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Four new Monogenean and a Caryophyllid Cestode Parasites from Indigenous Catfishes of Bangladesh.

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Abstract

Investigation ws conducted on helminth infestation in three species of indigenous catfishes namely *Ompok pabda*, *Clupisoma garua* and *Eutropiichthys vacha* from different water bodies of Mymensingh, Netrakona, Habigonj and Sunamgonj districts from June, 2003 to May 2004. Among a good number of helminth parasites collected from these fishes five species of monogenetic treamatodes four of which described here are new species and a caryophylid cestode also as new after critical morphological and taxonomical stuy. The identified monogeneans were *Silurodiscoides sudhakari* (Gussev, 1976). *Eutropiichthys vacha*; *Silurodiscoides, eutropiichthys* n.sp. from *Eutropiichthys vacha* and *Neosprostonia sunamgonji* n.sp. from *Clupisoma garua* and *Eutropiichthys vacha*. A single caryophyllid *Lytocestoides pabai* n.sp. was recovered from *Ompok pabda*.

Keywords: Monogeneans, Cestode, Parasites, Freshwater fish, Bangladesh

Introduction

Studies on helminth parasites of indigenous catfishes in Bangladesh are fragmentary. Though a number of helminthes are reported from catfishes, information on monogeneans is particularly limited. Most of the works were concentrated on walking catfish (Ahmed and Sanaullah, 1977; Rashid *et al.*, 1984; Ahmed *et al.*, 1985 and Chandra *et al.*, 1997). However, basic study on monogenean and caryophillids have been done from different freshwater catfishes in Banglaesh, (Chandra and Khatun, 1993; Chandra and Yasmin, 2003; Begum and Chandra, 2003; Chandra and Banerjee, 1992; Hafizuddin and Shahabuddin 1996; Banerjee, and Jannat 2002). The other important related works in this region are (Rizvi, 1971, Kulkarni, 1969, Lim, 1986, Tripathi, 1957, Jain, 1959 and Hafeezullah, 1993). Present investigation was initiated with a view to record the helminth infestation of indigeneous catfish of freshwater bodies as a part of a project work funded by the Bangladesh Agricultural University Research system.

Material and methods

Samples of indigenous catfishes *Clupisoma garua*, *Eutropiichthys vacha* and *Ompok pabda* were manualy collected from different areas of Bangladesh such as Mymensingh, Netrakona, Habiganj and Sunamgonj districts, 133 host fishes were examined. Both external and internal examinations were made for the collection of parasites. For external observation body slime and gills were examined.

Gills were dissected out from the bronchial cavity and placed in petridish containing distilled water an observed under dissecting microscope. The gills were gently scrapped to dislodge the live monogeneans from the gill filaments with the help of a bent needle and forceps. The monogeneans were picked up by a micropipette with a small drop of water on a glass slide and covered with cover slip, sealed with 'sialant' to prevent them

moving. After few minutes it was fixed with ammonium picrate. For internal examination the host fishes were dissected and opened along mid-ventral line. Each internal organ like liver, gall bladder, parts of alimentary tract were carefully opened separately by longitudinal incision and observed for presence of any metazoan parasite under microscope. The cestode worm was fixed in AFA, stained in alum carmine and mounted in Canada balsam. Parasites were drawn with the help of a Camera lucida.

Results

Silurodiscoides sudhakari (Gussev, 1976) (Fig.1)

Host :*Eutropiichthys vacha*

Localities : Mymensingh, Netrakona (Mohongonj) and Sunamgonj

Site of infestation : Gill filaments

No. of parasites measured : 5

Prevalence (%) : 30.23

Description

Small to moderate-sized worms, length 0.970mm 0.870-1.150; width 0.130mm 0.090-0.180; two pairs of eyespots scattered as pigment granule in some specimens; pharynx nearer to the head spherical; 0.074mm x 0.062mm.

The opisthohaptor has two pairs of anchors, a dorsal and a ventral pair. Dorsal anchors with powerful sabre-like point and small wing. Their total length 0.046 mm - 0.042-0.048, length of main part 0.033-0.036 mm, of inner root, 0.014 - 0.017mm, point 0.019-0.021mm. The patches of dorsal anchors were widened at one termination, and narrowed towards the other, their size 0.007-0.011x 0.002 - 0.004mm; dorsal bar in the form of slightly curved chitinoid stick with widened round end, its size 0.004 -0.005 x 0.022-0.034 mm; ventral anchors with small roots and smoothly recurved point, their total length 0.026-0.029 mm; length of main part about 0.022 mm; of inner root 0.002-0.004mm; of point 0.012-0.014mm; ventral connective bar-shaped, size of its every S-shaped half 0.0018-0.0029 x 0.029-0.031mm; hooks of larval type with protruding 'heel' of hooklet; their total length 0.013-0.021mm.

Copulatory complex consists of a spiral, coil-shaped tube with widened initial part almost cylindrical on its terminal end and a curved getter-shaped accessory piece. Its length along curve 0.027-0.029 mm; initial part 0.03-0.0017 mm; length of accessory piece 0.032-0.037 mm; width 0.009-0.019mm; length of accessory piece 0.032-0.037 mm; width 0.009-0.019 mm; vaginal armament with a cylindrical tube bending into a bubble-like widening at one end; length of vaginal tube 0.011-0.011 at one end; length of vaginal tube 0.011-0.012 mm in width.

Discussion

The specimen resembles *Silurodiscoides sudhakari* (Gussev, 1976) collected from the gill filaments of *Wallago attu* from

Bhavanisagar reservoir, India; in all of its morphology and main identifying characters but minor differences found in some measurements and structure of dorsal bar which may be an individual variation due to host differences. Therefore it has been identified as *Silurodiscoide sudhakari* (Gussev, 1976) reported from Bangladesh water and from the new host.

