

ON THE BLOOD FLUKE, *CARDIOTREMA ROPARENSIS* MEHROTRA, 1973
AND VALIDITY OF *C. LONGIVESTICULATA* DWIVEDI, 1967
(SPIRORCHIIDAE : COEURITREMATINAE)

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ABSTRACT

Cardiotrema roparensis Mehrotra, 1973 is described in detail and its validity discussed. *C. longivesticulata* Dwivedi, 1967 is considered synonymous with *C. vajdyai* Dwivedi, 1967 since the position of the vesicula seminalis externa in relation to the ventral sucker has been found variable. Some diagnostic features of the genus *Cardiotrema* are emended.

During a survey of blood flukes parasitising freshwater chelonians in India, about 125 specimens of *Cardiotrema roparensis* Mehrotra, 1973 were recovered from the blood vessels, washings of the body cavity and teased hepatic tissue of *Kachuga sylhetensis* (Jerdon) and *Lissemys punctata punctata* Bonnaterre from Ropar (Punjab) and *Geoclemys hamiltoni* (Gray) from Karnal (Haryana). The maximum number of the parasites recovered from one host was six. The location of the flukes obtained from the washings of the body cavity is most probably the blood vessels from which they escaped during the autopsy of the hosts. No specimen was recovered from the heart.

This species is being described here in details since only its diagnostic features have earlier appeared in an abstract (Mehrotra, 1973).

Cardiotrema roparensis Mehrotra, 1973

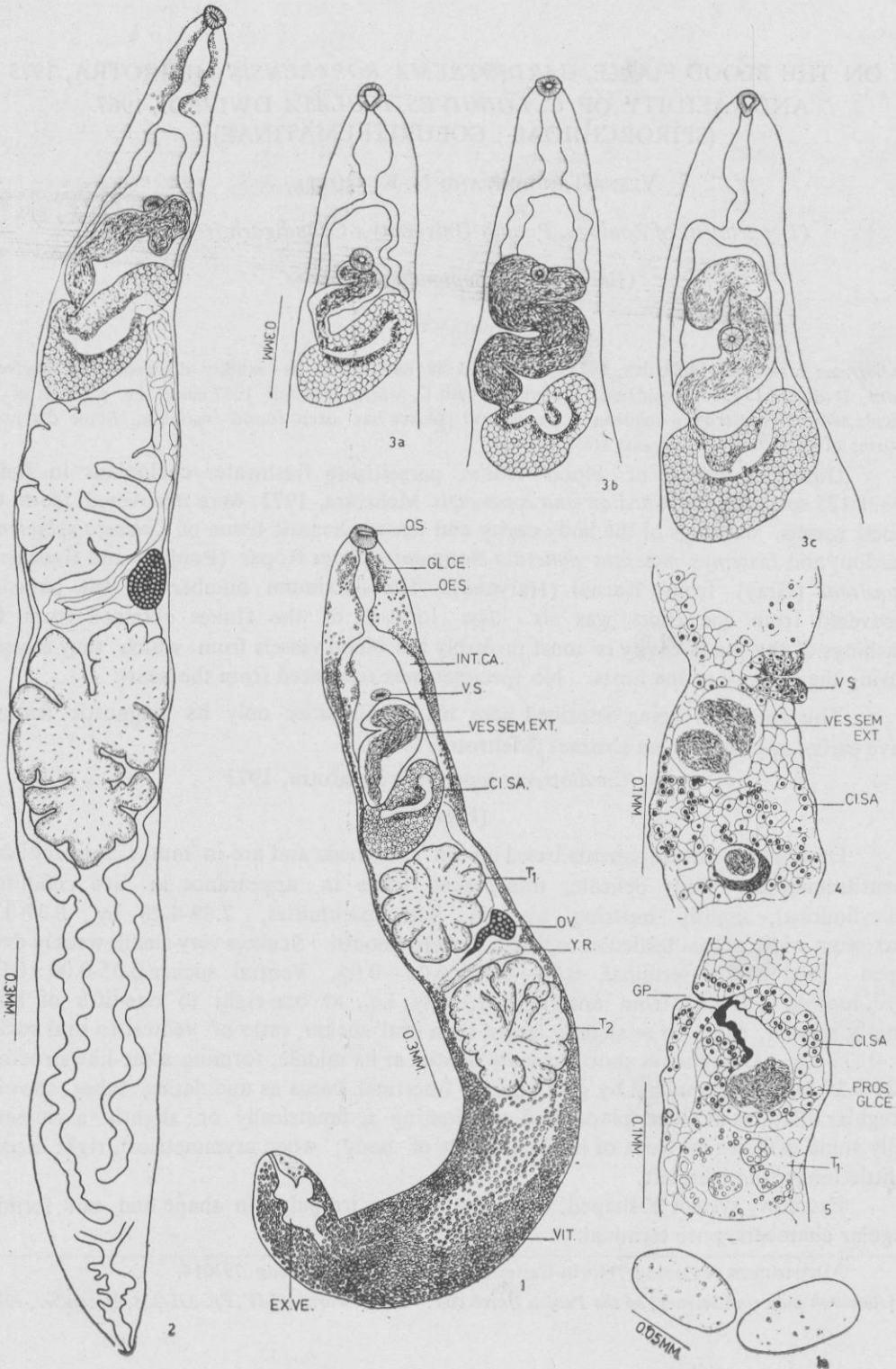
(Figs. 1-5)

