

A ptychobothridaen cestode *Senga killedharurensis* sp. Nov. of fresh water fish from Kille Dhadur, Dist., Beed, M.S., India

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ABSTRACT

The genus *Senga* was erected by Dollfus in 1934, with its type species *Senga bensardi* from *Betta splendens* a siamese fighting fish, in an aquarium at Vincennes, France. This communication *Senga killedharurensis* sp. Nov. a Ptychobothridaen cestode of fresh water fish from Kille Dharur, M.S., India is having a scolex almost triangular with sac like two bothria and rostellum with rostellar hooks. The mature segments are broader than long, testes small and round, pre ovarian; The cirrus pouch medium, cylindrical, cirrus thin, slightly curved. The ovary medium distinctly bilobed; isthmus small and short; vagina thin tube; ootype small, round, post ovarian; vitellaria granular.

Key words : Ptychobothridae, Cestode, *Senga killedharurensis*, Fresh water fish.

Introduction

The genus *Senga* was established by Dollfus (1934) with its type species *Senga besnardi* from *Betta splendens*, a Siamese fighting fish, in an aquarium at Vincennes, France.

Later on Tseng (1934) recorded a new species *Senga ophiocephalina* from *Ophiocephalus argus*. Woodland (1934) described *Senga pycnomera* from *Ophiocephalus marulius*, *Senga lucknowensis* Johri (1956); Fernando and Furtado (1963) added three new species *Senga malayana* from *Channa striatus*, *Senga parva* from *Channa micropeltes* and *Senga filiformis* from *Channa micropeltes*. After that Furtado *et al.* (1971) reported *Senga pahangensis* from *Channa micropeltes*.

Then Ramadevi *et al.* (1972) added a new species to this genus *Senga visakhapatnamensis*. from *Ophiocephalus punctatus*. Afterwards Deshmukh *et*

al. (1980) reported *Senga khami* from *Ophiocephalus marulius*.

Later on Jadhav and Shinde (1980) added a new species *Senga aurangabadensis* from *Mastacembelus armatus*. Then Shinde *et al.* (1980) added *Senga godavari* from *Mastacembelus armatus*, Gupta *et al.* (1980) added two new species *Senga punctati* and *Senga Mastacembali*, Kadam *et al.* (1981) reported *Senga paithanensis*, from *Mastacembelus armatus*. After that a new species added by Majid *et al.* (1984) as *Senga jagannathae* from *Ophiocephalus punctatus*. Gupta and Parmar (1985) added a species *Senga indica* from *Mastacembelus aramatus*. Jadhav *et al.* (1991) added new species *Senga maharashtrii* from *Mastacembelus aramatus*. After that Monzer Hasnain (1992) recorded *Senga chauhani*. Then Mathur *et al.* (1994) added *Senga Jhansiensis*, Tat *et al.* (1997) added a new species *Senga mohekarae* from the intestine of *Mastacembelus armatus*.

Then Wongsawad *et al.* (1998) recorded a new species as *Senga chingmaiensis* from *Mastacembelus armatus*, Hiware (1999) added *Senga armatusae* from *Mastacembelus armatus*. Patil (2003) reported *Senga tappi*, from *Mastacembelus armatus*. After that Pande *et al.*, (2006) recorded two new species *Senga baughi* and *Senga ayodhensis* from *Rita rita* and then Bhure *et al.*, 2007 added a new species to this genus *Senga jadhavae* from *Mastacembelus armatus*.

After that Khadap *et al.* (2007) recorded a new species *Senga chandikapurensis* from *Mastacembelus armatus*. Then Srivastav *et al.* (2007) added *Senga ticto*, from *Puntius ticto* and *Senga panzaraensis* was added by Mangale *et al.* (2009) from *Mastacembelus armatus*. After that Wankhede *et al.* (2009) recorded a new species *Senga kaigaonensis* to this genus. Then Minaj *et al.* (2010) added a new species as *Senga govindi* from *Mastacembelus armatus*. Bhure *et al.* (2010) added a new species *Senga madhavae* and *Senga satarensis* and *Senga mangalbaiae* in 2011, from fresh water fish *Mastacembelus armatus*. Pardeshi and Hiware (2011) described *Senga rupchandensis* from *Channa straitus*. Dhole *et al.* (2011) reported two new species *Senga rostellarae* and *Senga chandrashekari* from *Mastacembelus armatus*. Puinyabati *et al.*, (2013) reported *Senga silcharensis* from intestine of *Channa punctatus*. Bhure *et al.* (2014) described *Senga microrostellata* from *Mastacembelus armatus*. Fartade *et al.* (2014) added new species *Senga nandedensis* from fresh water fish *Mastacembelus armatus*. Deshmukh (2015) reported two new species *Senga rostellata* and *Senga triangulata* from fresh water fish *Mastacembelus armatus*. Fartade *et al.* (2015) added one more species *Senga madhukari* from *Mastacembelus armatus*. Recently Fartade and Fartade (2015) described *Senga mastacembelus* from *Mastacembelus armatus*. Lakhe (2017) added one species *Senga mohkhedensis* from *Mastacembelus armatus*.