Copulatory complex larger, present at the anterior half of the body. It consists of an elongated tube and an accessory piece. Tube coiled; length about 0.250mm, diameter of anterior widened part 0.008 mm, middle 0.001mm and distal widened part 0.005mm. accessory piece claw like peculiar shaped, its length 0.058mm; vaginal armament with a samll semi-curved attached with a long zigzag coiled narrow tube.

***Silurodiscoides eutroiichthys* n.sp. (Fig.2)**

Host : *Eutropiichthys vacha*

Localities : Sunamgonj

Site of infestation : Gill filaments

No. of parasites measure : 3

Prevalence% : 16.27

Description

The fluke is elongate in size, length 1.850-2.000mm, width 0.170-0.190mm. Eye goblets scattered along anterior end of body as individual granules. Mouth bears muscular pharynx, which is 0.120mm diameter. Opisthohaptor not constricted off from body proper but with two pairs of dissimilar anchors. Dorsal anchors larger, have ridge like structure at the base, total length 0.048-0.052mm, the main part 0.041mm, length of inner root 0.008mm, triangular elongate patches 0.21mm x 0.008mm in size, with sharp point, 0.022mm. Dorsal connective bar curved with widened middle, 0.009 x 0.047mm. Ventral anchors, 0.025-0.28mm, with well developed roots, 0.003mm and curved point, 0.014mm. Ventral bar flexible} – shape, half of its size 0.006 x 0.035mm. Marginal hooks with protruding 'heel' of hooklet. Their length 0.013 – 0.015mm, handle 0.008 mm and point 0.005 mm.

Discussion

The species collected from *Eutropiichthys vacha* coincides with the basic generic characters of the genus *Silurodiscoides* but differs morphologically from other reported species of the genus. The following species are recorded as catfishes under the genus: *S. inicus*, Kulkarni (1969). *S. sunhakari* Gussev (1976), *S. octotylus* Kulkami (1969), *S. devarajii* Gussev (1976), *S. malabaricus* Gussev (1976). *S. vaginalis* Gussev (1976), *S. aori* Rizvi (1971), *S. pusillus* Gussev (1976), *S. parvalus* Gussev (1976), *S. microhaptorus* Lim (1986). As the present form does not coincide with the basic morphological feature of any known species it warrants erecting a new species for this form and the name *Silurodiscoides eutropiichthys* n. sp is proposed after the name of the host genus for its acceptance.

Bychowskyeela vachai n.sp. (Fig.3)

Host	: *Eutropiichthys vacha*
Localities	: Mymensingh, Mohongonj, Surma river at Sunamgonj
Site of infestation	: Gill filaments
No. of parasites measure	: 5
Prevalence%	: 20.93

Description

The fluke with medium body, length 0.888mm (0.747-0.971); breadth 0.133mm (0.099-0.166); haptor broader than the body 0.158-0. 174 x 0.141-0.191 mm in size; four pairs of head organs; Eyepots absent only separate pigment granules dispersed in the anterior part of body; pharynx ovoidal, 0.034-0.048 x 0.041-0.58 mm; intestinal crura extends down to the posterior quarter of the body.

Two pairs of unequal anchors of which dorsal anchor is 0.058mm (0.056-0.059); its sharp point 0.009-0.011mm in length; a single dorsal bar lip-shaped widened in the middle with articulate knob measuring 0.013 mm (0.011-0.017) x 0.056mm (0.053-0.058). Each of the dorsal anchors with an accessory piece at its base, curved and tapering size 0.048 x 0.008mm; ventral anchors smaller than dorsal one have wings not reaching to the point total length 0.030- 0.036mm; length of main part 0.026-0.033mm; inner root 0.004-0.005mm; outer root 0.003-0.004mm; point 0.014-0.016mm; a spiny ear-like accessory piece attached at the base of ventral anchor, its size 0.003-0.004 x 0.002-0.003mm; ventral paired bars meet in the median line size 0.008-0.010 x 0.049-0.055mm.

The ventral cuticular plate or 'onchium' is Y-shaped 0.021mm (0.019-0.022) x 0.0019mm (0.017-0.021); seven pairs of marginal hooklets of these three pairs are larger 0.031-0.042mm; one pair near the onchium, one pair behind it, and the third pair near dorsal anchors. Four pairs of small marginal hooklets present near the margin; size about 0.014 -0.017mm.

Copulatory complex consists of a smooth curve tube and an accessory piece. The length of tube along curve 0.053mm (0.052-0.054); diameter of its widened initial part 0.012-0.013mm; middle 0.004-0.007mm and posterior 0.001-0.003mm; accessory piece looks like a thin tape going from initial part of tube and forming 2/3 horned widening part at its end its length 0.054-0.059mm. Vaginal armament not observed.

Discussion

The present specimens coincide with the generic characters of the genus *Bychowskyella Ahneriwm* (1952) in the structure of dorsal and ventral anchors, patches, copulatory complex, presence of onchium and number of hooks; the best known species of the genus are, type species *B. pseudobagri* Achmerow, (1952) recorded from *Parasilurus asotus* and *B. tchangi* Gussev, (1976) describe from *Clarias batrachus* in India. Tripathi (1957) described several species after erecting a new genus *Silonditrema* but Jain (1959) synonymized *Silonditrema* as *Bychowskyella* later accepted by Gussev (1976). They state that presence of onchium in some species and peculiar ear-shaped processes on the shaft of ventral

anchor do not give any base for separating it into different genera.

