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Brief communication

Analysis of Ambazari Lake Water of Nagpur City, Maharastra, India

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ABSTRACT

One of the essential requirements of human species is water. The present manuscript deals with the contemplation of Ambazari lakelet. Ambazari Lake water is degraded as abundant discharge of tarnished things after hunky-dory operation to annihilate malicious commixtures. Water condition analyzes as well as reconsiders and has performed considering multifarious physico-chemical characteristics. The particular contents are: Potential of hydrogen, Electric Conductivity, Dissolved Oxygen, Biochemical oxygen demand, Chemical oxygen demand, Phosphate, Suspended solid, Nitrate and Coliforms consequently. Correlation coefficients between attributes and Clustering are accomplished to cognize the nearness of the attributes. The obtained values of each attributes has compared with the standard values set by the World Health Organization(WHO) .The results attained show that most of the attributes does not satisfy the permissible limit recommended by WHO. Hence the lake water is not suitable for drinking purposes.

Keywords: Ambazari lakelet, Nitrate, Coliforms, Phosphate, Clustering, Correlation coefficients.

INTRODUCTION

Water is one of the invaluable things to save life[1-5]. Water is deteriorated by human activity. The increase of population and industrial headlong has escort immense worriment and salaciousness of situation; alchemical, noxious morphemes are mixing toward the cloacae runnel and unshed area interconnecting the factory-made space. Since many industries find water bodies as the best place for their waste discharge, the water condition is getting poor and the uniformly occurring equilibrium of the ecosystem getting disturbed[6].

Lakes are one of the important water resources used for irrigation, drinking, fisheries and flood control prospect. The present study ruminates on determining the physical, chemical and bacteriological profile of Ambazari lakelet to find the pollution sources and causes of concerning variations in water quality.

A number of scientific methods and tools have been developed to assess the water contaminants. These methods include the analysis of different attributes such as Potential of hydrogen, Electric conductivity, Dissolved oxygen, Biochemical oxygen demand, Chemical oxygen demand, Phosphate, Suspended solid, Nitrate and Coliforms.

The results of each attributes has compared to the guidelines set by World Health Organization

MATERIALS AND METHODS

Study area of the samples

Nagpur is one of the wonderful city in Maharashtra, India. This city is surrounded by so many lakes. Amabazari Lake is one of these lakes. Ambazari Lake is made by Raja Bhosle and is spanning up 60 acres. It is one of the wonderful lakes in Nagpur, Maharashtra. The condition of the lake is reported to be precarious and needs urgent remedial measures for conservation.

Fig. 1. Map of sample locations

Collection of Samples

All the samples were taken from the chosen point of the lake in resilient bottle to bypass fluky changes in temperament as per standard procedure[7-11].

Exploration of Samples

The selected samples were scrutinized for distinctive attributes such as Potential of hydrogen (pH), Electric conductivity (EC), Dissolved oxygen (DO), Chemical oxygen demand(COD), Biochemical oxygen demand (BOD), Phosphate(TP), Suspended Solid(SS), Nitrate(TN) and Coliforms(TC) as per the standard methods (APHA, 1998)[12]. pH is calculated using pH meter, Electric conductivity is measured using conductivity meter. Closed reflux titrametric method is used for COD. Approved borderline of drinking water condition are shown in Table 1.

RESULTS AND DISCUSSION

The dissimilarity of numerous attributes of Ambazari Lake water are recorded in Table 2 and presented in Fig. 2. Some attributes has crossed the permissible limit prescribed by WHO for drinking purposes.Hence the lake water is not suitable for drinking purposes.

