



QUANTIFYING HARDNESS OF THE WATER OF CHINCHOLI TANK OF SOLAPUR DISTRICT, MAHARASHTRA

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ABSTRACT

The water in which the soluble salts like calcium, magnesium, chloride, Sulfate and bicarbonates are present is called as hard water, while the water with fewer salts is called as soft water. Originally, water hardness was understood to be a measure of the capacity of water to precipitate soap. Soap is precipitated chiefly by the calcium and magnesium ions. Other polyvalent cations also may precipitate soap, but they often are in complex forms, frequently with organic constituents, and their role in water hardness may be minimal and difficult to define. Hence, total hardness can be defined as the sum of the calcium and magnesium concentrations. In the present investigation hardness was found maximum in summer while minimum in winter. Results are discussed with recent literature.

KEYWORDS : Hardness, Chincholi tank

Introduction

Hardness is the property of water which prevents the lather formation with soap and increase the boiling point of waters. Hardness to water is mainly imparted by alkaline earth metallic actions, mainly calcium and magnesium present. Ecologically temporary hardness plays a key role in buffering capacity thus neutralizing an off set in pH due to addition of acidic products. Hardness represents amount of salts present in water (Salunkhe *et al.*, 2015). Hardness also restricts water use, hard water is unsuitable for cooking, washing and bathing due to high boiling point in the, first while poor lather forming capacity in the latter two uses. Generally an aquatic ecosystem receives calcium from limestone, dolomite and gypsum deposits in the catchments and its level may range between to several hundred mg/l. Further hardness could to temporary due to carbonates and bicarbonates or permanent due to sulphates and chlorides of main cations. Hardness of water has a great effect on biotic diversity and biomass in an ecosystem. Many workers have carried out extensive research in quantification of hardness like Sakhare (2002), Rao *et al.*, (1981), Narayana *et al.*, (2008) and Bade *et al.*, (2009).

Materials and Method

Present investigation of piscine studies is carried out on Chincholi tank during June 2015 to May 2016. The Chincholi tank is situated in District Solapur (M.S.) north east of Sangola city. It is located along Sangola Mahud roadway, 4 km away from Sangola. Chincholi tank is located at 17°15'4" to 17°24'5" along North latitude and 74°49'5" to 75°15'9" along East longitude. The Chincholi Tank is constructed in 1966 for irrigation purpose. The Chincholi tank on the local nala coming from Ekathpur Village. It is an Earthen Dam maximum height of dam 15.24 Mts. The tank is surrounded by agriculture fields and town Sangola. The average rainfall at the Chincholi tank is 570 mm. Temperature ranges from 22.0 C to 39.50 C climate is hot and dry in summer, cold in winter.

During present investigation water samples were collected from four sampling sites for 12 months during June 2009 to May 2010. Water samples were collected and brought to laboratory for analysis. Total hardness was estimated by the titration method prescribed by APHA (2012), Trivedi and Ragothaman (2002).

RESULT AND DISCUSSION

Monthly total hardness values of water samples from the four stations are shown in table During the study period (June 2009 to May 2010). Maximum hardness values was recorded 14.6 in month of May 2010, while its minimum hardness value was recorded 6.5 in month of Aug 2009. The hardness of water is mainly due to the presence of calcium and magnesium. Maximum values were found during summer and minimum values were found during winter higher hardness values in summer were also reported by Devi (1985) and Devi (1997) according to Jhingran (1988) and Sugunan (1990) the hardness above 70 ppm is a indicator of the better

productivity.

Title: Monthly variation in Total Hardness in mg/lit at four different sites of Chincholi tank from Jun 2009 to May 2010.

Sr. No.	Month	Site A	Site B	Site C	Site D	Average	Seasonal Average
1	Jun 09	10.0	9.8	10.2	10.2	10.05	7.56
2	Jul 09	6.9	6.5	6.8	7.0	6.80	
3	Aug 09	6.5	6.5	6.5	6.6	6.52	
4	Sep 09	6.5	6.9	7.1	7.0	6.87	
5	Oct 09	10.0	10.2	10.3	10.3	10.20	10.74
6	Nov 09	10.4	10.3	10.5	10.5	10.42	
7	Dec 09	11.2	11.2	11.2	11.1	11.17	
8	Jan 10	11.2	11.1	11.2	11.3	11.20	
9	Feb 10	12.5	12.8	13.3	13.3	12.95	13.90
10	Mar 10	14.0	13.8	14.1	14.1	14.00	
11	Apr 10	14.1	14.2	14.3	14.0	14.15	
12	May 10	14.5	14.5	14.6	14.5	14.52	

Conclusion

During present investigation total hardness was found maximum in summer while minimum in winter. The summer maxima of the hardness is attributed to concentration effect while minimal values of hardness are attributed to dilution effect.

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