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REPORTING A NEW SPECIES OF SENGA FARTADENSIS IN A FRESHWATER FISH MASTACEMBELUS ARMATUS FROM SOLAPUR DISTRICT

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Abstract

The paper deals with the new species of the genus Senga fartadensis form freshwater fish M. armatus in Solapur district. The differentiating character of Senga fartadensis Sp. Nov. The differentiating character of Senga fartadensisSp.Nov.are scolex triangular No.of hooks 80-90 in number, neck present, testes are 250-305 in number, ovary is butterfly shape and bilobed.

***Keywords**: M. armatus, Senga fartadensis, Solapur.*

Introduction:-

The genus Senga was established by Dollfus, 1934 with its type species S. besnardi from Betta splendens at Vinecunes, France. S. ophiocephalina Tseng, 1933 as Anchistrocephalus ophiocephalina from Ophiocephalus argus at Taimen, China and identified with a form previously recorded by Southwell, 1913 as Anchitrocephalus polyptera (Anchitrocephalus)Monticelli, 1890 Syn. Anchistrocephalus Luhe, 1899 from Ophiocephalus striatus in Bengal, India S. pcynomera Woodland, 1924 as Bothriocephalus pcynomera from Ophiocephalus marulius at Allahabad, India. S. lucknowensis. Johri, 1956 from Mastacembelus armatus in India. Fernando and Furtado, 1963 recorded S. malayana from Channa striata, S. parva and S. filiformis from Channa micropeltes at Malacca. Ramadevi and Hanumantha Rao, 1966 reported the plerocercoid of Senga sp. from Panchax panchax. Tadros, 1968 synomised the genus Senga with the genus Polyonchobothrium and proposed new combinations for the species. Furtadoand Chauhan, 1971 reported S. pahangensis from Channamicropeltes at Tesak Bera. Shinde, 1972 redescribed S. besnardi from Ophiocephalus gachua in India. Ramadevi and Rao, 1973 reported another species of S. visakhapatanamensis India. Ramadevi (1976) described the life cycle of S. visakhapatnamensis from Ophiocephalus punctatus in lake at Kondakaria, Andhra Pradesh, India. But they do not agree with Tadors statements. Wardle, McLeod and Radinovsky, 1974 put Senga as a distinct genus

in the family Ptychobothridae. Deshmukh, 1980 reported S. khami from Ophicephalus marulius, a fresh water fish from Kham river at Aurangabad. Jadhav and Shinde, 1980 reported S. godavarii from M. armatus at Nanded, M.S. India. One more species S. aurangabadensis was added by Jadhav and Shinde, 1980 from M. armatus at Aurangabad M.S. India. A new addition made by Kadam et.al. 1981 as S. paithaensis from host M. armatus. Majid et. al., 1984 added S. raoi and S. jagannathae from Channa punctatus. Two more new species erected by Jadhav et.al. 1991 as S. maharashtrii and S.gachuae from the intestine of M. armatus. Monzer Hasnain, 1992 added S. chauhani from Channa punctatus. Tat and Jadhav, 1997 added S. mohekarae from the intestine of the M. armatus, at Parli, Dist. Beed, M.S. India. Patil and Jadhav added S.tappifrom M. armatusin 2003. Jadhav, 2005 made the review article of the genus Senga from freshwater fishes from Maharashtra state, India. Pande et.al, 2006 added two new species i.e. S. ayodhensis from Amphinuous cuchia and S. baughi from Rita rita.Kalse A. T, 2009 added one new species senga panzarensis from Mastacembelus armatus. Bhure et.al, 2010 added one new species S.madhaviifrom Mastacembelus armatus.P.R, 2011 added one new species Senga rupchandensis from Channa striatus.lastly Fartade A.M et.al added four new species of S.mastacembelusae and S.nandensis in 2014 and S.madhukarii and S.jadhavii in 2015 from M.armatus.

Materials and Methods

The present specimens were recovered from the intestineof the freshly killed fresh water fish Mastacembelus armatus from different dams rivers and lakes in Solapur District during the period of August 2015-May 2017 . Each fish was dissected and examined in all partslike fins, gills, scales, and visceral organs under a microscope. Fishes were opened up dorso-ventrally and the internal organsexamined. The entire digestive system was removed andplaced in a Petri dish with physiological saline. Infection ofeach group of parasites was treated as follows: collectedparasites were first relaxed and then fixed in hot 4% formalinand stain using Harris haematoxyline. Stained parasites werewashed in distilled water, dehydrated in ascending grades ofalcohol, cleared in xylene, mounted in D.P.X. Drawings weremade using a camera lucida.

Description of Senga fartadensis :

Ten mature, specimens were collected from the intestine of freshwater fish M.armatus (Lecepede, 1800) from Ujani Dam in the month of May, 2016.

The cestode were flattened, preserved in 4% formalin, stained with borax carmine passed through various alcoholic grades, cleared in xylene, mounted in D.P.X. Whole mount slides were prepared for further anatomical studies. Drawing was made with the aid of Camera Lucida. All measurements are given in millimeters.

All the cestodes are long, consisting of scolex, immature, mature and gravid proglottids.

The scolex is large well developed triangular in shape measures 3.81(3.43-4.19) in length and 2.1(1.9-2.4) in breadth, anterior part of scolex contains rostellum with rostellar hooks, in 80-90 in number. Hook are arranged in circular position and measures 2.89(2.34-2.73) in length and 0.05(0.01-0.03) in breadth. The scolex bears two bothria and spatulate in shape and measures 3.9(3.6-3.81) in length and 1.04(0.9-1.14) in breadth.

Neck is present mature segment is rectangular in shape, broader than long measures 302(3.0-3.62) in length and 5.79(5.6-5.7) in breadth. The testes are oval, medium in size 250-300 in number 0.20(0.15-0.26) in length and 0.076(0.038-0.0114) in breadth spread in the segments each side of ovary.

The cirrus pouch is oval medium in size anterior to ovary and measures 0.34(.0114-0.22) in length and 0.057(0.03-0.076) in breadth. The cirrus is thin tube and measures 0.019(0.0009-0.038) in length and 0.114(0.076-0.152) in breadth.

Ovary is bilobed butterfly shape, it measures 2.17(1.9-2.09) in length and 0.11(0.10-0.19) in breadth situated in the middle of the segment. The vagina is thin coiled tube starts from genital pore posterior to cirrus pouch and measures 0.09 diameters.

The vitellaria are follicular arranged in two rows at each lateral margin of the segment.

Discussion

The genus Senga was established by Dollfus, 1934 with the type species Senga besnardi from Betta splendens. The present worm comes closer to all the known species of the genus Senga Dollfus, 1934 in general topography of organs. But differs due to some characters from following species.

1} The present worm differs from S. besnardi Dollfus, 1934 in the shape of scolex which is triangular, hooks 50 in numbers, testes 160-175 in numbers, ovary compact and reported from Betta splendens in France.

2}The present cestode differs from S. ophiocephalina Teseng, 1933 in having hooks 47-50 in numbers, testes 50-55 in numbers, ovary bilobed but equatorial in position, vitellaria lobate and reported from Philocephalus argua argua in China.

3}The present tapeworm differs from S. pcynomera Woodland, 1924 in having scolex elongated, hooks 68 in numbers, mature segments are indistinct, ovary discontinuous into two groups and reported from Philocephalus marulius in India .

4}The present parasites differs from S. lucknowensis Johri,1956 in having hooks 36-48 in numbers, ovary post equatorial, vitellaria lobulate and discontinuous in two groups.

5}The present cestode differs from S.malayana Furnando and Furtado, 1964 in having scolex circular, hooks 60 in numbers, ovary slightely bilobed, post equatorial, vitellaria lobate, discontinuous in two groups and reported from Channa striata, in Malacca.

6}The present tapeworm differs from S.parva Furnando and Furtado, 1964 in having hooks 38-40 in numbers, testes 150-180 in numbers and reported from Channa micropeltis, in Malacca.

