

## ABSTRACT

Asto Wahyuaji Purnomo. 24020122120035. **Biostratigraphy and Community Structure of Epipellic Diatoms as Bioindicators of Changes in Water Quality in Lake Matano.** Ecology Laboratory, Department of Biology, Faculty of Science and Mathematics, Diponegoro University, under the supervision of Tri Retnaningsih Soeprbowati and Jumari.

Lake Matano is an ancient lake with a high level of endemism and plays an important role in maintaining ecosystem balance. However, increasing anthropogenic pressures may lead to a decline in water quality. Several studies have reported evidence of pollution in Lake Matano, highlighting the need for continuous monitoring of its ecological condition using epipellic diatoms as effective bioindicators. This study aims to analyze the community structure and assess changes in lake water quality based on epipellic diatom biostratigraphy. Lake sediment samples were collected from three stations representing the study area. Sediment cores were sectioned at 2 cm intervals and treated with 10% HCl and 10% H<sub>2</sub>O<sub>2</sub> solutions for diatom preparation, observation, and identification. The obtained diatom data were analyzed using PAST and C2 Stratigraphy software. The results identified 148 diatom species from the three sampling stations. The community structure at all stations showed diversity index values ranging from 2 to 3.8, indicating relatively stable ecosystem conditions. Species distribution was relatively even, with evenness index values ranging from 0.3 to 0.9, while no dominant species were observed across the three stations, suggesting stable ecological conditions in Lake Matano. Epipellic diatom biostratigraphic analysis revealed three biostratigraphic zones across the study sites. The dominance of *Gomphonema lagenula*, *Mastogloia malayensis*, and *Navicula radiosa* indicated mesotrophic conditions in the surface sediments of stations M2 and M3. Furthermore, barren zones were observed at stations M1 and M2 (26–22 cm depth at station M1 and 10–8 cm depth at station M2), indicating low nutrient availability and relatively stable lake conditions.

**Keywords:** *epipellic diatoms, Lake Matano, bioindicators, community structure, biostratigraphy, water quality*