Gussev (1976) also stated that despite great similarities the presence of onchium in *B. garui* and its absence in *B. indica* also differs in the shape of vaginal armament, they should be considered as independent species. Here different hosts are important characters.

anchors with sharp point, indistinct roots, comparatively broadened at the base, total length 0.044mm (0.042-0.046); length of main part 0.037-0.042mm, length of point 0.018mm (0.0166-0.021); patches short, triangular, length 0.018mm (0.016-0.020); width 0.008mm (0.007-0.009); dorsal connective bar widened at the middle, where there are two articulate

Bychowskyeela vachai n.sp. (Fig.4)

Host : *Clupisom garua* and *Eutropiichthys vacha*

Localities : Mymensingh, Habigonj and Sunamgonj

Site of infestation : Gill filaments

No. of parasites measure : 5

Prevalence% : 20.93 – C. garua
16.27 – E. vacha

However, the present specimen though resembles *B. pseudobagri* but differs in the presence of onchium and process on the shaft of ventral anchors also, to an extent. On the basis of this ground present specimen collected from *Eutropiichthys vacha* is erected as an independent species and the name *Bychowskyella vachai* n.sp. is proposed.

Description

Elongated body 2.797mm (2.130-3.150) long; 0.380 mm (0.270-0.400 wide. Two pairs of eyespots; posterior two eyespots dispersed as pigment granules. Pharynx spherical to ovoid at the anterior part of body its size is 0.137 x 0.145mm. Head organs located at anterior region.

Haptor is armed with seven pairs of hooks and two pairs of anchors; the ventral pair nearly half of the dorsal pair; dorsal

knobs, its size 0.017-0.022 x 0.048-0.052mm; Ventral anchors with total length 0.029-0.030mm, accessory piece on the base of ventral bar 0.004-0.005mm length of point 0.017-0.018mm; ventral connective bar paired, meet at the midline, articulate at widened end, with knob of 0.004mm, length of each half 0.008-0.010mm, width 0.041-0.046mm.

Three pairs of hooks larval type; their length 0.015-0.017mm, diameter of handle of these hooks about 0.002mm; hooks of two pairs with long widened handle and thickened pivot of handle, their total length 0.042-0.024mm, with handle 0.005-0.007mm; one pair of hooks near the base of dorsal anchors 0.029-0.030mm long, diameter of handle 0.003mm; one pair of hooks near the ventral anchors, length 0.018-0.021mm, and diameter of handles 0.002mm.

Copulatory organ consists of tube and accessory piece. Tube smoothly curved with widened initial part almost cylindrical on its rest part. Its length along curve 0.052-0.058mm, diameter of initial part 0.009-0.012mm, of medial part 0.004-0.005mm. Accessory piece look like a thin tape whose lateral lines are rough, going from the initial part of tube and embraces the tube near about its end; its length 0.048-0.057mm. Vaginal armament was not found.

(0.020-0.0260); each consists of a stout rounded base and a stout shaft. The base has a small lateral projection, with no differentiation of superficial and deep root. The bar between the dorsal anchors is smaller and lip-shaped with a wide aperture in the middle, its length 0.016mm (0.010-0.017) and width 0.069mm (0.058-0.079); at the root of each anchor of the dorsal pair an

***Neosprostonia sunamgonji* n.sp. (Fig.5)**

Host : *Clupisoma garua* and *Eutropiichthys vacha*

Localities : Mymensingh, Habigonj and Sunamgonj and Surma river

Site of infestation : Gill filaments

No. of parasites measure : 5

Prevalence% : 32.70-C.garuai
34.88 – E, vacha

Discussion

The present specimen collected from *Eutropiichthys vacha* and *Clupisoma garua* belongs to be genus *Bychowskyella* Achmerow, 1952. The present specimens seem only nearer to *Bychowskyella tchangi* (Gussev, 1976) general morphology but differs in the structures of chitinoid haptoral armature like hooks bar and anchors and their measurement of different parts so it has been considered as a new species and the name *Bychowskyella garuai* is proposed.

Description

Body of the parasite is elongated, length 1.20mm (0.91-1.59), breadth 0.18mm (0.13-0.21) slightly broadening in the ovarian region; haptor (0.192mm x 0.178mm) completely demarcated with two pairs of anchors; dorsal pair of anchors is long, 0.073mm (0.071-0.075) and the point more or less straight

0.022mm accessory bar is attached. The accessory bar is thicker at the outer end; tapering on the inner side and strongly curved, about 0.059 x 0.009mm; anterior to this a pentagonal chitinous conspicuous onchium (0.025-0.027mm) is present on the ventral side.

Ventral pair of anchors is nearly three-quarters of the dorsal pair in size, length 0.065mm (0.060-0.074), having a spur on the outer side near the base of the shaft; anterior and internal to the curvature of the anchor point. The bars attached with the ventral pair are thinner and longer 0.011 (0.008-0.012) x 0.077 (0.064-0.086mm) joining in the middle.

Each hook consists of an elongated base, and insignificant shaft and a small crochet-shape portion. Four rod like hooks are present near the plate, size 0.038mm (0.035-0.044); three pairs of small curve hooklets (0.021mm) present along the margin of the haptor; two pairs

of sickle-shaped hooks, 0.036-0.047mm, located near the base of dorsal anchor.

