RESEARCH PAPER

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Microbiolgical study of root nodule bacteria from wild legumes

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Nitrogen fixing microorganism of genus *Rhizobium* lives in root nodules of legumes and also in the soil. An attempt has been made to isolate and characterize this *Rhizobium* strains from different wild legumes like *Meliolotus indicus, Medicago denticulate, Desmodium triflorum* and *Alycicarpus hamosum*. Phosphorus is one of the major nutrients next to nitrogen which is present in the soil in insoluble form. Characterization of the isolated strains form wild legume plants was done by using certain other biochemical test, this included indole production, MR-VP, cirate utilization ketolactose production, nitrate reduection, phosphate solubilization, pH and Salt tolerance. Five isolates DT02, DT03, DT04, MI01, EH04 showed good phosphatase activity. Isolate DT02, DT03, DT04, MI01, EH04 grew well at concentration of 2%, 3% salt and grew well in alkaline and acid condition *i.e.* at pH10 and pH4.

Key words : Root nodule bacteria, Microbiological study, Wild legume *Rhizobium*

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INTRODUCTION

The legume *Rhizobium* interaction is a result of specific recognition of the host legume by *Rhizobuim*. Legumes play critical role in natural ecosystems, agriculture and agro-forestry. Their ability to fix nitrogen in symbiosis make them excellent colonizers of low environment and economics and environment friendly crop pasture and herb species.

Biological nitrogen fixation (BNF) is an efficient source of fixed nitrogen which plays an important role in land remediation. Interest in BNF has focused on the systems of leguminous plants and *Rhizobium* because associations have the greatest quantitative impact on the nitrogen cycle.

Wild legumes (herbs or tree) are widely distributed in arid regions and actively contributed to soil fertility in these environments. The nitrogen fixing activity and tolerance to drastic condition may be higher in wild legumes than in crop legumes. The wild legumes arid zone harbour diverse and promiscuous rhizobia in their root nodules. Specificity existed only in few rhizobia from wild legumes, however the majority of them are with the wide host range (Nagales *et al*., 2002).

Wild or crop legumes can be a source for genetic information to improve symbiotic character of other rhizobia. The significance of rhizobia of wild legumes are not restricted to their symbiotic nitrogen fixation activity or to several other activities in the soil, which eventually improved soil fertility and plant productivity, but some strains of rhizobia may be used for other biotechnological applications (Villegas, 2002). These biotechnologies include the production of polysaccharides enzyme and antibiotics. This field of research will be focus of future investigations for biotechnology purposes.

RESEARCH METHODOLOGY

Isolation of *Rhizobium* from wild legume plants:

Rooted plants of wild leguminous crops were collected from Botanical Garden, Dr. Hari Singh Gour Central University, Sagar (M.P.) and Patkui area of Sagar (M.P.) and were brought to microbiology laboratory of the Deptt. of Applied Microbiology and Biotechnology Dr. H.S. Gour V.V. Sagar for isolation of *Rhizobium* from root nodules of these plants.

Method of Isolation:

The details of methods followed for isolation of *Rhizobium* from root nodules of different samples of wild leguminous plants *viz.,Desmodium triflora, Elicicarpus hamosus, Medicago deniticulata, Meliotus indicus.* are as given below: