

# Systematic observation of new pseudophyllidean tapeworm *Senga* [1] from *Mastacembelus armatus*

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## Abstract

The present investigation deals with the morpho-taxonomic observation of Pseudophyllidean tapeworm *Senga satarensis* Sp. Nov. collected from intestine of a *Mastacembelus armatus* at various places of Satara districts of (M.S.) India. The worm comes closer to all the known species of this genus in general topography of organ but differs due to scolex pear shaped, tapering anteriorly and broad posteriorly, rostellum medium, rounded, bearing 28-30 rostellar hooks, neck absent, mature proglottids six to seven times broader than long, testes 175-200 in numbers, scattered throughout the segment, cirrus pouch oval, ovary distinctly bilobed, vagina thin, runs posteriorly, genital pores oval in shape, vitellaria granular, uterus saccular and egg elongated.

**Keywords:** *Mastacembelus armatus*, Systematic observation, *Senga*

## INTRODUCTION

The genus *Senga*<sup>[1]</sup> was established with its type species *S. besnardi* from *Betta splendens*. The Siamese fighting fish in an aquarium at Vincennes, France. *S. ophioccephalina*<sup>[2]</sup> as *Anchirocephalus ophioccephalina* from *Ophioccephalus argus* at Taimen, China and identified with a form previously recorded by Southwell, 1913 as *Anchirocephalus polyptera* (*Anchirocephalus*). *S. pcyonera*<sup>[3]</sup> as *Bothriocephalus pcyonera* from *Ophioccephalus marulius* at Allahabad, India; *S. lucknowensis*<sup>[4]</sup> from *Mastacembelus armatus* in India. *S. malayana*<sup>[5]</sup> from *Channa striata*, *S. parva*<sup>[5]</sup> and *S. filiformis*<sup>[5]</sup> from *Channa micropeltes* at Malacca. Ramadevi and Hanumanh Rao<sup>[6]</sup>, reported the plerocercoid of *Senga* sp. from *Panchax panchax*. Tadros, 1968 synonymised the genus *Senga* with the genus *Polyonchobothrium* and proposed new combinations for the species. *S. pahangensis*<sup>[7]</sup> from *Channa micropeltes* at Tesak Bera. From Maharashtra firstly recorded redescribed species of *S. besnardi*<sup>[8]</sup> from *Ophioccephalus gachua* in India. Then *S. visakhapatnamensis*<sup>[9]</sup> from *Ophioccephalus punctatus* at India. *S. khami*<sup>[10]</sup> from *Ophioccephalus marulius*, a fresh water fish from Kham river at Aurangabad; *S. godavari*<sup>[11]</sup> from *M. armatus* at Nanded, M.S. India. One more species *S. aurangabadensis*<sup>[12]</sup> was added from *M. armatus* at Aurangabad M.S. India. A new addition as *S. palthaniensis*<sup>[13]</sup> from *M. armatus*. Two species added *S. raoi*<sup>[14]</sup> and *S. jagannathae*<sup>[14]</sup> from *Channa punctatus*. Two more new species erected as *S. maharashtrii*<sup>[15]</sup> and *S. gachuae*<sup>[15a]</sup> from the intestine of *M. armatus*. Monzer Hasnain, 1992 added *S. chauhan*<sup>[16]</sup> from *Channa punctatus*; *S. mohekarai*<sup>[17]</sup> from the intestine of the *M. armatus*, at Parli, Dist. Beed, M.S. India; Then *S. armatusae*<sup>[18]</sup> from *Mastacembalus armatus*. *Senga tappi*<sup>[18]</sup> from *M. armatus*. Jadhav<sup>[19]</sup> made the review article of the genus *Senga* from freshwater fishes from Maharashtra state, India. Then two new species i.e. *S. ayodhensis*<sup>[20]</sup> from *Amphinuus cuchia* and *S. baghu*<sup>[20]</sup> from *Rita rita*. *S. jadhavae*<sup>[21]</sup> from *Mastacembelus*

*armatus*; *S. chandapurensis*<sup>[22]</sup> from *Mastacembelus armatus*. Later on *S. ticto*<sup>[23]</sup> from *Punctatus ticto*. Recently *S. madhavae*<sup>[24]</sup> from *M. armatus*.

## MATERIALS AND METHODS

Ninety two cestode parasites were collected from the intestine of freshwater fish *Mastacembelus armatus* (Lecepede, 1800) from various places of Satara districts (M.S.) India during the period of Feb., 2005 to Jan., 2007. These cestodes are preserved in hot 4% formalin and seven specimens are stained with Harris haematoxylin and Borax carmine, passed through various alcoholic grades, cleared in xylene, mounted in D.P.X. and drawings are made with the aid of camera lucida. All measurements are given in millimeters unless otherwise mentioned.

