



PHYSICO-CHEMICAL PARAMETERS ASSESSTMENT OF DAM WATER IN DIFFERENT SITES OF AHMEDNAGAR DISTRICT OF MAHARASHTRA

Arangale K. B.^{1*}, Raut V. R.², Gavit M. G.³, and Shinde Y. P.⁴

1. Department of Botany, Sanjivani Arts, Commerce and Science college, Kopargaon.

2. Padamshri Vikhe Patil Arts, Commerce and Science College, Pravaranagar.

3. K.A.A.N.M. Sonawane Arts, Science and Commerce College, Satana.

4. Sanjivani Arts, Commerce and Science College, Kopargaon.

Email : kiranarangale@gmail.com

ABSTRACT:

The quality of water is of main role for man since it is directly linked to human health. The quality of water varies widely with respect to its various uses and the water quality suitable for one purpose may not satisfactory for another. The present investigations of the comparative study of physico chemical parameters of Bhandardara dam and Mula dam water in Ahmednagar district of Maharashtra. Four samples were collected in the month of February, July and November 2017. Physical and chemical parameters such as pH, TDS, Free CO₂, Alkalinity, Chlorides, Total Hardness, Calcium Hardness, Magnesium hardness, Dissolve Oxygen, BOD and COD were studied. The result indicates that there is marked variation in physico chemical parameters of that dam water. The observed values of various physico chemical parameters from water samples have been compared values recommended by World Health Organization.

Keywords: Bhandardara dam, Mula Dam, Physico chemical analysis.

INTRODUCTION:

The prosobranch molluscs are much economic The quality of ground water depends on various chemical constituents and their concentration, which are mostly derived from the geological data of the particular region. Industrial waste and the municipal solid waste have emerged as one of the leading cause of pollution of surface and ground water. The quality of water is of vital concern for man since it is directly linked to human health (Odum, 1971). The presence of safe and reliable source of water is an essential prerequisite for the establishment of a stable community. The quality of water varies widely with respect to its various uses and the water quality suitable for one purpose may not satisfactory for another. Chemical contamination of drinking water either naturally or by anthropogenic sources is a matter of serious concern as the toxic chemicals do not show acute health effects unless they enter into the body in appreciable amounts but they behave as a cumulative poison showing the adverse health effects after a long period of exposure.

Water plays an important role of human life. It is necessary for industry and living thing resistance. All living organisms on the earth need water for their survival and growth, on our earth having about 70% of water (Balsane et.al. 2015). Though water is abundant on earth it is precious for living organisms

because out of total water reservoir of the world about 97% is salty and only 3% is fresh water (Kamble et.al, 2011). The healthy water reservoir is dependent on the physico chemical and biological characteristics. Although statistics the WHO report that approximately 36% of urban and 65% of rural Indian were without access to safe drinking water.

The human activities like industrialization, urbanization and domestic activates which been affecting water qualities and leads to large scale water pollution. The industries like tanneries and textile relies to large quantities of heavy metals into the natural environmental (Kocaoba and Akain, 2005). The quality of ground water depends on various constituent and their concentration which are mostly derived from the geological data of the particular region.

Study Area

Bhandardara Dam- The Bhandardara dam was designed by Wilson. This dam was built across the Pravara River near village Bhandardara, in Akole Taluka of Ahmednagar district, Maharashtra. The construction of the dam was completed in 1926. The maximum height of the dam is 82.30 meters and length of top is 598.33 meters. The capacity of dam is 11 TMC.

Mula Dam – This dam was built across the Mula River near village Baragaon nandur in Rahuri Taluka of Ahmednagar District, Maharashtra. The construction of the dam was completed in 1972. The maximum height of

the dam is 48.17meters and length of top is 2,856 meters. The capacity of dam is 26 TMC. The reservoirs water has been used for drinking and irrigation purpose by the people of the Ahmednagar district.

MATERIALS AND METHODS :

Four different sites were selected for collection of samples in two dams. The samples were collected in sterilized polythene bottles of one litter capacity monitoring were done during February 2017. Samples were analysis of physico chemical parameters in laboratory.

