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Antagonistic endophytic *Streptomyces* strains, taxonomic characterization, plant growth promoting activities, effect on cocoyam (*Xanthosoma sagittifolium* (L.) Schott) and biochemical constituents

Djuidje Koumou P F^{1,2,3}, Boudjeko T^{1,2,3}, Asultan W⁴, Nouemssi S B¹, Lerat S³, Beaulieu C³ and Wong Mui-Yun⁴

¹Biotechnology Centre-Nkolbisson, Cameroon

²University of Yaoundé, Cameroon

³Université de Sherbrooke, Canada

⁴Universiti Putra Malaysia, Malaysia

In the present study, 7 endophytic actinobacteria were isolated from cocoyam's roots. Due to their antagonistic activity against *P. myriotylum* and other plant pathogens, four isolates PERM1, PERM2, PERM4 and PERM5 were selected. These four selected isolates were subsequently characterized taxonomically, evaluated for *in vitro* biocontrol traits, plant growth promoting (PGP) activity and their effect was evaluated on cocoyam's vitro plants. The antagonistic endophytic isolates were able to grow in NaCl concentrations of up to 8%, at pH values between 5 and 9, temperatures between 25°C and 45°C. Of the four selected isolates, PERM2 and PERM4 produced cellulase; PERM1 and PERM2 produced pectinase whereas all the selected isolates produced chitinases, proteases, lipases and β -1,3-glucanases. The selected isolates were able to solubilize phosphate, were positive for siderophores, ACC deaminase, nitrogen fixation, ammonia (NH₃) and indole-3-acetic acid (IAA) production. The amount of IAA ranges between 12.53-20.30 μ g/ml and amount of ammonia ranges between 261.71-633.42 mg/ml. Of the four isolates, PERM1, PERM2 and PERM4 produced HCN. Based on sequences of 16S rRNA gene, the selected endophytic isolates were identified as *Streptomyces* but different species in BLAST analysis. Regarding their effect on cocoyam's root development, in comparison to control only isolate PERM2 demonstrated the maximum increase in root length whereas PERM2; PERM4 showed a remarkable effect in number of primary and lateral roots of cocoyam's vitro plants and *Streptomyces* sp. PERM2 and PERM4 showed greatly increase in fresh cocoyam's vitro plant weight. Biochemical assay revealed the highest amount of protein content and peroxidase activity in roots inoculated with PERM1 and PERM5 compare to control. These results clearly suggest the possibility of using endophytic *Streptomyces* strains from cocoyam's roots as biocontrol agents against fungal phytopathogens and as bio-inoculant for plant growth promotion for sustainable and environmentally friendly agriculture.

muiyun@upm.edu.my