

## New Species of the *Ptychobothridean* Tapeworm *Circumoncobothrium* from *Mastacembalus armatus*

M B Sonune and C R Kasar<sup>1</sup>

Department of Zoology,

Shri. Shivaji Science, and Arts College, Chikhali, Dist- Buldhana, M.S. (India)

<sup>1</sup>S.P.M. Science, Gilani Arts, Commerce College, Ghatanji Dist- Yavatmal -445 301 (M. S.)

### ABSTRACT

The present study deals with a new species of the genus *Circumoncobothrium* (Shinde, 1968) viz. *Circumoncobothrium chandrabhagae* Sp. Nov. collected from *Mastacembalus armatus* from Chandrabhaga river at Daryapur Dist.- Amaravati, Maharashtra State India. The present parasites are comes closer to all the known species of this genus in general topography of organs but differ from all the known species of the genus *Circumoncobothrium* (Shinde, 1968) in having scolex triangular, narrow anteriorly and broad posteriorly, rostellar hooks 26-30 in numbers, arranged in single circle, testes 120-130, cirrus pouch oval, obliquely placed, ovary bilobed, vagina long coiled tube, uterus sacular, convoluted tube, and vitellaria follicular.

**Key words-** Amaravati, Ptychobothridean tapeworm, *Mastacembalus armatus*, *Cicumoncobothrium*.

### INTRODUCTION

The genus *Circumoncobothrium* is erected by Shinde (1968) from the intestine of fresh water fish *Ophiocephalus leuconpunctatus* as a type species *C. ophiocephali*. Jadhav and Shinde (1976) added two new species of this genus viz., *C. aurangabadensis* and *C. raoii* from *Mastacembalus armatus*. Jadhav and Shinde, 1976 reported *C. gachuai* from *Ophiocephalus gachua*. Chincholikar and Shinde (1976) described two new species of this genus *C. Shindei* from fresh water fish *Mastacembalus armatus* and *C. bagariusi* from *Bagarius* species. Shinde (1977) reported *C. khami* from *Ophiocephalus striatus*. Jadhav *et al*, (1990) described *C. yamaguti*, from *Mastacembalus armatus* Shinde *et al*, 1994 created *C. alii* from *Mastacembalus armatus*. Patil *et al*, (1998) added *C. vadgaonensis* as a new species to this genus. Wongsawad and Jadhav, (1998) added *C. baimaii* from *C. punctatusi* Kalse and Shinde, 1999 *Mastacembalus armatus*, Shinde *et al*, (2002) described *C. mastacembelusae* as a new species from *Mastacembalus armatus*. Pawar *et al*, (2002) reported *C. armatusae* (minor) from *Mastacembalus armatus* to this genus. Tat and Jadhav (2004) reported *C. manjari* from *Ophiocephalus gachua*. Later on Supugade *et al*, added *C. vitellariensis* from *C. armatusae* Shinde *et al*, *Mastacembalus armatus* in 2005.

### MATERIALS AND METHODS

One hundred and eleven cestode parasites were collected from the intestine of freshwater fish *Mastacembalus armatus* (Lecepede, 1800) at

Daryapur, Districts Amravati (M.S.) India during the period of Jan., 2003 to Dec., 2005. These cestodes were preserved in hot 4% formalin and seven specimens were stained with Harris haematoxylin and Borax carmine, passed through various alcoholic grades, cleared in xylene, mounted in D.P.X. and drawings were made with the aid of Camera Lucida and all measurements were recorded in millimeters unless otherwise mentioned.

### RESULTS

The scolex was large, triangular in shape, narrow anteriorly and broad posteriorly, distinctly marked off from the strobila and measures 1.330 (1.067-1.592) in length and 0.708 (0.393-1.024) in width (Description based on seven specimens, Figure 1& 2). Scolex bears pair of bothridia, large sac like in appearance, start from the rostellum extends posteriorly almost towards the posterior margin of the scolex and measures 1.128 (0.72 8-1.529) in length and 0.325 (0.106-0.543) in width. The scolex bears rostellum, median in size, oval in shape and measures 0.075 (0.058-0.092) in length and 0.165 (0.140 -0.189) in width. The rostellar hooks were 26-30 in numbers, arranged in a single circle, measure 0.036 (0.020-0.051) in length and 0.006 (0.005-0.006) in width. Neck absent. Mature segments were slightly broader than long, slightly concave and measures 1.003 (0.728-1.037) in length and 1.178 (1.159-1.196) in width. Testes were oval in shape, medium in size, 120-130 in numbers, pre-ovarian, placed centrally and measures 0.071 (0.068-0.075) in length and 0.045 (0.037-0.053) in width.

