



ZOOLOGY

A NEW TAPEWORM *CIRCUMONCOBOTHRIUM JADHAVAE* N.SP. FROM *MASTACEMBELUS ARMATUS* (LECEPEDE) 1800, AT AURANGABAD M.S. INDIA

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Abstract

The present communication deals with the description of a new species of genus *Circumoncobothrium* (Shinde, 1968), viz., *Circumoncobothrium jadhavae* n.sp. from *Mastacembelus armatus* (Lecepede, 1800) Kham river at Aurangabad district, the present form differ from the known species of the genus in the shape and size of the scolex, number of hooks and arrangement of rostellum, shape of segment, number of testes, position of cirrus pouch and arrangement of vitellaria.

Keywords: Cestode parasite, *Circumoncobothrium jadhavae* n. sp., *Mastacembelus armatus*, Aurangabad

Introduction

The genus *Circumoncobothrium* is erected by Shinde G.B., (1968) described species *C. Ophiocephali* from the intestine of freshwater fish, *Ophiocephalus leucopunctatus*. Jadhav and Shinde, (1976) described three new species i.e., *C. aurangabadensis* and *C. raoii* from the host, *Mastacembelus armatus* and *C. gauchai* from *Ophiocephalus gauchua*. Chincholkar and Shinde, (1976) was reported two new species i.e., *C. shindei* from *Mastacembelus armatus* and *C. bagariusi* from the freshwater fish, *Channa striatus*. Later, Shinde added the new species *C. khami* in 1976 from the host, *Ophiocephalus striatus*. Jadhav *et al.*, (1990) was reported new species *C. yamaguti* from *Mastacembelus armatus*. Later Shinde *et al.*, (1994) described new species *C. alii* from the freshwater fish, *Mastacembelus armatus*. Later Patil *et al.*, (1998) described new species *C. vadgaonensis* from host, *Mastacembelus armatus* Wongsawad and Jadhav, 1998 was added new species *C. baimaii* from freshwater fish, *Mastacembelus armatus*. Kalse and Shinde, (1999) described two new species *C. punctatusi* from host, *Channa punctatus* and *C. armatusae* from *Mastacembelus armatus*. Shinde *et al.*, (2002) added a new species *C. mastacembelusae* from the host, *Mastacembelus armatus*. Later Pawar *et al.*, (2002) added new species *C. armatusae* (Minor) from *Mastacembelus armatus*. Tat and Jadhav, (2004) described the new species *C. manjari* from the fish, *Mastacembelus armatus*. Supugade *et al.*, (2005) described new species *C. vitellariensis* from host, *Mastacembelus armatus*. Later, described the new

species *C. purnae* by Borde S.N. and Sushil J. in 2008 from the host, *Mastacembelus armatus*.

The present communication deals with the description of new species *Circumoncobothrium jadhavae* n.sp. from *Mastacembelus armatus*.

Material and Methods

Fifteen worms were collected from the intestine of *Mastacembelus armatus* (Lecepede, 1800) collected from Kham river of Aurangabad District, (M.S.), India, in the month of April 2008. Worm were collected from the intestine, washed in distilled water, flattened between coverglass and slides, fixed in 4% formalin until 24 hours, washed in distilled water, stained with Harri's Haematoxylene, dehydrated in alcoholic ascending series (30%,50%,70%,90%,100%), cleared in Xylene and mount in DPX. Drawings were made by using Camera Lucida and measurements are taken in millimeter. Identification was carried out by using Systema Helminthum Vol. II, (Yamaguti, 1956).

Description

The worms are elongated, tape like, yellowish or cream in colour. The scolex is triangular, dome shape and it measures 1.1022 mm. in length and 0.7727 mm. in breadth. Scolex bears two bothria, elongated, spoon like. Right bothria measures 1.19311 mm. in length and 0.2045 mm. in breadth and left bothria measures 0.9431 mm. in length and 0.1931 mm. in breadth. Hooks are located on the tip of the scolex. Hooks are overlapping one another, 35-45 in number; it measures 0.4812mm in length and 0.05347 mm. in breadth. Neck is present.