Description (measurements based on ten specimens and are in mm) : Spirorchiidae, coeuritrematinae. Body delicate, transparent white in appearance in live condition, subcylindrical, slightly tapering towards both extremities, 2.89-4.28 by 0.37-0.62 maximum width across testicular region. Cuticle smooth. Suckers very small, weakly developed. Oral sucker terminal, 0.06-0.09 × 0.06-0.08. Ventral sucker 0.05-0.09 × 0.06-0.10, located 0.42-0.61 from anterior extremity, i.e., at one-eighth to one-fifth of body length; smaller, equal to or slightly larger than oral sucker, ratio of ventral to oral sucker 1 : 0.72-1.6. Oesophagus short, usually dilated at its middle, forming a sac-like structure, 0.21-0.28 long, surrounded by gland cells. Intestinal caeca as undulating tubes, showing irregular dilations at some places and terminating symmetrically or slightly asymmetrically some distance in front of hind extremity of body; when asymmetrical, right caecum a little longer than the left.

Excretory system Y-shaped, excretory vesicle irregular in shape and not forming regular chambers, pore terminal.

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Testes deeply lobed, occupying almost whole width of body in its middle third; anterior testis $0.32-0.73 \times 0.32-0.54$, posterior testis $0.41-0.91 \times 0.31-0.57$. Vesicula seminalis externa well developed, postacetabular or extending into preacetabular region, depending upon the amount of sperms stored in it (Figs. 3a, b and c). Cirrus sac large, with membranous wall, pretesticular and placed somewhat obliquely behind vesicula seminalis externa, $0.33-0.57$ long by $0.16-0.31$ broad, enclosing pars prostatica and protrusible cirrus. Genital pore sinistral, dorsal, at a distance of one-fifth to one-third of body length from anterior extremity.

Ovary oval or irregular in shape, located in intertesticular space or in level with posterior half of anterior testis on the left, $0.09-0.24 \times 0.06-0.14$. Uterus running anteriorly along left margin of anterior testis, containing thin-shelled and large eggs without polar filaments. Eggs $0.08-0.09 \times 0.04-0.04$; as many as fourteen eggs were observed in one specimen. Vitellaria extensive, from anterior to posterior end of body, sparse in prebifurcal region, restricted to lateral sides in region of reproductive organs and dense in posttesticular zone. Yolk reservoir intertesticular, postovarian.

