

NOTES ON HELMINTH PARASITES FROM AFGHANISTAN.

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Afghanistan, so far as its Helminth fauna is concerned, is almost a *terra incognita*; the earlier naturalists, who visited the country, seldom, if at all, paid any attention to the collection of parasites. The author during his leisure hours collected parasites of the domestic animals at Kabul, and the following note gives a list of the various forms collected, as also a record of his observations on the eggs and hatching of *Echinuria uncinata* (Rudolphi) outside an intermediate host.

A detailed account of the forms collected with figures of the various species was submitted to Dr. H. A. Baylis of the British Museum (Natural History), South Kensington, London, and the author is greatly indebted to him for checking the results and for his very valuable advice in connection with the synonymy of various species and the literature on the subject. Grateful thanks are also tendered to Dr. B. Prashad, Director, Zoological Survey of India, for facilities in consulting literature, and comparing the Kabul material with the named collections in the Indian Museum, Calcutta.

LIST OF PARASITES.

TREMATODA :

1. *Fasciola hepatica* Linnaeus, 1758.
Host.—Sheep. *Location.*—Liver.
2. *Echinostoma revolutum* (Frölich, 1802).
Host.—Fowl. *Location.*—Caeca.

NEMATODA :

3. *Heterakis gallinae* (Gmelin, 1790).
Host.—Fowl. *Location.*—Caeca.
4. *Ascaridia galli* (Schrank, 1788), Freeborn, 1923.
Host.—Fowl. *Location.*—Caeca.
5. *Nematodirus abnormalis* May, 1920.
Host.—Sheep. *Location.*—Intestine.
6. *Amidostomum railletii* Skrijabin, 1916.
Host.—Coot (*Fulica* sp.). *Location.*—Under cuticular lining of gizzard.
7. *Trichuris ovis* (Abildgaard, 1795).
Host.—Sheep. *Location.*—Intestine.

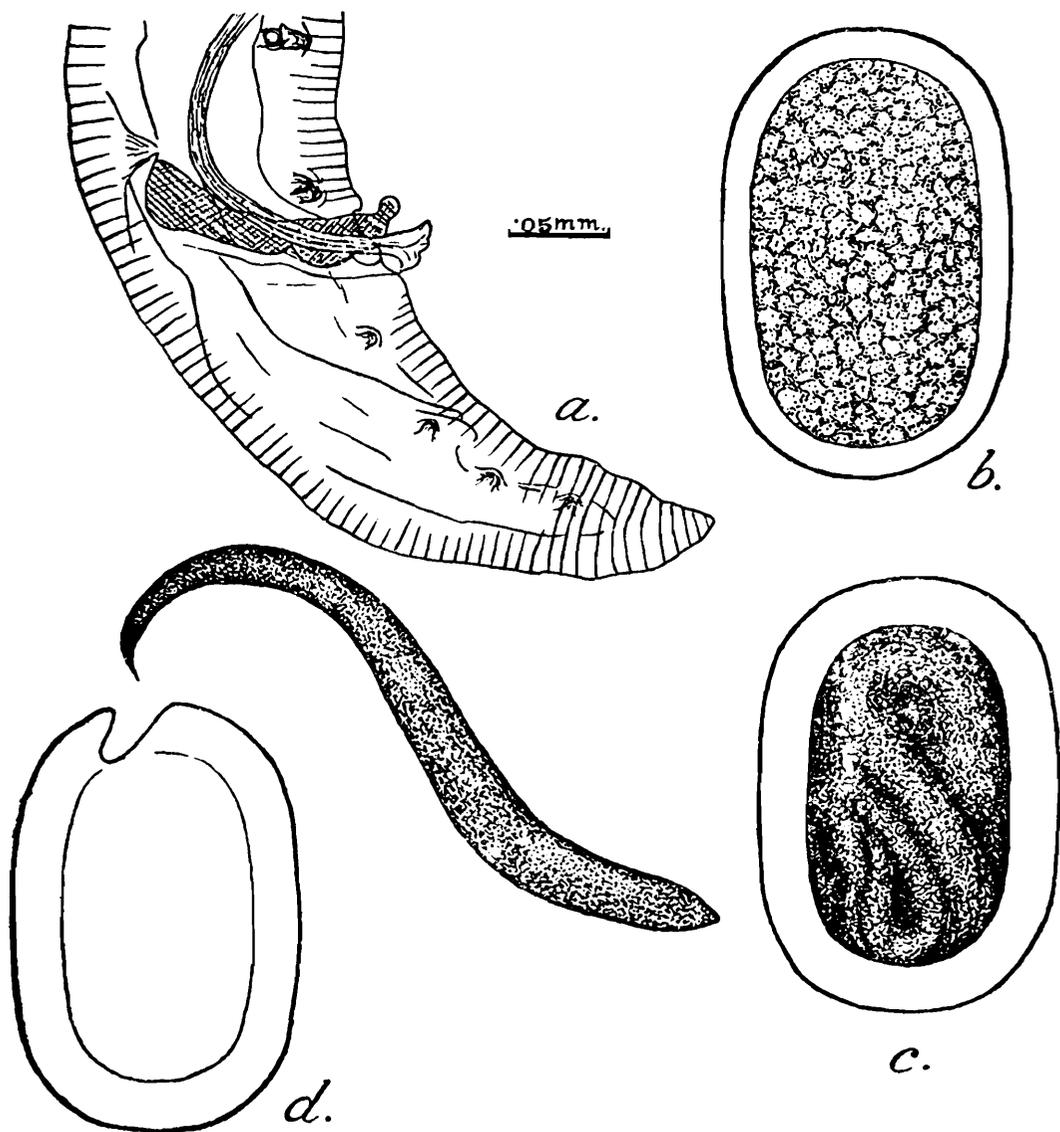
OBSERVATIONS ON THE EGGS OF *Echinuria uncinata* (RUDOLPHI, 1819) AND THEIR HATCHING OUTSIDE AN INTERMEDIATE HOST.

