

ABSTRACT

Aqila Khaira Razana, 24020222140076. ***Molecular Identification of Kappaphycus sp. and Evaluation of Its Activity on High-Density Polyethylene (HDPE) based on pH Variation***, under the guidance of Hermin Pancasakti Kusumaningrum and Nurhayati

The increase in microplastic pollution, especially the Polyethylene (PE) group in the marine environment, has become a serious ecological issue because of its nature that is difficult to decompose naturally and is toxic when consumed by living things. The Central Statistics Agency in 2021 stated that Indonesia produces an annual amount of plastic waste of up to 64 million tons, with 3.2 million tons of plastic waste dumped into the marine environment. The approach that can be taken to overcome this problem is by utilizing marine microorganisms associated with macroalgae. One of the macroalgae that is widely cultivated in Indonesia is the type of Kappaphycus sp. which is often found in the waters of karimunjawa. The purpose of the study was to identify the activity of Kappaphycus sp. association bacteria in degrading HDPE based on variations in pH 5, pH 7, and pH 9. The methods used are the measurement of bacterial growth in degradation test media, HDPE weight reduction, and Fourier Transform Infrared Spectroscopy (FT-IR) for the analysis of chemical group changes in HDPE degradation test results, and molecular characterization for the identification of potential bacterial types. The results showed that Kst-2 isolate at pH 5 conditions had the highest HDPE degradation ability. Kst-2 isolates showed the occurrence of degradation processes characterized by significant bacterial growth, the occurrence of a decrease in HDPE weight with Kst-2 isolate treatment, and a decrease in functional groups, and had a homogeneous morphology and close genetic kinship with the genus Enterobacter.

Key words: Biodegradation, Enterobacter, HDPE, Kappaphycus sp., pH

Pembimbing I

Pembimbing II

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