**TURBIDIMETRIC AS AN EFFICIENT SIGN OF WATER
CHARACTERISTICS ALTERATION****Shaziya Mohammed Irfan Momin***

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ABSTRACT

The physico-chemical parameters of water samples collected from three sites of Varal Devi lake in Bhiwandi city were assessed. The physicochemical parameter like Turbidity were determined. This parameters were determined during festival period (Before, During and Post Idol immersion activities). The results were compared with standards prescribed by WHO (1973) and ISI (10500-91). It was found that the water samples collected from three sites from Varal Devi Lake

in Bhiwandi city was contaminated. All sampling sites showed this physicochemical parameters above the water quality standards and the quality of water are bad and it is unfit for drinking purpose.

KEYWORDS: Lake water, Turbidity Parameter, Festival Period.**I. INTRODUCTION**

Natural resources are the important wealth of our country, water is one of them. Water is a wander of the nature. There is no life without water on the earth, is a common saying depending upon the fact that water is one of the naturally occurring essential requirement of all life supporting activities.^[1] Since it is a dynamic system, containing living as well as nonliving, organic, inorganic, soluble as well as insoluble substances. So its quality is likely to change day by day and from source to source. The immersion of idol of Lord Ganesh during month of August to October is a major source of contamination and sedimentation to the Varal Devi lake water. The idol are made up of clay, plaster of paris, cloth, paper wood,

thermocool, jute, adhesive materials and synthetic paints etc. Any change in the natural quality may disturb the equilibrium system and would become unfit for designated uses. The availability of water through surface and groundwater resources has become critical day to day. Only 1% part is available on land for drinking, agriculture, domestic power generation, industrial consummation, transportation and waste disposal.^[2,7]

In India, most of the population is dependent on surface water (damp water) as the only source of drinking water supply. The groundwater is believed to be comparatively much clean and free from pollution than surface water. Economy of Bhiwandi is mostly dependent on the power loom industry. Aim of the present research work is to analyse the lake water of one area of Bhiwandi and determine some physical and chemical parameter of lake water. The rapid growth of urban areas has further affected groundwater quality due to overexploitation of resources and improper waste disposal practices. Hence, there is always a need for and concern over the protection and management of surface water and groundwater quality.^[4]

The lakes have complex and fragile ecosystem, as they do not have self cleaning ability and therefore readily accumulate pollutants.^[6] The consequence of urbanization and industrialization leads to spoil the water. The release of pollutants and harmful substance due to idol immersion activity changes the original characteristics of water which could be rather harmful to human health after consumption. The literature survey reveals that no water quality management studies are made in this region so far. Hence it is very essential to maintain the quality of surface water for human consumption, for the aquatic life and for other subsequent uses. Thus, in this research work an attempt has been made to assess the quality of surface water like Turbidity. The analyzed data were compared with standard values recommended by WHO.^[11]

2. METHOD AND MATERIALS

The water samples was collected from lake during morning hours from First Ganpati Vicersion point, Near Lake View Restaurant (Site S1), Second Ganpati Vicersion Ghat, Kamat Ghar Gaon, Chandan Baug, Near Peace Park (Site S2) and Third Ganpati Vicersion point, Phenapada, Phulegaon (Site S3) idol immersion point and the site of idol immersion at different intervals i.e. pre immersion, during immersion and post immersion in the period of Ganesh Chaturthi from the month of July to December respectively. Pre idol immersion samples were collected a three week before the commencement of the immersion activities.

During idol immersion samples were collected during the immersion activities. Post idol immersion samples were collected till six week after the completion of immersion activities. The water samples collected and analysed for Turbidity measurement.

2.1 Preparation Of Water Samples

The sample were collected (pre, during and post idol immersion) from all the three points at 08.00 am in the morning for Turbidity examinations, standard procedure for sampling were adopted. The samples were collected in plastic canes of two liters capacity without any air bubbles. The samples were kept in refrigerator.^[11]

2.2 Turbidimetric Analysis

Analysis was carried out for turbidity of water sample by standard method. All the reagents used for the analysis were AR grade and double distilled water was used for preparation of solutions. Turbidity is determined by using Turbimeter.^[11]

3. RESULTS AND DISCUSSION

The Turbidity parameters of the above mention sites in Varal Devi lake can be determined and consequences of turbidity in water are as described below.

