International Journal of Zoology and Applied Biosciences **ISSN: 2455-9571**
Volume 8, Issue 5, pp: 16-20, 2023
https://doi.org/10.55126/ijzab.2023.v08.i05.003
http://www.ijzab.com

Research Article

STUDIES ON SOME ASPECTS OF THE FISH ENDOPARASITES (CESTODES)

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Article History: Received 27th August 2023; Accepted 23th September 2023; Published 30th September 2023

ABSTRACT

Parasitic diseases are the major cause of morbidity and mortality in man, domesticated animals and wild life. Cestodes are multicellular, bilaterally symmetrical and parasites of great importance to human health. Intestinal infections of cestodes are very common in country and areas with poor socio-economic status are endemic unhygienic living and food habits promote the spread of infection causing high morbidity and complications. Mixed intestinal infection due to cestodes and nematodes is quite common and therefore, there is a need to study the cestode parasites whose prevalence is high. Cestodes infect almost all vertebrates. The freshwater fish species found in Nagapur Reservoir, Parli-Vaijnath, Dist. Beed (M.S.) were observed for the infection of cestode parasites. It was found that the freshwater fishes like *Mystus seenghala* and *Mastacembelus armatus* were infected by the cestode parasites. After detail study they were identified as *Gangesia senghali* (Hiware, 1999), *Circumoncobothrium yamaguti* (Jadhav *et al*., 1990). The cestode parasites were found in the small intestine of the host fishes.

Keywords: *Mystus seenghala, Mastacembelus armatus, Gangesia senghali, Circumoncobothrium yamaguti,* Cestodes.

INTRODUCTION

Although, the fishes are aquatic and cold blooded animals, they also suffer from different types of diseases. To acclimatize with aquatic habitat fishes shows aquatic adaptations to make life easy and healthy. However, to overcome unfavorable conditions and continuous adjustment with changing aquatic environment fishes have to face stress to maintain stable state. Such stress looses physiological control of fishes. As a result, defense mechanism or immune system gets affected and finally fish becomes susceptible to different types of diseases. Cestode parasites are one of the most common endoparasites of fishes. Cestode parasites found in the small intestine of fishes and get required nourishment for their development. Heavy infection of cestodes shows effects on their reproduction, general health, decreases their food value, causing various diseases and increases the rate of mortality. In India, considerable economy regularly earned from fishes. Fishes are not only the source of nutritious food but a fish fulfills different kinds of demands of mankind. Fish glue, fish manure, fish liver oil, poultry food, etc. are the well known product from fishes and these fish products raise the Indian economy. Aquarium fishes are also plays important role in Indian market. Indirectly, cestode parasites not only harmful for fishes but mankind also. Because fishes are regularly consumed by mankind as a delicious food. Fish oriented economy is also affected by cestodes. Hence present research work is undertaken to study some aspects of fish endoparasites i.e. cestodes. The present research work takes place at a sight i.e. Nagapur Reservoir (The Wan medium project) is 10 km far away from Parli taluka. It is located 18^0-53'-00" latitude and 76^0-27'-00" longitude. The catchment area of the project is near about 379.92 sq/km. the submergence area is 347.00 hector and gross storage capacity is near about 25.181 mcm.

MATERIAL AND METHODS

To study cestode parasites, the fresh water fishes were collected from Nagapur Reservoir, Parli-Vaijnath, Dist.

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Beed (M.S.). The intestines of the fishes were removed and cut to open in normal saline water in petridishes these intestines tested and observe under binocular microscope (recorded infected and non infected hosts) the collected tapeworms were washed in distilled water to make them free from intestinal contents. The tapeworms were preserved in hot 4 % formalin. Borax carmine and Haematoxylin stain were used for identification of cestode parasites. The parasites were passed through various alcoholic grades i.e. 30 %, 50 %, 70 %, 90 % and 100 % cleared in xylene and mounted in DPX. All the drawings were made with the aid of camera lucida. All measurements are in millimeters, if not otherwise indicated.

