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STUDY OF ICHTHYOFAUNAL DIVERSITY IN RELATION TO PHYSICO-CHEMICAL CHARACTERISTICS OF SUSRI DAM WATER, SHAHADA TALUKA, DIST. NANDURBAR MAHARASHTRA, INDIA

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ABSTRACT:
Aquatic ecosystems consist of physico-chemical and biotic components are directly affecting to diversity of fish of water bodies. Location, 21.5966600 N 74.4966600 E, longitude was mainly built as a storage reservoir. Study for a period of Monthly variation of Site 'A' and Site 'B' during morning between 7 am to 9 am in the first week of every month, June 2019 to May 2020 to assess fish fauna along correlation with the physico-chemical parameters like AT, WT, PH , DO and CO_2 analyzed by standard methods. 16 species of fishes which belongs to 7 families were reported.

Keywords:- Physico-chemical Parameters, Ichthyofaunal, Susri dam water, Shahada.

INTRODUCTION :

Anthropogenic activities have contributed to the pollution of water bodies which serve as habitat for fishes (Iwama, G.K., *et al*, 2000). The deterioration of water quality, loss of biodiversity and depletion of water resources and main challenges which need urgent attention. Biodiversity is a variety of life which encompasses different genus, species, community and ecosystem. Fresh water ecosystem includes primary producers as phytoplankton, algae and hydrophytes, primary consumers as fishes and other organisms. Fish diversity has been declined to greater extent due to destruction of habitat has an adverse impact on aquatic ecosystems as well as on human population as it is one of the primary food sources. Fishes are widely used to evaluate the health of aquatic ecosystems because pollutants build up in the food chain and are responsible for adverse effects and death in the aquatic systems (Tiwari R.N., 2011). The status of any river system can be determined by the quality and quantity of fish species (Kumar Naik A. S., 2013). Water from Susri dam is used such as domestic, agricultural, drinking and fishery.

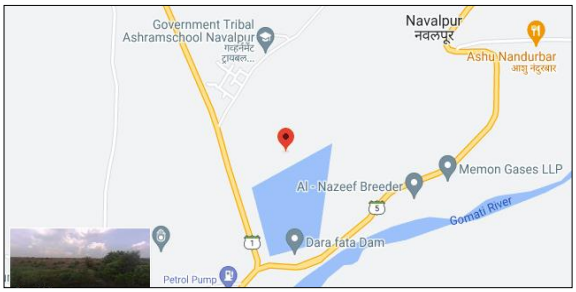
MATERIAL AND METHODS :

Water samples were collected from two sampling site at regular intervals of one month a period of one year from June, 2019 to May, 2020 during morning between 7 am to 9 am in the first week of every month. Analysis of physico-chemical parameters by methods (APHA, AWWA and WPCF, 2005).

Ichthyofaunal study: The entire study was undertaken mostly in morning hours. The samples were captured at intervals with the help of local fishermen. Drag net, caste net, scoop net, basket trap, hooks etc. for capturing fish samples from Susri dam reservoir. Fishes were transferred in 5% formalin and preserved for further study in the Dept. of Zoology, Jijamata College, Nandurbar, Maharashtra specimens were identified using taxonomic keys and Standard literatures (Bhalerao, S. N., 2012).

Study area Fig. 1: - Shows the location map of Susri dam on Susri River is located around 7 Km (4.3 mi) North of Shahada, Nandurbar

District. Susri Dam is a Diversion dam is called 'Mahavir Bandhara' on official record because several centuries old Mahavir Sculpture in Gomai River is just around 500 metres (1,600 ft) away from Susri dam barrage. Susri dam office is built on the bank of Gomai river just around 50 metres away from Mahavir sculpture in Pandav Leni Complex. Location, Shahada 21.596660⁰ N 74.496660⁰ E. Susri River is affluent of Gomai River. Both rivers originate in the Levee Mountain Range. Near Dara faata, which is 7 Km. (4.3 m.) north of Shahada, both rivers used to flow just 200–250 metres (660–820 ft) apart. Around 10 years ago Engineers built a Levee to block the path of the water of the Susri River. Water in the Susri dam is used for irrigation.



RESULTS AND DISCUSSION:

The data showing physico-chemical parameters (Fig. 2 to Fig. 6),

Systematic list of fish fauna (**Table 1**), during period of June 2019 to May, 2020. Seasonal variations in the physicochemical parameters are the important constituents of the aquatic ecosystem.

