



Assessment of fluoride level in Manar Reservoir from Maharashtra, India

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Abstract

Human health is severely harmed by water pollution. Consumption of high fluoride containing water may create serious issue worldwide that causes Fluorosis in humans. Fluoride is a factor that pollutes both the surface and groundwater sources.

Surface water samples were collected from Manar reservoir by selecting three different locations. The fluoride content in surface water resources of manar reservoir was monitored during the period from January 2018 to December 2018. The fluoride content of all three sampling sites from manar reservoir was found below permissible limits.

Keyword: Human Health, Surface water, Fluoride.

I Introduction

Clean water is a vital resource because of its various uses like drinking, agricultural, industrial, transportation, sustenance of biodiversity and other purposes due to this people gave importance to lakes, rivers and coastlines (Carpenter et al, 1998)

It becomes dangerous when the level of fluoride in potable water exceeds the permissible limit. Prolonged exposure to fluoride in drinking water can cause health problems in humans studied from three districts of southern Rajasthan (Choubisa, 2001).

Chronic fluoride toxicity in the form of osteo-dental fluorosis was found in several domestic animals from some villages of southern Rajasthan (Choubisa, 1999).

Small amount of fluoride is an essential component to maintain human health. Fluorosis is a serious health issue caused by prolonged exposure to excessive levels of fluoride. Fluoride pollution of water supplies is a problem in several Asian countries, including India (Yadav et al., 2019).

The aim of this investigation was to analysis of fluoride. Three different selected sampling locations of Manar reservoir was assessed for fluoride concentration.

II. Study Area

During the research three sites were selected for fluoride analysis from Manar reservoir near at Barul village, Kandhar taluka, Nanded district, Maharashtra. There are three locations in the study area.



Three sampling sites of the Manar Reservoir in Barul Village, Kandhar Taluka, Nanded District, Maharashtra, India,

III. Materials and Methods

Three separate sampling locations were selected for the Manar reservoir's fluoride parameter analysis. These samples were collected once a month for analysis until one year of research, during the period of January 2018 to December 2018.

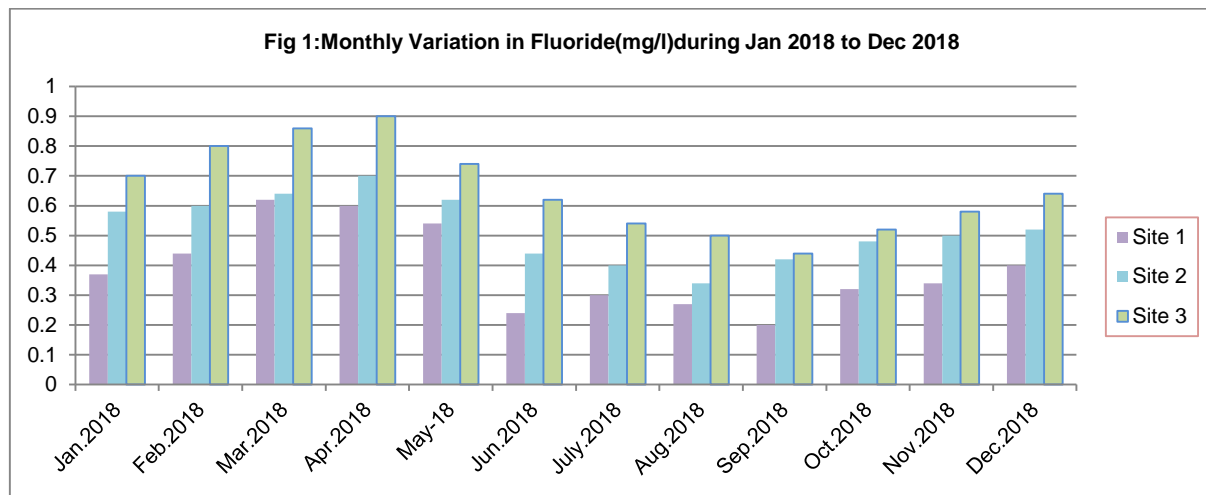
The fluoride content in collected water samples were estimated by using SPADNS calorimetric method as described by Maiti (2004) and results were expressed in mg/lit

IV. Result and Discussion

During the present investigation three sampling stations were selected for analysis of Fluoride content in Manar Reservoir. Samples were collected from different sampling locations monthly and analyzed in the laboratory. The study was carried out during January 2018 to December 2018. The results obtained from present sampling sites were summarized in table 1 and presented in graphical form (fig.1)

Table 1. Monthly variation in Fluoride levels During January 2018 to December 2018, in Manar Reservoir Barul in mg/L

Study Period	S1(Site 1)	S2(Site 2)	S3(Site 3)
Jan.2018	0.37	0.58	0.70
Feb.2018	0.44	0.60	0.80
Mar.2018	0.62	0.64	0.86
Apr.2018	0.60	0.70	0.90
May2018	0.54	0.62	0.74
Jun.2018	0.24	0.44	0.62
July.2018	0.30	0.40	0.54
Aug.2018	0.27	0.34	0.50
Sep.2018	0.20	0.42	0.44
Oct.2018	0.32	0.48	0.52
Nov.2018	0.34	0.50	0.58
Dec.2018	0.40	0.52	0.64



The acceptable level of fluoride in potable water, according to the BIS standard (IS 10500: 2012), is 1.0 mg/L. As a result, the current fluoride levels are within the acceptable range. According to the analysis, it was discovered that the third site(S3) had the highest fluoride content.

Table 1 shows the obtained values of the fluoride concentration during the study period from January 2018 to December 2018. The content of Fluoride in the Site 1(S1) water sample was minimum **0.20 mg/L to maximum 0.62 mg/L** during the study period. The quantity of Fluoride from Site 2 (S2) sample was minimum **0.34 mg/L to Maximum 0.70 mg/L** during one year period, whereas the levels of fluoride in the Site 3(S3) sample was minimum **0.44 mg/L to maximum 0.90 mg/L** during January 2018 to December 2018.

In figure 1 it indicates that fluoride levels in all of the sites studied were within the BIS permissible limit (i.e., 1.5 mg/L) indicating that there was no excess fluoride concentration and the observed values of fluoride may be due to weathering of fluorine-containing rocks and it is a typical cause of fluoride richness in a reservoir. Probable reason of high content of fluoride in summer was due to low water quantity in summer season.

(Sayyad and Bhosle, 2012) studied water samples of Sudha Dam in Bhokar, Maharashtra and observed that Fluoride content between range of 0.25 to 1.2 mg/L, and it was due to presence of fluoride rich rock.

(AKM Fazlul Hoque et al., 2003), examined fluoride levels from different water sources of Bangladesh and observed surface water resources contain lowest amount of fluoride i.e., in the range between 0.04-0.40 mg/L.

(Mamatha & Haware, 2013) studied the surface and Ground water fluoride concentration from Mysore district and found the fluoride contents varied from 0.25 to 3 ppm in the surface water bodies.

(Yadav and Lata, 2003) examined the prevalence of dental Fluorosis and observed the mean fluoride concentration in drinking water was between range of (1.93 to 2.14 mg/l) in the Jhajjar district of Haryana.

V. Conclusion

After studying the content of Fluoride from Manar reservoir, the current investigation indicated that from all three sampling stations of Manar reservoir Fluoride contents were within permissible limits

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