

**On a New Monogenetic Trematode, *Bychowskyella tripathii*
n. sp. from the Gills of a Fresh Water Fish
Wallago attu (Bl. & Schn.)**

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Key words: monogenetic trematode, *Bychowskyella tripathii*, *Wallago attu*

In India, during past years the monogenetic trematodes were not given much attention as compared to the digenetic ones. It is only in recent years that monogenetic trematodes have been studied.

Achmerow (1952) created the genus *Bychowskyella* for a new monogenean obtained from fish *Pseudobagrus fulvidraco*. Subsequently, Tripathi (1959) described another new genus *Silonditrema* from *Silonia silondia* (Ham.) and added three species to this genus. In the same year, Jain (1959 a, b) described another new genus *Sprostonia* from *Wallago attu* (Bl. & Schn.) and renamed it as *Neosprostonia*. Further, he considered both the genus i. e. *Silonditrema* and *Neosprostonia* as synonyms of *Bychowskyella* followed by Gussev (1976) to which the writers also agree. Thus till now, eight species of this genus are known, seven from India and one from Russia.

During October and November 1976 twenty worms belonging to the genus *Bychowskyella* Achmerow, 1952 were collected from gill filaments of fresh water food fish *Wallago attu* (Bl. & Schn.). These fishes were obtained from a local fish market, Dassashwamedhghat, Varanasi and were initially caught by local fisherman from river Ganges at Varanasi. All the six fishes were found infected by this species. Maximum 6 flukes

from one fish, 5 each from two fishes, 2 from one fish and one each from two fishes were recorded.

Material and Methods

The live specimens were examined by keeping them in normal saline in a cavity slide and studied under microscope. Fresh preparations for study of cuticular structure were made with glycerine or lactic acid which proved very successful. For permanent preparations worms were fixed under slight pressure of a coverglass either in 90% alcohol or in alcoholic bouin's fluid and preserved in 70% alcohol. They were stained in acet-alum carmine or in Ehrlich's hematoxylin and cleared in clove oil. All the drawings were made with camera lucida and measurements in millimeters were taken from permanent mounts.

Description

The worm has an elongated body about seven times than the width. The blunt anterior end of the body is demarcated as the head which has three pairs of head organs and two pairs of eye spots. The posterior eyes are bigger and have more melanistic granules than the anterior ones and are present on the anterior margin of the pharynx.

Posteriorly the worm bears a haptor which occupies one fourth of the body length and

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Table 1 Measurements (in mm.) of different species

Species	<i>B. pseudobagri*</i> Achmerow, 1952	<i>B. cauveryi</i> (Tripathi, 1959)	<i>B. gharui</i> (Tripathi, 1959)	<i>B. vacha</i> (Tripathi, 1959)
Host	<i>Pseudobagrus fulvidraco</i>	<i>Silonia silondia</i>	<i>Pseudotropius garua</i>	<i>Eutropichthys vacha</i>
Locality of host	USSR	River Ganga & Cauvaryi, India	River Ganga & Hoogly, India	River Ganga, Buxar, India
Total length	0.55	1.044-1.276	0.87-1.101	0.437-0.609
Width	0.085	0.101-0.145	0.07-0.145	0.058-0.072
Pharynx	—	0.038-0.064× 0.038-0.057	0.022-0.038× 0.020-0.041	0.022-0.026× 0.022-0.026
Haptor (H)	—	0.135-0.145× 0.135-0.145	0.114-0.119× 0.19-0.232	0.068-0.076× 0.087-0.117
Dorsal bar (DB)	—	0.076-0.083	0.064	0.041-0.049
Ventral bar (VB)	—	0.152-0.166	0.136	0.045-0.057
Dorsal anchor (DA)	—	0.095	0.068	0.059-0.06
Ventral anchor (VA)	—	0.049-0.057	0.057	0.034-0.038
Marginal hooklet	—	0.038 and 0.015	0.038-0.045 and 0.015	0.011
Testis	—	0.095-0.203× 0.101-0.19	0.133-0.217× 0.076	0.057-0.076× 0.03
Seminal vesicle	—	0.038×0.015	0.057×0.038	0.041×0.019
Prostate vesicle	—	0.038-0.057× 0.019-0.022	0.057-0.01× 0.022-0.038	0.022×0.015
Cirrus	—	0.076-0.087	0.19	0.041-0.049
Ovary	—	0.068-0.049	0.068-0.072× 0.038	0.03×0.038
Egg	—	—	—	—

broader than the body width. The armature of haptor consists of two pairs of unequal anchors—dorsal anchors and ventral anchors. Both the anchors are broad at the base and become curved posteriorly and pointed at the tip. The ventral anchors are one third of dorsal anchors in size. Three horizontal and two accessory bars are present. The two dorsal anchors are joined by a horizontal dorsal bar. The two thicker accessory bars being in the same horizontal plane are attached with the base of the dorsal anchor anterior to the dorsal bar. Each ventral anchor has a horizontal bar

which unite with its counterpart in the middle and forms a ventral bar which is double in length of the dorsal bar. Besides this, a plate with four projecting processes, looking like an ox-head in appearance, is present on the ventral side of the peduncle of the haptor and anterior to the ventral bar. The two anterior projections are long and more or less pointed while the two posterior lateral projections are short and blunt. Two pairs of large and three pairs of small marginal hooklets are present.

Behind the head organs a spherical muscular pharynx is present. The oesophagus

of the genus *Bychowskyella* Achmerow, 1952

<i>B. wallagonia</i> (Jain, 1959)	<i>B. asiatica</i> (Jain, 1959)	<i>B. indica</i> (Jain, 1959)	<i>B. tchangi</i> (Gussev, 1976)	<i>B. tripathii</i> n. sp.
<i>Wallago attu</i>	<i>Callichrous pabda</i>	<i>Eutropiichthys vacha</i>	<i>Clarias batrachus</i>	<i>Wallago attu</i>
Lucknow, India	Lucknow, India	Lucknow, India	India	River Ganga, Varanasi, India
0.58-0.73	0.52-0.64	0.55-0.69	0.41	0.780-0.822
0.06	0.022	0.038	0.12	0.095-0.123
0.028(Diam.)	0.012×0.01	0.025(Diam.)	—	0.03×0.03
0.085×0.13×	0.09×0.11×	0.1×0.3×	0.039-0.042×	0.109-0.137
0.055-0.1	0.07-0.09	0.09-0.1	0.013	0.15-0.18
0.044-0.049×	0.028-0.031	0.05-0.062×0.013	0.008-0.012×	0.071-0.084
0.01			0.033-0.036	
0.076-0.079	0.09-0.096	0.11-0.13	0.030×0.004	0.150-0.154
0.07-0.078×0.02	0.048-0.051×0.01	0.062-0.075×	0.033-0.035×	0.126-0.137
		0.013-0.017	0.004-0.005	
0.028-0.031×	0.023-0.025×	0.048-0.057×	0.022-0.024×	0.033-0.045
0.012-0.014	0.01-0.012	0.017-0.021	0.008	
I-0.021-0.022	I-0.029-0.032	I-0.036-0.037	Larval,	0.015 and 0.018
II-0.03-0.032	II-0.024-0.025	II-0.019-0.02	0.012-0.015,	
III-0.01-0.013	III, IV &	III-0.012-0.013	0.03	
IV-0.009-0.012	V-0.006-0.007	IV-0.011-0.012		
V-0.009-0.012	VI-0.023-0.03	V-0.027-0.029		
VI-0.032-0.034	VII-0.029-0.03	VII-0.028-0.036		
0.1-0.121×	0.065-0.071×	0.14-0.16×	—	0.105-0.120×
0.021-0.029	0.006-0.012	0.027-0.039	—	0.027-0.036
—	—	—	—	0.036-0.045×
—	—	—	—	0.012-0.021
—	—	—	—	0.045×0.018
0.064-0.067	0.03-0.032	0.125-0.165	—	0.008-0.09×
				0.003
0.04×0.047×	0.013-0.016	0.056-0.063×	0.023-0.027×	0.024-0.033×
0.011-0.014		0.025-0.033	0.003-0.004	0.018-0.021
0.06×0.048	—	0.055×0.04	—	0.039×0.054

is absent. The two intestinal caeca are clearly visible for a short distance but their ends could not be ascertained because of dense accumulation of the vitellaria at this region. An oval or elliptical testis with smooth outline is located in the posterior half region of the body. A long vas deferens originates from the anterior end of the testis and enters a pyriform seminal vesicle which opens at the base of the cirrus. Two balloon shaped prostate vesicles, one anterior to the other, are present on either side of the seminal vesicle. The slightly curved cirrus is cuticularized and is provided with a sickle-shaped

accessory piece at its tip. The pre-testicular ovary is smaller than testis, about one third in size of the testis, is present in the middle of the body. A small funnel-shaped vagina is present along the right margin of the body between the prostate vesicle and ovary. The egg (seen in one specimen only) is oval in shape. The vitellaria extend from the posterior part of the pharynx up to the region of peduncle.

Measurements of the different organs of body are given in Table 1.

Table 2 Showing a comparison of the various parts of the

Body Parts	<i>B. pseudobagri</i> * (Achmerow, 1952)	<i>B. cauveryi</i> (Tripathi, 1959)	<i>B. garui</i> (Tripathi, 1959)	<i>B. vacha</i> (Tripathi, 1959)
Host	<i>Pseudobagrus fulvidraco</i>	<i>Silonia silondia</i>	<i>Pseudotropius garua</i>	<i>Eutropiichthys vacha</i>
Locality of host	USSR	River Ganga & Cauvaryi, India	River Ganga & Hoogly, India	River Ganga, Buxar, India
Number of head organs	—	4 pairs	4 pairs	4 pairs
Posterior pair of eye spots	—	At the side of pharynx	At the side of pharynx	At the side of pharynx
Shape of pharynx	—	Oval	Ovoid	Ovoidal
Ratio of H/BS	—	1/8 of body length	1/7-1/8 of body length	1/5-1/7 of Body length
Ratio of DA/VA	1.75 : 1	2 : 1	1.16 : 1	1.52 : 1
Ratio of DB/VB	1 : 2.5	1 : 2	1 : 2	1 : 1
Accessory bar	Inner ends pointed	Inner ends blunt	Inner ends pointed	Inner ends pointed
Slit in dorsal bar	Present	Present	Present	Present
Shape of cuticular plate	—	Shield like	Pentagonal	Trapizoidal
Marginal Hooklet	—	3 large pairs, 4 small pairs	3 large & 3 small pairs	3 large & 4 small pairs
Location of reproductive organs	—	Middle	Middle and posterior half	Middle
Shape of testis ^s	—	Elliptical	Ellipsoidal	Ovoid
Course of vas deferens	—	Long and straight	Long and straight	—
Shape of seminal vesicle	—	Pyriiform	Pyriiform	Fusiform
Shape of prostatpe vesicle	—	Pyriiform	Long pyriiform	Small
Shape of cirrus	Thick at base and tapers at tip	Curved cuticularized	Thick at base, tapering to distal end and filiform	Slightly curved at distal end
Accessory piece	Equal to cirrus and bifurcate at tip	straight at the base	Long and thin, bound round the cirrus	Curved and equal in length of cirrus
Ovary	—	Pre-Testicular & ovoid	Pre-testicular & spheroidal	Pre-testicular & spheroidal
Vagina	—	Funnel-Shaped	Thistle-shaped	Funnel-shaped
Egg	—	—	—	—
Position of Vitellaria	—	Behind the pharynx to the end of intestine	Behind the Pharynx to the end of intestine	Behind the pharynx to the end of intestine

* Not Consulted in Original. Abbreviations as given in Table 1.

Discussion

So far eight species of the genus *Bychow-skyella* are reported—*B. pseudobagri* Ach-

merow 1952, *B. cauveryi* (Tripathi, 1959), *B. gharui* (Tripathi, 1959), *B. vacha* (Tripathi, 1959), *B. wallagonia* (Jain, 1959), *B. asiatica* (Jain, 1959), *B. indica* (Jain, 1959)

