

Abstract

Endophytic bacteria are microorganisms that live within plant tissues and are known to create bioactive secondary metabolites with medicinal applications. The purpose of this study was to isolate and analyze the antibacterial and antibiofilm properties of endophytic bacteria found in the leaves, stems, and roots of *Piper crocatum*, a medicinal plant used in Indonesia. Surface sterilization was used to produce endophytes, which were then grown on nutritional medium and biochemically profiled by Gram staining. Cross-streaking was used to screen for antibacterial activity against *Escherichia coli*, *Pseudomonas aeruginosa*, and *Staphylococcus aureus*, which was validated using Kirby-Bauer disc diffusion. The antibiofilm activity was measured using a crystal violet microtiter test. Moreover, gram staining obtained on bacterial isolates was gram negative with *bacilli* shapes for all tissues. The biochemical test indicate that plant adapted endophytes, probably *Pseudomonas* or *Burkholderia*, are marked by acidogenic metabolism, restricted use of complex carbon sources, and tissue specific motility traits. The stem and root isolates inhibited *E. coli* and *P. aeruginosa*, while no inhibition was seen against *S. aureus*. Leaf extracts had the most potent antibacterial action, particularly against *P. aeruginosa*. However, antibiofilm inhibition was insufficient in all isolates as compared to antibiotic controls. These data suggest that *P. crocatum* contains endophytic bacteria capable of creating antibacterial compounds; nevertheless, modification or optimization is required to improve antibiofilm capability. Additional characterisation of active compounds is proposed to help in their development as antimicrobial compounds.

Keywords: Endophytic bacteria, *Piper crocatum*, Antibacterial, Antibiofilm, Metabolites