## RESULTS

### (Description based on seven specimens, Figure 1 & 2)

All the cestodes are long, consisting of scolex, immature, mature and gravid proglottids. The scolex is pear shaped, tapering anteriorly and broad posteriorly and measures 0.635 (0.582-689) in length and 0.410 (0.203-0.616) in breadth. The scolex having pair of sessile bothria, which extends from the anterior end to posterior end of the scolex and measures 0.684 (0.650-0.718) in length and 0.067 (0.048-0.087) in breadth. The anterior end of the scolex terminates in a rostellum, which is oval to rounded in shape and measures 0.030 (0.02-0.039) in length and 0.070 (0.064-0.087) in breadth. The rostellum is armed with 28-30 hooks, which are arranged in two semicircle unequal length i.e. short and long. The long hooks measures 0.083 (0.076-0.090) in length and 0.009 (0.005-0.013) in breadth, while the short hooks measures 0.071 (0.009-0.072) in length and 0.009 (0.005-0.013) in breadth. The neck is absent.

The mature proglottids are about 6-7 times broader than long and measures 0.337 (0.300-0.373) in length and 1.618 (1.606-1.631) in breadth. The testes are small, oval in shape, 175-200 in number, scattered throughout the segment and measures 0.024 (0.019-0.029) in length and 0.019 (0.014-0.024) in breadth. The cirrus pouch is oval in shape, pre-ovarian in position, situated in the centre of the segment and measures 0.065 (0.058-0.072) in length and

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0.021 (0.0014-0.029) in breadth. The cirrus is short, thin, present within the cirrus pouch and measures 0.046 (0.038-0.053) in length and 0.009 (0.004-0.014) in breadth. The vas deferens is short, thin, straight tube and measures 0.019 (0.014-0.024) in length and 0.009 (0.004-0.0014) in breadth. The vagina and cirrus pouch open a common pore known as genital pore, which is small in size, oval in shape and measures 0.012 (0.09 - 0.014) in length and 0.09 (0.04 - 0.014) in breadth.

The vagina is a thin tube, slightly curved, arises from the genital pore, runs posteriorly and forms receptaculum seminis and measures 0.065 (0.058-0.072) in length and 0.009 (0.004-0.014) in breadth. The receptaculum seminis is straight tube open into ootype and measures 0.021 (0.019 - 0.024) in length and 0.014 (0.009 - 0.019) in breadth, which is oval, medium in size, present between the ovarian lobes and measures 0.053 in diameter. From the ootype ovarian lobes start. The ovary is large, distinctly bilobed, transversely

placed at posterior margin of the proglottids and measures 0.497 (0.461-0.533) in length and 0.055 (0.033-0.077) in breadth. The vitellaria are granular, on each lateral side from anterior to posterior margin of the proglottids. The uterus is saccular, filled with eggs and measures 0.145 (0.106-0.184) in length and 0.342 (0.218-0.466) in breadth. Eggs are elongated, tapering at both ends and measures 0.040 (0.038-0.043) in length and 0.015 (0.012-0.019) in breadth. The uterine pore is rounded, to words anterior region of the proglottids and measures 0.028 in diameter.

## DISCUSSION

The genus *Senga* was established by Dollfus 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.

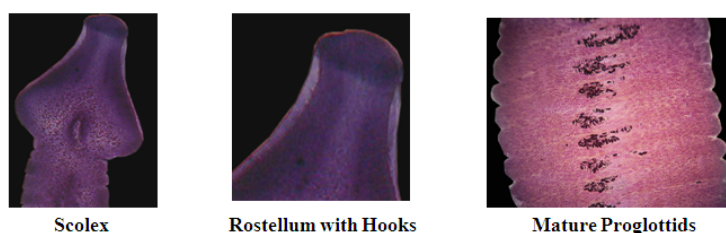


Figure 1- Micro-photograph of *Senga satorensis* Sp.Sov.

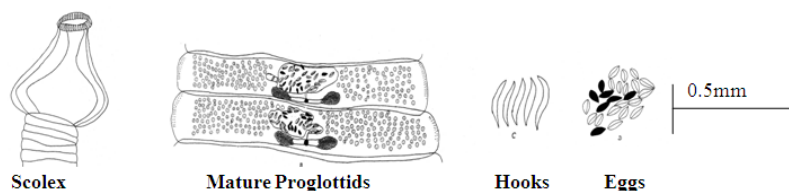


Figure 2- Camera Lucida diagram of *Senga satorensis* Sp.Sov.

