

DIFFERENT TYPES OF SOLID AND SUSPENDED MATTER POLLUTANTS IN MUMBAI REGION

Vijay D. Gangan^{a*}, Rida Ansari^a, Jason Gonsalves^a, Soham Parmar^a, Sheetal Chaudhary^a, Sweety Vishwakarma^a, Khushi Warsi^a, Om Prakash Yadav^a, Pradip S. Shelar^b and Sharad G. Shilkande^c

^aDepartment of Chemistry, Reena Mehta College of Arts, Commerce, Science and Management Studies, Bhayandar (W), Thane – 401101.

^bDepartment of Chemistry, K. J. Somaiya college of Arts, Science and Commerce, Mohinirajnagar, Kopergaon - 423601, Dist. Ahemadnagar.

^cDepartment of Chemistry, Sheth J. N. Paliwala College of Arts, Science and Commerece, Pali-Sudhagad, Dist. Raigad – 410205.

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*Corresponding Author: Vijay D. Gangan

Department of Chemistry, Reena Mehta College of Arts, Commerce, Science and Management Studies, Bhayandar (W), Thane – 401101.

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ABSTRACT:

Water plays a very important role in sustaining life. The quality of water acts as a barometer of the environmental health and well being of the human society. In the last 3 to 4 centuries, urbanization and industrialization have progressed affecting water bodies, which are being generally used for discharging domestic and industrial wastes. The river water pollution has an adverse effect on the environmental health and hygiene of people in surrounding areas of the river. It also affects the river water ecosystem. In order to assess the quality of Mithi River water, four sampling stations along the course of the Mithi River were selected. The sampling points were selected in such a manner so as to ensure substantial pollution, considering the residential units and commercial activities near the sampling points. The investigation has been carried out throughout the month *i.e.* from September 2025 to December 2025. The physico-chemical parameters *viz.*, pH, TDS, metal ions were analysed and were found to be within limits.

KEYWORDS: Physicochemical parameters, Water pollution, pH, TDS, metal ions, Mithi River, Mumbai, environmental health, hygiene, aquatic life *etc.*

INTRODUCTION

The island of Mumbai which is one of the numerous island that fringe the western coast of India, was once a group of seven islands, now welded together by filled in material, is situated at latitude 90° N and longitude 72.5° E (Survey of India toposheet no. 47B/13 and 47A/16). The city of Greater Mumbai includes a large part of the Salsette Island, in addition to Mumbai Island. To the west, it is bounded by the Arabian Sea, to the east of Mumbai Harbor and Thane Creek, to the North by Bassein Creek into which enters the Ulhas River.

In spite of a large amount of reclamation, Mumbai is still surrounded by a few beaches along the western coast. Progress and industrialization¹⁻¹⁰ has not brought a cleaner Mumbai. The hazard of pollution has increased a thousand fold and damage to all kinds of life has multiplied. To estimate the extent of pollution, this study was carried out to collect data regarding the different parameters.

The present study is an initial study of the effects of pollution in Mithi River samples around Mumbai. The locations selected for this study includes Bandra (Mouth of the Mahim Creek), Sakinaka, Powai Lake, MadhMarve, Kalina near The Grand Hyatt and Gorai around Salsette Island.

The large quantities of domestic waste water generated within the municipal area of Greater Mumbai are discharged indiscriminately to the coastal water. In addition, several industries such as pharmaceutical¹¹⁻¹⁴, textile processing, dyes and pigments, tanneries *etc.* release their untreated and partially treated effluents¹⁵⁻¹⁷ through point discharges into the Mahim River which impose additional stress on the receiving water.

Objective:

To generate resources for industrial and domestic purposes by recycling waste water by the waste water treatment plant depending on physicochemical parameters observed.

With reference to the foregoing, the aims and objective of this study can be classified as follows:-

1. The degree of heavy metal pollution of the sediments due to industrial and sewage effluents.
2. Effect of heavy metals on the recent for amination tests.

Over a period of three months from 3rd September 2025 onwards about four samples were collected at different timings and on different dates.

Sampling Points: Mithi River is subject to tidal variation, in order to get proper idea of population load in high and low tide; sampling schedule was spread over 15 to 20 days period. Five sampling points were selected starting from origin *i.e.* overflow of Powailake and ending at Mahim creek where Mithi River meets the sea. Sediment samples were collected from the river at the same locations but at different timings.. Based on above considerations, sampling point on the Mithi was selected at following location.

