International Journal of Applied Research 2019; 5(10): 105-108

ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2019; 5(10): 105-108
www.allresearchjournal.com
Received: xx-08-2019
Accepted: xx-09-2019

V Venkateswarlu
Research Scholar,
Department of Marine Biology,
Vikrama Simhapuri
University, Nellore,
Andhra Pradesh, India

K Venkaiah
Research Scholar,
Department of Biotechnology,
Vikrama Simhapuri
University, Nellore,
Andhra Pradesh, India

G Govardhan Reddy
Research Scholar,
Department of Biotechnology,
Vikrama Simhapuri
University, Nellore,
Andhra Pradesh, India

Corresponding Author:
V Venkateswarlu
Research Scholar,
Department of Marine Biology,
Vikrama Simhapuri
University, Nellore,
Andhra Pradesh, India

A study on the effect of festive idol immersion on water quality in Nellore, Andhra Pradesh

V Venkateswarlu, K Venkaiah and G Govardhan Reddy

Abstract
Pollution of natural water-bodies is a major concern nowadays. Idol immersion activities during various religious festivals are adding pollution to the water bodies. In that Non-biodegradable materials, plaster of paris, white cement and synthetic paints used for making these idols are posing a serious threat to aquatic life and environment. Water quality assessment is important concern to evaluate the nature and extent of pollution in order to take appropriate control measures. The present work is concern about the Water quality parameters assessment to evaluate the nature and the extent of pollution in the water body. The major lord Ganesh idol-immersion sites of Penna river canal and Mypadu coast, Nellore were selected for taking the freshwater sample and Mypadu coast marine water sample respectively in the present study. Pre-immersion, immersion, and post-immersion samples were collected from two stations and analyzed for various water quality parameters such as pH, Total suspended solids (TSS), Total dissolved solids (TDS), Turbidity, conductivity, hardness, Dissolved oxygen (DO) and COD. The variations in the values of these parameters were more prominent in freshwater samples than marine samples. It was observed that the values of these parameters significantly increased during the post immersion period. However the general trend observed was: immersion > post-immersion > pre-immersion values. pH declined slightly during the immersion period whereas DO showed only slight variations in the pre-immersion, immersion and post-immersion samples.

Keywords: Idol immersion, water pollution, water quality, Nellore

1. Introduction
Water pollution is a major global problem. It occurs when pollutants are discharged directly or indirectly into water bodies without adequate treatment to remove harmful compounds. Water pollution occurs due to the city sewage and industrial waste discharge into the river in addition to many religious activities and now become a threat to the ecosystem [1]. India is a country of festivals where people enjoy cultural and traditional festival celebrations. Some of these involve 'idol immersion' in water as the celebration finale. Beautiful idols are immersed into water bodies like rivers, ponds, and lakes with prayers for success, happiness and peace. Two major festivals in India that involve idol immersion are dedicated to Lord Ganesha and Durga Puja, dedicated to Maa Durga [2]. These activities cause water pollution and adversely affect the flora and fauna of the balanced ecosystem. In India, a lot of religious activities take place all round the year. Most of the temples and ritual places are located near the aquatic resources like pond, lakes, rivers, etc. The people of Andhra Pradesh state are always excited for the celebration of festivals. Ganesh Chaturthi is one of the important festivals of them. In this festival number of Ganesh idols in different sizes are immersed in canals and rivers after worship of 3-11 days.
When the idols are immersed, their colors, chemicals and other components that are used for idol preparation get dissolved and lead to significant changes in the water quality [3, 4] observed that Ganesh idol increases pollution in Hussain sagar Lake, Hyderabad. Deterioration in water quality of rivers due to idol immersion in south Gujarat [5]. The input of biodegradable and non-biodegradable substances deteriorates the river water quality and enhances silt loaded in the aquatic bodies.

