



Environmental impact of idol immersion on Kakerpura Lake, Mhow

Billore, D.K. and Dandawate, Maneesha

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Abstract

This paper intends to prepare the environmental impact of "Ganesh Idol" and "Durga Pratima" immersion on water quality of Kakerpura Lake, Mhow. For this purpose site of Kakerpura lake was selected where idols are actually immersed. Water samples were collected in morning at different intervals i.e. pre-immersion (August) immersion (September, October) Post immersion period (November). The "Ganesh Idols" & "Durga Pratima" are made up of degradable and non degradable components and paints containing heavy metals due to that immersion activity deteriorates water quality. The physico-chemical parameters were analysed to study the environmental impact of idol immersion on Kakerpura Lake and these parameters shows the significant variation due to immersion of idols.

Keywords: Pollution, idol immersion, Kakerpura Lake, water quality

Introduction

All forms of life depend upon water & it provides sustenance of plants, animals, aquatic organisms to meet the human need like agriculture and industries (Prasad & Gaur 1992). The quantity & quality of utilizable water is degrades due to overexploitation and increase of pollution by the dumping of domestic, industrial and hospital waste, domestic activities like washing, bathing and religious rituals (Shukla 2004 and Gupta *et al.* 2011). India is the country of rituals and people believed in these and they deeply follow it. Most of the rituals are performed near banks of river of water bodies. The "Ganesh Chaturthi" is one of the important festivals of Hindi and during these festivals thousands of Ganesh idols of various sizes are immersed every year in different water bodies. Similarly in Kakerpura Lake about 600-700 Ganesh Idols & 400-500 Durga Pratima are immersed. Idols are constructed by plaster of paris, clay, cloths, small iron rod, bamboo and decorated with different paints such as varnish, water colour, when these idols are immersed in water bodies, these constituting components lead to significant alteration in water quality (Photel *et al.* 2001; Reddy & Kumar 2001, Bajpai *et al.* 2002, Mukherjee 2003, Swain *et al.* 2005; Vyas *et al.*;

2006, 2008, Vyas and Bajpai 2008; Vyas and Bajpai 2008, Dhote and Dixit 2011 and Bhat *et al.* 2012). The input of Biodegradable and non biodegradable substances deteriorates the water quality and enhances silt load in the river. The floating material released through idol in the river and lake after decomposition result in eutrophication (Leland, 1991). In addition, various other aspects related to water quality have been widely studied by different workers in the literature (Khanna and Bhutiani, 2003; Khanna and Bhutiani, 2005; Khanna *et al.* 2007; Khanna *et al.* 2011; Khanna *et al.* 2012; Khanna *et al.* 2013; Bhutiani *et al.* 2015).

Material and Methods

For this study water samples were collected from surface water during morning hours, from actual immersion site. During the Ganesh festival 2012 at different intervals i.e. Pre-immersion (Aug) immersion of Ganesh idol (Sep.), Durga Pratima visarjan (Oct.) Post immersion (Nov.) period samples were collected and were subjected to analyze physico-chemical parameters including pH, temperature, Transparency, total Hardness, dissolved oxygen (DO), calcium, BOD, Total alkalinity and oil and Grease to follow the standard methods of Trivedi and Goyal (1980), Khanna and Bhutiani (2008) and APHA (2005). The

Author's Address

Department of Botany. G.P.G. College, Mhow
E-mail: maneeshadandawate@gmail.com



measurement of temp and pH of water samples conducted at lake site while for analysis of other parameter the samples are collected in well rinsed and pre cleaned plastic canes and transferred to research lab.

Results and Discussion

The environmental impact of Ganesh idol immersion activity & Durga Pratima visarjan on

water quality of Kakerpura lake assessed and significant changes in physico-chemical properties of water were observed. The pH of water is important because it affects solubility of nutrients. pH was determined by the digital pH meter and significant variation was observed during the study. It was noted acidic or high 7.6 - 7.8 during the immersion period while it was low 6.9 to 7.1 during the pre immersion and post immersion period respectively. (Table - 1)

Table-1: Showing the Physico-chemical characteristics, during,before and after the idol immersion

