

INTISARI

PENINGKATAN AKTIVITAS TOTAL MIKROBA DAN KERAGAMAN BAKTERI RHIZOSFER PADA 5 VARIETAS TANAMAN TEBU (*Saccharum officinarum* L.) DI TANAH INCEPTISOL MELALUI INOKULASI JAMUR MIKORIZA ARBUSKULA

Interaksi antara mikoriza, tanaman, dan bakteri sering digambarkan sebagai interaksi tripartit yang dapat meningkatkan pertumbuhan tanaman dan aktivitas total mikroba serta keragaman bakteri rhizosfer. Penelitian ini bertujuan untuk mengetahui tanggapan dan ketergantungan tanaman tebu pada jamur mikoriza arbuskula (JMA), mengetahui hubungan antara tingkat infeksi JMA terhadap peningkatan aktivitas total mikroba rhizosfer serta keragaman bakteri rhizosfer. Pada penelitian ini sampel tanah dan akar diambil dari lima varietas tanaman tebu yaitu varietas VMC, Kidang Kencana, Bululawang, PS 864 dan PS 881 yang diberi perlakuan inokulasi JMA dan tanpa inokulasi JAM di tanah inceptisol Desa Harjobinangun Pakem, Sleman, Yogyakarta. Metode *Fluorescein Diacetate-Hidrolisis Assay* (FDA) digunakan untuk mengukur aktivitas total mikroba dan metode *Terminal Restriction Fragment Length Polymorphism* (T-RFLP) digunakan untuk mengetahui keragaman dan komposisi bakteri pada tanah maupun akar dari lima varietas tanaman tebu. Hasil penelitian menunjukkan bahwa pada tiap varietas tanaman tebu memiliki tanggapan dan tingkat ketergantungan yang berbeda pada JMA dengan tingkat ketergantungan sedang 19,3 – 25,8% yaitu varietas VMC, Kidang Kencana, PS 881 dan PS 864 dan Bululawang dengan nilai ketergantungan tinggi 78,8%. Terdapat korelasi positif antara derajat infeksi akar dengan aktivitas total mikroba pada tanah ($R^2 = 0,951$) dan aktivitas total mikroba pada tanah ($R^2 = 0,952$). Inokulasi JMA pada lima varietas tebu mengubah komposisi bakteri pada akar dan tanah dan meningkatkan keragaman bakteri. Inokulasi JMA juga memunculkan genus *Bacillus* sp., *Gluconacetobacter* sp., *Brevibacillus* sp., dan *Brevibacterium* sp. Dari hasil –hasil tersebut mengindikasikan bahwa inokulasi JMA dapat digunakan untuk meningkatkan aktivitas total dan keragaman bakteri pada rhizosfer tanaman tebu.

Kata kunci: bakteri, mikoriza, rhizosfer, *Saccharum officinarum*, tebu

ABSTRACT

THE INCREASE OF TOTAL MICROBIAL ACTIVITY AND DIVERSITY OF RHIZOSPHERE BACTERIA ON FIVE VARIETIES OF SUGARCANE (*Saccharum officinarum* L.) IN INCEPTISOL SOIL BY INOCULATION ARBUSKULAR MYCORRHIZAL FUNGI

Interactions among mycorrhiza, plants, and bacteria can be described as tripartite association which able to promote the growth of plants and microbiological activities, as well as the diversity of rhizosphere bacteria. The purpose of this study were to investigate the response and dependency of sugarcane plants toward arbuscular mycorrhizal fungi (AMF), to observe the correlation between infection level of AMF in the increase in total rhizosphere microorganism activities and the diversity of rhizosphere bacteria on five varieties of sugarcane plant. In this study, root and soil samples were obtained from five varieties of AMF- treated and un-treated sugarcane including VMC, Kidang Kencana, Bululawang, PS 864 and PS 881 in inceptisol soil located in Harjobinangun Pakem District, Sleman, Yogyakarta. Fluorescein Diacetate-Hydrolysis Assay (FDA) was carried out to measure the total of microbial activities and Terminal Restriction Fragment Length Polymorphism (T-RFLP) method was conducted to observe the diversity and composition of bacterial community in the soil and root from the five varieties of sugarcane. The results showed that each sugarcane plant has different response and dependency level toward mycorrhiza in whice the level dependency varied from middle dependency between 19,3 – 25,8% for VMC, Kidang Kencana, PS 881 and PS 864 and high dependency 78.8% for Bululawang. Positive correlation was observed between infection degree and total microbial activity in soil ($R^2 = 0,951$) and in root ($R^2 = 0,952$). Inoculation AMF on five varieties of sugarcane changed the bacterial composition both in soil and root and was found to increase the bacterial diversity of *Bacillus* sp., *Gluconacetobacter* sp., *Brevibacillus* sp., and *Brevibacterium* sp. obtain by inoculation AMF both in soil and root.

Keyword : bacteria, mycorrhizal, rizhosphere, *Saccharum officinarum*, sugarcane