Sampling Location:

1. On road from Western Express highway to Kalina near the Grand Hyatt Hotel.

Table 1: Kalina

Quantity of Sample collected = 1000 ml

Location	Time	Date	Quantity Analyzed (50 ml)	pH	TDS (ppm)	Metal ions (Cd, Hg, Pb)
Kalina- 1	11.30 am	03/09/2025	0.0208	6.80	21.2	ND
Kalina - 2	02.30 pm	08/10/2025	0.0238	6.81	27.4	ND
Kalina- 3	05.30 pm	13/11/2025	0.0214	6.82	22.3	ND
Kalina- 4	08.30 pm	18/12/2025	0.0236	6.81	27.5	ND

Table 2: Average values of parameters measured.

Sr. No.	Location	pH	TDS in ppm	Content of metals (Cd, Hg, Pb)
1	Kalina	6.81	24.6	ND

It is observed that the pH value ranges between 6.80 – 6.82 and TDS ranges between 21.2 – 27.5.

In addition, none of the metals were detected in any sample. Standards for potable water as prescribed by WHO in mg/mL for pH as average range of 6.0 – 8.0 in a river. Suspended solids range between 10 – 30 mg/L.

RESULTS AND DISCUSSION:

For different locations of Mithi river in Mumbai region for the measurements of different parameters like

- 1 – pH measurements
- 2 – Contents of TDS

3 – Presence and contents of heavy metals like Hg, Pb and Cd following conclusions can be made.

1- pH : pH values for different timings are varying from range of about pH 6.80 – 6.82 for different samples of Mithi River at different times. Thus, it can be concluded that for a particular location, pH value remains more or less similar / constant for different samples at different timings.

2 – TDS and Presence of heavy metals : From Tables following conclusions can be obtained.

Locations :

Kalina – near Hyatt

Table for Result:

Sr. No.	Location	pH	TDS (in ppm)	Cd	Hg	Pb
1	Kalina	6.81	24.6	ND	ND	ND

Recent Maharashtra Government initiatives:

The Maharashtra Water Policy presents a comprehensive road-map to address the state's water challenges. By embracing integrated water management, demand-side efficiency, and conservation measures, the policy strives to bridge the demand-supply gap sustainably.

The Water (Prevention and Control of Pollution) Act, 1974 that emphasizes to maintain and restore the 'wholesomeness' of our aquatic resources by not discharging sewage or pollutants into water bodies including lakes.

Most state policies provide Central Pollution Control Board (CPCB) or State Pollution Control Board (SPCB) TWW discharge standards. However, they do not define treated wastewater quality standards for specific reuse purposes. Most policies do not define binding provisions to aid effective implementation.

Emphasis be laid on collection and treatment of all sewage using cost effective technological innovations and minimum 30 % of the recycled water shall be reused to reduce the fresh water demand in next 5 years. Comprehensive policy in this regard shall be framed by respective department.

Government of India, in partnership with State, is implementing Jal Jeevan Mission (JJM) to make provision of tap water supply to every rural household of the country by 2024.

What Steps have been taken by the Government?

National Water Policy, 2012.

- Pradhan Mantri Krishi Sinchayee Yojana.

- Jal Shakti Abhiyan - Catch the Rain Campaign.
- Atal Bhujal Yojana.
- Per Drop More Crop.

What are the treatments for waste water?

A sewage treatment works typically operates through a series of physical, chemical, and biological processes that remove contaminants from wastewater. These processes may include screening, sedimentation, biological treatment, and disinfection.

What is waste water treatment project?

Wastewater treatment plants operate at a critical point of the water cycle, helping nature defend water from excessive pollution. Most treatment plants have primary treatment (physical removal of floatable and settleable solids) and secondary treatment (the biological removal of dissolved solids).

How do you recycle and reuse water?

- Reuse your pasta, veggie, or aquarium water to irrigate plants.
- Reuse water from old bottles and glasses.
- Put excess ice in your pet's bowl.
- Place a bucket in your shower.
- Install a sink-to-toilet water system.
- Install a grey water collection system.
- Recycle pool water.

CONCLUSION: Since it is observed that pH of the samples were found nearly ~ 7.0 which is near to potable water. Also it was observed that absence of metal ions can be made use as a potable water in emergency situations like scarcity of natural resources of water.

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