PART-I

CESTODES TAXONOMY

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Cotyloda	Wardle, McLeod and Radinovsky, 1974
Pseudophyllidea	Carus, 1863
Ptychobothriidae	Luhe, 1902
Circumoncobothrium	Shinde, G.B. 1968

***Circumoncobothrium jadhavi* n.sp.**

GENERIC DIAGNOSIS

Scolex with a crown of hooks arranged in continuous circle, apex elevated a pair of well-developed bothria, testes medullary lateral to ovary, Cirro vaginal aperture. Ventro lateral to ovary transverly elongated in median posterior medulla, vitellaria in 4 cortical fields, uterus sac like and oblique, eggs thin shelled not operculated.

INTRODUCTION

The genus *Circumoncobothrium* is erected by Shinde, G.B., 1968 for accommodating *C. ophiocephali* as a type species, from the intestine of a fresh water fish. *Ophiocephalus leucopuntatus.* Chincholikar, 1977 described two new species of this genus as *C. shindei*, from *Mastacembelus armatus* and *C. bagarius* from a fresh water fish, *Bagarius* Sp. Shinde, 1977 described *C. khami* from *Ophiocephalus striatus*.

Jadhav and Shinde, 1976 added two new species, under this genus, viz. *C. aurangabadensis* and *C. raoii* from *Mastacembelus armatus*. Jadhav *et al*., 1990 described *C. yamagutti* from *Mastacembelus armatus*. Shinde *et al*., 1994 added *C. alii* from *Mastacembelus armatus.* Then Jadhav and Shinde, 1976 described *C. gachuai* from *Ophiocephalus gachua* Patil *et al*., 1998 contributed *C. vadagaonensis* under this genus from *Mastacembelus armatus.* Later on Wongsawad and Jadhav 1998 added *C. baimaii* from *Mastacembelus*

armatus India. In 1999 Kalse and Shinde *et al*., described. *punctatusi* from *Ophiocephalus punctatus* in India. Later on Shinde *et al*., in 1999 and 2002, added *C. armatusae* and *C. Mastacembelusae* irespectively from *Mastacembelus armatus* in India. Pawar *et al*., 2002 descrbed *C. armatusae* (minor) from *Mastacembelus armatus* in India.In 2004 Tat and Jadhav, added *C. manjari* from *Ophiocephalus gachua* in India. Supugude *et al*., 2005 described *C. vitellariensis* from Mastacembelus *armatus* in India. Recently Jawalikar *et al.,* 2009 described *C. yogeshwari*, from *Mastacembelus armatus* and Kalse *et al*., 2009 described *C.naidui* from *Mastacembelus armatus*.

DESCRIPTION

Three hundred thirty five specimens of the cestode parasites were collected from the intestine of a freshwater fish, *Mastacembelus armatus* (Lacepede 1800) from Dist. Ahmednagar (M.S.) India during July 2007 to June 2010.

Out of these four specimens were processed for taxonomical studies. The worms were considerably long, thin, and white in colour, with scolex, numerous immature and mature segments. The cestodes were flattened, preserved in 4% formalin, 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. All measurements were given in millimeters

The scolex is large in size, triangular in shape, distinctly marked off from the strobila, narrow anteriorly, broad posterior and measures 2.028

(1.795-2.262) in length and 0.975(0.973-0.977) 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 1.715(1.564-1.866) in length and 0.221(0.159-0.284) in breadth.

The scolex bears the rostellum its anterior end, which is medium in size, oval shape, transversely elongated, having constriction at the middle and measures 0.130(0.128-0.133) in length and 0.286(0.284-0.288) in width. The rostellar hooks are 63 (60-65) in number, which are long, stout, rod shaped pointed at both ends, longer hooks present in the centre of the quadrant and later on decreases in length on both the sides. The hook measures 0.041(0.028-0.055) in length and 0.007(0.004-0.010) in width.

The neck is absent.

The mature proglottids are broader than long, nearly three to four times broader than long with straight, irregular, slightly concave or convex lateral margins and measure 0.428(0.360-0.497) in length and 1.599(1.577-1.622) in breadth.

The testes are small in size, oval in shape, 176(170 -180) in number, arranged in a single field or either lateral sides of ovary and covers almost entire segments. In left lateral side (97) and right lateral side (79) testes

present. Measure 0.0310(0.022-0.039) in length and 0.022(0.013-0.032) in width.

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 0.102(0.097-0.106) in length and 0.035(0.026-0.044) in breadth. The cirrus is thin, coild, obliquely placed, contained within the cirrus pouch and measures 0.115(0.111-0.119) in length and 0.011(0.008-0.013) in width.The vas deferens is short, thin, extends obliquely and measures 0.088(0.084-0.093) in length and 0.006(0.004-0.008) in breadth.

The ovary is medium in size, distinctly bilobed roughly dumb-bell shaped in appearance, transversely placed, near the posterior margin of the segments and measure 0.199 (0.195-0.204) in length and 0.124 (0.119-0.128) in breadth. The isthmus is connecting the two ovarian lobes, slightly curved, uneven in width, transversely placed, near and posterior margin consisting 4-6 acini and measure 0.219(0.213-0.226) in length and 0.037(0.035-0.039) in breadth. The vagina is thin, short, arises from the genital pore, slightly curved, runs posterior, reaches and opens into the ootype and measure 0.061(0.0577-0.066) in length 0.008(0.004-0.013) in width. The ootype is medium in size, oval in shape, near the posterior margin of the segment; either to the right or to the left of the middle line of the segments and measure 0.015(0.0133-0.017) in length and 0.033(0.031-0.035) in breadth.

The genital pore is small in size, oval in shape, preovarian, and measures 0.015(0.013-0.017) in length and 0.011(0.008-0.013).

Longitudinal excretory canals are not distinct.

The vitellaria are granular, small in size, round in shape, in 3-4 rows, on each lateral side, extending from the anterior to the posterior margin of segments.

Gravid segment are three times broader then longer measure 0.393(0.346-0.440) in length and 1.204(1.124-1.284) in breadth. With uterus which is sac like oval structure measuring 0.457(0.453-0.462) in length and 0.379(0.377-0.382) in breadth.

The eggs are oval to elongated, thin-shelled and non-operculated measuring 0.045 (0.043-0.048) in length and 0.027(0.0243-0.0297) in width.

DISCUSSION

The genus *Circumoncobothrium* is erected by (Shinde, G.B.1968) as a type species *C. ophiocephali* from *Ophiocephalus leucopunctatus*. After this following species are added to this genus.

1. *C. ophiocephali* Shinde, G.B.1968
2. *C. aurangabadnesis* Jadhav and Shinde, 1976.
3. *C. raoii* Shinde and Jadhav, 1976.
4. *C. shindei* Shinde and Chincholikar 1977.

5.	*C. bagariusi*	Chincholikar and Shinde, 1977.
6.	*C. khami*	Shinde and Jadhav, 1977.
7.	*C. gachaui*	Jadhav and Shinde, 1980.
8.	*C. yamaguti*	Jadhav, Gavahande and Sawarkar, 1990.
9.	*C. alii*	Shinde *et al*., 1994.
10.	*C. vadgaonensis*	Patil *et al*., 1998.
11.	*C. baimaii*	Wongswad and Jadhav 1998.
12.	*C. punctatusi*	Kalse and Shinde *et al*., 1999.
13.	*C. mastacembelusaei*	Shinde *et al*., 2002.
14.	*C. armatusae* (minor)	Pawar *et al*., 2002.
15.	*C. armatusi*	Pawar *et al*., 2003.
16.	*C. majari*	Tat and Jadhav, 2004.
17.	*C. vitellariensis*	Supugude *et al*., 2005.
18.	*C. yogeshwari*	Jawalikar *et al*., 2008.
19.	*C.naidui*	Kalse *et al*., 2009.

The worm under discussion is having the scolex large, triangular shaped, narrow anteriorly, broad posterior, having two bothria, rostellum medium, armed; the rostellar hooks 63(60-65) in number, arranged in a single circle, stout, slightly curved, mature proglottides medium in size, slightly concave or convex lateral margins, three to four times broader than long; testes 170-180 (176) in number, small to medium, oval, arrangedin a single field; ovary large, distinctly bilobed, dumb-bell shape, with 5-6 acini. situated

near the posterior margin of the segment, vitellaria follicular, small, round in 3-4 rows on each side.

1) The present cestode differ from *Circumoncobothrium ophiocephali* (Shine G.B.1968) which is having the scolex distinct, hooks 80 in number, rod shaped; testes 90-100 in number, on two lateral fields, round in shaped; ovary single, conical mass to irregular shaped band, thinner in the middle and expanded in lateral ends; lobes with 2-3 acini and vitellaria follicular, in 3-4 rows on each side.

2) The present worm differs from *C. aurangabadensis* (Jadhav and Shinde, 1976.) which is having the scolex broad in the middle, narrow at the ends; the rostellar hooks 42 in number, rod shaped; testes 130-140 in number, round in shape; ovary bilobed, each lobe 3-4 acini near the posterior margin of the segment and vitellaria granular near the lateral margin.

3) The present tapeworm differs from *C. raoii* (Shinde and Jadhav, 1976) This 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 segment and vitellaria granular at the lateral sides of the segments.

4) The present worm differs from *C. shindei* (Shinde and Chincholikar 1977)This is having the rostellar hooks 49 in number, rod shaped;

ovary dumb-bell shaped, lobes rounded, compact, in the centre of the segments and vitellaria granular, Testes 260-275 in numbers, vitellaria granular.

5) The worm under discussion differs from *C. bagariusi* (Chincholikar and Shinde, 1977) This is having the rostellar hooks 55 in number, rod shaped; testes 275-285 (276) in number, in two fields; 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.

6) The present worm differs from *C. khami* (Shinde and Jadhav, 1977) which is having the scolex cylindrical, with even width, apical disc separate by a notch, rostellar hooks 48 in number, lancet shaped, tastes 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 round, in a single layer, near the lateral margins.

7) The present tapeworm, differ from *C. gachuai* (Jadhav and Shinde, 1980) 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.

8) The worm under discussion differs from *C. yamaguti* (Jadhav, Gavahande and Sawarkar, 1990.) this is having the scolex distinct, rostellar hooks 56 in number, straight, stout, in a single circle testes

130-150 in number, round; ovary centrally placed near the posterior margin and vitellaria granular, corticular, along the lateral margin.

9) The present cestode differs from (*C. alii* Shinde et al., 1994.)Which is having the rostellar hooks 34 in number, testes rounded, 230-240 in number; ovary compact, centrally placed; lobes long, oval and vitellaria granular.

10) The present worm differs from *C. vadgaonensis* (Patil 1998) This is having scolex triangular, rostellar hooks 56 in number, testes 490-510 in number, evenly distributed; ovary distinctly bilobed, in posterior half of the segment; vitellaria follicular, in two rows on each side.

11) The present worm differ from *C. baimaii* (Wongswad and Jadhav 1998) which is having scolex pear shape, rostellar hooks 48 in number, testes 88-100 in number, ovary compact, vitellaria granular at the lateral side.

12) The worm under discussion differs from *C. punctatusi* (Kalse and Shinde et al., 1999) 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 numbers.

13) The worm under discussion differs from *C. mastacembelusaei* (Shinde et al., 2002) which is having scolex pear shaped; rostellar hooks 38 in number; neck is absent; testes are 130-140 in numbers, unevenly distributed in lateral field, ovary distinctly bilobed, compact, unequal lobes.

14) The present worm differs from *C. armatusae* (Minor) (Pawar et al., 2002) which is having scolex triangular, broad at the base tapering at apex; rostellar hooks 58 in numbers, small and large in single circle, 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 proglottids.

15) The present worm differs from *C. armatusi* (Pawar *et al.*, 2003) which is having scolex large and triangular; rostellar hooks 23 in number, slightly curve, stout, large hooks in center.

16) The present worm differs from *C. manjari* (Tat and Jadhav, 2004.) which is having scolex triangular in shape, broad at the base tapering at anterior; neck is present; testes 128-145 in numbers, rounded.Ovary bilobed, posterior to the middle of the proglottids. Vitellaria follicular, oval arranged in two rows on each lateral side.

17) The worm under discussion differs from *C. vitellariensis* (Jawalikar *et al*., 2008) which is having scolex triangular, broader at base, narrow at the apesx, rostellar hooks 48 in numbers, pointed at the apex; neck is absent. testes 250-260 in number, Oval pre-ovarian. ovary bilobed, transversely placed near posterior margin of the proglottids. Vitellaria follicular, rounded, 3-4 rows on each lateral side.

18) The present worm differs from *C. yogeshwari* which is having scolex large triangular in shape, long, broad at the base, tapering at apex, with

two bothridia; rostellum armed, rostellar hooks 53, arranged in single circle, neck very short, mature segment broader than long, testes 95-98, medium oval ovary bilobed, lobes compact, vitellaria follicular small, rounded from anterior to posterior margin of the segment. in two row on each side of segment.

19) The present worm differs from *C. naidui*, Kalse *et al*., 2009. which is having scolex cylindrical, rostellum oval, armed; rostellar hooks 40 in numbers arranged in four quadrants; bothria two; neck absent; mature segment broader than long; testes rounded, 200-210 in number, ovary medium, a single mass, with many rounded acini, vitellaria small, granular from anterior to posterior margin of segment; gravid segment broader than long.

Some additional and differentiating characters are given in the comparative chart at the end. These distinct characters are more than enough to erect a new species from this genus and hence the name *Circumoncobothrium jadhavi* n.sp. is proposed in honouof late prof. Baba Jadhav under whose guidance and inspiration, this work was carried out

TAXONOMIC SUMMARY

Genus	*Circumoncobothrium* Shinde, 1968.
Species	*Circumoncobothrium jadhavi* n.sp.
Type host	*Mastacembelus armatus* (Lacepede, 1800).
Habitat	Intestine.
Type locality	Ahmednagar dist.
Holotype and Paratype	Deposited in Helminthology Research Lab. Dept. of Zoology, Dr. B.A.M.U. Aurangabad.
Date of collection	July 2007 to June 2010.
Etymology	As the cestode species reported from Ahmednagar (M.S.) India.

COMPARATIVE CHART SHOWING AN ACCOUNT OF OLD AND NEW SPECIES OF THE GENUS *CIRCUMONCOBOTHRIUM*, SHINDE, 1968.

Species	*C. shindei*, Shinde & Chincholikar 1976.	*C. bagariusi*, Chincholikar & Shinde 1976.	*C. khami*, Shinde, 1977.
Scolex	Narrow anteriorly, broad posteriorly, length 1.56, breadth 1.21.	Narrow anteriorly broad posteriorly, length 1.31, breadth 1.65	Cylindrical with even width, apical disc separated by notchlength1.06 breadth 0.38.
Hooks	49, rod shaped	55, rod shaped larger	48, lancet shaped, two type large and small
Neck	Present	Absent	Absent
Mature proglottids	Broader than long	Broader than long	Squarish
Testes	Evenly distributed 260-275 (273) in numbers	In two lateral fields 275-285 (276) in numbers	190-200 in numbers, rounded
Ovary	Bilobed, dumb bell 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	Bilobed, each lobe compact situated in near the posterior and centre of the segment
Vitellaria	Granular	Follicular	Follicules, rounded in a single layer near the lateral margin
Host	*Mastacembelus armatus*	*Bagarius bagarius species*	*Ophiocephalus*
Country	India	India	India

COMPARATIVE CHART SHOWING AN ACCOUNT OF OLD AND NEW SPECIES OF THE GENUS *CIRCUMONCOBOTHRIUM*, SHINDE, 1968.