Cirrus pouch was oval, pre- ovarian, near the central side of the segment, not opening on lateral margin and measures 0.128 (0.098-0.159) in length and 0.049 (0.037-0.060) in width. The cirrus is thin, straight, within the cirrus pouch and measures 0.094 (0.083-0.106) in length and 0.011 (0.007-0.015) in width. The vas deferens is short, thin, extends obliquely anteriorly and measures 0.098 (0.090-0.106) in length and 0.005 (0.003-0.007) in width. Cirrus and vagina opens from a common genital pores, which is small, oval, sub-marginal and measures 0.189 (0.151-0.228) in length and 0.026 (0.022-0.030) in width.

The vagina arises from the gonopore, runs towards posterior side of the cirrus pouch, curved slightly, opens in ootype and measures 0.125 (0.113-0.136) in length and 0.018 (0.015-0.022) in width. Ootype is small, oval to rounded in shape and measures 0.049 (0.045-0.053) in length and 0.034 (0.030-0.037) in width. The ovary is distinctly bilobed, large in size, transversely placed near the posteriorly margin of the segment and measures 0.238 (0.174-0.303) in length and 0.087 (0.068-0.106) in width. The vitellaria are follicular, small, oval, placed laterally from anterior and posterior margin of the segment, arranged in a two row.

