

Seasonal variation of the nematode *Camallanus anabantis* in the fish *Anabas testudineus* in Loktak Lake, Manipur, India

Th Ranibala*, M. Shomrendra¹ and Devashish Kar

Division of Wetlands, Fishery Science and Aquaculture, Department of Life Sciences, Assam (Central) University, Silchar-11, INDIA

¹Fish disease Research Lab, Department of Zoology, Thambal Marik College, Oinam-795134 (Manipur), INDIA

*Corresponding author. E-mail: ranithoudam@yahoo.in

Received: July 20, 2013; Revised received: September 4, 2013; Accepted: September 16, 2013

Abstract: The present paper deals with the study of the seasonal variation on the occurrence of the Nematode *Camallanus anabantis* from the fish host *Anabas testudineus* from Loktak Lake, Manipur during May 2010- April 2011. A total of 460 number of *A. testudineus* has been sampled for the parasite infection and 335 fishes (71 %) has been found to be infected with the nematode thereby indicating high prevalence of infection of the nematode parasites in the fish.

Keywords: *Anabas testudineus*, *Camallanus anabantis*, Loktak lake, Seasonal variation

INTRODUCTION

Anabas testudineus is one of the common fishes found in Manipur India. It inhabits the majority of lakes, swamps and rice fields etc. They are mostly found naturally and the culture of these has not yet been practiced. It is also one of the most preferred food fish in the state. These fishes are chiefly predatory though wild fish apparently feed on some vegetative matters including algae and rice grains as well as smaller fish, invertebrates and molluscs (Jayaram, 2010). Infection of fish with diverse form of parasite has been known. Among the parasites infecting the fishes nematodes parasites are most common. Fish diseases due to nematode parasite are one of the important problems in fish culture and fish farming Karve (1941), Agarwal (1965) and Soota (1983). The presence of nematode parasite upto a large extent is detrimental for a fish population consequently, imposing big loses to fish farmer. Kar (2007) made detailed study of the limnology and ichthyofauna of the water bodies of north- east (NE) India including diseases in fishes. The present study deals with the prevalence and intensity of infections of the nematode parasite in the fish *Anabas testudineus* for a period of 12 months extending from May 2010 to April 2011. The water temperature, one of the significant abiotic variables for seasonal variation has also been taken into account to study the occurrence of the nematode parasites *Camallanus anabantis* in the fish host *Anabas testudineus* in Loktak lake, Manipur, India.

MATERIALS AND METHODS

Fishes of different sizes were routinely collected from

Loktak Lake in Bishupur district of Manipur. Loktak lake which is the largest natural lake in eastern India is located about 38 km from Imphal in Manipur state. It has an area of 26000 ha with a catchments area of more than 98000 ha. It is situated between 93°46' E - 93°55' E and 24°25' N - 24°42' N. The maximum depth of the lake is 4.58m and the average depth is 2.07m. The unique feature of the Loktak Lake is the floating swamps or mats, locally called Phumdi. Small fishes were killed by pithing and somewhat larger specimens by blow on the top of cranium. The external body surface as well as the internal body e.g. alimentary canal, liver, heart, kidney, gonads, swim bladder etc were thoroughly examined for the occurrence of parasites. The living worms were placed directly in warm 70% alcohol for fixation. An alternate methods was used for killing and stretching by immersing the worms for 0.5-1 minutes in glacial acetic acid (Bylund *et al* 1980), and then preserved in 70% alcohol. Further the worms were cleared in Lactophenol and mounted in glycerine jelly. Data was collected monthwise and the incidence and intensity of parasites was calculated seasonally *i.e.* summer, autumn, winter and spring.

The data related to percentage of infection, intensity and abundance were determined following the standard formulae of Hoffmann (1999).

RESULTS AND DISCUSSION

From the recorded data, we have analyzed the incidence of nematode infection *Camallanus anabantis* in the fish host *Anabas testudineus* in Loktak Lake, Manipur, seasonally. Table 1, shows the prevalence, intensity and abundance of infection seasonally. From the

Table 1. Seasonal variation in prevalence, intensity and abundance of nematode parasite *C. anabantis* of the fish *A. testudineus* of infection (May, 2010 to April, 2011).

