

Selecting the most effective plant growth-promoting bacteria from oil palm (*Elaeis guineensis* Jacq) roots

ABSTRACT

A total of 30 bacterial isolates were isolated from soil, rhizoplane, and internal tissue of oil palm roots. The isolates were qualitatively tested for their potential to fix N₂, solubilize inorganic P and K, and produce phytohormone indole-3-acetic acid. Of the 30 isolates, six isolates were able to exhibit multiple beneficial traits. All six isolates were then identified based on fatty acid methyl esters profile as *Escherichia coli* strain EX2, *Serratia* sp. strain EN1, *Pantoea ananatis* strain EN3, *Bacillus* sp. strain EN5, *Pantoea ananatis* strain EN8 and *Pantoea* sp. strain EN9. Subsequently, all shortlisted isolates were evaluated for plant growth-promoting potential by using shallot as a test plant. The plant test showed no significant difference ($p>0.05$) between inoculated and uninoculated plants except for *Pantoea* sp. strain EN9 inoculation which increased significantly ($p<0.05$) total root length over uninoculated control. Host specificity and IAA capacity of the isolates may be among the important factors affecting their effectiveness in plant growth promotion.

Keyword: *Elaeis guineensis*; Oil palm; Plant growth-promoting; Rhizobacteria