

MATERIAL AND METHODS

The cestode parasites from fishes were collected from various localities of Panchaganga river at Kolhapur, Rukadi and Ichalkaranji. The specimens of cestode parasites were collected live and fixed in 4% formalin, for taxonomical study. The worms were stained in Harris haematoxylin, dehydrated, cleared in xylol and were mounted in D.P.X. for systematic study. The drawings are made with the aid of camera lucida. All the measurements are in millimeters unless otherwise indicated. The photoplates are also included in the dissertation.

Five new species of cestodes of fishes in Panchaganga river identified and classified on the basis of "Advances in the Zoology of Tapeworms" 1950-1970 by Wardle, McLeod and Radinovsky, 1974, "Systema Helminthum" Vol. II by S. Yamaguti (1939) and recent references.

Keys to the species of the genera *Ptychobothrium*, *Senga* and *Circumoncobothrium* are provided.

The dissertation also includes seasonal variation of the cestode parasites in fishes during June 2006 to May 2008.

All the specimens, slides of cestode parasites are deposited in the laboratory, Department of Zoology, Krishna Mahavidyalaya, Rethare Bk., Dist. Satara.

Ptychobothrium shindei n.sp.

Cotyloda	Wardle, McLeod and Radinovsky 1974.
Pseudophyllidea	Carus, 1863.
Ptychobothridae	Luhe, 1902.
Ptychobothrium	Lonnberg, 1889.

***Ptychobothrium shindei* n. sp.**

INTRODUCTION

Ptychobothrium belones was recorded by Dujardin 1845 as *Bothriocephalus belones* from the marine fish. *Belones acus* at Cette, France. Loennberg (1889) made Dujardin's species as the new genus *Ptychobothrium*. Linton (1891) reported it as *Dibothrium restiforme*, from *Tylosurus carribaeus*. Woods Hole Lintion (1934) described small immature worms from *Exocoetus volitans* as *Bothriocephalus* sp. Janiki (1928) published its detailed description. Ariola (1896) found it from *Tylosurus shismatorhynchus* in Japanese waters. Shuler (1938) recorded it from *Strongygylura notata* and *Tylosurus raphidoma* at Dry tortugas, Florida. Rao (1959) recorded a new species *Ptychobothrium cypseluri* from *Cypselurus poecilopterus*, India. Shinde and Deshmukh reported four new species, *P. khami*, *P. phuloi*, *P. chelai* from *Nemacheilus botia*, *Chela pulo* and *Chela clupeoides* from fresh water fishes and *P. ratnagiriensis* from *Exocoetus bahiensis*, marine fish.

Ptychobothrium clupeoides, recorded from *Chela clupeoides*, a freshwater fish at Aurangabad, India by Miss.

Chincholikar, G.B. Shinde, R.A. Deshmukh and B.V. Jadhav 1976.

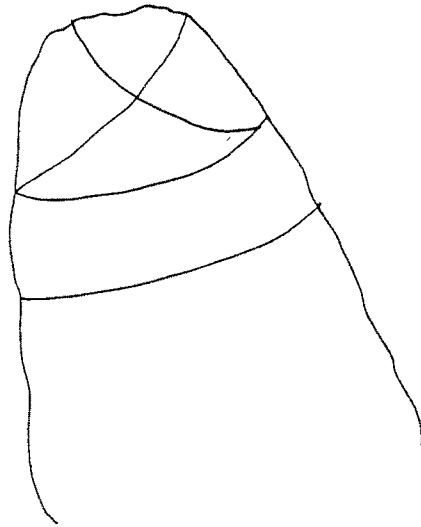
The present communication deals with description of *Ptychobothrium shindei* n. sp. collected from the intestine of fresh water fish *Channa marulius* at Rukadi, Tal : Hatkanangale, Dist : Kolhapur.

DESCRIPTION

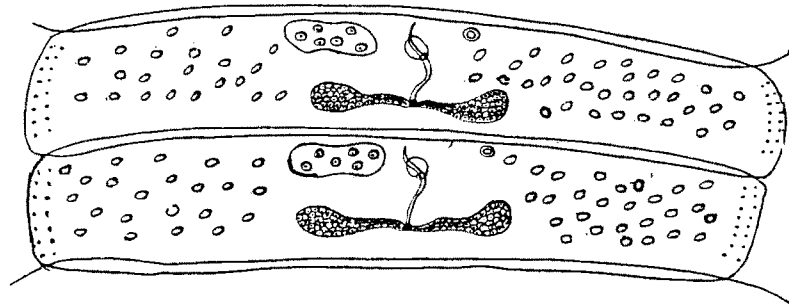
Two specimens of the cestode parasites were collected from the intestine of *Channa marulius* from Panchganga river at Rukadi, Dist. Kolhapur, in the month of October 2006.