Table 1: Approved borderline of drinking water condition

Parameters	WHO
pH	6.5 – 8.5
Electricity Conductivity Mho/cm	400
Nitrate	50
Phosphate	0.1
Dissolved Oxygen	5 – 6
BOD	6.0
COD	10.0

All units are in mg/l except pH and Electric Conductivity
WHO - World Health Organization

Treatment of data using statistically

Clustering has accomplished by Systat[13] and a Dendogram is presented in Fig. 3. There

are two statistical conceivable clusters are shaped. Current consideration proclaims that there dissimilarities in the physico-chemical properties of cluster 2 and cluster 1. Factor analysis is accomplished and Data matrix is shown in Fig. 4. From data matrix it shows that there is differences between the attributes. Correlation matrix has accomplished using Microsoft Excel 13 software and presented in Table 3 to see the relationship between the physico-chemical attributes.[13] The correlation analysis of measured water parameters (Table 3) execute strong positive correlations between PH-EC, EC-TN, DO-TN, SS-BOD. Positive relationship between the components can be explained due to homogeneity in their distribution pattern or they are sourced from same origin.[14]

Table 2: Water Quality of Ambazari Lake water (Laboratory Analysis)

Name of Sample Sites	pH	EC(μmhos/cm)	DO(mg/L)	CODmg/L)	BOD(mg/L)	TP(mg/L)	SS(mg/L)	TN(mg/L)	TC
S1	6.2	998	3.2	128	43	0.35	198	1.66	1108
S2	8.5	786	2.7	80	34	0.20	208	1.26	988
S3	8.2	743	2.9	36	16	0.21	72	1.34	640
S4	6.5	618	2.7	78	30	0.78	98	0.90	1280

pH-potential of hydrogen, EC-electric conductivity, DO-dissolved oxygen, COD-chemical Oxygen demand, BOD-biochemical oxygen demand, TP-phosphate, SS-suspended solid, TN-nitrate, TC- coli forms.

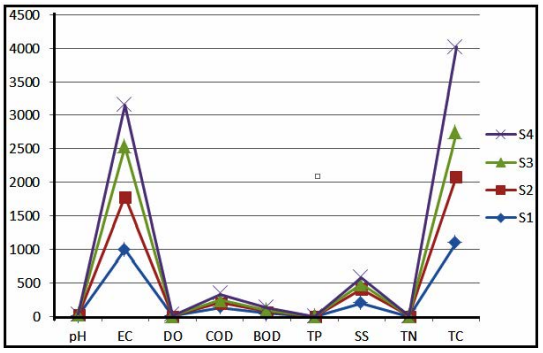

Fig. 2. Graphical representation of Samples

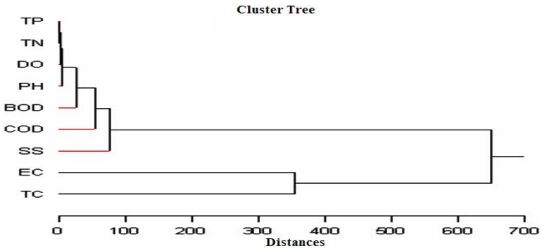

Fig. 3. Dendrogram using Ward Linkage

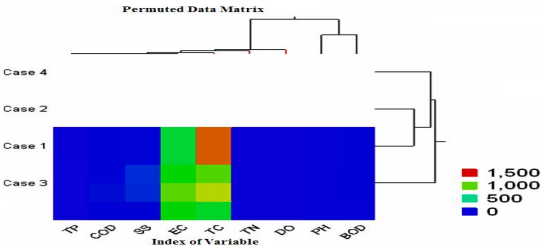

Fig. 4. Data Matrix

Table 3: Pearson Correlation Matrix for the Samples

	pH	EC	DO	COD	BOD	TP	SS	TN	TC
pH	1								
EC	-0.24832	1							
DO	-0.48931	0.867344	1						
COD	-0.69003	0.69523	0.557035	1					
BOD	-0.56532	0.629837	0.398621	0.976974	1				
TP	-0.68933	-0.51329	-0.27219	0.170369	0.136834	1			
SS	-0.04381	0.67972	0.257343	0.750961	0.844417	-0.34232	1		
TN	-0.07864	0.957501	0.881127	0.463903	0.379147	-0.66788	0.500848	1	
TC	-0.71939	-0.06751	-0.10842	0.669924	0.699774	0.778747	0.322824	-0.34275	1

CONCLUSION

The results attained show that most of the attributes does not satisfy the permissible limit recommended by World Health Organization

This study determines the importance of multivariate statistical techniques in the analysis and interpretation of important data sets, in identifying pollutant sources, and in understanding variations in water quality for effective lake water management.