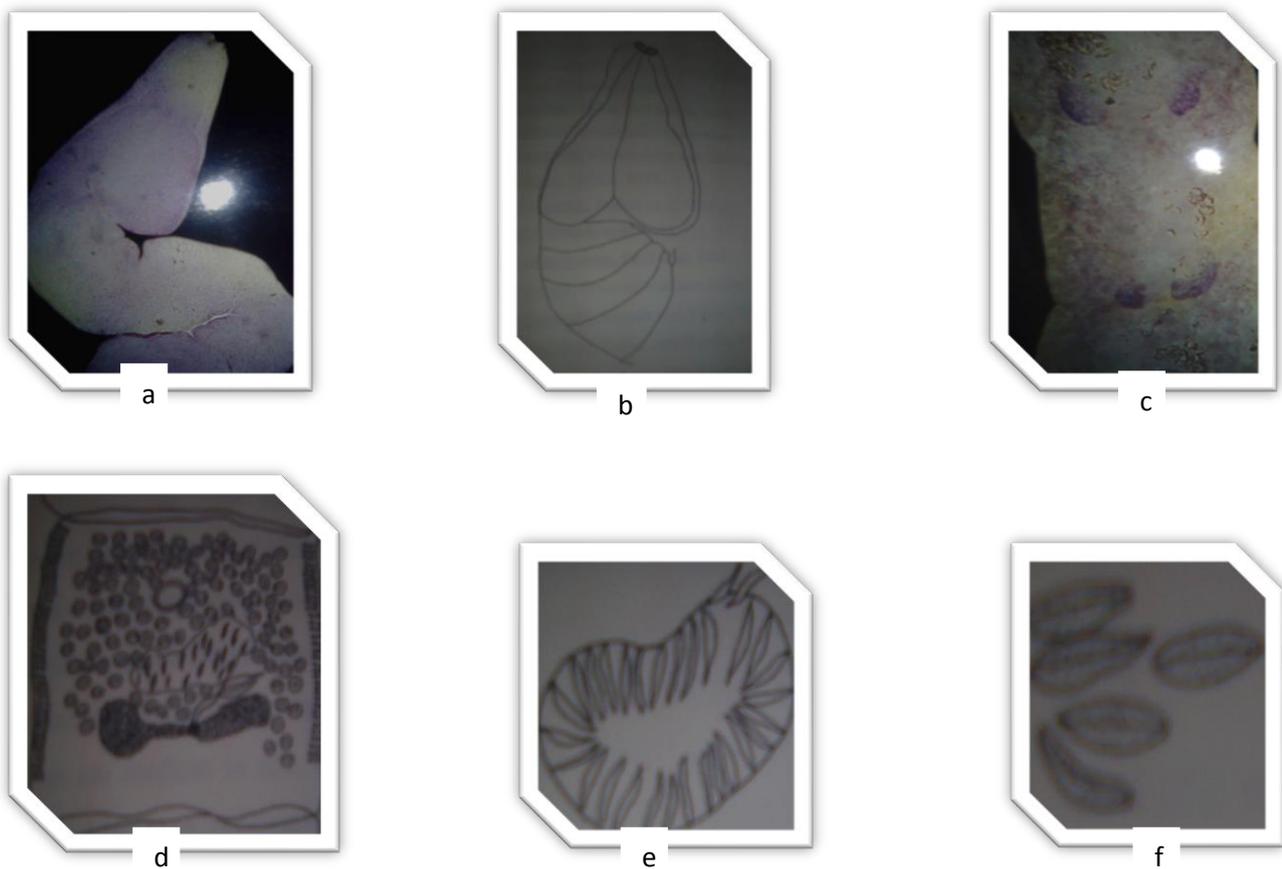


Fig. 1 to 3: Microphotograph and Camera Lucida diagram of *Circumoncobothrium chandrabhagae* n.sp. (a) and (b) Scolex, c & d Mature Segment, (e) Rostellum with Hook & (f) Eggs.

Fully gravid segment consist sacular uterus, placed in a central region of segment, which contain numerous eggs and measures 0.162 (0.136-0.189) in length and 0.446 (0.378-0.615) in width. The uterine pore is medium, oval, touching to the anterior side

of the segment and measures 0.113 (0.083-0.143) in length and 0.087 (0.075-0.098) in width. Eggs are elongated, oval, operculated and measures 0.037 (0.034-0.039) in length and 0.013 (0.010-0.017) in width.

**DISCUSSION**

The genus *Circumoncobothrium* is erected by Shinde in 1968 as a type species *C. ophiocephali*.

The present parasites under discussion in having scolex triangular, narrow anteriorly and broad posteriorly, rostellar hooks 26-30 in numbers, arranged in single circle, testes 120-130, cirrus pouch oval, obliquely placed, ovary bilobed, vagina long coiled tube, uterus sacular, convoluted tube, and vitellaria follicular. The present form comes closer to all the known species of this genus in general topography of organs but differs from the following species in many characters as follows.

1} The present cestode differs from *C. ophiocephali*, in having distinct scolex, broad in the middle and tapering at both the ends, rostellar hooks 80 in number, testes 70- 80 in numbers and ovary single conical mass to irregular shaped band.

2} It differs from *C. aurangabadensis* in having the scolex broad in the middle, narrow at both the ends, the rostellar hooks 42 in numbers, testes 135-145 in numbers, scattered throughout the segment, rounded and ovary bilobed with 3-4 acini.

3} The present tapeworm differs from *C. raoii* in having scolex broad in the middle, narrow at both the ends rostellar hooks 46 in numbers, rod shaped in single circle, testes 210-215 in numbers, rounded and arranged densely in two fields.

4} *Circumoncobothrium chandrabhagae* differs from *C. gachuai* in having the scolex pear shaped, rostellar hooks 46 in number, mature segments squarish and testes 375-400 in numbers.

5} *Circumoncobothrium chandrabhagae* distinguish from *C. shindei*, in having the scolex narrow anteriorly, broad posteriorly, rostellar hooks 49 in number, testes 260-275 in numbers, evenly distributed, ovary bilobed, dum-bell shaped and vitellaria granular.

6} It differs from *C. bagariusi*, in having the scolex narrow anteriorly, broad posteriorly, rostellar hooks 55 in numbers, rod shaped, neck absent, testes 275-285 in numbers arranged in two lateral fields, ovary bilobed, each lobe with 5-6 globular acini.

7} New parasite differs from *C. khami*, in having the scolex cylindrical, rostellar hooks 48 in numbers, lancet shaped, neck absent, mature segments squarish, testes 190-200 in numbers, evenly distributed and ovary bilobed, each lobe compact.

8} The present cestode differs from *C. yamaguti*, in having the scolex distinct, narrow anteriorly, broad

posteriorly, testes 130-150 in numbers, and granular vitellaria.

9} The present worm differs from *C. alii*, in having the scolex triangular, rostellar hooks 34 in numbers and testes 230-240 in numbers.

