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SEASONAL VARIATION STUDY OF PARASITIC INFECTION IN FRESH WATER FISHES FROM CHANDRAPUR DISTRICT (M.S), INDIA

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ABSTRACT: Like Plants, Humans and other animals, fish agonize from diseases and parasites. Fish defenses towards disease may specific and non-specific. Non-specific resistances include skin, scales and mucus layer secreted by the epidermis that catches microorganisms and inhibits their growth. This study analyses the effects of parasites of fresh water fishes. Fish harbor parasites either external or internal which cause pathological strengths in them. The collective parasites of fishes include the microparasites (viruses, bacteria, fungi and protozoans). Fish harbor a variety of parasites viz. protozoan's, cestode, trematode and nematode. In the present study, collected freshwater fishes of species, Clariusbatrachus Channamarulius and Channapunctatus, from different reservoirs of Chandrapur District during summer, monsoon and winter season respectively. During the Jun 2018 to May 2019 we observed high parasitic infection in the fishes during summer season as compared to the winter and monsoon season.

Key words: - Seasonal Variation, Parasites, Clarusbatrachus and channamarulius.

INTRODUCTION:

Parasites have a varied range of distribution in all groups of animals. India is one of the mega biodiversity countries in the world of freshwater biodiversity (Mittermerier RA, Mitemeir CG 1997). For the last few decades, fishes have been extensively used as food for human consumption in the Indian subcontinent and thus contribute substantially to its economy. These edible fishes are known to harbour a number of parasites which cause deterioration in their health, hence their market and nutritious value is affected. Parasite can have wide range of influence on the ecology of their hosts in terms of health (Atme and Owen, 1967) behavior (Milinski 1984, Moore 1984) sexual selection (Howard and Minchella, 1990 Watve and Sukmar, 1977) and regulation of the host population (Freeland, 1983). Parasites of fish found one of the major problems to fish health. Besides the direct losses caused by mortality, parasites have considerable impact on growth, resistances to other stressing factors, susceptibility to predation, marketability and pave way for secondary infection. Many authors have carried out studies on the helminthes parasites and population dynamics of those occurring in Piscean hosts and work on different aspects of parasites.

Thestudy of population dynamics can be used as the biological method to regulate population of parasite. Fishes are important components of ecosystem from ecological, medicinal, nutritional and economical point of view. Study of population dynamics can be used as the biological basis of method to regulate population of parasite. Keeping in view, importance of helminthes parasitic infection to freshwater fishes, seasonal prevalence of helminthes parasitizing freshwater fishes for parasites are common and hazardous among fishes living in confined space such as aquarium, hatcheries, stocking ponds and tanks (Ali, 1990). Fishes usually have mixed infections of parasites. The amount of damage by infection is influenced to a large extent by the type and the number of parasites presents (Bauer, 1941).Parasites can affect fish population by affecting mortality, reduction in growth, weight loss and suppression of reproductive activity

(Bauer, 1961). Keeping in view the severity of the damages due to parasites in the fisheries sector, different researchers in different parts of the world have conducted studies for the assessment of parasitic population by applying various epidemiological techniques (Wilson, 1926; Jain, 1957;Wilmer, 1967; Ahmed, 1976; Sinhgal et al., 1986; Oldewage and Van As, 1988). In Pakistan research on fish disease is at its early stage except taxonomic studies on fish parasites. The parasitic studies are on Crustaceans, Protozoans, Helminthes and Nematodes (Zaidi et al., 1976 and 77; Bilqees, 1975 and 76; Muzamil, 1983; Jafri, 1993).

Present study was designed to make a survey for the parasitic infections, including their identification, their prevalent frequencies and host specificity in the Wardha River in Chandrapur district region.

MATERIALS AND METHODS :

Fishes are collected from the fresh water fishes, Clariusbatrachus, Channamarulius and Channapunctatus, were collected from different water bodies of Wardha and Wainganga river from Chandrapur Dist. During the early hours of morning, Jun 2018 to May 2019. They were carried in to the laboratory and dissected out. The helminthes parasites were collected and then they were preserved in 4% formaline. Then they were stained with borax carmine for the permanent slide preparation. These slides were observed and identified under microscope. Their identification was done with the 1934help of "SystemaHelminthum" Vol II "Helminths of Vertebrates" (Yamaguti S. 1934). Population dynamics of helminthes parasites were determined by following formula.

$$\text{Incidence of Infection} = \frac{\text{Infected host}}{\text{Total number of host}} \text{ X } 100$$

$$\text{Intensity of Infection} = \frac{\text{No.of paracites collected in sample}}{\text{No.of Infected host}}$$

$$\text{Density of Infection} = \frac{\text{No.of paracites collected in sample}}{\text{Total host examine}}$$

RESULT :

Table no. 1 and graph no. 1 shows that incidence, intensity and density parasites during Jun 2018 and May 2019. The maximum parasitic infection was observed in summer season (Feb 2019 – April 2019). During summer season maximum numbers of parasites (Trematode, Cestode and nematode) were collected from freshwater fishes. From the above results it is clear that a considerable difference was found in the occurrence of parasitic infections among different season. The highest Cestode prevalence (50%), Trematode prevalence (20%) and Nematode prevalence (70%) recorded during summer season where as lowest Trematode prevalence (30%), Cestode prevalence (10%) and Nematode prevalence (400%) in monsoon season. These finding of high occurrence during summer season was due tovariants in temperature and other weather condition that influences the occurrences of parasitic infection in fishes.

