

Assessment of Water Quality of Mahanadi and It's Tributary Katha Jodi River, Cuttack District, Odisha

Subhashri Priyadarsini¹, T. Gayatri² and Satya Narayan Sahoo³

¹Research Scholar, Department of Life Sciences, GIET University, Odisha, INDIA.

²Assistant Professor, Department of Bio-Tech/Life Sciences, GIET University, Odisha, INDIA.

³HOD, Department of Zoology, Niali College, Cuttack, INDIA.

¹Corresponding Author: subhashripriyadarsini2405@gmail.com



www.jrasb.com || Vol. 1 No. 5 (2022): December Issue

Received: 14-12-2022

Revised: 18-12-2022

Accepted: 28-12-2022

ABSTRACT

For all living things, water is one of the most important sources. Despite being a renewable resource, clean water scarcity is a major problem in many regions of the world. We require water for a variety of things, including food production, personal hygiene, electrical generation, fire control, and most importantly, survival. Nine sampling stations were chosen at various locations along the Mahanadi and its tributary, the Katha Jodi River, in the Cuttack area (S1-S9). To collect a tiny amount of water from the water source for water analysis and to look at the physico-chemical components that are present in the water, sampling is done. Our study sites' dissolved oxygen concentrations range from 3.9 to 5.8 mg/lit, and the water samples from all of the sites are only mildly alkaline. All study sites have alkalinities below 150 mg/lit, ranging from 129 mg/lit to 162 mg/lit. All of the study sites' water conductivities are within the typical range of river water, or 200 to 1000 mhos/cm. All of the study locations, with the exception of our study sites 1 and 2, have high nitrate levels of greater than 100 mg/lit. Our study sites had phosphate concentrations between 0.8 and 2.0 mg/lit, and a river shouldn't have more phosphates than 0.1 mg/L. Over these limits, phosphorus can be quite hazardous.

Keywords- Water, Mahanadi and it's tributary katha Jodi River, physico-chemical elements, pH, DO, Alkalinity, Hardness, Conductivity, Nitrate, Phosphate.

I. INTRODUCTION

For all living things, water is one of the most important sources. Despite being a renewable resource, clean water scarcity is a major problem in many regions of the world. We require water for a variety of things, including food production, personal hygiene, electrical generation, fire control, and most importantly, survival. Numerous pollutants, such as pathogenic bacteria, putrescible organic waste, fertilisers and plant nutrients, poisonous compounds, sediments, heat, petroleum (oil), and radioactive materials, etc., can damage water bodies.

It is important to be knowledgeable about the several physico-chemical criteria used to test the quality of water, including colour, temperature, acidity, hardness, pH, sulphate, chloride, DO, BOD, COD, and alkalinity. Because they induce chronic poisoning in fish

and other aquatic creatures or create water pollution, heavy metals like Pb, Cr, Fe, and Hg are of particular concern. The physico-chemical properties of river water and their impacts have been studied by many researchers. Rosli et al. (2012) [1], Ravindra et al. 2003 [2], Namrata, 2010 [3], Jindal et al. 2011 [4], Otokunefor et al. 2005 [5], and Weldemariam (2013) [6] are only a few of the researchers who have looked into the physico-chemical properties of river water and their impacts. According to Korai et al. (2008)[7] and Murugan et al. (2012)[8,] the physico-chemical properties of river water affect fish diversity.

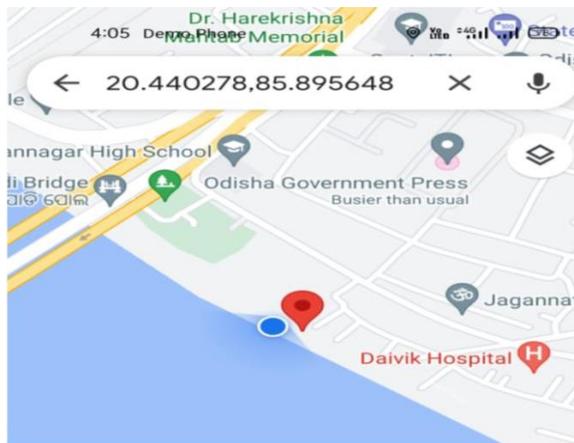
One of the oldest districts in Odisha is Cuttack. The city serves as the administrative centre for the district. The district's namesake, Cuttack, is regarded as Odisha's commercial hub. Geographically speaking, it is situated between 20°03' and 20°40' N latitude and 84°58'

and 86°20' E longitude. Kathajodi River to the south and Mahanadi River to the north flank Cuttack City. The District, which spans a region of 3932 sq km, is densely populated. The District has a tropical climate, with hot summers and chilly winters.

In order to manage it for health and hygienic reasons as well as to see its impact on fish diversity, the current investigation of water quality in the Mahanadi and its tributary katha Jodi River, Cuttack area, was undertaken from January to May 2022.

