

Circumoncobothrium subhashae n.sp.

Cotyloda	Wardle, McLeod and Radinovsky 1974.
Pseudophyllidea	Carus, 1863.
Ptychobothridae	Luhe, 1902.
<i>Circumoncobothrium</i>	Shinde, 1968.

***Circumoncobothrium subhashae* n. sp.**

DESCRIPTION

Twelve specimens of Cestode parasites were collected from the intestine of *Channa marulius* from Panchaganga river at Ichalkaranji, Tal. Hatkanangale, Dist. Kolhapur, M.S. India, in the month of October 2006.

Out of these three parasites were flattened, preserved. The worms were preserved in 4% formalin and specimens were stained with Harris haematoxylin, passed through various alcoholic grades, cleared in Xylol, mounted in D.P.X. and then observed under microscope for taxonomical studies.

The worms were thin, medium in size, consisting of scolex, numerous immature, mature and gravid proglottids.

The scolex is small, somewhat squarish in shape. Scolex measures 0.485 [0.388 - 0.582] in length and 0.364 [0.194 - 0.533] in breadth. The scolex bears, rostellum which is medium in size. The rostellar hooks are 35 to 40 in number, arranged in four quadrants, rod shaped, measures

0.062 in length and 0.006 in width. It bears pair of bothria, which are large in size occupying almost whole region of the scolex, measures 0.582 [0.485 - 0.631] in length and 0.242 [0.194 - 0.291] in width.

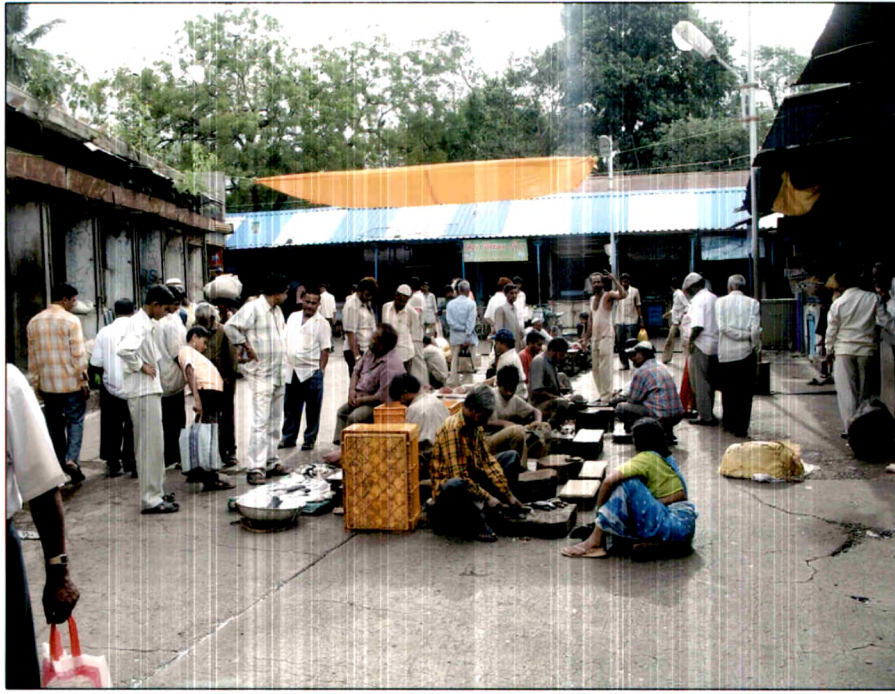
The neck is absent.

The mature segments are broader than long, almost four times broader than long and measures 0.349 [0.339 - 0.359] in width. The testes are medium, oval, preovarian, scattered almost lateral to ovary, 50-60 in number, unevenly distributed from anterior to posterior side of the segment and measures 0.015 in length and 0.008 in breadth.

The cirrus pouch is of medium size, oval in shape, preovarian, slightly obliquely placed, almost in the centre of the segment, measures 0.048 in length and 0.033 in width. The cirrus is thin, short, contained within the cirrus pouch and measures 0.043 in length and 0.009 in width. The vas deferens short, thin, extends anteriorly and measures 0.046 [0.043 - 0.048] in length and 0.006 [0.004 - 0.007] in width.

