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Antifungal Potential of the Plant Growth-Promoting Rhizobacteria Infecting Kidney Beans

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Abstract : Bacteria that colonize plant roots and promote plant growth are referred to as plant growth-promoting rhizobacteria (PGPR). They not only provide nutrients to the plants (direct plant growth promotion) and protect plants against the phytopathogens (indirect plant growth promotion) but also increase the soil fertility. Indirectly PGPRs improve the plant growth by becoming a biocontrol agent for a fungal pathogen. The antifungal activities of the PGPrhizobacteria were assayed against different species of phytopathogenic fungi such as Fusarium tricinctum, Fusarium oxysporum, Sclerotiniasclerotiorum, and Botrytis cinerea. Pseudomonas putidaSM-1, Azotobacter sp., and Bacillus thuringiensis AKS/16 strains have been used in experimental tests on growth inhibition of phytopathogenic fungi infecting Kidney beans. Agar well diffusion method was used in this study. Diameters of the zones of inhibition were measured in millimeters. It was found that Bacillus thuringiensis AKS/16 strain showed the lowest antifungal activity against all fungal pathogens tested. Zones of inhibition were 15-18 mm. In contrast, Pseudomonas putida SM-1 exhibited good antifungal activity against Fusarium oxysporum and Fusarium tricinctum by producing 29-30 mm clear zones of inhibition. The moderate inhibitory effect was shown by Azotobacter sp. against all fungal pathogens tested with zones of inhibition from24 to 26 mm. In summary, Pseudomonas putida SM-1 strain demonstrated the potential of controlling root rot diseases in kidney beans.

Keywords : PGPR, pseudomonas putida, kindey beans, antifungal activity
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