

# Some Ptychobothridaen tapeworm from freshwater fish *Mastacembelus armatus* at Aurangabad district (M.S.) India

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## Abstract

The present communication deals with description of some Ptychobothridaen tapeworm of the genus *Circumoncobothrium* Shinde [17] viz *Circumoncobothrium hemlatae* n.sp and *Circumoncobothrium shindei* [21] from freshwater fish *Mastacembelus armatus* at Aurangabad district. *Circumoncobothrium hemlatae* n.sp it differs from all the known species of this genus scolex triangular, bothria sac like, mature segment twelve to thirteen time broader than long, testes 200 – 225 in number, ovary dumbbell shaped, vitellaria granular. *Circumoncobothrium shindei* [21] is redescribed here; the present worm having some distinct character such as, in number of rostellar hooks and size of scolex.

**Keywords:** Ptychobothridaen tapeworm, *Mastacembelus armatus*, Aurangabad

## INTRODUCTION

The genus *Circumoncobothrium* is erected by Shinde in 1968 [17] from the intestine of fresh waterfish *Ophiocephalus leuconpunctatus* as a type species *C. ophiocephali*. Jadhav [3] added new species of this genus viz., *C. aurangabadensis* from *Mastacembelus armatus*. Shinde [20] added *C. raoii* from *Mastacembelus armatus*. Shinde and Chincholikar [21] described new species of this genus *C. shindei* from fresh water fish *Mastacembelus armatus*. Chincholikar and Shinde [2] described new species *C. bagariusi* from *Bagarius* species. Shinde [18] reported *C. khami* from *Ophiocephalus striatus*. Jadhav *et al.*, [4] added *C. gachuai* from *Ophiocephalus gauchua*. Jadhav [5] described *C. yamaguti*, from *Mastacembelus armatus*. Shinde [22] created *C. alii* from *Mastacembelus armatus*. Patil [13] added *C. vadgaonensis* as a new species to this genus from *Mastacembelus armatus*. Wongsawad and Jadhav [26] added *C. baimaii* from *Mastacembelus armatus*. Shinde and Kalse [19] added two new species of the genus viz. *C. armatusae* from *Mastacembelus armatus* and *C. punctatusi* from *Ophiocephalus punctatus*. Shinde [23] described *C. mastacembelusae* as a new species from *Mastacembelus armatus*. *C. armatusae* (minor) [14] reported from *Mastacembelus armatus* to this genus. Tat and Jadhav, [25] reported *C. manjari* from *Ophiocephalus gachua*. Supugade [24] added *C. vitellariensis* from *Mastacembelus armatus*. Kharade [9] added *C. cirrhinae* from *Cirrhina mrigila*. Shelke, [16] added one more species *C. mehdii* from *M. armatus*. Pardeshi [12] added *C. ambajogaiensis* from *Mastacembelus armatus*. Jawalikar [6] added one more new species *C. yogeshwari* from *M. armatus*. Borde [1] added *C. purnae*

from the host, *Mastacembelus armatus*. Later on Kalse [8] added one more new species *C. naidui* from *M. armatus*. Shah [15] added *C. paithanensis* from *M. armatus*. Menkundale *et al.*, [10] added one more new species *C. thapari* from *Ophiocephalus stratus*. *C. jadhavae* Pardeshi [11] added from *M. armatus* and lastly Kadam [7] added one more new species from *i. e. Circumoncobothrium clariasi* reported from *Clarias batrachus*.

## MATERIALS AND METHODS

Eight specimens of the cestode parasites were collected from the intestine of a fresh water fish, *Mastacembelus armatus* (Lacepede, 1800) from Paithan, Tq. Paithan, Dist. Aurangabad M. S., India in the month of September 2006. The worms were collected, washed with saline water, flattened and preserved in 4% formalin, the parasites were stained with Harris haematoxylin passed through various alcoholic grades, cleared in xylol, mounted in D.P.X. and whole mount slides were prepared, for further anatomical studies. Sketches are drawn with the help of Camera Lucida and all measurements are in millimeters.

## Description: (Based on eight specimens)

The worms were considerably long, thin, and white in colour, with scolex, numerous immature and mature segments. These cestodes were flattened, preserved in 4 % formalin, stained with Harris haematoxylin, passed through various alcoholic grades, cleared in xylol, mounted in D.P.X. and whole mount slides were prepared, for further morphological studies. Sketches are drawn with the help of Camera Lucida and all measurements are in millimeters.