Species	***C. gachuai*, Jadhav & Shinde 1980**	***C. Yamaguti*, Jadhav *et al*., 1990**	***C. alii*, Shinde *et al*., 1994**
Scolex	Pear shaped, length 0.72 breadth 0.45	Distinct narrow anteriorly, broad posteriorly	Triangular, narrow anteriorly, broad posteriorly
Hooks	46, large 0.034x0.008, smaller 0.017x 0.005 in length and breadth.	56,single circle, straight stout	34, single circle, two types
Neck	present	Present	Present
Mature proglottids	Squarish,1.40 length and 1.44 breadth	Broader than long0.32x2.23	Broader than long1.53 breadth, and 0.32x0.34 length
Testes	Densely in two field, 375-400 in number, 0.03-0.04 in diameter.	130-150 in numbers, rounded in two lateral fields	230-240 in numbers, evenly distributed
Ovary	Bilobed, post equatorial with short, blunt 5-6 acini 0.31-0.10 in length	Bilobed, centrally placed near the posterior margin of the segment	Distinctly bilobed, centrally placed lobes, oval and compact
Vitellaria	Follicular, corticular in position, 1-2 rows on each side.	Granular, corticular, along lateral margin	Granular, at lateral margin of the proglottids
Host	*Ophiocephalus gachua*	*Mastacembelus armatus*	*Mastacembelus armatus*
Country	India	India	India

COMPARATIVE CHART SHOWING AN ACCOUNT OF OLD AND NEW SPECIES OF THE GENUS *CIRCUMONCOBOTHRIUM*, SHINDE, 1968.

Species	***C.vadgaonensis*, Patil, Shinde *et al*., 1998**	***C. baimaii*, Wongsawad and Jadhav 1998**	***C. punctatusi*, Kalse& Shinde, *et al*., 1999**
Scolex	Triangular, narrow anteriorly broad posteriorly.	Pear shaped	Medium, rectangular
Hooks	56, arranged in four quadrants	48, hooks some are short, some are long	40-50 (48) , arranged in single circle, stout, tapering at both ends
Neck	Present	Present	Present
Mature proglottids	Slightly broader than long	Broader than long	Squarish, 6-7 times, broader than long
Testes	490-510 in numbers, evenly distributed	88-100 in number	140-150 in numbers
Ovary	Distinctly bilobed, lobes compact, situated at posterior half of the proglottid	Compact	Medium, short blunt, round acini
Vitellaria	Follicular, oval in two rows	Granular at lateral sides	Granular at lateral sides.
Host	*Mastacembelus armatus*	*Mastacembelus armatus*	*Ophiocephalus punctatus*
Country	India	India	India

COMPARATIVE CHART SHOWING AN ACCOUNT OF OLD AND NEW SPECIES OF THE GENUS *CIRCUMONCOBOTHRIUM*, SHINDE, 1968.

Species	***C. armatusi*,** **Shinde *et al*., 1999**	***C. mastacembelusaei*,** **Shinde *et al*., 2002**	***C. armatusae* (minor)** **Pawar *et al*., 2002**
Scolex	Large, triangular	Pear shaped	Triangular, broad at the base tapering at apex
Hooks	23, slightly curve, stout, larger hooks in centre	38, rod shaped	58, straight, small and large in single circle
Neck	Present	Absent	Absent
Mature proglottids	3-4 times broader than long	Broader than long	Broader than long
Testes	Small, oval, follicular, distributed in two lateral field, 90-100 in number	130-140 in numbers, unevenly distributed in lateral field	190-200 in number, unevenly distributed in two group
Ovary	Large, oval a single mask and compact	Distinctly bilobed, compact, unequal lobes	Distinctly bilobed, situated at posterior half of the segment, lobe unequal
Vitellaria	Follicular, small, round in 3-4 rows on each side	Small follicular, round arranged in2-3 row on each side.	Follicular, oval in 2-3 rows open each side.
Host	*Mastacembelus armatus*	*Mastacembelus armatus*	*Ophiocephalus punctatus*
Country	India	India	India

COMPARATIVE CHART SHOWING AN ACCOUNT OF OLD AND NEW SPECIES OF THE GENUS *CIRCUMONCOBOTHRIUM*, SHINDE, 1968.

Species	*C.manjari*, Tat and Jadhav,2004	*C. vitellariensis*, Supugade *et al.*, 2005	*C.yogeshwari*, Jawalikar *et al.*, 2009
Scolex	Triangular, broader at the base tapering at anteriority	Triangular, broader at the base, narrow at the apex	Large, triangular, broad at base, tapering at apex.
Hooks	48, small and large in single circle	48, round at the base, pointed at the apex, short and long	Hooks, 53, in single circle, straight
Neck	Present	Absent	Very short
Mature proglottids	Broader than long, convex lateral margin	3-4 times broader than long	Broader than long
Testes	128-145 in numbers, rounded	250-260 in numbers, oval pre-ovarian	95-98, medium, oval, in two groups, lateral to ovary
Ovary	Bilobed, just posterior to the middle of the proglottid	Distinctly bilobed, compact, unequal lobes	Ovary compact, oblong
Vitellaria	Follicular, small round in 3-4 rows on each side	Follicular, small rounded 3-4 row on each lateral side	Follicular, follicles small, rounded
Host	*Ophiocephalus gachua*	*Mastacembelus armatus*	*Mastacembelus armatus*
Country	India	India	India

COMPARATIVE CHART SHOWING AN ACCOUNT OF OLD AND NEW SPECIES OF THE GENUS *CIRCUMONCOBOTHRIUM*, SHINDE, 1968.

Species	***C. naidui*, Kalse *et al*., 2009**	***C. jadhavi* n.sp.**
Scolex	Medium, cylindrical, even width.	Triangular, broader at the base tapering at anteriority
Hooks	Straight or slightly curved, quadrant, 40 in numbers	63, straight, large and small in single circle
Neck	Neck absent	Neck absent
Mature proglottids	Broader than long, convex at lateral margin	3-4 times broader than long, slightly concave or convex at lateral margin
Testes	Medium, rounded, unevenly distributed, lateral to ovary, 200-210	170-180 (176), medium, oval, in two groups, lateral to ovary
Ovary	Oval, single mass, compact, transversely elongated, with acini	Bilobed, dumb bell shaped with long isthmus, post equatorial with short, blunt 5-6 acini
Vitellaria	Small, from anterior to posterior margin of the segment	Follicular, small rounded 3-4 rows on each side , from anterior to posterior margin of the segment
Host	*Mastacembelus armatus*	*Mastacembelus armatus*

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 proglottids squarish *C. khami* Shinde, 1971

   Mature proglottids broader than long 5

3. Scolex triangular *C. alii* Shinde *et al*., 1974

   Scolex pear shaped *C. baimaii* Wongsawad and Jadhav, 1998

   Scolex narrows anteriorly &

   Broad posteriorly *C. shindei* 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 30 in numbers 9

   Hooks in between 30-50 in number *C. vitellariensis* Supugude et *al*., 2005

   Hook above 50 in numbers 10

6. Testes below 200 in numbers *C.aurangabadensis* Jadhav *et al*., 1976.

   Testes above 200 in numbers *C.raoii* Jadhav & Shinde, 1976.

7. Scolex rectangular in shape *C. punctatusae* Jadhav *et al*., 1976.

Scolex pear shaped C. *gachuai* Jadhav *et al*., 1976.

8. Hooks 20-40 in numbers C. armatusae Shinde *et al*., 1999.

Hooks 40-50 in numbers C. manjari Tat *et al*., 2004

Hooks 50-60 in numbers C. vadgaonensis Patil, 1998

Hooks above 60 in numbers *C. ophiocephali* Shinde, 1968

Hooks above 63 in numbers ***C. jadhavi*. n.sp.**

9. Scolex pear shaped C.mastacembelusaei Shinde *et al*., 2002

Testes in between 100-150 in numbers *C. yamaguti* Jadhav et *al*., 1990

Testes in between 150-200 in numbers *C. armatusae* (minor) Pawar *et al*., 2002.

Testes above 200 in numbers *C. bagariusi* Chincholikar *et al*., 1976

Eucestoda	Wardle, McLeod and Radinovsky, 1974
Proteocephalidea	Mola, 1928
Proteocephalidae	La Rue, 1911
Proteocephalinae	Mola, 1929
Proteocephalus	Woodland, 1925

***Proteocephalus shrirampurensis* n.sp.**

GENERIC DIAGNOSIS

Scolex unarmed with four typical suckers. A fifth sucker or apical organ present or absent. Unsegmented neck region present. Gravid proglottides wider than long or longer than wide. Inner longitudinal muscle sheath present. Excretory stem slightly medial to outer edge of medulla. Testes in one continuous layer in inter vascular medulla dorsal to uterus. Cirrus pouch transverse, at varying levels Cirro vaginal atrium opening indifferently on right or left margin of proglottis. Ovary bilobed, extending transversely at posterior end of Proglottis. Vitellaria in lateral fields of medulla outside of excretory stems. Uterus extending in median field between ovary and anterior end of Proglottis, developing a number of lateral outgrowths, may occupy while available space of inter vascular medulla, eggs globular, embryonated, Vagina opening into genital atrium anterior, dorsal or posterior to cirrus.

INTRODUCTION

The genus proteocephalus is erected with it type species as *P. tignus* wood land (1925).According to Rego (2003) cestodes of the order Proteocephalidea (Mola, 1928) mainly in habit fresh water fishes but also Parasitise, through to a less degree, Amphibia and Reptilia. The genus, *proteocephalus* has shown to represent an artificial assemblage of unrelated taxa occurring in fish, amphibians, and reptiles (Zehnder and Mariaux, 1999).

Rama Devi (1972) recorded *proteocephalus hanumanthi* from the intestine of *Rana cynophylctis* which was a very large species having a total length of 20 cm which appears to be erronecus compared to the other body measurements. Ulmer and James (1976) examined 706 amphibians belonging to eight species and recorded 13.6% infection with cestodes.

Brooks (1978) conducted and exhaustive survey on the systematic status of proteocephalid cestodes from amphibian and reptialan hosts of North America and reported *proteocephalus loennbergii* from *Necturus maculossus* from America as a new locality record. Recently Pooja Chandra and Neelima Gupta (2007) added *Proteocephalus bufonis* from *Bufo Melanostictus* M.K.Kale and A.D. Lakhe (2007) redescribed *Proteocephalus tigrinus* from *Rama tigrina* having apical sucker, mature segment large, longer than broad.

DESCRIPTION

Six cestodes were collected from intestine of frog, *Rana tigrina* Linnaeus, 1758. (=*Hoplobatrachus tigrinus*, Daudin 1992) in September 2008 in Shrirampur dist Ahmednagar. They were flattened, preserved in 4% formalin stained with Harris haematoxylin, passed through various alcoholic grades, cleared in xylol, mounted in D.P.X. whole mount slides were prepared

for further anatomical studies and sketches were drawn with the help of camera Lucida and all measurements are in millimeter.

The worms were large, long with scolex, numerous immature, mature and gravid segments; scolex large, more or less globular slightly broader than long, broad at base, tapering At apex, With 4 typical suckers, and one apical sucker (organ) i.e. fifth sucker. Measuring 0.188 (0.182-0.195) in length and 0.272 (0.266-0.279) in breadth.

Suckers are medium, oval, arranged in a square, not overlapping on each other, measuring 0.119 (0.102-0.137) in length and 0.128 (0.106-0.150) in breadth.smaller 5^{th} apical sucker at the apex; 0.059 (0.057-0.062) in length and 0.092(0.088-0.097) in breadth.

Neck short, broad anteriorly, narrow posteriorly, measure 0.348(0.310-0.386) in length and 0.215(0.173-0.257) in breadth.

The mature segments large squarish,broader than long measuring 0.999 (0.986 -1.013) in length and 1.234(1.222-1.240) in breadth.

Testes 90-100 (92) in numbers medium oval, in single continuous field, distributed mainly pre ovarian from anterior margin up to ovary, excretory canals laterally measures 0.050(0.022-0.079) in length and 0.057(0.053-0.062) in breadth.

Cirrus pouch medium, long, cylindrical, at posterior margin of segment, measuring 0.268 (0.261-0.275) in length and 0.093(0.075-0.111) in breadth.

Cirrus thin, protruded, contained within the cirrus pouch. Measuring 0.223 (0.217-0.230) in length and 0.019 (0.017-0.022) in breadth.

Vas deferens thin, long, coiled, reaches up to middle of the segment, measuring 0.746 (0.742-0.751) in length and 0.015(0.013-0.017) in breadth. Genital pore medium, oval, and irregularly alternate at just posterior margin of the segment. And measures 0.115(0.111-0.119) in length and 0.026 (0.022-0.031) in breadth.

Ovary big distinctly bilobed, follicular, near the posterior margin of the segment. lobes with irregular margin, with long thick follicles, measuring 0.622 (0.613-0.631) in length and 0.312(0.306-0.319) in breadth.isthmus short, wide, thick connecting two ovarian lobes, measures 0.122 (0.111-0.133) in length and 0.144(0.133-0.155) in breadth.

Vagina anterior, starts from genital pore, wide proximally, narrow distally, runs parallel to cirrus pouch, turns posteriorly taking wide curve, opens into ootype, measures 0.701 (0.697-0.706) in length and 0.019(0.017-0.022) in breadth.

Ootype small, rounded, anterior, post ovarian, located in concavity of ovary, posterior to the isthmus, 0.028 in diameter.

Vitellaria granular corticular 2-3 rows, on each lateral side, anterior to posterior margin of segment. Exception cirrus pouch region genital pores, medium, oval, irregularly alternate at posterior of lateral margin.

Gravid proglottid longer than broad, the uterus becomes fully developed, consisting of wide central passage,slightly oval , from which arise 10-12, diverticula on each side are not deeply constricted and measures 1.870(1.831-1.910) in length and 1.545 (1.531- 1.559) The eggs are rounded or oval in shape and measures 0.017 (0.012-0.022) in diameter.

DISCUSSION

The genus *Proteocephalus* is erected with its type species as *P. tigrinus* (Woodland, 1925) following species of *Proteocephalus* are added to this genus.

1. *P. tigrinus*, Wood land, 1925.
2. *P. hanumanthii*, Rama Devi, 1972.
3. *P. niuginii*, Schmidt, 1975.
4. *P. bufonis* Pooja Chandra, 2007.

The present cestodes bear Scolex large, globular, (0.188x0.272) in size sucker's oval, medium, (0.119x0.128) in size overlapping, with 5^{th} apical sucker at the apex. neck short (0.348x0.215) in length.Mature segment broader than longer, (0.999x1.230) in size.testes oval about 90-100 (92) in numbers.Ovary bilobed, near the posterior region.Ootype small rounded pre ovarian, genital pores, just posterior, irregularly alternate.

1) The present cestodes differs from *P. tigrinus* (Wood land, 1925) Length of mature segment (30-40) cm. Scolex large globular, (0.146x0.233) in

size.5th apical sucker absent.Testes (70-110) in numbers.mature segment are (1.160-1.390) in size.

2) The present cestodes differ from *P. hanumanthii* (Rama Devi, 1972) having Length of mature segment (20) cm. medium scolex (1.400x0.256) in size. neck long (2.32x0.2) in size. apical sucker (organ) absent.Testes (104-114) in numbers. Mature segment are (0.760x1.480) in size.

3) The present cestodes differ from *P. niuginii*, (Schmidt, 1975.) having small scolex (315-325) um in size.Testes (135-165) in numbers. . Neck very long. Eggs are (60µm-65µm).

4) The present cestodes differ from *P. bufonis* (Pooja Chandra, 2007) having Length of mature segment (3-5) cm. small scolex (0.08x0.120) in size. apical sucker absent.Neck small (0.150) in size. Testes (100-110) in numbers. Mature segment are (0.260x0.200) in size.

Some additional and differentiating characters are given in the comparative chart at the end. These distinct characters are more than enough to erect a new species from this genus and hence the name is given as *Proteocephalus shrirampurensis*. n.sp. after the locality.

