



Exploring Plant Growth-Promoting Rhizobacteria from Oil Palm Rhizospheres: Isolation and Characterization

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Abstract. The present study aimed to characterize the potential plant growth- promoting rhizobacteria (PGPR) based on biochemical tests based on bacterial isolate, and to identify potential PGPR based on the 16S rRNA sequencing molecular method. Potential PGPR strains isolated from oil palm (*Elaeis guineensis*) rhizospheres across UiTM Share farm were selected because of their most PGPR activities. The isolates were screened for nitrogen fixation, phosphate and potassium solubilization, production of indole-3-acetic acid (IAA), siderophore production and hydrolysing enzyme production tests. The beneficial bacteria (AR 6) showed a convinced result on all tests which showed the ability to fix nitrogen, to solubilize phosphate and potassium, had the potential to produce IAA, siderophore production and hydrolysing enzyme production tests. Thus, the oil palm farming sector stands to gain from the beneficial PGPR isolate. The molecular identification based on 16S rRNA gene sequence revealed that AR 6 was identified as *Klebsiella quasipneumoniae* subsp. *Similipneumoniae*. This novel strain can be further investigated for their viability and effectiveness for biofertilizer production and application on oil palm cultivation.

Keywords: Characterization, Isolation, Molecular identification, Oil palm, Plant growth-promoting rhizobacteria