Materials and Methods

Seven specimens of the Cestode parasites were collected from the intestine of fresh water fish *Mastacembelus armatus*. All the parasites were flattened, preserved in 4 % formalin and stained with Harris haematoxylin, whole mount slides were prepared for anatomical studies. The drawings are made with the aid of Camera Lucida and all measurements in millimeter.

Description

The worms are medium in size and length, whitish with thin musculature. Scolex medium, distinct, highly muscular, rostellum with rostellar hooks, almost triangular and measures 3.876 in length and 2.644 in breadth. Bothria are two in number, flasked shaped, elongated almost equal in size and shape and measures 3.130 in length and 1.404 in breadth. Rostellar hooks are 20 in number, small and large in size, lancet shaped or cutter like, arranged in semi-circle, sharp, pointed and measures 0.634 in length and 0.046 in breadth. The mature segments broader than long, almost four times broader than long, rectangular in shape, with single set of reproductive organs and measures 0.040 in length and 0.167 in breadth. Testes small in size, round in shape, 60-70 in number, pre ovarian, scattered throughout the segment and measures 0.046-0.068 in diameter. Cirrus pouch medium, cylindrical, transversely situated, pre ovarian and measures 1.32 in length and 0.032 in breadth. Cirrus thin, slightly curved, contains within the cirrus pouch and measures 0.096 in length and 0.006 in breadth. Vas deferens thin, short, coiled and measures 0.068 in length and 0.006 in breadth. The ovary is medium sized, distinctly bilobed, highly muscular; ovarian lobes almost equal in size, situated near the posterior margin of the proglottid and measures 0.356-0.578 in length and 0.126 in breadth; isthmus small in size, short tube, connects the two ovarian lobes and measures 0.086 in length and 0.026 in breadth. Vagina thin tube, short, starts from genital pore, curved, runs posteriorly and opens into ootype and measures 0.096 in length and 0.005 in breadth. Ootype small in size, round in shape, post ovarian, towards the posterior margin of the proglottid and measures 0.056 in diameter. *Vitellaria granular* on each lateral sides from anterior to posterior margin of the segment, dens, distinct, arranged in 2-3 rows. Longitudinal excretory canals are thin, paired, medium in size and measures 0.002 in breadth.

Results and Discussion

After going through the literature, the worm under discussion deals with the description of new species *Senga killedharurensis* sp. nov., which differs from all known species in many characters which are as follows-

1) The present worm under discussion, differs

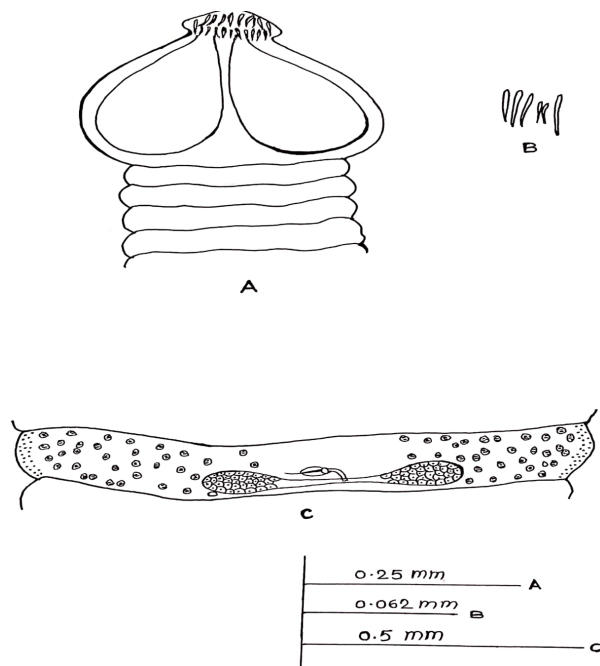


Fig. 1. *Senga killedharurnsis* sp. nov. A) Scolex B) Hooks C) Mature segment.

