

# Role of Microbial Community in the Field of Agriculture

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**Abstract**—Microbial diversity is an unseen international resource that deserves greater attention. North—Eastern India is best known for its rich biodiversity and its un-tapped bioresources have been identified as the Indo-Burma Mega Hot Spot. The ability of microorganisms to synthesize bioactive compounds plays a significant role in agriculture, drug discovery, as well as in industrial research. Endophytic actinomycetes one of the major communities that share symbiotic relationships with medicinal plants and are key reservoir of biologically active compounds and play a key role for sustainable crop production. Six important medicinal plants have been selected for this study, viz. *Emblica officinalis*, *Terminalia chebula*, *Terminalia arujuna*, *Muraya koenigi*, *Azadirachta indica* and *Rauwolfia serpentina* and accordingly isolated 120 endophytic actinomycetes. These endophytic bacteria were characterized using morphological and biochemical parameters and assessed for their plant growth promoting rhizobacteria (PGPR) traits like indole acetic acid (IAA) production, hydrogen cyanide (HCN) production and screened for their antimicrobial activity. 16S rRNA sequencing revealed some specific genera like *Verrucosipora*, *Isopterocola*, *Micrococcus*, *Sacharopolyspora*, *Kytococcus* etc., and the study revealed the dominant character of *Streptomyces*. However, these 120 endophytic Actinomycetes isolates showed the inhibitory activity against at least one plant pathogen and subsequently good producers of Indole-Acetic Acid (IAA). Thus, the study clearly suggests the possibility of using endophytic actinomycetes as bioinoculant for plant growth promotion, nutrient mobilization or as biocontrol agent against fungal as well as bacterial phytopathogens for sustainable agriculture.

**Keywords:** Endophytic Actinomycetes, Indole-Acetic Acid, 16S rRNA.