Remarks :

The genus *Cardiotrema* includes two species so far, viz. *C. vaidyai*, Dwivedi, 1967 from *Kachuga kachuga* in Jabalpur (Madhya Pradesh) and *C. longivesticulata* Dwivedi, 1967 from *Kachuga dhongoka* in the same locality. (The latter species has been considered a synonym of *C. vaidyai* by the present authors, discussion vide infra). *C. roparensis* can be differentiated from *C. vaidyai* in which the intestinal caeca form 'knobs' at their distal ends, the excretory vesicle is distinctly five-chambered and the uterus contains a single egg with polar filaments.

- Hosts : *Kachuga sylhetensis* (Jerdon),
Lissemys punctata punctata Bonnaterre,
Geoclemys hamiltoni (Gray)
- Locations : Blood vessels, liver, body cavity
- Localities : Ropar (Punjab), Karnal (Haryana)

Discussion on the validity of *Cardiotrema longivesticulata* Dwivedi, 1967 :

Dwivedi (1967) described two new species, *Cardiotrema vaidyai* (as type species) and *C. longivesticulata* under a new genus *Cardiotrema*, from *Kachuga kachuga* and *K. dhongoka* respectively, in Jabalpur (M.P.) He differentiated *C. longivesticulata* from the type species in having the ventral sucker situated at the level of one-sixth to one-fifth of the body length from the anterior end, ventral sucker to the oral sucker ratio 1 : 2.2, preacetabular extension of the vesicula seminalis externa, genital pore at one-fourth of the body length from the anterior end, and lobed ovary. In

FIGURES 1—5. *Cardiotrema roparensis*. 1, a whole mount (ventral view), 1a, eggs; 2, another specimen with numerous eggs in the uterus; 3 a, b, c, portions of specimens showing variations in the extent of vesicula seminalis externa anteriorly; 4, ventral sucker in sagittal section; 5, a portion of sagittal section passing through the genital pore.

ABBREVIATIONS

CI.SA.—cirrus sac; EX. VE.—excretory vesicle; G. P.—genital pore, GL. CE.—gland cells; INT.CA.—intestinal caeca; O.S.—oral sucker; OES.—oesophagus; OV.—ovary; PROS.GE.CE.—prostate gland cells; T₁—anterior testis; T₂—posterior testis; V.S.—ventral sucker; VES.SEM. EXT.—vesicula seminalis externa; VIT.—vitellaria; Y. R.—yolk reservoir.

C. vaidyai the ventral sucker lies at a little less than one-fifth of the body length from the anterior end, the ratio of the ventral to the oral sucker is 1 : 1.7, the vesicula seminalis externa does not extend into the preacetabular region, the genital pore is a little in front of the one-third of the body length from the anterior extremity, and the ovary is entire.

It appears that the characters on the basis of which Dwivedi distinguished *C. longivesticulata* from *C. vaidyai* are mere variations. The situation of the ventral sucker and genital pore (in relation to the anterior end of the body), the suckers' ratio, the extension of the vesicula seminalis (in relation to the ventral sucker) and the contour of the ovary are found to be varying in *C. roparensis*, too, by the present authors. Therefore, *C. longivesticulata* should be regarded as a synonym of *C. vaidyai*.

In the light of the studies on *C. roparensis* a few diagnostic characters of the genus *Cardiotrema*, as given by Dwivedi (1967), need to be emended. The emended characters (italicised) are as follows :

Ventral sucker feebly developed or rudimentary, smaller *or slightly larger* than oral, situated at *one-eighth to one-fifth* of body length from anterior end. Intestinal caeca converging behind posterior testis and terminating symmetrically *or asymmetrically* in front of excretory vesicle, forming *or not* knobs at their distal ends. Excretory vesicle composed of regular chambers, *or of irregular shape*, with terminal pore. Genital pore dorsal, sinistral, *one-fifth to one-third* of body length from anterior extremity.

LITERATURE CITED

- Dwivedi, M. P. (1967) *Ind. Jour. Helminth.* 9, 1
Mehrotra, V. (1973) *Proc. 60th Ind. Sc. Cong.* IV, 46