

digenea since the former are found in superficial locations in aquatic vertebrates and consequently are much exposed to changes in the environmental conditions.

The observations on the discontinuity in the distribution of *Lethacotyle* is significant in view of the statement made by Manter¹⁶ that "parasites of the same or related hosts now having a discontinuous distribution are of special interest because if the parasites in the two localities are the same or closely related the evidence of a former continuity and sympatry is strong".

Studies on the distribution of parasites similar to the one presented, if extended to more hosts from different regions, according to Manter,¹⁶ may give information not only about the ecology and travels of the host but also furnish evidence of origin and phylogeny of hosts. Further investigations on these lines are in progress.

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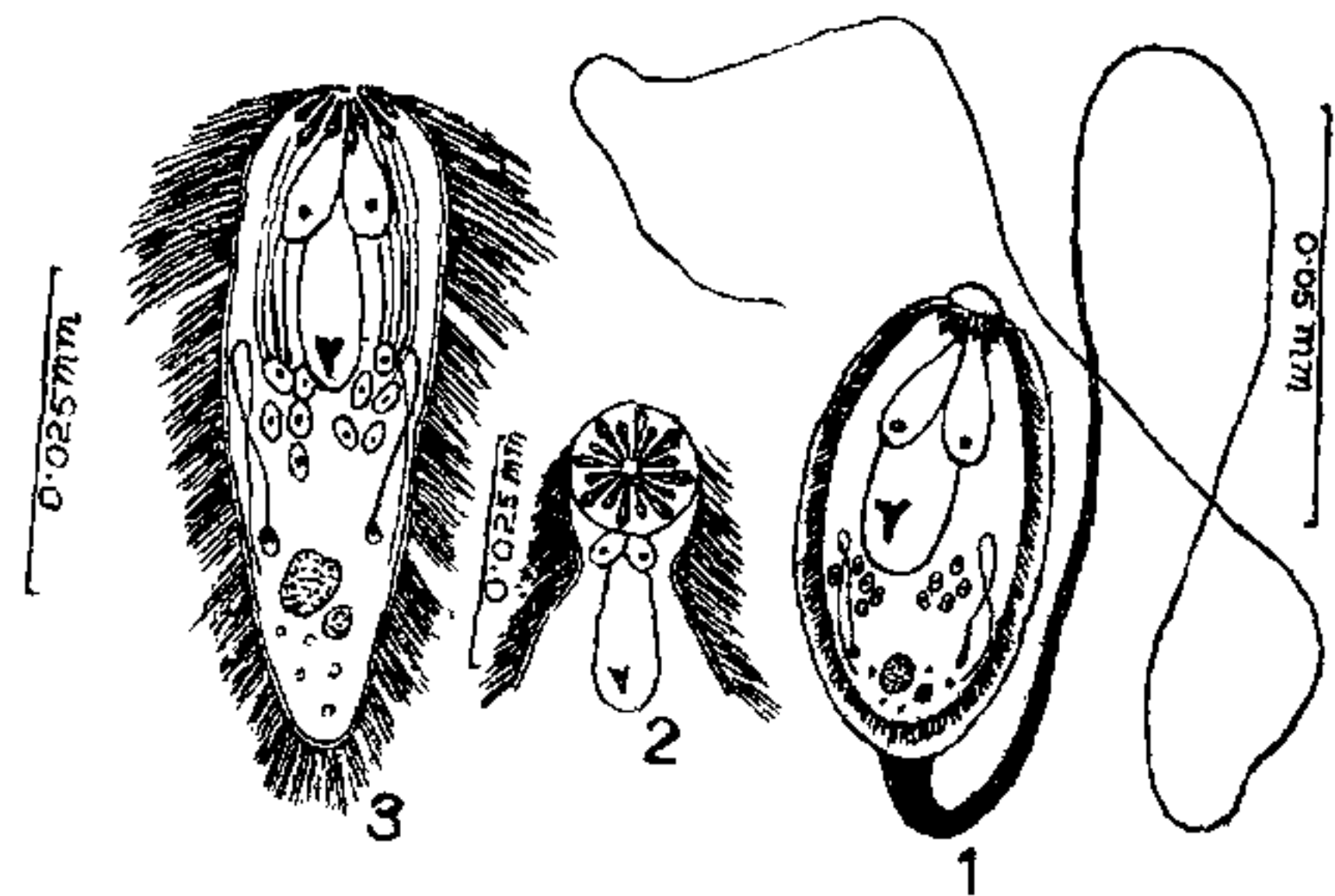
EGG AND MIRACIDIUM OF A GENARCHOPSID FLUKE (HEMIURIDAE) IN LOCAL FISHES

HEMIURID FLUKES, which are usually parasitic in oesophagus and stomach of fishes and sometimes reported from other lower vertebrates, have been described from Indian fresh-water

fishes.^{1,2} Out of a total of eleven species recognised by Yamaguti³ under the halipegine genus *Genarchopsis* Ozaki, 1925 (characterised by the posterior union of its intestinal caeca and possession of filamented eggs) as many as six species have alone been reported from *Ophiocephalus punctatus* and *O. striatus* and a seventh one from *Mastacembelus armatus*. These species: *G. lobata*,² *G. ovocaudata*,² *G. piscicola*,² *G. singularis*,² *G. dassus*,¹ *G. indicus*¹ and *G. faruquis*,¹ have been differentiated on such topographical variations as the position of genital pore, the presence or absence of oesophageal pouch, the lobed or compact character of vitellaria and the extent of the uterine coils. Adequate details of the structure of the embryonated egg including its filament and the contained miracidium are lacking.