- from *Senga bensardi*, Dollfus, 1934, in the shape of the scolex (triangular vs. rectangular); in the number of rostellar hooks (20 vs 50); in the number of testes (60-70 vs. 160-175); in the shape of ovary (bilobed vs. compact) and reported from (*Mastacembelus armatus* vs. *Beta splendens*).
- 2) The present cestode, differs from *Senga ophiocephalina* Tseng, 1933 which is having scolex (triangular vs. pear shaped); number of rostellar hooks (20 vs. 47-50); testes (60-70 vs. 50-55) and reported from the host (*Mastacembelus armatus* vs. *Ophiocephalus argus*).
 - 3) The present form, differs from *Senga pycnomera* Woodland, 1934 which is having scolex (triangular vs. elongated); rostellar hooks (20 vs. 68); ovary (bilobed vs. discontinuous in two groups) and reported from host (*Mastacembelus armatus* vs. *Ophiocephalus marulius*).
 - 4) The present tapeworm, differs from *Senga lucknowensis* Johri, 1951 in the shape of the scolex (triangular vs. pear shaped); rostellar hooks (20 vs. 36-40); testes (60-70 vs. numerous) and vitellaria (granular vs. lobular).
 - 5) The present worm under discussion, differs from *Senga malayna* Furnando *et al.*, 1963 in having scolex (triangular vs. circular); the number of hooks (20 vs. 60); vitellaria (granular vs lobate discontinuous in two groups) and reported from host (*Mastacembelus armatus* vs. *Chana striatus*).
 - 6) The present cestode, differs from *Senga parva* Furnando *et al.*, 1963 which is having scolex (triangular vs. pear shaped); in the number of rostellar hooks (20 vs. 38-40); vitellaria (granular vs. granular) and reported from the host (*Mastacembelus armatus* vs. *Chana micropeltes*).
 - 7) The present tapeworm, differs from *Senga filiformis* *et al.*, 1963 which is having scolex (triangular vs. rectangular); in the number of hooks (20 vs. 51-52); testes (60-70 vs. 318-320) and reported from the host (*Mastacembelus armatus* vs. *Chana micropeltes*).
 - 8) The present cestode, differs from *Senga phangensis* Furtado and Chauhan, 1971 which is having number of rostellar hooks (20 vs. 52); neck (absent vs. short); testes (60-70 vs. 50-55); vitellaria (granular vs. lobulated) and reported from the host (*Mastacembelus armatus* vs. *Ophiocephalus micropeltes*).
 - 9) The present worm, differs from *Senga visakhapatnamensis* Ramadevi *et al.*, 1972 in the shape of scolex (triangular vs. rectangular); in the number of rostellar hooks (20 vs. 46-52); in the number of testes (60-70 vs. 52-55); in the position of ovary (anterior to equatorial vs. posterior to equatorial); in arrangement of vitellaria (granular vs. absence of continuous arrangement) and reported from the host (*Mastacembelus armatus* vs. *Channa punctatus*).
 - 10) The present tapeworm, differs from *Senga khami* Deshmukh *et al.*, 1980 in the shape of scolex (triangular vs. rectangular); neck (absent vs. present); in the number of rostellar hooks (20 vs. 55-57); in the number of testes (60-70 vs. 155) and reported from the host (*M. armatus* vs. *Ophiocephalus marulius*).
 - 11) The present cestode, differs from *Senga aurangabadensis* Jadhav *et al.*, 1980 in the shape of scolex (triangular vs. pear to oval); in the number of rostellar hooks (20 vs. 52); in the number of testes (60-70 vs. 240-260) and reported from the host (*M. armatus* vs. *M. armatus*).
 - 12) The present worm, differs from *Senga godavari* Shinde *et al.*, 1980 in the shape of the scolex (triangular vs. pear shaped); in the number of

