STUDIES ON THE HELMINTH PARASITES
OF KASHMIR

Part III. Description of a New Allocreaidid, *Crepidostomum indicum*,
from a fresh-water fish, *Schizothorax niger*, from the Dal Lake, Kashmir

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The genus *Crepidostomum* was erected by Braun (1900) and was placed
under the sub-family Bunoderinæ by Looss (1902) and under Stephanophialinæ by Nicoll (1909). Subsequently several other genera were described
under papillose Allocreadiidæ, but the recent researches of Hopkins (1931, 1933 and 1934), Van Cleave and Mueller (1934) and Lyster (1939) have
reduced their number to three, viz., *Bunodera Ralilet* (1896), *Crepidostomum* Braun (1900) and *Creptotrema* Travassos, Artigas and Pereira (1928)—Acro-
dactyla Stafford (1904), Stephanophiala Nicoll (1909), Acrolichanus Ward (1918) and Megalogonia Surber (1929) being considered synonyms to *Crepidos-
ptomum*. Besides, Hopkins (1933 and 1934) and Van Cleave and Mueller (1934) established a close relationship of *Crepidostomum* with *Bunodera*
and *Allocreadium* and found no justification for maintaining the sub-family Stephanophialinæ of Nicoll (1909) and the family Bunoderidæ of Poche (1926) and Fuhrmann (1928).

There are twenty-two species reported under the genus *Crepidostomum*
but Van Cleave and Mueller (1932 and 1934) and Hopkins (1933 and 1934)
have reduced their number to the following eleven species:—

1. *C. farionis* Müller (1788), Syn. *Stephanophiala laureata* Zeder
   (1800), *S. transmarinum* Nicoll (1909), *S. vitelloba* Faust (1918), *C. ussuriense* Layman (1930) and *C. fausti* Hunnien and Hunter (1933);
2. *Crepidostomum* (Distomum) auriculatum Wedl. (1857);
3. *C. metaceus* Braun (1900), Syn. *C. suecicum* Nybelin (1932);
4. *C. lintoni* Pratt (Linton, 1901), Syn. *Acrolichanus* (Acrodactyla
   Stafford, 1904) *petalosa* Looss (1902);
5. *C. cornutum* Osborn (1903);
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6. *C. illinoiense* Faust (1918), Syn. *C. hiodontis* Hunter and Bengham (1932);
7. *Crepidostomum* (Syn. *Megalogonia*) *ictaluri* Surber (1928);
8. *C. latum* Pigulewsky (1931);
9. *C. cooperi* Hopkins (1931), Syn. *C. ambloplitis* Hopkins (1931), *C. solidium* Van Cleave and Mueller (1932);
10. *C. isostomum* Hopkins (1931), Syn. *C. canadense* Hopkins (1931);

As will be discussed later in this paper, the author believes that *C. auriculatum* and *C. lintoni* are also identical and hence the number of valid species would be reduced to ten. In the present communication the writer describes another species of the genus obtained from the intestine of a fish, *Schizothorax niger* caught from the Dal Lake in Kashmir. This is the first record of the genus *Crepidostomum* from India.

*Crepidostomum indicum* (n.sp.)

Body is more or less flat and lanceolate and measures 2.24 x 0.72 mm. in size, the maximum breadth being in the region of the ovary. There are no body spines. The oral sucker is subterminal, broad and oval, and measures 0.12 x 0.17 mm. It bears six preoral papillae at its anterior end, each being 0.03-0.06 x 0.11-0.13 mm. in size. They are broader than long and each one appears lobe-like, being anteriorly rounded or flat with a slight notch in front. Acetabulum is larger than the oral sucker and lies at a distance of one-fifth of the body-length from the anterior end. It is circular with a diameter of 0.27 mm.

Mouth is ventral. Pharynx is globular and greatly muscular with a diameter of 0.13. Oesophagus is narrow and elongated, being three times the length of the pharynx. Intestinal cæca are long and terminate just behind the posterior testis.