Head provided with four pairs of head organs and two pairs of eyespots; in some specimen eye goblets scattered along anterior end of body as individual granules. pharynx spherical,0.04-0.06mm; copulatory complex very stout consisting of very long cork-screw-like cirrus; 0.048mm x 0.043mm, an elongated accessory piece and a coiled cirrhal thread. The cirrus and the accessory piece are firmly articulated at the base; is thick-walled hollow tube having 3 or 4 spiral turns around the accessory piece; length 0.192-0.402mm; the accessory piece lies parallel to the cirrus and is 0.014-0.18 mm long. The vagina has a short funnel shaped mouth and a looped vaginal tube. The single egg o.108 x 0.061 mm is oval with a hook like projection.

Discussion

The genus *Neosprostonia* was erected by Jain (1959) for a new mongenean collected from the gill filaments of *Eutropiichthys vacha* (Ham.), here to *the known species of the genus Neosprostonia Jain, 1959 are N. indica, N. gomtia, N. asiatica* and *N. wallagonia*. The hosts for the later two worms, *Callichorous pabda* (Ham.) and *Wallagonia attu* (Sch). Agarwal and Singh (1982) are reported *N. garuai* for the first time from *Clupisoma garua*. The present specimens collected from *Clupisoma garua* resembles *N. gomtia* in many characters and measurements but differs in the presence of egg and other morphological structure of copulatory complex which somewhat coincides with the *N. indica* (Table 1). These distinguishing armatures warrant erecting a new species for this specimen, which can be titled as *Neosprostonia sunamgonji* n.sp. after the name of the locality of collection of the host fish.

Table 1: Comparison of measurements and characteristics of *Neosprostonia gomtia, Neosprostonia indica* with the present species

Morphological Characteristics	***Neosprostonia Sunamgonji* n.sp.**	***Neosprostonia gomtia***	***Neosprostonia inidica***
body length	0.910-1.590	0.70-0.820	0.550-0.690
Breath	0.130-0210	0.100-0.120	0.038-0.080
Position and size of pharynx	Nearer to the head; 0.040-0.060	Nearer to the head; 0.030 x 0.035	Comparatively far from the head; 0.025
Eyespot	Scattered as pigment granules	Two pairs	Two pairs; one pair scattered.
Dorsal anchor shape an size Ventral anchor length and shape	Elongate 0.071-0.075, points more or less straight. About three quarters of the dorsal anchor, 0.060-0.074.	Length 0.07-0.076mm, Consists of a fine recurred point. Wing present. Length 0.037-0.042	Length 0.062-0.075 No wing length 0.048-0.057.
Size and shape of hooks	Seven pair hooks are same in shape but differ in size; 2 pair larger hooks 0.035-0.044; three pair smaller marginal hooks 0.021 and two pair sickle-shaped hooks 0.036-0.047.	Seven hooks similar in shape, their dimension ranges 0.009-0.044.	Seven pair hooks;
Size and shape of dorsal bar	Lip shaped, with wide aperture in the middle; 0.016 x 0.069; Accessory bar strongly curved 0.059 x 0.009;	Straight has a large aperture in the middle 0.062 x 0.015; Accessory bar 0.043-0.045 in length.	Dimension ranges 0.011-0.037
Size and shape of ventral bar	Thin and elongate 0.011 x0.077	Straight 0.11-0.125 long	Straight has a large aperture in the midle 0.056 x 0.013; Accessory bar length 0.032-0.036; stout, transverse shaft.
Onchium	Pantagonal 0.025-0.027	Leaf like, 0.024-0.027	Absent
Copulatory organ	Consists of long cork screw-like cirrus, 0.048 x 0.043, coiled cirrhal thread.	Cirrus stout, thick walled, 0.08-0.084 long	Cirrus stout thick walled 0.125-0.165.

***Lytocestoies pabdai* n.sp. (Fig.6)**

Host	: *Clupisoma garua Ompok pabda*
Localities	: Sunamgonj Habigonj
Site of infestation	: Intestine
No. of parasites measured	: 5
Prevalence%	: 25

Description

Body elongated, unsegmented, slightly tapering posteriorly. Length of body 3.03-4.77mm, with 0.81-0.96mm. Scolex reduced unspecialized. Neck absent testes follicular numerous (about 80-150), mulary distributed from the base of scolex to cirrus sac; size 0.21 x 0.18mm to 0.42 x 0.37mm; vitellaria extening throughout in cortical parenchyma, in double field. Postovatian vitellaria absent. Vitelline follicles, 38-57 regular in shape form a continuous layer surrouning testes.

Ovary bilobed butterfly-shaped in the posterior region of body length 0.50-0.65mm with 0.54 - 0.58mm lobes connected by narrow isthmus measuring about 0.07mm; uterine region comparatively short not extending anterior to cirrus sac; gonoducts separate. Intrauterine eggs numerous 0.021 x 0.020 mm to 0.023 x 0.022mm in size.

Remarks

The present specimen belongs to the order Caryophylliea as it has no segmentation in its body. No proper development of scolex at its anterior end. Several genera have been reported from this order in Bangladesh and India. The present genus *Lytocestoides* Baylis, (1928) reported H-shaped ovary, follicular testes, separate gonopore. Mackiewiez (1981) stated that the characters like reduced and widened scolex, the body tapering gradually posteriorly right from anterior end testes extening to near anterior end of body: presence of postovarian follicles of vitellaria and butterfly shaped ovary suggests the genus *Breviscolex* Kulashovskaya (1962) in the family Capingentiae. But the present specimens have no postovarian vitelline follicles. But most of its characters resemble *Lytocestoides* and is therefore described under the genus *Lytocestoides*. A number of species of the genus *Lytocestoies auranabadensis*, *L.* naldurgensis L. mackiewiezi were synonymized with the genus Breviscolex an L. fossilis was synonymized with *Lytocestus* Cohn, (1908) Hafeezullah, 1993. Therefore only a single species *Lytocestoides paithanensis* Shine and Desmukh, (1975) recorded from *Pseudeutropius taakree* of Godavari river is valid species of Indian subcontinent. The present specimen differs from *L. paithanensis* in the position of genital pore situated at the posterior half of the body and shorter and straightened uterus so it may be consiered as a new species and *Lytocestoides pabdai* is proposed as its specific name.

