

**CEKCARIA GURAYAI, A NEW SPECIES (FURCOCERCARIA)  
FROM THE FRESHWATER SNAIL, FAUNUS ATER (LINNAEUS)**

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INTRODUCTION

Out of 1,200 specimens of the snail, *F. ater* (Linnaeus), collected from Jaisamand and Fateh sagar lakes of Udaipur district, Rajasthan, only one was found liberating a furcocercaria, which is described below as a new species. It has been named in honour of Prof. S.S. Guraya, Department of Zoology, Punjab Agriculture University, Ludhiana.

MATERIAL AND METHODS

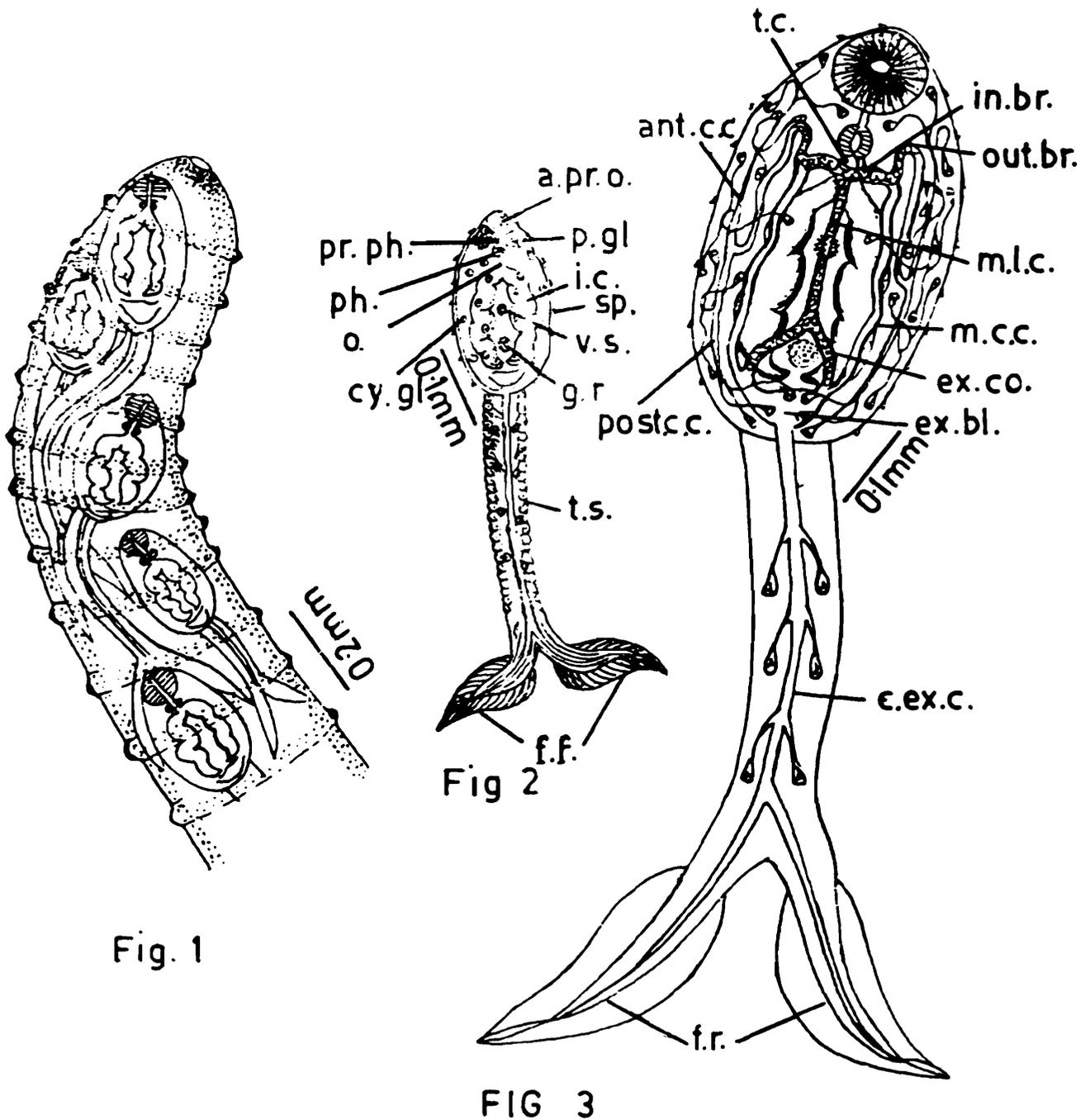
The snails, *F. ater* collected from Jaisamand and Fateh Sagar lake, Udaipur, were kept in medium size beakers (500 ml) containing pond water and exposed to light to facilitate cercarial emergence (positive phototropic). The cercariae were studied both live and after making stained whole mounts. Intra-vital stains such as Neutral red and Methylene blue were also employed on live cercariae for detailed study of their penetration glands, gut and genital rudiments. For measurements, five living and fixed, cercariae were taken.

Intramolluscan larval stage, sporocyst was obtained by dissecting the infected snails.

OBSERVATIONS

*Sporocyst* (Fig. 1) : 25-35 sporocysts were collected from the infected snail. These were elongated, unbranched and whitish in colour, located in the distal part of digestive gland and gonads. The body measures  $1.98-3.12 \times 0.09-0.13$  mm. Sporocysts were observed undergoing contraction and expansion. Each sporocyst become divided into 12-16 pseudocompartments by ingrowths from the body wall, contains few mature and immature cercariae and germ balls.

*Emergence and behaviour of cercaria* : Cercariae emerge mostly in the morning hours but are continuously shed during day also. They swim in water by lashing of their powerful tail. At the bottom of container, they make caterpillar like movements with the help of their suckers. During rest, it hangs down in water, body downwards with stretched furcae. They remain active for a maximum period of about 16 to 18 hours after which they die without encystment.



