



PHOREIOBOTHRIUM HIWARAE NEW SPECIES OF THE CESTODE PARASITES FROM MARINE WATER FISH CHILOSCYLLIUM PLAGIOSUM (Anonymous Bennett 1930)

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ABSTRACT:

A new species of Cestode *Phoreiobothrium hiwarae* was erected from the marine fish *Chiloscyllium plagiosum* (Anonymous (Bennett 1930) collected from Bankot, Ratnagiri (West coast of India). We have described this new species in the genus *Phoreiobothrium* (Linton) 1989). We found *P. gawali* different from other species in body measurement, scolex length, breadth, sucker, neck, testes, ovary, vagina, genital pore, vitellaria, host and locality.

KEY WORDS: Cestoda *Phoreiobothrium*, *Chiloscyllium plagiosum*, Parasites etc.

INTRODUCTION:

Linton (1889) erected genus *Phoreiobothrium* from dusky Shark *Carcharias obscurus* at Woods Hole with its type species, *P. lasium* Linton in 1901 reported *P. triloculatum*. Later on reported



two new species in 1929 i.e. *P. exceptum*, *P. pectinatum*, Woods Hole Shivastava & Capoor (1982) reported *P. puriensis* from *Zugaena blochi* at Puri, Orissa, India. Later on Jadhav and Shinde reported *P. arabiensis* in 1984 and in 1987, Shinde and Jadhav reported *P. ratnagiriensis* from *Carcharia sacutus* at Ratnagiri, M.S. (West Coast of India). In 1990, Shinde et. al, *P. shindei* reported from *Carcharias acutus* and Jadhav et. al, in 1990 and *P. carchariasae* from *Carcharias acutus* at Bombay, M.S. India. In 2003 Pawar reported new species *P. bhagwatiensis* from Ratnagiri West Coast of India.

The present research deals with *P. hiwarae* n.sp. which is collected from, *Chiloscyllium plagiosum* (Anonymous (Bennett 1930) a marine water fish from Murud Janzira (West Coast of India) during the period of June 2009 to May 2011.

MATERIAL AND METHODS:

Two hundred and twelve specimens of worm were collected from the intestine of *Chiloscyllium plagiosum* (Anonymous (Bennett), 1930) at Murud Janzira, Dist. Raigad, West Coast of India during the June 2009 to May 2011. The collected cestode were observed under microscope, flattened, fixed in 4% formalin, stained with Harris haematoxyline dehydrated and mounted in D.P.X. Drawings were made with the aid of camera lucida. All measurements were done in millimeters.

RESULT AND DISCUSSION:

Two hundred and twelve specimens of worm were collected from the intestine of *Chiloscyllium plagiosum* (Anonymous (Bennett), 1930) at Murud Janzira, Dist. Raigad, West Coast of India during the June 2009 to May 2011.

