

ABSTRACT

Nur Afifah Fauziah. 2025. The Potential of Manglicolous Yeast from Mangrove Sediment of Pandansari Brebes as a Producer of Protease Enzyme for Detergent Additive. Department of Biology, Faculty of Science and Mathematics, Diponegoro University. Under the Guidance of Agung Suprihadi and Arifa Rizqi Nafisa.

Manglicolous yeasts are microorganisms from mangrove ecosystems. Has potential as producers of protease enzymes, which are widely applied in industries such as detergent additives. This study aimed to investigate the ability of manglicolous yeast isolates from the mangrove sediment of Pandansari Brebes to produce protease enzymes, determine the optimal temperature and pH for protease activity, and assess the compatibility of the enzyme for application as a detergent additive. Yeast isolates were identified morphologically, followed by qualitative screening of proteolytic activity using Skim Milk Agar (SMA) medium. Enzyme production was conducted out in Yeast Malt Broth (YMB) supplemented with casein. Protease activity was determined using the Folin–Ciocalteu method under varying temperature (30, 40, and 50°C) and pH (5, 7, and 9) condition. Compatibility tests were performed using several types of commercial liquid detergents, and the application of the protease enzyme was tested in the washing of blood-stained white cotton fabric. Initial screening revealed that isolate BRB26 exhibited the highest proteolytic index among four isolates. Results showed that the protease enzyme from isolate BRB26 reached optimal activity at 0.3906 U/mL at 30°C and pH 9. Compatibility tests revealed that the enzyme retained residual activity after incubation with commercial detergents. The application of the protease enzyme in detergent formulations enhanced the cleaning effectiveness on blood-stained fabrics. These findings indicate that the BRB26 yeast isolate from the mangrove sediment of Pandansari Brebes has potential as a source of protease enzyme for use as a detergent additive.

Keywords: *manglicolous yeast, protease enzyme, temperature, pH, detergent*