- hooks (20 vs. 40-42); in the number of testes (60-70 vs. 220-230); ovary (elongated vs. short).
- 13) The present form differs from *Senga punctati* Gupta and Sinha, 1980 in the size of scolex (3.876 x 3.430 vs. 2.644 x 0.78); in the number of rostellar hooks (20 vs. 28-30); in the size of ovary (0.356-0.578 x 0.050 vs. 0.126 x 0.05-0.55).
 - 14) The present tapeworm, differs from *Senga mastacembali* Gupta and Sinha, 1980 in the size of scolex (3.876 x 3.430 vs. 0.92-0.99); in the number of rostellar hooks (20 vs. 30-36); in the size of mature proglottid (0.040 x 0.167 vs. 0.235-0.23 x 0.85-0.89); in the size of ovary (0.356 x 0.578 vs. 0.06-0.07 x 0.05-0.55).
 - 15) The present cestode, differs from *Senga indica* Gupta and Parmar, 1985 in the size of scolex (3.876 x 3.430 vs. 0.78 x 0.62); in the number of rostellar hooks (20 vs. 36); in the size of ovary (0.356 x 0.578 vs. 0.18 x 0.16).
 - 16) The present tapeworm, differs from *Senga paithanensis* Kadam *et al.*, 1981 in the number of rostellar hooks (20 vs. 54); in the number of testes (60-70 vs. 130-135); in arrangement of vitellaria (2-3 rows vs. 3 rows).
 - 17) The present worm, differs from *Senga jagannathae* Majid *et al.*, 1984 in the shape of scolex (triangular vs. pear shaped); in the number of rostellar hooks (20 vs. 44); neck (absent vs. short); in the number of testes (60-70 vs. 240-250).
 - 18) The present form, differs from *Senga maharashtrii* Jadhav *et al.*, 1991 in the shape of scolex (triangular vs. oval); in the number of rostellar hooks (20 vs. 45-46); in the number of testes (60-70 vs. 80-90).
 - 19) The present cestode, differs from *Senga chauhani*, Monzer Hasnain, 1992 in the shape of scolex (triangular vs. oval); in the number of rostellar hooks (20 vs. 40-44); in the number of testes (60-70 vs. 45-50 and reported from (*Mastacembelus armatus* vs. *Channa punctatus*).
 - 20) The present tapeworm differs from *Senga jhansiensis*, Mathur, Srivastav and Daisy Rani, 1994 in the size of scolex (3.876 x 3.430 vs. 0.98-1.4 x 0.23-0.61); in the number of hooks (20 x 28-32); in the size of mature proglottid (0.040 x 0.167 vs. 0.26-0.49 x 0.78-1.23); in the size of ovary (0.356 x 0.578 vs. 0.013-0.21 x 0.197-0.390).
 - 21) The present worm, differs from *Senga mohekarae* Tat *et al.*, 1997 in the shape of scolex (triangular vs. pear shaped); in the number of hooks (20 vs. 22-26); in the number of testes (60-70 vs. 60-70); in the arrangement of vitellaria (2-3 rows vs. 5-6 rows).
 - 22) The present cestode, differs from *Senga chiangmaiensis* Wongsawad *et al.*, 1998 which is having scolex (triangular vs. large, pear shaped); in the number of rostellar hooks (20 vs. 28).
 - 23) The present form, differs from *Senga armatusae* Hiware, 1999 which is having hooks (20 vs. 32-40); testes (60-70 vs. 230-240) in number.
 - 24) The present tapeworm differs, from *Senga tappi* Patil *et al.*, 2003 in the number of rostellar hooks (20 vs. 42-44); in the number of testes (60-70 vs. 285-295); neck (absent vs. present).
 - 25) The present cestode, differs from *Senga baughi* Pande *et al.*, 2006 in the shape of scolex (triangular vs. pear shaped); in the number of rostellar hooks (20 vs. 40-50) and reported from the host (*M. armatus* vs. *Rita rita*).
 - 26) The present worm under discussion, differs from *Senga ayodhensis* Pande *et al.*, 2006 in the shape of scolex (triangular vs. conical); in the number of rostellar hooks (20 vs. 29); in the number of testes (60-70 vs. numerous) and reported from the host (*M. armatus* vs. *Amphinuous cuchia*).
 - 27) The present cestode, differs from *Senga jadhavae* Bhure *et al.*, 2007 in the number of rostellar hooks (20 vs. 50-54); neck (absent vs. present); in the number of testes (60-70 vs. 310-320).
 - 28) The present tapeworm, differs from *Senga chandikapurensis* Khadap *et al.*, 2007 in the shape of scolex (triangular vs. barrel shaped); neck (absent vs. short); in the number of rostellar hooks (20 vs. 28-30); in the number of testes (60-70 vs. 170-180).
 - 29) The present form, differs from *Senga tictoii* Srivastav *et al.*, 2007 in the shape of scolex (triangular vs. oval); rostellum (spherical, round vs. bilobed); in the number of rostellar hooks (20 vs. 24-28); in the number of testes (60-70 vs. 60-120) and reported from the host (*M. armatus* vs. *Punctius ticto*).
 - 30) The present worm, differs from *Senga pazaraensis* Mangale *et al.*, 2009, in the number of rostellar hooks (20 vs. 58); neck (absent vs. short); in the number of testes (60-70 vs. 40-45).
 - 31) The present cestode, differs from *Senga*