DISCUSSION :

The present study, analysis of data shows that the occurrence of parasites varies according to seasons. The incidences, intensity and density of all the parasites were found to be high in summer, medium in winter whereas lower in rainy season. Parasite and host species, host size and feeding habitats, seasons and locality were also effect the intensity. The similar trend was also observed for incidence, density and index of infection in Piscean nematode of genus Camallanussp. and Spinitectussp (Bhure, Nanware 2016). Similar type of results were also observed in case of Sengasp, Gangesiasp., Proteocephalussp. infected to Channasp. in summer, winter and monsoon (Bhure,Nanware

2016). The seasonal variation study of Caryophyllidean tapeworms show infection trend as, rainy < winter < summer season (SunitaBorde, SushilJawale 2012). Seasonal environmental changes of water such as temperature, pH and conductivity effect on the occurrences of parasites from aquatic host (Kennedy CR 1976). High temperature, low rainfall and sufficient moisture were necessary for development of parasite (Jadhav BV. Bhure2006). Increase in parasitic influx occurs due to elevated temperature, agriculture runoff, organic enrichment of the water bodies caused by pollution, indiscriminate use of antibiotics and this also causes increase in density of intermediate hosts. Lessermeatoblicacticity along with suppression of natural immune system makes them more susceptible to a wide range of parasites and diseases. Thus aquatic organisms respond directly to environmental changes due to influence of pH, temperature, and dissolved O2 levels on the metabolic processes.

CONCLUSION :

In this study, after the analysis of data, can be concluded that the high infections of parasite (incidence, intensity and density) were occurred in summer season. Then it was followed by summerwhereas very low in monsoon and winter season. This type of results indicated that theenvironmental factors and feeding habitat are influencing the seasonality of parasitic infection either directly or indirectly way.

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Table 1: Seasonal variation study of parasitic infection in freshwater fishes from ChandrapurDistrict (M.S), India, during the year Jun 2018 to May 2019.

Month	Name of paracites	No. of host examine	No. of host infected	Total No. of host infected	Total No. of parasite collected	Incidence %	Intensity	Density	Habitat
Jun-18	Nematode	50	18	10	8	20	0.44	0.16	NAKODA
	Cestode			5	4	10	0.22	0.08	
	Trematod			3	2	6	0.11	0.001	
Jul-18	Nematode	50	22	10	7	20	0.31	0.14	GHUGUS
	Cestode			10	8	20	0.36	0.16	
	Trematod			2	1	4	0.04	0.02	
Aug-18	Nematode	50	25	12	6	24	0.24	0.12	VADHA
	Cestode			8	4	16	0.16	0.08	
	Trematod			5	2	10	0.08	0.04	
Sep-18	Nematode	50	28	12	4	24	0.14	0.08	USEGAON
	Cestode			10	4	20	0.14	0.08	
	Trematod			6	2	12	0.07	0.04	
Oct-18	Nematode	50	30	14	5	28	0.16	0.1	BHADRAVATI
	Cestode			10	4	20	0.13	0.08	
	Trematod			6	3	12	0.1	0.06	
Nov-18	Nematode	50	26	8	3	16	0.11	0.06	CHANDRAPUR
	Cestode			11	5	22	0.19	0.1	
	Trematod			7	2	14	0.07	0.04	
Dec-18	Nematode	50	16	8	3	16	0.18	0.06	VISAPUR
	Cestode			4	2	8	0.12	0.04	
	Trematod			4	1	8	0.06	0.02	
Jan-19	Nematode	50	24	10	4	20	0.16	0.08	RAJURA
	Cestode			10	3	20	0.12	0.06	
	Trematod			4	1	8	0.04	0.02	
Feb-19	Nematode	50	32	15	6	12	0.18	0.12	BHADRAVATI
	Cestode			12	4	24	0.12	0.08	
	Trematod			5	3	10	0.09	0.06	
Mar-19	Nematode	50	36	20	15	40	0.41	0.3	SASTI
	Cestode			10	8	20	0.22	0.16	
	Trematod			6	4	12	0.11	0.08	
Apr-19	Nematode	50	38	18	16	36	0.42	0.32	VIRUR
	Cestode			14	12	28	0.31	0.24	
	Trematod			6	4	12	0.1	0.08	
May-19	Nematode	50	34	15	13	30	0.38	0.26	GADCHANDUR
	Cestode			12	11	24	0.32	0.22	
	Trematod			7	5	14	0.1	0.08	

Graph 1: Seasonal variation study of parasitic infection in freshwater fishes from Chandrapur District (M.S), India, during the year Jun 2018 to May 2019.