The scolex is large in size, triangular in shape, distinctly marked off from the strobila, narrow anteriorly, broad posterior and measures 0.113 in length and 0.031 – 0.084 in breadth. It bears two bothria, which are large in size, sac like in appearance and start from the rostellum, extend up to the posterior margin of the scolex, narrow tube-like anteriorly and broad posterior, do not overlap on each other and measures 0.088 in length and 0.033 - 0.022 in breadth. The scolex bears the rostellum at its anterior end, which is medium in size, oval in shape, transversely elongated, having constriction at the middle and measures 0.011 in length and 0.024 in width. The

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rostellar hooks are 54 in number, which are long, stout, slightly curved, round at the base, pointed posterior at the tip, longer hooks present in the centre of the quadrant and later on decreases in length on both the sides. The longer hook measures 0.007 in length and 0.001 in width. The shorter hooks measures 0.003 in length. The neck is short, broader than long and measures 0.011 to 0.016 in length and 0.063 to 0.075 in breadth.

The mature proglottids and broader than long, nearly twelve to thirteen time broader than long, with straight, irregular, slightly concave or convex lateral margins and measure 0.013 – 0.177 in length and 0.150 – 0.161 in breadth. The testes are small in size, oval in shape, 200 to 225 in number, arranged in a single field on either lateral sides of ovary and covers almost entire segment and measure 0.035 x 0.032 in size. The cirrus pouch is small in size, cylindrical in shape transversely placed, preovarian in position, situated just anterior to the middle of the segment and measures 0.090 in length and 0.034 in breadth. The cirrus is thin, obliquely placed, contained within the cirrus pouch and measures 0.102 in length and 0.011 in width. The vas deferens is short, thin, extends obliquely and measures 0.068 in length and 0.0008 in breadth.

The ovary is large in size, distinctly bilobed, roughly dumb-bell shaped in appearance, transversely placed, near the posterior margin of the segments and measures 0.035 in breadth. The ovarian lobes are club shaped with globular distal end, large in size, with irregular margin and measure 0.397 in length and 0.170 in breadth. The isthmus is connecting the two ovarian lobes, slightly curved, uneven in width, transversely placed, near and posterior margin consisting 3 acini's in left and 5 acini's in right lobe of segment and measures 0.568 in length and 0.045 in breadth. The vagina is thin, short, arises from the genital pore, slightly curved, runs posterior, reaches and opens into the ootype and measures 0.113 in length 0.011 in width. The ootype is medium in size, oval in shape, at middle, near the posterior margin of the segment; either to the right or to the left of the middle line of the segments and measures 0.022 in length and 0.022 in breadth. The genital pore is small in size, round in shape, preovarian, and measures 0.011 in diameter. The vitellaria are granular, small in size, round in shape, in 2-3 rows, on each lateral side, extending from the anterior to the posterior margin of segments.

Gravid segment is broader than longer measure 0.219 in breadth and 0.022 – 0.026 in length, with uterus which is sac like tubular structure measuring 0.0777 in breadth and 0.017. The eggs are oval to elongated, thin-shelled and non-operculated measuring 0.004-0.002 mm in size.

## DISCUSSION

The genus *Circumoncobothrium* is erected by G. B. Shinde in 1968 as a type species *C. ophiocephali* from *Ophiocephalus leucopunctatus*. Later on the following species are added to this genus.

The present worm differ from *Circumoncobothrium ophiocephali* [17] which is having the scolex distinct, hooks 80 in number, rod shaped: testes 70-80 in number, in two lateral fields, round in shaped: ovary single, conical mass to irregular shaped band, and vitellaria follicular. The present worm differ from *C. aurangabadensis* [3] which is having the scolex broad in the middle, narrow at the ends; the rostellar hooks 42 in number, rod shaped; testes 135-145 in number, round in shape; ovary bilobed, each lobe with 3-4 acini near the posterior margin of the . The present worm differ from *C. raoi* [20] which is having the scolex broad in the middle, narrow at both the ends; rostellar hooks 46 in number, rod shape; testes 210-