RESULT AND DISCUSSION

Twenty eight cestode parasites were collected from the intestine of freshwater fish *Mystus seenghala* (Ham and Buch, 1822) at Nagapur Reservoir, Parli-Vaijnath (M.S.) India during the period of June 2008 to May 2010. All the specimens were fixed in 4% formalin and were stained with Harris Haematoxylin. Sketches are drawn with the help of Camera Lucida and all measurements are in millimeters. The tapeworm is whitish in color, body is slender, thin, and medium in size and it is considerably long with numerous segments having a maximum length 36 mm and width of 1.49 mm with segments increasing length towards posterior side. Scolex is globular shaped, broader from anterior to posterior side, distinctly marked off from the proglottids, muscular and measures 0.446 in length and 0.384 in width. Scolex consists of four suckers, oval in shape, muscular and overlapping on each other. The anterior end of scolex terminates into rostellum, rostellum with a single row of stout hooks, and it measures 0.216 in length and 0.124 in breadth. Rostellar hooks 36-38 in number arranged in single circle on the rostellum very stout, hooks are rose thorn shaped and have a single pointed prong and measures 0.317 in length and 0.022 in width. Neck is absent.

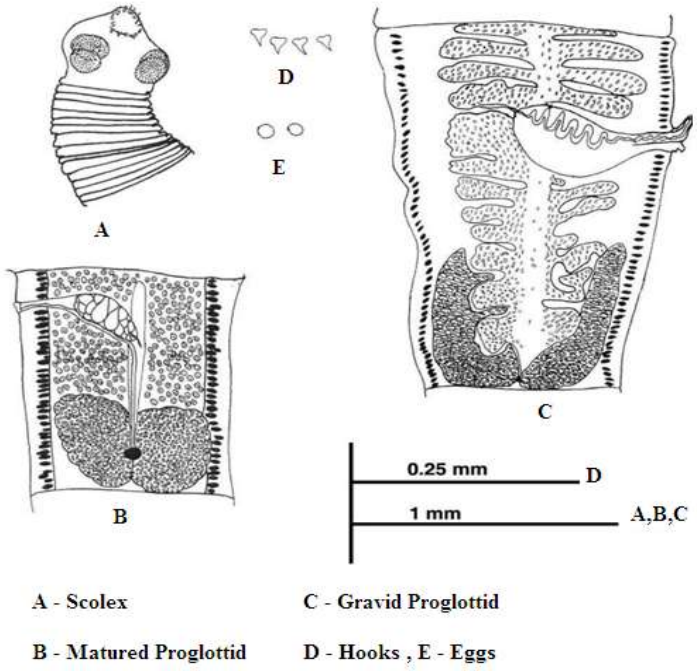

Figure 1. *Gangesia senghali* (Hiware, 1999).

Table 1. Classification *Gangesia senghali.*

Gangesia senghali (Hiware, 1999)		
Class	Eucestoda	Wardle, Mcleod and Radinovsky, 1974
Order	Proteocephalidea	Mola, 1928
Family	Proteocephalidae	La, Rue, 1911
Genus	*Gangesia*	Woodland, 1924
Species	*Gangesia senghali*	(Hiware, 1999)

The strobila is divided into many immature, (Table 1) mature and gravid segments. Proglottids starts immediately after the scolex, gradually increasing in length and width, immature proglottids much wider than long, In immature segments there is no trace of any reproductive organs and partly mature segments observe organs, mature segment longer than wide. Mature segment are squarish, longer than broad measuring 1.039 in length and 0.783 in width. Testes are 220-230 in number, oval to elongated, small in size, it measures 0.050 in length and 0.031 in width. Cirrus pouch, large, elongated, anterior to vagina, it measure 0.580 in length and 0.142 in width. Cirrus is thin, curved and present within the cirrus pouch it measures 0.59 in length and 0.014 in width and forms vas deferens. Vas deferens is coiled, tubular, starts from cirrus extend to the middle of the proglottids, it measures 0.054 in length and 0.007 in width.

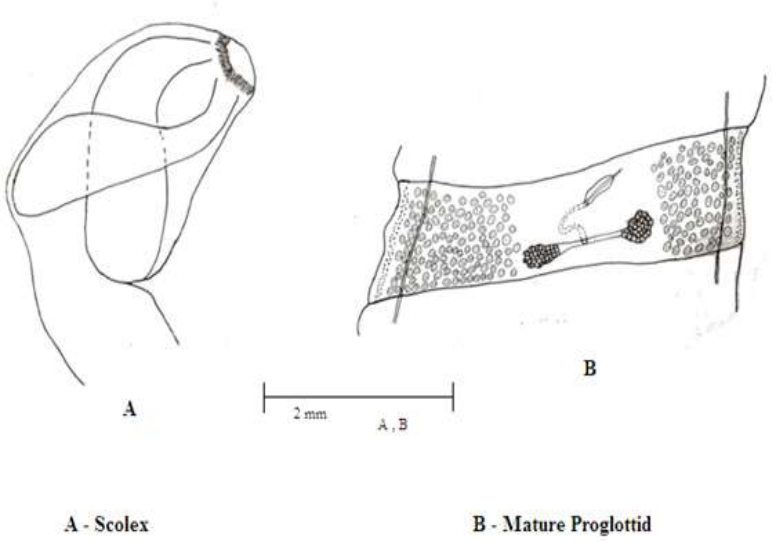

Figure 2. *Circumoncobothrium yamaguti* (Jadhav *et.al*., 1990).