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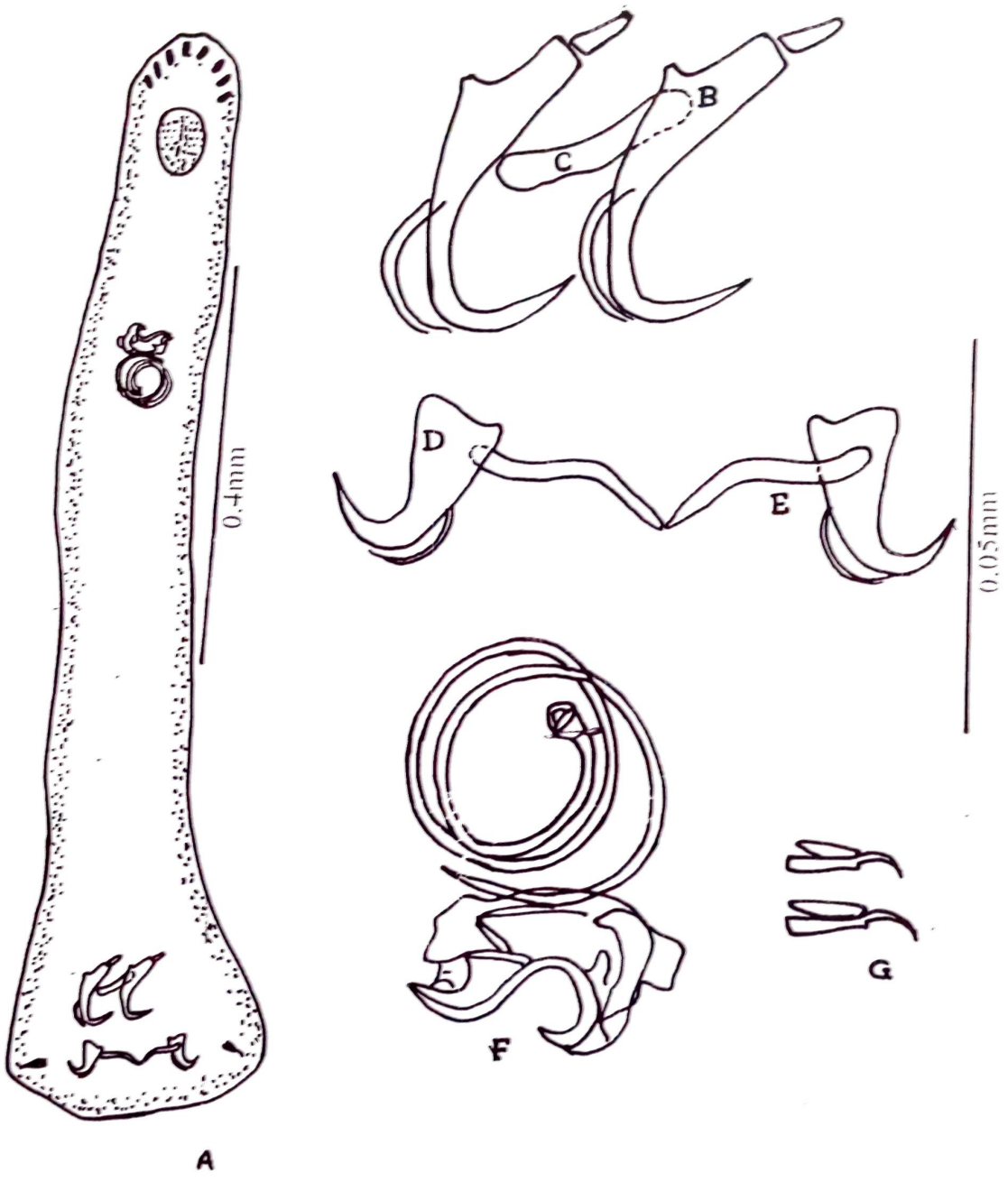


Fig. 1. ***Siluroiscoies Suhakari*** **(Gussev, 1978)**

A. Entire fluke B. Dorsal anchor C. Supporting bar (dorsal). D. Ventral ancho
E. Supporting bar (ventral) F. Copulatory complex G. Marginal hook