The ovary is medium in size, distinctly bilobed, present near the posterior margin of the segment; ovarian lobes compact, rounded, almost equal in size and measures 0.060 [0.048 - 0.072] in length and 0.072 [0.048 - 0.097] in breadth. Vagina arises from the genital pore, straight, runs obliquely, open into ootype, measures 0.046 [0.043 - 0.048]

FISH MARKET AT KOLHAPUR

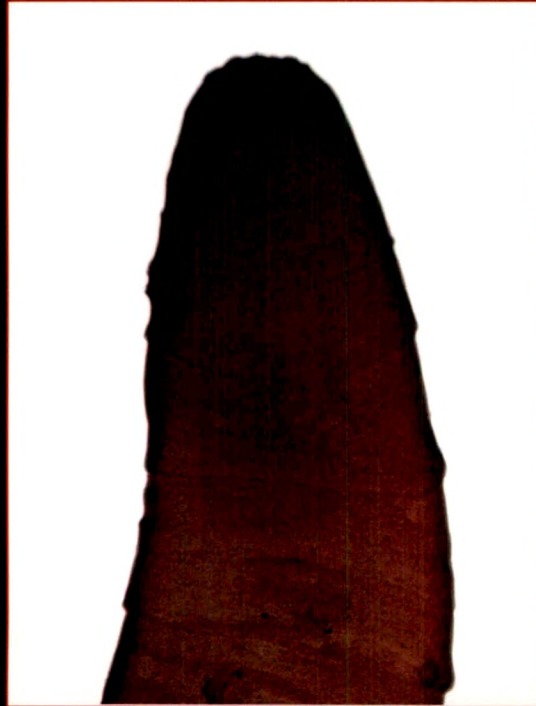


TAXONOMY

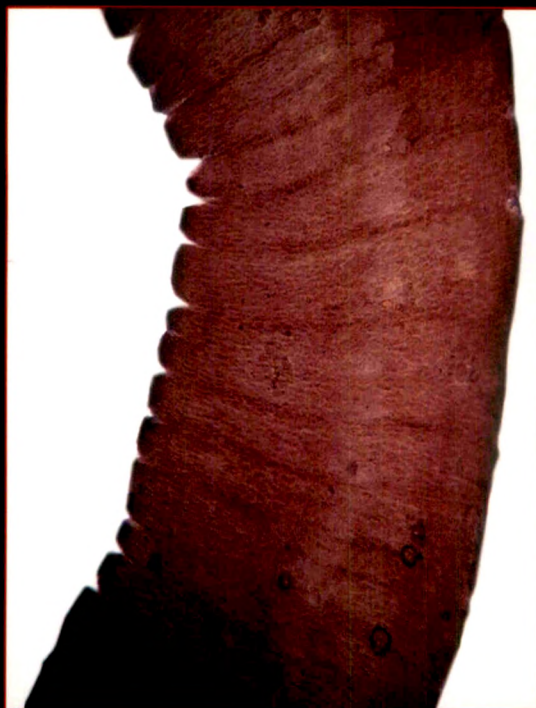


PLATE - 1

Ptychobothrium shindei n.sp.



Scolex



Mature segments

PLATE - I

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

A. Scolex

B. Mature Segment

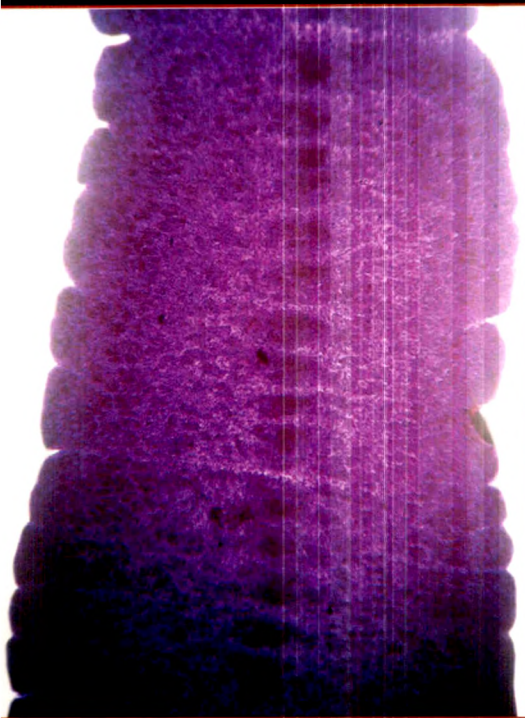
Senga kolhapurensis n.sp.