The worms are flattened, preserved in 4% formalin stained with Harris haematoxylin whole mount slides were prepared for further taxonomical studies. The drawings are made with the aid of camera lucida. All the measurements are in millimeters. The worm measures 80-100 mm in length.

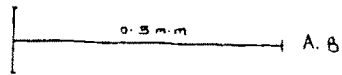
The scolex is large in size as compared to the body of the animal, well developed with oval shape, anterior rounded end with rough margin. Scolex is not distinctly marked off from the strobilla and measures 2.839 [2.475 - 3.154] in length and 3.470 [2.912 - 4.029] in breadth. Scolex bears two bothria measures 0.473 [0.461 - 0.485] in length and 1.893 [1.844-1.941] in width.



A



B



Neck is absent, as the segmentation starts immediately behind the scolex.

The mature segments are large in size, nearly four times broader than long with convex lateral margin, measures 0.201 [0.194 - 0.208] in length and 1.350 [1.286 - 1.359] in width. The testes are oval, medium in size, 50 to 60 in number, scattered in two fields, from anterior to posterior margin of the segments, lateral to the ovary. Cirrus pouch is rounded in shape, medium in size, measures 0.036 in length and 0.041 in width. Cirrus is thin, tube like, 0.032 in length and 0.004 in width, anteriorly directed contained with the cirrus pouch. The vas deferens is long, thin, curved measures 0.026 [0.024 - 0.029] in length and 0.007 [0.004 - 0.009] in breadth.

The ovary is medium in size, bilobed, flattened present in the posterior half of the segment measuring 0.655 [0.582-0.679] in length and 0.189 [0.184 - 0.194] in width. The vagina is thin, long, posterior to cirrus pouch, turns posteriorly and open into the ootype and measures 0.060 [0.058 - 0.063] in length and 0.012 [0.009 - 0.014] in width. The ootype is almost rounded, 0.007 in width. The genital pore is small, oval in shape.

The uterus is dumb-bell shaped, sac like structure, present at anterior side of the segment, measures 0.600 [0.582 - 0.63] in length and 1.749 [1.747 - 1.796] in width; uterus filled with small, rounded eggs less in number with 0.005 in diameter.

The vitellaria are granular, corticular in position; on each lateral side and from anterior to the posterior margins of the segments.

DISCUSSION

The genus *Ptychobothrium* was proposed by Loennberg 1889 for *Bothriocephalus belones*. Later on the following species are added to this genus.

The worm under discussion *P. shindei* n. sp. is having scolex anteriorly blunt with rough margin; testes are oval, 50-60 in number; uterus dumb-bell shaped.

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|-----------------------------------------|-------------------------------------------------------------------|
| 1. <i>Ptychobothrium belones</i> - | Dujardin (1845) |
| 2. <i>Ptychobothrium cypseluri</i> | Rao (1959) |
| 3. <i>Ptychobothrium khami</i> | Shinde & Deshmukh 1976 |
| 4. <i>Ptychobothrium phuloi</i> | Shinde & Deshmukh 1976 |
| 5. <i>Ptychobothrium ratnagiriensis</i> | Shinde & Deshmukh 1976 |
| 6. <i>Ptychobothrium chelai</i> | Shinde & Deshmukh 1976 |
| 7. <i>Ptychobothrium clupeioidesii</i> | Chincholikar, G.B.
Shinde, R.A. Deshmukh &
B.V.Jadhav 1976. |

1. The present cestode under discussion *Ptychobothrium shindei* n. sp. differs from *P. belones* in the shape of spatulate and elongated scolex; testes are 55-60 number, small compact ovaries; S-shaped uterus in immature segment and sac like uterus in mature segment.