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Mature proglottids are longer than broad, measures 1.3688 mm. in length and 0.3300 mm. in breadth. Cirrus pouch is oval, bulb like at the anterior end of the vagina, measures 0.03398 mm in length and 0.01941 in breadth. Cirrus is slightly curved at the anterior of genital opening, genital opening or pore is small, rounded located on the cirrus pouch, and it measures 0.04368 mm. in diameter. Testes are oval to rounded, 95-105 in number, and it measures 0.07281 mm in diameter.

Ovary is bilobed, right and left lobes separated from the ootype. Right lobe measures 0.2330 mm. in length and 0.07766 mm. in breadth. Left lobe measures 0.1213 mm. in length and 0.0484 mm. in breadth. Vagina is tube like at the anterior of the genital pore measures 0.01456 mm. in length 0.004854 mm. in breadth. Ootype is circular or rounded located between ovarian lobe and it measures 0.04368 mm. in diameter. Isthmus at the distal portion of the ovary, it measures 0.04368 mm in diameter. Mature proglottids are broader than gravid proglottids. Vitellaria are follicular in two rows at the lateral side of the proglottids.

Gravid proglottids longer than mature proglottids, it measures 1.4563 mm. in length and 0.2281 mm. in breadth. Eggs are operculated and measures 0.02566 mm. in length and 0.1283 mm. in breadth.

Discussion

The genus *Circumoncobothrium* is erected by Shinde G.B. (1968) with species *C. ophiocephali* from the intestine of freshwater fish *Ophiocephalus leucopunctatus*, in India. The present worms discussed with following species.

The present parasite comes closer to *C. vadgaonensis* Patil, (1998); *C. armatusae* (Minor) Pawar, (2002); *C. manjari* Tat and Jadhav, (2004) and *C. vitellariensis* Supugale *et al.*, (2005); in having scolex triangular, ovary bilobed, mature segment is broader than long, vitellaria are follicular, however it differs from *C. vadgaonensis* Patil, (1998) having hooks (35-45 vs 56) in number, testes (95-105 vs 490-510) in number; *C. armatusae* (Minor) Pawar, (2002) in having hooks (35-45 vs 58) in number, neck (present vs absent), testes (95-105 vs 190-200) in number; *C. manjari* Tat and Jadhav, (2004) in having hooks (35-45 vs 48) in number, testes (95-105 vs 128-145) in number; *C. vitellariensis* Supugale *et al.*, (2005) having hooks (35-45 vs 46-48), neck (present vs absent), testes (95-105 vs 250-260), above mentioned species vitellaria are follicular in two rows. Remaining species differs from the *Circumoncobothrium jadhavae* n.sp. are as discussed below,

The present worm differs from the species *C. ophiocephali* (Shinde, 1968) from *Ophiocephalus leucopunctatus* in India in having scolex (triangular, dome shape vs broad), hooks (35-45 vs 80) in number,

testes (95 – 105 vs 70-80) in number, ovary is (bilobed vs single conical mass to irregular shaped band).

The present worm differs from the species *C. aurangabadensis* (Jadhav and Shinde, 1976) from *Mastacembelus armatus* in having hooks 42 in number, testes are (95-105 vs 135-145) in number, ovary is bilobed with 3-4 acini, vitellaria are (follicular vs granular).

The present worm differs from the species *C. raoii* (Jadhav and Shinde, 1976) from *Mastacembelus armatus* in India. Which is having hooks (35-45 vs 46), broad in the middle and narrow at both ends, testes are (95-105 vs 210-215) in number. Vitellaria are (follicular vs granular).

The present parasite differs from *C. gachuai* (Jadhav and Shinde, 1976) from *Mastacembelus armatus* which is having scolex is (triangular, dome shape vs pear shaped), hooks (35-45 vs 46) in number, mature segments are squarish, testes (95-105 vs 375-400) in number.

The present worm differs from the species *C. shindei* (Chincholkar and Shinde, 1976) from *Mastacembelus armatus* in India. Which is rostellar hooks (35-45 vs 49) in number, testes are (95-105 vs 260-275) in number, vitellaria (follicular vs granular).

The present parasite differs from the species *C. bagariusi* (Chincholkar and Shinde, 1976) from *Bagarius* sp. which is hooks (35-45 vs 55) in number, neck (present vs absent) testes are (95-105 vs 275-285) in number.