7} The present cestode differs from S. pahangensis Furtado et. al., 1971 in having triangular scolex, hooks 52 in numbers, neck short, segmentation clear, testes laterally situated in the proglottids, vitellaria lobulated and reported from Channa micropeltis, in Tasek, Bera.

8} The present tapeworm differs from S. visakhapatanamensis Ramadevi et. al., 1973 in having circular scolex, hooks 46-52 in numbers, testes 50-55 in number, vitellaria lobulated and reported from Ophiocephalus punctatus, in India.

9}The present worm differs from S. khami Deshmukh and Shinde, 1980 having scolex rectangular, oval, shallow bothria, hooks 55-57 in numbers, short neck, testes rounded, 155 in numbers and arranged in two fields, cirrus pouch is elongated, vitellaria follicular and reported from Ophiocephalus marulius, in India.

10} The present cestode differs from S. aurangabadensis Jadhav et. al., 1980 in having oval scolex, hooks 50-52 in numbers; in two half rows, overlapping on each other, mature segment broader than long, testes 240-260 in numbers and vitellaria follicular.

11} The present tapeworm differs from S. godavarii Shinde et. al., 1980 in having hooks 40-42 in numbers, arranged in two half rows, testes rounded, 220-230 in numbers, cirrus pouch is oval, situated in anterior half of the segment and vitellaria follicular.

12} The present worm differs from S. paithanensis Kadam et. al., 1981 which shows prominent, large, triangular scolex, hooks 54 in numbers, neck present, testes oval to rounded, 130-135 in numbers, arranged in two lateral groups, vagina posterior to cirrus pouch and vitellaria follicular.

13}The present cestode differs from S. raoi Majid and Shinde, 1984 in having hooks 46 in numbers, testes 65-170 in numbers, vagina posterior to cirrus pouch and reported from Channapunctatus, in India.

14}The present cestode differs from S.jagannathae Majid and Shinde,1984 in having hooks 44 in numbers, testes 240 - 250 in numbers, ovary compact, vagina anterior to cirrus pouch and reported from Channapunctatus, in India.

15} The present parasite differs from S. gachuae Jadhav et. al.,1991in having hooks 22-25 in numbers, neck present, testes 60-70 in numbers, vitellaria follicular and reported from Channagachua, in India.

16} The present cestode differs from S. maharashtrii Jadhav et. al., 1991 which shows muscular scolex, hooks 45-46 in numbers, large, arranged in two half crowns, testes oval 80-90 in numbers and vitellaria follicular.

17}The present worm differs from S.chauhani Monzer Hasnain,1992 in having scolex oval, hooks 40-44 in numbers and testes 200-210 in numbers, vitellaria non lobate and reported from Channapunctatus, in India.

18}The present cestode differs from S. mohekarae, Tat and Jadhav,1997 which shows elongated scolex, hooks 151 in numbers, neck short and broad, testes 300-310 in numbers and vitellaria follicular.

19}The present parasite differs fom S. armatusae Hiware,1999 in having scolex triangular, hooks 32-40 in numbers, vagina anterior to cirrus pouch and vitellaria follicular.

20} The present cestode differs from S. tappi Patil et. al., 2003 which is having triangular scolex, hooks 42-44 in numbers, neck is very short and squarish, testes 285-295 in numbers, small, rounded, distributed in 2 fields, vagina anterior to cirrus pouch and vitellaria follicular.

21} The present parasite differs from S.ayodhensis Pande et. al., 2006 in having conical scolex, hooks 29 in numbers, testes numerous, vitellaria follicular and reported from Amphinuous cuchia, in India.

22} The present cestode differs from S.baughi Pande et. al., 2006 in having hooks 28 in numbers, neck present, testes 40-50 in numbers, ovary compact, vitellaria follicular and reported from Rita rita, in India.

23}The present worm differs from S.panzarensis et.al. 2008, having scolex triangular, no.of hooks 58, neck absent, testes 40-45, ovary compact, vitellaria 4-5 lateral side reported from Mastacembelus armatus in India.

24} The present worm differs from S.madhavii Bhure et.al. 2010 having no. of hooks 40-42, testes 200-225 in numbers, vitellaria granular lateral to testicular fields and reported from Mastacembelus armatus in India.

