

Studies on prevalence, abundance and intensity of Fish parasites in *Monopterusuchia*

Biplab Kumar Das^{1*}, Sulata Kar¹ and Devashish Kar²

¹Research Scholar, Department of Life Science and Bioinformatics,
Assam University, Silchar- 788011, Assam (India)

²Professor and Dean, School of Life Sciences, Assam University,
Silchar-788011, Assam (India)

ABSTRACT

The present investigation was on occurrence on different parasites found in thirty (30) specimens of *Monopterusuchia*. The present study on helminth parasite of *Monopterusuchia* with respect to length, weight and sex of the host revealed that Cestode infection was the highest in all fish samples of the fish species. The high worm burden was located in the gut mainly the intestine of the fish. Also some eggs (5) were detected in the liver of two host fishes. In this study thirty specimen fishes were examined among which fourteen were male specimens and sixteen were female specimens. The female specimen showed higher prevalence of about 75% than the male specimens which have prevalence of only 14.3. But the intensity of infection in male is 3.5 and that of female is 1.75.

Keywords: *Monopterusuchia*, Helminth parasite, Cestode, Prevalence, Intensity, Barak Valley.

North-East is endowed with huge fishery potential, also Assam possesses immense fishery resources in the form of rivers, beds, swamps, ponds, tanks, forest, fisheries and paddy fields. Fishery is considered as one of the important sectors for the economy of the State. *Monopterusuchia* is a freshwater fishes of North-East India, also found in some wetlands of Barak Valley (Southern Assam),

commonly known as Gangetic mud-eel, is a mud dwelling fish with snake like appearance and smooth, slimy skin⁷. *M.uchia* belongs to the family Synbranchidae and order Synbranchiiformes^{1,7,8,12}. It is an indigenous fish species of N.E. India and locally known as 'kuchia'. Rivers, ponds, beels and other fresh water bodies are the natural habitat of this eel⁸. Parasites are small players with crucial role in

*Corresponding Author

E-mail: biplabrsandgis@yahoo.com & Phone No: [+91-9706682188](tel:+91-9706682188)

ecological system. Parasites are metabolically dependent on their hosts mainly for their nutritional requirements^{12,13,14}. Many workers have been done in relation to the occurrence of parasites of fresh water fishes in many countries. Chubb^{3,4,5,6} illustrates the studies of helminthes in freshwater fishes of different climatic zone of the world. The influence of parasitic infection in relation to the length of fish has been described by many workers Baylis^{1,2}, Firadaus⁹, Hiware¹⁰, Shomorendra *et. al.*¹⁶, worked on the fish parasites of fresh water fishes in India. Puinyabati¹⁰, Ratnabir *et. al.*¹⁵ studied on the Cestode parasites in relation to length of three freshwater fishes of Dolu Lake of Silchar, Assam, India. Das *et. al.*⁷, Studies on Intensity of Cestodes Parasite Infecting *Monopterusuchia* in Cachar District, Assam, India.

The fishes were collected from the study site and brought to the laboratory in the polythene bags containing water of the same locality. The identification of each fish was done following Jayaram,¹¹. Small fishes were killed by pitching and somewhat larger specimens by blow on the top of the cranium. The abdominal cavity of all the fishes were then dissected using dissecting kit along the mid-ventral line of the fish for the diagnosis of different helminth parasite. The viscera consisting of the gut, liver, heart, gonads and kidneys were kept separately in petridishes and washed properly with water. The surfaces of visceral organ and body cavities were examined properly for any encysted larvae and parasites. The external body organs as well as the internal body organs were thoroughly examined for the parasites. The parasites collected, upon being fully relaxed, were fixatives prescribed

for different parasitic group. The parasites were fixed in Alcohol-Formalin-Acetic acid solution and immersing in warm 70% alcohol and were finally stored in 70% alcohol. To facilitate identification the parasites were cleared in Lactophenol and mounted in Glycerin jelly or Canada Balsam and stained in Alum carmine. Prevalence, abundance and intensity of infection in accordance to various criteria were estimated following the formula proposed by Margolis *et al.*¹³:

$$\text{Prevalence} = \frac{\text{Total number of infected fishes}}{\text{Total number of fish hosts examined}} \times 100$$

$$\text{Abundance} = \frac{\text{Total number of parasites recovered}}{\text{Total number of fish hosts examined}}$$

$$\text{Mean Intensity} = \frac{\text{Total number of parasites recovered}}{\text{Total number of infected fishes}}$$

