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Rhizobacterial Potential to Alter Auxin Content and Growth of *Vigna radiata* (L.)

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Phytohormones especially indole-3-acetic acid (IAA) is considered very crucial in plant growth and development. Auxin production potential of plant associated bacteria offers good opportunity to use these microbes as biofertilizers to enhance the growth and yield of agronomically important crops. In present study, sixteen *Bacillus* strains isolated from rhizosphere, histoplane and phyllosphere of different plant species were identified by 16S rDNA gene sequencing. Potential of bacterial strains to influence the endogenous indole-3-acetic acid (IAA) content and growth of *Vigna radiata* (L.) was evaluated. Auxin production by *Bacillus* spp. in L-broth medium supplemented with 1000 μg ml^{-1} L-tryptophan ranges from 0.60 to 3.0 μg IAA ml^{-1} as revealed by gas chromatography and mass spectrometric (GC-MS) analysis. Plant microbe interaction experiments conducted under gnotobiotic conditions recorded 55.55%, 46.46% and 46.20% increase in shoot length with *Bacillus megaterium* MiR-4, *B. pumilus* NpR-1 and *B. subtilis* TpP-1, respectively, over control. *Bacillus* inoculations also increased shoot fresh weight with *B. megaterium* MiR-4 (60.94%) and *B. pumilus* NpR-1 (37.76%). Highly significant positive correlation between *in vitro* auxin production analyzed by GC-MS and shoot length (r = 0.687**) and shoot fresh weight (r = 0.703**) was noted under gnotobiotic conditions. Similarly, significant correlation was also found between auxin production by *Bacillus* spp. (GC-MS analysis) and different growth parameters such as shoot length (r = 0.495*), number of pods (r = 0.498*) and grain weight (r = 0.537*) at full maturity under natural wire house conditions. Results showed that auxin production potential of plant associated *Bacillus* spp. can be effectively exploited to enhance the growth and yield of *V. radiata*.