) has any claim to be regarded as a natural group, the inclusion in it of such a form as this would merely tend to make it appear an unnatural one.

There is, as Hall (1916) points out, considerable doubt as to the position of the second species, *C. tentaculatus*, referred to this genus by Hemprich and Ehrenberg. In the absence of an adequate description of this form, it is at present impossible to determine whether it belongs to the same or to another genus.

REFERENCES.

- HALL, M. C. 1916. "Nematode Parasites of Mammals of the Orders Rodentia, Lagomorpha, and Hyracoidea." Proc. U.S. Nat. Mus. 1. pp. 1-258.
- HEMPRICH, F. G., and EHRENBURG, C. G. 1828. "Symbolae physicae seu icones etc." Pars Zoologica [unp.]. Berlin.
- RAILLIET, A., and HENRY, A. 1912. "Quelques Nématodes parasites des Reptiles." Bull. Soc. Path. Exot. v. 4, pp. 251-259.
- SCHNEIDER, A. 1866. 'Monographie der Nematoden.' Berlin.