

## **ABSTRACT**

**Winda Amira Rafifah, 24020222140075 Identification and Enzymatic Analysis of Bacterial Isolates from Green Mussels in Tambakrejo Waters, Semarang under Conditions of Exposure to Heavy Metals Copper (Cu) and Lead (Pb), supervised by Arina Tri Lunggani and Ditta Putri Kumalasari.**

Tambakrejo waters in Semarang represent a coastal area exposed to various anthropogenic activities, including industrial waste and port operations that potentially elevate concentrations of heavy metals lead (Pb) and copper (Cu). This study aimed to isolate and identify heavy metal-tolerant bacteria from the tissue of green mussels (*Perna viridis*) inhabiting these waters, and to analyze the activity of superoxide dismutase (SOD) enzyme as a response to Pb and Cu exposure. Bacterial isolation was performed using selective media at a heavy metal concentration of 10 ppm, yielding 6 isolates from Cu media and 7 isolates from Pb media. Resistance tests were conducted at concentrations of 10, 100, and 1000 ppm. Isolate RKC 10 exhibited the highest resistance to Cu, while isolate RKP 7 was selected as the best-performing isolate in Pb media. SOD activity assay results revealed different responses between Cu and Pb exposure: Cu exposure significantly increased SOD activity in RKC 10, whereas Pb exposure significantly decreased SOD activity in RKP 7. Molecular identification based on 16S rRNA gene analysis identified RKC 10 as *Shewanella algae* (98.47% identity) and RKP 7 as closely related to *Escherichia*. Both isolates demonstrated good bioremediation potential, with high efficiency in reducing heavy metal concentrations. These findings indicate the potential of local bacteria as bioremediation agents in aquatic environments contaminated with heavy metals.

**Keywords:** *Bioremediation; Perna viridis, heavy metals, SOD.*