RESULT AND DISCUSSION :

Four physico-chemical parameter of water sample were determined in month of February 2017. The pH, Alkalinity, Calcium, Magnesium, Chloride, Total Hardness, Do and COD were measured within few hours from sampling. The parameters were analysed by prescribed standard method. The variation in various parameters of different samples is shown in Table-2.

pH

Observation reveals that, (Table-2) the pH of Bhandardara dam water reservoir is 6.5 to 6.8 and Mula dam reservoir is 7.2 to 7.4. Mula dam water is highly alkaline than Bhandardara dam water. The higher pH may due to photosynthetic activity in water body and helps in photosynthesis of phytoplanktons.

Alkalinity

The alkalinity of Bhandardara dam water varied between 115 to 120 mg/l and Mula dam water varied between 90 to 80 mg/l. Total alkalinity of Bhandardara dam is higher than Mula dam.

Calcium

The water above Calcium values 25 mg/l are classified as 'Calcium rich'. The present investigation shows that the concentration of calcium of the Bhandardara water is 16.8 to 17.6 mg/l and Mula dam water is 15.8 to 16.4 mg/l. Bhandardara dam water contains high concentration of calcium than Mula dam. All the water samples are Calcium deficient.

Magnesium

The observed value of Magnesium in Bhandardara dam is 4.20 to 4.36 mg/l and Mula dam is 4.0 to 4.84 mg/l. The observed value of Magnesium of Mula dam is 4.84 mg/l is higher than Bhandardara dam. The present investigations shows that the Magnesium content in majority of samples does not exceed the limit as prescribed by ISI as well as WHO.

Chloride

The suitability of water resource for the irrigational use in agricultural is depends on its salt concentrations, especially Chloride contents. In the present investigation Chloride concentration is in the range of 17.68 to 20.71 in Bhandardara dam and 14.72 to 15.69 in Mula dam water. Chloride value is much higher in Bhandardara dam water than Mula dam water. According to WHO maximum permissible limit for Chloride is 500 mg/l. the value observed in present study are well below the permissible limit.

Total Hardness

Total hardness of water is caused by the presence of Calcium and, Magnesium salts. Hardness has no known adverse effect on health. However, maximum permissible level has been prescribed for drinking water is 500mg/l, by WHO. According some classifications water having Hardness up to 75 mg/l is classified as soft, 76 to 150 mg/l is moderately soft, 151-300 mg/l as hard and more 300 mg/l as very hard. In present investigation Hardness of various samples of Bhandardara dam water is in the range of 60 to 112 mg/l. the result shows that, this water is moderately soft. Hardness of Mula dam water is in the range 64 to 140 mg/l, reveals that, this water is soft. So all the water samples have values within the permissible limits.

Dissolved Oxygen

During the study, the concentrations of DO recorded are 9.0 to 10.4 mg/l for Bhandardara dam and 9.6 to 9.8 mg/l for Mula dam water. It is observed that Bhandardara dam water has higher value of dissolve oxygen than Mula dam water.

COD

C.O.D. is the major of oxygen consumed during the oxidation of oxydisable organic matter present in the water. C.O.D. of Bhandardara dam water is in the range 20 to 24 mg/l and Mula dam water is 34 to 36 mg/l. It is observed that Mula dam water has higher value of dissolve oxygen than Bhandardara dam water and below the permissible limit.

CONCLUSION

In the present study most of the parameters are found within the prescribe limit of IS and WHO.

ACKNOWLEDGEMENT

The author are grateful to Dr. R. D. Borse, Dr. M. N. Kharde and Dr. A. S. Wabale Dept. of Botany Padamshri Vikhe Patil college of Arts

commerce and science Pravaranagar Tal Rahata and also thankful to Dr. S. B. Dahikar Principal of Sanjivani Arts Commerce and science College Kopargaon Maharashtra for providing Laboratory facilities.