Scolex



Hooks



Mature segments

PLATE - II

***Senga kolhapurensis* n. sp.**

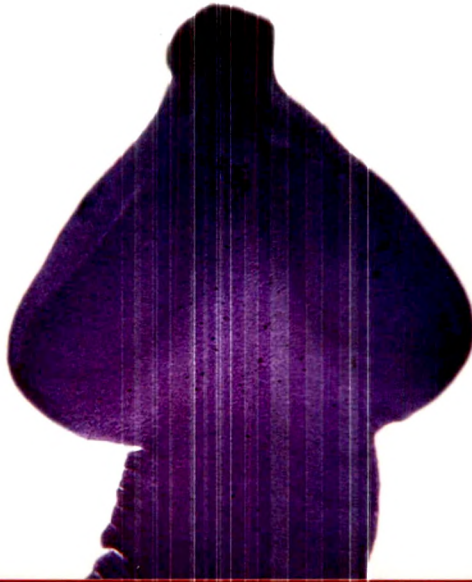
A. Scolex

B. Hooks

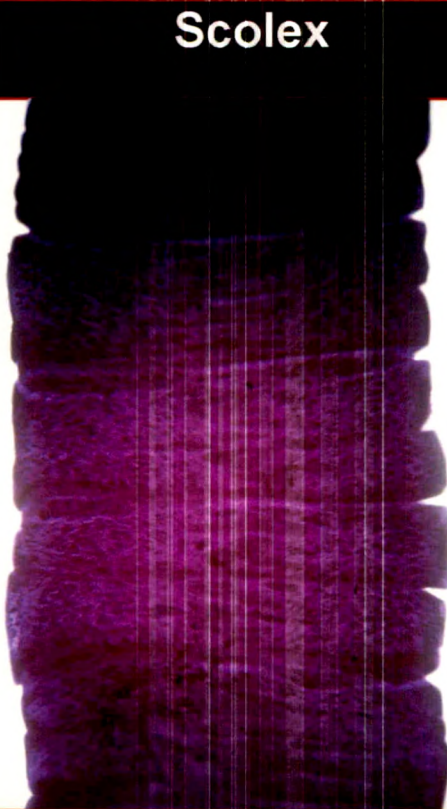
C. Mature Segment

PLATE - 3

Senga bhauraoae n.sp.



Scolex



Mature segments

PLATE - III

***Senga bhauraoae* n. sp.**

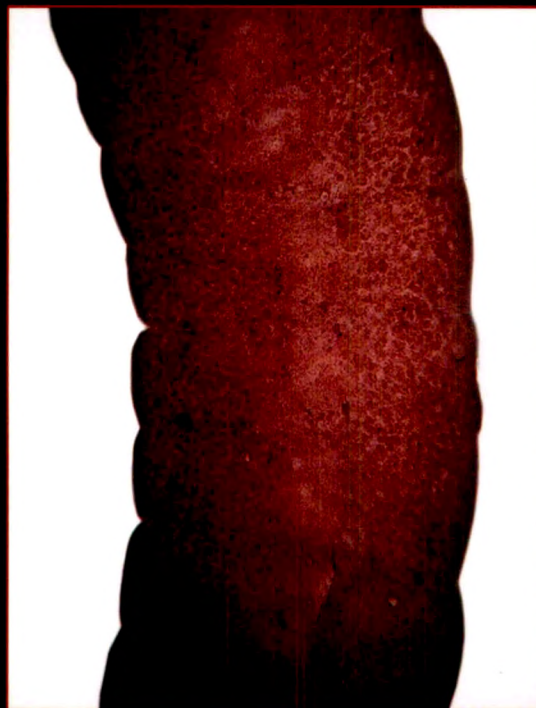
- A. Scolex
- B. Hooks
- C. Mature Segment

PLATE - 4

Circumoncobothrium panchagangae n.sp.



Scolex



Mature segments

PLATE - IV

***Circumoncobothrium panchagangae* n. sp.**

- A. Scolex
- B. Hooks
- C. Mature Segment

PLATE - 5

Circumoncobothrium subhashae n.sp.