Atm. Temp. Fig. 2: was recorded maximum 31⁰C in the month of May 2020 at Site 'A' and 30⁰C at Site 'B' and minimum 14 ⁰C in the month of June 2019 at Site 'A' and 15⁰C at Site 'B'. The air temperature ranges between 14 to 31⁰C at site 'A' and 15 to 30 ⁰C at site 'B'. The low oxygen values coincided with high temperature during the summer (Mazher Sultana and Dawood Sharief., 2004).

Water Temp. Fig. 3: shows the temperature is one of the most ecological factors which control the physiological behavior, distribution of organisms and some chemical reactions in aquatic ecosystem. Water temperature ranges between 15 to 29 ⁰C at site 'A' and 16 to 31⁰C at site 'B'. The maximum air temp. was recorded in summer 31⁰C and minimum in winter 15⁰C. The result shows that water temperature varies with the atmospheric temp. may be due to different timings of collection and influence of season (Zafar A. and Sultana N., 2008) .

Hydrogen ion concentration (pH) Fig. 4: pH is an important limiting factor in fish culture and for survival and growth of fish. It indicates the acid base balance of the water. The ideal pH for the growth of fishes is between 7.5 to 8.5, above and below this is stressful to the fishes. Maximum pH was recorded in summer may be due to decreased volume of water by evaporation and monsoon and minimum in winter season may be due to short day length and decrease in photosynthetic activity. The range of pH was 7.7 to 8.6 at site 'A' and 7.3 to 8.7 at site 'B'. The maximum pH 8.6 and 8.7 recorded site 'A' and 'B' respectively in the month of May,2020 and minimum pH 7.5 and 7.3 recorded at site 'A' and 'B' in the month of December, 2019. The observations indicate that the water was alkaline throughout the study period. An acceptable pH of drinking water is in between 6.5 to 8.5. (WHO (2008). Fishes have their own tolerable limits for pH fluctuation, beyond which they cannot survive (Alikunhi, K.H., 1957) Though the pH was slightly high during summer, it was good enough for normal fish growth.

Dissolved Oxygen (DO) Fig. 5: DO concentration is another parameter used in judging the suitability of a water body to support fish community. Maximum DO was recorded in winter this may be due to the solubility of DO increases with the decrease in water temperature and minimum in summer this may be due to higher the rates of respiration, temperature organic decomposition where the rate of photosynthesis is high and decay of micro and macro-vegetation during the study period. DO levels are important in the natural self purification capacity of the water bodies. The range of DO was 5.9 mg/l. to 10.5 mg/l at site 'A' and 5.7 mg/1 to 10.4 mg/1 at site 'B'. The maximum DO 10.4 mg/1 and 10.3mg/1 recorded at site 'A' and 'B' in the month of December, 2019 and minimum DO 5.9mg/l and 5.8 mg/1 was recorded at site 'A' and 'B' in the month of June, 2020. DO is most important abiotic parameters and its effect on metabolic activities of organisms levels are important in the natural self purification capacity of the water bodies (Zeb B.S., *et al*, 2011, Sahni K. and Yadav S. (2012).

Free carbon dioxide (CO_2) Fig. 6: CO_2 in water is the by-product of metabolism. More than a particulate level, CO_2 in water is toxic to the life in water. Shows maximum CO_2 was recorded in summer and minimum in winter. The range of CO_2 was 1.9 mg/1 to 5.0 mg/1 at site 'A' 1.7 mg/1 to 4.8 mg/1 at site 'B' respectively. The maximum CO_2 5.0 mg/1 and 4.8 mg/1 recorded at site 'A' and 'B' in the month of June, 2019 and minimum CO_2 1.9 mg/1 and 1.7 mg/l was recorded at site 'A' and 'B' in the month of January, 2020. During present study it was observed the relationship between CO_2 and DO was an inverse. Atm. CO_2 may enter surface water by absorption, but only when its concentration in water is less than its equilibrium. CO_2 content depend upon water temp, depth, rate of respiration, decomposition of decaying organic matter and chemical nature of bottom (Sakhare, V.B. and Joshi P.K., 2002)

Fish species are an economic value, provide approximately 25 % protein rich nutritious food from fish sources of water ecosystem. Fish research has become an increasingly important study area, as fish population is declining throughout the world. Over fishing, pollution by flood and soil erosion etc. has also been responsible for the depletion of fish fauna (Bhat Jahangeer A., *et al,* 2012). It has an adverse impact on aquatic ecosystems as well as a significant impact on human population as food sources. In the field of Ichthyology valuable contributions were made (Arya Mohit, *et al,* 2012). Seasonal dynamics of the fish population showed that high value of fish diversity during rainy and winter months in the present study[15],which implied that reservoir receive large volume of less polluted and high oxygenated water which favoring the improvement of fish growth and most of the fishes migrate for breeding. During summer water flows are greatly reduced in to reservoir appears to be devoid fish.

