

**INTESTINAL HISTOPATHOLOGY OF *MASTACEMBELUS ARMATUS*<sup>13</sup>  
PARASITIZED BY PSEUDOPHYLLIDEAN CESTODES  
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**Received** : 8.3.16; **Accepted** : 12.4.16**ABSTRACT**

Present study was conducted to investigate histopathology of intestinal tissue of freshwater fish, *Mastacembelus armatus*, parasitized by Pseudophyllidean cestodes, *Polyonchobothrium Sp.* and *Senga Sp.* Obviously, the direct effect of cestode parasites mainly depend on their holdfast organs. In all 360 host specimens of *Mastacembelus armatus* were examined out of which 212 were found infected by cestode parasites viz. *Polyonchobothrium Sp.* and *Senga Sp.* Total incidence of cestodal infection was recorded to be 58.88 % during February, 2015-January, 2016. Deep penetration of intestinal tissue of *Mastacembelus armatus* infected with *Polyonchobothrium Sp.* and *Senga Sp.* were found to occur due to penetrative scolex. Transverse section of intestinal tissue showed that cestodes attached to mucosal, sub-mucosal and muscularis mucosa of intestine with scolex and damaged host intestinal villi, invaded deep forming cyst. Its scolex caused destruction and defection of the infected intestinal tissue of fish host. Parasite derives nutritive material, required for growth, from host tissue by causing damage to it. Thus the study reveals that association of *Polyonchobothrium Sp.* and *Senga Sp.* with *Mastacembelus armatus* is more negative on health of fish host.

Figures : 04

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KEY WORDS : Intestinal Histopathology, *Mastacembelus armatus*, Pseudophyllidean Cestode *Polyonchobothrium Sp.*, *Senga Sp.*

**Introduction**

Most of the freshwater fishes constitute highly nutritive food for human being. Some of them are considered as delicacies. These edible fishes are known to harbour a number of cestode parasites which cause deterioration in their health, hence their nutritive and market value is affected. Helminths infect alimentary tract of fish. Any damage to the alimentary canal will alter physiological activities of fish. For cestode parasites, most favourable and selected site is alimentary canal, and the reason is to meet their

primary need of food from host. Cestodes have also been found to infect many freshwater fish and cause pathological effects on the host as irritation, injury or atrophy of tissues and occlusions of alimentary canal, blood vessels or other ducts. Host parasites relationship results in gain of one organism and loss of another. It leads to various diseases and disorders. Keeping in view the increasing importance of fish as cheap source of protein rich diet, an attempt has been made to study histopathological changes caused by *Polyonchobothrium Sp.* and *Senga Sp.* in intestine of *Mastacembelus armatus*.

**ACKNOWLEDGEMENTS** : Authors are indebted to Principal, Yeshwant Mahavidyalaya Nanded for the kind help, inspiration and providing necessary laboratory facilities. DBB is indebted to SERB, New Delhi for sanctioning Fast Track Research Project No. SR/FT/LS-19/2010 Dt. 2nd May, 2012.