Scolex



Hooks

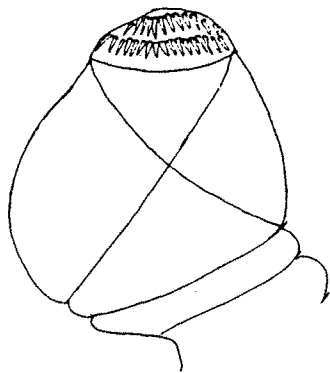


Mature segments

PLATE - V

***Circumoncobothrium subhashae* n. sp.**

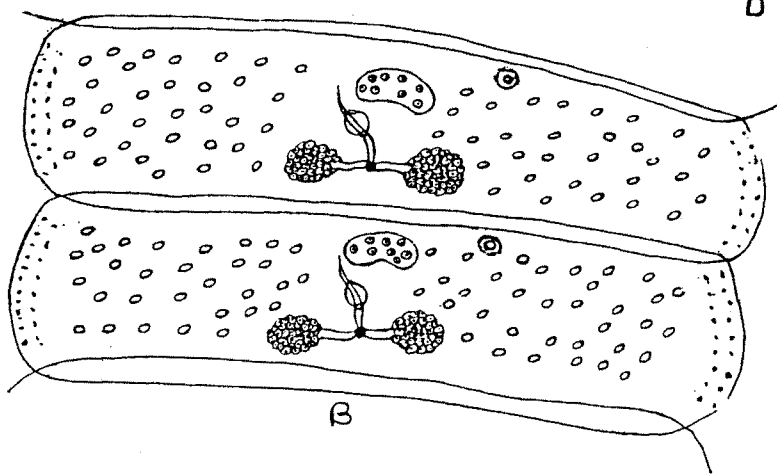
- A. Scolex
- B. Mature Segment
- C. Gravid segment
- D. Hooks



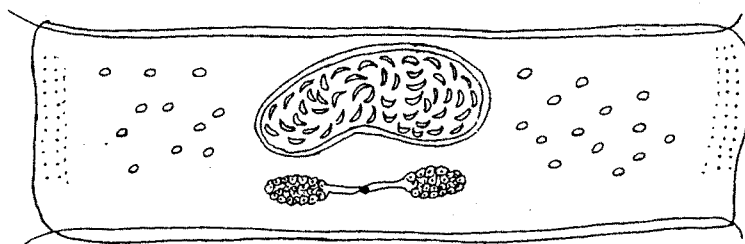
A



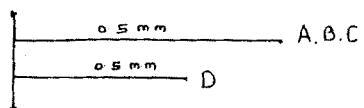
D



B



C



in length and 0.007 [0.004 - 0.009] in width. The ootype is almost rounded and measures 0.069 in diameter.

Vagina and cirrus opens through common pore known as genital pore which is oval, preovarian.

Fully gravid segments are broader than long and consist of bean shaped uterus, placed at the posterior margin of the segment, measures 0.133 [0.121- 0.145] in length and 0.400 [0.364 - 0.436] in width. Uterus filled with sickle shaped eggs, 0.048 in length and 0.009 in width.

The vitellaria are granular, the vitelline granules are small in size, marginal on either side of the segment.

DISCUSSION

The genus *Circumoncobothrium* was established by Shinde, 1968 with the type species *C. ophiocephali*. Later on the following species are added to this genus.

- 1) *C. aurangabadensis* Jadhav and Shinde, 1976
- 2) *C. raoii* Jadhav and Shinde, 1976
- 3) *C. gachuai* Jadhav and Shinde, 1976
- 4) *C. shindei* Chincholikar and Shinde 1977
- 5) *C. bagariusi* Chincholikar and Shinde 1977
- 6) *C. khami* Shinde, 1977.
- 7) *C. yamaguti*, Jadhav *et al.* 1990
- 8) *C. alii*, Shinde *et al.* 1994
- 9) *C. vadgaonensis* Patil, 1998

- 10) *C. baimaii* Wongsawad and Jadhav, 1998
- 11) *C. punctatusi*, Kalase and Shinde *et al.* 1999.
- 12) *C. armatusae* Pawar *et al.* 2002
- 13) *C. mastacembulusae* Shinde *et al.* 2002
- 14) *C. manjari* Tat and Jadhav, 2004
- 15) *C. vitellariensis* Supugade *et al.* 2005.
- 16) *C. panchagangae* n. sp. (described earlier)

The present communication deals with the description of *C. subhashae* n. sp. which bears scolex small, squarish; rostellar hooks are 35-40 in number. Neck is absent. Testes 50-60 in number. Granular vitellaria.

