Potential use of endophytic bacteria to control pratylenchus brachyurus on pathcuoli

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Abstrak

Pratylenchus brachyurus is an important parasitic nematode which significantly decreases quality and quantity of patchouli oil. One potential measure for controlling the nematode is by using endophytic bacteria. These bacteria also induce plant growth. This study aimed to evaluate the potential of endo-phytic bacteria to control P. brachyurus. The experiments were carried out in the Bacteriological Laboratory of the Plant Protection Department, Bogor Agricultural University, and the Laboratory and Greenhouse of the Indonesian Spice and Medicinal Crops Research Institute from April to December 2007. Endophytic bacteria were isolated from the roots of patchouli plants sampled from various locations in West Java. Antagonistic activity of the isolates were selected against P. brachyurus and their abilities to induce plant growth of patch-ouli plants. Isolates having ability to control P. brachyurus and promote plant growth were identified by molecular techniques using 16S rRNA universal primers. The results showed that a total of 257 isolates of endophytic bacteria were obtained from patchouli roots and their population density varied from 2.3 x 102 to 6.0 x 105 cfu g-1 fresh root. As many as 60 isolates (23.34%) were antagonistic against P. brachyurus causing 70-100% mortality of the namatode, 72 isolates (28.01%) stimu-lated plant growth, 32 isolates (12.47%) inhibited plant growth, and 93 isolates (36.18%) were neutral. Based on their antago-nistic and plant growth enhancer characters, five isolates of the bacteria, namely Achromobacter xylosoxidans TT2, Alcaligenes faecalis NJ16, Pseudomonas putida EH11, Bacillus cereus MSK, and Bacillus subtilis NJ57 suppressed 74.0-81.6% nema-tode population and increased 46.97-86.79% plant growth. The study implies that the endophytic bacteria isolated from patchouly roots are good candidates for controlling P. brachyurus on patchouly plants.