

# Occurrence, distribution and N<sub>2</sub> fixing ability of diazotrophic bacterial isolates from different rice production systems

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Rice is now grown in different production systems viz., lowland, system of rice intensification (SRI) and aerobic rice. Since the agronomic conditions prevailing in these systems are different, the nitrogen fixing ability of the diazotrophic bacteria associated with these production systems may also vary. Hence, heterotrophic diazotrophs were isolated from the rhizosphere soils of rice grown in three different rice growing systems to assess their N<sub>2</sub> fixing potential. The diazotrophs were isolated from five different locations in Tamil Nadu. The different diazotrophs isolated belonged to the genera *Azospirillum*, *Azotobacter*, *Beijerinckia*, *Derxia* and *Pseudomonas*. A total of hundred and ten isolates obtained were subjected to acetylene reduction assay (ARA) and ninety eight isolates recorded significant amount of nitrogenase activity in the range of 185.73 to 3794.55 nmoles of ethylene mg of protein<sup>-1</sup> h<sup>-1</sup>. Maximum nitrogenase activity was recorded by *Derxia* (3794.55 nmoles of ethylene mg of protein<sup>-1</sup> h<sup>-1</sup>) isolated from Trichy (lowland). Among the three different rice production systems, isolates obtained from lowland rice (*Derxia* – 3794.5 nmoles of ethylene mg of protein<sup>-1</sup> h<sup>-1</sup>) recorded higher nitrogenase activity followed by aerobic rice isolate (*Pseudomonas* - 2194.89 nmoles of ethylene mg of protein<sup>-1</sup> h<sup>-1</sup>) and SRI rice isolate (*Azotobacter* - 1971.85 nmoles of ethylene mg of protein<sup>-1</sup> h<sup>-1</sup>). The results revealed marked variation in the ARA of the diazotrophic isolates obtained from lowland, SRI and aerobic rice.

**Key words :** Acetylene reduction assay, Diazotrophs, Heterotrophs, Lowland, Aerobic, SRI

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