different species of *Bychowskyella* Achmerow, 1952

<i>B. wallagonia</i> (Jain, 1959)	<i>B. asiatica</i> (Jain, 1959)	<i>B. indica</i> (Jain, 1959)	<i>B. tchangi</i> (Gussev, 1976)	<i>B. tripathii</i> n. sp.
<i>Wallago attu</i>	<i>Callichrous pabda</i>	<i>Eutropiichthys vacha</i>	<i>Clarias batrachus</i>	<i>Wallago attu</i>
Lucknow, India	Lucknow, India	Lucknow, India	India	River Ganga, Varanasi, India
4 pairs	3 pairs	4 pairs	—	3 pairs
At the side of pharynx	At the anterior margin of pharynx	At the side of pharynx	Absent	At the anterior margin of pharynx
Spherical	Ovoidal	Spherical	—	Spherical
1/6 of body length	1/6 of body length	1/5 of body length	1/10 of body length	1/4 of body length
2.5 : 1	2 : 1	1.5 : 1	2 : 1	3 : 1
1 : 1.5	1 : 3	1 : 2	1 : 2	1 : 2
Inner ends pointed	Inner ends pointed	Inner ends pointed	—	Inner ends blunt
Absent	Present	Present	Present	Absent
Absent	Straight and elongated	Absent	Absent	Ox-head shaped
6 pairs	7 pairs	7 pairs	7 pairs (6 pairs larval type)	2 large & 3 small pairs
Middle and posterior half	Middle	Middle and posterior half	—	Middle and posterior half
Elliptical	Elongated	Elliptical, elongated	—	Elliptical
—	—	U-shaped	—	Long and curved at the level of ovary
Pyriform	—	Spindle shaped	—	Long pyriform
Long pyriform	—	Absent	—	Pyriform
Stout, thick walled terminated in a fine point	Elongated	Cork screw like	Tube like smoothly curved	Curved
At the base, inverted & y-shaped	At the base articulate with cirrus	3-4 spiral turns of cirrus around accessory piece	Thin tape like	At the distal end, sickle-shaped
Pre-testicular & ovoid	Pre-testicular & Median	Pre-testicular & pyriform	—	Pre-testicular & oval
Horse shoe shaped	Funnel shaped	Funnel shaped	—	Funnel shaped
Oval	—	Oval	—	Oval
Posterior end of pharynx to the end of intestine	From pharynx to posterior end of body	Posterior end of Pharynx to the end of intestine	—	Posterior end of pharynx upto the peduncles

and *B. tchangi* Gussev, 1976. On the basis of description available for these species, a comparison has been made on the size of different body parts (Table 1) and the struc-

ture, nature and shape of different organs (Table 2).

The new species resembles closely *B. asiatica* in having 3 pairs of head organs

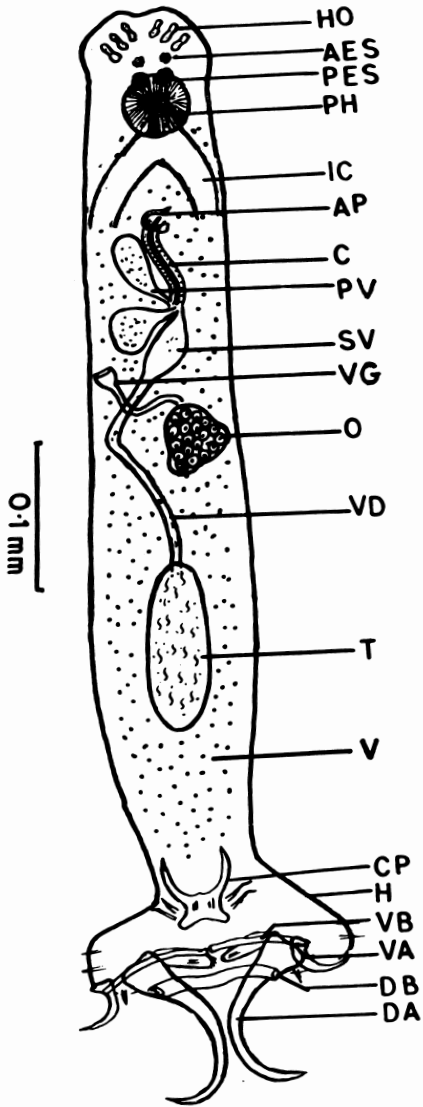


Fig. 1 Ventral view of *B. tripathii* n. sp.

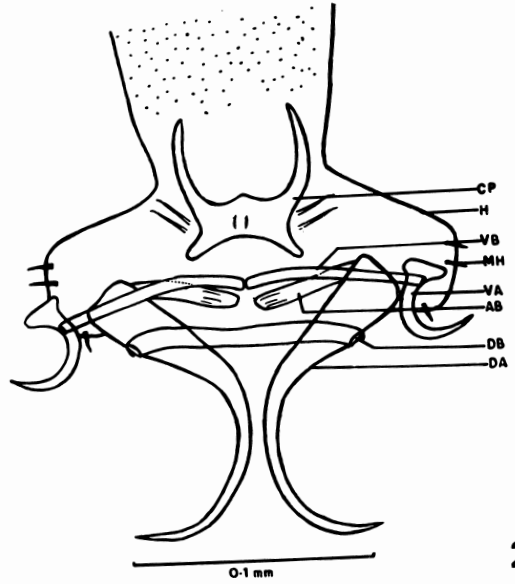


Fig. 2 Haptor of *B. tripathii* n. sp.