2. The worm under discussion differs from *P. cypseluri* which bears arrow shaped scolex. Mature segment having 55-68 testes. Ovaries triangular and 'V' shaped sac like uterus.
3. The present tapeworm differs from *P. khami* in not having inverted, heart shaped scolex. Mature segments 0.7 - 0.74 x 1.32 in measurement. Testes are 80-90 in number; ovary cylindrical; 'S' shaped uterus.
4. The present worm differs from *P. phuloi* in the heart shaped scolex. Mature segments 0.91 - 1.09 x 2.92 in measurement; 110-120 testes present in one segment and cylindrical ovary; large sac like uterus.
5. The present cestode differs from *P. ratnagiriensis* which bears scolex, bluntly pointed. The length of mature proglottid 0.86 - 0.95 x 1.73 - 1.77 breadth; 100-110 numbers of testes in mature segment. Irregular shaped uterus in different segments.
6. The worm under discussion differs from *P. chelai* which bears triangular scolex. Mature segment 0.53 - 0.69 x 2.68 - 2.70 in measurement. Testes 85 to 95 in number and ovary elongated, curved, anteriorly.
7. The present cestode differs from *P. clupeoidesi* in heart shaped scolex. Mature segment is 1.06 x 1.89 in measurement. Testes were rounded, 230-245 in numbers. Ovary roughly u-shaped and sac like uterus.

In view of the above differences it is regarded as a new species for which the name *Ptychobothrium shindei* is proposed in honour of Dr. G.B. Shinde, one of the founder member and popular Helminthologist.

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Type species	<i>Ptychobothrium shindei</i> n. sp.
Host	<i>Channa marulius</i>
Habitat	Intestine
Locality	Kolhapur, M.S., India
Date of collection	30 th Oct. 2006

**A KEY TO THE SPECIES OF THE GENUS
PTYCHOBOTHRUM - LOENNBORG (1889)**

- Scolex spatulated *P. belones*
Dujardin, 1845
- Scolex arrow shaped *P. cypseluri*
Rao, 1959
- Scolex inverted heart shaped 1
- Scolex triangular *P. chelai*
Shinde & Deshmukh, 1976
- Scolex blunt 2
1. Testes below 100 in numbers *P. cypseluri*
Testes in between 100-200 in number *P. phuloi*
Shinde & Deshmukh, 1976
- Testes above 200 in number *P. clupeoidesii*
Miss. Chincholikar
G.B. Shinde,
R.A. Deshmukh &
B. V. Jadhav, 1976
2. Ovary compact *P. ratnagirinensis*
Shinde & Deshmukh, 1976
- Ovary bilobed *P. shindei* n.sp.

**The chart showing comparative Account of the species of the
Genus *Ptychobothrium*, Dujardin, 1845**

Species ♂ Characters ♀	<i>P. belones</i> Dujardin 1845	<i>P. cypseluri</i> Rao (1959)	<i>P. khami</i> Shinde & Deshmukh
Country	France	India	India
Host	Belones acus	<i>Cypselurus poecilopterus</i>	<i>Nemacheilus botia</i>
Scolex	Spatulate elongate	Arrow shaped, bothria with rough margin	Inverted, heart shaped
Hooks	-	-	-
Mature Proglottids	-	-	length 0.7 - 0.074, breadth 1.32
Testes	55 - 60	55 - 68	80 - 90
Ovary	small compact	Triangular and lobulated	Cylindrical with small acini
Uterus	S-shaped in immature & sac like in mature	V-shaped sac	'S' shaped in immature & sac like in immature

Species ♂	<i>P. phuloi</i>	<i>P. ratnagirinensis</i>	<i>P. chelai</i>
Characters ♀	Shinde & Deshmukh	Shinde & Deshmukh	Shinde & Deshmukh
Country	India	India	India
Host	<i>Chela phulo</i>	<i>Exocoetus bahiensis</i>	<i>Chela clupeioides</i>
Scolex	Inverted heart shaped	Bluntly pointed and compressed laterally	triangular
Hooks	-	-	-
Mature Proglottids	length 0.91 - 1.09 breadth 2.92	length 0.86 - 0.95 breadth 1.73 - 1.77	length 0.53 - 0.69 breadth 2.68 to 2.7
Testes	110 - 120	55 - 65 in immature 100 - 110 in mature	85 to 95 in numbers
Ovary	cylindrical with broad elongated	Elongated compact	Elongated, curved anteriorly
Uterus	acini large sac like	Irregular shape in different segments	-
Vitellaria	-	-	Granular

Species ♂ Characters ♀	<i>P. elupeioidesii</i> Miss. Chincholikar, G.B. Shinde, R.A. Deshmukh and B.V. Jadhav , 1976	<i>P. shindei</i> n. sp.
Country	India	India
Host	<i>Chela clupeioides</i>	<i>Channa marulius</i>
Scolex	Inuverted heart shaped	Anteriorly blunt having rough margin
Hooks	-	-
Mature	1.06 in length	0.201 in length
Proglottids	1.89 in breadth	1.35 in width
Testes	rounded, 230-245	oval 50 - 60 in number
Ovary	roughly, U-shaped	Bilobed
Uterus	sac like	dumb-bell shaped
Vitellaria	-	-