

ABSTRACT

Fadila Fitriana Azati. 24020121120004. Antibacterial Activity Against MRSA and MSSA, Bioactive compound Profiling of *Padina* sp. Associated Bacteria and Molecular Identification using 16S rRNA. Supervised by Hermin Pancasakti Kusumaningrum and Budi Raharjo.

Padina sp. was one of the brown macroalgae that exhibited uniqueness compared to other species because it was able to produce exclusive bioactive compounds such as hydroxypadinate and padinoside, which demonstrated unique mechanisms of action in inhibiting bacterial growth. Associated bacteria in *Padina* sp. play an important role in the alga's natural defense system through the production of bioactive compounds with antibacterial potential. This study aims to conduct the antibacterial potential of *Padina* sp. associated bacteria against *Methicillin-Resistant Staphylococcus aureus* (MRSA) and *Methicillin-Sensitive Staphylococcus aureus* (MSSA). This study aims to conduct antibacterial assays and analyze the bioactive compound profiles from associated bacteria of *Padina* sp., followed by molecular identification using 16S rRNA. The research methods included antibacterial activity assays using the disk diffusion method, followed by bioactive compound test to detect the content of tanins, alkaloids, flavonoids, saponins, and steroids, as well as molecular identification using the 16S rRNA gene. The results showed that in the antibacterial activity assay, isolate P4 produced an inhibition zone against MSSA of 1.1 mm, but did not show inhibitory activity against MRSA. The detected bioactive compound was alkaloid and flavonoid, indicating the presence of nitrogen-containing compounds with antibacterial activity. Molecular identification of the potential isolate was performed using the 16S rRNA gene with primers 27F and 1492R, showing that isolate P4 had a 99.64% similarity to *Cobetia amphilecti*, thus classified within this genus. This study concludes that the associated bacterium *Cobetia amphilecti* from *Padina* sp. has potential as a natural antibacterial source against MSSA, although its activity against MRSA remains weak.

Keywords: *Padina* sp., Antibacterial, Bioactive Compounds, Molecular Identification, MSSA.