

# Ganesh Idol Immersion: Impact on Benthic Communities of Tapi River (Surat) with reference to Chemical Properties of Sediment

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**Abstract:** Ganesh Chaturthi is Hindu festival celebrated annually in India. As a part of celebration, Ganesh idol immersion activity causes several environmental problems. In this study, impact on benthic communities with reference to sediment quality due to Ganesh idol immersion was carried out. Two study area were selected i.e., Utran and Ashwanikumar which are located on the bank of Tapi river because lots of Ganesh idols immersed on these sites. Sediment samples were collected in morning hours during Pre immersion, Immersion and Post immersion period. Sediment samples were analysed for Chemical properties like Nitrate, Nitrite, Ammonia, Phosphate, Sulphate and Chloride. During study period different types of benthic organisms were observed like Nematode, Copepoda, Polychaeta, Cladocera, Rotifer and Gastropoda. Nematodes were observed dominant in Pre immersion, Immersion and Post immersion period. Rotifer and Gastropoda were remaining less during Pre immersion, Immersion and Post immersion period.

**Key Words:** Ganesh Idol Immersion, Tapi River, Sediment, Benthic Communities, Chemical Properties

## 1. INTRODUCTION:

Ganesh Chaturthi is one of the most celebrated festivals of India. As a part of celebration after few days several Ganesh idols are immerse in water body like pond, lake, river and sea. Nowadays in Surat artificial lakes are created by Surat Municipal Corporation (SMC) for immersion of POP made Idols for decreasing water and sediment pollution in Tapi River. SMC also has started awareness about the restriction on size of Idol and material like Plaster of Paris (POP) which is used for making Idols and the appeal for maximum use of Idols which are made up of clay and other material which are easily degradable in environment.

After the immersion of idols in river, sediment quality affects the growth of benthic communities. Benthic organisms are dominant metazoans and important bio indicator. They play an important role in aquatic ecosystem in food web. Sediment analysis is progressively more important in evaluating qualities of the total ecosystem of a water body. Present study investigates the impact of Ganesh Idol Immersion on benthic organisms with reference to chemical quality of sediment during Pre immersion, Immersion and Post immersion period.

## 2. METHODOLOGY:

To fulfil the aims and objectives of the study, sediment Samples were collected as described by Nybakken (1988)<sup>1</sup> in morning hours during Pre immersion, Immersion and Post immersion period at two sites i.e., Utran which is located near Gas based power station and Ashwinikumar which is located near cremation ground on the bank of Tapi River. Sediment samples were collected by using 30 cm long acrylic core of 7.5 cm diameter which was pushed into mudflats up to 5cm and the sediments were scooped out per m<sup>2</sup> area. At each sample site, two sediment samples were collected, pooled and stored in polythene bags. One sediment sample was dried and preserved for selected Chemical parameters. Second set was used to extract benthic organisms using isotonic solution of NaCl (modified method described in Nybakkan, 1988). It release them from the particles and pour off the water and it was constantly stirred up so the organisms were dislodged which were filtered on a very fine mesh and preserved in 5% formalin and they were identified with the help of, (1988), (Nybakken, 1988), (OlaveGiere,1993)<sup>2</sup>.

Table1: Methods for analysis of sediment

Sr. No.	Parameter	Method	Source
1.	Nitrate	Cadmium Reduction Method	IS 3025(P – 34) 1988
2.	Nitrite	Spectrophotometric Method	IS 3025(P – 34) 1988

3.	Ammonia	Phenate Method	Carter – 1993 ( pp. 32 )
4.	Sulphate	Morgan Extraction Method	IS 2720 (P-27) 2006
5.	Phosphate	Stannous Chloride Method	APHA 21 <sup>st</sup> edition -4500 (pp 4-151)
6.	Chloride	Titrimetric Method	Trivedy and Goel -1986

### 3. RESULTS AND DISCUSSION

Table 2: Chemical Properties of sediment

Sr. No	Parameters	Utran			Ashwanikumar		
		Pre Immersion	Immersion	Post Immersion	Pre Immersion	Immersion	Post Immersion
1	Nitrate (mg/kg)	12.21	17.5	14.26	10.45	20.8	18.12
2	Nitrite (mg/kg)	1.97	1.87	1.39	1.29	1.05	0.32
3	Ammonia (mg/kg)	22.4	24.5	25.2	13.2	21.3	19.1
4	Sulphate (mg/kg)	394	405	407	563	570	532
5	Phosphate (mg/kg)	49.1	51.9	49.3	53.2	57.2	59.3
6	Chloride (mg/kg)	132	167	157	179	220	214

