

## ABSTRACT

Najmi Farisa Ghaissani. 24020121140202. The Potential of *Gracilaria* sp.-Associated Bacteria as Antibacterial Agents Against Methicillin-Resistant *Staphylococcus aureus* (MRSA) and Methicillin-Susceptible *Staphylococcus aureus* (MSSA). Supervised by Wijanarka and Budi Raharjo.

Antibiotic resistance has become a major global health challenge, with infections caused by methicillin-resistant *Staphylococcus aureus* (MRSA) and methicillin-susceptible *S. aureus* (MSSA) contributing significantly to morbidity and mortality. Marine macroalgae-associated bacteria, particularly those symbiotic with *Gracilaria* sp., represent a promising but underexplored source of novel bioactive compounds with potential antibacterial properties. This study investigated the antibacterial activity of bacterial isolates associated with *Gracilaria* sp. against MSSA, characterized the bioactive compounds involved, and identified the most potent isolates through 16S rRNA gene analysis. Antibacterial assays were conducted using the disc diffusion method, followed by phytochemical screening and molecular identification. Several isolates demonstrated weak inhibitory activity against MSSA. Alkaloids and saponins were detected as the dominant bioactive metabolites. Molecular characterization indicated that the most active isolates belonged to the genera *Cobetia* showing >97% sequence similarity with reference strains in the GenBank database. These findings highlight *Gracilaria* sp.-associated bacteria as promising candidates for the development of alternative antibacterial agents targeting multidrug-resistant pathogens such as MSSA.

*Keywords* : *Gracilaria* sp., Methicillin-Resistant *Staphylococcus aureus* , Methicillin-Susceptible

*Staphylococcus aureus*