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Exploring the Potential of Plant Probiotic Microorganisms for Advancements in Agriculture

The symbiotic relationship between plants and microorganisms, particularly plant probiotic microorganisms (PPM), holds immense promise for revolutionizing agriculture and forestry practices. This paper explores the potential of harnessing PPM to address pressing challenges facing global food security and environmental sustainability. PPM, which include beneficial bacteria, fungi, and endo mycorrhizae, play pivotal roles in promoting plant growth, enhancing nutrient uptake, and mitigating environmental stresses. By forming symbiotic associations with plants, PPM contributes to increased crop yields, reduced reliance on chemical inputs, and improved soil health. The paper reviews the diverse mechanisms through which PPM exerts their beneficial effects on plants, highlighting the intricate interplay between microbes and their host plants. Additionally, case studies exemplify the practical applications of PPM in agriculture, such as enhancing the growth of valuable tropical hardwood trees for sustainable harvesting and promoting reforestation efforts. Overall, this paper underscores the potential of PPM as valuable tools for advancing agricultural and forestry practices towards greater sustainability and resilience in the face of ongoing environmental challenges.

Primary author: GANESAN, Subbulakshmi (Jain university)

Co-authors: Ms DE ZOYSA, Agampodi Sandali Inupama (JAIN UNIVERSITY); Ms PRIYA, Padma (Jain university)

Presenter: GANESAN, Subbulakshmi (Jain university)

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