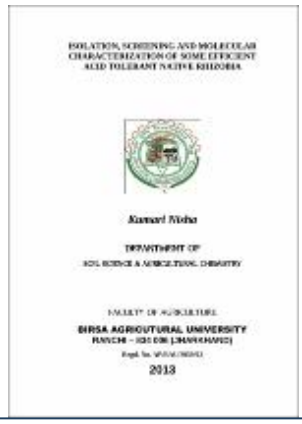
Authors:	Niisha, Kumarii (/browse?type=author&value=Niisha%2C+Kumarii)
Advisor:	Shahi, D. K. (/browse?type=author&value=Shahi%2C+D.+K.)
Title:	ISOLATION,, SCREENING AND MOLECULAR CHARACTERIZATION OF SOME EFFICIENT ACID TOLERANT NATIVE RHIZOBIA
Publisher:	Birsa Agricultural University, Kanke, Ranchi, Jharkhand
Language:	en_US
Type:	Thesis
Pages:	104
Agrotags:	null
Keywords:	ISOLATION,, SCREENING AND MOLECULAR CHARACTERIZATION OF SOME EFFICIENT ACID TOLERANT NATIVE RHIZOBIA

Abstract:	Despite being the largest producer of pulses (25% of global production) in the world, the productivity of pulses is very low in our country. In order to ensure self sufficiency the pulse requirement in the country is projected at 32 MT by the year 2030 which necessitates an annual growth rate of 4.2%. Acid soils pose a major challenge to sustainable agriculture by limiting rhizobial growth, nodule development, N-uptake and consequent yield. However, application of suitable Rhizobium (Acid tolerant, competitive and efficient) may curtail these problems and the yield may go up to some extent. It has not been possible so far to enhance the nitrogen fixation in pulses through available rhizobial strains and different management practices especially in acid soils of India, proteomics study of rhizobial strains can provide an answer to agricultural practices through enhancement of nitrogen fixation. Keeping this in view the present investigation was planned to isolate, purify acid tolerant Rhizobium isolates, their screening on the basis of competitive ability, to observe their efficiency on crop growth and yield and their molecular characterization by proteomics study. Nodules of different grain legumes grown during Kharif and Rabi under natural conditions were collected from acid soils of various locations viz; Jamtara, Dumka, Giridih, Deoghar, Sahebganj, Garhwa and Ranchi. Pigeonpea revealed very poor to poor nodulation status, Groundnut poor to moderate, Blackgram very poor to moderate and Greengram revealed very poor nodulations in most of the locations except Garhwa district. Fifty three (53) rhizobial isolates belonging to Rhizobium sp. and Bradyrhizobium sp. were isolated and subjected to different physiological tests and these were screened for efficiency test on homologous hosts under green house conditions following modified Leonard Jar Technique (Vincent, 1970). Thirty eight (38) isolates belonging to slow growing rhizobia of Pigeonpea, Groundnut, Greengram, Blackgram and Soybean exhibited good growth after 72 hours and turned the media alkaline. While fifteen fast growing isolates belonging to Pea, Lentil and Chickpea produced acidity of varying intensity. None of the rhizobial strain showed positive reaction in regard to utilization of peptone (Glucose peptone agar test) and growth at higher pH (Hofer's alkaline medium test). All the young cultures of isolates showed Gram +ve reaction. Isolates were tested for their competitive ability (effective nodulation and dry matter production) under Leonard Jar Experiment. BGA11, BDe9 (Pigeonpea), BDS1 (Soybean), BBU6 (Blackgram), BGM12 (Greengram), BRC5 (Chickpea) and BRP2 (Pea) were found to be superior on account of better survival in the rhizosphere, increased adhesion on root and inducing effective nodulation and dry matter production by the homologous hosts. Three competitive acid tolerant isolates of Pea BRP2, BRP4 and BRP1 alongwith the BRP3 (reference strain) were assessed for their effect on nodulation, crop growth and yield in combination with 0, 10 and 20 kg ha□1 N using Pea (Cv. Azad P1) as test crop in an acid soil (pH 5.3) of Ranchi. Maximum grain yield (15.09 q ha□1), straw yield (37.33 q ha□1), nodule number (33.0 plant□1), nitrogen content of nodule plant□1 (2.88%) were observed due to inoculation with BRP2 supplemented with 20 kg ha□1. The three isolates of Pea were further characterized with their most unique protein spots by Two dimensional electrophoresis study. This study will help in identification of proteins which are related to nitrogen fixation and a more thorough understanding of gene expression and function can be achieved through the characterization of the products of expression, the proteins.
Description:	ISOLATION,, SCREENING AND MOLECULAR CHARACTERIZATION OF SOME EFFICIENT ACID TOLERANT NATIVE RHIZOBIA
Subject:	Soil Science and Agriculture Chemistry
Theme:	ISOLATION,, SCREENING AND MOLECULAR CHARACTERIZATION OF SOME EFFICIENT ACID TOLERANT NATIVE RHIZOBIA
These Type:	Ph.D
Issue Date:	2013
Appears in Collections:	Thesis (/handle/1/93550)

Files in This Item:

File	Description	Size	Format	
1413 Kumari Nisha.pdf		3.34 MB	Adobe PDF	

View/Open (/displaybitstream?handle=1/5810021819)

Show full item record (/handle/1/5810021819?mode=full)

(/handle/1/5810021819/statistics)