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A NEW STRIGEID METACERCARIA *TETRACOTYLE CHAUHANI N. SP.* (TREMATODA : PROTERODIPLOSTOMIDAE) FROM THE FROG *RANA CYANOPHLYCTIS* AND ITS PROBABLE IDENTITY WITH *PROALARIOIDES TROPIDONOTIS*, VIDYARTHI, 1937

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The paper deals with the study of *Tetracotyle chauhani n. sp.* a metracercaria of *Strigeid* from *Rana cyanophlyctis*. An attempt is being made to trace out the probable identity of *T. chauhani n. sp.* with *Proalarioides tropidonotis*, a common proterodiplostome parasite of water snake in India.

INTRODUCTION

On 13th July 1970 fifteen encysted metacercariae were recovered from the mandibular region (lower jaw) of the frog, *Rana cyanophlyctis* in Chhindwara, M.P. The met cercariae were burried in the host tissue. The cysts were visible in the form of elevations underneath the lower jaw.

MATERIAL AND METHODS

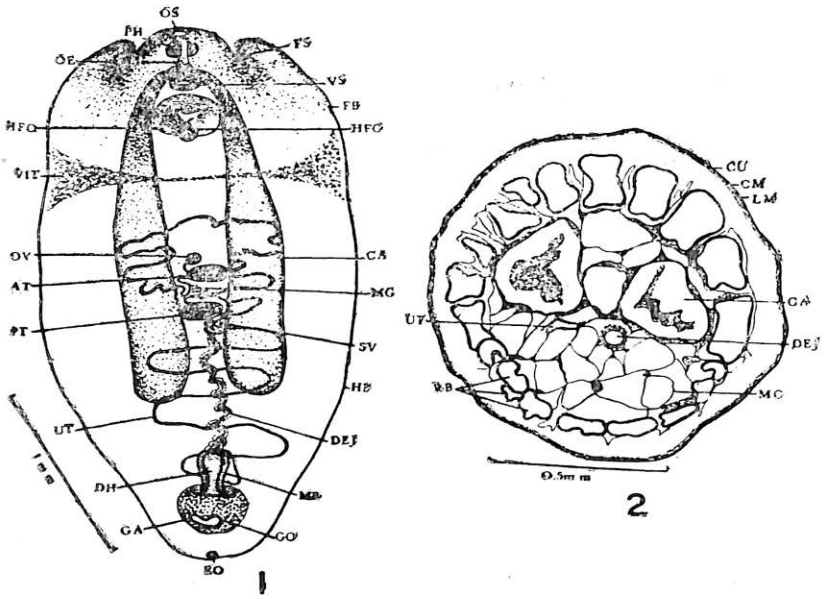
The cysts were carefully removed from the host tissue. They were oval, translucent and white. The metacercariae were liberated in the petridish containing saline water by teasing the tissues of the cysts. They were very inactive. Thirteen metacercariae were pressed under the light pressure of the coverslip and fixed in alcoholic Bouin's fluid. They were stained in Gowar's carmine and mounted in canada balsam for microscopic examination. Two metacercariae were fixed in warm aqueous Bouin's fluid and serial sections cut to study the anatomical details. Drawings were made with the aid of camera lucida. All measurements were recorded in millimetres. The metacercariae were found to be new and hence they have been described under the name *Tetracotyle chauhani n. sp.* in honour of Dr. B.S. Chauhan, an eminent Indian Helminthologist.

SYSTEMATIC DESCRIPTION

Family Proterodiplostomidae Dubois, 1936

Genus *Tetracotyle* Fillipi, 1859

T. chauhani n. sp. (Figs. 1 & 2)



Figs 1–2. **1.** *Tetracotyle chauhani n. sp.* (dorsal view). **2.** T. *chauhani n sp.* (T. S.) (Abbreviation with the text))

Body pyriform, aspinous, freely divided into forebody (FB) and hind body (HB), body length 2.42–3.37; forebody length 0.70–0.84 width 1.12–1.35, hindbody length 1.72–2.53 width 1.34–1.65; forebody and hindbody not sharply demarcated. Oral sucker (OS) terminal, transversely elongated, length 0.05–0.07, width 0.11–0.14. Ventral sucker (VS) immediately behind the caecal bifurcation, transversely elongated, length 0.05–0.09, width 0.12–0.14. Two pseudosuckers (PS), each on the lateral sides of oral sucker. Prepharynx absent, pharynux (PH) barrel-shaped, length 0.08–0.11, width 0.10–0.12. Oesophagus (OE) small, length 0.03–0.032; caeca (CA) inflated terminating between posterior testis and ductus hermaphroditicus (DH). Holdfast organ (HFO) length 0.22–0.30, width 0.2–0.34, in the centre of forebody, spherical, opening semicircular, holdfast gland (HFG) spherical diameter 0.07, on the posterior margin of holdfast organ, bearing a minute opening.