TAXONOMIC SUMMARY

Genus	*Proteocephalus*, Woodland, 1858.
Type species	*Proteocephalus shrirampurensis*. n.sp.
Host	*Rana tigrina* Linnaeus, 1758.
	(=*Hoplobatrachus tigrinus* Daudin, 1803).
Habitat	Intestine
Locality	Shrirampur, Dist. Ahmednagar
Date of collection	19th September 2008.
Type locality	Ahmednagar (M.S.) India
Holotype	Deposited in Helminthology Research Lab.
Paratype	Dept. of Zoology, Dr.B.A.M.U. A'bad
Period of collection	July 2007 to June 2010
Etymology	As the cestode species reported from
	Ahmednagar (M.S.)India

Comparative chart showing an account of old and new species of the genus *Proteocephalus*, Woodland, 1925

Name of the species	*P.tigrinus*, Wood land 1925	*P.hanumanthi*, Rama Devi, 1972	*P.niuginii*, Schmidt, 1975
Host	*Rana tigrina*	*Rana cyanophlyctis*	*Rana arfarki*
Locality	India	India	Niugini (New Guines)
Length of mature worm	30-40 cm	20 cm	____
Scolex (LxW)	0.146x0.233	0.256-0.288	315-325x380-385µm
Sucker (No.)	4(0.091)apical organ absent	4,apical organ absent	4(180-185µm) apical organ present
Neck(LxW)	_____	2.32x0.2	2 long
Mature proglottid(LxW)	0.71(broader than long)	0.76x1.48	_____
Cirrus sac (LxW)	0.201x0.051	0.25x0.082	140-165µmx80-85µm
Testes number	70-110	104-114	135-165
Testis (LxW)	0.033x0.024	0.06(diameter)	32.48µm wide
Ovary (LxW)	____	0.32x1.04	____
Gravid proglottid (LxW)	1.16x1.39	1.44-1.52x1.92-2.0	____
Egg diameter	11µm	0.02	60-65µmx40µm

Comparative chart showing an account of old and new species of the genus *Proteocephalus*, Woodland, 1925

Name of the species	***P.bufonis, Pooja Chandra 2007***	**P. *shrirampurensis*.** n.sp.
Host	*Bufo melanostictus*	*Rana tigrina* (*=Hoplobatrachus tigrinus* Daudin, 1803).
Locality	India	India
Length of mature worm	3-5 cm	15-20 cm
Scolex (LxW)	0.08-0.120	0.188-0.272
Sucker (No)	4(0.050x0.040) apical organ absent	4(0.119x0.128) apical organ present
Neck(LxW)	0.150	0.348-0.215
Mature proglottid(LxW)	0.260x0.200	0.999x1.230
Cirrus sac (LxW)	0.040x0.020	0.268-0.093
Testes number	100-110	90-100
Testis (LxW)	0.02 diameter	0.042x0.037
Ovary (LxW)	0.06x0.04	0.177-0.057
Gravid proglottid (LxW)	0.700x0.120	1.87 x 1.54
Egg diameter	0.030x0.020	0.017

Eucestoda	Wardle McLeod and Radinovsky, 1974
Cyclophyllidea	Ben. in. Braun.1900.
Anoplocephalidae	Cholodkovsky, 1902.
Oochoristica	Luhe, 1898.
Oochoristica fibrata	Meggitt, 1927

GENERIC DIAGNOSIS

Medium Size worms. Scolex not well marked off. Short neck may be present.Gravid proglottides commonly longer than wide.Dorsal and ventral excretory stems with anastomossing branches. Testes numerous, some times reduced. Cirrus pouch small. Genital atrium thick walled, pores irregularly alternating, at anterior half of lateral margin. Genital ducts passing between two excretory stem or dorsal to them. Ovary two winged, medium or slightly poral. Vitellaria median, post ovarian. Gravid uterus breaking down in to capsules each containing a single egg; capsules occupying whole medullary parenchyma, may intrude into cortex; middle embryonic shell thick, with or without processes.Vagina passing dorsal to nerve trunk and opening immediately behind cirrus.

INTRODUCTION

Luhe (1898) established the genus *Oochoristica*. Since then large number of species have been added to this genus from all world, mainly from reptiles and few others from mammals. Yamaguti (1959) listed 48 species, all from reptiles. From India as many as Ninteen species have been described and

are from reptiles also. Kennedy, Kivick and Buton (1982) described *O. javaensis* from Indonesia and grouped the specie of *Oochoristica* from Gekkonid lizard on the basis of number of testes 20-35 in one group and above 40 testes in another group. In 1927, Meggitt described *Oochoristica fibrara* from *Boigo cyancus*, *B. multimaculata*, *and Pityophis sayi* at Burma. Malhotra, S.K, Capoor V.N. 1984, added new reptilian cestode *Oochoristica pauriensis* from *Hemidactylus flaviviridis* from Garhwal Hills, U.P. India. Also Nama, H.S. 1977 added one species of *Oochoristica* from the house lizard *Hemidactylis flaviviridis*. So far *O. crassiceps*, *B. aylis*, 1919, *O. sigmoides*, Moghe, 1926, *O. thapari*, Johri, 1934, *O.indica* Misra, 1945 and *O.calotes* Nama and Khichi, 1974 have been described from Indian subcontinent.

DESCRIPTION

Two hundred ninety two worms were collected from the intestine of wall lizard, *Hemidactylus flaviviridis* (Ruppell, 1835) at Ahmednagar Dist. (M.S.) India during the period of July 2007 to June 2010.

Ten worms were taken for taxonomical studies. The worms were medium in size, with thick musculature, Scolex, immature, mature and gravid proglottides.

The Scolex is small in size, almost squarish in shape, distinctly marked off from the strobila, slightly long than broader without rostellum and measures 0.257(0.239-0.275) in length and 0.248(0.226- 0.270) in breadth.

The suckers are large in size, almost round in shape, four in number, arranged in two pairs, one pair in each half and measures 0.075(0.071 - 0.079) in length and 0.066 (0.057 - 0.075) in breadth.

The neck is long wide, cylindrical, without segment measures 1.043(0.999 - 1.088) in length and 0.230(0.226 - 0.235) in breadth.

The mature segments are squarish slightly broader than long, cylindrical in shape, with irregular, concave or convex lateral margins, without projections at the anterior and posterior corners of the segments and measure 0.911(0.883 -0.939) in length and 1.287(1.105 - 1.469) in breadth.

The testes are medium in size, oval in shape, evenly distributed.In the central medulla, in the posterior one third region of the segment. Post ovarian, posterior to the vitelline gland, 35-40 in numbers, in single field, bounded laterally by longitudinal excretory canals and measure0.068(0.066-0.071) in length and 0.055(0.048-0.062) in breadth.

The cirrus pouch is small in size, cylindrical in shape, runs parallel to the anterior margin of the segment, situated in the anterior one third of the segment. Marginal and measures 0.146(0.142 - 0.150) in length and 0.057(0.532- 0.062) in width. The cirrus is thin, coild, contained with in the cirrus pouch and measures 0.170(0.168 -0.173) in length and 0.011(0.008 - 0.013) in breadth. The vas deferens is short and thin measures 0.255(0.253-0.257) in length and 0.011(0.008-0.013) in breadth.

The ovary is large in size; butterfly shaped in appearance, distinctly bilobed, with irregular margin, centrally placed, ovarian lobes unequal in size, each lobe with 6to8 short blunt, rounded acini, situated just anterior to the middle of the segments and measures 0.546(0.533 - 0.560) in length and 0.382(0.342 - 0.422) in breadth. The poral lobe is small in size and measures 0.237(0.235 - 0.239) in length and 0.328(0.324-0.333) in breadth. Where as the aporal lobe is slightly large in size and measures 0.243 (0.239-0.248) in length and 0.415 (0.408-0.422) in breadth. The isthmus is short, wide and measures0.066 (0.062 - 0.071) in length and 0.066(0.053 - 0.079) in breadth.

The vagina is a thick, and runs transversely reaches middle and turns posteriorly, opens in to the ootype and measures 0.830(0.826 - 0.834) in length and 0.015(0.013 - 0.017) in breadth.

The Ootype is medium in size, with irregular margin, oval to rounded in shape, post ovarian, situated in the concavity of the ovarian lobes and measures 0.044(0.039 -0.048) in breadth.

The genital pore are small in size, oval in shape, at anterior margin, irregularly alternate and measures 0.051(0.048-0.053) in lengths and 0.011(0.008-0.013) in breadth.

The longitudinal excretory canals are wide and measures 0.932(0.870 - 0.094) in length and 0.044(0.039 - 0.048) in breadth.

The Vitelline gland is large in size; Heart or triangular in shape Extends slightly transverse, broad anteriorly and narrow posteriorly, post

ovarian, compact and measures 0.230(0.226 - 0.235) in length and 0.193(0.182 - 0.204) in breadth.

The gravid segment are large in size, cylindrical in shape, longer than broad, almost three times longer than broad, fully contained with eggs. Which are evenly distributed and measure3.248(3.188 - 3.33) in length and1.193 (1.032 - 1.354) in breadth.

The eggs are medium in size, oval in shape, numerous in number and measure 0.117(0.018 to 0.216) in length and 0.018(0.016 to 0.020) in breadth.

DISCUSSION

The genus *Oochoristica* was erected by Luhe, 1898 as a type species *O. tuberculata* in *Lacetra, Eumeces, Cerastes, Agama, Varanus* etc.

After going through the literature, the worm under discussion, turned out to be *Oochoristica fibrata* Meggitt, 1927.

The present cestode resembles *O. fibrata* Meggitt, 1927 in having the Scolex small, squarish; cirrus pouch elongated, cylindrical and the genital pores irregular alternate; but differs from it, in few characters, which are known as additional characters, as follows:

1) The present tape worm differs from *O. fibrata* Meggitt, 1927 in the number of testes (35-40 as against 35-56).
2) The present Cestode, differs from it, in the Structure of ovary (distinctly bilobed, butterfly shaped in appearance, with 6to 8 short, blunt, acini as against bilobed, with 7-8 acini).

3) The present worm, differ from same, in the position of the genital pore (at 1/3rd from the anterior margin as against at ¼ th from the anterior margin of the segment).

4) The mature segments are slightly broader than long Vs the mature segment longer than broad.

As the characters are minor, it is redescribed here as *Oochoristica fibrata* Meggitt, 1927 from *Boiga cyancus*, *B. multimaculata*, *Pityophis sayi* at Burma; where as the present worm being reported from *Hemidactylus flaviviridis*, (Ruppell, 1835) collected at Ahmednagar dist, (M.S).

TAXONOMIC SUMMARY

Genus	*Oochoristica* Luhe, 1898.
Species	*O. fibrata* Meggitt, 1927.
Type host	*Hemidactylus flaviviridis* (Ruppell, 1835)
Habit	Intestine.
Type locality	Ahmednagar dist, (M.S).
Holotype and Paratype	Deposited in Helminthology Research Lab. Dept. of Zoology, Dr. B.A.M.U. Aurangabad.
Date of collection	July 2007 to June 2010.
Etymology	As the cestode species reported from Ahmednagar (M.S.) India.

Eucestoda	Wardle, McLeod and Radinovsky, 1974
Cyclophyllidea	Ben, in Braun, 1900
Davaineidae	Fuhrmann, 1907
Davaineinae	Braun, 1900
Cotugnia	Diamare, 1893

***Cotugnia kamalae* n.sp.**

GENERIC DIAGNOSIS

With double set of genitalia.Proglottides very short, linear except the last ones. Inner longitudinal muscle in several layers, alternating with transverse muscles.Testes in inter-vascular field, continues or interrupted medianly, may or may not over reach the excretory stems laterally. Genital ducts dorsal to excretory stem and nerve trunk. Cirrus pouch Sub cylindrical. Genital pores bilateral.Female glands just medial to excretory stems. eggs in parenchymatous capsules one per capsule.

INTRODUCTION

The genus *Cotugnia* was erected by Diamare in 1893, with type species *C. diagonopora* (Pasquale, 1890) collected from the domestic fowl. In 1971 Malviya, H.C and Dutta studed morphology and life history *of Cotugnia srivastavi* from the domestic Pigeon, Mahajan (1999) was added *C. mehdi* from *Gallus domesticus* in Aurangabad, In 1963, Quentin was added *Cotugnia daynensis.* Shinde G.B.1969 added two new species of *Cotugnia* from the *Columbiformes* birds in Maharashtra.In 1961 Siddiqui studed the morphology

of *Cotugnia digonopora*. In 1999 Shinde G.B. added *C. manishae* from *Columbia livia* at Amravati and *C.ganguae* from *Carvus* splendens so far 26 species of *Cotugnia* was reported.

DESCRIPTION

Six hundred Sixteen cestodes were collected from the intestine of domestic fowl, *Gallus gallus domesticus* (Linnaeus, 1758) at Ahmednagar M.S. India during July 2007 to June 2010.

Out of these seven cestodes were stained with Harris haematoxylin, passed through various alcoholic grades, cleared in xylene, mounted in D.P.X. and drawings were made with the aid of camera lucida. All measurements were given in millimeters.

The worms are medium in size, 200 mm in length, creamy white in colour, containing scolex, immature, mature and gravid proglottids.

The Scolex is approximately quadrangular measuring 0.768 (0.763-0.772) in length and 1.212 (1.207-1.216) in breadth. Rostellum is small in size; oval in shape, measures 0.093 (0.084-0.102) in length and 0.099 (0.093-0.106) in width. The four suckers are of medium size, rounded in shape, placed at four corners, measuring 0.197 in diameter. Neck is absent.

The mature segments are broader than long 4 times broader than long, craspedote with slightly concave or convex lateral margin, measuring 0.606 (0.492-0.719) in length and 2.382 (2.362-2.402) in breadth.

Tests are medium in size, oval to elongated in shape in shape, scattered in the posterior half of the segment , unevenly distributed, bounded laterally by the longitudinal excretory canals, 110-120 in numbers and measures 0.153 (0.131-0.175) in length and 0.078 (0.061-0.096) in breadth.

Cirrus pouch is small, cylindrical, which is extends up to the longitudinal excretory canal, slightly curved, and extends towards posterior margin of the segment, measuring 0.095 (0.088-0.102) in length and 0.032(0.028-0.035) in breadth. Cirrus is short thin straight blunt at genital pore. Contained with in the cirrus pouch and measures 0.102 (0.097-0.106) in length and 0.015 (0.013-0.017) in breadth.

The vas deferens is thin, long tube, coiled posteriorly directed and 0.626 (0.612-0.639) in length and 0.015 (0.008-0.022) in width.The vagina short narrow tube, posterior to cirrus pouch. Measures 0.725 (0.714-0.737) in length and 0.019 (0.013-0.026) in width.and forms seminal receptacle which is curved, broad and measures 0.144(0.131-0.0157) in length and 0.048 (0.035-0.061) in breadth.

The Ootype is small in size, round in shape, posterior to the ovary measures 0.144 in diameter. Ovaries medium in size, bilobed not compact at posterior to the segment, laterally placed, with 9-11 acini, poral lobe is smaller than aporal lobe.measuring 0.517 (0.482-0.552) in length and 0.302 (0.280-0.324) in breadth.

The genital pores are medium in size, rounded in shape at anterior margin of the segment and measuring 0.134 (0.133-0.135) in diameter.

Vitelline glands are large, elongated and slightly triangular with 4-6 small acini.rounded in shape, posterior to ovary, measuring 0.241 (0.219-0.263) in length and 0.091 (0.078-0.105) in width.

The excretory canals are thin, runs along the lateral side of the segment and measures 0.943(0.927-0.959) in length and 0.066 (0.062-0.071) in width.

DISCUSSION

The genus *Cotugnia* was erected by Diamare in 1893, with its type species *C. digonopora* from *Gallus gallus dometicus*. So far 26 species of *Cotugnia* was added to this genus.

1) *Cotugnia digonopora,* Diamare, 1893.

2) *C. polyacantha,* Fuhrmann, 1909.

3) *C. cuneata tenuis,* Meggitt, 1924.

4*) C.parva,* Baer, 1925.

5) *C.jyoeuxi,* Baer, 1925.

6*) C.fleari,* Meggitt, 1927.

7*) C.bhali,* Johri, 1934.

8*) C.intermedia,* Johri, 1934.

9*) C. noctua,* Johri, 1934.

10) *C. taiwanensis,* Yamaguti, 1935.

11) *C.magna,* Burt, 1940.

12) *C. columbae*, Shinde, 1969.

13) *C. aurangabadesis*, Shinde, 1969.

14) *C. shrivastavi*, Malviya and Dutta, 1970.

15) *C. magdoubii*, Megzoubi and Kasim, 1980.

16) *C. satpulensis*, Shinde *et al*.,1983.

17*) C. yamaguti*, Shinde *et al*., 1985.

18) *C. kamatiensis*, Kharade and Shinde, 1995.

19) *C. chaingmaii*, Wongsawad & Jadhav, 1998.

20) *C. manishae*, Shinde *et al*., 999.

21) *C. ganguae*, Shinde *et al*., 1999.

22) *C. mehdii*, Mahajan *et al*., 1999.

23) *C. alii*, Shinde, Pawar and Garad, 2002.

24) *C. sillodensis*, Jadhav *et al*., 2003.

25) *C. singhi*, Pawar, Shinde and Garad, 2004.

26) *C. lohanesis*, Jadhav *et al*., 2004.

The present form having scolex large, quadrangular medium. rostellum, rectangular, four cup shaped suckers, rounded, arranged at four cor ners, absence of neck, mature segment four times broader than long.testes 110-120 in numbers, small oval to rounded scattered in the posterior half of the segment. Cirrus pouch long cylindrical, cirrus short, thin, straight.vas deferens thin short curved, genital pores marginal at anterior end of segment Ootype small rounded and vitelline gland small, rounded, post ovarian.

1) The present cestode differs from *Cotugnia digonopora*, Diamare, 1893.in the size of the scolex (0.768x1.212 as against 1.560) size of rostellum (0.093x0.099as against 0.150) testes (110-120 as against 100-150 in numbers) in length of cirrus sac (0.095x0.031 as against 0.300)

2) The present cestode differs from *C. polyacantha*, Fuhrmann, 1909. in the size of the scolex (0.768x1.212 as against 0.450) size of rostellum (0.093x0.099as against 0.220absence of hooks as against presence of hooks and testes 110-120 in number as against 100.

3) The present cestode differs from *C. cuneata tenuis*, Meggitt, 1924.in the size of the scolex (0.768x1.212 as against 0.260) size of rostellum (0.093x0.099 as against0.12) and testes 110-120 in number as against 30-50 in numbers.

4) The present cestode differs from *C. parva*, Baer, 1925.in the size of the scolex (0.760x1.212 as against 0.490-0.680x0.68-0.85) size of rostellum (0.093x0.099as against 0.150) and testes (110-120 in number as against 32-41 in numbers).

5) The present cestode differs from *C. jyoeuxi*, Baer, 1925.in the size of the scolex (0.768x1.212 as against 0.670) size of rostellum (0.093x0.099as against 0.190) and testes (110-120 in number as against 30-50 in numbers).

6) The present cestode differs from *C. fleari*, Meggitt, 1927.in the size of the scolex (0.768x1.212 as against 0.450x0.580) and testes (110-130 in number as against 28-44 in numbers).

7) The present cestode differs from *C.bhali,* Johri, 1934.In having the size of the scolex (0.768x1.212 as against 0.500), size of rostellum (0.093x0.099as against 0.340) and testes (110-130 in number as against 69-74 in numbers).

8) The present cestode differs from *C.intermedia*, Johri, 1934. In having the size of the scolex (0.786x1.212 as against 0.440-0.520) and testes (110-130as against 69-74 in numbers) the length of cirrus sac (0.095x0.031 as against 0.215x0.225)

9) The present cestode differs from *C. noctua*, Johri, 1934.in the size of the scolex (0.768x1.212 as against 0.510) size of rostellum (0.093x0.099 as against 0.225) and testes (110-120 in number as against170-182in numbers) in length of cirrus sac (0.095x0.031 as against 0.176x0.200)

10) The present cestode differs from *C. taiwanensis*, Yamaguti, 1935.in the size of the scolex (0.768x1.212 as against 0.510-0.740), size of rostellum (0.093x0.099 as against 0.440) and testes (110-120as against12-13 in numbers).

11) The present cestode differs from *C.magna*, Burt, 1940.In having the size of the scolex (0.768x1.212 as against 0.580-0.620), size of

rostellum (0.093x0.099 as against 0.285-0.315) and testes (110-120 in number as against150 in numbers).

12) The present cestode differs from *C. columbae*, Shinde, 1969. In having the shape and size of the scolex (quadrangular 0.768x1.212 as against wide,0.540-0.740), size of rostellum (0.093x0.099as against 0.447) and testes (110-120 in number as against12-14 in numbers).

13) The present cestode differs *C. aurangabadesis,* Shinde, 1969.In having the shape and size of the scolex (quadrangular 0.78x1.212 as against broad quadrangular, 0.483) shape and size of rostellum (rectangular 0.093x0.099 as against flat 0.300) and testes (110-120 in number as against 80-90 in numbers).

14) The present cestode differs *C. shrivastavi*, Malviya and Dutta, 1970.In having the size of the scolex (0.768x1.212 as against 0.726), size of rostellum (0.093x0.099as against 0.446) and testes (110-130 in number as against80-85 in numbers).

15) The present cestode differs *C. magdoubii*, Megzoubi and Kasim, 1980.In having the size of the scolex (0.768x1.212 as against 0.44-0.55), size of rostellum (0.093x0.099as against 0.250-0.440) length of cirrus pouch (0.15-0.18)

16) The present cestode differs from *C. satpulensis*, Shinde *et al*., in having the size of the scolex (0.768x1.212 as against 0.535), size of rostellum

(0.093x0.099 as against 0.230) Absence of hooks as against present of hooks. testes (110-120 in number as against 43-52 in numbers).

17) The present cestode differs from *C. yamaguti*, Shinde *et al*., 1985.In having the size of the scolex (0.768x1.212 as against 0.510-0.600), size of rostellum (0.093x0.099 as against 0.260-0.270), testes (110-130 in number as against 190-200 in numbers).

18) The present cestode differs from *C. kamatiensis,* Kharade and Shinde, 1995 in having the size of the scolex (0.768x1.212 as against 0.848-1.00x0.917-1.099), size of rostellum (0.093x0.099 as against 0.068x0.152), testes (110-130 in number as against 95-105 in numbers).

19) The present tapeworm differs from *C .chaingmaii,* Wongsawad and Jadhav, 1998 in having the size of the scolex (0.768x1.212 as against 0.580-0.738), shape and size of rostellum (rectangular, 0.093x0.099as against spinose 0.194x0.249), testes (110-130 in number as against 30-35 in numbers).ovary bilobed, (0.11x0.31).

20) The present tapeworm differs from *C. manishae,* Shinde *et al*., 1999, in having the size of the scolex (0.768x1.212 as against 0.462x0.485), size of rostellum (0.093x 0.099 as against spinose 0.223x0.227), testes (110-120 in number as against 85-90 (90) in numbers).

21) The present tapeworm differs from *C. ganguae,* Shinde *et al*., 1999, In having the shape and size of the rostellum (rectangular 0.768 x 1.212 as

against oval 0.529 x0.636), testes (110-120 in number as against 155-160 in numbers).

22) The present tapeworm differs from *C. mehdii,* Mahajan *et al*., 1999, In having the size of the scolex (0.768x1.212 as against 0.985-1.516), size of rostellum (0.093x 0.099 as against spinose 0.129x0.182), testes (110-120 in number as against 140-150 in numbers).

23) The present tapeworm differs from) *C. alii,* Shinde *et al*., 2002, in having the size of the scolex (0.768x1.212 as against 0.450-0.456x0.636-0.657), testes (110-120 in number as against 80-85 in numbers).

24) The present tapeworm differs *C. sillodensis,* Jadhav *et al*., 2003. in having the size of scolex (0.768x1.212as against 0.851-1.192x1.192-1.395) size of the rostellum (rectangular 0.0.093x0.0999 as against oval 0.170x0.281).testes (110-120 in number as against 165-175 in numbers).

25) The present tapeworm differs from *C. singhi,* Pawar *et al*., 2004 in having the size of the scolex (0.768x1.212 as against 0.363x0.436), size of rostellum (0.093x0.099 as against 0.154x0.255), testes (110-130 in number as against 65-70 in numbers).

26) The present tapeworm differs *C. lohanesis,* Jadhav *et al*., 2004.in having the size of scolex (0.768x 1.212 as against 0.590-0.660x0.741-

0.757) shape of the rostellum (rectangular as against oval) testes (110-120 in number as against 28-30 in numbers).

The above noted characters of these worms are valid enough to erect a new species hence the name of the new species is proposed as *Cotugnia kamalae* n.sp.is proposed in honour of mother of the author, for the inspiration and to the complitation of this work.

TAXONOMIC SUMMARY

Genus	*Cotugnia* Diamare, 1893
Species	*C. kamalae* n.sp.
Type host	*Gallus gallus domesticus* (Linnaeus, 1758)
Habitat	Intestine
Type locality	Ahmednagar dist. (M.S.) India
Holotype	Deposited in Helminthology Research Lab.
Paratype	Dept. of Zoology, Dr. B.A.M.U. Aurangabad
Period	July 2007 to June 2010
Etymology	As the cestode species reported from Ahmednagar (M.S.) India.

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893

Species	***C.diagnopora*, Pasqual,1890, Diamare, 1893**	***C.polyacantha*, Fuhrmann, 1909**	***C. cuneata*, Meggitt, 1924**
Country	Africa, Burma, India	Europe, Africa, Egypt	Burma, Egypt, India
Host	*Gallus gallus domesticus*	*Columba turtur*	*Columba livia*
Diameter of Scolex	1.56	0.450	Rounded (0.26)
Diameter of rostellum	0.150	0.220	Rounded (0.12)
No. of hooks	Very numerous	420	400
Number of testes	100-150 in number	About 100 in numbers	30-50 in numbers
Length of Cirrus pouch	0.300	0.180	Not mentioned
Genital pores	Not mentioned	Not mentioned	Not mentioned
Ovary	Not mentioned	Not mentioned	Not mentioned
Vagina	Not mentioned	Not mentioned	Not mentioned
Vitelline gland	Not mentioned	Not mentioned	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. parva*, Baer, 1925**	***C. joyeuxi*, Baer, 1925**	***C. fleari*, Meggitt, 1927**
Country	Burma, India	French, Guinea	Egypt, India
Host	*Columba livia*	*Turtur sengalensis*	*Columba livia*
Diameter of Scolex	0.49-0.68 x 0.69-0.85	0.67	0.45 x 0.58
Diameter of rostellum	0.15	0.19	Not mentioned
No. of hooks	378-396	250	Not mentioned
Number of testes	32-41	30-50 in number	28-44
Length of Cirrus pouch	0.96-0.106	0.075	0.29-0.31
Genital pores	Not mentioned	Not mentioned	Not mentioned
Ovary	Not mentioned	Not mentioned	Not mentioned
Vagina	Not mentioned	Not mentioned	Not mentioned
Vitelline gland	Not mentioned	Not mentioned	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. bhali*, Johri, 1934**	***C. intermedia*, Johri, 1934**	***C. noctua*, Johri, 1934**
Country	India	India	India
Host	*Gallus gallus domesticus*	*Gallus intermedia*	*Columba intermedia*
Diameter of Scolex	0.50	0.44-0.525	0.510
Diameter of rostellum	0.34	Not mentioned	0.225
No. of hooks	332	Not mentioned	Not mentioned
Number of testes	69-74	69-74	170-182
Length of Cirrus pouch	0.215-0.223	0.215-0.225	0.176-0.200
Genital pores	Not mentioned	Not mentioned	Not mentioned
Ovary	Not mentioned	Not mentioned	Not mentioned
Vagina	Not mentioned	Not mentioned	Not mentioned
Vitelline gland	Not mentioned	Not mentioned	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. taiwanensis*, Yamaguti, 1935**	***C. magna*, Burt, 1940**	***C. columbae*, Shinde, 1969**
Country	Indochina, India	Ceylon	India
Host	*Columba livia*	*Columba livia*	*Columba livia*
Diameter of Scolex	0.51-0.740	0.580-0.620	Wide , 0.54-0.74
Diameter of rostellum	0.440	0.285-0.315	0.447
No. of hooks	About 200	480-500	'T' shaped, about 1200
Number of testes	12-13	About 150	12-14
Length of Cirrus pouch	Not mentioned	Not mentioned	Narrow and short, 0.3
Genital pores	Not mentioned	Not mentioned	1/3rd of the anterior margin
Ovary	Not mentioned	Not mentioned	Bilobed
Vagina	Not mentioned	Not mentioned	Runs parallel to cirrus pouch
Vitelline gland	Not mentioned	Not mentioned	Absent

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. aurangabadensis*, Shinde 1969**	***C. shrivastavi*, Malviya and Dutta, 1970**	***C. Magdaubii*, Mezoubi and Kasim, 1980**
Country	India	India	India
Host	*Columba livia*	*Columba livia*	*Columba livia*
Diameter of Scolex	Broad, 0.483	0.726	0.44-0.55
Diameter of rostellum	Flat, 0.300	0.446	0.25-0.44
No. of hooks	About 500 in two rows	Not mentioned	Not mentioned
Number of testes	Small, rounded 80-90	80-85	Not mentioned
Length of Cirrus pouch	Slender 1.130x1.040	Not mentioned	0.15-0.18
Genital pores	Slightly anterior to segment.	Not mentioned	Not mentioned
Ovary	Compact	Not mentioned	Not mentioned
Vagina	Posterior to cirrus pouch	Not mentioned	Not mentioned
Vitelline gland	Compact	Not mentioned	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. Satpulensis*, Shinde *et al*., 1983**	***C. yamaguti*, Shinde *et al*., 1985**	***C. Kamatiensis*, Kharade *et al*., 1995**
Country	India	India	India
Host	Pigeon	*Columba livia*	*Gallus, gallus domesticus*
Diameter of Scolex	0.535	Globular, 0.51-0.60	Squarish, 0.84-1.00 x 0.917-1.099
Diameter of rostellum	0.230	Rounded 0.26-0.27	Small, oval, 0.068x0.152
No. of hooks	337	About 500	200-210
Number of testes	43-52	190-200	95-105
Length of Cirrus pouch	0.190-0.283	0.005-0.132-0x044-0.197	Oval, cylindrical, 0.005-0.60
Genital pores	Not mentioned	$1/4^{th}$ from anterior margin of the segment	Bilateral, anterior to middle of the segment
Ovary	Not mentioned	Bilobed, lobes with 8-10 acini	Bilobed
Vagina	India	Large post ovarian	Not mentioned
Vitelline gland	Not mentioned	Large post ovarian	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. chiangmaii*, Wongsawad *et al*.,1998**	***C. Manishae*, Shinde *et al*.,1999**	***C. ganguae*, Shinde *et al*., 1999**
Country	Thialand	India	India
Host	*Gallus, gallus domesticus*	*Columba livia*	*Corvus splendens*
Diameter of Scolex	Quadrangular, 0.58x0.738	0.462x0.485	Squarish, 0.529x 0.636
Diameter of rostellum	Spinose, 0.194x0.249	0.223x0.227	Big, Oval, 0.189x 0.216
Number of hooks	Numerous	110-120	275-300
Number of testes	30-35	85-90 (90)	Oval to rounded 155-160
Length of Cirrus pouch	0.32x0.043	Not mentioned	Cylindrical, 0.260
Genital pores	Small, placed at 1/3rd from anterior margin of segment	Not mentioned	Oval
Ovary	Bilobed,0.11x0.31	Not mentioned	Bilobed
Vagina	India	Not mentioned	Posterior to cirrus pouch
Vitelline gland	Small	Not mentioned	Small, post ovarian

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. mehdii*, Mahajan *et al*., 1999**	***C. alii*, Shinde *et al*., 2002**	***C. sillodensis*, Jadhav *et al*., 2003**
Country	India	India	India
Host	*Gallus gallus domesticus*	*Columba livia*	*Gallus gallus domesticus*
Diameter of Scolex	0.985x1.516	0.450-0.456x 0.636-0.657	Quadrangular, 0.851-1.192 x 1.192-1.395
Diameter of rostellum	0.129x0.182	Not mentioned	Oval 0.170 x 0.281
No. of hooks	110	100-110	220-250
Number of testes	140-150	80-85	165-175
Length of Cirrus pouch	0.530	Not mentioned	0.067-0.092 x 0.035
Genital pores	Not mentioned	Not mentioned	Marginal, bilateral at the middle of segment
Ovary	Not mentioned	Not mentioned	Irregular, median 0.321-0.628 x 0.178-0.267
Vagina	Not mentioned	Not mentioned	Thin
Vitelline gland	Not mentioned	Not mentioned	Small, post ovarian

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *COTUGNIA*, DIAMARE, 1893.

Species	***C. singhi*,** **Pawar *et al.*, 2004**	***C. lohanesis*,** **Jadhav *et al*., 2004**	***C .kamalae* n.sp**.
Country	India	India	India
Host	*Columba livia*	*Columba livia*	*Gallus gallus domesticus*
Diameter of Scolex	0.363 x 0.436	Oval, 0.590-0.660 x 0.741-0.757	quadrangular0.768 (0.763-0.772)
Diameter of rostellum	0.154 x 0.255	Oval, 0.227 x 0.242	rectangular (0.093x0.031)
Number of hooks	200-210	190-210	-
Number of testes	65-70	28-30	110-120
Length of Cirrus pouch	0.229-0.159	0.086-0.097 x 0.004-0.009	Small, cylindrical (0.095x 0.031)
Genital pores	Marginal, bilateral at the middle of segment	Marginal	Anterior, marginal, 0.024diameter.
Ovary	Irregular, median 0.321-0.628 x 0.178-0.267	Distinct, bilobed 0.0203-0.233 x 0.071-0.097	Distinct bilobed (0.517x 0.302)
Vagina	Thin	Thin, posterior to cirrus pouch	Short narrow, (0.725x 0.019)
Vitelline gland	Small, post ovarian	Post ovarian	Post ovarian.

Key to the Species of genus *Cotugnia*, Diamare, 1893

Testes in between 12-13 in number	C. taiwanensis, Yamaguti 1935
Testes in between 12-14 in number	*C. columbae*, Shinde, 1969
Testes in between 28-30 in number	*C. lohanesis*, Jadhav *et.al*. 2004
Testes in between 28-44 in number	*C. fleari*, Meggitt, 1927
Testes in between 30-35 in number	*C. chiangmaii*, Wongswad & Jadhav 1998
Testes in between 30-50 in number	*C.* jyoeuxi, Baer, 1925
Testes in between 32-41 in number	*C. Parva*, Baer, 1925
Testes in between 43-52 in number	*C. satpulensis*, Shinde *et al*., 1983
Testes in between 50 in number	*C. cuneata*, Meggitt, 1924
Testes in between 65-70 in number	*C. singhi*, Pawar *et al*., 2004
Testes in between 80-90 in number	*C. aurangabadensis*, Shinde et al., 1969
Testes in between 85-90 in number	*C. manishae*, Shinde *et al.*, 1999
Testes in between 95-105 in number	*C. kamatiens*, Kharade *et al*., 1995
Testes in between 100 in number	*C. polycantha*, Fuhrmann, 1909
Testes in between 110-120 in number	***C. kamalae* n.sp**.
Testes in between 100-150 in number	*C. digonopora*, Diamare, 1893
Testes in between 140-150 in number	*C. mehdii*, Mahajan *et al*., 1999

Testes in between 150 in number	*C. magna*, Burt, 1940
Testes in between 155-160 in number	*C. ganguae*, Shinde 1999
Testes in between 166-175 in number	*C. Sillodensis*, Jadhav *et al*., 2005
Testes in between 170-182 in number	*C. noctua*, Johri, 1934
Testes in between 190-200 in number	*C. yamaguti*, Shinde *et al*., 1985
Absence of rostellum	*C. intermedia*, Johri 1934
Presence of rostellum	*C. bhali*, Johri, 1934
Absence of rostellum	*C. alii*, Shinde, *et al*., 2002
Presence of rostellum	*C. Shrivastavi*, Malviya & Dutta, 1970

Eucestoda	Wardle, McLeod and Radinovsky, 1974.
Davaineidea	Wardle, McLeod and Radinovskys, 1974.
Davaineidae	Fuhrmann, 1907.
Raillietina	Fuhrmann, 1920.

Raillietina (R) ***singhi*** Malviya and Datta, 1971

GENERIC DIAGNOSIS

With numerous proglottids, rostellum with double circle of hammer shaped hooks.sucker margins with several circles of minute hooks.testes usually numerous cirrus pouch small, usually not reaching excretory stems, rarely crossing them. Genital pores unilateral or irregularly alternating.ovary bilobed or not, median or somewhat poral; vitelline gland compact, post ovarian.Sminal receptacle present.egg capsule containing one to several eggs. Capsules often grouped or surrounded by modified parenchyma.

INTRODUCTION

Fuhrmann, 1920 established the genus Raillietina with type species *R. tetragona* (Syn. Taenia bothrioplitis) which harbours *Gallus*, *Numida*, *Lagopus*, *Colinus* as their host Moghe, 1925 reported following species, *R. nagpurensis* in domestic Pigeons from India, Nepal and Australia, R. *quadritesticulata* in *oenopopelia tranguedarica*, *Goura coronata* and *Chalcophaps indica* from India. Baylis, 1929 described *R. taylori* in *Psittacus erythraeus* at Africa. Meggitt in 1931 described three species *R. pseudocrytus* in duck from Burma.*R flaminata* in *Columba punicea* and *Goura coronata*

also from Burma. *R. fragilis* in *Columba punicea* also from Burma.In 1935 Yamaguti described the *R. galli* in *Gallus gallus domesticus* in Japan. This species was considered synonym of *R. tetragona* Sawada, 1957. Sharma in 1943 described three species *R. chilmei* in *Lerwa nivicola* at Nepal. Malvia and Dutta, 1971 reported *R. singhi* from the domestic Pigeon in India. Tulika Kumari, 2009 added *Raillietina jharkhandensis* from *Gallus gallus domesticus*. from Dhanabad. So far large number of species added to this genus.

DESCRIPTION

Five hundred twenty four cestode parasites were collected from the intestine of *Columba livia* (Linnaeus, 1758) at Ahmednagar during the year June 2007 to July 2010.

Out of these eight specimens were processed for taxonomical studies. The cestodes were flattened, preserved in 4% formalin, three worms 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. All measurements were given in millimeters.

The worms were medium in size, with thin musculature and Scolex, numerous immature and mature proglottids.

The Scolex is small in size, rectangular in shape, distinctly marked off from the strobila and measures 0.168 (0.155-0.182) in length and 0.281 (0.279-0.283) in breadth. The Scolex bears rostellum which is oval, measures

0.022(0.017-0.026) in length and 0.104(0.097-0.111) in width. Rostellum armed with two circles of spines having 270(280-320) in numbers, measures 0.037 (0.033-0.040) in length, and 0.008 (0.006-0.009) in width.

The sucker are four in number, medium in size, oval in shape, vertically placed, with thick musculature, arranged in two pairs overlapping on each other in each pair and measure 0.148 (0.142 -0.155) in length and 0.108 (0.102-0.115) in breadth.

The neck is medium, measures 0.471 (0.462 -0.480) in length and 0.199 (0.182-0.217) in breadth.

The mature proglottids are medium in size, squarish in shape, broader than long, four times broader than long, Craspedote, with slightly concave or convex lateral margins having short or long blunt, round, conical projections at the posterior corners of the segments slightly unequal in length, with straight or irregular lateral margins and measures 0.295 (0.288-0.301) in length and 1.135(1.120-1.151) in breadth.

The testes are medium in size, oval in shape, occurs on either side of ovary the number of testes (12-14) varies from 8to9 on aporal side and 4 to 5 on poral side measures 0.028 (0.022-0.035) in length and 0.039 (0.031-0.048) in breadth.

Ovary single, rounded, compact with irregular margins, anteriorly placed in the central medulla, bounded laterally by the longitudinal excretory canals and measure 0.164(0.159-0.168) in diameter.

The cirrus pouch is large in size, oval in shape slightly curved posteriorly, obliquely placed, narrow proximally, broad distally, almost at the posterior margin of the segments and measures 0.188 (0.177-0.199) in length and 0.033 (0.026-0.039) in breadth.

Cirrus is small, thin, slightly coiled, contained with the cirrus pouch and measures 0.188 (0.182-0.195) length and 0.0066 (0.0044 -0.0088) in breadth

The vas deferens is small in size, tube like, runs transversely curved slightly crosses longitudinal excretory canals, and measures 0.432 (0.426-0.439) in length and 0.0132 (0.008-0.0177) in breadth.

Genital pores are opens at posterior 2/3rd of the segments, unilateral, oval in shape and measures 0.035 (0.031-0.039) in length 0.017 (0.013-0.022) in breadth.

The vagina is thin tube, straight posterior to cirrus pouch, formes seminal receptacle take a turn and opens into ootype and measures 0.619 (0.608-0.631) length and 0.017 (0.133-0.022) in breadth.

Ootype is small, oval in shape, post ovarian, compact measures0.0155 (0.0133-0.0177) length and 0.0111 (0.0088-0.0133) in breadth.

Vitelline gland oval in shape, medium in size, not attached posterior to the ovary and measures 0.0177 (0.0133-0.022) length and 0.035 (0.031-0.039) in breadth.

The gravid segment are four times broader than long and measures 0.482(0.403-0.561) in length and 2.096 (2.078-2.114) in breadth. It contains (90-95) egg capsules. Each egg capsule contains (5-7) eggs. they are rounded in shape and measure 0.057 (0.043-0.070) in diameter.

The longitudinal excretory canals are present in each segment, measures 0.247 (0.241-0.253) length and 0.033 (0.026-0.039) in breadth.

DISCUSSION

The genus *Raillietina* (R.) was erected by Fuhrmann in 1920. The present form comes closer to following species also.

1) *Raillietina* (R.) *tetragona,* Molin, 1858.

2) *Raillietina* (R.) *microscolecina*, Fuhrmann, 1908.

3) *Raillietina* (R.) *spiralis*, Baczynska, 1914.

4) *Raillietina* (R.) *fuhrmanni*, Southwell, 1922.

5) *Raillietina* (R.) *nagpurensis*, Moghe, 1925.

6) *Raillietina* (R.) *jharkhandensis*, Tulika Kumari, 2009.

After going through the literature, the worm under discussion, turned out to *Raillietina* (R) *singhi*, Malviya and Datta, 1971. The present form resembles it in many characters, but differs from the same in few characters known as additional characters, which are as follows

1. The worm under discussion differs from *Raillietina* (R) *singhi* (Malviya and Datta, 1971) The number of rostellar spines (270 Vs 280-320).

2. The present worm differs from it, in the number of testes (12-15 Vs 33)

3. The present worm differs from it, in the number egg capsules in gravid segment (90-95 Vs 133).

As the characters are minor, it is redescribed here, as *Raillietina* (R) *singhi,* Malviya and Datta, 1971.who reported that worms in a domestic pigeon where as the present worms also reported from pigeon *Columba livia* (Linnaeus,1758) at Ahmednagar district (M.S.),India.

TAXONOMIC SUMMARY

Genus	*Raillietina*, Fuhrmann, 1920.
Species	*Raillietina* (R) *singhi,* Malviya *et al*., 1971.
Type host	*Columba livia* (Linnaeus, 1758).
Habitat	Intestine.
Type locality	Ahmednagar district (M.S.) India.
Holotype	Deposited in Helminthology Research Lab.
Paratype	Dept. of Zoology, Dr.B.A.M.U. Aurangabad.
Period of collection	July 2007 to June 2010
Etymology	As the cestode species reported from Ahmednagar district (M.S.) India.

Eucestoda	Wardle, McLeod and Radinovasky, 1974.
Cyclophllidea	Ben. in Braun, 1900.
Anoplocephalidae	Cholodkovsky, 1902.
Moniezia	Blanchard, 1891.

Moniezia (B) ***chaudhariae n.sp.***

GENERIC DIAGNOSIS

With double genitalia per segment.Scolex rounded quadrangular, unsegmented neck present. Strobila serrate; proglottides crowded, much wider than long. Inter proglottidal glands usually present inner longitudinal muscle sheath in two layers in immature proglottids. Dorsal excretory stems medial or dorsomedial to ventral stems, latter with transverse anastomoses.Testes numerous, modularly, between and posterior to ovaries. May or may not extend into pre ovarian area. Genital ducts dorsal to excretory stems and nerve trunk. Cirrus pouch elliptical or pyriform, containing small seminal vessicles, cirrus covered with extremely minute spines ovary rosette shaped, a little medial to excretory stems; vitelline gland compact, posterior to ovary. Uterus at first reticular later sac-like and occupying whole medulla, over reaching excretory stems laterally; eggs with pyriform apparatus vagina posteroventral to cirrus pouch on one side but posterodorsal on the other.Cysticercoids in oribatid mites.

INTRODUCTION

Blanchard, 1891 erected the genus *Moniezia***.** Later on Skrjabin and Schulz, 1937 divided this genus into three subgenera.

1) *Blanchariezia* – interproglottidal gland arranged lineally (some times absent).

2) *Baeriezia* – interproglottidal gland absent.

3) *Moniezia* - interproglottidal gland grouped in rosettes.

Monnig, 1926 added *M (B.) pallida*. In India Jadhav et al., 1985 added two species of the genus i.e. *M.(B.) aurangabadensis* and *M.(B.) bharalae*. Later on Patil et al, 1997 described *M. (B.) warnanagarensis*. In 1999 two species are added to this genus i.e. *M. (B.) kalawati* by Nanware *et.al.* and *M.(B.) murhari* by Kalse et al. Later on 2004 three species are added to this genus i.e. .*M. (B.) caprai* by Pokle *et al.*, *M.(B.) shindei* Pawar *et.al.*, and *M.(B.) hircusae* by Tat and Jadhav *M.(B.) rajalaensis* Borde *et.al.*,2007 and recently add *M.(B.) caprae* Nanware S. S. 2010.

DESCRIPTION

Five hundred thirty five specimens of the cestode parasite were collected from the small intestine of Goat *Capra hircus* from Ahmednagar (M.S.) India in the July 2007 to June 2010.

Out of these four species were processed for taxonomical studies. They were flattened, preserved in 4% formalin. The flattened parasites were

then washed thoroughly for several times under running water. The parasites stained with Harris haematoxylin, then passed through

the various alcoholic grades for dehydration, cleared in xylene, mounted in D.P.X. and prepared whole mount slide for further taxonomical studies. All Measurements are in given millimeters.

The scolex is medium, globular, distinctly marked off from the strobila.slightly longer than, broad, having median groove at anterior end and measures 1.284 (1.254-1.315) in length and 1.205 (1.140-1.270) in breadth.

Suckers are large, rounded overlapping to each other and situated in the anterior 3/4th region of the scolex and measures 0.333 (0.307-0.359) diameter.

Neck is medium, unsegmented measures 2.113 (2.017-2.210) in length and 0.530 (0.526-0.515) in width.

The mature segments are broader than long, almost 3-4 times broader than long, craspedote with either concave or convex lateral margin. it measures 1.526 (1.403-1.649) in length and 4.959 (4.938-4.980) in width double sets of reproductive organs.

Cirrus pouch is protrucible with large opening on each side and medium in size, elliptical in shape situated anterior, in the projected region of the segments and measures 0.355 (0.342 -0.368) in length and 0.157(0.149-0.166) in breadth. Protrucible cirrus on each side is wide, slightly curve, contained within cirrus pouch and measures 0.258 (0.245-0.271) in length and 0.030 (0.026-0.035) in width.

The vas deferens on each side is thin, long, coiled and dorsal to excretory stem measures 1.771 (1.587-1.956) in length and 0.048 (0.035-0.061) in breadth.

Vagina is a thin convoluted tube, situated posteriorly to cirrus pouch, starts from genital pore, crosses the longitudinal excretory canal, then enlarge to form seminal receptaculum, reaches and open into the ootype. It measures 1.109 (1.052-1.166) in length and 0.034 (0.026-0.043) in width.

The Ootype is small in size, round in shape, situated posterior to ovary and measures 0.039(0.035-0.043) in diameter. The genital pore is medium in size, oval in shape, placed anterior to middle of the segment and 0.284 (0.271-0.298) and length and 0.127 (0.105-0.149) in breadth.

