

# Effects on the Water Quality Parameters of Water during Ganesh Idol Immersion

**Dr. Harshal M. Bachhav and Dr. D. M. Sapkal<sup>2</sup>**

Department of Chemistry

S.I.C.E.S Degree College of Arts, Science and Commerce, Chikhholi, Ambarnath(W), Maharashtra, India

**Abstract:** *Pollution has been a major factor over the years in disturbing the day to day lives of living beings. Humans create the pollution for their own needs but then there must also be developed some ways constantly to reduce the pollution. Air, water, sound pollution being of major concern, continuous attempts must be made to reduce them. Amongst different types of pollution, water pollution is also a matter of concern especially with technological development and social activities. In India social activities, festivals have special importance of their own and they are celebrated accordingly which involves use of lakes, rivers, sea. Current activity involves analysis of polluted water bodies and steps to minimize water pollution in rivers and lakes caused by certain social activities but which are important to perform at the same time.*

**Keywords:** Quality of Water; Water Bodies; Water Pollution; Maharashtra.

## I. INTRODUCTION

Ganapati festival is one of the most important festivals in Maharashtra, but along with joy and enjoyment it also invites the tremendous pollution of water bodies which primarily affect aquatic life and water quality. This causes a kind of domino effect in which species depending on water bodies get affected and have to face severe ecological damage within a span of only a few days and creates lots of problem to aquatic animals too.

If we trace the root cause for this damage, we can conclude that the idols contain various organic and inorganic chemicals. As immersion of idols takes place in water bodies concentration of these chemicals exceeds beyond permissible level as far as pollution standards are concerned. Nowadays these idols are made up of POP which is nothing but gypsum or Calcium Sulphate. Solubility of gypsum is only 0.26g per liter, so when lots of idols are immersed in a small pond it gets accumulated in that water body.

Most importantly, paints which are used to colour these idols contain various heavy metals such as Mercury, Cadmium, Arsenic, Zinc, Chromium and lead. Particularly, red, blue, orange and green colours contain mercury, zinc oxide, chromium and lead, which are potent carcinogens [1]. Normally two heavy metals such as Lead and Chromium also added in the water bodies through Sindoor. Lead and Chromium are very toxic even in very small quantities for human beings through the process known as Bioaccumulation and Biomagnifications [2]. Through food chains, these heavy metals can enter into the living systems [3]. Immersion of these idols poisons the waters of lakes, rivers and the sea by increasing acidity and the content of heavy metals. Heavy Metal pollution caused by idol immersion can damage the ecosystem as it kills aquatic animals like fish, crabs, also damages aquatic plants, blocks the natural flow of the water, causing stagnation. It also pollutes drinking water sources and damages the health of human beings causing breathing problems, blood and skin diseases [4].

## II. LITERATURE REVIEW

Immersion of painted idols and dumping of organic wastes in the lakes, as a part of religious activities, are immensely adding to water quality deterioration. Incorporation of alkaline, alkali-earth metals and heavy metals through the idol-making paints are likely to promote the hardness and heavy metal concentration of water in these surface water bodies, and therefore, deteriorate the water quality[5].

## III. METHODOLOGY

Water samples were collected from the different locations in Ambarnath & Badlapur city. (Figure 1 to 5) during the Ganesh festival 2019. Samples were collected in Afternoon hours (5.00 to 6.00 pm) in pre-clean 1 liters plastic bottles. These samples were analyzed in College Chemistry Research Laboratory to study the physico-chemical parameters like pH,

total hardness, biological oxygen demand, chemical oxygen demand, turbidity and total calcium and lead because changes in these parameters shows the pollution status.

#### IV. RESULTS AND DISCUSSION

We visited a total of five locations in the locality of our college from which 3 were from Badlapur and 2 from Ambernath. All these water bodies are well known for immersion of ganesh idols. We took 10 samples from each pond. 5 samples were taken before ganesh chaturthi i.e before 2<sup>nd</sup> September on five different days while 5 are taken after ganesh visrjan i.e. after 12<sup>th</sup> September on 5 different days. Our focus is mainly on pH, Turbidity, Calcium content, Pb content, Chemical oxygen demand (COD) and Biological oxygen demand (BOD). All tests are performed in the college laboratory itself. The average values of five samples are shown in tabular format for each location.

