

## ABSTRACT

Aina Putri Sekar Arum. 24020121120009. **Water Quality Assessment of Mangrove Forest in Telang Village, Kamal, Bangkalan, Madura Using Diatom Index Approach.** Laboratory of Ecology and Biosystematics, Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Under the supervision of Tri Retnaningsih Soeprbowati and Jumari.

The location of the mangrove in Telang Village, Bangkalan, Madura adjacent to the harbour, makes it vulnerable to various anthropogenic pressures. Maritime industrial activities, such as oil transportation, as well as regional development in the form of aquaculture ponds and settlements, have collectively led to the degradation of the mangrove ecosystem. Consequently, the quality of the surrounding waters has also been altered, necessitating a biological monitoring method. Diatom communities can be applied as bioindicators to assess these changes, given their high sensitivity to fluctuations in environmental conditions. This study aims to analyze the structure of diatom communities and water quality using a diatom index approach. Sediment samples were collected from the mangrove forest in Telang Village using a Russian corer. The digestion process involved 10% HCl and 10% H<sub>2</sub>O<sub>2</sub> solutions, followed by sample preparation and observation. The analysis identified 30 families, 68 genera, and 134 species. The diversity index ranged from 1.08 to 2.44, indicating a moderate level of species diversity. The evenness index ranged from 0.49 to 0.86, suggesting a fairly even distribution of diatom species at the sampled depths. The dominance index ranged from 0.1 to 0.46, indicating no dominance by any single species. Cluster analysis revealed two zones: Zone 1 (200 cm – 20 cm), characterized by a balanced growth of freshwater, marine, and brackish water species, with the presence of *Amphipleura pellucida*, *Tryblionella granulata*, and *Eupodiscus radiatus*. Zone 2 (10 cm – 0 cm), where freshwater species dominate, marked by the presence of *Fragilaria ulna*. Changes in water quality based on the Generic Diatom Index (IDG) 9,3 – 13,5 indicated a shift towards meso-eutrophic conditions, evidenced by *Fragilaria ulna*. The Specific Pollution Sensitivity index (IPS) 11,3 – 15,9 showed mesotrophic conditions with indications of increased nitrate and phosphate levels. The application of diatom indices in mangrove ecosystems provides an effective tool for monitoring changes in water quality by specifically analyze diatom communities.

**Keywords:** Diatoms Indices, Telang Village Mangrove, Bioindicators, Biostratigraphy, Water Quality