Turbidity in water are due to solid particles may be dissolved and undissolved forms in water. In stream water, dissolved solids consist of calcium, chlorides, nitrate, phosphorus, iron, sulfur, and other ion particles that will pass through a filter with pores of around 2 microns (0.002 cm) in size. Suspended solids include silt and clay particles, plankton, algae, fine organic debris, and other particulate matter. These are particles that will not pass through a 2-micron filter. All these particles scatter the light in turbimeter and gives turbidance of solution.

The concentration of particles scattering the light affects the water balance in the cells of aquatic organisms. An organism placed in water with a very low level of solids, such as distilled water, will swell up because water will tend to move into its cells, which have a higher concentration of solids. An organism placed in water with a high concentration of solids will shrink somewhat because the water in its cells will tend to move out. This will in turn affect the organism's ability to maintain the proper cell density, making it difficult to keep its position in the water column. It might float up or sink down to a depth to which it is not adapted, and it might not survive.

Higher concentrations of suspended particles can serve as carriers of toxics, which readily cling to suspended solids. This is particularly a concern where pesticides are being used on irrigated crops. Where solids are high, pesticide concentrations may increase well beyond those of the original application as the irrigation water travels down irrigation ditches. Higher levels of solids can also clog irrigation devices and might become so high that irrigated plant roots will lose water rather than gain it.

A high concentration of floating solids will make drinking water unpalatable and might have an adverse effect on people who are not used to drinking such water. Levels of scattering particles that are too high or too low can also reduce the efficiency of wastewater treatment plants, as well as the operation of industrial processes that use raw water.

Solids particles also affect water clarity. High amount of particles decreases the passage of light through water, thereby slowing photosynthesis by aquatic plants. Water will heat up more rapidly and hold more heat; this, in turn, might adversely affect aquatic life that has adapted to a lower temperature regime.

Sources of solid particles include industrial discharges, sewage, fertilizers, road runoff, and soil erosion. Turbidity is measured in terms of the light scattering characteristics of the solid particles in Nephelometric Turbidimetric Unit.

Turbidity is determined by various concentration of standard solution of Barium Sulphate using Turbimeter.^[11] Calibration plot is given below.

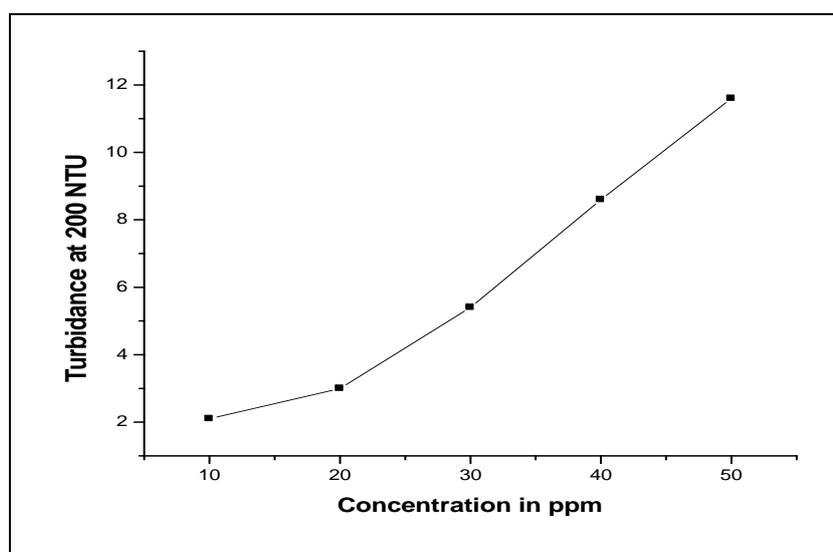
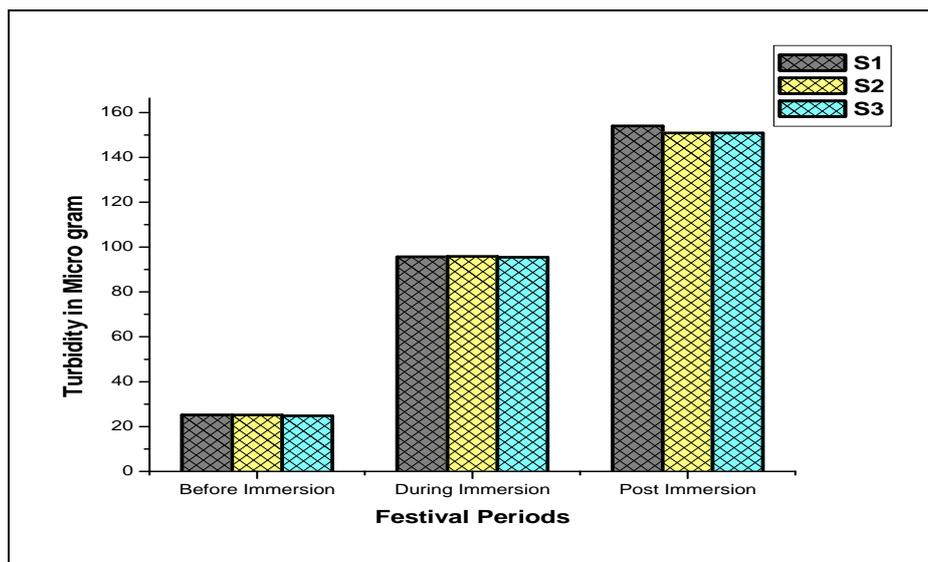