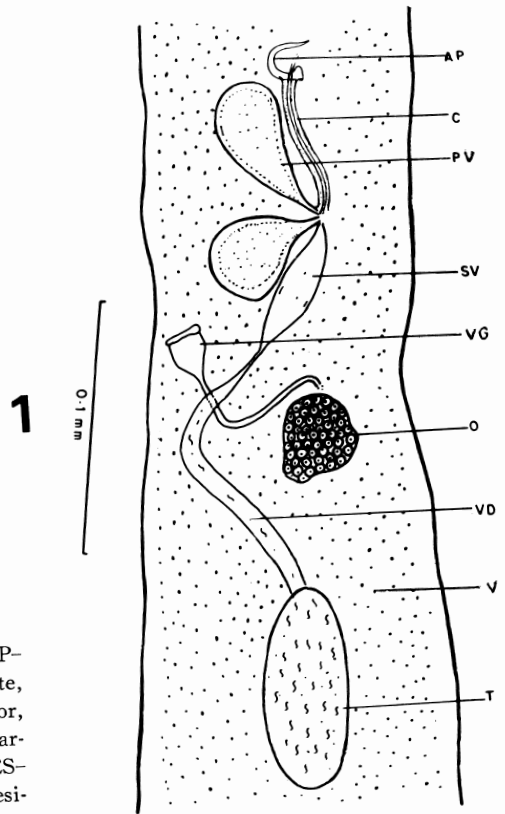


Fig. 3 Reproductive organs of *B. tripathii* n. sp.

Key to Lettering in Figures :
 AB-Accessory bar, AES-Anterior eye spot, AP-Accessory piece, C-Cirrus, CP-Cuticular plate, DA-Dorsal anchor, DB-Dorsal bar, H-Haptor, HO-Head organ, IC-Intestinal caeca, MH-Marginal hooklet, O-Ovary, PV-Prostate vesicle, PES-Posterior eye spot, PH-Pharynx, SV-Seminal vesicle, T-Testis, V-Vitellaria, VA-Ventral anchor, VB-Ventral bar, VD-Vas deferens, VG-Vagina.

and in the shape of vagina; *B. cauveryi*, *B. gharui*, *B. wallagonia* and *B. indica* in the ratio of dorsal and ventral bar and in the shape of testis; *B. vacha* in the shape of vagina and *B. cauveryi* and *B. wallagonia* in the shape of ovary and seminal vesicle, whereas it differs much from other species in the following points :

1. Ratio of haptor and body, being 1 : 4, different from other species
2. Ratio of dorsal and ventral anchor, 3 : 1
3. Absence of slit in dorsal bar, different from all other species except for *B. wallagonia*
4. Shape of cuticular plate from all other species
5. Number of marginal hooklets from all other species
6. Number of head organs from all other species except for *B. asiatica*
7. Shape of testis which is ovoid in *B. vacha*
8. Shape of cirrus from *B. gharui* and *B. indica*
9. Shape and location of accessory piece from all other species
10. Shape of ovary from *B. gharui* and *B. vacha*
11. Shape of vagina from *B. gharui* and *B. wallagonia*

Therefore, on the basis of the ratio of haptor and body in size, ratio of dorsal and ventral anchors, number of head organs, absence of slit in dorsal bar, position and shape of accessory piece and shape of cuticular plate, the species found from *Wallago attu* is quite different from all the known species and new to science. The species has been named in the honour of Dr. Y. R. Tripathi, Director of Fisheries, Uttar Pradesh, INDIA.

Summary

A new species *Bychowskyella tripathii* has been described from a fresh water fish *Wallago attu* (Bl. & Schn.) from the river Ganges at Varanasi. It differs from all the known species in the ratio of haptor size to body size, ratio of dorsal and ventral anchors, number of head organs, absence of slit in dorsal bar and in the position and shape of accessory piece.

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淡水魚 *Wallago attu* の鰓から得られた新単生目吸虫
Bychowshyella tripathii n. sp.

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バラナシ付近のガンジス川で採取された淡水魚 *W. attu* 6匹の鰓から、魚1匹あたり最高6匹の単生目吸虫が採取された。本種は、固着器 haptor と体長との比、背鉤 dorsal anchor と腹鉤 ventral anchor との

比、粘着突起 head organ の数、背部支持棒 dorsal bar に裂け目 slit がないこと、交接補助器 accessory piece の位置と形などによつて、8種の *Bychowshyella* 属の既知種から区別できる。