1. The worm under discussion *Circummonocobothrium subhashae* differs from *C. ophiocephali* which bears distinct scolex with 0.81 length and 0.51 breadth, rostellar hooks are 80 in numbers, which are rod shaped. Neck is present. Testes are 70-80 in numbers and ovary is single, conical mass with irregular bands. Vitellaria are follicular.
2. The present cestode differs from *C. aurangabadensis* in the shape of scolex which is broad in middle and narrow at both ends, rostellar hooks are 42 in number, Neck is present. Testes are round 135-145 in number.
3. The present tapeworm differs from *C. raoii* which is having scolex broad in the middle, narrow at both ends, rod shaped hooks; neck present; testes arranged densely in two fields, 210-215 in number.

4. The present worm differs from *C. gachuae* in pear shaped scolex, two types of hooks that are large and small; neck present; squarish mature segments. Testes are densely arranged in two fields, 375-400 in numbers and follicular vitellaria.
5. The cestode under discussion differs from *C. shindei* in shape of scolex, narrow anteriorly and broad posteriorly, rod shaped, two types of hooks large and small; neck present. Testes 260-275 in number. Dumb-bell shaped ovary.
6. The present tapeworm differs from *C. bagariusi* in not having rostellar hooks, 55 in number, rod shaped. Testes 275-285 in number. Ovarian lobes with 5-6 globular acini and follicular vitellaria.
7. The present cestode differs from *C. khami*. which bear cylindrical scolex with even width, apical disc separated by notch, rostellar hooks are of two types that are large and small. Mature segments are squarish in shape and testes 190-200 in numbers and vitellaria are follicular.
8. The present form differs from *C. yamaguti* in having distinct scolex narrow anteriorly and broad posteriorly rostellar hooks are 56 in number. The number of testes are 130-150.
9. The tapeworm under discussion differs from *C. alii* which bears triangular scolex, rostellar hooks are 34 in number; neck is present. Testes are 230-240 in number.
10. The present cestode differs from *C. uadgaonensis* in not having triangular scolex, rostellar hooks are 56 in

number; neck is present; mature segments are slightly broader than long. Testes are 490-510 in numbers and vitellaria are follicular.

11. The present worm differs from *C. baimaii* which bears pear shaped scolex. Neck is present. Testes are 88-100 in numbers.
12. The present cestode differs from *C. punctatusi* in not having rectangular scolex; neck is present; mature segments are squarish; testes 140-150 in numbers. Vitellaria follicular, follicles are small, round in 3-6 rows on each side.
13. The tapeworm under discussion differs from *C. armatusae* which have large, triangular scolex, rostellar hooks are 58 in numbers. Testes 190-200 in number and ovarian lobes are unequal.
14. The present cestode differs from *C. mastacembelusae* which bears pear shaped scolex, rostellar hooks are 38 in number. Testes are 130-140 in numbers. Ovary compact with unequal lobes and follicular vitellaria.
15. The present tapeworm differs from *C. manjari* which shows triangular scolex; neck is present. Testes are 128-145 in numbers and follicular vitellaria.
16. The present cestode under discussion differs from *C. vitellariensis* in not having large triangular scolex number of testes 250-260 and dumb-bell shaped ovary. Vitellaria is follicular.
17. The tapeworm under discussion differs from *C. panchagangae* which shows large, conical shaped scolex, rostellar hooks are 50-52 in number; mature

segments six times broader than long; the number of testes 80-90 and follicular vitellaria.

The above noted characters are valid enough to accommodate these worms into a new species and accordingly the name *C. subhashae* n sp. is proposed in honour of Dr. S. V. Kharade, Reader and Head, Department of Zoology, Krishna Mahavidyalaya, Rethare, Bk, who spend his total life in the welfare of department.

Type species	<i>Circumoncobothrium subhashae</i> n. sp.
Host	<i>Channa Marulius</i>
Habitat	Intestine
Locality	Ichalkaranji, Dist. Kolhapur, M.S., India
Date of collection	24 th October, 2006.