Table 3: Benthic Communities in sediment

Sr. No	Benthic Communities	Utran			Ashwanikumar		
		Pre Immersion	Immersion	Post Immersion	Pre Immersion	Immersion	Post Immersion
1	Nematode	+++++	+++++	+++++	+++++	+++++	+++++
2	Copepoda	++++	++++	++++	++++	++++	++++
3	Polychaeta	++++	++++	++++	++++	++++	++++
4	Cladocera	++	+++	+++	++	++	+++
5	Rotifer	+++	++	+	+	+++	+
6	Gastropoda	+	+	++	+++	+	++

Figure 1: Showing Comparison of Chemical Quality of Sediment

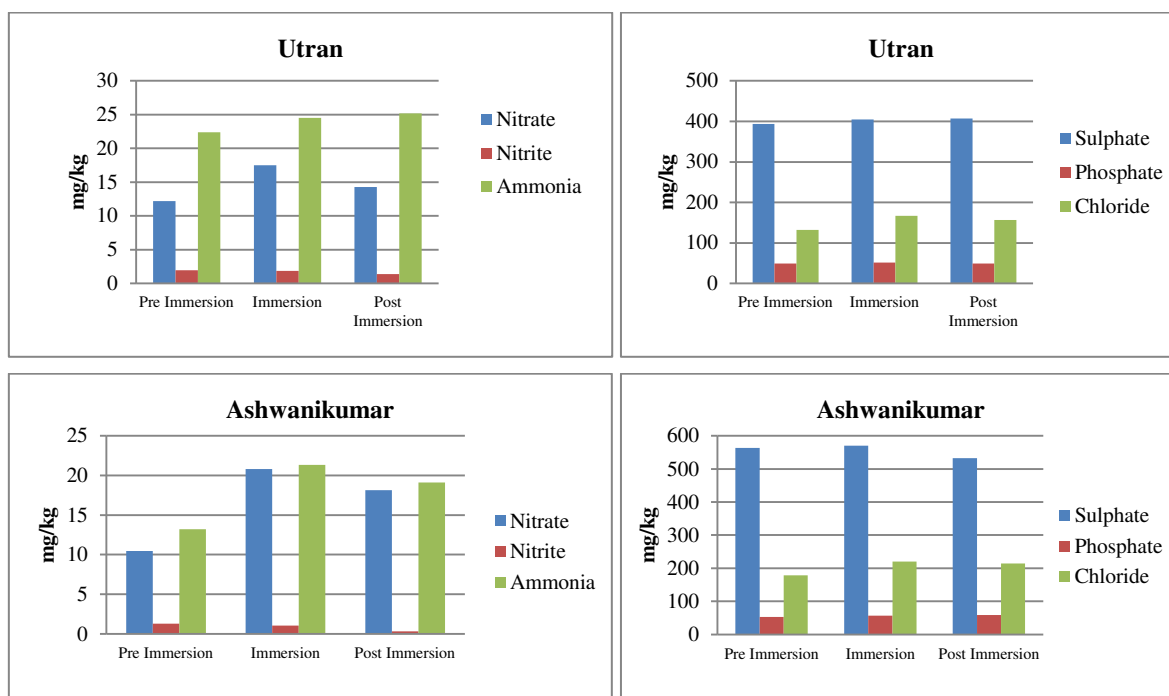
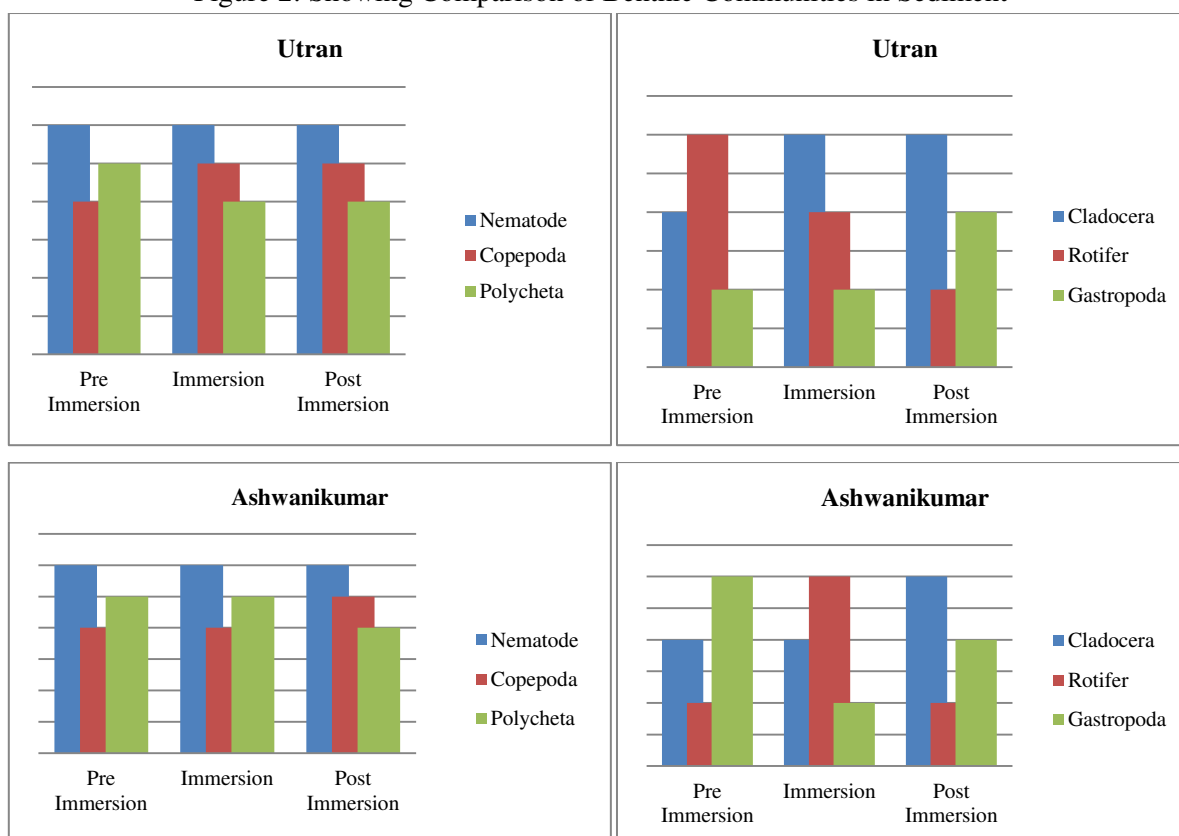