Figure 3.1: Graph of Turbidity at 200 NTU Vs Concentration in ppm

Table 3.1: Amount of Turbidity.

Sr. No	Periods	Amount of Turbidity in $\mu\text{g/ml}$			WHO $\mu\text{g/ml}$	BIS NTU
		S1	S2	S3		
1.	Before Immersion	25.17 \pm 0.5715 V=0.3266	25.17 \pm 0.5715 V=0.3266	24.77 \pm 1.2528 V=1.569	Not mentioned	5.0
2.	During Immersion	95.67 \pm 0.2792 V=0.0779	95.836 \pm 0.2826 V=0.0798	95.5 \pm 0.8410 V=0.7072		
3.	Post Immersion	154.0 \pm 0.00 V=0.000	150.836 \pm 5.479 V=30.019	150.836 \pm 5.4790 V=30.021		

**Figure 3.2: Amount of Turbidity in $\mu\text{g/ml}$ Vs Festival Periods.**

The turbidity of water samples collected before idol immersion was less than the standards set by BIS (Below 30.0 $\mu\text{g/ml}$). During immersion and post immersion the turbidity levels are high. At idol immersing period the value of turbidity of water samples collected from all three stations were found to lie between 95.5 $\mu\text{g/ml}$ and 95.836 $\mu\text{g/ml}$ and after idol immersion the values were from 150.836 $\mu\text{g/ml}$ to 154.0 $\mu\text{g/ml}$.

The most important aspect to drinking water quality is its effect on taste. The drinking water containing high amount of particles causing turbidity is not considered desirable and it can also cause excessive scaling in water pipes, water heaters, boilers and household appliances.^[8,9]

4. CONCLUSION

Water have been subjected to maximum exploitation and severely degraded or polluted due to anthropogenic activities. The pollution includes point sources such as emission, effluents and solid discharge from industries, vehicle exhaustion and metals from smelting and mining,

and nonpoint sources such as soluble salts (natural and artificial), use of insecticides and pesticides, disposal of industrial and municipal wastes in agriculture, and excessive use of fertilizers. Each source of contamination has its own damaging effects to plants, animals and ultimately to human health.^[5]

Turbidity is found to be greater than standard values provided by the standard body. Turbidity of water sample is light scattering properties of the water sample. It is one of the optical properties. The particles of clay, soil, silt, mud, waste particles, insoluble chemical compounds scatter the light and does not allow the sunlight to enter beneath or depth of the water body. Therefore aquatic organisms living and breeding in water does not get sufficient light for survival purpose and die. Sedimentation and filtration processes are carried out to remove the turbidity to some extent. Water clarity is very significant in producing the various desired products. Water clarity also determine the productivity of lake. Direction or flux level will not change through the sample as the sample scatter or transmit the light.

We will also try to motivate people as far as possible to avoid using the lake as immersion site as it provides drinking water and source of food for the local population.

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