A total of 30 individuals of *Monopterusuchia* were examined. All helminth infection observed and recorded were restricted to the intestine of the fish. Fourteen specimens were found to be infected with Cestodes. Total of 128 Cestodes were found in the host fishes, Helminth parasites infection in *M. cuchia* with relation to length, weight and sex of the host are recorded. Table 2 depicts the prevalence (%) abundance and intensity of infection of helminth parasite in the host fish species, *Monopterusuchia*. Table 3 shows the prevalence (%), abundance and intensity of infection of helminthic group, in this case cestode, in relation to sex of the host, *Monopterusuchia*. A total of fourteen male specimens were examined; two were infected with seven helminthic parasites which show prevalence (%) of 14.3, with abundance of 0.5 and intensity of infection is 3.5. In case of female,

sixteen host specimens were examined among them twelve were found infected with twenty-one helminthic parasites, which shows an prevalence (%) of 75 of the total sample, having abundance of 1.31 and intensity of infection is 1.75. Table 4 shows the prevalence (%), abundance and intensity of helminth infection in relation to size of *M. cuchia*. Eight length groups were recorded. The group with a length between 40cm – 45cm showed prevalence of 66.7% of infection, abundance of land intensity of infections 1.5 length between 46cm – 50cm showed prevalence of 40% of infection, abundance of 0.6 and intensity of infection is 1.5. Length between 51cm – 55cm showed prevalence of 28.6% of infection, abundance of 1.14 and intensity of infection is 4. The group of fishes with length between 56cm – 60cm are not infected by any of helminthic group of parasites. The group of fishes with length between 61cm – 65cm showed prevalence of 40% of infection, abundance of 0.4 and intensity of infection being 1 length between 66cm – 70cm showed prevalence of 50% of infection, 0.5 of abundance and intensity of infection being 1. Length between 71cm–75cm showed prevalence of 66.67%, 1.67 of abundance and intensity of infection being 2.5. Fishes with length group of 76cm – 80cm showed prevalence of 100% of infection, abundance of 1 and intensity of infection being 1.

The weight of fish specimens examined ranged between 78.83gm and 296.2gm. Table V shows the prevalence (%), abundance and intensity of infection of helminth parasite in relation to weight group of *M. cuchia*. Five weight groups were recorded. The fish specimens with weight group of 78gm – 127gm showed 36.4% of prevalence, 0.55 of abundance and

1.5 of intensity of infection. The weight group of 128gm – 177gm showed prevalence of 50%, abundance of 1.5 and intensity of infection being 3. The weight group of 178gm – 227gm showed 66.7% of prevalence, abundance of 0.67 and intensity of infection is 1. The weight group of 228gm – 277gm showed prevalence of 50%, abundance of 0.83 and intensity of infection is 1.67. The fish specimens with weight group of 278gm–327gm showed 50% of prevalence, abundance, of 1.5 and intensity of infection being 3. Eggs of some unknown parasites are also detected in the liver of two host fishes.

Fish helminth parasites are generally found in all freshwater fishes. The parasite prevalence, abundance and intensity depend on many factors like parasite its life cycle, host and its feeding habits and the physical factors of water body where the fish inhabit. It also depends upon the presence of intermediate host such as Piscivorous birds mainly for the spread of Cestode infections.

A total of fourteen male specimens were examined; two were infected with seven helminthic parasites which show prevalence (%) of 14.3, with abundance of 0.5 and intensity of infection is 3.5. In case of female, sixteen host specimens were examined among them twelve were found infected with twenty-one helminthic parasites, which shows an prevalence (%) of 75 of the total sample, having abundance of 1.31 and intensity of infection is 1.75. Prevalence of helminth infection in all the eight length groups were almost equal but the fish host with length group 76cm – 80cm i.e. the highest in this study shows 100% prevalence whereas fish in the length group 56cm – 60cm shows 0% of prevalence of

Table-1. Prevalence, Abundance and intensity of Cestode infection in *Monopterusuchia*