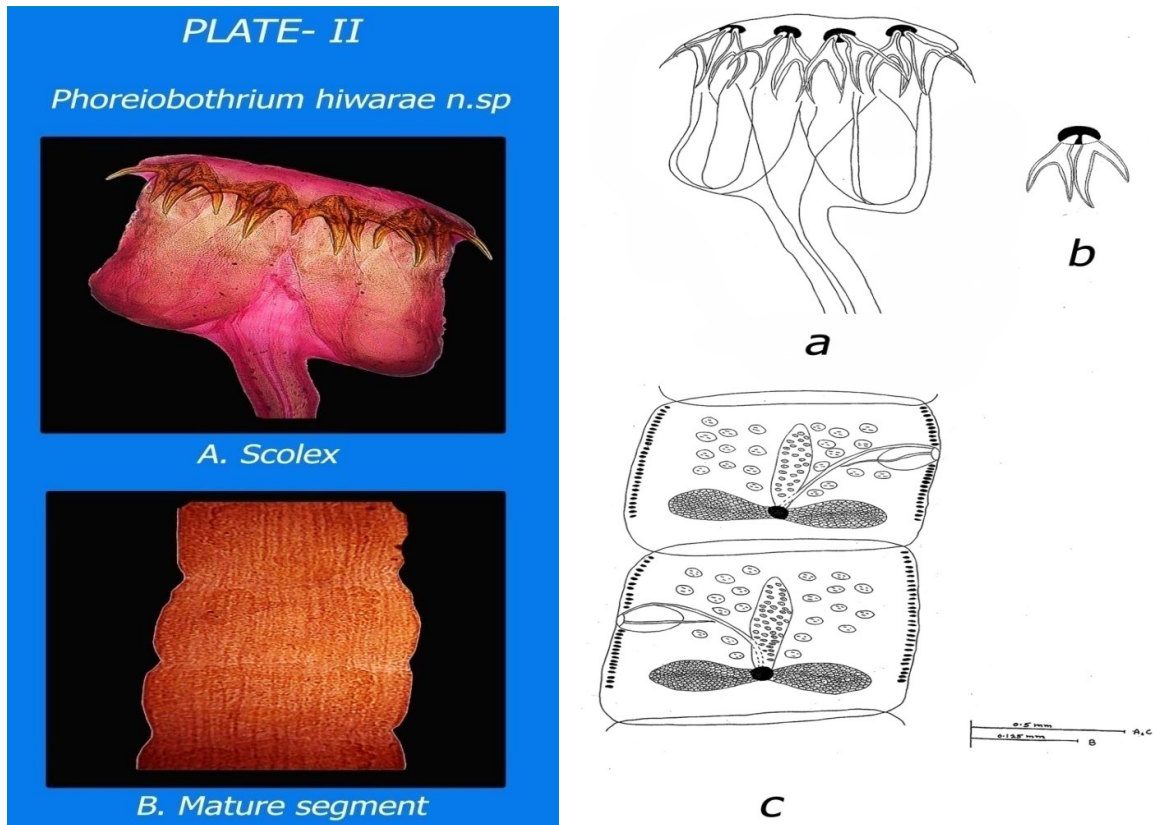


Fig. 1. Microphotograph and Camera lucida diagram of *phoreiobothrium hiwarae* n.sp.

The worm measures about 24 in length and 0.4 in breadth, with 40 segments. The scolex is quadrangular in shape, size, somewhat narrow anteriorly and broad posteriorly, with concave ventrally margins. It measures 0.81 (0.077-0.086) in length and 0.089 (0.084-0.096) in breadth. The scolex with four bothridia, each of which is concave on the external surface and the posterior end and armed with a pair of hooks each two having unequal prongs and each bothridium measures 0.073 (0.071-0.076) in length and 0.015 (0.013-0.017) in breadth. Each bothridium is with a single, loculum at its posterior end. The hooks are paired and bifurcated i.e. having two prongs, The outer prong measures 0.019 (0.017-0.022) in length and 0.003 (0.002-0.004) in breadth. The inner prong measures 0.019 (0.018-0.020) in length and 0.004 (0.002-0.007) in breadth. Each hook bears a handle, which measures 0.007 (0.006-0.008) in length and 0.001 (0.001-0.002) in breadth.

The scolex is followed by a short neck, without spines and measures 0.062 (0.060-0.067) in length and 0.016 (0.015-0.018) in breadth.

The mature segments are broader than large with convex lateral margins without spines. These segment varies in length. The segment measures 0.072 (0.065-0.080) in length and 0.089 (0.086-0.093) in breadth. Testes 20 in number, oval in shape, medium in size, pre-ovarian and measures 0.004 (0.003-0.005) in diameter. These are distributed from ovary to the anterior margin of the segment. The cirrus pouch is large oval, and elongated in shape, not reaching up to the middle of the segment just anterior to the middle, marginal and measures 0.017 (0.015-0.020) in length and 0.001 (0.001-0.002) in breadth.

The cirrus is straight slightly curved at anterior side and measures 0.017 (0.016-0.017) in length and 0.007 (0.006-0.009) in breadth. Cirrus is short, lies inside the cirrus pouch. The vas deferens is short tube runs anteriorly in the medullary part of the segment and measures 0.010 (0.009-0.011) in length and 0.006 (0.0003-0.0008) in breadth.

The ovary is slightly medium posterior to the segments and bilobed measure in size with irregular margins measures 0.028 (0.023-0.032) in length and 0.009 (0.005-0.013) in breadth.

Vagina placed antero-dorsal to the cirrus pouch which is elongated, thin tube runs starts from the common genital pore, antero-dorsal to the cirrus pouch elongated, thin tube runs transversely up to the middle of the segment, take a turn to the posterior side, runs in the middle of the segment, reaches and opens into the ootype and measures 0.058 (0.055-0.062) in length and 0.003 (0.002-0.004) in breadth. Common genital pores are small, somewhat oval, irregular alternate and measures 0.005 (0.004-0.005) in length and 0.001 (0.001-0.002) in breadth. The ootype is medium in size and rounded in shape, medium in size and post-ovarian. genital pores measures 0.005 (0.004-0.005) in diameter.