The ovary on each side is medium in size, oval shaped, and compact measures 0.355 (0.333-0.377) in length and 0.245 (0.201-0.289) in breadth.

The testes are medium in size, rounded in shape, 95-100 in numbers, scattered in posterior $3/4^{th}$ region of the segment measures 0.140 (0.131-0.149) The vitelline glands on each side are large in size, rectangular to oval in shape, post ovarian and measures 0.118(0.096-0.140) in diameter.

The longitudinal excretory canals are medium in width and measures 1.386 (1.370-1.403) in length and 0.096 (0.087-0.105) in breadth.

The interproglottidal glands are present in the inter segmental region of the anterior and posterior margin of the segment, 9-11 in number, round in shape and measure (0.062-0.087) in diameter.

DISCUSSTION

The present worm resembles in all the characters with the subgenus Blanchariezia Skrjabin and Schulz, 1937, which is having the following species as follows.

1) *Moniezia* (B): *benedeni*, (Moniez, 1879) Skrjabin and Schulz, 1937.
2) *Moniezia* (B): *pallida*, Monning, 1926.
3) *Moniezia* (B): *aurangabadensis*, Shinde *et al*.,1985.
4) *Moniezia* (B) : *bharale*, Shinde *et al*.,1985
5) *Moniezia* (B) : *warnanagarensis*, Patil *et al*., 1997
6) *Moniezia* (B): *kalawati*, Nanware, *et al*., 1999.
7) *Moniezia* (B): *murhari*, Kalse, *et al*., 1999.
8) *Moniezia* (B): *caprai*, Pokale, *et al*., 2004.
9) *Moniezia* (B): *shindei*, Pawar, *et al*., 2004.
10) *Moniezia* (B): *hircusae*, Tat and Jadhav B.V., 2004.
11) *Moniezia* (B): govindae, Padwal, *et al*., 2006.
12) *Moniezia* (B): *rajalensis*, Borde, S.N, *et al*., 2007.
13) *Moniezia* (B): *caprae*, Nanware, S.S. 2010.

The worm under discussion is having the scolex medium. Globular, neck long unsegmented, suckers are large, rounded and overlapping to each other. Mature segment 3-4 times broader than long, testes medium, rounded and 95-100 in numbers, cirrus pouch is medium elliptical, Ovary medium in size, oval shaped, Vitelline glands large rectangular to oval, genital pore is

small in size and at anterior to lateral margin, the vas deferens is thin and coiled tube.

1) The present worm differs from *Moniezia* (B.) *benedeni* (Moniez, 1879, Skrjabin and Schulz 1937) this is having globular scolex broader than long proglottids. Testes 500 in numbers, arranged in the form of two triangles in two fields, cirrus pouch wide vas deferens with 2 - 3 coils, ovary compact, in the centre of the segments, eggs well developed, Interproglottidal glands linear and close to the posterior margin of the segments, arranged transversely and it is reported from the claves and lambs.

2) It differs from *Moniezia* (B) *pallida* Monning, 1926, which is having the uterus internal, dorsal and ventrally over excretory canals, the Interproglottidal gland varies in size. It is reported from horse in South Africa .testes 100-200 in numbers. Ovary compact.

3) The present worm differs from *Moniezia* (B) *aurangabadensis* Shinde *et al.*1985 which is having the scolex simple and oval, tests small, rounded 1100-1200 in number, vas deferens coiled, cylindrical cirrus pouch, ovary is bilobed, each lobe with small and round acini, uterus is reticular and full of eggs, the Interproglottidal gland 12-15 in numbers. It is reported from *Ovis bharal*.

4) The present worm differs from *Moniezia* (B) *bharalae* Shinde *et.al* 1985 which is having the mature segment broader than long testes small, rounded 190-220 in numbers. Vas deferens short, elongated, fusiform, presence of

seminal vesicle, genital pores bilateral, sub marginal, ovary bilobed, compact antero-posterior in direction. Interproglottidal glands arranged in two rows, small in size, 38-44 in numbers. It is reported from *Ovis bharal*.

5) The present cestode differs from *Moniezia* (B) *warnanagerensis* Patil *et al.*, 1997, which is having scolex large globular, mature segment broader than long, almost 4-5 times broader than long, testes 300-320 in numbers, distributed throughout the segment in single field, ovary indistinctly nobbed with 13-15 short, blunt acini. Interproglottidal gland, 56 in numbers, oval medium in size, cirrus pouch medium oval, elongated obliquely place. It is reported from *Capra hircus*.

6) The present worm differs from *Moniezia* (B) *kalawati Nanaware et al.*, 1999, which is having squarish scolex, mature segment broader than long, with medium in size, oval shaped cirrus pouch. Testes small, oval distributed throughout the segment, 172 in numbers ovary medium, short, blunt acini, 54 Interproglottidal glands in the inter segmental region, medium, oval either single or paired, irregularly arranged in the central width of the segments, having space on each lateral side. It is reported from *Capra hircus*.

7) The present cestode differs from *Moniezia* (B) *murhari* Kalse *et al.*, 1999, which is having scolex squarish, medium neck, mature segments broader than long, each with double set of reproductive organs, testes 400-415 in numbers, cirrus pouch oval, elongated, ovary bilobed, lobes unequal with numerous

short blunt acini with 63 interproglottidal glands and it is reported from *Capra hircus*.

8) The worm under discussion differs from *Moniezia* (B) *caprai* Pokale, *et al*., 2004 which is having the scolex squarish, with squarish neck, mature, mature segments are medium in size, broader than long, double set of reproductive organ, one set on each side, Testes follicular 255-260 in number, cirrus pouch medium and flask shaped, vas deferens thin coiled, the ovary is

medium, inverted horse-shoe shaped or kidney shaped with numerous short blunt acini, vagina is thin tube situated posteriorly to cirrus pouch the genital pore crosses the longitudinal excretory canal, the ootype is small in size, rounded in shape, genital pore medium in size, oval in shape,

Interproglottidal gland 15-17 in numbers, vitelline gland oval in shape.it is reported from *Capra hircus*.

9) The present tapeworm differs from *Moniezia* (B*) shindei* Pawar *et al.*, 2004, which is having scolex large, mature segments craspedote, Testes 190-200 in numbers scattered all over segment, ovary a single mass, large in medium in size, cirrus pouch oval elongated, in centre of the segment and vitelline gland large, oval, internal to ovary. It is reported from *Ovis bharal*.

10) The worm under discussion from *Moniezia* (B) *hurcusae* Tat and Jadhav B.V. 2004 which is having Scolex large, globular mature segments large, Craspedote, broader than long. Testes 168 in number, cirrus pouch medium and oval, vas deferens wide and coiled, ovary large in size, oval with

numerous short, blunt, rounded acini, ootype round in shape, Interproglottidal glands 14-15 in numbers. It is reported from *Capra hircus*.

11) The present tapeworm differs from *Moniezia* (B) *govindae*, Padwal *et al*., 2006 which is having scolex medium, globular, mature segment craspedote and broader than long, testes are small, oval 100-140 in numbers, ovary large single mass, nut shaped, cirrus pouch oval shaped, short obliquely placed, Situated anterior to the middle of the segment. it is reported from *Capra hircus.*

12) The present tapeworm differs from *Moniezia* (B): *rajalensis*, Borde, S.N, *et al*. 2007 which is having scolex large, globular, mature segment Squarish, broader than long, testes are small, oval 250-260 in numbers, ovary large single mass, horse shoe shaped interproglottidal gland large, oval 31-32 in numbers.

13) The present tapeworm differs from *Moniezia* (B): *caprae*, Nanware, S.S. 2010 which is having scolex simple,squarish, mature segment broader than long, testes are medium, oval 84-94 in numbers, ovary large single mass, oval shaped, cirrus is thin elongated.

The above differentiating characters are valid enough to erect a new species for this cestode and hence the name has been given to this new species as Moniezia chaudhariae n.sp.in honour of Mrs. Hemlata S. Chaudhari, the guide of the author, of her full co- operation for the complitation of the work. *Moniezia* (B) *chaudhariae* n.sp.

TAXONOMIC SUMMARY

Genus	*Moniezia* Blanchard, 1891
Species	*Moniezia* (B) *chaudhariae* n.sp.
Type host	*Capra hircus* (Linnaeus, 1758)
Habitat	Intestine
Type locality	Ahmednagar (M.S.) India
Holotype	Deposited in Helminthology Research Lab.
Paratype	Dept. of Zoology, Dr.B.A.M.U. Aurangabad.
Period of collection	July 2007 to June 2010
Etymology	As the cestode species reported fromAhmednagar (M.S.) India.

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *MONIEZIA* BLANCHARD, 1891

Species	***M*.(B)*benedeni*, Moneiz,1879, Skrjabin *et al*., Schulz, 1937**	***M*.(B) *Pallida*, Moning, 1926**	***M*.(B) *aurangabadensis* Shinde *et al*., 1985**
Country	South Africa	South Africa	India
Host	Horse	Horse	*Ovis bharal*
Scolex	Globular	Globular	Oval
Mature Segment	Broader than long	Squarish	Broader than long
Testes	500 in numbers, arranged in the form of two triangular fields	100-200 in numbers	1100-1200 in numbers distributed fully
Ovary	Compact with acini, present at the center of the segment on each side	Compact	Bilobed and each lobe with acini present on each side of the segment
Interproglottidal glands	Varying in size, narrow, short and in transverse row	Varying in size	12-15 in numbers in a row
Cirrus pouch	Wide, short, oval, do not touch excretory canal	Small, cylindrical	Small, cylindrical
Vitelline gland	Oval	Oval	Oval
Vagina	Posterior to cirrus pouch	Anterior to cirrus pouch	Posterior to cirrus pouch

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *MONIEZIA* BLANCHARD, 1891

Species	***M*.(B) *bharale*, Shinde *et al*., 1985**	***M*.(B) *Warananagarensis*, Patil *et al*., 1997**	***M*. (B) *Kalawati*, Nanware *et al*., 1999**
Country	India	India	India
Host	*Ovis bharal*	*Capra hircus*	*Capra hircus*
Scolex	Globular	Globular	Squarish
Mature Segment	Broader than long	Broader than long	Broader than long
Testes	190-200 in numbers	300-320 in numbers	Small, oval 172 in numbers
Ovary	Bilobed, present on each lateral side of the segment	Bilobed with 13-15, short blunt acini	Oval, single mass with irregular margin
Inter proglottidal glands	In two tow at posterior margin and 38-44 in numbers	Oval, medium in size 56 in numbers	Medium, oval 54 in numbers
Cirrus pouch	Small, oval, obliquely placed	Small, oval	Medium, oval broader in obliquely situated
Vitelline gland	Absent	Medium oval, elongated obliquely placed	Rounded
Vagina	Anterior to cirrus pouch	Posterior to the cirrus pouch	Thin, posterior to cirrus pouch

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *MONIEZIA* BLANCHARD 1891.

Species	*M. (B) murhari,* Kalse *et al*., 1999	M. (B) Caprai, Pokale *et al*., 2004	*M*. (B) *Shindei,* Pawar *et al*., 2004
Country	India	India	India
Host	*Capra hircus* (L.)	*Capra hircus* (L.)	*Ovis bharal* (L.)
Scolex	Squarish	Medium, squarish in shape	Large
Mature Segment	Broader than long	Medium in size, broader than long	Craspedote
Testes	405-415 in numbers	Follicular, small, oval in shape 255-260 in numbers	190-200 in numbers
Ovary	Invented house shoe, shaped with many short, blunt acini	Medium in size, horse shoe shaped	Single mass, large
Interproglottidal gland	Medium, rounded, 63 in numbers	15 to 17 pair in number	76 in numbers medium in size
Cirrus pouch	Elongated, medium, oval in the anterior half of the segment	Medium in size, flask shaped	Oval, elongated
Vitelline gland	Rounded	Medium in size, oval in shape	Large, oval

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *MONIEZIA* BLANCHARD, 1891.

Species	***M.* (B) *hircusae,* Tat and Jadhav, 2004**	***M.*(B) *govindae,* Padwal *et al*., 2006**	***M.*(B) *rajalaensis,* Borde *et al*., 2007**
Country	India	India	India
Host	*Capra hircus* (L.)	*Capra hircus* (L.)	*Capra hircus* (L.)
Scolex	Large, globular	Oval, globular	Large, globular
Mature Segment	Craspedote	Broader than long	Squarish, Broader than long
Testes	168 in numbers	100-140 in numbers	250-260 in numbers
Ovary	Single mass, large	Compact, nut shaped	Horse shoe shape
Interproglottidal gland	14-15 in numbers, medium in size	Large, oval, 40-42 in numbers	Large, oval 31-32 in numbers
Cirrus pouch	Oval, elongated	Oval, elongated	Oval in shape
Vitelline gland	Large, oval	Oval	Squarish
Vagina	Small in size	Posterior to cirrus pouch	Posterior to cirrus pouch

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *MONIEZIA* BLANCHARD, 1891.

Species	***M.* (B) *caprae*** **Nanware S.S. 2010**	***M.* (B) *chaudhariae n.sp.***
Country	India	India
Host	*Ovis bharal* (L.)	*Capra hircus* (L.)
Scolex	Simple, large, squarish	Simple, medium, globular
Mature Segment	Broader than long	Broader than long
Testes	84-95 in numbers	95-100 in numbers
Ovary	Large in size, oval in shape	Large in size, oval in shape, compact.
Interproglottidal gland	Large in size, oval in shape	Large in size, rounded in shape, variable in size. (9-11) in number
Cirrus pouch	Oval in shape , elongated	elliptical in shape
Vitelline gland	Oval	Rectangular to oval in shape
Vagina	Thin, convoluted in shape	Thin, coil tube, dorsal to excretory canals

Key to the Species of the genus *Moniezia* (Blanchard, 1891)

Mature segments broader than long - 1

Mature segments Squarish - *M*. (B.) *pallida* Moning, 1926

Mature segments medium in size - *M*. (B.) *caprai* Pokale *et al*., 2004

Mature segments Craspedote - 2

1) Scolex globular - 3

Scolex quadrangular - 4

Scolex squarish - 5

2) Inter proglottidal glands 14-15 in number - *M*. (B.) *hircusae* Tat and Jadhav, 2004

Inter proglottidal glands 76 in number - *M*. (B.) *shindei* Pawar *et al.,* 2004

3) Testes in between 95-100 in number - ***M***. (B.) ***chaudhariae* n. sp**

Testes in between 100-150 in number - *M*. (B.) *govindae* *Padwal et al.,* 2007

Testes in between 150-200 in numbers - *M*. (B.) *bharalae* *Shinde et al.*, 1985

Testes in between 250-260 in numbers - *M*. (B.) *rajalaensis* Borde *et al.*, 2007

Testes above 300-350 in numbers - *M*. (B.) *warnanagarenisis* Patil *et al.*,. 1997

Testes more than 350 in numbers	-	*M.* (B.) *benedeni* Moniez, 1879 Skrjabin *et al.,* Schulz, 1937
4) Cirrus pouch cylindrical	-	*M.* (B.) *aurangabadensis* Shinde *et al.* 1985
5) Vitelline gland rounded	-	*M.* (B.) *murhari* Kalse *et al.,* 1999
Vitellaria follicular	-	*M.* (B.) *kalawati* Nanware *et al***.,** 1999
Vitelline gland oval	-	*M.* (B.) *Caprae* Nanware *et al.*,2010

Eucestoda	Wardle, McLeod and Radinovsky, 1974.
Cyclophyllidea	Ben, in Braun, 1900.
Anoplocephalidae	Cholodkovisky, 1902.
Thysanosomatinae	Skrjabin, 1933.
Stilesia	Railliet, 1893.

***Stilesia ovisi* n.sp**

GENERIC DIAGNOSIS

Long narrow worms, segmentation weak except for posterior segments. One set of genitalia per Proglottis.testes few, in two lateral fields. Genital ducts passing between excretory stems and dorsal to nerve trunk. Genital pores irregularly alternating.ovary in poral half of proglottids.Vitellaria and shell gland lacking. Uterus at first a long, transverse, dumb bell shaped tube, later replaced by two paruterine organs.

