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Plant growth promoting Rhizobacteria: A boon for sustainable agriculture

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The past couple of decades, Plant Growth Promoting Rhizobacteria (PGPR) will begin to replace the use of chemicals in agriculture, horticulture, silviculture and environmental cleanup strategies. Scientific researchers involve multidisciplinary approaches to understand adaptation of PGPR, effects on plant physiology and growth induced systemic resistance, bio-control of plant pathogens and bio-fertilization. PGPR are naturally occurring soil bacteria that aggressively colonize in plant roots and play a vital role in crop protection, growth promotion and in the improvement of soil health. The study was conducted to isolate plant growth promoting *Rhizobacteria* from sugarcane rhizosphere and assess their potential with combination of chitosan for plant growth and bio-control activities. Isolated Rhizobacteria were characterized by morphological, physiological, biochemical and molecular identification of bacteria by 16S rRNA sequencing. They were screened in vitro plant growth promoting traits viz., production of indole acetic acid, hydrogen cyanide, ammonia production and antifungal activity against Colletotrichum falcatum. Five isolates showed highest plant growth promoting activities. All isolates identified as Enterobacter hormaechei, Bacillus megaterium, Bacillus cereus, Bacillus thuringiensis and Bacillus pumilus. For bio-control activities against Colletotrichum falcatum, the significant growth inhibition was observed. This study was further preceded in sugarcane. Sugarcane setts were soaked into PGPR and chitosan solution for 12 hours. Germination percentage, growth parameters, chlorophyll, proline content, nitrate reductase activity, anti-oxidative enzyme superoxide dismutase activity showed significant findings. The study suggests that PGPR and chitosan can be used as an effective biological fertilizer combination for increasing sugarcane production.

Recent Publications

Katiyar D, Hemantaranjan A, Singh B (2015) Chitosan as a promising natural compound to enhance potential physiological responses in plant: a review. Indian Journal of Plant Physiology; 20(1): 1-9.

Katiyar D, Hemantaranjan A, Singh B (2016) Plant growth promoting Rhizobacteria- an efficient tool for agriculture promotion. Advances in Plants & Agriculture Research; 4(6): 00163.

Biography

Deepmala katiyar is currently pursuing her Post-doctoral Studies on Plant Growth promoting Rhizobacteria of sugarcane. She has attended more than 20 National and International conferences. She has published 25 research papers and 4 book chapter and 1 book. She has received 1 young scientist awards and 6 best paper presentation awards from various National and International conferences. She is the Editorial Board Member of International Journal of Pharma and Biosciences.

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