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UT PART	THE DEV FISC EXP	ENCYSTMENT AND AN EARLY ELOPMENT OF CERCARIA OF HOEDERIUS ELONGATUS IN ERIMENTAL ANIMALS	<b>KEY WORDS:</b> cercaria, F. elongates, encystment, development.
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The elor of the rep	The collection from the lamb, consisting of specimens from the rumen, was clearly referable to <i>F. elongatus</i> . The flattened and elongated specimens in the regions of the ventral pouch were typically pinkish and exhibited excretory system conforming to that of the cercaria. In permanent stained mounts of the dorsoventrally and laterally pressed specimens, the digestive and reproductive systems tallied fully with descriptions available for this species in the extent and character of the intestinal caeca: one		

testis was placed dorsal to the other; vesicula seminalis with associated structures and developing uterus were mainly situated.

INTRODUCTION

Numerous specimens of L. luteola f. australis were collected, on many occasions, from several ponds at Bhaisa (13 Km. away from Etah) and around the Gopalganj area, Etah. They were individually kept under diffuse sunlight, between 9 A.M. and 12 noon, in beakers half-filled with tap-water for observing the emergence of the cercariae developing in them. The emerging amphistome cercariae were studied in slide preparations of the. live specimens. The two types available represented the Pigmentata group. A form enjoying a comparatively greater incidence in L. luteola f. australis was, after tentative identification, allowed to encyst on clean leaves of Ficus religiose (peepal) placed in the beakers. The extensive metacercarial material was subsequently fed to 5 laboratory - reared guinea-pigs, 1 rabbit, 3 albino rats, 1 kitten, 2 kids and 1 lamb to determine its specific identity and to evaluate the course of development, whether successful or refractory, in these experimental animals.

### MATERIAL AND METHODS CERCARIA

Cercariae collected from *L. luteola* were identified as *Carcariae indicae* Sewell, 1922. These cercariae were studied alive and after encystment. These encysted cercariae were fed to a lamb, a guinea pig, a kid and other animals. Apart from the lamb which, autopsied 126 days after infection, had alone yielded a number of developing juveniles referable to *F elongatus*, the 2 developing flukes available from the other experimental animals included 1 specimen each from a guinea-pig and a kid. These specimens were studied alive for details of the excretory system and, after fixation in 10 per cent formalin, the immature fluke from the guinea-pig was stained in borax carmine for permanent mount.

Brief accounts of the cercaria, metacercaria and the recovered juveniles and flukes attaining maturity have been attempted. Observations made during this study have further enriched our knowledge about the development and morphology of the cercaria of *Felongatus*.

## OBSERVATION

## Cercaria and its encystment

The cercariae lacked pigmentation. The body was of 0.412-0.912 mm X 0.294-0.627 mm. size and had 0.529-0.999 mm. long tail carrying a median excretory duct. It had typical eye spots lying just behind the brain area. The oral sucker was small, had minute papillae on its anterior margin and was of 0.044-0.118 mm. size. The oesophagus was 0.059 — 0.190 mm. long. There was a revealing prominent brain mass near its middle. It lacked the sphincter. Caecum was 0.118 — 0.323 mm. long and terminated near the middle of the body; oesophagus and intestinal caeca had granular contents. Acetabulum was well-developed and measured 0.073 — 0.206 mm. in size; the ratio between suckers was 3:5. Excretory bladder was prominent and had an anteriorly situated

excretory pore. Main excretory trunk had a transverse commissure and carried a median diverticulum lying near the level of the caecal ends and passing backward towards the acetabular level near the level of the brain. Large excretory granules filled the main longitudinal trunks and transverse commisure including its diverticulum (Fig. 1). Rudiments of symmetricaly placed testes and medianly situated ovary connected with the ducts were visible in front of the excretory bladder in stained preparations (Figs. 2, 3).

The cercaria started to encyst on the sides of the beaker and on the leaves introduced. The process was initiated by the detachment of the tail about 15 minutes after emergence (Fig. 4). The cyst wall was 0.015 - 0.022 mm. thick, yellowish-brown and was in two layers. The structures visible in metacercaria of 0.294 - 0.353 mm X 0.350 - 0.382 mm. size were : oral sucker, 2 eye-spots, typical excretory system and an acetabulum (Fig. 5).

#### JUVENILES

The youngest of the juveniles, a 5-day-old specimen, recovered from guinea-pig, revealed distinctive features of the digestive and excretory systems in the living state (Fig. 6, 7). The measurements recorded from the permanent preparation were : length, 333.9 1..t : width, 111-3 p. ; oral sucker, 31.8 p. X 47.7 1,1 ; and acetabulum, 63.6p, X 63.6g.

The collection from the lamb, consisting of 21 specimens from the rumen, was clearly referable to *F elongatus*. The flattened and elongated specimens in the regions of the ventral pouch were typically pinkish and exhibited excretory system conforming to that of the cercaria (Fig. 8). In permanent stained mounts of the dorsoventrally (Fig. 9) and laterally pressed (Fig. 10) specimens, the digestive and reproductive systems tallied fully with descriptions available for this species in the extent and character of the intestinal caeca; one testis was placed dorsal to the other; vesicula seminalis with associated structures and developing uterus were mainly situated.

*F* elongatus, recorded in bovine and bubaline hosts (Yamaguti, 1958), occurs in Indian cattle, buffalo, sheep and goats (Thapar, 1956). The infection developing successfully in an experimental lamb adds to the cases so far recorded in 2 calves and 1 cow from Madras and Bareilly respectively. The present experimental work on partial life-cycle in an ovine host is evidently a first report.

The collection from the experimental animals included 8 specimens found to represent the type (*P* (*E.*) explanatum) developing from the encysted cercariae obtained mostly from I. exustus (Singh, 1970). The recovery figures relating to this type from *L*. *luteola f australis* are given. These specimens were easily distinguishable on account of the excretory system, extent and character of intestinal caeca and the topography of the developing gonads (Figs. 11, 12).



# Fig: Encysted stages of Cercaria

This infection, as stated previously, had resulted from contamination of the metacercarial material fed. Rao and Ayyar (1932) reported that Cercariae indicae

Sewell, 1922 from Lymnaea luteola f. succinia, had developed into Fischoederius elongatus (Poirier, 1883) in a calf. Confirming this finding, Vaidyanathan (1941) stated that Sewell's cercaria from L. acuminata and Gyraulus euphraticus belonged to F elongatus. L. luteola at Hyderabad and L. luteola f. succinia at Bareilly were named as the cercarial hosts by Bhalerao (1943) and Peter and Srivastava (1960) repectively. In feeding experiments with cercarial material from the snail host at Bareilly, in 2 clean goats and 1 clean cow, Mukherjee (1966) recovered amphistome eggs in the droppings of the cow alone after 126 days from the infection.

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