Classification

Circumoncobothrium yamaguti (Jadhav *et al*., 1990)		
Class	Cotyloda	Wardle, Mcleod and Radinovsky, 1974
Order	Pseudophyllidea	Carus, 1863
Family	Ptychobothridae	Luhe, 1902
Genus	*Circumoncobothrium*	Shinde, 1968
Species	*Circumoncobothrium yamaguti*	(Jadhav *et al*., 1990)

Ovary is large in size, bilobed, "H" shaped with small acini, situated near the posterior margin of the segment. Both the lobes of the ovary are transversely elongated large in size, quadrangular in shape, antero – posteriorly elongated; it measures 0.409 in length and 0.260 in width. The isthmus is connecting the two ovarian lobes, transversely placed; it measures 0.019 in length and 0.010 in width. The vagina is a thin tube posterior to cirrus pouch, enlarges at the genital pore, runs along with margin of cirrus pouch, take a curve and run posterior, reaches and opens in to the ootype and measures 0.098 in length and 0.014 in breadth. Ootype is rounded, big and present at the centre of the two ovarian lobes posteriorly and measures 0.057 in diameter. In mature segment uterus is tubular arises from the ootype occupying the vertical position of the central medulla, reaches up to the anterior margin of the segment. Gravid segment is longer than broader and it measures 1.659 in length and 0.0918 in width. The uterus which is 18 -19 diverticulae, it measures 6.140 in length and 0.772 in width, which is filled with numerous eggs. The eggs are oval to elongated, it measures 0.014 in diameter. The present tapeworm comes closer to *Gangesia senghali* (Hiware, 1999) (table 1) in having scolex distinct and globular in shape. Hooks 36-38 in number and arranged in single circle. Neck is absent. The mature segments are broader than long. The testes are 220-230 in number, oval to elongate. Vas deference is coiled. Ovary is bilobed and "H" shaped with small acini. Vagina is posterior to cirrus pouch. Uterus is tubular having 18-19 diverticulae. The genus *Gangesia* was erected by

Woodland in 1924 with its type species *G. macrons* collected from the *Macrones seenghala* from India. Southwell (1930) however recognized only four valid species of the genus, others being regarded as synonyms and *G. parasiuri* was reported by Yamaguti in 1934. Later on Wardle McLeod, (1952) accepted Verma‟s *G. pseudotropii* which is proposed as new genus Vermala by Nybelin, (1942) but later Dhar *et al.*, (1980) added on more species and given a revised diagnosis of the genus *Gangesia* and proposed to divide genus *Gangesia* Woodland (1924) into two sub-genera as one *Gangesia* (*Gangesia*) second *Gangesia* (Vermaia). *Gangesia* (Gangesia) have genital pores irregularly alternating, neck and strobila without spines, rostellum with single or double row of hooks and testes in one field; *Gangesia* (Vermaia) have genital pores regularly alternating, neck and strobila with spine, rostellum with single crown of hooks and testes in single or double field. So far twenty nine species have been have been reported till to date under this genus. The genus *Gangesia* is the sole representative of the family Proteocephalidae from fresh water fishes.