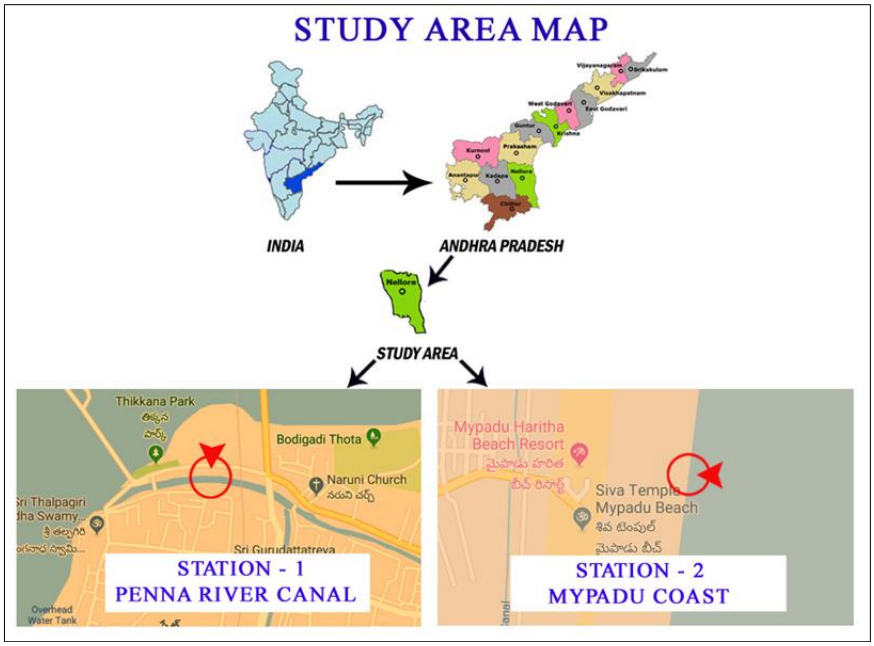

Fig 1: The water samples were collected during morning hours from Ganesh idol immerses point

1.1 Water pollution

The immersion symbolizes the return of Ganesh from the earth, after removing the obstacles and unhappiness of his devotees. If it is a small idol (up to 1 feet height) which is made up of natural soil, it will not affect the water after immersion. But due to giant-sized idols (above 25 feet height), that too, made up of plaster of Paris prove to be hazardous to the environment. Also, the material used for the decoration purpose is non-degradable that comprises thermocol, plastic which again leads to pollution and show the severe water quality deterioration.

2. Material and Methods

The water samples were collected during morning hours from Ganesh idol immerses point (Figure 1) during pre-immerse, immerse and post-immerse periods of idols immersion. The measurement of temperature and fixation of dissolved oxygen was completed in situ and for analysis the various parameter samples were collected in well rinsed and pre-cleaned plastic canes and immediately brought to the laboratory. For analysis of the water samples, standard methods of American Public Health Association (APHA) twenty-second edition [6].

3. Results and Discussion

3.1 pH: In Fresh Water (FW) samples pH varied from 7.5-7.9 in pre immersion, 7.2-7.4 in immersion and 7.6 in post immersion period whereas in marine water(MW) samples pH ranged from 7.6-8.0, 7.8 in the pre immersion, 7.4 in immersion and 7.7 in post immersion period respectively. In the present study, lowering of pH during immersion has been observed.

Table 1: Variation in pH in Pre-immersion (Pre-Imm), at immersion (Imm) and Post-immersion (Post-Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm	Imm	Post-Imm
1	FW	7.9	7.4	7.6
2	MW	7.8	7.4	7.7

3.2 TSS: Total Suspended Solids almost doubled during immersion period and then decreased in the post immersion period in the collected water samples. The effect was more pronounced in the fresh water samples than the marine water samples.

Table 2: Variation in TSS in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post-Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm	Imm	Post-Imm
1	FW	12	31	22
2	MW	42	82	67

3.3 TDS: The water samples collected from fresh water and marine water sites, TDS increased by 40% and 7.7% respectively during immersion period which then declined to 11.5% and 4% respectively in the post immersion period.

Table 3: Variation in TDS in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post- Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm	Imm	Post-Imm
1	FW	196	289	221
2	MW	44680	48970	46540

3.4 Turbidity: Ranged from 4 – 5.8 NTU, 4 NTU in pre immersion, 5.8 NTU in immersion and 4.6 NTU in post immersion in fresh water samples whereas in marine water samples the values varied from 4.2-5.6 NTU, 4.2 NTU, 5.6 NTU and 4.9 NTU respectively.

Table 4: Variation in Turbidity in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post-Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm (NTU)	Imm (NTU)	Post-Imm (NTU)
1	FW	4	5.8	4.6
2	MW	4.2	5.6	4.9

3.5 Conductivity: In the fresh water samples on an average conductivity increased from 180 uS/cm to 298uS during immersion and then decreased to 269uS/cm in the post immersion samples. Similar trend was observed in marine water samples, the average conductivity values being 54900 uS, 58500 uS and 56800 uS for pre immersion, immersion and post immersion period respectively.

Table 5: Variation in Conductivity in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post-Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm (µS)	Imm (µS)	Post-Imm (µS)
1	FW	180	298	269
2	MW	54900	58500	56800

3.6 Hardness: Increase in hardness was observed in the fresh water and marine water samples collected 104 mg/lit during the pre-immersion period 158 mg/lit in Immersion and 137 mg/lit in Post immersion period in fresh water. In marine water 3890 mg/lit in pre immersion period, 4300 mg/lit in immersion period and 4020 mg/lit respectively in the post immersion period.

