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On a new Coccidium *Eimeria stolatae* n. sp., from the intestine of common Indian Grass snake, *Natrix stolata* (LINN.).

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With Plate 19.

Introduction.

During the period from October, 1933 to August, 1936, we examined the gut contents of thirty common Indian grass snake, *Natrix stolata*. Out of this number only four were found to harbour a coccidium belonging to the genus *Eimeria*.

The literature extant on the subject records the following species of Coccidia from different grass snakes:

E. cystisfelleae DEBAISIEUX (1914);

E. tropidonoti GUYENOT, NAVILLE and PONSE (1922);

Cyclospora tropidonoti Phisalix (1924);

Coccidium persicum PHISALIX (1925) and Isospora natricis YAKIMOFF and GOUSSEFF (1935). The coccidium described here differs from the above mentioned species of *Eimeria* in the shape and size of its oocyst and sporoblast.

We propose to call this parasite *Eimeria stolatae* n. sp., the specific name being given after the specific name of the host.

1) A species of *Eimeria* from the gall bladeler and bile duct. Archiv für Protistenkunde. Bd. XC.

Material and Methods.

Systematic examination of rectal contents diluted with saline was done in preparations sealed with vaseline. The oocysts were transferred to $1 \, {}^0/_0$ chromic acid solution where they completed their development in three days. For studying endogenous stages, portions of the infected intestne were fixed in Bouin-Duboscq-Brasil's fluid and later on, cut 6 μ thick and stained in HEIDENHAIN's iron haematoxylin. Oocysts in $1 \, {}^0/_0$ chromic acid were examined daily and camera lucida drawings were made of their various stages of development. Measurements of the oocysts were taken from specimens both in fresh state and in chromic acid solution.

Observations on *Eimeria stolatue* n. sp.

a) Schizogony.

The smallest schizont (Pl. 19 Fig. 1) that we have observed in our preparations, shows a two nucleated condition. It is fully spherical and measures 2.06 μ in diameter and is clearly seen lying in a vacuole in the epithelial cell. As it grows in size (P. 19 Fig. 2) the individual measuring 4.12 μ in diameter is found with four smaller nuclei. In a later stage (Pl. 19 Fig. 3) it becomes much bigger and irregular in shape and measures 8.24 μ in length and 4.12 μ in breadth. With the advancement of age the schizont (Pl. 19 Fig. 4) becomes sperical acain and contains eight irregularly arranged nuclei. In the fully formed schizont (Pl. 19 Fig. 5) we find eight merozoites each measuring $6.18 \times 2.06 \,\mu$ in dimension. The nucleus of the merozoite is situated not in the middle butmore towards the broad anterior end. Fig. 6 represents an transverse section of a group of merozoites passing through the nuclear region. No sexual dimorphism was however, noticed amongst the groups of merozoite seen by us.

b) Sporogony.

A fully formed macrogametocyte (Pl. 19 Fig. 7) measures $18-20 \mu$ in diameter. It is spherical in shape with a big karyosome in its nucleus and contains darkly staining granules in its cytoplasm. On a single instance we saw a macrogametocyte with a fertilisation tube and a male gamete just entering it (Pl. 19 Fig. 8).

The smallest microgametocyte (Pl. 19 Fig. 9) measures 4.12μ in diameter and is spherical in shape. It is distinguished from the macrogametocyte by its smaller karyosome, clear cytoplasm and a very small darkly stained dot near the karyosome. This dark dot persists throughout in all the later stages (Pl. 19 Fig. 10) of its growth until the nucleus breaks up into numerous nuclei to form male gametes (Pl. 19 Figs. 11, 12).

The microgametocyte changes its shape, as it gows in size, from spherical to oval and agian spherical and last of all, it becomes irregular. When fully formed the biflagellated microgamete (Pl. 19 Fig. 13) measuring 6.18 μ in length are found to lie round a central mass of cytoplasm.