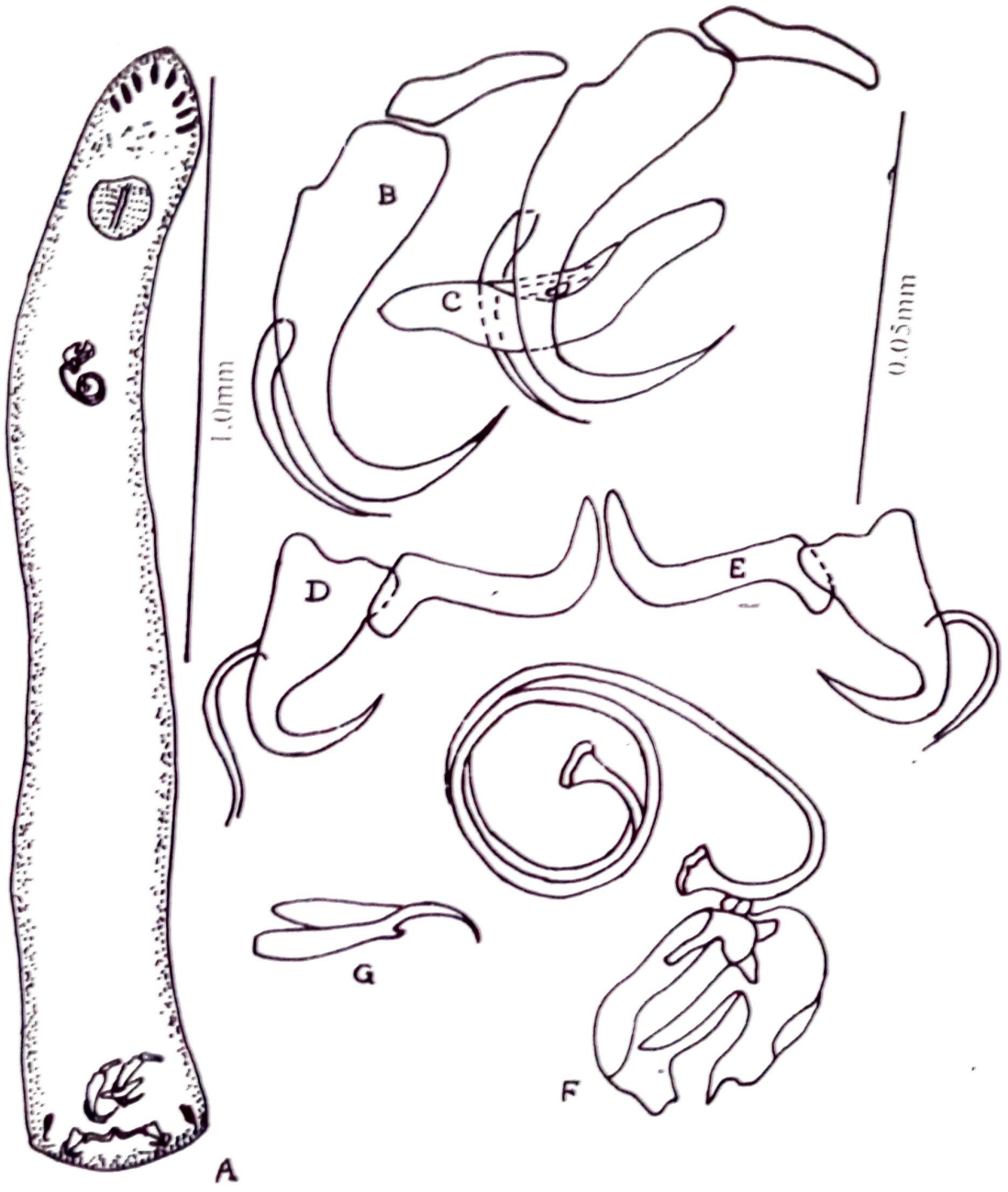


Fig. 2. ***Siluroiscoies eutropiichthyes*** **n.sp.**

A. Entire fluke B. dorsal anchor C. Supporting bar (dorsal) D. Ventral anchor
E. Supporting bar (ventral) F. Copulatory complex G. Marginal hook