The vitellaria are large, follicular, oval and single row on each side from the anterior margin to the posterior margin of the segment except the cirrus pouch region.

DISCUSSION

The genus *Phoreiobothrium* was erected by Linton 1889, as a type species, *P. lasium* from *Carchariasobscures* at Wood Hole. Later on following species are added to this genus.

- 1) *P. trilocolatum*, Linton, 1901.
- 2) *P. exceptum*, Linton, 1924.
- 3) *P. pectinatum*, Linton, 1924.
- 4) *P. puriensis*, Shrivastava & Capoor, 1982.
- 5) *P. arabiansis*, Jadhav and Shinde, 1984.
- 6) *P. ratnagiriensis*, Shinde and Jadhav, 1987.
- 7) *P. shindei*, Shinde et al, 1990.
- 8) *P. carchariasae*, Jadhav et al, 1990.
- 9) *P. bhagwatiensis*, Pawar et.al 2005.

The present communication deals with a new species of the genus *Phoreiobothrium hiwarae* n. sp. having quadrangular shaped scolex with four elongated bothridia, neck is short but without spines, mature segments are broader than long, ovary bilobed, genital pores sub-marginal irregularly alternate, vitellaria are follicular.

- 1) The present cestode differs from *P. lasium* which is having tubular bothridium, posterior end, divided into number of loculi by transverse septa, ovary bilobed and vagina anterior to cirrus pouch.
- 2) The present form differs from *P. trilocolatum* which is having the bothridium, whose posterior margin with three loculi, hooks paired, trifurcated symmetrical, tubercle on middle prong, testes 150 - 160 in number, vitellaria are granular.
- 3) The present tapeworm differs from *P. exceptum* which is having triangular scolex and bothridium enlarge towards the posterior end and six loculi present at the posterior end only.
- 4) The present cestode differs from *P. pectinatum* which is having rounded scolex the bothridium with 7 loculi at the posterior end, in front of loculi bordered with seven papillae, pair, trifurcated, symmetrical hook in middle prong.
- 5) The present tapeworm differs from *P. puriensis* which is having scolex pyramidocolin shaped neck is present with spines, bothridium with posterior end divided into 12 or more loculi, neck present with spines, testes 125 - 140 in number, cirrus pouch is oval, vitellaria are follicular rounded and one or two row on each side.
- 6) The present tapeworm differs from *P. arabiansis* which is having quadrangular scolex with four sessile, quadrangular bothridia each a pair of trifurcated hooks and testes 60 – 75 in number. Vagina is bilobed and anterior to cirrus pouch. Vitellaria are follicular.

7) The present form differs from *P. ratnagiriensis* which is having scolex with spines , bothrium with a single large loculus at posterior end neck present with spines, testes 180 (175 - 185) in number, mature segment with spines. Ovary is bilobed.

8) The present tapeworm differs from *P. shindae* which is having the quadrangular scolex with spines bothrium with a single large loculus at posterior end neck present with spines, testes 92 - 98 in number, cirrus pouch oval just posterior to middle of the segment, vagina oval posterior to cirrus pouch, granular vitellaria.

9) The present tapeworm differs from *P. carchariasae* which is having the scolex rectangular without spines, bothrium with a single large loculus at posterior end, neck present without spines, testes 180 - 190 in number, ovary with 38 - 41 acini. Cirrus pouch oval and posterior to middle segment.

10) The present cestode differs from *P. bhagwatiensis* which is having bothrium rectangular hooks paired and trifurcated, Cirrus pouch is sub-marginal testes 116-126 in number, ovary "U" shaped, mature segments longer than broad, vagina postero-ventral to cirrus pouch, vitellaria are granular.

The above justifying characters are valid enough to erect a new sp. *P. hiwarae n.sp.* is proposed in honour of Prof. C.J. Hiware, well known Parasitologist particularly in the field of Helminthology