##### 4.1 Gaondevi Mandir Lake



**Figure 1**

Being located in the middle in Badlapur city, and due to religious importance it is one the most famous location for ganpati visarjan in Badlapur. According to the local information collected around 450 idols were immersed in this pond during ganpati visarjan of 2019. This figure also reflects the pollution caused by it as the Ca content has increased almost double from 360 ppm to 760 ppm. This is due to the dissolution of gypsum in water. Also water gets turbid after immersion of the idol as its turbidity shows 85 NTU. While there are no significant changes in COD and BOD. Due to the presence of Pb in paints its concentration has also risen up to 14ppb.

	Before	After
pH	6.9	8.6
COD	53	48
BOD	15	4
Turbidity (NTU)	35	85
Ca	360	790
Pb	5	14

##### 4.2 Katrap Lake



**Figure 2**

It is the second most famous location for ganpati visarjan. Ca content here is increased from 300 ppm to 680 ppm. Also turbidity increases upto 70 NTU. There are no significant changes in COD and BOD values. The Pb content is also increased upto 10 ppb.

	Before	After
pH	7.5	8.9
COD	40	45
BOD	10	5
Turbidity (NTU)	40	70
Ca	300	680
Pb	3	10

#### 4.3 Lotus lake garlik naka Badlapur



**Figure 3**

Ca content here is increased from 380 ppm to 615 ppm. Also turbidity increases upto 50 NTU. There are no significant changes in COD and BOD values. The Pb content is also increased upto 9 ppb.

	Before	After
pH	7.8	8.2
COD mg/l	49	55
BOD	12	8
Turbidity (NTU)	35	50
Ca (ppm)	380	615
Pb (ppb)	4	9

#### 4.4 Nilimbi road Khadan Ambarnath



**Figure 4**

Ca content here is increased from 340 ppm to 610 ppm. Also turbidity increases upto 55 NTU. There are no significant changes in COD and BOD values. The Pb content is also increased upto 7 ppb.

	Before	After
pH	6.5	8.8
COD	45	40
BOD	9	7
Turbidity (NTU)	30	55
Ca	340	610
Pb	4	7

#### 4.5 Khadan, Ambernath



**Figure 5**

Ca content here is increased from 300 ppm to 490 ppm. Turbidity has not changed much. There are no significant changes in COD and BOD values. The Pb content is also increased upto 8 ppb.

	Before	After
pH	7.6	8.2
COD	38	50
BOD	8	7
Turbidity (NTU)	25	35
Ca	380	490
Pb	6	8

From analyzing above data we can conclude that due to immersion of idols made up of plaster of paris the water quality of natural water bodies deteriorates. A pond where around 450 idols were immersed has reported an increase in Ca contents double than before Ganapati idol immersion. Where there was less immersion of idols like Khadan Ambernath it is increased by 100 ppm. So we have to reduce the number of idols we are immersing in these ponds so as to control the pollution level.

#### Steps needs to be taken

To avoid plaster of paris and use clay found on river banks for molding idols instead. To immerse the idols in bucket at home. As an environment concern needs to avoid unwanted Paintings (Chemicals) and decoration to Idols.

#### ACKNOWLEDGMENTS

I am thankful to my final year Chemistry students Mr. Kartik Khude, Mr. Kazim Shaikh and Mr. Shoaib Shaikh for being a part of this research activity and to the Department of Chemistry, S.I.C.E.S. Degree College of Arts, Science and Commerce for supporting me in this research activity for creating necessary awareness about water pollution and care to be taken among the students.

**REFERENCES**

- [1]. Effects of Idol Immersion on the Water Quality Parameters of Indian Water Bodies: Environmental Health Perspectives
- [2]. The times of india. Idols' immersion adds to Ganga's pollution. Accessed on 30/05/2014, <http://timesofindia.indiatimes.com/city/patna/Idols-immersion-adds-to-Gangas-pollution/articleshow/16964313.cms>.
- [3]. Bibicz, M. 1982. Heavy metal in the aquatic environment of some water bodies of the Lublin basin, Actuatice Hydrobiology, 24, 125-138.
- [4]. Handy R.D. 1993. The accumulation of dietary aluminium by rainbow trout *On corhynchus mykiss* at high exposure concentrations. Journal of Fish Biology 42(4), 603-606
- [5]. Bisweswar Gorain and Srijita Paul, *Current World Environment; An International Research Journal of Environmental Science*, vol 14, 2019