

ABSTRACT

Wonorejo Mangrove Ecotourism Park in Surabaya faces ecological pressure due to increasing anthropogenic activities. This study aims to analyze the diatom community structure as a biological indicator and to reconstruct the history of environmental changes in the area using a biostratigraphic approach. The research method involved collecting a sediment core sample down to a depth of 200 cm, which was then analyzed for its diatom content to identify community structure and biostratigraphic zonation. The results identified a total of 111 diatom species from freshwater (44%), marine (40%), and brackish habitats, confirming the estuarine characteristics of the study site. Sediment analysis revealed a shift from stable past environmental conditions to a degraded current state. The deepest biostratigraphic zone (200-160 cm) showed a diverse and balanced community (Shannon Diversity Index 3.868), indicating relatively clean water conditions (oligotrophic-mesotrophic). However, younger zones showed a significant transition towards degradation, culminating in Zone 2B (80-40 cm) with a population bloom of the eutrophication indicator diatom, *Skeletonema costatum*, reaching up to 24.8%. The surface layer (0 cm) reflects the most stressed conditions, marked by a sharp decline in diversity (Shannon Index 2.593) and an increase in dominance by pollution-tolerant species (Dominance Index 0.1191). This reconstruction proves a significant degradation of environmental quality in Wonorejo Mangrove, shifting from clean to highly eutrophic conditions due to the strong impact of anthropogenic nutrient pollution from upstream areas.

Keywords: diatom, community structure, mangrove ecotourism, bioindicator, biostratigraphy.