Species	No. of fish examined	No. of fish infected	Total No. of parasites	Site of infection	Prevalence (%)	Abundance	Intensity of Infection
<i>Monopterusuchia</i>	30	14	28	Intestine	46.67	0.93	2

Table-2. Prevalence, Abundance and Intensity of Infection of Helminth Parasites in relation to the sex of the host, *Monopterusuchia*

Sl No.	Parameters	Male	Female	Combined sex
1	No. of Fish Examined	14	16	30
2	No. of Fish infected	2	12	14
3	Total No. of Parasites	7	21	28
4	Prevalence %	14.3	75	46.67
5	Abundance	0.5	1.31	0.93
6	Intensity of Infection	3.5	1.75	2

Table-3. Prevalence, abundance and Intensity of Infection of helminth parasites in relation to the length group of *Monopterusuchia*

Parameters	40-45 (cm)	46-50 (cm)	51-55 (cm)	56-60 (cm)	61-65 (cm)	66-70 (cm)	71-75 (cm)	76-80 (cm)	Total
No. of Fish Examined	3	5	7	1	5	2	6	1	30
No. of Fish infected	2	2	2	0	2	1	4	1	14
Total No. of Parasites	3	3	8	0	2	1	10	1	28
Prevalence %	66.7	40	28.6	0	40	50	66.67	100	46.67
Abundance	1	0.6	1.14	0	0.4	0.5	1.67	1	0.93
Intensity of Infection	1.5	1.5	4	–	1	1	2.5	1	2

Table-4. Prevalence, abundance and Intensity of Infection of helminth parasites in relation to the weightgroup of *Monopterusuchia*

Parameters	78-127 (gm)	128-177 (gm)	178-227 (gm)	228-277 (gm)	278-327 (gm)	Total
No. of Fish Examined	11	6	3	6	4	30
No. of Fish infected	4	3	2	3	2	14
Total No. of Parasites	6	9	2	5	6	28
Prevalence %	36.40	50	66.7	50	50	46.67
Abundance	0.55	1.5	0.67	0.83	1.5	0.93
Intensity of Infection	1.5	3	1	1.67	3	2

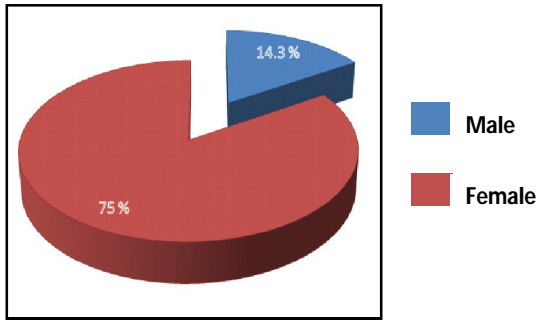


Fig 1. Graphical representation of prevalence percentage of **Helminth** infection in male and female species of *Monopterus cuchia*.

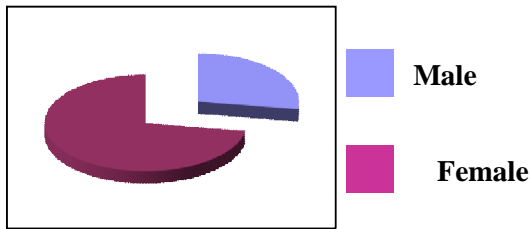


Fig 2. Graphical representation of Abundance of **Helminth** infection in male and female species of *Monopterus cuchia*.

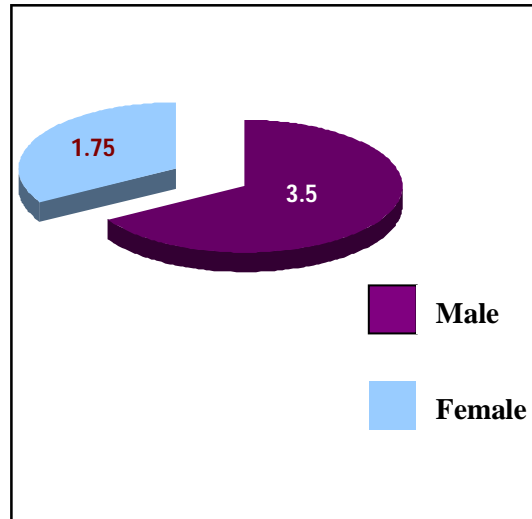


Fig 3. Graphical representation of Intensity of **Helminth** infection in male and female species of *Monopterus cuchia*.

