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## **Assessment of Amount of Phenol in Lake Water During Festival Period**

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**Abstract-**The concentration of phenol in the Varal Devi lake water were determined during festival periods. This lake provide drinking water and a source of edible fishes. The water sample collected from three different sites used for idol immersion activities in Bhiwandi city. Sampling of water sample carried out before, during and after Idol immersion activities. The concentration of phenol was determined. The results were compared with standards prescribed by WHO (1973),USPH and ISI (10500-91). Concentration of phenol get increased due to idol immersion activity. It was found that the water samples collected from three sites of Varal Devi Lake in Bhiwandi city was not contaminated with phenol.

**Keywords:** *Lake water, Phenol,UV-Visible Spectrophotometer,Festival Period.*

### **I. Introduction**

Varal Devi Lake is situated at Dhamankarnaka, Bhiwandi city, District Thane, Maharashtra. The lake is surrounded by hills, residential places, buildings, hotels, shops, gardens, road, hall, rocks, temple, dargah and huts .Waste from all this places to some extent are disposed in to the lake. This water is also used for washing of cloths, utensils and vehicles. In this way the lake water is highly contaminated. This lake is also used for idol immersion activities[2,3].

**Phenol** mainly enters the water from industrial effluent discharges. Phenol is degraded rapidly in air by gas-phase hydroxyl radical reaction (estimated half-life 14.6 hours), but may persist in water for a somewhat longer period. Half-lives for biodegradation range from <1 day in samples of lake water to 9 days in estuarine water; a typical half-life for photooxidation by photochemically produced peroxy radicals is approximately 19 hours. Phenol is released to the water as a result of its manufacture, its use in phenolic resins, and in organic synthesis [1] .

Phenol and its derivatives induce toxic effect for fish. They induce various genotoxic, carcinogenic, immunotoxic, hematological and physiological effects have a high bioaccumulation rate along the food chain due to its lipophilicity. Thus phenol pollution represents a threat against natural environment and also to human health when phenol is present in the aquatic environment; fish food consumption, mean weight and fertility are significantly reduced [1].

## II. Material and Method

The samples were collected from three station which is used for idol immersion and sampling stations are marked as S1,S2 and S3 in triplicate and analyzed for phenol content as per Standard Methods [5,6]. S1,S2 and S3 indicates the following station in the lake water.

- First Ganpati Vicersion point, Near Lake View Restaurant (Site S1)
- Second Ganpati Vicersion Ghat,Kamat Ghar Gaon,Chandan Baug,Near Peace Park (Site S2)
- Third Ganpati Vicersion point,Phenapada,Phulegaon (Site S3).

### Phenol:

- Phenol reacts with 4-Aminoantipyrin and  $K_3Fe(CN)_6$  and yellow coloured complex is formed.
- This complex is extracted in Chloroform
- Intensity of this coloured complex was measured Spectrophotometrically at 430nm which is directly proportional to concentratiopn of phenol [4,6].

Table 2.1: Determination of Phenol

Sr.No	Conc of phenol in ppm	4N $NH_3$ in $cm^3$	4-Aminoantipyrin in $cm^3$	$K_3Fe(CN)_6$ in $cm^3$	Final dilution with water
01	0.2	2.5	1.0	10.0	50.0
02	0.3	2.5	1.0	10.0	50.0
03	0.4	2.5	1.0	10.0	50.0
04	0.5	2.5	1.0	10.0	50.0
05	0.6	2.5	1.0	10.0	50.0

