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Correlation Between the Phytoplankton Distribution with the Oceanographic Parameters of the Deep-Sea Surface of Sangihe-Talaud, North Sulawesi, Indonesia

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Abstract. Phytoplankton is the primary producer and plays an important role in the food chain process, especially in the oceans. This study aims to describe the phytoplankton distribution and correlations with oceanographic parameters in the deep-sea surface, Sangihe-Talaud, North Sulawesi. Research methodologies include; oceanographic data collection (salinity, temperature, dissolved oxygen, and density), field methods, and phytoplankton samples processing. Data analysis includes abundance, diversity and domination index, PCA analysis, and Similarity index. The results showed that the phytoplankton composition in the sea surface layer of the Sangihe-Talaud waters has three classes: Bacillariophyceae and 86% with ten generai.e., Chaetoceros, Coscinodiscus, Dactyliosolen, Eucampia, Guinardia, Hemiaulus, Leptocylindrus, Pleurosigma, Rhizoselenia, and Skeletonema. The class of Dinophyceae 8%, as many as 17 genera, i.e., Actiniscus, Amphisolenia, Ceratium, Ceratocorys, Gambierdiscus, Gonyaulax, Gymnodinium, Heterodinium, Mesoporos, Noctiluca, Ornithocercus, Oxyphysis, Podolampas, Prorocentrum, Protoperidinium, Pyrocystis, and Pyrophacus. The class of Cyanophyceae 6% and found only one genus Trichodesmium. Phytoplankton abundance was calculated as 65.63 to 1,071.88 cells L^{-1} , with an average of 419.03 cells L^{-1} . The distribution is exhibited that the higher abundance in the southern part near the mainland of the Sulawesi and Maluku channels compared to the northern part, which is directly connected with the Pacific Ocean. The diversity and dominance index of phytoplankton are categorized as generally moderate and no species domination. The correlation between oceanographic parameters with abundance and diversity of phytoplankton is characterized by the identifiers using salinity, density, and temperature; and indicated a strong similarity index.

1. Introduction

Phytoplankton has an important role as a primary producer in the waters' food chain, especially in oceanic or deep-sea waters. Like an oasis in the desert, it is irreplaceable and crucial in the next food chain [1] and also a water quality indicator [2]. The phytoplankton distribution is strongly influenced by the oceanography parameters such as current, temperature, salinity, pH, dissolved oxygen, density [3-7].

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