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Physiological and molecular characterization of transgenic pigeon pea (*Cajanus cajan* Mill. Sp (L)) plants over expressing citrate synthase gene for phosphorous uptake

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Phosphorus, a macronutrient is essential for many growth processes and biochemical reactions involved in the metabolism of carbohydrates, fats, proteins and energy transfer in plants. It is highly immobile in the plant system and is present in bound forms with other elements like Fe, Al, Ca and Mg in the soil and become unavailable to plants. So, plants have adopted several strategies, to take up phosphorus (P) from the soil under P deficient conditions. Exudation of organic acids like citrate is one such strategy where in the released citrate solubilizes the bound P and makes it available to plants. With this view pigeon pea plants over expressing gene encoding an enzyme *citrate synthase* (*DcCS*), under the control of 35s promoter were developed by using *Agrobacterium* mediated in *planta* transformation technique with the intention of increasing synthesis and exudation of citrate. The putative transgenic plants over expressing gene encoding *citrate synthase* showed faster germination than wild type and also performed better than wild type in terms of plant height, leaf number, SCMR and total chlorophyll content under P sufficient and P deficient condition. Leaf tissue phosphorus, was higher in the transgenic plants under P sufficient condition than the P deficient condition. Transgenic plants showed an increased citrate synthase activity, citrate synthase content and also citrate content in the root tissues. The citrate content increased with increase in the citrate synthase activity in the transgenic plants than wild type. Molecular analysis like PCR and Dot blot technique of putative transgenic pigeon pea plants confirmed the integration and expression of *citrate synthase* gene. The results demonstrated that transgenic pigeon pea plants over expressing *DcCs* gene had better uptake of phosphorous under P deficient condition compared to non transformed wild type.

Biography

Manasa K M has completed her M.Sc. (Agri) at the age of 23 years from Department of Crop Physiology, University of Agricultural Sciences, GKVK, Bangalore. At present she is pursuing Ph.D. degree in the Department of Crop Physiology, UAS, GKVK, Bangalore, under the supervision of Dr. R. S. Uma Shaanker, with the thesis entitled "Identification and characterisation of endophytic fungi from natural habitats of different abiotic stress (drought, temperature and salinity) conditions".

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Gap between agricultural scientists recommendations and farmers practice in disease and pest management

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India is the country with diversified natural resources, micro flora and fauna. From green revolution many agro chemicals are dumped to the fields for controlling disease and pests. Currently, India is the largest producer of pesticides in Asia and ranks twelfth in the world for the use of pesticides. Due to unscientific usage and methods of application, pesticides are degrading natural fertility of soil & divesting natural micro flora. This resulted in severe pest and disease outbreak, which in turn resulted in consumption of more insecticides and fungicides. Hence achieving food security in future days is a major task, which can be achieved only through sustainable agriculture production. But usage of recommended proportion and various forms of pesticides for different pest and diseases is a confusing concept for farmer. We conducted a survey to know the gap between agricultural scientist's recommendations and farmers practice in disease and pest management. Survey reveals that scientists say before any treatment firstly the disease or pest should be diagnosed by experts, based on expert recommendation farmers should take-up spraying of specific pesticides, but farmers are far from this knowledge. Scientists recommend integrated disease/pest management approach in that chemical treatment at last, but farmers are using as a first component. Scientists prefer crop rotation in places of endemic diseases but most of the farmers are following monoculture of same crop. So we can say due to all these reasons pesticides are utilized unscientifically. In this situation we are displaying the difference in opinion of agriculture scientists and farmers understanding in 15 Q questionnaires.

Biography

Sunag M N is final year BSc Agriculture, in Agriculture College, Hassan, affiliated to Gandhi Krushi Vignana Kendra, Bangalore, Karnataka, India. Has published 1 paper in international journals, 1 international conference papers. His area of interest is Modernization of Indian Agriculture, Agriculture Engineering.

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