The present parasite are differ from species the *C. khami* (Shinde, 1976) in having scolex cylindrical, hooks (35-45 vs 48) in number, neck (present vs absent), testes (95-105 vs 190-200) in number, mature segments is Squarish, ovary bilobed, post-equatorial with short, blunt with 5-6 rows.

The present worm differ from species *C. yamaguti* (Jadhav *et al.*, 1990) from *Mastacembelus armatus* which is having hook (35-45 vs 56) in number, neck is (present vs absent), testes are (95-105 vs 130-150) in number, vitellaria are (follicular vs granular) The present worm differs from species *C. alii* (Shinde *et al.*, 1994) in having hook (35-45 vs 34) in number, testes are (95-105 vs 230-240) in number, vitellaria are (follicular vs granular).

The present worm differ from the species *C. baimaii* (Wongswad and Jadhav, 1998) in *Ophiocephalus punctatus* which is having scolex is (triangular vs pear shaped), hooks (35-45 vs 48) in number, testes (95-105 vs 88-100) in number, ovary (bilobed vs compact), vitellaria (follicular vs granular).

The present worm differ from the species *C. punctatusi* (Kalse and Shinde, 1999) from *Mastacembelus armatus* in having hooks 40-50 in number, mature segment is squarish, 6-7 times broader than long, testes (95-105 vs 140-150) in

number, vitellaria (follicular, two rows at the lateral side vs follicular, 3-6 rows at the lateral side).

The present worm differ from the species *C. armatusae* (Shinde *et al.*, 1999) from *Mastacembelus armatus* which is having hooks (35-45 vs 23) in number, mature segment is 3-4 times broader than long, testes (95-105 vs 90-100) in number, vitellaria (follicular, two rows at the lateral side vs follicular, 3-4 rows at the lateral side).

The present worm differs from the species *C. mastacembellusaei* (Shinde, *et al.*, 2002) from *Mastacembelus armatus* which is having scolex (triangular vs pear shaped), hook 38 in number, neck is

(present vs absent), testes are small, oval (95-105 vs 130-140) in number, ovary bilobed, compact.

The present parasites differ from the species *C. purnae* (Borde S.N. and Sushil J., 2008) from *Mastacembelus armatus* in having hooks (35-45 vs 52) in number, mature segments squarish and broader than long, testes (95-105 vs 230-235) in number, vitellaria follicular in 3-5 rows.

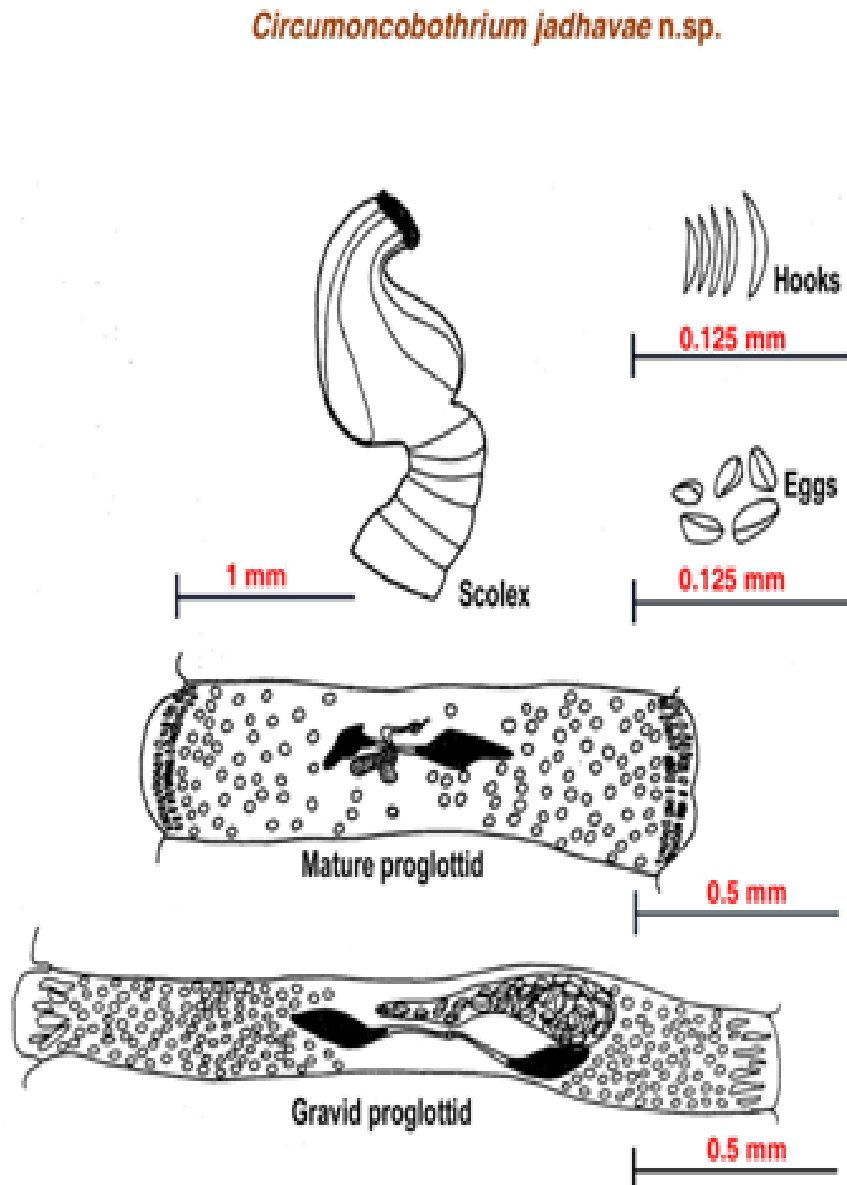
Type species: *Circumonchobothrium jadhavae* n.sp.