**TABLE-1: Prevalence of Cestode Parasites of *Mastacembelus armatus* during February,2015 to January,2016**

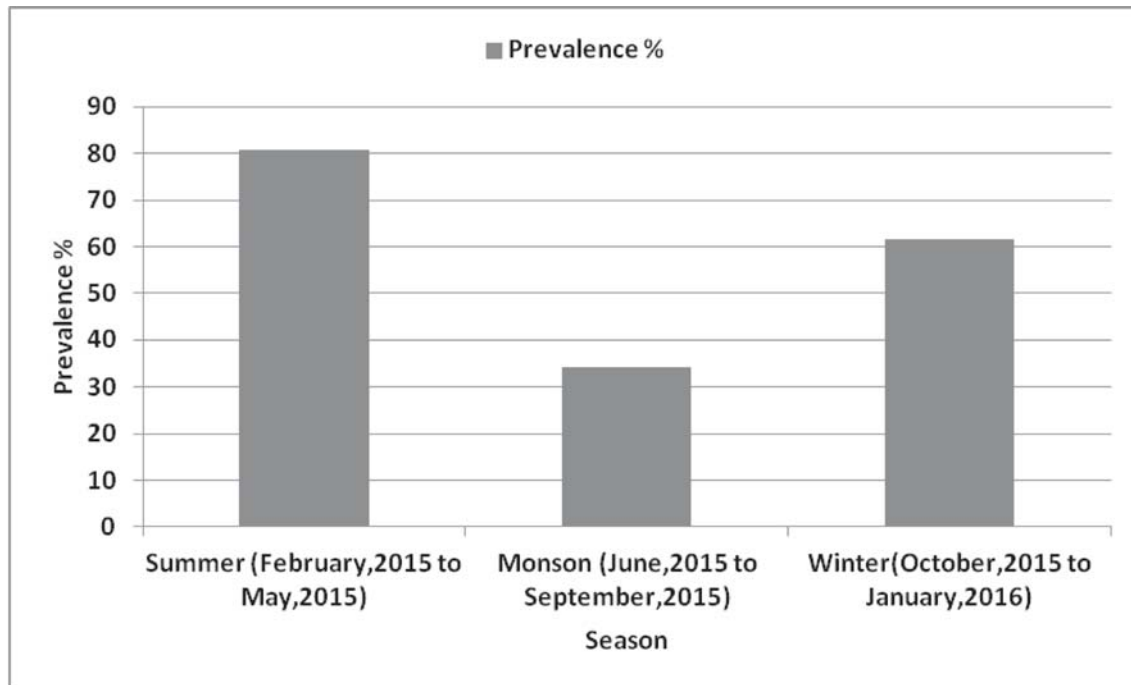
Season	No. of Host Examined	No. of Host infected with Cestodal infection	Prevalence %
<b>Summer</b> (February, 2015 to May, 2015)	120	97	80.83
<b>Monsoon</b> (June, 2015 to September, 2015)	120	41	34.16
<b>Winter</b> (October, 2015 to January, 2016)	120	74	61.66
<b>TOTAL</b>	360	212	58.88

### Materials and Methods

To record the rate of cestode infection and histopathological study, a total of 360 *Mastacembelus armatus* were examined and screened during February, 2015 to January, 2016. Main sites for cestode infection were intestine. Study revealed cestode infection of *Mastacembelus armatus* by Pseudophyllidean cestodes *Polyoncobothrium*<sup>7</sup> and *Senga*<sup>8</sup> whose identification was done by morphological features<sup>10,23,24</sup>. The prevalence was recorded and calculated<sup>14</sup>. Pisces of the infected and uninfected intestine of freshwater fish *Mastacembelus armatus* were fixed in Bouin's fluid to study histopathological changes<sup>2,21</sup>. Fixed materials from Bouin's fluid were removed, washed, dehydrated through alcoholic grades, cleared in xylene and embedded in paraffin wax (58-62°C). The sections were taken at 9 $\mu$ m and slides were stained routinely with haematoxylin and eosin (H-E) for histopathological examination.

### Results and Discussion

In all 360 host specimens of *Mastacembelus armatus*<sup>12</sup> were examined out of which 212 were



**Fig. 1 : Prevalence of Cestode Parasites of *Mastacembelus armatus* during February,2015 to January, 2016**

**TABLE-2: Incidence of infection of Cestode Parasites *Polyoncobothrium Sp.*, *Senga Sp.* and Mixed infection of *Mastacembelus armatus* during February, 2015 to January, 2016**