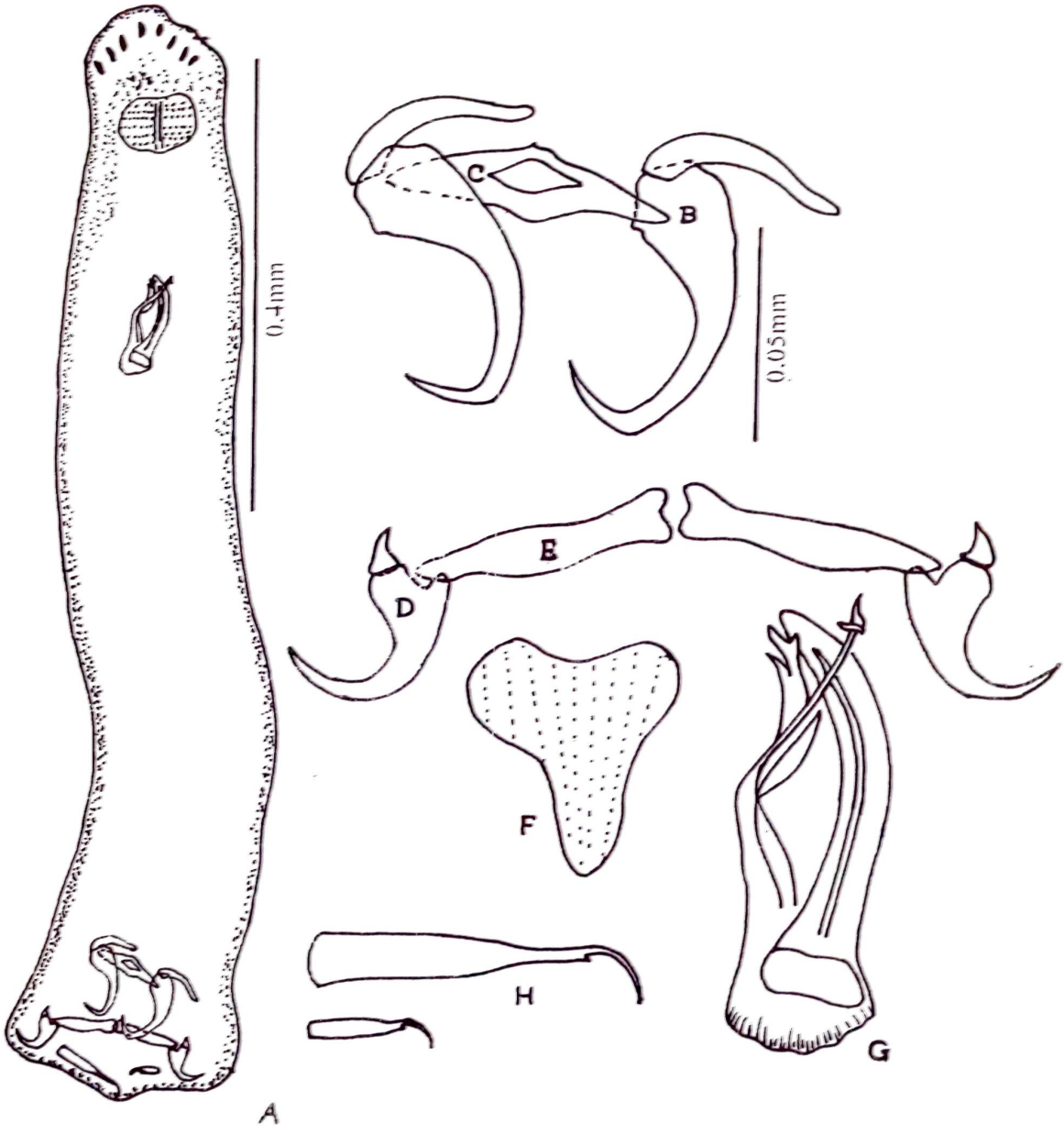


Fig. 3. *Bychowskyella vachai* n. sp.

A. Entire fluke B. Dorsal anchor C. Supporting bar (dorsal) D. Ventral anchor
E. Supporitng bar (ventral) F. Onchium G. Copulatory complex H. Marginal hooks

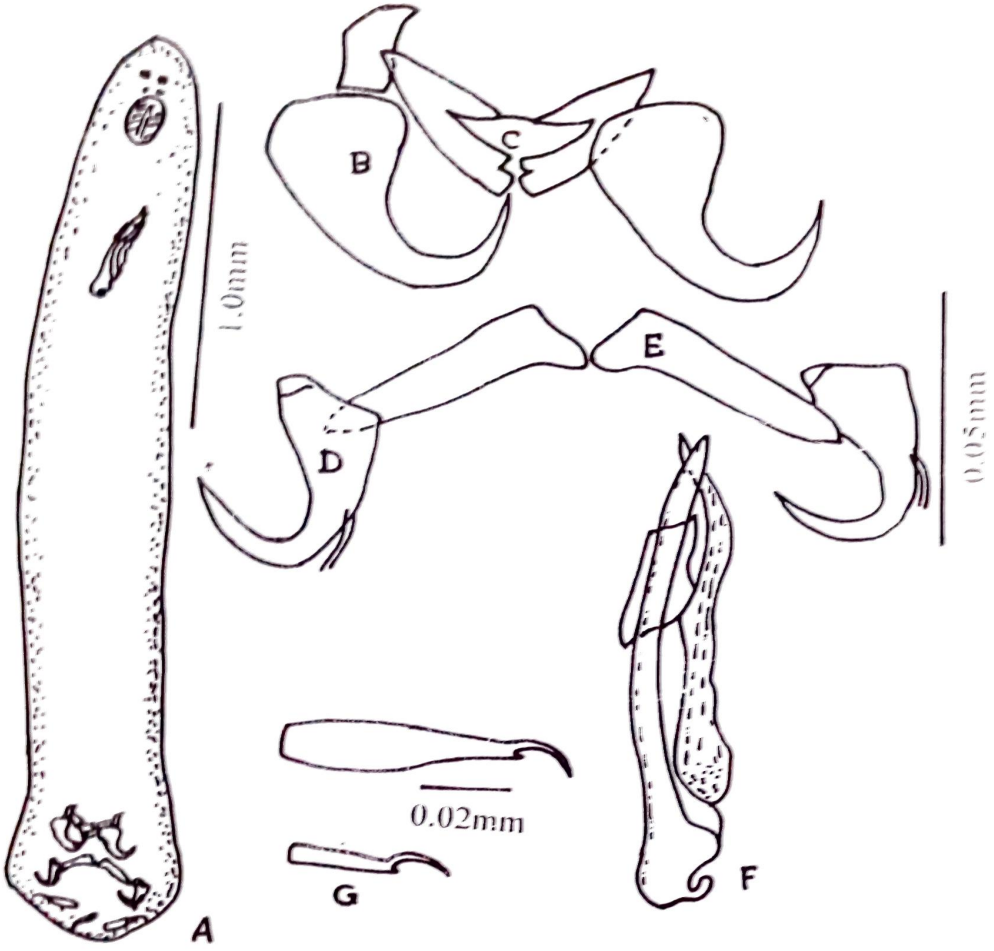


Fig 4. ***Neosprostonia sunamgonji*** **n.sp.**

A Entire fluke B. Dorsal anchor C. Supporting bar (dorsal) D. Ventral anchor E. Supporitng bar (ventral) F. Copulatory complex G. Onchium H. Marginal hooks I. Egg.

