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Research Article

Phylogenetic studies among different groundnut (*Arachis hypogaea* L.) root nodule bacteria (*Rhizobium)* isolated from Junagadh and Rajkot districts of Gujarat

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ARITCLE INFO	ABSTRACT
Article Chronicle : **Received :** *28.09.2011* **Revised :** *07.11.2011* **Accepted :** *25.01.2012* *Key words* : BOX PCR, 16 S rDNA, *Nif* H gene, Phylogenetic study, *Rhizobium* *Corresponding author*: rashmin17@gmail.com	Groundnut (*Arachis hypogaea* L.) is one of the most important oilseed crops cultivated in different areas of Junagadh and Rajkot districts. The diversity of root nodule bacteria that can nodulate groundnut is poorly understood. Twenty one samples along with reference strains, TAL-1000, IGR-6 and NC-92 were analyzed using restriction patterns produced by amplified DNA coding for 16 s rDNA with two enzymes (*Hinf* I and *Alu* I) and were placed in four genotypes. Genetic diversity was also assessed by repetitive PCR using BOX primers and in all isolates were placed in five genotypes. Nitrogen-fixing ability of the isolates was confirmed by amplification of 781 bp *nif*H fragment. A considerable level of genetic diversity was determined among Rhizobial strains isolated from different areas of Junagadh and Rajkot districts. *How to view point the article* : Malaviya, B.J., Chovatia, V. P., Mehta, D.R., Madariya, R.B. and Dhingani, R.M. (2012). Phylogenetic studies among different groundnut (*Arachis hypogaea* L.) root nodule bacteria (*Rhizobium)* isolated from Junagadh and Rajkot districts of Gujarat. *Internat. J. Plant Protec*., **5**(1) : 36-39.

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) is one of the most important oilseed crops, commercially popular due to its superior edible oil quality, protein in the meal and confectionery purposes. Groundnut has a wide range of adaptability in varying agro-climatic conditions and soils, which has made its cultivation possible in most of the tropical and sub-tropical countries in the world. The total area under groundnut cultivation in India during the year 2006-07 was 6.7 million hectares and total production was 6.6 million tons with the productivity of 985 Kg ha^{-1} (FAO Database, 2007). Among the major groundnut growing states of India, Gujarat ranks first, in groundnut production and second in area under production. In the districts of Junagadh and Rajkot of Gujarat state, groundnut is the major oilseed crop.

Besides its nutritional and agricultural importance, groundnut (as a legume) plays an important role in maintaining and improving soil fertility through the process of biological nitrogen fixation (BNF). Groundnut has been reported to form effective nodules with slow-growing rhizobia. Currently,

Taurian *et al.* (2006) demonstrated that *Arachis hypogaea* L. is nodulated by *Bradyrhizobium* species and also by fast growing rhizobia closely related to *Rhizobium giardini* and *Rhizobium tropici* species.

Nodulation of groundnut by indigenous bacteria is usually assumed to be adequate, and inoculation is seldom practiced. However, survival and effective functioning of Rhizobium populations are reduced by high soil temperatures, salt and osmotic stress, soil acidity and alkalinity, pesticide and fungicide applications as well as nutrients deficiencies stress (Zahran, 1999).

The different areas of Junagadh and Rajkot districts contain *Rhizobium* strains, well adapted to varying soil and environmental conditions. The *Rhizobium* strain isolated from these areas will be very effective for evaluating as a groundnut inoculants in different areas of Saurashtra, because the inoculated *Rhizobium* should survive or persist in critical number for a long time in the rhizosphere of the groundnut to out-compete and/or complement the native microflora. To achieve the maximum biological nitrogen fixation in these areas,