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Title: Identification of genes conferring soil tolerance to various soil regimes from Rhizobium isolates of pigeon pea by using MALDI TOF/TOF analysis.

Publisher: Birsa Agricultural University, Ranchi, Jharkhand-6

Language: en_US

Type: Thesis

Pages: 71

Agrotags: null

Keywords: Identification of genes conferring soil tolerance to various soil regimes from Rhizobium isolates of pigeon pea by using MALDI TOF/TOF analysis.

Abstract: Aim of the present study is to identify unique protein from Rhizobium isolates of cajanus cajan collected from acidic soils of the State of Jharkhand and comparing its protein profile with Rhizobium residing in neutral pH. Rhizobia are the bacteria that form nitrogen- fixing symbiosis with legumes. Leguminous crops have the ability to fix nitrogen (N) biologically from the atmosphere. Various genes have been identified in R. leguminosarum that are specific to acid stress response in Rhizobia. Soil acidity is one of the most serious problems affecting growth of Rhizobia in the soil of Jharkhand. Rhizobium – legume symbiosis is one of the ideal solutions to improve the fertility soil and restoration of arid land. Different species of Rhizobium display varying degrees of pH resistance as measured by their ability to grow. Some inducible systems raise the internal pH of the bacterium, in order to counter any intruding acidic molecules or protonated species. These systems employ ABC systems and other transport mechanisms to either move acidic molecules out of the cell, or import basic ones. Another common response to acid shock is for the bacteria to produce acid shock proteins (ASPs). These contribute to acid tolerance by conferring acid protection on the bacteria but do not alter the internal pH of the cell. Various genes have been identified in R. leguminosarum that are specific to acid stress response in Rhizobia and are termed act genes (acid tolerance) Vertisols are deep clayey soils, with more than 45% clay. These are low hydraulic conductivity and stickiness when wet and high flow of water through the cracks when dry. Environmental factors influence all aspects of nodulation and symbiotic N₂ fixation, in some cases reducing rhizobial survival and diversity in soil, in others affecting nodulation or nitrogen fixation and even growth of the host. Factors that are important include acidity, temperature, mineral nutrition, salinity and alkalinity. In the crop Pigeon pea four unique spots at various pH regimes are observed. These unique spots are analysed with the help of Two Dimensional Gel Electrophoresis. Now MALDI-TOF/TOF MS is being done, it is the method for both protein identification and characterization. Predicated function of four unique spots have been identified from Rhizobium isolates of Pigeon Pea towards the identification of genes associated with acid soil tolerance which play crucial role in acid tolerant mechanism of Rhizobium.

Description: Identification of genes conferring soil tolerance to various soil regimes from Rhizobium isolates of pigeon pea by using MALDI TOF/TOF analysis.

Subject: Biotechnology

Theme: Identification of genes conferring soil tolerance to various soil regimes from Rhizobium isolates of pigeon pea by using MALDI TOF/TOF analysis.

These Type: M.Sc

Issue Date: 2017

Appears in Thesis (/handle/1/93550)

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