

## ABSTRACT

Devina Nadya Anggraini, 24020222140079. **Exploration and Testing of the Bioremediation Potential of Lead and Copper by Bacteria from the Green Mussel Ecosystem in Tambak Mulyo, Semarang**, under the supervision of Arina Tri Lunggani and Irfan Anwar Fauzan.

The Tambakmulyo area is one of the green mussel farming sites affected by environmental pollution, including heavy metal contamination. Bacteria associated with green mussels possess various mechanisms for coping with excessive heavy metals. The objective of this study was to determine the potential of these bacteria for bioremediation and their ability to form biofilms. The methods employed included bacterial purification from green mussel flesh and seawater using Zobell Marine Agar (ZMA) medium with lead and copper concentrations, testing the bioremediation potential against lead and copper, and identifying biofilm formation. The results showed that seven isolates were resistant to copper (Cu), with three isolates exhibiting the highest OD values at 1000 ppm: MKC4 (0.0655), MKC6 (0.147), and MAC8 (0.072). The results of the lead (Pb) resistance test showed that there were four resistant isolates, three of which had the highest average OD values: MKP 5 (1.278), MKP8 (1.223), and MKP10 (1.2455). The results of the bacterial bioremediation efficiency against 10 ppm Cu were as follows: MKC4 (84.39%), MKC6 (85.056%), and MAC8 (83.70%), with MKC6 showing the highest efficiency. The results of bacterial bioremediation efficiency against 10 ppm Pb were as follows: MKP5 (84.94%), MKP8 (95.76%), and MKP10 (86.76%), with MKP8 showing the highest efficiency. Biofilm formation assays showed that the majority of bacterial isolates produced biofilms when grown in ZMB containing 10 ppm of lead or copper. Molecular identification results indicated that MKC6 is closely related to *K. pneumoniae*, while MKP8 is related to *Pseudomonas songnenensis*, *P. aeruginosa*, and *Stutzerimonas stutzeri*. In conclusion, the bacteria isolated from green mussels and seawater possess resistance capabilities, and some have bioremediation potential.

*Keywords: Biofilm, resistance, Perna viridis.*