

ABSTRACT

Syifa Nurani Rahmandina, 24020220120008. Isolation and Characterization of Endophytic Bacteria from Mangrove *Rhizophora* sp. and Their Potential in Indole Acetic Acid (IAA) Production In-Vitro (under the supervision of Dr. Drs. Wijanarka M.Si. and Dr. rer. nat. Yustian Rovi Alfiansah. S.Si. M.Sc.)

Mangroves are unique coastal ecosystems, found in tropical and subtropical regions, characterized by salt-tolerant trees and shrubs growing in the tidal zone. Endophytic bacteria that live in mangrove plant tissues without causing disease potential to produce various secondary metabolites, including the hormone IAA which plays a role in plant growth. This study aims to isolate and characterize endophytic bacteria from *Rhizophora* sp. mangrove plants and test their potential in the production of Indole Acetic Acid (IAA) hormones. The research methods include isolation of endophytic bacteria from mangrove roots, bacterial characterization, qualitative testing using Salkowski reagents and IAA production with the addition of L-tryptophan. Statistical analysis used the *Two Way* ANOVA test and continued with the Duncan test. The results showed that 3 selected endophytic bacterial isolates from *Rhizophora* sp. produced IAA with different concentrations at certain incubation times and tryptophan concentrations. Isolate A14 produced the highest IAA at a tryptophan concentration of 150 ppm and an incubation time of 36 hours of 16.07 ppm. Isolate B9 produced the highest IAA at a tryptophan concentration of 250 ppm and an incubation time of 48 hours of 7 ppm. Isolate P7 produced the highest IAA at a tryptophan concentration of 150 ppm and an incubation time of 48 hours of 12.94 ppm. The two-way ANOVA test showed a significant interaction between incubation time and L-tryptophan concentration on IAA production. The Duncan test showed a significant difference between treatment groups, indicating that treatment with a certain incubation time and L-tryptophan concentration increased IAA production optimally. This study reveals the potential of mangrove endophytic bacteria as producers of IAA hormones that can be utilized in agricultural biotechnology to increase plant growth. The use of these endophytic bacteria can be an environmentally friendly solution to increase plant production without relying on chemical fertilizers.

Keywords: Endophytic bacteria, Rhizophora sp., Indole acetic acid, L-Tryptophan