

## Potential use of endophytic bacteria to control *pratylenchus brachyurus* on patchouli

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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 endophytic 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 patchouli 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  $2.3 \times 10^2$  to  $6.0 \times 10^5$  cfu g<sup>-1</sup> fresh root. As many as 60 isolates (23.34%) were antagonistic against *P. brachyurus* causing 70-100% mortality of the nematode, 72 isolates (28.01%) stimulated plant growth, 32 isolates (12.47%) inhibited plant growth, and 93 isolates (36.18%) were neutral. Based on their antagonistic 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% nematode population and increased 46.97-86.79% plant growth. The study implies that the endophytic bacteria isolated from patchouli roots are good candidates for controlling *P. brachyurus* on patchouli plants.