Echinuria uncinata probably not yet reported from any part of Asia, is found at Kabul generally in tumours at the junction of the proventriculus and the gizzard or in the oesophagus of a species of wild

duck (*Anas* sp.). The Kabul specimens differ from the published descriptions of the species in the following points :—

Male.—8-10-462 mm. long. In a specimen 10-462 mm. long, the cordons are 0-652 mm. long and 0-023 mm. wide ; the spicules are 0-778 mm. and 0-225 in length respectively. The cloacal aperture is situated at a distance of 0-355 mm. from the posterior end. There are eight pairs of caudal papillae, four pairs pre-anal in two sets, and four pairs post-anal. The papillae of the first pre-anal set are more closely situated than those of the second set. The papillae of each pair of the second set point in different directions. Of the other four pairs, which are post-anal, the first pair is not double, as stated in the published accounts of the species.

Female.—12-915 mm. long and 0-832 mm. wide. The cordons are 0-866 mm. long and 0-031 mm. wide. The vulva is situated 1-125 mm. from the posterior end.



TEXT-FIG.—*Echinura uncinata* (Rudolphi, 1819). a. Posterior extremity of a male, lateral view, showing arrangement of papillae ; b. Egg in oviduct ; c. Egg in vagina ; d. Ruptured egg with embryo escaping.

In some groups of Nematodes the development of the embryo is completed within the eggs *in utero*, and the same is the case with *E. uncinata*. Towards the end of May 1935, a living female of

E. uncinata was dissected in distilled water and eggs were taken out on a slide for examination. Within about 15 minutes these eggs began to hatch out on the slide. The temperature of the room was 25° C. The remaining females were preserved in a weak solution of formalin. The preserved specimens were re-examined this year, when the eggs hatched out in precisely the same way as the fresh specimen in 1935. The temperature of the room on the second occasion was 26.5° C.

These observations lead to the conclusions that (i) the embryos of *Echinuria uncinata* can remain alive within the eggs for a period of at least one year, (ii) weak solution of formalin does not kill the embryos within the eggs, and (iii) the embryos hatch out of eggs not only in the intestine of the water-flea, *Daphnia pulex*, as stated by Hamann, but may be liberated in water.

With regard to the above observations Dr. H. A. Baylis remarks as follows:—

“I do not think their hatching [eggs of *Echinuria*] outside an intermediate host has been observed. The continuance of their viability in weak formalin is, of course, paralleled by the eggs of some Ascarids.”