INTRODUCTION

The genus *Stilesia* was erected by Railliet in 1893 with its type species *S. globipunctata* in 1896; *S. vittata* is also added by Railliet. Wolffhugel, 1903 described *S. hepatica*. Later on Leiper, 1936 added *S. okapi*. In India Kadam et al, 1980 described *S. leperi*. In 1981 Kalayankar added *S. caballeroi*. Shinde *et.al*, 1982 described *S. southwelii*. Jadhav *et al.*,1982 added *S. aurangabadensis*. Malhotra and Capoor, 1983 added two species to this genus i.e. *S. garhwalensis* and *S. kotwarensis*. *S. marathwadensis* is added by Shinde

et al., 1985.In 1999 two species are added to this genus i.e. *S. jadhavae* by Jadhav and S. *yawalensis* by Kalse *et al.*, In 2001 Deshmukh and Shinde added S. *dhondgae.* In 2004 four species are added to this genus i.e. S. *pandeyi,* by Nanware and Jadhav, S. *ambajogaiensis* by Pawar *et.al.*, S. *indapurensis* by Khadap *et.al.,* and S. *daulatabadensis* by Shelke and Shinde. Nanware *et al*., added S. *jadhavi,* Padwal and Jadhav described S. *govindae* in 2006 and recently add S. *shrigondaensis* Pokale *et al.*, 2008.

DESCRIPTION

Four hundred twenty five specimens of the cestode parasites were collected from the intestine of *Ovis bharal* from Dist. Ahmednagar (M.S.) India during July 2007 to June 2010.

Out of these six specimens were processed for taxonomical studies. The worms were Creamy white, thin, long and consist of scolex, immature, mature and gravid segments. The cestodes were flattened, preserved in 4% formalin, 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. All measurements were given in millimeters

The scolex is large in size, rectangular in shape, distinctly marked off from the strobila, broader than long and measures 0.822(0.811-0.833) in length and 1.218 (1.211-1.255) in width.

Suckers four, almost rounded, two suckers of both the sides over lapping and measures 0.449(0.422-0.477) in length and 0.355(0.333-377).in width. Long neck, slightly broad anteriorly narrow posteriorly and measures 2.522 (2.500-2.554) in lengths and 0.388(0.366-0.411) in breadth.

The mature proglottids are eleven to twelve times broader than long with convex lateral margins.Slight projections towards posterior corners of the segment measures 0.157(0.149-0.166) in length and 1.916 (1.912-1.92) in width. The testes are small in size, rounded to oval in shape, (8to9) in two groups on the lateral side of the segment, on poral regain 3 and aporal regain 4-5 in numbers and measures 0.052(0.043-0.0061) in diameter.

The cirrus pouch is small in size sac like, oval in shape and measures 0.122(0.105-0.140) in length and 0.087(0.070-0.105) in width. The cirrus is thin, slightly curved with in the cirrus pouch and measures 0.082(0.078-0.087) in length and 0.012(0.008-0.017) in width.

The vas deferens is short, thin, extends transversely and measures 0.113(0.105-0.122) in length and 0.02(0.017-0.026) in breadth.

Genital pores are small, oval, marginal, irregularly alternate and measures 0.065 (0.061-0.070) in length and 0.043(0.035-0.052) in breadth. The vagina is a thin tubes slightly curved pass throw excretory canals and measures 0.0344 (0.333-0.359) in length and 0.021(0.017-0.026) in

breadth.Ootype small, rounded, lateral to ovary and measures 0.034 (0.026-0.043) in diameter.

The ovary is small, compact, single, rounded with small acini irregular alternate in poral half of proglottids. Which measures 0.056 (0.070-0.105) in length and 0.096(0.078-0.114) in width.Vitellaria absent.

Paruterine organ is rounded one pair in each segment with uterine cap and measures 0.046 (0.044-0.048) in length and 0.019(0.018-0.021) in width. Each paruterine organ contains 8-10 eggs. Eggs are rounded measures0.014 (0.012-0.017) in diameter.

Pair of excretory canals, lateral excretory canals are narrow passing along the length of the segment and measures 0.166 (0.140-0.192) in length and 0.052(0.043-0.061) in width.

Dorsal excretory canals are broader than lateral excretory canals, measures 0.166 (0.140-0.192) in length and 0.100(0.087-0.114) in width.

DISCUSSION

Genus *Stilesia* was erected by Railliet (1893), from *Ovis aries* in Europe; the following species have been added under this genus:

1) *Stilesia globipunctata*, (Rivolta 1874) Railliet, 1893.

2*) S.vittata* Railliet, 1896

3) *S. hepatica*, Wolffhugel, 1903

4) *S.okapi* Leiper, 1936

5) *S. leiperi*, Kadam *et al*., 1980

6) *S. caballeroi*, Kalyankar, *et al*., 1981.

7) *S. Southwelli*, Shinde *et al*., 1982.

8) *S. aurangabadensis*, Majid *et al.*, 1982.

9) *S. garhwalensis*, Malhotra and Capoor 1983.

10) *S. kotwarensis*, Malhotra and Capoor 1983.

11) *S. marathwadensis*, Shinde *et al*., 1985.

12) *S. jadhavae*, Jadhav, 1999.

13) *S. yawalensis* Shinde *et al*., 1999.

14) *S.dhondgae*, Deshmukh *et al*., 2001.

15) *S.pandeyi*, Nanware and Jadhav, 2004.

16) *S.indapurensis*, Khadap and Jadhav, 2004.

17) *S. daulatabadensis*, Shelke and Shinde, 2004.

18) *S. kapadnesis*, Kalse *et al.*, 2008.

19) *S. songirensis*, Kalse *et al.*, 2008

The present cestode bears scolex large, rectangular suckers over lapping, rounded.mature segment eleven to twelve times broader than long. testes small oval 7-8 in numbers, 3 on poral and 4-5 on aporal regions. Vas deferens short, thin, cirrus pouch sac like, small, anterior on lateral margine. cirrus thin, slightly curved with in cirrus pouch. Paruterine organ rounded,

with uterine cap, contains rounded 8-10 eggs. Genital pores small, oval, irregular alternate,

1) The present parasite differs from *Stilesia globipunctata*, (Rivolta 1874) Railliet, 1893. Scolex small in size, rounded 0.5 to 0.8 in diameter, the total number of testes 4-7 in numbers, size of testes 0.04-0.050. dorsal to cirrus pouch and ovary is globular and measures 0,04-0.05.

2) The worm under discussion differs from *S.vittata*, Railliet, 1896, segmentation not distinct, testes 5-9 in two lateral groups, 0.046-0.066 in diameter, vas deferens closely coiled, between cirrus pouch and outer wall of excretory vessel. Cirrus pouch 0.090-0.112 long and 0.55 thick, elongated, cylindrical, ovary rounded, compact 0.10 in diameter, situated between poral vessel, vagina posterior to cirrus pouch and genital pores in anterior half of the segment.

3) The worm under discussion differs from) *S. hepatica*, Wolffhugel, 1903, which is described from the liver, there are 6-7 testes on each side pre-ovarian in anterior half. The parasite under discussion also differs in vas deferens not closely coiled but extending up to excretory canal, ovary small compact, oval, vagina anterior to cirrus pouch, genital pores in the middle of the segment.

4) The worm under discussion differs from *S. okapi*, Leiper, 1936, which is differentiated from the present form mainly by the number of the

testes and other features. In Stilesia okapi there are only 2-3 testes in each lateral side.

5) The present parasite differs from *S.leiperi*, Kadam *et al*., 1980 which is having 5-6 testes on each side.Cirrus pouch elongated, cylindrical. vas deferens not closely coiled but extends beyond long excretory canals, ovary medium, almost circular, compact with small acini, genital pores in anterior half of the segment.

6) The present parasite differs from *S. caballeroi*, Kalyankar, *et al*., 1981 which is having the scolex very small, 0.41 in width, size of suckers 0.12 in diameter.Size of cirrus pouch 0.11-0.14 x 0.033-0.055, shape of the testes oval 1to11 in numbers, on each side, present in 2to3 rows and measures 0.038-0.088. Vas deferens forms a dense bundle of convolutions

7) The present parasite differs from. *S.southwelli*, Shinde *et.al*., 1982 which is having quadrangular scolex, mature segment 5 times broader than long, testes 4 in each two lateral groups, vas deferens very much coiled, reaching up to ovary, ovary small, rounded without acini, vagina posterior to cirrus pouch, genital pores at $1/3^{rd}$ from anterior margin of the segment, paruterine organs two in each segment, saccular, transversely elongated, containing (10-15) group of eggs.

8) The present parasite differs from *S. aurangabadensis*, Majid *et al*., 1982. This is having Scolex large, spherical, 0.728 in diameter, testes

rounded in two lateral groups five on each side of the segment and lateral to ovary, measures 0.028 in diameter. Vas deferens not coiled, reaches up to longitudinal excretory canals, cirrus pouch cylindrical, elongated, measures 0.146. Ovary medium in size, compact, circular and measures 0.097.

9) The present cestode can further be distinguished from *S. garhwalensis*, Malhotra and Capoor 1983.in the size of scolex 0.510- 0.840, the number of testes 0-9.Size of cirrus pouch .011-0.101 in diameter.Size of ovary 0.009-0.097.in diameter. The vagina posterior to cirrus pouch genital pores situated at anterior1/3rd level of lateral margins of segment.

10) The present worm can be different *S. kotwarensis*, Malhotra and Capoor 1983. by number of testes 1to12, width of scolex 0.836-1.102, size of cirrus pouch 0.022-0.179x0.101-0.150 shape and size of ovary small, spherical situated inner to the longitudinal excretory canal on poral side and measures 0.019. Genital pore irregularly alternate at anterior 1/3rd level of lateral margin of segment.

11) The parasite differs from *S. marathwadensis*, Shinde *et al*., 1985, is having segments broader than long 0.022-0.025, testes, 5-7 in numbers, rounded, in two groups, 0.008 in diameter

12) The present parasite differs from *S. jadhavae*, Jadhav, 1999, in having the segments 8 times broader than long, number of testes 5-7. Length of

cirrus pouch 259, diameter of Ootype 0.045, size of ovary 0.197, vagina anterior to cirrus pouch.

13) The present parasite differs from *S. yawalensis*, Kalse *et al*., 1999, in having scolex quadrangular, distinctly marked from the strobila, segments broader than long, testes rounded, in numbers)vas deferens thin, curved, cirrus pouch oval, ovary medium, globular, a single mass, vagina thin, genital pores marginal.

14) The present cestode differs from S.*dhondagae*, Deshmukh *et al*., 2001. in having scolex quadrangular, broad anteriorly as well as posteriorly testes oval, 8-10 in numbers, arranged in 2 rows. Vasdeferens short, cirrus pouch small, oval situated middle to posterior side, ovary bilobed.Elongated, and paruterine organ simple.

15) The present cestode differs from *S.pandeyi*, Nanware and Jadhav, 2004.in having scolex scolex with four suckers, neck short, mature segment almost 17 times broader than long with convex lateral margins and slight projections at posterior corner of segment. Testes at two lateral fields, twenty in numbers, oval, measures 0.010-0.039, cirrus pouch small, elongated, obliquely placed. Cirrus thin, curved. Vas deferens short medium obliquely placed and measures 0.072. Ovary small oval measures 0.029x 0.058., vagina thin tube, run obliquely. Ootype small, rounded genital pores medium, oval, marginal, and regularly alternate.

16) The present cestode differs from *S. indapurensis*, Khadap *et al*., and 2004.In having scolex medium, quadrangular, simple, broad, segments thin, small, and squarish.Testes medium, oval 8 to 9 in numbers. Vas deferens curved, cirrus pouch large elongated, slightly curved and vagina thin paruterine organ two in each mature segment.

17) The present parasite differs from *S. daulatabadensis*, Shelke *et al*., 2004 in having scolex globular, rostellum absent, segments medium, squarish. Testes 11 in number 7 on poral and 4 on aporal. Vas deferens medium slightly curved. Cirrus pouch medium, oval, anteriorly placed Ovary medium, oval single mass.vagina thin, long, anterior to cirrus pouch, slightly wavy and paruterine organ 2 in numbers.

18) The present parasite differs from *S. kapadnensis* Kalse *et al*., 2008. In having scolex globular, neck long, narrow with no segmentation; mature segment wider than long, genital pore unilateral, irregularly alternate testes 4-6 in number, in two groups. ovary large with rounded acini.cirrus pouch oval in shape, cirrus thin. Paruterine organs large, oval contains 22-30 eggs.

19) The present parasite differs from *S. songirensis* Kalse *et al*., 2008. In having scolex globular, neck small narrow with no segmentation; mature segment wider than long, genital pore unilateral, irregularly alternate testes 7-8 in number, in two groups,ovary large with rounded acini.cirrus pouch oval in shape, cirrus thin, ovary oval.

The above noted characters are enough to distinguish these worms from the earlier species and hence the new species is named as *Stilesia ovisi* n.sp. after the generic name of the host.

TAXONOMIC SUMMARY

Genus	*Stilesia,* Railliet, 1893.
Species	*Stilesia ovisi* n.sp.
Type host	*Ovis bharal*.
Habitat	Intestine.
Type locality	Ahmednagar dist. (M.S) India.
Holotype and	Deposited in Helminthology Research Lab.
Paratype	Dept. of Zoology, Dr. B.A.M.U. Aurangabad.
Date of collection	July 2007to June 2010.
Etymology	As the cestode species reported From Ahmednagar (M.S.) India

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *STILESIA*, RAILLETS, 1893

Species	***S. globipunctata*** **Railliet, 1893**	***S. Vittata*,** **Railliet, 1896**	***S. hepatica*** **Wolffhugel, 1903**
Country	Europe, Africa	East Africa	Asia, Africa
Host	*Ovis aries*	*Camelus bactranus*	*Ovis aries, Camelus bactranus*
Scolex	Rounded	Rounded	Rounded
Mature Segment	Broader than long	Broader than long	Broader than long
Testes	In two groups, 4-7 on one side	In two groups, 5-9 on one side	In two groups 6-7 on one side, preovarian in anterior half
Vas deferens	Not closely coiled, between cirrus pouch and wall of excretory vessel	Closely coiled, between cirrus pouch and outer wall of excretory vessel	Not closely coiled, but extending up to longitudinal excretory canal
Cirrus pouch	Small, pyriform, ventral to vagina	Elongated, cylindrical	Almost oval
Ovary	Some what globular, medium to ventral vessel	Large, some what compact	Small, compact, oval
Vagina	Dorsal to cirrus pouch	Posterior to cirrus pouch	Anterior to cirrus pouch
Par uterine organ	From uterus paruterine organs developed	From uterus paruterine organs developed	Situated internal to longitudinal excretory vessels.
Genital pores	Irregularly alternate and near anterior sides of the segment	In anterior half	In the middle of the segment

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *STILESIA*, RAILLET, 1893.

Species	***S. okapi*** **Leiper, 1936**	***S. Leperi*** **Kadam *et al*., 1980**	***S.caballeroi*** **Kalyankar *et al*., 1981**
Country	Africa	India	India
Host	*Okapi family graffidae*	*Ovis bharal (L.)*	*Capra hircus (L.)*
Scolex	Not mentioned	Not mentioned	Small
Mature Segment	Longer than broad	Longer than broad	Longer than broad
Testes	2-3 on each side of the lateral field	In two groups 5-6 in each side posterior lateral to ovary	1-11 in number
Vas deferens	Short, coiled	Not closely coiled but extend beyond long excretory canals	Forms dense bundles of convol-utions anterior to the testes
Cirrus pouch	Elongated	Elongated, Cylindrical	Oval
Ovary	Spherical	Medium almost circular, compact with small acini	Not mentioned
Vagina	Posterior to cirrus pouch	Posterior to cirrus pouch	Posterior to cirrus pouch.
Paruterine organ	Two, saccular transversely elongated	Develops from uterus, situated below dorsal and ventral excretory canal.	Spherical on posterior lateral surface
Genital pores	Marginal	In anterior half	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *STILESIA* RAILLET, 1893.