A KEY TO THE SPECIES OF THE GENUS

***Circumoncobothrium* Shinde. 1968**

Vitellaria granular	1
Vitellaria follicular.....	2
1. Neck present	3
Neck absent	4
2. Mature segment Broader than long.....	5
Mature segment squarish.....	6
3. Scolex - Narrow anteriorly and Broad.....	<i>C. Shindei</i> Chincholikar and Shinde-1977
Scolex - broad in middle and narrow at both end.....	7
Scolex - Triangular	<i>C. alii</i> Shinde et. al. 1994
Scolex - Pear shaped.....	<i>C. baimaii</i> Wongsawad and Jadhav 1998
4. Hooks below 50 in number.....	<i>C. subhashae</i> n.sp.
Hooks above 50 in number.....	<i>C. Yamaguti</i> Jadhav et. al. 1990.
5. Neck present	8
Neck absent	9
6. Scolex cylindrical	<i>C. Khami</i> Shinde, 1977
Scolex pear shaped	<i>C.gachuae</i> Jadhav and Shinde,1976
Scolex rectangular	<i>C.punctatusi</i> Kalase et al. 1999

7. Testes in between 100-200.....*C. aurangabadnensis*
in number Jadhav and Shinde, 1976
Testes above 200 in number *C. raoii*
Jadhav and Shinde, 1976
8. Testes below 100 in number*C. panchagangae* n. sp.
Testes in between 100-150
in number*C. mastacembulusae*
Shinde *et. al* 2002
Testes in between 150-200 in
number*C. armatusae* (miror)
Powar *et. al* 2002
Testes above 200 in number10
9. Hooks below 50 in number..... 11
Hooks above 50 in number 12
10. Ovary bilobed*C. bagarus*
Chincholikar and
Shinde, 1977
Over dumb-bell shaped *C. vitellariensis*
Supugade *et. al* 2005
11. Testes below 100 in number.....*C. armalusae*
Shinde *et. al* 1999
Testes above 100 in number*C. manjari*
Tat and Jadhav, 2004.
12. Scolex triangular*C. vadgaonensis*
Patil, 1998.
Scolex distinct*C. ophiocephali*
Shinde, 1968.

**Comparative chart showing an account of old and new species of the
genus *Circumcobotrium* Shinde, 1968.**

Species ♂ Characters ♀	<i>C. ophiocephali</i> Shinde, 1968	<i>C. aurangabadensis</i> Jadhav and Shinde, 1976	<i>C. raoii</i> Jadhav and Shinde, 1976
Country	India	India	India
Host	<i>Ophiocephalus leucopunctatus</i>	<i>Mastacembellus armatus</i>	<i>Mastacembellus armatus</i>
Scolex	Distinct, length 0.81, breadth 0.51	Broad in middle and narrow at both ends, 1.68 x 0.91	Broad in middle and narrow at both ends, 1.96 x 1.86
Hooks	80, rod shaped	42, rod shaped	46, rod shaped in single circle
Neck	Present	Present	Present
Mature segments	Broader than long	Broader than long	Broader than long
Testes	70-80 in numbers, rounded in two lateral fields	135-145, rounded, scattered throughout the segment	210-215 rounded, arranged densely in two fields
Ovary	Single, conical mass with irregular bands, thinner in middle and expanded at lateral ends, lobes with 2-3 acini.	Bilobed, each lobe with 3-4 acini, situated near the posterior margin of the segment	Bilobed, situated at almost to the posterior margin of the segment
Vitellaria	Follicular	Granular	Granular

Species ♂ Characters ♀	<i>C. gachuae</i> Jadhav and Shinde, 1976	<i>C. shindei</i> Jadhav and Shinde, 1977	<i>C. bagariusi</i> Jadhav and Shinde, 1977
Country	India	India	India
Host	<i>Ophiocephalus gachua</i>	<i>Mastacembellus armatus</i>	<i>Bagarius sp.</i>
Scolex	Pear shaped	Narrow anteriorly, broad posteriorly.	Narrow anteriorly, broad posteriorly.
Hooks	46, of two types large and small	49, rod shaped, of two types large and small	55, rod shaped of two types large and small
Neck	Present	Present	Present
Mature segments	Squarish, 1.04 x 1.44	Broader than long, 0.38 x 1.79	Broader than long, 0.29 x 2.12
Testes	375-400 in numbers, densely in two fields	260-275 in numbers, evenly distributed	275-285 in numbers, in two lateral fields.
Ovary	Bilobed, post-equatorial with short, blunt with 5-6 acini.	Bilobed, dumb-bell shaped with long isthmus, lobes rounded and compact.	Bilobed, in the middle 1/3 rd of the segment, each lobe with 5-6 globular acini.
Vitellaria	Follicular	Granular	Granular