The incidence of genarchopsid representatives without oesophageal pouch, in *O. punctatus*, *M. armatus* and *Mystus seenghala*, was ascertained by collecting adult specimens during different months. The embryonated eggs with the miracidia have been studied in tap-water and are briefly described here.

The oval eggs are straw-coloured, operculate, fully embryonated and carry a prominently long but tapering filament at the opposite pole (Fig. 1). These measure 0.046-0.07 mm. ×



FIGS. 1-3. Fig. 1. An egg with filament. Fig. 2. Apical crown of spines (dorsal view). Fig. 3. The miracidium.

0.023-0.032 mm. in size and the filament, with a broader base and pointed tip, is 0.276-0.358 mm. long. The contained embryo is clearly visible and exhibits such structural details as the characteristic anterior crown of spines placed against the operculum, the apical gland with the eye spot, the pair of penetration glands with the ducts lying lateral to the hind margin of the apical gland, the two flame cells with their sinuous ducts, and the masses of germ cells.

The eggs, left in tap-water for two weeks, remained unhatched. A slight pressure on the coverslip, however, easily liberated the miracidium through the opercular end. The protrusible apical crown contained sixteen pen-shaped spines in two distinct rows (Fig. 2). The prominent rows of cilia, in four distinct groups, had larger cilia in the anterior group occupying a comparatively greater area. Epidermal plates were not detected but the ciliated coat had below it a covering of squamous cells.

The miracidium (Fig. 3) measured 0.047–0.062 mm. in length and 0.020–0.028 mm. in maximum breadth. The larger spines measured 0.006–0.007 mm. in length and the smaller ones were 0.004–0.005 mm. long. The apical gland, granular and opaque in character, nearly reached the middle of the body in its extended form and distinctly showed, on each side, the five unicellular glands with their separate ducts. The brain mass and eye spot lay along the middle of its posterior region. A large unicellular penetration gland, with its prominent duct, was observed on either side of the apical gland in its anterior region. A pair of flame cells, lying at about two-third of the body length from the anterior end and with their sinuous ducts passing anteriorly and lying lateral to the five pairs of glands, was detected. Excretory pore was in level with the flame cells. Germ cells occurred in the posterior half of the body.

A study of the numerous stained and permanent mounts of the available adult specimens, on comparison with the accounts of the species so far described, emphasises the need for a re-examination and reassessment of the various forms so far described. In view of the confusion resulting from the extremely variable and intergrading characters that have been relied upon for specific differentiation, a correct identification of our material becomes difficult. Further, the sizes of the egg filaments do not seem to have correctly been recorded in the different forms. The present description of the egg and its miracidium might be useful in establishing the validity or otherwise of the known Indian forms in conjunction with or without the differential characters that have been utilised. Work in this direction is in progress.

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MEROZOITES FROM GLOBIDIAL SCHIZONTS IN ABOMASUM OF INDIAN GOATS

THE globidial cysts/nodules in abomasum of goats have been assigned to *Globidium gilruthi* (Chatton, 1910) by Sarwar (1951), Soliman (1958, 1960) and Ferguson and Goldsby (1961) who have given the sizes of these bodies and the sickle-shaped "spores" contained inside. Levine (1961) believed that these structures were schizonts and merozoites of *Eimeria gilruthi* (Chatton, 1910), Reichenow and Carini, 1937.

Of the hundred abomasa, available from local slaughter-houses during this month, nine were found to harbour giant eimerian schizonts—the so-called globidial cysts. These white rounded bodies, occurring mostly in the mucous membrane of the folds of the fundus of abomasum, could easily be located when the abomasum had been left for an hour in tap-water. Mature cysts, after extraction, measured $580-966 \mu \times 500-830 \mu$ while the developing forms ranged from $200-780 \mu \times 180-670 \mu$ in size. The distinctly double-layered cyst wall was upto 40μ in thickness.

Stained smears from the fluid taken from twenty-two mature schizonts, after adequate fixation in 90% alcohol and methanol pure and subsequent staining in Ehrlich's hæmatoxylin and eosin, revealed numerous crescent-shaped merozoites which, under oil immersion objective of Olympus phase-contrast microscope, occurred in three sizes. The largest merozoites, $9.0-12.3 \mu \times 1.2-1.5 \mu$ in size and more common than the two others, were straight or slightly curved and with tapering ends, the nuclear end being somewhat blunt. The oval or ellipsoidal nucleus lay about 1/3rd of the body length from the blunt posterior end (Fig. 1 a). Differences in size and shape were observed in the two other types. In the first type, the merozoites were $6.0-8.5 \mu \times 1.0-1.3 \mu$ in size, thin, slender and slightly curved in form and with tapering ends. The nearly oval or spherical nucleus was situated a little away from the centre but mostly towards the anterior pointed end (Fig. 1 b). The second type, with a comparatively robust and stumpy form and abruptly ending extremities, measured $5.0-7.7 \mu \times 1.5-1.7 \mu$ and the distinctly rounded

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