

# Physico-Chemical Analysis of Water Quality of Bhitarkarnika Mangrove Forest, Odisha, India

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**Abstract** —Water quality plays a pivotal role in determining the health of mangrove ecosystems. Mangroves, found in coastal areas, are highly sensitive to changes in salinity, nutrient levels, sedimentation, and pollutants. Elevated salinity or nutrient loading can stress mangrove plants, leading to mortality and disrupting the delicate balance of the ecosystem. Additionally, temperature fluctuations and reduced oxygen levels associated with poor water quality can impact the resilience of mangrove ecosystems to climate change and other stressors. Therefore, safeguarding water quality is essential for the conservation and sustainable management of mangroves, ensuring their ecological functions and the benefits they provide to coastal communities.

Bhitarkanika is the second largest mangrove ecosystem in India situated on the east coast of the country, mangrove ecosystem experiences a tropical monsoon climate, characterized by distinct wet and dry seasons. Physico-chemical analysis of water quality of Bhitarkanika mangrove forest, Odisha, India, was studied at four different stations for a period of one year during April-2022 to March-2023. Surface water temperatures ( $^{\circ}\text{C}$ ) varied from  $27^{\circ}\text{C}$  to  $30^{\circ}\text{C}$  respectively. Seasonal variations of different parameters investigated were as follows: pH (6.65 to 8.0), dissolved oxygen (6.0 to 7.6mg/l), biological oxygen demand (0.22 to 7.02mg/l), electrical conductivity (580 to 2162  $\mu\text{mho/cm}$ ), hardness (200 to 3800mg/l), chloride (248 to 6600mg/l). A seasonal variation in these parameters was observed throughout the study period and monthly comparisons were made as pre-monsoon, post-monsoon, winter and summer.

**Keywords:** Mangrove ecosystem, physico-chemical analysis, pre-monsoon, post-monsoon, winter and summer.