10} Tapeworm differs from *C. vadgaonensis*, in having the scolex triangular, mature segments slightly broader than long, testes 490-510 in numbers and vitellaria follicular.

11} Our estode differs from *C. baimaii* in having the scolex pear shaped, rostellar hooks 48 in numbers in single circle, testes 88-100 in numbers, ovary compact and vitellaria granular in lateral field from anterior to posterior margin of the segment.

12} The present worm differs from *C. punctatusi* in having scolex rectangular in shape, rostellar hooks 40-50 in number and testes 140-150 in number, mature segment squarish 6-7 times broader than long.

13} Worm differs from *C. armatusae*, in having scolex triangular, rostellar hooks 58 in numbers, testes 190-200 in numbers, ovary bilobed, vitellaria follicular, oval, 2-3 rows on lateral side of the segments.

14} The present parasite differs from *C. mastacembelusae*, in having scolex pear shaped, rostellar hooks 30 in numbers, testes 130-140 in numbers, ovary bilobed, comp-act, vitellaria follicular, rounded and arranged in 2-3 rows on each lateral side.

15} *Circumoncobothrium chandrabhagae* cestode differs from *C. armatusae* (minor) in having scolex triangular, rostellar hooks 58 in number, testes 190-200 in number, ovary distinctly bilobed, neck absent.

16} The present form differs from *C. manjari*, in having the scolex triangular, rostellar hooks 48 in numbers in single circle, neck present, testes 128-145 in number, rounded.

17} The present parasite differs from *C. vitellariensis*, in having scolex large, triangular, rostellar hook 48 in numbers, neck absent, testes 250-260 in numbers, vitellaria follicular, follicles small round arranged in 3-4 rows on each lateral side.

In view of the above differences, it is regarded as a new species for which the name *Circumoncobothrium chandrabhagae* n.sp. proposed after Chandrabhaga River from where the author has collected the worm.

**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	-	<i>C. khami</i> , Shinde, 1971
	Mature segment broader than long	-	5
3)	Scolex triangular	-	<i>C. alii</i> , Shinde et. al, 1994
	Scolex pear shaped	-	<i>C. baimaii</i> , Wongsawad and Jadhav, 1998
	Scolex narrow anteriorly and broad posteriorly	-	<i>C. shindei</i> Chincholikar et. al, 1976
	Scolex broad in the middle and narrow at both end	-	6
4)	Mature proglottids squarish	-	7
	Mature proglottids broader than long	-	8
5)	Hooks below 50 in numbers	-	9
	Hooks above 50 in numbers	-	10
6)	Testes below 200 in numbers	-	<i>C. aurangabadensis</i> , Jadhav et. al, 1976
	Testes above 200 in numbers	-	<i>C. raoii</i> , Jadhav and Shinde, 1976
7)	Scolex rectangular in shape	-	<i>C. punctatusae</i> , Jadhav et. al, 1976
	Scolex pear shaped	-	<i>C. gachuai</i> Jadhav et. al, 1976
8)	Hooks 20-40 in numbers	-	<i>C. armatusae</i> Shinde et. al, 1999
	Hooks 40-50 in numbers	-	<i>C. mangari</i> , Tat et. al, 2004
	Hooks 50-60 in numbers	-	<i>C. vadgaonensis</i> Patil, 1998
	Hooks above 60 in numbers	-	<i>C. ophiocephali</i> Shinde, 1968
9)	Scolex pear shaped	-	<i>C. mastacembelusaei</i> Shinde et. al, 2002
	Scolex triangular	-	11
10)	Testes in between 100-150 numbers	-	<i>C. yamaguti</i> , Jadhav et. al. 1990
	Testes in between 150-200 numbers	-	<i>C. armatusae</i> , Miner Pawar et. al, 2002
	Testes above 200 in numbers	-	<i>C. bagariusi</i> Chincholikar et. al, 1976
11)	Testes below 200 in numbers	-	<i>C. chandrabhagae</i> n.sp.
	Testes above 200 in numbers	-	<i>C. vitellariensis</i> Supugade et. al, 2005

**LITERATURE CITED**

**Chincholikar LN and Shinde GB, 1976.** On a new species of *Circumoncobothrium* Shinde, (1968) (Cestoda-Pseudophyllidea) Carus, 1863 from a fresh water fish in India. *Marathwada University Journal of Sciences & Natural Sciences* 16, (Sci): 9: 183-185.