BIBLIOGRAPHY

- APHA, (1985). Standard Method for Examination of water and waste water, American public Health Association, AWWA, WPCF, Washington Dc. 20th Edn. : 1134.
- Balsane V.K., Bansode R.D., Atre A.A, (2015) Environmental flow: Water quality assessment of Mula river, *International Journal of enhanced research in science technology and engineering*, Vol-4:44-49.
- Bhardwaj R.M, (2005).Water quality monitoring in India achievement and constraints. *IWG- Env, Vienna*, june, 20-22.
- Deshmukh B.S, and Sathe S.D.(2013). Physico- chemical characteristics of Pravara river, Maharashtra. *Journal of aquatic biology and fisheries*, Vol-2:101-105.
- Deshmukh B.S. (2012) Hydrobiological studies of river Pravara in Ahmednagar district (Maharashtra), *Eco revolution-2012 Colombo,Shrilanka*: 89-92.
- Deshmukh K.K. (2011) Chemistry of Ground water in sangamner area with regarded to their suitability for drinking purpose, *Rasayan journal.chemistry*, Vol-4,No-4:770-779.
- Deshmukh K.K. (2014) Assessment of ground water quality and its impact on Human Health from sangamner area, Ahmednagar district Maharashtra, India, *International Journal of research in chemistry and environment*, Vol- 4:4048.
- Deshmukh B.S. (2015) Physico-chemical characteristics of Pravara River, *International journal of research studies in bioscience(IJRSB)* Vol-3 :14-18
- Geneva. 1983. WHO Guidelines for drinking Water Quality, Second Edition Vol.6:52-82.
- Jadhav, S.D. and D.G. Kanase, 2005.Physico-chemical assessments of Nira and mutha river, pune , (Maharashtra, India), *J.indianchem.Soc*, 62, vol.6: 1038.
- Kamble, P.N. and S.R. kuchekar, 2011. Monitoring of physico-chemical parameter and quality assessment of water from bhandardara reservoir. *Pelagia research library*, :229-234.
- Kharde, A.K.(2014). Study of chemical properties of ground water in Pravara Area in Ahmednagar District, India. *Research Journal of Resent science*, Vol-3(IVC-2014):71-75.
- Maharashtra Pollution Control Board (MPCB), 2014. Water quality status of water bodies of Maharashtra, MPCB, Mumbai.
- Odum, E.P.1971.Fundamental of Ecology. Saunders Company, Philadelphia.
- Rahane, P.B. and Jadhav, M.V. (2016). The analysis of ground water quality status using linear regression method, *International Journal Of Engineering trends and technology (IJETT)*.Vol-38.No-4:223-228
- Santra, S.C, 1998 .A text book of Environmental science. Edn2nd, publisher Navaman.
- Sayed,A.R. and Jadhav, S. (2015). An assessment of physic-chemical characteristics to study the pollution potential of mula reservoir Ahmednagar District, Maharashtra, India. *Journal of Basic Science*:10-13.
- Trivedy, R. K., and P. K. Goel, 1984. Chemical and Biological Methods for Water Pollution Studies. Environmental publication, Karad. India.

SN	Parameters	Bhandardara dam			Mula dam		
		February	June	October	February	June	October
1	pH	6.8	6.2	6.5	7.2	6.8	7.4
2	TDS	0.21	0.28	0.26	1.30	1.52	1.12
3	Alkalinity (Mg/l)	115	120	112	82	90	80
4	Chloride (Mg/l)	17.68	20.71	15.40	14.38	15.69	14.72
5	DO	9.3	10.4	9.0	9.1	9.8	9.6
6	BOD	11.0	10.5	10.9	12.7	10.0	13.0
7	COD	20	21	24	36	32	34
8	Total Hardness (ppm)	60	112	70	64	140	72
9	Calcium (Mg/l)	17.6	18.2	16.8	16.4	17.5	16.8
10	Magnesium (Mg/l)	4.36	4.50	4.20	3.00	4.84	4.20
11	Free CO ₂	6.1	6.6	6.2	6.4	6.9	6.6