It is concluded that Ambazari Lake water is contaminated as well as not thoroughly camouflaged for drinking expectation. It is desirable to important survey and useful plans to restraint the freeing of dispersal. It shows that the desecration is by virtue of uncovering, industrialized discharge, domestic discharge.

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Conflict of interest

No conflict of interest regarding this research paper.

REFERENCES

1. Salahuddin.; Analysis of Futala Lake Water Nagpur City, Maharastra, India. *To Chemistry Journal*., **2020**, *7*(4), 163-167.
2. Salahuddin and Husain, Intazar, Analysis of Sea Water from Tupilipalem Coastal area, India. *International Journal of Oceans and Oceanography*., **2020**, *14*(2), 277-283.
3. Salahuddin and Husain, Intazar Analysis of Katraj Lake Water in Pune Region of Maharashtra, India. *International Journal of Lakes and Rivers*., **2020**, *13*(1), 27-34.
4. Salahuddin and Husain, IntazarAnalysis of Lower Lake Water in Bhopal Region of Madhya Pradesh, India. *International Journal of Lakes and Rivers*., **2020**, *13*(1), 17-25.
5. Salahuddin. Khola, R. K, Physico-Chemical Analysis for the Presence of Oxygen Content of Ground Water at Different Locations of Dildar Nagar of U.P, India. *Global Journal of Science Frontier Research* (B)., **2014**, *14* (6), 01-03.
6. Arasu, T.P.; Hema, S., and Neelakantan, M.A.,Physico-chemical analysis of Thamirabarani river water in South India, *Indian Journal of Science and Technology*., **2007**, *2*(1), 155-165.
7. Anita. and Salahuddin, Analysis of Electrical conductivity of Ground water at different locations of Phooli of U.P, India. *International Journal of Emerging Trends in Engineering and Development*., **2019**, *3*, 1-5.
8. APHA., Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF, Washington D.C., **1998**.
9. Salahuddin, Physico-chemical analysis of upper lake water in Bhopal region of Madhya Pradesh, India. *Advances in Applied Science Research*., **2014**, *5*(5), 165-169.
10. Salahuddin, Analysis of electrical conductivity of ground water at different locations of Dildar Nagar of U.P, India, *Advances in Applied Science Research*., **2015**, *6*(7), 137-140.
11. Salahuddin, Analysis of Magnesium contents of Ground water at surrounding areas of Dildar Nagar of U.P. India. International *Journal of Innovative Research in Science, Engineering and Technology*., **2020**, *9*(4), 1607-1610.
12. Salahuddin and Khola, R. K., Analysis of Chloride Content in the Surface of water using two way Anova. *International Journal for Pharmaceutical Research Scholars*., **2013**, *2*(4), 51-53.
13. Salahuddin, Analysis of Chloride Content in the Surface of water at different locations of Madhya Pradesh. *International Journal for Pharmaceutical Research Scholars*., **2013**, *2*(4), 107-109.
14. Nayek, S.; Gupta, S. and Pobi, K.K., Physicochemical characteristics and trophic state evaluation of post glacial mountain lake using multivariate analysis. *Global J. Environ. Sci. Manage*., **2018**, *4*(4), 451-464.
15. Kistan, A.; Kanchana, V. and Ansari, A.T., Analysis of Ambattur Lake water quality with reference to physic-chemical aspects at Chennai, Tamil Nadu. *Int J Sci Res*., **2015**, *5* (5), 944-947.