Figs. 1-3. 1. A portion of sporocyst enlarged. 2. *Cercaria gurayai* n. sp. a. pr. o. - anterior protrusible organ; Cy. gl.- Cystogenous gland; f.f. - fin fold; g.r. - rudiments of gonads; i.c. - intestinal caeca; O - Oesophagus; p. gl. - penetration glands; ph - pharynx; Pr. ph. - Prepharynx; Sp. - Spines; t.s. - tail stem; v.s. - ventral sucker. 3. *C. gurayai* n. sp. showing excretory system. Ant. c.c. - anterior collecting canal; C. ex.c. - Caudal excretory canal; ex. bl. - excretory bladder; ex. co. - excretory corpuscles; in. br. inner branch; m.c.c. - main collecting canal; m.l.c. - median longitudinal canal; Out br. - outer branch; Post. c.c. - posterior collecting canal.

*Cercaria* (Fig. 2) : The body is spinose with narrow anterior and broad rounded posterior ends. The circular and weakly muscular anterior protrusible organ ( $0.33 \times 0.29$  mm across) located in the midventral region of the body, is poorly developed and represented by an oval mass of dark staining cells. Mouth leads into a muscular and rounded pharynx which measures  $0.01 \times 0.01$  mm across, prepharynx being present. Oesophagus short, intestinal caeca are sinus broad and extended posteriorly up to the level of excretory bladder.

Penetration glands (Fig. 2), 18 in number, are located on the either sides of anterior protrusible organ. They are gorged with fine granules, centrally placed nucleus and stain pink with neutral red. Irregular cystogenous glands contain fine granules and are distributed all over the body. The rudiments of the gonads are located a little in front of the excretory bladder and are represented by a small mass of darkly staining cells.

Spinose tail (Fig. 2), which is longer than the body ( $0.19-0.26 \times 0.01-0.03$  mm) is provided with well developed caudal bodies, circular, longitudinal and oblique muscles. The tail terminates into a furcal rami, each of which measures  $0.13-0.22 \times 0.01 \times 0.02$  mm. Each furcae has well developed and prominent fin-fold with fin rays.

V-shaped excretory bladder (Fig. 3) is situated at the hind end of the body. Main collecting canal, one on each side of the body, originates from antero-lateral cornua runs up to the region of intestinal bifurcation, where it divides into an outer and inner branches. Inner branches run transversely for a short distance and unite its fellow from opposite side in the median region of the body to form a transverse canal. Each outer branch turns upwards and then downwards and runs up to middle of the body and divides into two fine branches, an anterior and a posterior collecting canals. The former runs up to the region of pharynx and divides into three branches, each with three capillaries capped with flame cells, while the latter runs posteriorly and divides into two fine branches, each with three capillaries capped with flame cells. A median longitudinal canal originates from the transverse canal and runs posteriorly where it divides into two short branches, each opening into cornua of the excretory bladder. Thus the flame cells formula for cercarial body is  $2(3 + 3 + 3) + 2(3 + 3) = 30$ .

The excretory granules, which are elongated, solid and arranged in a single row are found only in the transverse canal, median longitudinal canal and each out branch up to its turning downwards.

A caudal excretory canal originates posteriorly from the excretory bladder, runs medially along the tail stem and bifurcates to open out side through excretory pore at the tip of furcal rami. Three pairs of flame cells (Fig. 3) originate laterally from the caudal excretory canal are present in the tail stem. Thus, the flame cells formula for tail is  $2(1 + 1 + 1) = 6$ .

## DISCUSSION

Different types of sporocysts such as oval, spherical, elongated and branched and

unbranched have been reported by many parasitologists time to time. In an available literature no such sporocysts having segmented body by pseudocompartments have yet been reported from India. However, Erasmus (1972) has discussed regarding the presence of pseudocompartments in the body of certain sporocysts of cercarial species, e.g. *Plagiorchis muris*. Although the significant role of segments in the sporocysts is still unknown, but it may be presumed that they may have some role in the locomotion.

The present cercaria belongs to the Cyathocotylidae as it has long furcal tail, slender tail stem, well developed oral sucker, ventral sucker undeveloped, penetration glands near caecal bifurcation, protonephridia mesostomate and develop in elongated sporocysts.

The present form shows affinities with following species belonging to Cyathocotylid cercariae viz., *C. pendulata* Baugh, 1954; *C. multiplicata* Premvati, 1955; *C. kumauensis* Singh and Malaki, 1963; *C. kukrailensis* Thaper, 1969; *C. sewelli* Pandey and Agrawal, 1977; *C. esplanadensis* Mukharjee and Ghosh, 1982 and *C. udaipuriensis* Sharma and Choubisa, 1983; but chiefly differs from all of them except *C. udaipuriensis* in the number and arrangements of penetration glands and flame cells. It differs from *C. udaipuriensis* in having (i) prepharynx, (ii) prominent fin fold, (iii) arrangement of flame cells, flame cell formulae and presence of three pairs of flame cells in tail (iv) excretory granules in transverse canal, median longitudinal canal, and one fourth of outer branches of each main collecting canal.

### SUMMARY

A new species of cercaria, *Cercaria gurayai*, collected from a freshwater snail, *Faunus ater* (Linnaeus), is reported. It belongs to the Cyathocotylidae family and is characterised by spinose body, differential sucker ratio, number and position of penetration gland, extension of cystogenous glands and prominent furcal ramii. The affinities of the new cercaria have been discussed. A peculiar sporocyst of it, characterised by evidence of pseudocompartments which has also been reported first time from India.

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