**Wongsawad C and Jadhav BV, 1998.** *Circumoncobothrium baimaii* n.sp. (Cestoda: Pseudophyllidea) from a fresh water fish, *Maesa stream* Chiang Mai, Thailand. *Rivista Di Parasitologia*, 15: 291-294.

**Shinde GB and Kalse AT, 1999.** Two new species of the genus *Circumoncobothrium* Shinde, (1968) (Cestoda: Pseudophyllidea) Carus, 1893 from a freshwater fish at Khandesh (M. S.), India. *Rivista Di Parasitologia*, 16: 209-215.

**Shinde GB, Pawar SB and Chavhan SP, 2002.** A new species *Circumoncobothrium mastacembelusae* n.sp (Cestoda: Pseudophyllidea) from *Mastacembalus armatus* at Paithan, India. *Rivista Di Parasitologia*, 20: 195-198.

**Jadhav BV, 1976.** New species of the genus *Circumoncobothrium* Shinde 1968. (Cestoda: Pseudophyllidea) from a freshwater fish in Maharashtra. India. *Marathwada University Journal of Sciences & Natural Sciences*, 8: 269-272.

**Jadhav BV and Shinde GB, 1976.** New species of genus *Circumoncobothrium* Shinde, 1968 (Cestoda: Pseudophyllidea) Carus, 1863) from a freshwater fish at Aurangabad India. *Indian Journal of Biological Science Association*, 112: 163-164.

**Patil SR, Shinde GB and Jadhav BV, 1998.** A new species of the genus *Circumoncobothrium* Shinde, 1968 (Cestoda: Pseudophyllidea) Carus, 1963 from *Mastacembalus armatus* at Vadgaon, Maharashtra, India. *Journal of Parasitic Diseases*, 22: 148-151.

- Pawar SB and Lakhe AD, 2002.** A new species *Circumoncobothrium armatusae* n.sp (Cestoda-Pseudophyllidea) from *Mastacembalus armatus* at Paithan, India. *Rivista Di Parasitologia*, **20**: 219-222.
- Shinde GB, 1968.** On *Circumoncobothrium ophiocephali* n. gen. n.sp. from a freshwater fish *Ophalocephalus lecopunctatus* in India. *Rivista Di Parasitologia*, **29**: 111-114.
- Shinde GB and Jadhav BV, 1972.** A new species *Circumoncobothrium mastacembellusae* n.sp. (Cestoda Pseudophyllidae) from *Mastacembalus armatus* at Paithan, India. *Rivista Di Parasitologia*, **33**: 195-198.
- Shinde GB and Jadhav BV, 1976.** On a new species of genus *Circumoncobothrium* Shinde, 1968 (Cestoda Pseudophyllidea) from a freshwater fish from Maharashtra, India. *Marathwada University Journal of Sciences & Natutal Sciences (Sci)*, **8**: 24-29.
- Shinde GB, 1977.** On a new species of *Circumoncobothrium* Shinde, 1968 (Cestoda: Pseudophyllidea Carus, 1863) from a freshwater fish in India. *Marathwada University Journal of Sciences & Natutal Sciences (Sci)*, **16** : 129-132.
- Shinde GB and Chincholikar LN, 1977.** On a new species of *Circumoncobothrium*, Shinde. 1968 (Cestoda: Pseudophyllidea) Carus, 1863 from freshwater fish in India. *Marathwada University Journal of Sciences & Natural Sciences (Sci)*, **9**: 177-179.
- Shinde GB, Sarwade DV, Jadhav BV and Mahajan MA, 1994.** On a new species of the genus *Circumoncobothrium* Shinde, 1968 (Cestoda- Pseudophyllidae Carus, 1963) from *Mastacembalus armatus* (Cuv. And Val.) from freshwater fish at Aurangabad (M. S.) India. *Rivista Di Parasitologia*, **11**: 167-169.
- Tat MB and Jadhav BV, 2004.** A new species of the genus *Circumoncobothrium*, Shinde (1968) (Cestoda: Pseudophyllidea Carus, 1863) from *Ophiocephalus gachua* at Dhanegaon Dist. Beed. *Journal of Life Sciences*, **1**: 129-132.