Figure 2: Showing Comparison of Benthic Communities in Sediment



Chemical quality of sediment plays an important role for benthic organisms. Nitrite and Nitrate were increased during immersion period and decreased during Post immersion period at Utran and Ashwanikumar. Ammonia was slightly increased during Post immersion period at Utran site where as decreased during post immersion period at Ashwanikumar site. Sulphate was also slightly increased during Post immersion period at Utran site and decreased during post immersion period at Ashwanikumar site. Phosphate and Chloride were decreased during post immersion period at Utran site where as at Ashwanikumar Phosphate was increased and chloride was decreased during post immersion period.

So only Sulphate and Phosphate were increased during post immersion at Utran site and other parameters were decreased during post immersion period. At Ashwanikumar only phosphate was recorded slightly higher during post immersion period than immersion period.

Nematode community were observed higher than other organisms during Pre immersion, Immersion and post immersion period. Copepoda and Polychaeta were observed higher than Cladocera, Rotifer and Gastropoda found lower than Nematode communities at both sites.



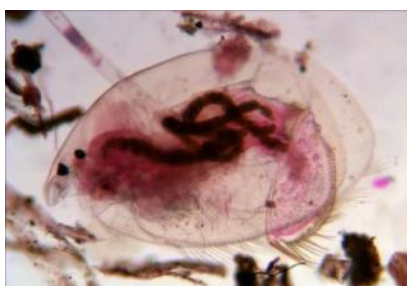
Nematode



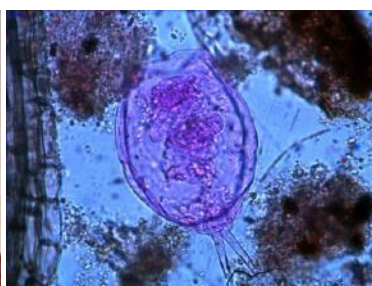
Copepoda



Polychaeta



Cladocera



Rotifer



Gastropoda

#### 4. CONCLUSION:

Tapi River is one of the perennial river of India. There is so many ritual activities done in rivers but from the recent study we can conclude that during Ganesh Idol immersion activities there is no drastic change in Sediment quality is found. Nematode Community remains dominant and there are no valuable changes in other communities due to idol immersion activities so there is no adverse effect on aquatic ecosystem is observed. It might be because of the use of idol which are made up of clay and other biodegradable material and also application of artificial pond to immerse Ganesh idol.

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