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Seasonal Fluctuations in Quality of Water from Gandak River

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ABSTRACT

During present investigation, water samples were collected from GANDAK RIVER during June 2016 to July2017and analyzed the same by examining various parameters like pH, Temperature, Turbidity, Dissolved oxygen, Free CO_2, Alkalinity, Chloride etc. The temperature, turbidity were determined using thermometer, Sacchi disc, Ruttner's Barrier layer Photocells respectively. The pH, dissolved oxygen, free CO_2 & alkalinity, Chloride and nitrogen were analyzed following Kodarkar(1992)..

Keywords: water, seasonal fluctuations, Zooplanktons.

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INTRODUCTION:

India is facing a serious problem of natural resource scarcity, especially that of water in view of population growth and economic development. Water is a prime natural resource, a basic human need and a precious national asset and hence its use needs appropriate planning, development and management. However, studies related to ecology and environment are often perceived as 'anti-development and detrimental to the overall growth and welfare of human beings and are viewed with suspicion and generally considered as nuisance. The trophic status of a water body depends on the locality and its topography. Of all renewable resources of planet, water has the unique place. It is essential for sustaining all forms of life, food production, economic development and for general well being. Due to tremendous development of industry and agriculture, the water ecosystem has become perceptibly altered in several respects in recent years and as such they are exposed to all local disturbances regardless of where they occur (Venkatesan, 2007)

Water quality parameters are important for the survival of aquatic flora and fauna. some important physical and chemical factors influencing the aquatic Environment are temperature, pH and dissolved oxygen. Others are, nitrate, chloride, turbidity, transparency Aquatic organisms have their own tolerance limits to temperature and this affects their distribution the amount of dissolved oxygen in water is very important for aquatic organisms. Dissolved oxygen affects the growth, survival, distribution of aquatic organisms source of oxygen that is dissolved in water is by direct absorption at the air-water interface, which is greatly influenced by temperature at low temperature more oxygen diffuses into water because the partial pressure is reduced, while at high temperature when the partial pressure is high oxygen diffuses out of water. The surface agitation of water helps to increase the solubility of dissolved oxygen, in water.(Boyd, 1982). The hydrogen ion concentration of water is usually measured in terms of pH, which is defined as the negative logarithms of hydrogen ion concentration. (Boyd, 1979).

This concentration is the pH of neutrality and is equal to 7 pH higher than 7 inducates increasing basic while values lower than 7 tend towards acidityi.e., increase in hydrgoen ion concentration water. The pH of natural waters is greatly influenced by the concentration of carbon dioxide, which is an acidic gas factors that may affect pH are total alkalinity, acid rain and run-off from surrounding rocks and water discharges. Alkalinity of a water body refers to the quantity and kinds of dissolved ions (anions), which collectively change the pH to the alkalinity side of the scale.

The plankton production of fish culture. Waters with high alkalinity are undesirable because of the associated excessive hardness or high concentration of sodium salts. The sources of nitrates in water include human and animal wastes presence in nitrates in water indicates the final stage of mineralization (Neema et.al.1984)

MATERIALS AND METHODS:

Two plastic bottles measuring one thousand milimeters each were used to collect water samples. Each bottle was flushed to ensure that no air bubble existed and transported to the laboratory for further analysis. Water

temperature was measured in situ using mercury in-glass thermometer. The thermometer was immersed in water to about 6 cm below the water surface and left to stabilize for about five minutes and the average value was recorded in degrees centigrade. The beaker of dissolved oxygen in the water was fixed during the sample collection. 100m of water was put into a clean oxygen bottle and flushed several times until all air bubbles escaped. 2mm of manganeous sulphate (Wrinkler's solution I) and another 2mm of Potassium iodie – Sodium Hydroxide (Winkler's solution II) were added to the bottle using a pipette. The bottle was closed and thorougly shaken to ensure proper mixing. A brown precipitate forms at the bottom of the bottle after this process. The bottle was then, transported to the laboratory for further analysis.

Laboratory activities:

The titrimetric method (APHA, 1998) was used to determine the alkalinity of the water. One hundred milimeters test water was placed in an Erlenmeyer flask and two drops of methyl orange solution was added. The flask was shaken and color changed to yellow. The solution was then titrated with 0.0N sulfuric acid (H_2SO_4) color changed from yellow to pink at the end of the titration. This procedure was repeated three times and the average value recorded.