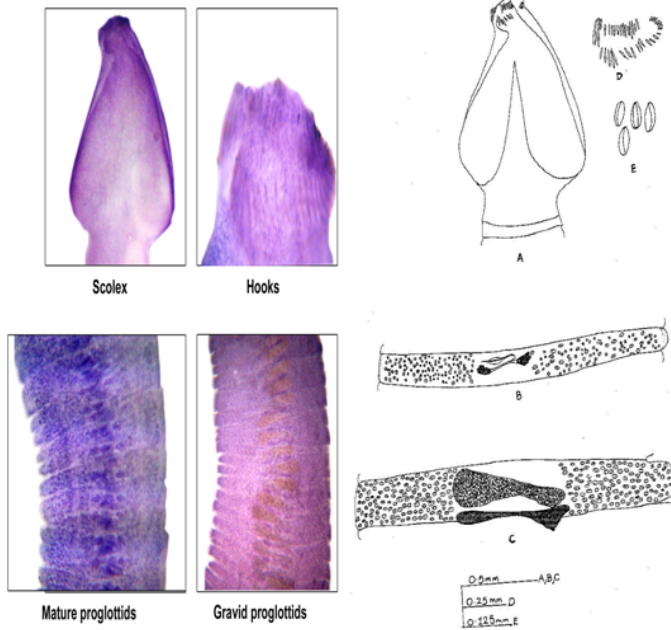
215 in number, rounded in shape, in two fields; ovary bilobed, situated at almost near the posterior margin of the segments. The present worm differs from *C. shindei* [21] which is having the rostellar hooks 49 in number, rod shaped, testes 260 – 275 in number, evenly distributed. The present worm differ from *C. bagariusi* [2] which is having testes 275-285 (276) in number, in two field; ovarian lobes each with 5-6 globular acini; in the middle one third of the segment and vitellaria follicular, with irregular shape, in 4-5 rows on each side. The present worm differ from *C. khami* [18] which is having the scolex cylindrical, with even width, apical; disc separate by a notch; rostellar hooks 48 in number, lancet shaped; testes 190-200 in number, rounded ovary bilobed, each lobe compact, situated near the posterior end and in the center of the segments and vitelline follicles around, in a single layer, near the lateral margins. The present worm differ from *C. gachuai* [4] which is having scolex pear shaped in appearance, rostellar hooks 48 in number, testes 375-400 in number, rounded, densely placed in two fields; ovarian lobes each with 5-6 short blunt acini and vitellaria follicular, corticular in position, in 1-2 rows on each side. The present worm differ from *C. yamaguti* [5] which is having the scolex distinct, testes 130-150 in number, round; ovary centrally placed near the posterior margin. The present worm differ from *C. alii* [22] which is having the rostellar hooks 34 in number, testes rounded, 230-240 in number; ovary compact, centrally placed; lobes long, oval. The present worm differ from *C. vadgaonensis* [13] which is having testes 490-510 in number, evenly distributed; vitellaria follicular, in two rows on each side. The present worm differ from *C. balmii* [26] which is having scolex pear shape, rostellar hooks 48 in number, testes 88-100 in number; ovary compact. The present worm differ from *C. punctatusi* [19] which is having scolex rectangular in shape, rostellar hooks 40-50 (48) in numbers, arranged in single circle stout, tapering at both ends, testes 140 – 150 in number, ovary medium, short blunt round acini, vitellaria follicular. The present worm differ from *C. armatusae* [19] which is having rostellar hooks 23 in number, slightly curve, stout, large hooks in center, testes 90 -100 small, oval, vitellaria follicular. The present worm differ from *C. mastacembelusaei* [23] which is having scolex pear shaped; rostellar hooks 38 in number; neck is absent; testes is 130-140 in numbers, unevenly distributed in lateral field, vitellaria follicular. The present worm differ from *C. armatusae* (minor) [13] which is having neck is absent; testes 190-200 in numbers, unevenly distributed in two groups; ovary is large, oval and compact, vitellaria follicular arranged in 2-3 rows on lateral side of the proglottid. The present worm differs from *C. manjari* [25] which is having testes 128-145 in numbers, rounded; vitellaria follicular, arranged in two rows on each lateral side. The present worm differ from *C. vitellariensis* [23] which is having rostellar hooks 48 in numbers, pointed at the apex; neck is absent; testes 250-260 in number, oval, pre-ovarian; vitellaria follicular, rounded, 3-4 rows on each lateral side. The present worm differ from *C. cirrhinae* [9] in having scolex cylindrical, barrel shaped, rostellar hooks 56 in number, mature segments slightly longer than broad, testes 300-305 in number, ovary multi lobed with 7-8 acini. The present worm differ from *C. mehdii* [16] scolex mature proglottids medium, testes 284, medium, oval, Vitellaria follicular. The present worm differ from *C. ambajogaiensis* [12] mature segments two and half times broader than long, testes (150-160) in number, vitellaria are follicular, in two rows. The present worm differ from *C. yogeshwari* [6] testes 95 – 98 number, vitellaria follicular. The present worm differ from *C. purnae* [1] from *Mastacembelus armatus* in having mature segments squarish and slightly broader than long, testes 230-235 in number,