II. MATERIAL & METHODS

Nine sampling stations were chosen at various locations along the Mahanadi and its tributary, the Katha Jodi River, in the Cuttack area (S1-S9). To collect a tiny amount of water from the water source for water analysis and to look at the physico-chemical components of the water, sampling is done. Techniques for water analysis that were advised by NEERI were employed (1986) [9].



III. RESULTS AND SISCOUSSIONS

Table No. 1: Lists the physico-chemical characteristics of Mahanadi and it's tributary katha Jodi River,water.

NO	SITE	GPS location	pH	DO mg/lit	Alkalinity mg/lit	Hardness	Conductivity μ mhos/cm	Nitrate mg/lit	Phosphate mg/lit
1	S1	20.44 ⁰ N 85.88 ⁰ E	8	5.8	162	81	960.2	10.2	0.89
2	S2	20.44 ⁰ N 85.89 ⁰ E	8	5.4	160	87	954.1	12.6	0.92
3	S3	20.44 ⁰ N 85.74 ⁰ E	8	5.3	160	95	953.6	100.1	1.01
4	S4	20.47 ⁰ N 85.77 ⁰ E	8	5.0	154	101	941.3	103.3	0.99
5	S5	20.48 ⁰ N 85.85 ⁰ E	8	4.9	151	108	944.0	115.2	1.21
6	S6	20.46 ⁰ N	8	4.5	138	120	911.1	120.4	1.63

		85.83 °E							
7	S7	20.46 °N 85.82 °E	8	4.0	129	128	909.3	131.1	1.42
8	S8	20.46 °N 85.83 °E	8	4.2	132	129	921.5	132.9	1.88
9	S9	20.46 °N 85.84 °E	8	3.9	122	131	918.2	135.9	1.96

According to the physico-chemical features of the Mahanadi River and its tributary, the Katha Jodi, all 9 study sites had a pH of 8, which is somewhat alkaline. Our study sites had dissolved oxygen levels that range from 3.9 mg/lit to 5.8 mg/lit, which are not advised for direct human consumption because the river water may include toxins or pollutants. The pH reading data is supported by the alkalinity data, which ranges from 129 mg/lit to 162 mg/lit and is found in all of the study locations' water samples. All of the study sites had hardness levels below 150, which implies that the water has low TDS and TSS levels (total dissolved solids and total suspended solids). All of the study sites' water conductivities are within the typical range of river water, or 200 to 1000 mhos/cm. Normal surface water nitrate concentrations range from 0 to 18 mg/L, but they can increase due to agricultural runoff, refuse dump runoff, or contamination from human or animal waste. When the river is fed by nitrate-rich aquifers, the concentration may rise and fall often with the seasons. All of the study locations, with the exception of our study sites 1 and 2, have high nitrate levels of greater than 100 mg/lit. Our study sites had phosphate concentrations between 0.8 and 2.0 mg/lit, and a river shouldn't have more phosphates than 0.1 mg/L. Over these limits, phosphorus can be quite hazardous.

IV. CONCLUSION

Controls and actions should be made to improve the water quality of the Mahanadi River and its tributary, the Katha Jodi River, in the Cuttack district of Odisha. Our research indicates that none of the study sites' water is suitable for direct human consumption and must first be purified and free of pollutants.

REFERENCES

- [1] Rosli NA, Zawawi MH, Bustami RA. Salak river water quality identification and classification according to physico-chemical characteristics. *Procedia Engineering*,2012:50:69-77.
- [2] Ravindra K, Kaushik A. Seasonal variations in physico-chemical characteristics of River Yamuna in Haryana and its ecological best-designated use. *Journal of Environmental Monitoring*,2003:5(3):419-426.
- [3] Namrata S. Physicochemical properties of polluted water of river Ganga at Varanasi. *International journal of energy and environment*,2010:1(5):823-832.
- [4] Jindal R, Sharma C. Studies on water quality of Sutlej River around Ludhiana with reference to physicochemical parameters. *Environmental monitoring and assessment*,2011:174(1):417-425.
- [5] Otokunfor TV, Obiukwu C. Impact of refinery effluent on the physicochemical properties of a water body in the Niger delta. *Applied ecology and environmental research*,2005:3(1):61-72.
- [6] Weldemariam MM. Physico-chemical analysis of Gudbahri river water of Wukro, Eastern Tigray, Ethiopia. *International Journal of Scientific and Research Publications*,2013:3(11):1-4.
- [7] Korai, A. L., Sahato, G. A., Lashari, K. H., & Arbani, S. N. (2008). Biodiversity in relation to physicochemical properties of Keenjhar Lake, Thatta district, Sindh, Pakistan. *Turkish journal of fisheries and aquatic sciences*, 8(2).
- [8] Murugan, A. S., & Prabakaran, C. (2012). Fish diversity in relation to physico-chemical characteristics of Kamala Basin of Darbhanga District, Bihar, India. *International Journal of Pharmaceutical and Biological Archives*, 3(1), 211-217.
- [9] NEERI. Manual on water and waste water analysis. National Environmental Engineering Research Institute, Nagpur, 1986, 340.