Isolation and characterization of plant growth-promoting rhizobacteria (PGPR) and their effects on growth of strawberry (Fragaria Ananassa Duch.)

ABSTRACT

The interaction between plant and microbes can contribute towards plant health and productivity. Plant growth-promoting rhizobacteria (PGPR) are the bacteria that can enhance plant growth performance and production. PGPR were isolated from the rhizosphere of strawberry plants and the beneficial properties were identified. Effects of bacterial isolates on strawberry plant also being observed. Eighty isolates were isolated from three different strawberry cultivars. Seven isolates were positive for the N2-fixation. Eleven and twenty isolates showed solubilizing activity for potassium and phosphate, respectively. Phosphate solubilization efficiency ranged from 30.0 to 42.3%. Three isolates showed positive results for cellulase enzyme production. Meanwhile, the phytohormone (IAA) production of the isolates ranged from 2.001 to 42.414 μg/ml. Plants applied with bacterial isolates, namely STUPM01 (Microbacterium oxydans), STUPM12 (Bacillus cereus), STUPM20 (Leclercia adecarboxylata) and STUPM25 (Pseudomonas umsongensis) showed root and shoot growth enhancement compared to control. STUPM01 showed better performance compared to other isolates.

Keyword: Plant growth-promoting rhizobacteria; Growth; Strawberry; Fragaria Ananassa Duch.