CONCLUSION

Susari reservoir being a medium project is concerned poor attention towards systematic investigation on diversity of fish. The fish community in the lake includes the native species and introduced species for the purpose of fish production. Many fish species are endemic to prevent drainage of pesticides and fertilizers from surrounding crop fields.

REFERENCES:

Iwama, G.K., M.M. Vijayan, and J.D. Morgan (2000): The stress response in fish. Ichthyology, Recent research advances 453 pp. *Oxford and IBH Publishing Co, Pvt. Ltd, N. Delhi.*

Tiwari R.N. (2011): Assessment of groundwater quality and pollution potential of Jawa Block Rewa District, Madhya Pradesh, India,

Proc. Int. Academy of Ecology and Environ Sciences., 1(3- 4), 202-212.

Kumar Naik A.S., (2013): Studies on Ichthyofaunal Diversity of Karanja Reservoir, Karnataka, India, *Int. Res. Journal of. Environ. Sci.,* 2(2), 38-43.

APHA, AWWA and WPCF, (2005): Standard methods for the examination of water and wastewater. *APHA (17th ed.) Inc. New York.*

Bhalerao, SN., (2012): Study of fish diversity and water quality at Kasar Sai Dam, Hinjewadi, Pune MS, India, *I. Res. J. Biol. Sci.* 1(4), 51-55.

Mazher Sultana and Dawood Sharief., (2004): Water pollution studies in the double lake (Erretal eri) with relation to phytoplankton. *J. Aqua. Biol. Vol.* (1) pp.15-18.

Zafar A. and Sultana N., (2008): Seasonal analysis in the water quality of the river Ganga. *Journal. Curr. Sci.,* 12(1), 217-210.

WHO (2008): Guidelines for drinking water quality Vol.1, Recommend.*2nd Edn. Geneva,* 1-10.

Alikunhi, K.H. (1957): Fish culture in India. Fm. *Bull. Ind. Council Agric. Res*., 20, 144.

Zeb B.S., Malik A.H., Waseem A. and Mahmood Q. (2011): Water quality assessment of Siran river, *Pakistan, Int. J. Phys. Sci.*, 6(1), 7789-7798.

Sahni K. and Yadav S. (2012): Seasonal variations in physic-chemical parameters of Bharawas pond Rewari, Haryana, *Asian J. Exp. Sci.*, 26(1),61-64.

Sakhare, V.B. and Joshi P.K., (2002): Ecology of Palas-Nilegaon reservoir in Osmanabad Dist. Maharashtra. *J. Aqua. Bio.* 18(2), 17-22.

Bhat Jahangeer A., Kumar Munesh Negi, Ajeet K., Todaria N.P. (2012): Anthropogenic pressure along altitudinal gradient in a protected area of Garhwal Himalaya, India, *J. Environ. Res. Develop.*, 7(1),62-65.

Arya Mohit, Rao R.J and Mishra Anand Kumar (2012): Ecology and Diversity of fish fauna in the Sakhya Sagar lake, Shivpuri, Madhya pradesh, India, *J. of Research Biology* 7 (2A).

Thirupathaiah, M., Samatha Ch. and Sammaiah Ch. (2013): Diversity of fish fauna in lower Manair reservoir of Karimnagar district (A.P.). *India Pelagia Research Library Advances in Applied Science Research*, 4(2):203-211.

Table 1: List of fishes recorded from Londhare Dam water- June 2019 to May, 2020.

