ABSTRACT

Megananda Fajar Annisa. 24020122410003. **Water Quality Based on Phytoplankton Community Structure, Primary Productivity and Chlorophyll-A in Diwak River Bergas Semarang Regency.** Under the guidance of Tri Retnaningsih Soeprobowati and Jumari.

The Diwak River in Bergas Subdistrict, Semarang Regency has the potential to degrade water quality because the impact of various activities in the river basin that stand large industries, settlements and tourism. This research aims to analyse the water quality of Diwak River Bergas based on phytoplankton community structure, primary productivity value, chlorophyll-a value, Saprobic Index and Pollution Index (IP). The research was conducted in January-December 2024 at seven stations in the Diwak Bergas River using a purvosive sampling method. The determination of stations represents the river section, which is upstream, middle, downstream and activities in the watershed, which are industrial, residential, agricultural, tourism. Measurement of physico-chemical parameters was carried out in-situ and ex-situ. Calculation and identification of phytoplankton using Sedgewick Rafter Counting Cell (SRC) with a microscop in 10x100 magnification. Primary productivity was conducted in-situ using dark-light bottles and chlorophyll-a was conducted by laboratory analysis. Phytoplankton data were analysed using PAST. Data on diversity, dominance, and abundance with physico-chemical parameters relationships were analyzed using PAST software. The structure of the phytoplankton community in the Diwak River obtained 39 genus consisting of 5 phytoplankton divisions with the highest abundance in the Bacillariophyta group which indicates that the Diwak River does not occur eutrophication. The abundance of phytoplankton in the low category is in line with the concentration of chlorophyll-a and primary productivity which illustrates the low level of fertility with mild to moderate levels of pollution in the waters of the Diwak River. Phytoplankton diversity is categorized into moderate to high diversity with no dominance of certain species at a station. The Saprobic Index in the Diwak River describes the β-Mesosaprobic saprobic phase, which is lightly polluted, as well as the Pollution Index which shows lightly polluted waters. The β-Mesosaprobic phase is shown by the appearance of *Oscillatoria*, *Pinullaria*, *Nitzschia* species almost at every station which acts as a bioindicator of lightly polluted waters. The quality of thewak river which is classified as lightly polluted with a low level of fertility will cause an imbalance in the aquatic ecosystem and hinder the life of aquatic biota living in it.

Keywords: Water quality, phytoplankton community structure, primary productivity, chlorophyll-a phytoplankton, Diwak River Bergas