RESULT:

In the present investigation due to the sewage and domestic wastes of animals, the water body was to be contained various materials. From the physical parameters, the temperature was found to be maximum in the months of summer. The maximum temperature 39^0C and the minimum was 27^0C recorded in the month of December.

The present investigation is consistent with the parameters recorded in Indian Subcontinent, temperature in most of the water bodies ranges between 7.8 to 38.5^0.

Table No.1 Physiochemical parameters of water samples collected from Gandak river during 2016 to 2017

	Rainy				Winter				Summer				Mean	Range	
	Month													Min	Max
Parameters	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June			
Temp(^{0}C)	33	32	32	32	30	28	29	27	30	30	37	39	31.58	27	39
Turbidiy NTU	59.01	65	84	69	60	59	50.2	26	23	52	46	39	52.68	23	84
pH Units	7.2	7.1	7.3	7.1	8.0	8.2	7.3	7.0	7.3	7.1	8.1	8.3	7.50	7	8.3
D.O. mg/l	7.3	7.7	8.2	8.6	8.4	10.1	8.2	8.1	7.6	7.5	8.1	7.9	8.14	7.3	10.1
Free CO_2 mg/l	0.03	0.05	0.04	0.01	0.06	0.04	0.02	0.01	0.03	0.04	0.01	0.43	0.06	0.01	0.43
Alkalinity inmg/l	120	124	113	87	83	102	1102	102	104	129	140	129	194.58	83	1102
Chloride in mg/l	59	49	59	70.5	79	78	82	64	68	63	72	66	67.46	49	82

REFERENCES:

1. **Adoni, A.D.(1985)**. "Work book on Limnology, India MBA Comitte, Department of Environment Government of India." P.216.
2. **APHA (1998).** Standard method for the examination of water-water 20th(ed) Washington D.C. 1213pp.
3. **Agrio, K.R. and McClain, C.R. (1994),** Spring phytoplankton production in the Western Ross sea. Sincece 266:261-263pp.
4. **Asper, V.I. and Smith, W.O. (jr.) (1999).** Partice fluxes during Austral spring and summer in the southern Ross sea (Antactica). Journal of Geophysical REsearch 104 (in press).
5. **Boyd L.E. (1979),** Water quality in warm water fish pond, university press Alabama, USA, pp-59.
6. **Boyd. L.E.(1982),** Water management for pond fish culture, Elsevier, scientific publication, Amsterdam. Development of agriculture and fisheries science, 9:231.
7. **Garg, V.K. and Choudhary, A (1999),** "An appraisal of ground water quality in some village of dist. Jina India J. Envio. Protec", 19(4): 267-73.
8. **Ghosh A. and George J.P.(1989) ,** " Stuides on the biotic factors and zooplanktons in a polluted urban reservoir, Hussain sugar Hyderbad, impact in water quality and embryonic development of fishes Indian J. Envion Health", 37:49-59.
9. **Kedar, G.T. and G.P.Patil (2002),** "Studies on biodiversity and physico – chemical studies of Rishe lake, Karanja (lad), MS. Ph.D. Theisis, Amravati University, Amravati"
10. **Mustafa W., Somasundaram, Sahul Hameed P. & S.S. N. Palaniappan (1999)** " Evaluation of ground water quality in Tiruchirapalli City Ind. J. Env." Prot. 19(4): 284-89.
11. **Neema, P., Rajegopalan, S. and Mehta, C.G. (1984).** Quality and treatment for Sabarmati river water, Ahemedabad J.I.W.W.A. 16(I), 99-107.
12. **Quari M.Y. and Yusuf A.R. (1980) –** " Limnological studies an lake malpur, Geobios"7; 177-119.
13. **Sakhare V.B. and Joshi P.K.(2002),** "Ecology of Palas – Nilegaon reservoir in Osmanabad District Maharashtra," J.Aqua. Biol., 18(2) 17-22.
14. **Singhal R.N., S Jeet and Dwies R.W. (1986).** "The physicchemical environmental and phankton of managed rural pond was found in Haryana." India Proc. Ind Aca. Sc. (Anim Sc) 95:353 -363.
15. **Swarnalatha, N. and A.N.Rao (1998)** "Ecological studies of Banjara lake with reference to water pollution" J. Environ. Biol., 19(2) – 179-186.