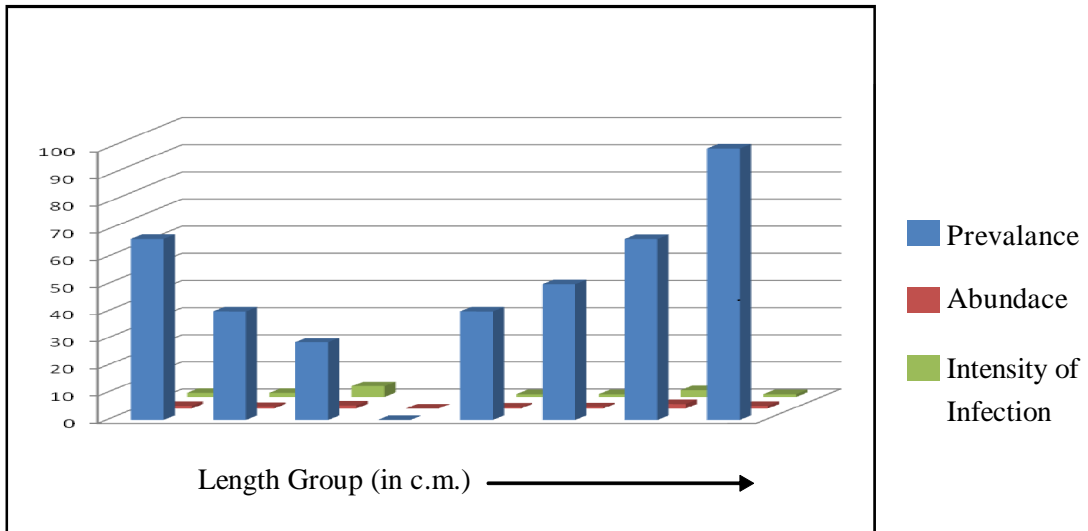


Fig 4. Graphical representation of Prevalance, abundance and intensity of infection of **Helminth** parasite in relation to length group of *Monopterus cuchia*.