25}The present worm differs from S.rupchandensis Pardeshi et.al.2011 having scolex tubular hooks 42-55 in numbers, testes 350-370 in numbers and reported from Channa striatus in India.

26} The present worm differs from S.mastacembelusae Fartade A.M et.al 2014 having scolex triangular hooks 20-22 in number, testes 100-130 in numbers and reported from M.armatus in India.

27} The present worm differs from S.nandedensis Fartade A.M et.al 2014 having scolex triangular hooks 50-60 in number and 150-200 testes and reported from M.armatus in India.

28} } The present worm differs from S.jadhavii Fartade A.M et.al 2014 having scolex cylindrical hooks 54 in number and reported from M.armatus in India.

29} The present worm differs from S.madhukarii Fartade A.M et.al 2015 having scolex cylindrical hooks 40-45 in number, testes 130 in number and reported from M.armatus in India.

The above noted characters are valid enough to erect a new species hence the name**S.fartadensis** Sp.Nov.is proposed on honour of late Prin.Dr.M.M.Fartade.

A Key to the species of the genus Senga Dollfus, 1934

Neck present	-	1
Neck absent	-	2
1) Scolex circular	-	S.malayana, Furnando and Furtado, 1964.
Scolex rectangular	-	S. khami, Deshmukh and Shinde, 1980.
Scolex cylindrical	-	S. jadhavi Fartade A.M et.al,2014.

	Scolex triangular	-	3
	Scolex pear shaped	-	4
	Scolex oval	-	5
2)	Scolex circular	-	S.visakhapatnamensis, Ramadevi et.al.1973.
	Scolex conical	-	S. ayodhensis, Pande et.al. 2006.
	Scolex cylindrical	-	S. madhukarii Fartade A.M et.al,2015..
	Scolex tubular	-	S. rupchandensis Pardeshi 2011.
	Scolex elongated	-	S. pcynomera, Woodland 1924.
	Scolex oval	-	6
	Scolex pear shaped	-	7
	Scolex triangular	-	8
3)	Vitellaria follicular	-	9
	Vitellaria lobulate	-	S.pahangensis, Furtado et.al. 1971.
4)	Testes below 50	-	S.baughi, Pande et.al. 2006
	Testes above 50	-	S. gachuae, Jadhav et.al 1999
	Testes in bet^{n} 100-200	-	S.parva, Furnando and Furtado, 1964
	Testes in bet^{n} 200-300	-	S.jagannathae, M. A. Majid and G. B. Shinde, 1984.
5)	Hooks below 100	-	S. chauhani, Monzer Hasnain, 1992
	Hooks above 100	-	S.mohekarae, Tat and Jadhav, 1997
6)	Testes below 100	-	S.maharashtrii, Jadhav and Tat 1991
	Testes above 100	-	S. aurangabadensis, Jadhav et.a1980
7)	Vitellaria lobulate	-	10
	Vitellaria follicular	-	S.godavarii, Shinde et.al. 1980.
	Vitellaria granular	-	S.raoi, M. A. Majid and Shinde1984
8)	Testes below 100	-	S. panzarensis, Kalse. A. T 2009.
	Testes in bet^{n}100-150	-	11
	Tetses in bet^{n} 150-200	-	S. besnardi, Dollfus, 1934
	Testes in bet^{n} 200-250	-	12
9)	Hooks below 50	-	S. tappi, D. N. Patil 2003.
	Hooks above 50	-	S. paithanensis, Kadam et.al. 1981.

Hooks above 80-90	-	**S.fartadensis Sp.Nov**
10) Hooks below 50	-	S. luknowensis, Johri, 1956
Hooks above 50	-	S. ophiocephalina, T seng, 1933
11) Hooks below 50	-	S.mastacembelusae Fartade A.M et.al2014
Hooks above 50	-	S. nandedensis Fartade A.M et.al2014
12) Vitellaria follicular	-	S. armatusae, C. J. Hiware, 1991
Vitellaria granular	-	S. madhavii, Bhure et.al. 2010

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