Testes are two and lie medially one behind the other in the posterior half of the animal. They are entire, oval and elongated. The two testes are nearly equal, the anterior one measures 0.37 x 0.22 mm. and the posterior one 0.37 x 0.2 mm., in size. Two vasa efferentia unite to form a small vas deferens at the posterior end of the cirrus sac. Cirrus sac is well developed and nearly oval in shape, measuring 0.33 x 0.17 mm. It lies immediately in front of the intestinal fork and contains inside it a coiled vesicula seminalis, pars-prostatica and well-developed cirrus.
**Fig. 1.** *Crepidostomum indicum* (n.sp.) from *Schizothorax niger* (ventral view).

*act.*, acetabulum; *c.s.*, cirrus sac; *eg.*, egg; *e.b.*, excretory bladder; *e.p.*, excretory pore; 
*g.p.*, genital pore; *i.b.*, intestinal bifurcation; *i.c.*, intestinal caecum; *mo.*, mouth; *oes.*, oesophagus; 
*o.p.*, oral papilla; *o.s.*, oral sucker; *ov.*, ovary; *ph.*, pharynx; *r.s.*, receptaculum seminis; 
*test.a.*, anterior testis; *test.p.*, posterior testis; *v.d.*, vitelline duct; *v.f.*, vitelline follicles; 
*v.r.*, vitelline reservoir; *v.s.*, vesicula seminalis; *vas.e.*, vas efferens.
Ovary is globular and median, measuring $0.24 \times 0.23$ mm. and lies in the second quarter of the body, behind the intestinal fork and acetabulum.

Receptaculum seminis is pear-shaped, measures $0.11 \times 0.2$ mm. and lies between the ovary and the anterior testis. It receives Laurer's canal before opening into the oviduct. Vitellaria are follicular and the follicles extend laterally from the intestinal fork up to the posterior end of the body, filling up the area behind the posterior testis. They cover the intestinal cæca on the ventral and the lateral sides. Two trans-vitelline ducts meet behind the receptaculum seminis to form a vitelline reservoir. Uterine coils are indistinct and the eggs, numbering 90–100, lie between the acetabulum and the middle region of the anterior testis. They are operculate, nearly oval and large in size, measuring $90–105 \times 56–80 \mu$. Metraterm is not distinct. Genital opening is median and lies in front of acetabulum and intestinal bifurcation.

Excretory pore is terminal and leads internally to form an elongated, tubular and undivided excretory vesicle.
Discussion

The present form differs from *C. metacarus*, *C. lintoni*, *C. cornutum*, *C. illinoiense* and *C. cooperi* in the position of genital pore and the anterior extension of vitellaria. It is different from *C. latum* and *C. brevivitellum* in the position of genital pore, from *C. faronis* in the anterior extension of vitellaria and from *C. ictaluri* in the position of genital pore, anterior extension of vitellaria and form and arrangement of testes. It, however, stands very near to *C. isostomum* from which it can be readily distinguished by the shape of its body, notched appearance of the oral papillae, relative length of oesophagus, form and size of cirrus sac and number and size of eggs. The writer, therefore, creates a new species, *C. indicum* for its reception.

*Distomum auriculatum* Wedl. (1857) is inadequately described by its author and according to Stafford (1904) and Faust (1918) the form described and provisionally placed under this species by Linton (1898) is really *Crepidostomum lintoni* (Syn. *Acrolichanus petalosa*). Hopkins (1933) while recognising *C. auriculatum* Wedl. (1857) as a species distinct from *C. lintoni*, recorded the following difference between the two:—

(a) *C. lintoni* has oral sucker much larger than acetabulum while *C. auriculatum* has either suckers equal or oral sucker only slightly larger than acetabulum and (b) *C. lintoni* has uterus reaching behind the anterior testis in older specimens while *C. auriculatum* does not show any such condition of uterus.

From the above it appears that the points differentiating the two species are variable within the species and hence not valid for specific diagnosis. Moreover according to Faust (1918), Hopkins (1933), Van Cleave and Mueller (1932 and 1934) and Lyster (1939 and 1940) the above differences are also reported as instances of individual variations in the other species. Sucker ratio is seen to vary in *C. faronis*, *C. ictaluri*, *C. cooperi* and *C. isostomum* and the posterior extent of uterus varies in *C. cornutum*, *C. ictaluri* and *C. cooperi*. Thus the two species lack morphological characters to warrant them as separate species and the differences reported fall within the bounds of individual variations.

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Note.—Type specimen is deposited in Dr. Thapar's Helminthological Collections, Lucknow University.
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