



On Annual Cycle of Monogenean Parasites Infestation in Freshwater Fish *Pangasius pangasius*

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ABSTRACT:

Annual cycle on the infestation of monogenean parasites found in fresh water fish *Pangasius pangasius* is statistically analysed and presented in this communication. During routine course of investigations for the presence of helminth parasites harbouring freshwater fishes found in Muzaffarnagar, annual data was collected for these parasites. Results are well presented in the form of tables. Statistical analysis of the data is carried for density, intensity, rate of infestation and the same has been correlated for annual cycle.

Keywords: Monogenetic trematodes, Fish, *Pangasius*, Population dynamics, Seasonal occurrence.

INTRODUCTION

Fish are a measure of environmental health, because everything that happens on the landscape goes into the rivers. Any change in the environment will be reflected as changes in physiological processes and survival of fish because fish are in direct contact with their surrounding environment (Wepener, 1997). This and various other reasons contribute to the fact that fish are excellent indicators of water quality, some of these reasons include that fish are at or close to the end of food chains in aquatic ecosystems, their sensitivity to a variety of pollutants, their size and they are easily visible when dead (Nussey, 1994).

Fish parasite communities may provide important information on ecosystem conditions due to their intimate contact with both the host and aquatic environment.

Monogeneans are a group of flukes, which are ectoparasitic in nature. Parasites are often described as an ideal biological model for ecological study (De Meeus, et. al. 1998).

This study aimed at determining the population dynamics and statistical analysis of monogenetic trematodes of *Pangasius pangasius*, which is an important

food fish being a hard variety and larger in size.

MATERIALS AND METHODS

The live fishes for the present work were obtained from the local fish markets and different water sources of Muzaffarnagar region. For collecting monogeneans, Mizelle's, 1936 and 1938, freezing technique was employed.

A thorough record of basic data comprising the number of host specimens examined, number of host specimens infected and the number of parasites collected were maintained throughout the year. The available data was analyzed for parameters such as prevalence, mean abundance, mean intensity, Simpson's index, Chi square test and "G" log-likelihood test with the help of formulae as suggested by Bush *et al.* 1997.

RESULTS AND DISCUSSION

The data obtained from the study of populations of monogenetic trematodes infesting *Pangasius Pangasius* during annual cycle from August 2006 to July 2007 was analyzed statistically as per Bush et. al. 1997 and is thereby presented in Table 1.

Table-1 Data showing the population dynamics & statistical results of helminth parasites of *Pangasius pangasius* from August 2006 to July 2007.

Months (2006-2007)	No. of fish examined		Standard length (cm)	No. of fish infected	Total no. of parasites			P(%)	MA	MI	Simpson index ©	Chi-square test (x ²)	“G”log likelihood test
	Total	M/F			Monogenean								
Aug	3	M-2	62.4-71.3	1	4	4	50	1.333	4	0.0625	15	5.5446	
		F- 1	52.8	0	0	0	0			0	0		
Sep	5	M-2	66.3-67.1	0	0	0	0	2.2	5.5	0	0	9.703	
		F- 3	55.8-71.2	2	11	11	66.6666			0.033	58.5		
Oct	6	M-2	65.7-69.2	1	13	13	50	2.5	7.5	0.0059	168	11.091	
		F- 4	68.4-73.3	1	17	17	25			0.0035	288		
Nov	5	M-3	59.9-73.1	3	35	35	100	6.3	7.88	0.0073	405.333	12.475	
		F- 2	61.6-64.4	1	28	28	50			0.0013	783		
Dec	8	M-3	72.2-79.2	2	37	37	66.6666	6.625	8.83	0.0029	682.5	19.456	
		F- 5	58.9-69.9	4	69	69	80			0.0034	1186.25		
Jan	14	M-6	62.7-77.6	1	1	1	100	1.893	13.25	1	0	32.593	
		F- 8	53.3-78.7	1	52	52	100			0.0004	2703		
Feb	7	M- 4	56.9-63.8	3	22	22	75	2.714	3.8	0.0186	158.333	16.636	
		F- 3	49.9-68.9	2	16	16	66.6666			0.0156	126		
Mar	4	M- 2	54.9-59.7	0	0	0	0	2.25	9	0	0	4.1585	
		F- 2	62.2-66.7	1	9	9	50			0.0123	80		
Apr	7	M-3	58.7-71.1	1	4	4	33.3333	0.786	2.75	0.0625	15	5.2052	
		F- 4	55.5-73.1	1	7	7	25			0.0204	48		
May	7	M-2	66.3-68.1	0	0	0	0	0	0	0	0	9.7054	
		F- 5	55.8-74.5	0	0	0	0			0	0		
Jun	6	M-3	71.2-73.6	0	0	0	0	0	0	0	0	8.3169	
		F-3	66.0-69.4	0	0	0	0			0	0		
Jul	7	M-3	56.6-69.6	2	6	6	66.6666	0.571	1.33	0.1111	16	9.7049	
		F-4	61.5-71.4	1	2	2	25			0.25	3		