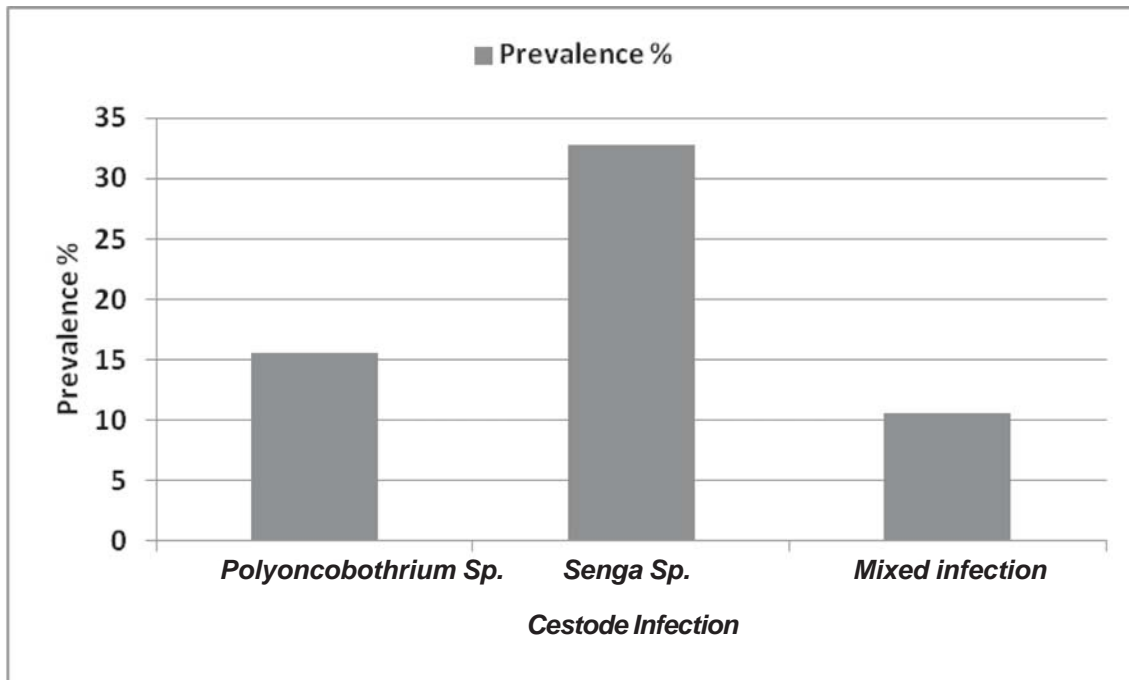
Cestodes	No. of Host Examined	No. of Host infected with Cestodal infection	Prevalence %
<i>Polyoncobothrium Sp.</i>	360	56	15.55
<i>Senga Sp.</i>	360	118	32.78
Mixed Infection	360	38	10.55
TOTAL	360	212	58.88

found infected with *Polyonchobothrium Sp.* and *Senga Sp.* Total incidence of cestodal infection to

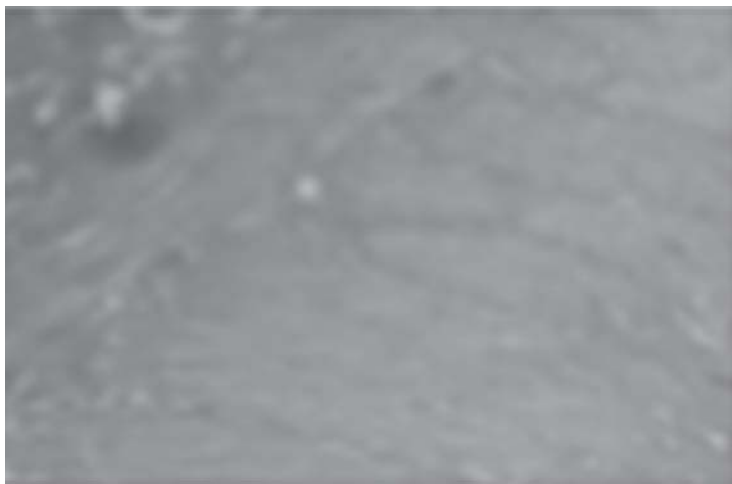
be 58.88 % during February, 2015-January, 2016.

High incidence of infection of cestode parasites of *Mastacembelus armatus* were recorded in Summer (80.83%) followed by Winter (61.66%) whereas infection was low in monsoon (34.16%) (Table-1 & Graph-1). As compared to *Polyoncobothrium Sp.* (15.55%) and Mixed infection(10.55%) the incidence of infection of *Senga Sp.*(32.78%) is high (Table-2& Graph-2).