- kaigaonensis* Wankhede *et al.*, 2009 in the number of rostellar hooks (20 vs.36); in the number of testes (60-70 vs. 285-295).
- 32) The present tapeworm, differs from *Senga govindi* Minaz N. Attar *et al.*, 2010 in the shape of scolex (triangular vs. barrel shaped); in the number of rostellar hooks (20 vs. 50-53); in the number of testes (60-70 vs. 318-320).
- 33) The present cestode species differs from *Senga madhavae* Bhure *et al.*, 2010 in having scolex triangular, rostellum armed with 40-44 hooks, neck absent, mature proglottid 5-6 times broader than long, vagina thin tube, vitellaria granular, uterus saccular and collected from *M. armatus*.
- 34) The present form, differs from *Senga mangalbaiiae* Bhure and Nanware, 2011 in possessing scolex conical, tapering at the apex and broad at the base, distinctly marked off from the strobila, uterus saccular, vitellaria granular, arranged in 2-3 rows and collected from the host *M. armatus*.
- 35) The reported cestode species, differs from *Senga rupchandensis* Pardeshi and Hiware, 2011 in having body long, scolex flat, tubular, cylindrical, scolex bears two bothria, rostellum flat, having two rows of semicircular hooks, 42-45 in number, neck absent, vitellaria follicular, egg oval, non operculate and recovered from *Channa striatus*.
- 36) The present worm, differs from *Senga rostellarae* Dhole *et al.*, 2011 in having body long, scolex pear shaped, medium, elongated, bothria two, large; cirrus pouch elongated, oval; vitellaria follicular, arranged in one row and collected from the host *M.armatus*.
- 37) It differs from *Senga chandrashekhari* Dhole *et al.*, 2011 in having scolex large, broad at the posterior end, narrow at the anterior end, neck short, testes medium, rounded 98-117 in numbers, evenly distributed in two lateral fields, vagina long, broad tube, eggs oval, operculate and reported from *M. armatus*.
- 38) The present tapeworm, differs from *Senga silcharensis* Puinyabati *et al.*, 2013 in having scolex pear shaped, bluntly rounded apically, anterior region of scolex having rostellum with 44 hooks in two semicircles, ovary post equatorial, bilobed, collected from host *Channa punctatus*.
- 39) The present tapeworm species, differs from *Senga microrostellata* Bhure *et al.*, 2014 in having scolex triangular, rostellar hooks 18-20, neck absent, mature proglottid 8-9 times broader than long, testes 250-300 in numbers; vitellaria follicular, arranged in a line.
- 40) The present species, differs from *Senga nandedensis* Fartade *et al.*, 2014 in having scolex large, well developed, triangular, bothria two, spatulate, neck absent, testes 150-200 in numbers, ovary bilobed, dumbbell shaped, vitellaria follicular arranged in two lateral margins.
- 41) The present form differs from *Senga rostellata* Deshmukh 2015, in having scolex with pair of bothria, rostellum oval, with rostellar hooks 20-22 in numbers, neck long, mature proglottids are 3 times broader than long, testes 25-30 in number, vitellaria follicular.
- 42) It also differs from *Senga tringulata* Deshmukh 2015, in having scolex with pair of bothria, scolex bears rostellum with hooks, neck absent, mature proglottid 4-5 times broader than long, testes 55-60 in number, ovary bilobed and dumbbell shaped, vitellaria follicular.
- 43) The present worm differs from *Senga madhukarii* Fartade 2015, in having scolex cylindrical, rostellum armed with 45 hooks, bothria spatulate, overlapping each other, neck absent, testes 130 in numbers, ovary bilobed, vitellaria follicular arranged in 2-3 rows.
- 44) The present form differs from *Senga mastacembelusae* Fartade *et al.*, 2015, in having scolex triangular, hooks 20-22, mature proglottid rectangular, genital pore rounded.
- 45) The worm under discussion differs from *Senga mohkhedensis* Lakhe 2017, in having scolex large, roughly triangular, rostellum armed with 48 hooks, arranged in circle, testes medium, oval, 95-105 in numbers, ovary bilobed, transversely elongated, vitellaria follicular arranged in two rows.

Taxonomic Summary

- Genus : *Senga* Dollfus, 1934.
 Species : *Senga killedharurensis* sp. nov.
 Type Host : *Mastacembelus armatus*
 Habitat : Intestine
 Type Locality : Kille Dharur, Dist. Beed, M.S., India.
 Date of collection : 30th January 2020

Etymology : The name of the species is proposed after the locality.

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