Species	***S. southwelli*** **Shinde *et al*., 1982**	***C.aurangabadensis*** **Majid*, et al*., 1982**	***S. garhwalensis*** **Malhotra and Capoor, 1983.**
Country	India	India	India
Host	*Capra hircus*	*Ovis bharal*	*Capra hircus*
Scolex	Quadrangular, broader anteriorly	Large, spherical in diameter	Large,0.510-0.840x0.675-01.235
Mature Segment	Broader than long, almost 5 times broader	Broader than long, 0.114 in length and2.414 in breadth	Broader than long, 0.045-0.020 x 0.555-1.805.
Testes	Only 4 in each group in two groups outside the long. excretory canal	Rounded in two lateral groups and on each lateral side 5 on each canal	0-9 in numbers on each lateral side, oval or spherical.
Vas deferens	Very much coiled, reaching up to ovary	Not coiled, reaches up to longitudinal excretory canal	coiled
Cirrus pouch	Sac like	Elongated, cylindrical in anterior of the segment	Oval extending up to half of the lateral margin and long. ext. canal, cirrus unarmed
Ovary	Small, rounded without acini	Medium sized, compact in the center.	Small spherical
Vagina	Posterior to cirrus pouch	Thin tube, posteriodorsal to cirrus pouch	Posterior to cirrus pouch
Paruterine organ	Two, saccular,transversely elongated, containing eggs, 10-15 in number	Two in numbers	Two in each segment, small, one on each lateral side

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *STILESIA* RAILLET, 1893.

Species	***S. kotwarensis*** **Malhotra and Capoor 1983**	***S. marathwadensis*** **Shinde *et al*., 1985**	***S. jadhavae*** **Jadhav, 1999**
Country	India	India	India
Host	*Ovis bharal* (L.)	*Capra hircus* (L.)	*Ovis bharal* (L.)
Scolex	Large	Circular, measuring 0.89-0.99	Globular, marked off from body
Mature Segment	Broader than long	Broader than long 0.022-0.025 x 0.37-0.38	8 times broader than longer
Testes	Oval to spherical, 1-12 in numbers	Rounded in two groups, 5-7 in number, post lateral to ovary	Rounded, 5-7 in number
Vas deferens	Coiled	Straight	Not mentioned
Cirrus pouch	Oval, extending half way, cross between lateral and ventral margin	Oval, elongated, cylindrical, present at anterior margin	Medium in size, oval in shape
Ovary	Small, spherical, situated inner to longitudinal excretory canal on poral side.	Medium size oval in shape, compact in anterior half of the segment	Rounded
Vagina	Posterior to cirrus pouch	Starts from posterior side of cirrus pouch	Thin, anterior to cirrus pouch
Paruterine organ	Small, two in each segment	Large, Two in number, oval in shape	Not mentioned
Genital pores	Irregularly alternate at anterior 1/3rd level of lateral margin of segment	Marginal	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *STILESIA* RAILLET, 1893.

Species	*S. yawalensis* , Kalse *et al.*, 1999	*S. dhondagae* Deshmukh and Shinde, 2001	*S. pandeyi* Nanware and Jadhav, 2004
Country	India	India	India
Host	*Capra hircus*	*Capra hircus*	*Capra hircus*
Scolex	Quadrangular, distinctly marked off from strobila.	Quadrangular, broad as well as posteriorly	Large, globular
Mature Segment	Broader than long	Broader than long	Broader than long
Testes	Rounded, in two groups, 5-6 in numbers	Oval, arranged in 2 rows, 8-10 in numbers	Oval, in 2 lateral field, 20 in numbers
Vas deferens	Thin, short, curve	Short	Short, medium
Cirrus pouch	Oval, present at posterior 1/2nd-1/3rd region of segment	Small, oval, situated middle to posterior side	Small, elongated, somewhat oval at 1/3rd of anterior margin of segment
Ovary	Medium, globular, single mass	Distinctly bilobed, elongated, has 8-9 acini in each lobe.	Small, oval, near anterior margin of the segment
Vagina	Thin, anterior to cirrus pouch	Thin tube	Thin, posterior to cirrus pouch
Paruterine organ	Not mentioned	Simple	Spherical on posteriolateral surface,
Genital pores	Oval, marginal	Marginal	Oval, marginal, 1/3rd from anterior margin of the segment

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS STILESIA RAILLIET, 1893.

Species	*S. indapurensis* Khadap, *et al*., 2004	*S. daulatabadensis* Shelke *et al*., 2004	*S.songirensis* Kalse and Patil 2008
Country	India	India	India
Host	*Capra hircus*	*Capra hircus*	*Capra hircus*
Scolex	Medium, quadrangular, simple broad with 4 suckers	Medium. globular, with 4 suckers large oval, rostellum absent.	Globular, broad anteriorly and narrow posteriorly
Segment	Thin, small, squarish, broader than long	Medium, squarish, broader than long	Wider than long craspedote
Testes	Medium, oval, 8-9 in numbers	Small to medium, oval, 11 in numbers. 7 on poral and 4 on aporal side.	7-8 in number (4+3 or 4+4 on each side)
Vas deferens	Thin, short, curve	Thin, medium, slightly curved	Slightly coiled
Cirrus pouch	Large, elongated, oval, slightly curved, obliquely placed	Medium, oval	Oval in shape
Ovary	Medium in size, oval in shape	Medium, oval, single mass, $1/3^{rd}$-$1/4^{th}$ from lateral margin	Oval with prominent acini
Vagina	Thin, placed posterior to cirrus pouch	Thin, long, placed posteriorly or anteriorly to cirrus pouch, slightly wavy.	Posterior to cirrus pouch
Paruterine organ	Two in numbers	Two in numbers	Not mentioned

THE CHART SHOWING AN ACCOUNT OF THE OLD AND NEW SPECIES OF THE GENUS *STILESIA* RAILLIET, 1893

Species	***S.kapadnensis*, Kalse and J.R.Patil 2008**	***S. ovisi* n.sp.**
Country	India	India
Host	*Capra hircus*	*Ovis bharal*
Scolex	Globular, broad anteriorly and narrow posteriorly	Large, rectangular, well marked. round, over lapping 4 suckers
Mature Segment	Wider than long craspedote	11-12 times broader
Testes	4-6 in number, in two groups	Oval, 7-8 in number., 3 poral and 4-5 on a poral side
Vas deferens	Thin, coiled	Short, medium, transversely placed
Cirrus pouch	Medium, oval cirrus thin	Small, sac like, somewhat oval, cirrus thin, slightly curved
Ovary	Large, rounded with acini in the centre of the segment	Small, rounded , compact
Vagina	Vagina dorsal to cirrus pouch	Thin tube at anterior region runs transversely to Ootype
Paruterine organ	Paruterine organs large, oval	Small, rounded, two in numbers
Genital pores	Unilateral, irregularly alternate	Small, oval, anterior, marginally placed, irregularly alternate.

A Key to the Species of the genus *Stilesia Railliet,* 1893.

Vagina anterior to cirrus pouch 1

Vagina posterior to cirrus pouch 2

Vagina postero-ventral to cirrus pouch - S. *govindae* Padwal & Jadhav, 2006

1) Scolex rounded 3

Scolex globular 4

Scolex quadrangular 5

2) Mature proglottids longer than broad 6

Mature proglottids broader than long 7

Mature proglottids squarish in shape 8

3) Cirrus pouch pyriform - *S. globipunctata* Railliet, 1893

Cirrus pouch oval - S. *hepatica* Wolffhugel, 1903

Cirrus pouch cylindrical - S. *vittata* Railliet, 1986

4) Ovary lobulated - S. *jadhavi* Nanware *et a.,* 2005

Ovary sac like - S. *capari* Patil *et al*., 2002

Ovary rounded - S. *jadhavae* Jadhav, 1999

5) Testes 5-6 in number - *S. yawalensis* Kalse et *al*., 1999

Testes 7-8 in number - ***S. ovisi* n.sp.**

Testes 8-10 in number - *S. dhondagae* Deshmukh and Shinde, 2001

6) Cirrus pouch elongated - *S. okapi* Leiper, 1936

Cirrus pouch cylindrical - *S. leiperi* Kadam *et al*., 1950

Cirrus pouch oval in Shape - *S. caballeroi,* Kalyankar *et al*., 1981

7) Scolex quadrangular - *S. southwelli,* Shinde *et al*., 1982

Scolex spherical in Shape - S. *aurangabadensis* Jadhav e*t al*.,1902.

Scolex globular - 9

Scolex circular - 10

8) Cirrus pouch oval in shape - *S.daulatabadensis* *Shelke et al., 2004.*

Cirrus pouch elongated - S. *indapurensis* Khadap et. *al.*, 2004

9) Ovary spherical - *S. garhwalensis* Malhotra and Capoor, 1983.

Ovary oval in shape - *S.pandeyi* Nanware and Jadhav, 2004

10) Vas deferens straight tube - S. *marathwadensis* Shinde *et al*., 1985

Vas deferens coiled tube - S. *kotwarensis* Malhotra and Capoor, 1983

Eucestoda	Wardle, McLeod and Radinovsky 1974
Cyclophyllidea	Ben. in Braun, 1900
Taeniidae	Ludwing, 1886
Taenia	Linnaeus, 1758

***Taenia taeniaeformis* (=*Hydatigera taeniaeformis*)** (Batsch, 1786)

GENERIC DIAGNOSIS

Rostellum with a double crown of hooks. Neck usually distinct. Strobila large, with numerous proglottides.Testes very numerous, not divided into two lateral groups,intruding into post vitellarian field or into space between ovary and Vitelline gland and only exceptionally. Cirrus pouch pyriform, not muscular Genital pores irregularly alternating. Ovary two winged, at posterior end of proglottis; Vitelline gland compact or elongated transversely, post ovarian, gravid uterus with long median stem and subdivided lateral branches and whole inter vascular medulla.Vagina opening behind cirrus.Larval stage cysticercus's, with only one scolex, in herbivorous mammals, occasionally in humans.Adults in carnivorous mammal including humans.

INTRODUCTION

The genus *Taenia* was erected by Linnaeus. 1758. as a type species *T. solium* in man. Nichol, *et al*., 1981 studded intermediate host of *T. taeniaeformis,* Strobilocercusis a larval stage of *T. taeniaeformis* which, commonly found in a liver of intermediated host through contaminated water

or feed materials with infected cat feaces. (Nichol, *et al*. 1981; Ekanayake, *et al.*1999) The final hosts are carnivores of the families, Felidae, Canidae and Mustelidae, including domestic cats and dogs (Nichol, *et al*., 1981). Neck region of *T. taeniaeformis* very small or absent, (*Iwaki, et al*., 1994), claw hammer shaped hooks (Dollfus, 1938).

DESCRIPTION

Seven specimens of the cestode parasites were collected from the intestine of a cat.*Felis domesticus* at Loni, Tal.Rahata, Dist. Ahmednagar M.S. India; in the month of November, 2007.

These cestodes were flattened, preserved in 4% formalin, 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. All measurements were given in millimeters

The scolex is large in size dome shaped, highly muscular, narrow anteriorly, broad posteriorly and measures 1.425(1.412-1.433) in lengths and 1.407(1.324-1.491) in breadth rostellum large in size, rounded in shape, with double crown of hooks and measures (0.622) in diameter. The hooks are claw hammer shaped, (44) in numbers.small and large in size, arranged in two circles.Smaller hooks measures 0.236(0.248-0.255) in lengths and 0.073(0.071-0.075) in breadth. where as the larger hooks are measures 0.380(0.350-0.411) in lengths and 0.102(0.100-0.104) in breadth. The suckers

are medium in size, arranged in four corners, oval in shaped, and measures0.293 (0.271-0.315) in lengths and 0.311(0.307-0.315) in width.
The neck is absent.

Mature segment are craspedote slightly broader than long.with irregular lateral margins and projections at the anterior and posterior corners of the segments and measures 2.346 (2.324-2.368) in lengths and 2.657(2.640-2.675) in breadth.

The testes are small rounded numerous in numbers, evenly distributed and measures 0.043(0.026-0.061) in diameter.The cirrus pouch medium, cylindrical, on middle of the lateral margin of the segment. And measures 0.223 (0.210-0.236) in lengths and 0.107(0.105-0.114).The cirrus is thin unarmed, slightly coiled, contained with in the cirrus pouch and measures 0.214 (0.201-0.228) in lengths and 0.026(0.017-0.035) in breadth.

Vas deferens is broad, small one loop, ventral to excretory stem, runs up to the middle region of the segment. And measures 0.657 (0.649-0.666 in lengths and 0.034(0.026-0.043) in breadth.

Ovary bilobed trace follicular extends laterally in the posterior region of the segment, unequal in size, poral lobe slightly smaller and narrow, aporal lobe large and broad. Measures 0.964 (0.956-0.973) in lengths and 0.232(0.210-0.250) in breadth.

The vagina is thick, wide and ventral to the cirrus pouch. starts from the genital pore, extends medially turns posteriorly runs a long distance, enlarges

and forms the receptaculum seminis, near the ovary and measures 2.365(2.350-2.380)in lengths and 0.034(0.026-0.043)in breadth. Receptaculum seminis is medium in size, oval in shape, measures 0.140 (0.131-0.149) in lengths and 0.061(0.052-0.070) in width, Opens in to the Vitelline duct, Vitelline duct opens in to the Vitelline gland, from the middle of the Vitelline duct forms another duct it opens in to the Mehalis gland, Mehalis gland forms oviduct, oviduct opens in to the isthmus, Mehalis gland is rounded, posterior to the ovary and measures 0.052(0.043-0.061) in diameter.

Genital pores are medium in size, oval in shape, placed anteriorly to the segment, regularly alternate measure 0.135(0.122-0.149) in lengths and 0.056(0.052-0.061) in breadth.

The longitudinal excretory canals are of medium size and measures 0.355(0342-0.368) in lengths and 0.157(0.149-0.166) in breadth

The Vitelline gland is large, elongated transversely, triangular in shape, post ovarian near the posterior margin of the segment with 14-16 acini, measures 1.096 (1.087-1.105) in lengths and 0.416(0.403-0.429) in breadth.

The gravid segments contains uterus and forms 11-13 digitiform lateral branches, measures 3.253 (3.236-3.271) in lengths and 2.732(2.587-2.877) in breadth. Eggs are rounded or slightly ovoidal embryonated. Measures 0.020 (0.017-0.024) in diameter.

DISCUSSION

The genus *Taenia* was erected by Linnaeus. 1758. as a type species *T. solium* in man.

After going through the literature, the worm under discussion turned out to be *Taenia taeniaeformis*, it referred to by some as *Hydatigera taeniaeformis*.

The worm under discussion, resembles, *T. taeniaeformis*, in having the scolex dome shaped, rostellum rounded. Mature segment broader than long (craspedote), neck absent, ovary bilobed, double crown of hooks, hooks are claw hammer shaped (Hall 1919). Vas deferens runs up to the middle of the segment, Vitelline gland triangular transverse plane, not contact the ovary.Uterus with 11-13 digitiform lateral branches.

1) The present cestode differs from *T. taeniaeformis* in the number of hooks 44 Vs 30-40.

2) The present cestode differs from *T. taeniaeformis* in the shape of ovary trace follicular Vs bipartite.

3) Vas deference and vagina slightly curved near the cirrus pouch Vs straight.

As the characters are minor, it is redescribed here, as *Taenia taeniaeformis*. From *Felis domesticus* collected at Loni. Tq. Rahata dist. Ahmednagar (M.S).

TAXONOMIC SUMMARY

Genus	*Taenia*, Linnaeus, 1758
Species	*Taenia taeniaeformis*, (Batsch, 1786)
Type host	*Felis domesticus*.
Habitat	Intestine.
Type locality	Loni,Tal. Rahata, Dist. Ahmednagar (M.S.)
	Holotype Deposited in Helminthology
	Research Lab.
Para type	Dept. of Zoology, Dr.
	B.A.M.U. Aurangabad.
Date of collection	November, 2007.
Etymology	As the cestode species reported
	from Ahmednagar (M.S.) India.