vitellaria follicular in 3-5 rows. The present worm differ from *C. naidui*, [8] having cylindrical, hook 40 in number, neck absent, broader than longer, ovary oval. The present worm differ from *C. paithenensis* [15] having mature segments are almost two times broader than long with irregular margins, testes 70 - 80 in number medium in size, oval in shape, vitellaria follicular. The present worm differ from *C. thapari* [10] having mature proglottids are medium in size, broader than long, the testes are 95 in number, medium in size, oval in shape, vitellaria are follicular, 2-3 rows. The present worm

differ from *C. jadhavae* [11], scolex is dome shape, hooks are 35-45 in number; testes are oval to rounded, 95-105 in number vitellaria are follicular in two rows. The present worm differ from *C. clariasi* [7], having mature segments are squarish, slightly broader than long, testes 254 in number, vitellaria follicular.

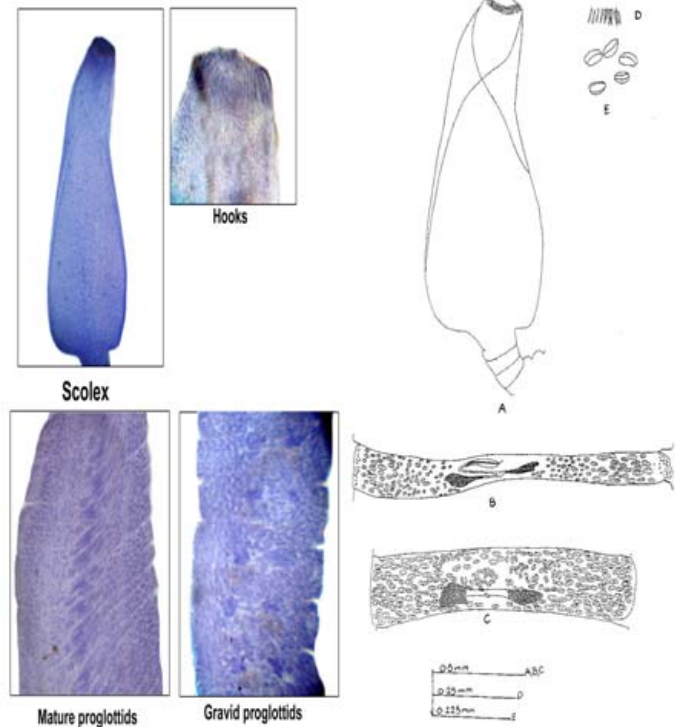
These distinct characters are more than enough to erect a new species from this genus and hence the name *Circumcobotrium hemlatae* n.sp is proposed in honour of author's research guide Dr. (Mrs) Hemlata S. Chaudhari (Wankhede).

*Circumcobotrium hemlatae* n.sp.



- A. Scolex
- B. Mature proglottid
- C. Gravid proglottid
- D. Hooks
- E. Eggs

*Circumcobotrium shindei* 1977.



- A) Scolex
- B) Mature proglottid
- C) Gravid proglottid
- D) Hooks
- E) Eggs

**Taxonomic summary**

Genus : *Circumoncobothrium* [16]  
 Species : *Circumoncobothrium hemlatae* n.sp.  
 Type host : *Mastacembelus armatus* L.  
 Habitat : Intestine  
 Type locality : Paithan, Aurangabad (M.S) India  
 Accession No.: HRL /2006-07/1a /1-10.  
 Holotype : Deposited in Helminthology Research Lab.  
 Paratype : Dept. of Zoology, Dr. B. A. M. U. Aurangabad.  
 Etymology: Named in honour of my research guide  
 Dr. (Mrs) Hemlata S. Chaudhari (Wankhede)