Host : *Mastacembelus armatus* (Lecepede, 1800)

Habitat: Intestine

Locality: Kham river of Aurangabad (M.S.) India.

Fig: Camera lucida drawing of *Circumonchobothrium jadhavae* n.sp. Scolex, mature and gravid proglottid



Comparative chart showing the account of different species of *Circumoncobothrium* Shinde, 1968

Species / Characters	<i>C. ophiocephali</i> Shinde, 1968	<i>C. aurangabadensis</i> Jadhav & Shinde, 1976	<i>C. gachuai</i> Jadhav & Shinde, 1976	<i>C. raoii</i> Shinde & Jadhav, 1976	<i>C. shindei</i> Shinde & Chincholikar, 1976	<i>C. bagariusi</i> Chincholikar & Shinde, 1976	<i>C. khami</i> Shinde, 1976
Scolex	Distinct length 0.81, breadth 0.51	Broad in the middle and narrow at both ends 1.68 x 0.81 in length & breadth respectively	Pear shaped length 0.752 mm length breadth 0.45	Broad in the middle and narrow at both ends, length 1.96 breadth 1.86	Narrow anteriorly, broad.	Narrow anteriorly broad posteriorly length 1.31 breadth 1.65	Cylindrical with even width apical disc, separated by notch, length 1.06, breadth 0.38
Hooks	80, rod shaped	42, rod shaped	46, large 0.034 x 0.008, smaller 0.017 x 0.005 mm in length & breadth	46 rod shaped	49, rod shaped	55, rod shaped large.	48, lancet shaped larger 0.065, smaller 0.007 in length
Neck	Present	Present	Present	Present	Present	Absent	Absent
Mature Segment	Broader than long, length 0.34 breadth 1.83	Broader than long length 0.92 breadth 2.11	Squarish, 1.40 length and 1.44 breadth.	Broader than long, length 0.35 breadth 0.35 - 0.50 Rounded arranged densely in two fields, 210-215 in number measuring 0.127-0.140 in diameter	Broader than long length 0.37-0.40	Broader than long length 0.28-0.34 & Breadth 2.12	Squarish, length 1.04 and breadth 1.14
Testes	In two lateral fields 70-80 0.20-0.30 in diameter & round in shape	Scattered throughout the segment 135-145 in number 0.03-0.07 in diameter round in shape	Densely in two field 375 - 400 in number 0.03 - 0.04 in diameter		Evenly distributed 260-275 (273) 0.02-0.03 in diameter	In two lateral fields 275-285 (276) 0.06-0.07 in diameter	Evenly distributed 190-200 (199) 0.04-0.05 in diameter
Ovary	Single conical mass to irregular shaped band thinner in the middle and expanded at lateral and lobes with 2-3 well developed acini, situated near posterior border length 0.36 - 0.40	Bilobed, each 10 be with 3-4 acini, situated near the posterior margin of the segment	Bilobed post - equatorial with short, blunt 5-6 acini 0.31 - 0.10 in length.	Bilobed, situated almost near the posterior margin of the segments. Length 0.07 - 0.98 mm.	Bilobed, dumbbell shaped with long isthmus lobes rounded and compact situated in the centre of the segment length	Bilobed in middle one third of segment each lobe with 5-6 globular acini length 0.07	Bilobed, each lobe compact, situated near posterior and centre of the segment, length 0.31
Vitellaria	Follicular	Granular	Follicular cortical in position 1-2 rows on each side.	Granular	Granular	Follicular	Follicular