Findings of present investigation agree with earlier<sup>6</sup> which showed high incidence (51.78%), intensity (1.18%) and density (0.613%) of *Rhabdocona Sp.* in summer followed by winter and rainy season<sup>11</sup> recorded highest prevalence of helminthes in *Schizothorax sp.* during summer and lowest in winter. There<sup>3</sup> was high incidence of infection of *Senga Sp.*, *Gangesia Sp.*, *Proteocephalus sp.* infected to *Channa sp.* was in summer (76.66 %, 73.33 % & 70.00 %) followed by winter (65.21 %, 52.17% & 56.52%) whereas infection was low in monsoon (36.84%, 26.31% & 31.57%). There<sup>16</sup> were high incidence, Density and Index of infection of Piscean nematode of genus *Camallanus sp.* and *Spinitectus sp.* in Summer followed by Winter whereas infection was low in



**Fig. 2 : Incidence of infection of Cestode Parasites, *Polyoncobothrium*, *Senga* and mixed infection of *Mastacembelus armatus* during February,2015 to January,2016**



**Fig. 4: Infected intestinal Tissue of *Mastacembelus armatus***

**Fig. 3: Non infected intestinal Tissue of *Mastacembelus armatus***

Intestine of *Mastacembelus armatus* infected with *Polyonchobothrium* shows damage to mucosa, submucosa and muscularis mucosa by penetrative scolex. Shortening, flattening and damage of villi and cyst formation in the intestine of fish host infected with *Senga* Sp. was observed in this study.

The present findings are more or less similar to the observations made earlier<sup>11</sup> from intestine of *Gallus gallus domesticus* parasitized by *Davainea* sp. A worker<sup>1</sup> studied the histopathology of *Gastrodicoides hominis* a

digenean trematode of pig and reported leucocytic infiltration and mucosal epithelium destruction. Another worker<sup>22</sup> noticed shortening of villous processes and inflammatory response in the submucosa and serosa of *C. batrachus* infected with *Lytocestus indicus* and *Diphyllobothrium penetrans*. A worker<sup>19</sup> studied the total destruction and necrosis of all layers of intestinal wall and severe destruction occurring in mucosa and sub-mucosa of *Nesokia indica* parasitized by *Syphacia* sp. There were intestinal inflammation and vasodilation of intestinal tissue of *Carcharias acutus* by *Phoreobothrium* Sp. and intestinal villi disturbed by the invasion of Scolex of *Moniezia* inhabiting intestinal tract of *Capra hircus*<sup>17,18</sup>. Workers<sup>15</sup> studied intestinal histopathology of *Capra hircus* L. infected with *Stilesia jadahave*, and their results show, that the worm is not having very close contact but it has developed very weak contact and attached loosely to crypts of Liberkuhn. it was found that infected intestinal tissue gets broken due to penetration of hooks and formed ulcer in intestine of *Aetomylaeus nichoffii* parasitized by *Uncibilocularis* Sp<sup>20</sup>. Piscean cestodes were attached to intestinal tissue and ruptured villi, destroyed mucosal, sub mucosal and muscularis mucosa of intestine<sup>4</sup>. Infection of Cestode causes alteration which leads to destruction of internal anatomy of intestine and resulting in total change of its appearance<sup>5</sup>.

### Conclusion

Recorded data of present study show that the incidence of infection of *Polyonchobothrium* Sp. and *Senga* Sp. of freshwater fish *Mastacembelus armatus* was high in summer followed by winter whereas low in monsoon due to environmental factors and feeding habitat of host influenced the seasonality of parasitic infection either directly or indirectly.

Histopathological Study shows that, Cestode parasites are attached to tissues of intestine with holdfast organs causing shortening, flattening and damage of villi, destructed mucosa, sub mucosa of intestine by scolex penetratation.

Thus the study reveals that association of *Polyonchobothrium Sp.* and *Senga Sp.* with *Mastacembelus armatus* is more negative on health of fish host, consequently causing economic loss to the fishery industry.

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