Reproductive analgens very clear. Testes two, entire, transversely elongated, in the anterior third of the hindbody, may or may not be overlapped by caeca;

anterior testis (AT) length 0.08–0.09, width 0.15–0.21; posterior testis (PT) length 0.07–0.09 width 0.16–0.26; intertesticular space occupied by the Mehlis's glands (MG); seminal vesicle (SV) convoluted, posterodorsal to posterior testis; ductus ejaculatorius (DEJ) length 0.8–1.0, opening into the ductus hermaphroditicus (DH); Ovary (OV) anterodorsal to anterior testis, entire, spherical, diameter 0.04–0.07; oviduct arising from the posterior side of the ovary; uterus (UT) in form of transverse coils. Distal part of uterus and ductus hermaphroditicus enclosed in a muscular bulb (MB); ductus hermaphroditicus opening into genital atrium (GA), genital atrium opening to the exterior through dorsal and sub terminal genital opening (GO). Vitelline follicles (VIT) small, mostly on the junction of forebody and hindbody. Excretory opening (EO) ventroterminal. Excretory system made up of reserve bladder (RB) in the form of large spaces (superficial plexus).

DISCUSSION

The metacercariae belong to the larval *Strigeid* group far body being divided into forebody and hindbody; pseudosuckers and holdfast organ present, genital opening in the posterior end of the body and the reserve bladder system. The *Strigeid* group of metacercariae includes four genera, *Tetracotyle* Fillipi, 1859; *Diplostomulum* Brandes, 1892; *Neascus* Hughes, 1927 and *Codonocephalus* Kopezynski, 1907. The present metacercariae are referred to the genus *Tetracotyle* in having well developed pseudosuckers, pyriform shape of the body and reserve bladder in the form of large spaces. The genus *Tetracotyle* includes the species *T. crystallina* Hughes, 1928; *T pipientis* Hughes, 1928 and *T ranae* Kaw, 1950. All these species have been reported from the amphibian shots. *T. crystallina* is characterised in having spiny pseudosuckers. In *T pipientis* the holdfast organ is modified to form a single transervse lappet. In *T. ranae* the holdfast organ is present on the posterior extremity of the body. As evident from the above discussion the metacercariae under study can not be referred to any of the above mentioned species of the genus *Tetracotyle*. To accommodate them, *Tetracotyle chauhani n. sp.* has been described.

Fillipi (1859) proposed the larval genus *Tetracotyle*. Since then much work has been added (Faust, 1918; Hughes, 1928; 1929 a & b; Kaw, 1950). Hence it is desirable to revise the genus in the light of recent work. The *italic* part indicates the revised diagnosis after Fillipi, 1859.

Revised Diagnosis of the Genus *Tetracotyle* Fillipi, 1859

Metacercariae free or *encysted in the host,* with or *without hindbody*. Pseudosuckers well developed or *groove like with* or witout spines. Oral and ventral suckers present. Holdfast organ behind the ventral sucker, in the centre of

the forebody. Its opening longitudinal or transverse, circular or *four raved: may be modified into a single transverse lappet, lobes of the holdfast organ may be further divided.* Pharynx small or prominent. Caeca reaching the caudal end or a little in front of the posterior end. *Reproductive analgens may* or may not be clear. Excretory system made up of reserve bladder in form of large spaces. Parasites in amphibian hosts.

Identity Of *Tetracotyle chauhani n. sp.* with *Proalarioides tropidonotis* Vidyarthi, 1937 (Proterodiplostomidae Dubois, 1936; Ophiodiplostominae Dubois 1936)

Yamaguti (1933) described *Proalarioides serpentis* from the intestine of *Elaphe quadrivirgata* and its metacercaria from the breast and thigh muscles of *Rana nigromaculata* in encysted condition in 1936. This idea led the authors to compare *Tetracotyle chauhani n. sp.* with the adult members of the genus *Proalarioides* Yamaguti, 1933. *T. chauhani n. sp.* resembles *Proalarioides* in having pseudosuckers, vitelline follicles mostly in forebody and the ductus hermaphroditicus The genus *Proalarioides* includes three species, *P. serpentis* Yamaguti, 1933; *P. tropidonotis* Vidyarthi, 1937 and *P. kobayashii* Park, 1940. *T. chauhani n. sp.* resembles *P. tropidonotis* and *P. kobayashii* in having the intertesticular space occupied by Mehlis's glands. In *P. serpentis* no intertesticular space is available due to close approximation of the testes. *T. chauhani n. sp.* resembles *P. tropidonotis* and differs from *P. kobayashii* in having forebody and hindbody not sharply demarcated. *T. chauhani n. sp.* further resembles *P. tropidonotis* in having barrel shaped pharynx, caeca terminating in between posterior testis and ductus hermaphroditicus, greatly convoluted seminal vesticle posterodorsal to the posterior testis, ovary anterodorsal to the anterior testis and the large size of ductus ejaculatorius.

The frogs harbouring encysted *T. chauhani n. sp.* are found in the habitat of *Natrix piscator*. *Proalarioides tropidonotis* is its common parasite. This further suggests that *T. chauhani n. sp.* is the metacercaria of *P. tropidonotis*. *Rana cyanophlyctis* forms food menu of *Natrix piscator*. Thus the encysted metacerariae reach the intestine of the water snake. The cyst is digested and the metacerearіae grow and mature into the adult *P. tropidonotis*.

T. chauhani n. sp. differs from *Proalarioides tropidonotis* in having pyriform shape of the body, distended caeca, holdfast gland and the absence of eggs. Except the holdfast gland all the differences may be eliminated during post-metacercarial growth and subsequent sexual maturation. The presence of holdfast gland in *Tetracotyle chauhani n. sp.* and absence in *P. tropidonotis* can

only be accounted after working out the life history of *P. tropidonotis*. Thus finding out the stage when the holdfast gland disperses. In view of the above discussion *Tetracotyle chauhani n. sp.* is suggested a probable metacercaria of *P. tropidonotis*.

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