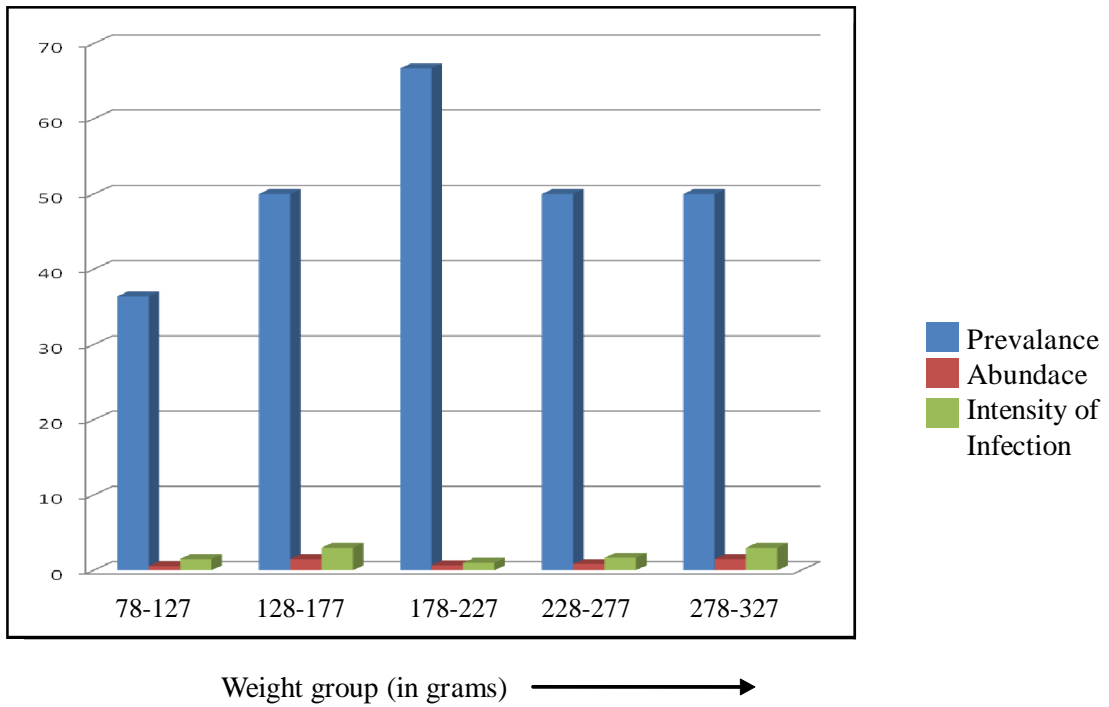


Fig 5. Graphical representation of prevalence, abundance and intensity of infection of **Helminth** parasite in relation to weight group of *Monopterus albus*.

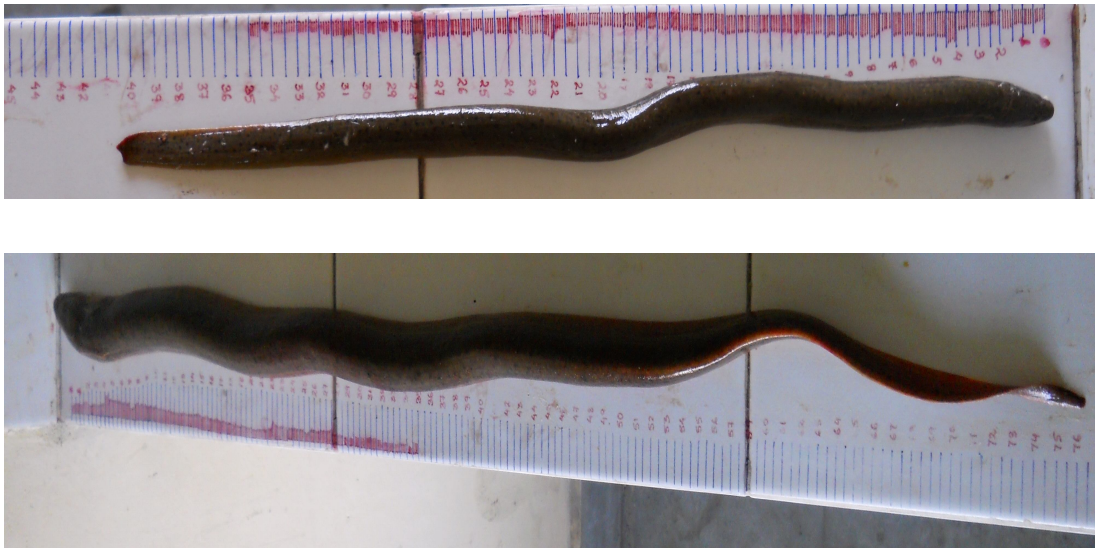
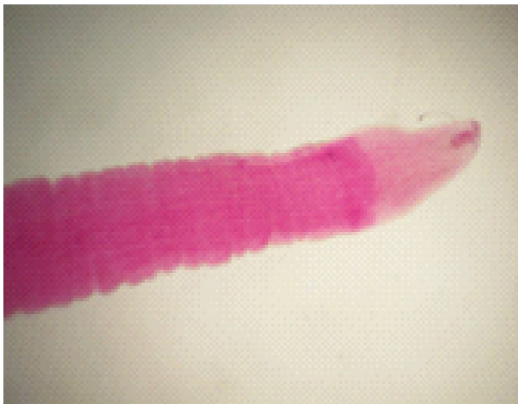


Fig 6. A view of *Monopterus albus*



Fig. 7. Showing live Cestode parasite recovered from the intestine of the host species, *Monopterus albus*



A. Anterior portion of a Cestode



B. Posterior portion of a Cestode

Fig. 8. Electron microscope photograph of sections of different Cestode

infestation. Similarly, in relation to weight group of *M. cuchia* infestation of helminth parasite; prevalence, abundance and intensity of infection is almost distributed. The weight group of 128gm – 177gm, 228gm – 277gm, 278gm – 327gm shows 50% prevalence of infection whereas weight group of 178 – 227 shows highest prevalence of about 66.7% of infection. The lowest weight group with 78gm – 127gm shows lowest prevalence of 36.4% of infection.

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