Species ♂ Characters ♀	<i>C. khami</i> Shinde, 1977	<i>C. yamaguti</i> Jadhav et. al., 1990	<i>C. aliti</i> Shinde et. al., 1994
Country	India	India	India
Host	<i>Ophiocephalus</i>	<i>Mastacembellus armatus</i>	<i>Mastacembellus armatus</i>
Scolex	Cylindrical with even width, apical disc separated by notch, 1.06 x 0.38	Distinct arrow anteriorly, broad posteriorly, 2.35 x 0.455.	Triangular, narrow anteriorly, broad posteriorly 1.26 x 0.64.
Hooks	48, lamcet shaped, of two types large and small	56, single circle, straight stout.	34, single circle, of two types.
Neck	Absent	Absent	Present
Mature segments	Squarish, 1.04 x 1.44	Broader than long, 0.32 x 2.33	Broader than long, 0.33 x 1.53
Testes	190-200 in numbers, almost rounded	120-150 in numbers, in two lateral fields	230-240 in numbers, evenly distributed.
Ovary	Bilobed, each lobe compact situated at the posterior and center of the segment.	Bilobed, centrally placed at the posterior margin of the segment.	Distinct bilobed, centrally placed lobes oval compact.
Vitellaria	Follicular	Granular	Granular

Species ♂ Characters ♀	<i>C. vadgaonensis</i> Patil, 1998.	<i>C. baimaii</i> Wongsawad and Jadhav, 1998.
Country	India	India
Host	<i>Mastacembellus armatus</i>	<i>Mastacembellus armatus</i>
Scolex	Triangular, 1.943 x 0.196	Pear shaped, 0.875 - 1.025 x 1.25-1.45
Hooks	56, of two types large and small single circle.	48, of two types large and small single circle.
Neck	Present	Present
Mature segments	Slightly broader than long, 0.844 x 1.011.	Broader than long, 1.75-2.10 x 0.25-0.375.
Testes	490-510 in numbers, evenly distributed	88-100 in numbers.
Ovary	Distinctly bilobed, lobes compact, situated at posterior half of the segment	Compact.
Vitellaria	Follicular	Granular

Species ♂ Characters ♀	<i>C. punctatusi</i> Kalase and Shinde <i>et al</i> 1999	<i>C. mastacembelusae</i> Shinde, <i>et. al.</i> , 2002.
Country	India	India
Host	<i>Ophiocephalus punctatus</i>	<i>Mastacembellus armatus</i>
Scolex	Medium, rectangular	Pear shaped
Hooks	40-50 (48) arranged in single circle	38, rod shaped.
Neck	Present	Absent
Mature segments	squarish, 6-7 times broader than long	Broader than long.
Testes	140-150 in numbers	130-140 in numbers, unevenly distributed in lateral field.
Ovary	Medium, short, blunt, rounded acini	Distinct bibloed, compact with unequal lobes.
Vitellaria	Follicular, small, round in 3-6 rows on each side.	Follicular

Species ♂ Characters ♀	<i>C. armatusae</i> Pawar <i>et. al.</i> , 2002.	<i>C. manjari</i> Tat and Jadhav, 2004.	<i>C. vitellariensis</i> Supugade, <i>et. al.</i> , 2005.
Country	India	India	India
Host	<i>Mastacembellus armatus</i>	<i>Ophiocephalus gachua</i>	<i>Mastacembellus armatus</i>
Scolex	Triangular, broad at the base tapering at apex.	Triangular, broad at the base tapering at anteriorly. 1.162 - 1.176 x 0.295 - 0.780	Large, Triangular, broad at the base narrow at the apex.
Hooks	58, straight, small and large in a single circle.	48, small and large in a single circle.	48, round at the base, pointed at the apex, short and long.
Neck	Absent	Present	Absent
Mature segments	Broader than long.	Broader than long, convex lateral margin 0.314 x 1.534-1.549.	3-4 times broader than long 0.50-0.58 x 1.80-1.84.
Testes	190-200 in numbers, unevenly distributed in two groups	128-145 in numbers, rounded.	250-260 in numbers, oval, pre-ovarian.
Ovary	Distinctly bilobed, situated at posterior half of the segment, lobes unequal.	Bilobed, just posterior to the middle of the segment.	Bilobed, dumb-bell shaped, transversely placed near posterior margin of the segment.
Vitellaria	Follicular	Follicular	Follicular