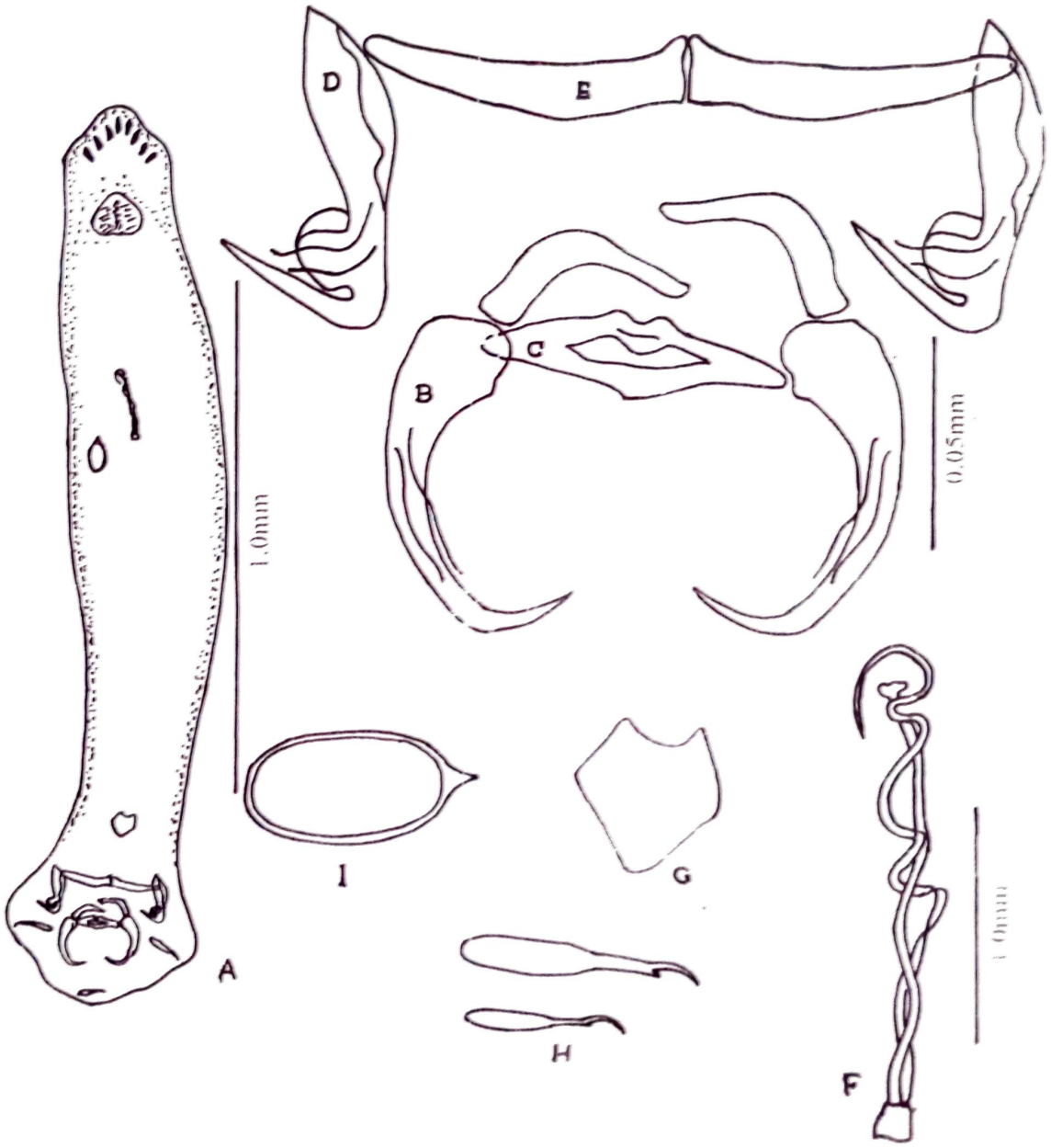


Fig 5. ***Bychowskyella garuai*** **n. sp.**

A. Entire fluke B. Dorsal anchor C. Supporting bar (dorsal) D. Ventral anchor
E. Supporitng bar (ventral) F. Copulatory complex G. Marginal hooks .

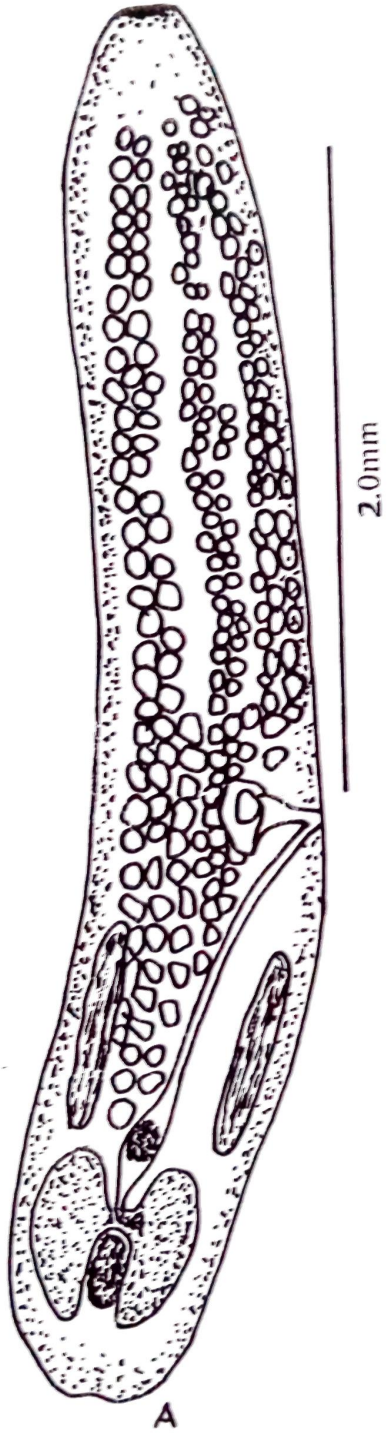


Fig. 6 . *Lytocestoides pabdai* n.sp.

A. Entire tape worm

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