Season	Water temperature in °C	No. of fish examined	No. of fish infected	No. of nematode parasites	Prevalence % (No. of fish infected)	Intensity	Abundance
Summer (May, June and July)	29-30	178	158	327	88.7	2.06	1.83
Autumn August, September and October	22-29	154	103	161	66.8	1.5	1.04
Winter (November, December and January)	18-20	86	20	25	23.2	1.25	0.29
Spring (February, March and April)	20-26	127	54	84	42.5	1.5	0.66

observations it has been found that the parasite has been recorded from the fish species throughout the year though the incidence of infection is different. There was a high rate of infection during the summer (88.7%), medium in autumn (66.8), and spring (42.5%), and low in winter (23.2%). The intensity of infection was highest in summer (2.06), and lowest in winter (1.25). The intensity of infection in autumn and winter was 1.5 each. Chubb (1982) emphasized that water temperature acts directly on the helminthes or indirectly through the host behaviour, especially feeding behaviour and metabolism. In the present study, it may be one of the reasons of leading to higher parasitic infection in the fishes in summer. Leningrad (1999) also pointed out that an increase in temperature to certain limits accelerates the fission and larval development parasites while beyond that limit these processes slow down. In the present study, both the maximum prevalence and intensity of helminth infection were observed in summer. The same has also been reported by Kennedy (1982), Gupta and Singh (1984) and Amin (1986) for more prevalence and intensity of helminthes in summer months in fishes.

Conclusion

The more prevalence of *C. anabantis* in the fish *A. testudineus* in Loktak lake, Manipur during summer appears to be due to the fact that water temperature acts directly on the larval stage of the nematode parasites or indirectly through the fish behavior, especially feeding behavior and its metabolic activity.

ACKNOWLEDGEMENT

The authors are indebted to the Director, ZSI, Kolkata, Principal, Thambal Marik College, Oinam for giving laboratory facilities. Thanks are due to Shri S. R. Dey Sarkar of ZSI, for identifying the specimens and to UGC, New Delhi for granting UGC-fellowship to the first author.

REFERENCES

- Agarwal, V. (1965). Some new nematode parasites from freshwater fishes of Lucknow. *Indian J. Helminth.*, 17(1): 1-17.
- Amin, O.M. (1986). Acanthocephala from lake fishes in Wisconsin: host and seasonal distribution of species of genus *Neoechinorhynchus* Hamann, 1892. *J. Parasitol.*, 72(1): 111-118.
- Bylund, G., Fagerholm, H.P., Calenius, G., Wikgreen, B.J. and Wikstrom, M. (1980). Parasites of fish in Finland-ii. Methods for studying parasite fauna in fish, *Acta Acad. Aboensis. Ser. B.*, 40(2):1-23.
- Chubb, J.C. (1982). Seasonal occurrence of helminth parasite in fishes. Part-iv. Adult Cestoda, Nematoda and Acanthocephala. *Advances in Parasitology*. Academic press. London & New york.20: 1-292.
- Gupta, V. and Singh, S.R. (1984). On a new species *Pseudocaryophyllaeus ritai* sp.nov. (Family

- Caryophyllaeidae) from the intestine of a freshwater fish, *Rita rita*, from river Gomati at Lucknow, U.P. *Indian J. Helminth.* 35 (1): 11-14.
- Hoffman, G.L. (1999). Parasites of North American Freshwater Fishes. 2nd ed. Ithaca and London, Comstock Publishing Associates (Cornell University Press).
- Karve, J.N. (1941). Some parasitic nematodes of fishes-I. *J. Univ. Bombay.* 10 (3): 9-42.
- Kennedy, C.R. (1982). Biotic factors. In: *Patterns- their world and ours. Proceedings of the Fifth International Congress of Parasitology.* Toronto, Canada. 7-14 August 1982, under the auspices of the World Federation of Parasitologists (Eds Mettrick, D.F and Desser, S.S). Amsterdam. The Netherlands. *Elsevier Biomedical Press.* pp. 293-302.
- Jayaram, K.C. (2010). The Freshwater Fishes of the Indian Region. *Narendra Publishing House* (Delhi). pp. 616.
- Kar D. (2007). *Fundamental of Limnology and Aquaculture and Biotechnology.* xiv + 609. Daya Publishing House (New Delhi).
- Leningrad, E. (1999). Parasites of freshwater fish and the biological control. Israel Program for Scientific translation Ltd. S. Monson Israel. pp: 137-77.