Species ♂ Characters ♀	<i>Circumconcothrium panchagangae</i> n. sp.	<i>Circumconcothrium subhashae</i> n. sp.
Country	India	India
Host	<i>Mastacembellus armatus</i>	<i>Channa marulius</i>
Scolex	large, conical in shape	small, squarish in shape.
Hooks	40 to 50 in number anteriorly blunt and posteriorly pointed	35 to 40 in number, anteriorly blunt and posteriorly pointed
Neck	Very short	Absent
Mature segments	six times broader than long	Four times broader than long
Testes	Oval, elongate in shape 80-90 in number	Testes 50-60 in number unevenly distributed
Ovary	Compact, rounded lobes, equal in size	Distinctly bilobed, ovarian lobes compact, rounded almost equal in size.
Vitellaria	Follicular	Granular

SYSTEMATIC LIST OF
CESTODE PARASITES WITH THEIR HOSTS
 (Classification of parasites - Wardle, McLeod and
 Radinovsky, 1974)

PARASITES	HOSTS
Class : Cotyloda - Wardle, MacLeod and Radinovsky 1974	
Order : Pseudophyllidea - Carus, 1863	
Family : Ptychobothridae, Luhe, 1902	
Genus : <i>Ptychobothrium</i>	
Species : <i>P. shindei</i> n. sp.	<i>Channa marulius</i> (Hamilton, 1822)
Class : Cotyloda - Wardle, MacLeod and Radinovsky 1974	
Order : Pseudophyllidea Carus, 1863	
Family : Ptychobothridae, Luhe, 1902	
Genus : <i>Senga</i> Dollfus, 1934	
Species : <i>S. kolhapurensis</i> n. sp.	<i>Mastacembellus</i> <i>armatus</i> (Lacepede, 1800)

Class : Cotyloda -

Wardle, MacLeod and
Radinovsky 1974

Order : Pseudophyllidea -

Carus, 1863

Family : Ptychobothridae,

Luhe, 1902

Genus : *Senga* Dollfus, 1934

Species : *S. bhauraoe* n. sp.

Mastacembellus

armatus

(Lacepede, 1800)

Class : Cotyloda -

Wardle, MacLeod and
Radinovsky 1974

Order : Pseudophyllidea

Carus, 1863

Family : Ptychobothridae

Luhe, 1902

Genus : *Circumoncobothrium*

Shinde, 1968

Species : *C. panchagangae* n. sp.

Mastacembellus

armatus

(Lacepede, 1800)

**SYSTEMATIC LIST OF HOSTS
WITH CESTODE PARASITES**

HOSTS	PARASITES
<p>Class : Actinoptecygi Order : Perciformes Family : Channidae Genus : <i>Channa</i> Species : <i>C. Marulius</i> (Hamilton, 1822)</p>	<p>1. <i>Ptychobothrium shindei</i> n. sp. 2. <i>Circumoncobothrium</i> <i>subhashae</i> n. sp.</p>
<p>Class : Actinopterygii Order : Synbranchiformes Family : Mastacembelidae Genus : <i>Mastacembellus</i> Species : <i>M. armatus</i> (Lacepede, 1800)</p>	<p>3. <i>Senga kolhapurensis</i> n. sp. 4. <i>Senga bhauraoe</i> n. sp. 5. <i>Circumoncobothrium</i> <i>panchagangae</i> n. sp.</p>

Class : Cotyloda

Wardle, MacLeod and

Radinovsky 1974

Order : Pseudophyllidea

Carus, 1863

Family : Ptychobothridae,

Luhe, 1902

Genus : *Circumoncobothrium*

Shinde, 1968

Species : *C. subhashae* n. sp.

Channa maurilius
(Hamilton, 1822)