Species / Characters	<i>C. yamaguti</i> Jadhav <i>et al.</i> , 1990.	<i>C. alii</i> Shinde <i>et al.</i> , 1994	<i>C. vadgaonensis</i> Patil, 1998	<i>C. balmali</i> Wangswad & Jadhav, 1998	<i>C. punctatusi</i> Kalse and Shinde <i>et al.</i> , 1999	<i>C. armatusae</i> Shinde <i>et al.</i> , 1999.	<i>C. Mastacembelellusaei</i> Shinde <i>et al.</i> , 2002
Scolex	District, narrow anteriorly broad, posteriorly	Triangular	Triangular	Pear shaped	Medium, rectangular	Large, triangular	Pear shaped
Hooks	56, single circle, straight	34, single circle	56, large and small in single circle	46-48 single circle	40-50 single circle	23, slightly curved	38 in number
Neck	Absent	Present	Present	Present	Present	Present	Absent
Mature Segment	Broader than long.	Broader than long .	Slightly broader than long	Broader than long.	Squarish, 6-7 times Broader than long	3-4 times broader than long	Broader than long
Testes	130-150 in number rounded in two lateral side.	230-240 in number Evenly distributed	490-510	88-100 Present in two field	140-150	Small, oval, 90-100 in number.	Oval, 130-140 in number
Ovary	Bilobed.	Distinctly bilobed Centrally placed, compact lobes oval.	Bilobed, compact	Compact.	Medium, short, blunt, rounded acini.	Oval, large compact.	Bilobed, compact
Vitellaria	Granular corticular along the lateral margin	Granular in lateral fields Of segment	FOLLICULAR, OVAL, TWO ROWS.	GRANULAR, LATERAL FIELD	FOLLICULAR, ROUNDED, 3-6 ROWS.	FOLLICULAR, SMALL, ROUNDED, IN THREE TO TWO ROWS.	----

Species/ Character	<i>C. armatusae</i> (Minor) Pawar <i>et al.</i> , 2002	<i>C. manjari</i> Tat & Jadhav, 2004	<i>C. vitellariensis</i> Supugade <i>et al.</i> , 2005.	<i>C. purnae</i> Borde S.N. and Sushil J., 2008	<i>Circumoncobothrium Jadhavae</i> n.sp.
Scolex	Triangular	Triangular, broad	Triangular, narrow, anteriorly, broad posteriorly 1.224 to 1.272 x 0.345 to 1.093	Triangular	Triangular, dome shaped.
Hooks	58, small and large straight in single circle.	48 circular shorter	46-48 single circle longer 0.064 x 0.007 shorter 0.043 x 0.005	52 in number	35-45 in number.
Neck	absent	Present	Absent	----	Present
Mature Segment	Broader than long	Broader than long	3-4 times broader than long, 1.806 to 1.841 x 0.509 to 0.582	Squarish, slightly broader than long	Broader than long
Testes	190-200 in number, unevenly distributed in two groups.	128-145	250-260 unevenly distributed, 0.019 to 0.024 x 0.024 to 0.029	230-235 in number	95-105 in number, oval.
Ovary	Distinctly bilobed.	Bilobed	Distinctly bilobed dumbbell shaped 0.150 to 0.189 x 0.238 - 0.272	Bilobed,	Bilobed with lobulated isthmus.
Vitellaria	Follicular two rows at lateral side.	Follicular two rows	Follicular, oval in 2 rows 0.015 x 0.004 - 0.015	Follicular in 3-4 rows	Follicular two rows at lateral side.

Acknowledgement

Authors are thankful to the Head, Department of Zoology, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (M.S.) for providing the necessary laboratory facilities in the research work.

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