Table 6: Variation in Total hardness in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post-Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm (mg/lit)	Imm (mg/lit)	Post-Imm (mg/lit)
1	FW	104	158	137
2	MW	3890	4300	4020

3.7 DO: Dissolved oxygen in fresh water was found to be in the range of 5-5.4 mg/lit in the pre immersion samples, while 3.9 mg/lit in immersion and 4.4 mg/lit in post immersion samples respectively. The range in marine water samples was 5.4 mg/lit (pre- immersion), 4.2 mg/lit (immersion) and 4.6 mg/lit (post immersion).

Table 7: Variation in DO in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post- Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm (mg/lit)	Imm (mg/lit)	Post-Imm (mg/lit)
1	FW	5	3.9	4.4
2	MW	5.4	4.2	4.6

3.8 COD: The COD values were higher by 24 mg/lit and 29 mg/lit respectively for fresh water and marine water samples during immersion period and by 82 mg/lit and 78 mg/lit respectively later in the post immersion period.

Table 8: Variation in COD in Pre-immersion (Pre-Imm), At immersion (Imm) and Post-immersion (Post- Imm) water samples collected from Station 1 fresh water (FW) and Station 2 marine water (MW) sites.

Sampling station	Water sample	Pre-Imm (mg/lit)	Imm (mg/lit)	Post-Imm (mg/lit)
1	FW	22	29	24
2	MW	69	82	78

In the water quality parameters like pH, TSS, TDS, Turbidity, Conductivity, Hardness, have significantly increased during the immersion period and then declined in the post immersion period. The post immersion values are lower than the immersion values for all the parameters, more so in the marine samples as the pollutants get dispersed. The present study indicates variation of the water quality parameters the pre-immersion, immersion and post immersion samples and also observed depletion of DO in water was observed after immersion and post immersion periods. The dissolved oxygen decreased during Ganesh idol immersion in the lakes of Bangalore city of Karnataka (CPCB Annual Report 1999-2000) [7]. On account of disturbance in the water column due to immersion activity, DO increases at the surface layers. COD measures the organic strength of the waste. The values are especially high when biologically resistant organic matter is present. In the present study, COD values were higher in immersion and post immersion samples as compared to pre-immersion samples. The present study indicates that the pollution load on water bodies has increased significantly during idol immersion period.

4. Recommendations

The recommendations for the effective communication of these measures are presented as below:

- All these measures can be incorporated in the syllabus of the subject 'Environmental studies' in primary Schools and colleges.
- Awareness programmes such asshort films, street-plays can be organized on a greater scale in schools, colleges and at public places.
- The government agencies, NGOs, schools and colleges may form groups for carrying out such awareness programmes on a greater scale.
- Small video clips can be play in the TV shows, cinema halls and shopping complexes.
- Banners prohibiting the immersion of idols may be displayed at seas, rivers, lakes and ponds.
- The print media such as newspapers and magazines may publish the measures for the eco-friendly Ganesh festival.
- Public announcements regarding the Dos and Don'ts may be made before and during the festival.

5. Acknowledgements

Authors were thankful to the department of Marine Biology, Vikrama Simhapuri University, Nellore for providing the laboratory facilities.

6. References

1. Variya. Impact of Ganesh Idol Immersion on Tapi River at Umara Ovara. M.Sc. dissertation, Veer Narmad South Gujarat University, Surat, 2010.
2. Panwar P. Idol immersion - not ideal at all! Available at, 2015. http://zeenews.india.com/Ganesha/story.aspx?aid=654035.24/11/2016.
3. Dhote S, Varghese B, Mishra SM. Impact of idol immersion on water quality of twin lakes of Bhopal. Indian Journal of Environ. Prot. 2001; 21:998-1005.
4. Reddy VM, Kumar VA. Effects of Ganesh Idol Immersion on some water quality parameter of Hussain sagar. Current Science. 2001; 81:1412.

5. Malik GM, Raval VH, Zadafiya SK, Patel AV. Idol immersion and physico-chemical properties of South Gujarat Rivers. Current World Evivi. 2010; 5(1):173-176.
6. APHA. Standard methods for examination of water and waste water. 22nd Edition. American Public Health Association, Washington DC, 2012.
7. CPCB Annual Report. Impact assessment due to immersion of Ganesha idols in the lakes of Bangalore city, 1999-2000. http://www.cpcb.nic.in/ old website/annual_report1999-2000-34.html