Monogeneans of fish are known to be remarkably host specific. A few may invade the rectal cavity, body cavity and even the blood vascular system. There are more than 100 families of monogeneans found on fishes of the world, in fresh and salt water, and at variety of temperatures. Most monogeneans are browsers, moving about the body surface and feeding on dermal (skin) mucus and gill debris. Monogeneans have a series of hooks that enable them to attach while feeding.

The importance of fish parasites as a factor contributing to fish mortality should not be underestimated especially in fish farming and culture, where sometimes the whole population of the pond is killed, resulting in the loss of potential food and financial loss to the culturist.

In general, and according to the life-cycle pattern of each helminth species, climate variables are able to affect the prevalence, intensity and geographical distribution of helminthes by directly influencing free-living larval stages as well as indirectly influencing mainly the invertebrate, but also the vertebrate, hosts (Coma, et. al. 2008).

Infestations are more liable to occur in ponds, which are heavily stocked. Since such congestion provides a favourable situation for rapid spread of infection among the fish (Jhingran, 1983).

Among host factors, host size was identified as the main factor influencing parasite community structure, especially for temperate and tropical ectoparasite species (Buchmann, 1989; Hayward, et. al. 1998; Lo, et. al. 1998).

Seasonal changes affect the number of parasites, parasitizing fresh water fishes which have been observed throughout the observation period.

In the present study Fishes were susceptible to high infestation with parasites mainly in winter season when fishes were weakened by hibernation.

In *Pangasius pangasius* the prevalence, mean abundance and mean intensity of helminth parasites was high from October to March dropping during April and no result was found during May to June and increasing again from July to September .

Simpson's index (C): In *Pangasius pangasius* the helminth parasites were dominant during January (1.00036) and July (0.3611).

Chi-square test: In *Pangasius pangasius*, at 1 degrees of freedom the obtainable value of 'x²' at 1% level of significance is 6.635 as found on reference to 'x²' table and the 'x²' values calculated in this experiment are 15, 58.5, 168, 288, 405.33, 783, 682.5, 1186.25, 2703, 158.33, 126, 80, 15, 48, 16 and 3 respectively.

"G " log-- likelihood test: In *Pangasius pangasius*, at 3 degrees of freedom the obtainable value of 'G' at 1% level of significance is 11.345 as found on reference to table and the 'G' value calculated in this experiment are higher than the tabulated value in few cases, except August (5.5446), September (9.703), October (11.091), March (4.1585), April (5.2052), May (9.7054), June (8.3169) and July (9.7049).

The study revealed that the rate of infection was higher during autumn and winter and lower during spring and summer.

ACKNOWLEDGEMENTS

Authorities of D.A.V. College Muzaffarnagar are acknowledged for providing infrastructural and laboratory facilities. This research was supported through a financial assistance in the form of a Major Research Project No. F- 34/470 (2008) SR Dated 29 December 2008 from University Grants Commission, New Delhi.

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