**A key to the species of the genus *Circumoncobothrium* Shinde, 1968**

- Neck present - 1
- Neck absent - 2
- 1) Vitellaria granular - 3
- Vitellaria follicular - 4
- 2) Mature segment squarish - 5
- Mature segment broader than long - 6
- 3) Scolex triangular - 7
- Scolex pear shaped - *C. baimaii* [26]
- Scolex narrow anteriorly and broad posteriorly - *C. shindei* [21]
- Scolex broad in the middle and narrow at both end - 8
- Scolex cylindrical - 9
- 4) Mature proglottids squarish - 10
- Mature proglottids broader than long - 11
- 5) Testes in bet. 190 -200 number - *C. khami* [18]
- Testes in bet. 230 – 235 number - *C. purnae* [1]
- 6) Hooks below 30 in numbers - 12
- Hooks in between 30 -50 in numbers - *C. vitellariensis*
- [24] Hooks above 50 in numbers - 13
- 7) Hooks 34 in number - *C. alii* [22]
- Hooks 54 in number - *C. hemlatae* n.sp
- 8) Testes below 200 in numbers - *C. aurangabadensis*
- [3] Testes above 200 in numbers - *C. raoii* [20]
- 9) Testes in bet. 300 – 310 number - *C. cirrihinae* [9]
- Testes in bet. 200 – 210 number - *C. naidui* [8]
- 10) Scolex rectangular in shape - *C. punctatusi* [19]
- Scolex pear shaped - *C. gachuai* [4]
- Scolex triangular - *C. mehdii* [16]
- 11) Hooks 20-30 in numbers - *C. armatusae* [19]
- Hooks 30-50 in numbers - 14
- Hooks 50-60 in numbers - 15
- Hooks above 60 in numbers - *C. ophioccephali* [17]
- 12) Scolex pear shaped - *C. mastacembelusaei* [23]
- Scolex triangular - *C. ambajogaiensis* [12]
- 13) Testes in between 90 – 100 - *C. thapari* [10]
- Testes in bet. 100-150 in numbers - *C. yamaguti* [5]
- Testes in bet. 150-200 in numbers - *C. armatusae (minor)* [14]
- Testes above 200 in numbers - *C. bagariusi* [2]
- 14) Testes in bet. 90 – 110 - *C. jadhavae* [11]
- Testes in bet. 125 -150 in number - *C. mangari* [25]
- Testes in bet. 250 -260 in number - *C. clariasi* [7]
- 15) Testes in bet. 70-80 in number - *C. paithenensis* [15]
- Testes in bet. 90 -100 in number - *C. yogeshwari* [6]
- Testes in bet. 490 - 510 in number - *C. vadgaonensis* [13]

***Circumoncobothrium shindei* [21]****Description:**

Fifteen of the cestode parasites were collected from the intestine of a fresh water fish, *Mastacembelus armatus* from Paithan near Aurangabad, Tq. Paithan, Dist. Aurangabad (M. S.) India in the month of March 2007. The worms were considerably long, thin, and white in colour, with scolex, numerous immature and mature segments.

The scolex is large well developed, which is narrow anteriorly and broad posteriorly and measures 0.18 in length and 0.075-0.444 in breadth, the anterior end of the scolex is bluntly rounded. On the apex of the scolex is present a complete circle of rod-shaped 45-50 hooks and measures 0.0027 in length and 0.0074 in breadth which is followed by a chain of segment, few proglottids followed by the neck are squarish.

Mature segment is 10 times broader than longer and measures 0.065 in length and 0.0054 – 0.0067 in breadth. The testes are oval in shape, 250-260 in numbers and measures 0.0020-0.0020 in size. Ovary is bilobed and dumbbell-shaped and measures 0.018 in length, both lobes of the ovary are round and compact with globular acini joint by isthmus, the ovary is situated at the centre of the segment.

Gravid segment is broader than longer measures 0.054 in length and 0.0108-0.0094 in breadth. The ovary in the gravid segment increases in length and width respectively; it is situated near the posterior margin of the proglottids. Vitellaria are follicular arranged in 2-3 rows, eggs are operculated, oval in shape measures 0.003 to 0.0020.

**DISCUSSION**

After going through literature, the worm under discussion turned out to be *Circumoncobothrium shindei* [21]. The present form resembles it in many characters, but differs from the same in few characters, which are as follows.

The worm under discussion differs from *Circumoncobothrium shindei*, [21] in numbers of rostellar hooks 45-50 against 43. The present cestode differs from it, in the size of the scolex. As the characters are minor. It is redescribed here as *Circumoncobothrium shindei*, [21].

**Taxonomic summary.**

Genus : *Circumoncobothrium* [17]  
 Species : *Circumoncobothrium shindei*, [21]  
 Type host : *Mastacembelus armatus* L.  
 Habitat : Intestine  
 Type locality : Paithan, Aurangabad (M.S) India  
 Accession No.: HRL /2007-07/1a /1-10.  
 Holotype : Deposited in Helminthology Research Lab.  
 Paratype : Dept. of Zoology, Dr. B. A. M. U. Aurangabad.  
 Date of collection : March 2007

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