The present worm differs from *S. besnardi* 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. It differs from *S. ophiocephalina* 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* in China. The present form differs from *S. pycnamera* in having scolex elongated, hooks 68 in numbers, mature segments are indistinct, ovary discontinuous into two groups and reported from *Philocephalus marulius* in India. The present parasites differs from *S. lucknowensis* in having hooks 36-48 in numbers, ovary post equatorial, vitellaria lobulate and discontinuous in two groups. It differs from *S. malayana* in having scolex circular, hooks 60 in numbers, ovary slightly bilobed, post equatorial, vitellaria lobate, discontinuous in two groups and reported from *Channa striata*, in Malacca. The present tapeworm differs from *S. parva* in having hooks 38-40 in numbers, testes 100 in numbers and reported from *Channa micropeltis*, in Malacca. It differs from *S. pahangensis* 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. The present tapeworm differs from *S. visakhapatnamensis* in having circular scolex, hooks 46-52 in numbers, testes 50-55 in number, vitellaria lobulated and reported from *Ophiocephalus punctatus*, in India. It differs from *S. khami* 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. The present cestode differs from *S. aurangabadensis* in having oval scolex, hooks 50-52 in numbers, in two half rows, overlapping on each other, mature segment longer than broad, testes 240-260 in numbers and vitellaria follicular. It differs from *S. godavarii* 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. The present form differs from *S. paithanensis* 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. It differs from *S. raoi* in having hooks 46 in numbers, testes 65-170 in numbers, vagina posterior to cirrus pouch and reported from *Channa punctatus*, in India. The present cestode differs from

*S.jagannathae* in having hooks 44 in numbers, testes 240 - 250 in numbers, ovary compact, and vagina anterior to cirrus pouch and reported from *Channa punctatus*, in India. It differs from *S. gachuae* in having hooks 22-25 in numbers, neck present, testes 60-70 in numbers, vitellaria follicular and reported from *Channa gachua*, in India. The present cestode differs from *S. maharashtrii* which shows muscular scolex, hooks 45-46 in numbers, large, arranged in two half crowns, testes oval 80-90 in numbers and vitellaria follicular. It differs from *S. chauhani* in having scolex oval, hooks 40-44 in numbers and testes 200-210 in numbers, vitellaria non lobate and reported from *Channa punctatus*, in India. The present cestode differs from *S. mohekarae*, which shows elongated scolex, hooks 151 in numbers, neck short and broad, testes 300-310 in numbers and vitellaria follicular. It differs from *S. armatusae* in having scolex triangular, hooks 32-40 in numbers, vagina anterior to cirrus pouch and vitellaria follicular. The present cestode differs from *S. tappi* 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. It differs from *S. ayodhensis* in having conical scolex, hooks 29 in numbers, testes numerous, vitellaria follicular and reported from *Amphiprion cuchia*, in India. The present cestode differs from *S. baughi* in having hooks 28 in numbers, neck present, testes 40-50 in numbers, ovary compact, vitellaria follicular and reported from *Rita rita*, in India. The present worm differs from *S. jadhavae* in having scolex triangular, hooks 50-54 in numbers, neck present, testes 310-320 in numbers and vitellaria follicular. It differs from *S. chankapurensis* due to scolex barrel shaped, rostellum rounded to oval, rostellar hooks 28-30 in numbers, neck short, testes 170-180 in numbers and vagina anterior to cirrus pouch; it differs from *S. ticto*, in having scolex oval, rostellum bilobed, rostellar hooks 24-28 in numbers, testes 60-120 in numbers and seminal vesicle absent. It differs from *S. madhavii* in having scolex conical, hooks 40-44 in numbers and testes 200-225 in numbers.

The above differentiating characters are valid enough for regarding these worms as a new species and named *Senga sataraensis* Sp. Nov. after the locality.

#### Taxonomic Summary

Genus - *Senga*<sup>(1)</sup>  
 Species - *Senga sataraensis* Sp. Nov.  
 Type host - *Mastacembelus armatus*  
 Habitat (Site) - Intestine  
 Type locality - India, Maharashtra (Satara district.)  
 Accession Number - HRL/2005-07/2b/1-7

**Holotype and Paratype** - Deposited in the Helminthology Research Lab., Department of Zoology, Dr. B.A.M. University, Aurangabad, (M.S.) India.

**Date of collection** - Feb., 2005-Jan., 2007.

**Etymology** - Named after the locality.

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