The completely spherical unsegmented oocysts (Pl. 19 Fig 14) measuring $20.5 \,\mu$ in diameter, are found in the rectal contents. When kept in $1^{0}/_{0}$ chromic acid solution they complete their development in three days (Pl. 19 Figs. 15, 16, 17). There is no occystic residue. Occystic membrane has a double contour, the inner one being more prominent than the outer. Sporocysts are spindle shaped and each measures $12.3 \ \mu$ in length and $6.15 \ \mu$ in breadth.

The two sporozoites each measuring $8.3 \times 2 \mu$ lie side by side with their broad nuclear ends facing each other while in between them lies the sporo- cystic residue (Pl. 19 Fig. 17).

Diagnosis: — Systematic position — Eimeria stolatae n. sp. (Coccidiida, Eimeriidae).

Oocysts thick walled, completely spherical, $20.5 \ \mu$ in diameter; no visible micropyle or operculum; oocystic residue absent; sporocysts spindle shaped, sporocystic residue present; unsegmented oocysts discharged from host; sporulation time three days.

Habitat. — Small Intestine (intracellular) of Natrix stolata. Locality. — Calcutta, Bengal, India.

The table below compares, in respect of oocyst and sporocyst, the species of *Eimeria* hitherto recorded from grass snakes.

Name	Oocyst.			Spore.		
	Form	Size in microns.	Resi- due	Form	Size in microns.	Host.
E. cystisfelleae Debais, 1914	Oval	$^{30-35}_{ imes 18-23}$	0	Oval	$9-11 \\ imes 7-8$	Natrix (Tropi- donotus) natrix
E. tropidonoti Guyenot, Na- ville and Ponse, 1922	Oval	$22-24 \\ \times 12-14$	0	Pyra- midal.	$16-18 \\ \times 7-8$	Natrix natrix
Coccidium persi- cum Phisalix, 1925	Oval	$\begin{array}{c} 31.33 \\ \times 18.9 \end{array}$	0	Ovoid.	10.5×8.4	Natrix natrix var. persa, Pallas
<i>E. stolatae</i> n. sp.	Spherical	20.5	0	Spindle- shaped.	$12.3\!\times\!6.15$	Natrix stolata

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References.

- DEBAISIEUX, R. (1914): Researches Sur les coccidies. IV. Eimeria cystifelleae nov. sp. La Cellule 29, 433.
- GUYENOT, E., A. NAVILLE, and K. PONSE (1922): Deux coccidies parasites de Tropidonotus natrix, Eimeria cystisfellae DEBAIS. et E. tropidonoti n. sp. Rev. Suisse Zool. 30, 115.
- PHISALIX, M. (1924): Cyclospora tropidonoti nov. spec., coccidie intestinale de la couleuvre a collier. Bull. Soc. Path. exot. Paris 17, 481.
- (1925): Coccidium persicum nov. sp. parasita de Tropidonotus natrix. var. persa PALLAS. Bull. Mus. Hist. Nat. Paris 31, 258.
- YAKIMOFF, W. L., and W. F. GOUSSEFF (1935): On the coccidia of Shrews, Grass snakes and Lizards. J. roy. microsc. Soc. 55, 170.

Explanation of plate.

Plate 19.

Eimeria stolatae n. sp.

Fig. 1. A small schizont with two nuclei.

Fig. 2. A bigger schizont with four nuclei.

- Fig. 3. A schizont much bigger in size and irregular in shape.
- Fig. 4. A bigger schizont, spherical in shape, with eight nuclei irregularly arranged.
 - Fig. 5. A fully mature schizont with eight merozoites. imes 3500.

Fig. 6. A transverse section through a group of merozoites.

Fig. 7. A mature macrogametocyte.

Fig. 8. A macrogametocyte with a fertilisation tube and male gamete just entering it.

Fig. 9. A smallest microgometocyte.

Fig. 10. A bigger microgametocyte with a darkly stained dot near the karyosome.

Figs. 11 and 12. Microgametocytes — early and late stages of male gamete formation.

Fig. 13. A biflagellated male gamete.

Fig. 14. An unsegmented oocyst.

Fig. 15. An oocyst with four spindle-shaped sporoblasts.

Figs. 16 and 17. Mature oocysts.



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