Sr.No.	Classification of fishes	Sr.No.	Classification of fishes
	Class: Pisces	**V**	**Family-: Nemacheilidae**
	Sub-Class Teleostei	7	*Nemacheilus moreh* (Sykes)
	Order-I: Clupeiformes	**VI**	**Family-: Poeciliidae**
I	**Family-: Notopterida**	8	*Gambusia affinis*(Baird & Girard)
1	*Notopterus chital* (Hamilton)	9	*Rasbora daniconias* (Hamilton)
2	*Notopterus notopterus* (Pallas)	10	*Garra gotyla gotyla* (Gray)
	Order-II: Cypriniformes	11	*Garra mullya* (Sykes)
II	**Family-: Balitoridae**	12	*Cyprinus carpio* (Linnaeus)
3	*Nemacheilus botia*(Hamilton)	13	*Cirrhinus mrigala* (Hamilton)
III	**Family-: Cyprinidae**	14	*Catla catla* (Hamilton)
4	*Nemacheilus moreh* (Sykes)		Order- III: Channiformes
IV	**Family-: Cobitidae**	**VII**	**Family-: Channidae**
5	*Labeo boga* (Hamilton)	15	*Channa punctatus* (Bloch)
6	*Labeo rohita* (Hamilton)	16	*Channa orientalis* (Schneider)

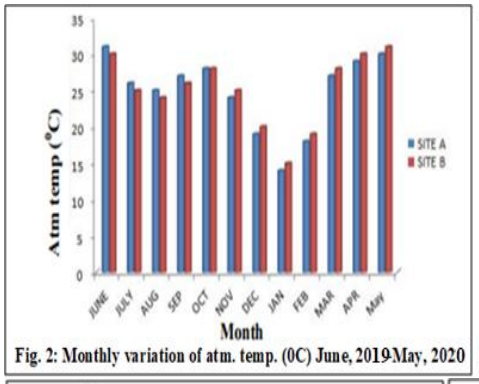


Fig. 2: Monthly variation of atm. temp. (0C) June, 2019-May, 2020

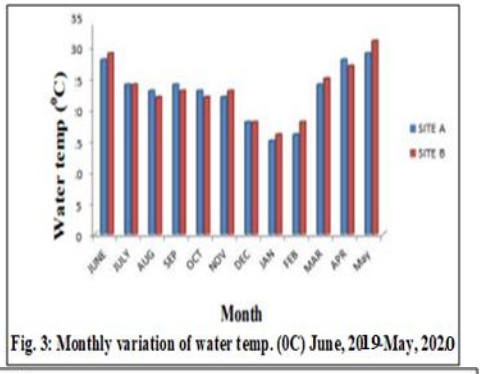


Fig. 3: Monthly variation of water temp. (0C) June, 2019-May, 2020

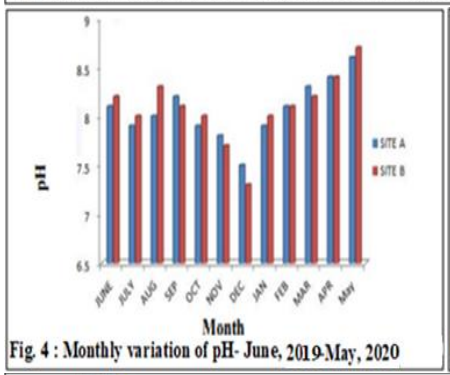


Fig. 4 : Monthly variation of pH- June, 2019-May, 2020

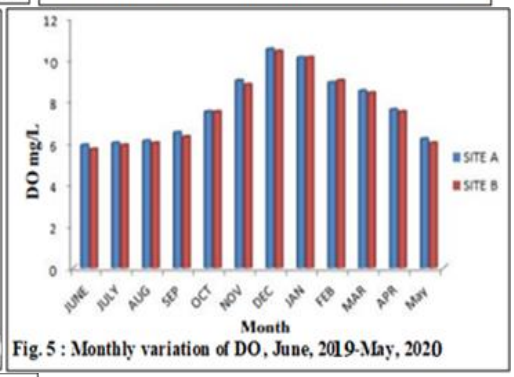


Fig. 5 : Monthly variation of DO, June, 2019-May, 2020

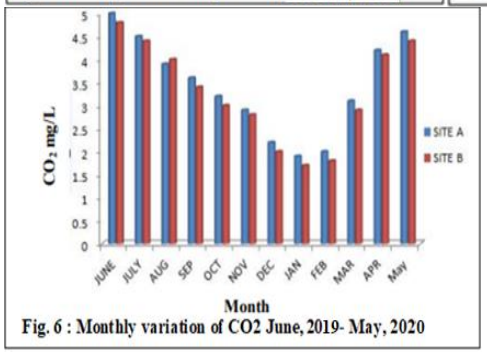


Fig. 6 : Monthly variation of CO2 June, 2019- May, 2020