As the characters are minor, it is redescribed here as *Gangesia senghali* (Hiware, 1999). The present tapeworm is collected from *Mystus seenghala* (Ham. and Buch, 1822) from Nagapur Reservoir Parli-Vaijnath M.S., India while *Gangesia senghali* (Hiware, 1999) is also collected from *Mystus seenghala* (Ham. and Buch, 1822). Thirty eight cestode parasites were collected from the intestine of a fresh water fish *Mastacembelus armatus* (Lecepede, 1800) from Nagapur Reservoir, Tq. Parli-Vaijnath, Dist. Beed during the period of June 2008 to May, 2010. The cestode were flattened, preserved in 4% formalin, stained with Harris haematoxylin, passed through various alcoholic grades, cleared in xylene, mounted in D.P.X. and whole mount slides were prepared for further anatomical studies. Drawing was made with the aid of Camera Lucida. All measurements are given in millimeters. The worms were considerably long, thin, milky white in colour, with scolex, numerous immature, mature and gravid proglottids. The scolex is distinct, which is narrow anteriorly and broad posteriorly and measures 5.96 (4.61-7.32) in length and 2.95 (2.74-3.16) in breadth, the anterior end of the scolex ends terminally in a prominent rostellum, armed with 56 single circle straight stout hooks. The scolex bears two bothria overlap on each other sack like and measures4.47 (4.38-4.75) in length and 1.37 (1.33-1.41) in breadth. Neck absent. Mature segment is broader than long and measures 1.71 (1.52-1.90) in length and 6.40 (6.29-6.52) in breadth. The testes are rounded in shape, 130-150 in numbers, situated at each lateral field of segment and measures 0.13 (0.11-0.15) in length and 0.09 (0.07-0.11) in breadth. The cirrus pouch is oval slightly elongated, long, anterior to ovary and measures 0.74 (0.68-0.80) in length and 0.17 (0.15-0.19) in breadth. The cirrus is thin tube and measures 0.79 (0.76-0.83) in length and 0.03 in breadth.

Ovary is bilobed, centrally placed near the posterior margin of the segment, dumb-bell shaped and measures 2.17 (2.09-2.25) in length and 0.35 (0.30-0.41) in breadth situated in the posterior half of the segment. The vagina is thin tube, starts from genital pore, posterior to cirrus pouch and measures 1.18 (1.14-1.22) in length and 0.07 (0.03-0.11) in breadth. Genital pore small, rounded and measures 0.08 in length and 0.04 in breadth. The vitellaria are granular, corticular, arranged in one-two rows at each lateral margin of the segment. The present form comes closer to *Circumoncobothrium yamaguti* (Jadhav *et al*., 1990) (Table 2) in having scolex distinct narrow anteriorly, broad posteriorly. Hooks 56 in number, single circle, straight stout. Neck is absent. The mature segments are broader than long. The testes are 130-150 in number, rounded and arranged in two lateral fields. Ovary bilobed, centrally placed near the posterior margin of the segment. Vitellaria granular, corticular along lateral margin.

The genus *Circumoncobothrium* is erected by Shinde G.B., 1968 from the intestine of fresh water fish *Ophiocephalus leuconpunctatus* as a type species *C. ophiocephali.* Jadhav and Shinde, 1976 added three new species of this genus viz., *C. aurangabadensis* and *C. raoii* from *Mastacembelus armatus and C. gachuai* from *Ophiocephalus gauchua.* Chincholikar and Shinde, 1976 described two new species of this genus *C. shindei* from fresh water fish *Mastacembelus armatus* and *C. bagariusi* from *Bagarius* species. Shinde, 1977 reported *C. khami* from *Ophiocephalus striatus*. Jadhav et.al, 1990 described *C. yamaguti*, from *Mastacembelus armatus* Shinde *et al*., 1994 created *C. alii* from *Mastacembelus armatus.* Patil *et al*., 1998 added *C. vadgaonensis* as a new species to this genus from *Mastacembelus armatus*. Wongsawad and Jadhav, 1998 added *C. baimaii* from *Mastacembelus armatus .C.punctatusi* is added by Kalse and Shinde, 1999 from *Ophiocephalus punctatus.* Shinde *et al*., 2002 described *C. mastacembelusae* as a new species from *Mastacembelus armatus.* Pawar *et al*., 2002 reported *C. armatusae* (*minor*) from *Mastacembelus armatus* to this genus. Tat and Jadhav, 2004 reported *C. manjari* from *Ophiocephalus gachuva*. Supugade *et al*., 2005 added *C.vitellariensis* from *Mastacembelus armatus.* Later on Bhure, 2008 reported *C. mangalbaiae* and *C. govindae* from *Mastacembelus armatus.*

CONCLUSION

The present communication deals with redescription of *Circumoncobothrium yamaguti* (Jadhav *et al*., 1990). The present form is collected from *Mastacembelus armatus* from Nagapur Reservoir Parli-Vaijnath (M.S.), India where as *Circumoncobothrium yamaguti* (Jadhav *et al*., 1990) is also collected from *Mastacembelus armatus* in Aurangabad region, (M.S.), India.

ACKNOWLEDGMENT

The authors express sincere thanks to the head of the Department of Zoology, LKDKBS College, Lonar, Dist. Buldhana and, Department of Zoology, S.S.V.P.S's. L.K.

Dr. P. R. Ghogrey Science College, Dhule (424005), Maharashtra, India for the facilities provided to carry out this research work.

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