ABSTRACT

Khofivah Fitri Afivi. 24020120140164. "**Reconstruction of Water Quality Based on Vertical Distribution of Diatoms in the Bedono Coastal Mangrove Area, Demak, Central Java**". Laboratory of Ecology and Biosystematics, Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Supervised by Tri Retnaningsih Soeprobowati and Riche Hariyati.

The coastal area of Bedono, Sayung Sub-district, Demak Regency, is experiencing mangrove ecosystem degradation due to abrasion, tidal flooding, sea level rise, and anthropogenic activities, leading to a reduction in mangrove cover and damage to aquatic ecosystems. This study aims to reconstruct water quality based on the vertical distribution of diatoms as environmental bioindicators. Diatom analysis was conducted through sediment sampling, slicing, digestion, preparation, observation, and data processing. In situ measurements of physicochemical water parameters (temperature 29.3°C, pH 7.2, DO 6.4 mg/L, salinity 21.23 ppt, conductivity 32.8 mS/cm, TDS 22.51 g/L) using a Horiba Multi-Parameter indicated stable brackish conditions but susceptibility to eutrophication. Data analysis included abundance (ind/gr), Shannon-Wiener index (H'), Simpson index (D), and evenness (E) using PAST 4.03 software, along with stratigraphic analysis using C2 and Bray-Curtis clustering. Results revealed 653 diatom individuals from 30 species and 21 genera, with fluctuating abundance (26-131 ind/gr) and dominant species Amphora ovalis, Tryblionella granulata, and Nitzschia recta. The diversity index (H') ranged from 1.51 to 2.8, indicating moderate diversity. The dominance index (D) ranged from 0.073 to 0.242, categorized as low, showing no extreme dominance. The evenness index (E) ranged from 0.81 to 0.95, classified as high, indicating relatively even species distribution. Stratigraphic analysis identified three zones: Zone 1 (50-40 cm) reflects eutrophic freshwater conditions dominated by Aulacoseira granulata and Nitzschia obtusa; Zone 2 (35-25 cm) represents a transition from freshwater to brackish with the emergence of euryhaline species and marine intrusion (Cyclotella meneghiniana, Tryblionella granulata); Zone 3 (20-5 cm) indicates estuarine conditions with strong marine influence and seasonal freshwater fluctuations.

Keywords: *diatom, paleolimnology, biostratigraphy, Bedono coastal mangrove ecosystem*