CHART SHOWING COMPARATIVE ACCOUNT OF THE SPECIES OF THE GENUS PHOREIOBOTHRIUM, LINTON, 1889

Species ⇒	<i>P. lasium</i> Linton, 1889	<i>P. trilocolatum</i> Linton, 1901	<i>P. exceptum</i> Linton, 1924	<i>P. pectinatum</i> Linton, 1924
Characters ↓	1	2	3	4
Scolex	Elongated	Rounded	Triangular	Rounded
Bothrium	Tubular, posterior end divided in to number of loculi by transverse septa.	Posterior margin with three loculi.	Elongated to words posterior end 6 loculi at posterior end.	7 loculi at posterior end, septa in front of loculi bordered with 7 papillae
Hooks	Paired, trifurcated inner prong small and symmetrical	Paired, trifurcated symmetrical in middle prong	Paired, bifurcated	Paired, trifurcated and asymmetrical
Accessory suckers	Present	-	-	-
Neck	Present	-	-	-
Testes	-	150 – 160	-	-
Cirrus pouch	-	-	-	-
Ovary	Granular	Granular	-	-
Mature segment	-	-	-	-
Vagina	Anterior to cirrus pouch	-	-	-
Vitellaria	-	-	-	-
Host	<i>Carcharias obscurus</i>	<i>Carcharias obscurus</i>	<i>Carcharias zygaena</i>	<i>Carcharias zygaena</i>
Locality	Woods Hole	Woods Hole	Woods Hole	Woods Hole
Species ⇒	<i>P. puriensis</i> Shrivastava and Capoor, 1982	<i>P. arabiansis</i> Jadhav & Shinde, 1984	<i>P. ratnagiriensis</i> Shinde & Jadhav, 1987	<i>P. shindei</i> Shinde. Et. al., 1990.
Characters ↓	5	6	7	8
Scolex	Pyramidi – colin	Quadrangular	Quadrangular with	Quadrangular

	shaped		spines	
Bothridium	posterior end divided in to 12 or more loculi.	Quadrangular	Signal large loculum at posterior end	Signal large loculi at posterior end
Hooks	Paired, trifurcated	Paired, trifurcated	Paired, trifurcated	Paired, trifurcated
Accessory Suckers	-	Present	Present	Present
Neck	Present with spines	Present with spines	Present with spines	Present
Test	125 – 140	60 – 75	180 (175 – 185)	92 – 98
Cirrus pouch	Oval	Oval, anterior to the middle of segment	Oval, elongated sub marginal	Oval just posterior to middle segment
Ovary	Anterior to cirrus pouch	Bilobed	Bilobed 'U' shaped	Thick, bilobed.
Mature segment	2.73 – 3.35 x 0.507 – 0.595	0.48 x 0.22	730 x 371 with spined	1.794 x 0.485
Vagina	Anterior to cirrus pouch	Anterior to cirrus pouch	Anterior to cirrus pouch	Posteroventral to cirrus pouch
Vitellaria	Follicular round small 1 – 2 rows on each side.	Follicular 3 – 4 in rows	Follicular, oval large in single row on each side	Granular
Host	<i>Zygaena blochi</i>	<i>Carcharias acutus</i>	<i>Carcharias acutus</i>	<i>Carcharias acutus</i>
Locality	Puri (orissa)	Ratnagiri,(M.S.) India	Ratnagiri,(M.S.) India	Bombay (M. S.) India
Species ⇒	<i>P. carchariasae</i> Jadhav, Shinde & Jadhav, 1990		<i>P. bhagwatiensis</i> Pawar, 2003	<i>P. hiwara</i> n.sp.
Characters ↓	9	10	11	
Scolex	Rectangular	Quadrangular	Quadrangular	Quadrangular
Bothridium	Single. Large loculum at posterior end	Rectangular, four sessile narrow anterior & broad posteriorly	Four, sessile elongated	Four, sessile elongated
Hooks	Paired, trifurcated	Paired, trifurcated	Paired and bifurcated	Paired and bifurcated
Accessory Suckers	Present	Present	Absent	Absent
Neck	Present	Present	Present	Present
Testes	180 – 190	116 – 126	20 in numbers	20 in numbers
Cirrus pouch	Oval, posterior to middle segment	Oval sub marginal	Oval, elongated	Oval, elongated
Ovary	Bilobed 'U' shaped	Bilobed 'U' shaped	Bilobed, medium in size	Bilobed, medium in size
Vagina	Posteroventral to cirrus pouch	Posteroventral to cirrus pouch	Anterior to cirrus pouch elongated, thin tube	Anterior to cirrus pouch elongated, thin tube
Vitellaria	Granular wide stripes	Granular	Follicular, oval	Follicular, oval
Host	<i>Carcharias acutus</i>	<i>Carcharias acutus</i>	<i>Chiloscyllium plagiosum</i>	<i>Chiloscyllium plagiosum</i>
Locality	Mumbai (M. S.) India	Bhagwati, Ratnagiri, (M.S.), India	Murud Janzira (M. S.), India	Murud Janzira (M. S.), India

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