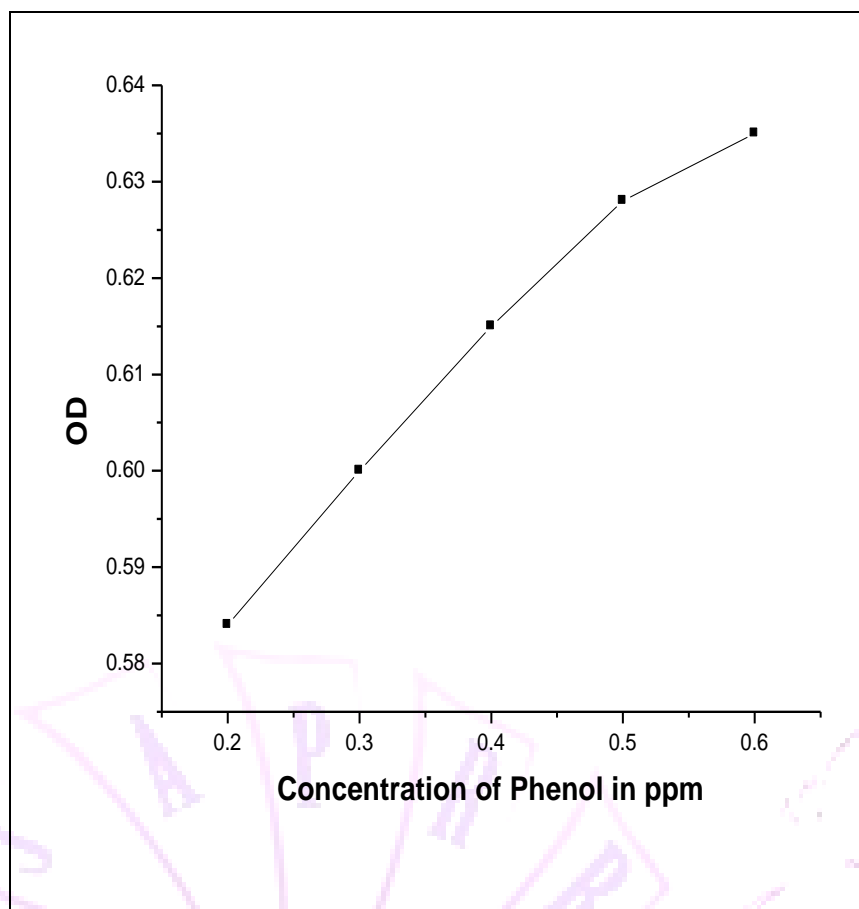


Figure 2.1: Graph of OD Vs Concentration of Phenol in ppms

Table 2.2: Amount of Phenol

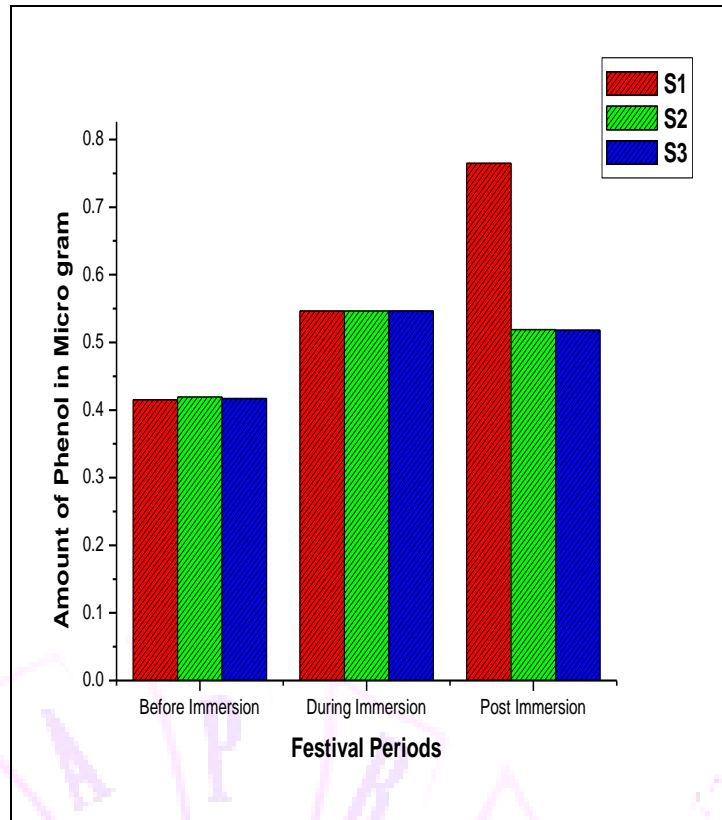
Periods	Concentration of Phenol in ppm		
	S1	S2	S3
Before Immersion	$0.4153 \pm 5.9665 \times 10^{-4}$	$0.419 \pm 4.714 \times 10^{-4}$	$0.417 \pm 7.071 \times 10^{-4}$
During Immersion	$0.5466 \pm 6.1806 \times 10^{-4}$	$0.5463 \pm 4.714 \times 10^{-4}$	$0.5466 \pm 2.3570 \times 10^{-4}$
Post Immersion	$0.765 \pm 0.000$	$0.519 \pm 7.071 \times 10^{-4}$	$0.518 \pm 0.000$

### III. Result and Discussion

#### Phenol:

Table 3.1: Amount of Phenol

Periods	Amount of of Phenol in $\mu\text{g/ml}$			WHO $\mu\text{g/ml}$	BIS $\mu\text{g/ml}$
	S1	S2	S3		
Before Immersion	$0.4153 \pm 5.9665 * 10^{-4}$ $V = 3.52 * 10^{-7}$	$0.419 \pm 4.714 * 10^{-4}$ $V = 2.22 * 10^{-7}$	$0.417 \pm 7.071 * 10^{-4}$ $V = 4.9 * 10^{-7}$	0.002	0.001
During Immersion	$0.5466 \pm 6.1806 * 10^{-4}$ $V = 3.81 * 10^{-7}$	$0.5463 \pm 4.714 * 10^{-4}$ $V = 2.22 * 10^{-7}$	$0.5466 \pm 2.35 * 10^{-4}$ $V = 5.5 * 10^{-8}$		
Post Immersion	$0.765 \pm 0.000$ $V = 0.00$	$0.519 \pm 7.071 * 10^{-4}$ $V = 4.99 * 10^{-7}$	$0.518 \pm 0.000$ $V = 0.000$		



**Figure 3.1: Graph of Phenol in  $\mu\text{g/ml}$  Vs Festival Periods**

Amount of phenol in water sample from all three stations are greater than the standard prescribed by BIS. Concentration of phenol is greater therefore it causes objectionable taste and odour in the water. USPH permissible limit for phenol in water is 0.001ppm [7,8]

#### **IV. Conclusion**

Amount of phenol in the lake water is greater than the standard value prescribed by WHO, BIS and USPH. As this water is used for drinking purpose, if concentration of phenol goes high then it leads to various disease and disorder in human being. This indicates that the water is not suitable for drinking purpose and may cause harmful effect. Therefore it is recommended that avoid using the water body for immersion of idol which is a source of eatables [9].

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