Study of Calcium Concentration of Neera River at Sarola Bridge Shirval, Pune, Maharashtra

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ABSTRACT

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Calcium is one of the important parameter for all the organisms which regulates the various physiological functions. The calcium ions along with magnesium ions contribute to the total hardness of water. Rivers generally contain 1-2 ppm calcium, but in some areas river may contain near about 100 ppm or more % of calcium concentrations depending upon the surroundings and addition of the foreign bodies into the river water. To calculate the concentration of calcium in the present study of Neera river water, samples were collected and analyzed from eight sampling stations in the year 2018-2019. In the present work calcium concentration is having high range at some sampling stations in summer season.

Keywords : Calcium Concentration, Physiological Functions, Neera River, Summer session

I. INTRODUCTION

River water is the major source of drinking water in urban as well as rural part of India. Also, it is an important source of water for the agriculture and industrial sectors. Near about 70% of the fresh water, used by human being goes to agriculture (Mushini Venkatesh Subba Rao & et.al. 2012). Agricultural run-off and industrial untreated waste effluents can bring about the considerable change in the river water quality. If the water is contaminated, then its quality cannot be restored by stopping the pollutants from the sources (Chatterjee S.N, et al. 2014, Hussain MF,

Ahmed I. 2002). Water is essential for any development activity and the availability of good quality of water for domestic and industrial use will help in fast development of the region (S. D. Jadhav, M. S. Jadhav, and R. W. Jawale, 2013). Due to rapid growth of population and industrialization there has been a tremendous increase in the demand for fresh water (Jaya Kalita Gogoi, 2016, Joshi DM, Kumar A, Agrawal N. 2009). Human health is threatened by most of the agricultural development activities like excessive use of fertilizers and unsanitary conditions (Katakwar M. 2014). Now a day's several places suffer from non-availability of water for domestic and

industrial use due to its over exploitation and improper waste disposal (Reddi Jhansilakshmi and E.U.B. 2014).

Devdhar dam is the origin place of Neera river. The river flows from its point of origin to the Veer dam and finally joins the Bhima river.

II. METHODS AND MATERIAL

Water samples were collected from seven sampling stations of river Neera at and near Sarola bridge in the year November 2018-June 2019 by following standard procedure (APHA1995, Trivedi R.K & Goel P.K. 1984). These samples were collected in two liter plastic bottles, which were washed with distilled water before the collection of water samplers. Collected water samples were preserved safely by taking suitable precautions to avoid deterioration.

OBSERVATION TABLE NO I

Sampling Stations	Nov. 2018	Dec. 2018	Jan. 2019	Feb. 2019	Mar. 2019	Apr. 2019	May. 2019	Jun. 2019	Permissible Limit
1	19	31	42	56	77	83	86	69	200mg/l
2	21	29	36	49	76	89	84	78	
3	23	36	44	51	78	84	80	76	
4	22	28	41	54	69	77	72	79	
5	18	29	33	46	80	89	91	82	
6	24	31	48	53	88	93	90	86	
7	21	27	39	48	73	88	92	78	

Fig 1. Graphical Presentation of Calcium Concentration

Fig 2. Stream Network Map of Nira River Basin

Fig 3. Neera River Flowing Water In Summer

III. RESULTS AND DISCUSSION

Calcium and magnesium are the most abundant elements in the natural surface and groundwater and

exist mainly as bicarbonates and to a lesser degree in the form of sulfate and chloride. Calcium concentration in present study ranges from minimum 19.00 mg/l to maximum 93.00 mg/l in the

river water. Its average value was higher in winter followed in the summer (93 mg/l). A similar pattern was observed by Chatterjee S.N, et al. (2014) while studying the physico-chemical properties of Ganga river in West Bengal, and Shukla Bramhanand and Upadhy Nidhi (2017) also found similar trend while studying physico-chemical and bacteriological characteristics of Bansagar lake, Shadol (M.P.). Higher calcium concentration in the study was found at sampling stations viz. 6, 7 and 5 respectively.

Increase in calcium concentration at these sampling stations may be due to human activities like bathing, washing cattle's, clothes and disposal of sewage as well as agricultural run-off into the river body (Varale Yashodhar, 2018, S. D. Jadhav & et.al, 2017). The presence of calcium in water results, from passage through or over deposits of limestone, dolomite and gypsum. Small concentrations of calcium carbonate combat corrosion of metal pipes by laying down a protective coating (Williams, G.P. 1989). Appreciable calcium salts on the other hand precipitate on heating to form harmful scale in boilers, pipes and cooking utensils.

IV. CONCLUSION

Hence, the present study was concluded that river water of the study area was not polluted in respect to calcium concentration assessment, which require continuous monitoring and treatment process if the water is to be used for drinking purposes. Some steps and awareness programs must need to educate local villagers to safeguard the precious river and its surrounding.

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