S.N o.	Physico-chemical Parameter	Pre - Immersion (Aug.)	Immersion		Post Immersion
			Sept.	Oct.	Nov.
1.	Temp °C (Water)	27.5	28	32	25
2.	pH	6.9	7.6	7.8	7.1
3.	Transparency (Cm)	18.5	25	27	33
4.	Total Hardness (mg/L)	115	160	170	145
5.	Dissolved O ₂ (mg/L)	5.8	4.4	4.0	6.8
6.	Total Calcium (mg/L)	15.50	25.5	26.5	20.5
7.	Total Alkalinity (mg/L)	290	310	340	230
8.	BOD (mg/L)	4.8	5.4	6.0	4.0
9.	Oil & Grease (mg/L)	0.33	0.69	0.8	0.6

The temperature of water was measured and there were changes in temperature were observed. The temperature which is observed in pre-immersion period was 27.5°C while post immersion 25°C & during immersion period it was from 28.0 -32 respectively (Table-1) Rising in temperature directly affect & speed up the chemical reaction & biological activity that reduces the solubility of gases in water (Murugesan *et al.*, 2004). Sacchi disc transparency varied between pre-immersion, immersion & Post immersion period. The minimum transparency observed in month of August because increased amount of particles were added due to surface run-off. (rainy season). It was observed between 25-27 cm in immersion period due to total dissolved solid particles and in post immersion period it was as high as 33 cm. Dissolved O₂ (DO) having great importance in water quality monitoring and it considered an important factor which reflects physical & biological processes in water body. Dissolved oxygen is one of the important parameter for the assessment of the solubility of water for flora & Fauna. During immersion period dissolved O₂ was observed very

low from 4.4 to 4.0 mg/L while during pre immersion period it was 5.8 mg/L while 6.8 mg/L in post immersion period. The idol immersion adversely affects the dissolved oxygen in water body and during this investigation it is observed in Kakerpura lake decrease in (DO) was due to cumulative effect of various religions activities and rise in temperature. Total hardness is not a pollution indicator but it indicates water quality. In this study high value 160 mg/L to 170 mg/L was observed during immersion period while low 115 mg/L was observed in pre immersion & 145 mg/L observed in post immersion period. Materials used for the preparation of idols is responsible for increasing hardness and in present study high value of total hardness was observed during the immersion activity. Total alkalinity is the buffering capacity of water and it increased due to various religious activities and domestic waste. In present study it was found high 310-340 mg/L during immersion period compared to pre immersion 290 mg/L and Post immersion 230 mg/L period respectively. Increase in value of total alkalinity was related to carbonate & bicarbonate concentration and the total



alkalinity value were fluctuated due to idol immersion (waikol and patil 2009). Biological oxygen demand (BOD) is one of the pollution indicating parameter and it increases due to decomposition of organic matter. BOD was observed quite high 5.4 - 6.0 mg/L during immersion period that was significantly high compare to pre-immersion 4.8/L and post immersion period 4.0 (Table-1). The high values of BOD has direct correlation with the increase in nutrient level of the lake due to immersion activity (McCoy & olson 1986). Oil & grease was observed high 0.6 to 0.8 mg/L during immersion period while pre-immersion & post immersion period it found low .33 to .60 mg/L respectively (Table- I) During immersion period the oil & grease was increased due to oil paint used for decoration of the idol and devotee offer oil to the Lord Ganesha & Durga ji during the worship. In present study total calcium was analysed and result were depicted in table- I. The total calcium observed high 25.5 to 26.5 mg/L during immersion period & low 15.50 - 20.5 mg/L during pre-immersion & Post-immersion period. Reddy and Kumar (2001) observed that the concentration of calcium had increased significantly in the lake water after the idol immersion in the Hussain Sagar Lake Andhra Pradesh.

Conclusion

Mythologically the water bodies are related to religious sentiments but scientifically these are not suitable for human uses. The main reason of the deterioration in water quality is various ritual activities in that "Idol immersion" plays an important role because these idols are made by plaster of paris & clothes, small iron rods., chemical colours, varnish and paints used as decorative components. These religious activity can not stop but awareness among people and proper management practices like use of eco-friendly Ganesh idols and Durga Pratima natural colors etc. can reduce the pollution problem of water bodies up to some extent.

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