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## Estimation of genetic diversity in farmers' varieties of rice (*Oryza sativa* L) through agro-morphological characterization

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Traditional varieties serve as a reservoir of useful genes and provide the genetic building blocks for plant breeding. These varieties not only possess high yielding potential but also resistance to biotic and abiotic stress. Systemic study and characterization of such genotypes is important for utilizing the appropriate attribute based donors and also essential in the present era for protecting the uniqueness of rice. In the present study an attempt was made to characterize a set of farmers' varieties for different agro-morphological traits as well as quality characteristics and identify the variability available in the collection. The genetic divergence in 57 farmers' varieties from the eastern region of the country was estimated using Mahalonobis's  $D^2$  - statistics. Cluster analysis was done based on morphological characteristics. The genotypes were grouped into 12 clusters of which cluster I, III, II were the major clusters. A total of 33 genotypes were grouped in cluster I, followed by cluster III and II with 8 and 6 genotypes respectively. Cluster III showed maximum intra cluster divergence while inter cluster divergence was maximum between clusters IX and X. Traits like gelatinization temperature, grain aroma, endosperm content of amylose, presence of amylose and decorticated grain colour were the major contributors to genetic divergence. The study helped to understand the extent of genetic diversity among the farmers' varieties which are a potential source that can be exploited.

#### **Biography**

L V Subba Rao has done Ph.D. in Genetics & Plant Breeding from ANGRAU and completed 22 years of service in ICAR in different capacities from Scientist to Principal Scientist at Directorate of Rice Research, Hyderabad. He was trained at Hybrid Rice Research Centre (HRRC) Changsha, China on Hybrid Rice Technology during 1995. He had successfully completed NATP supported projects on 1) Evaluation of rice cultivars for rain fed rice ecology and 2) Sustainable management of Plant Biodiversity as Principal Investigator during 1999 to 2004. At present, he is the Nodal Officer for Germplasm, DUS testing in Rice and National Seed Project at DRR. He is also PI for the DBT funded project on "Establishment of National Rice Resource Data Base" and associated with the project on National Initiative on Climate Resilient Agriculture (NICRA). He has published 35 research papers in referred journals and 90 papers in national & international symposia/ conferences.

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### Space breeding- An emerging technique for crop improvement

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The spaceflight-induced mutation technique, or "space breeding," is a technique that utilizes the produced genetic variations in plant seeds or other plant parts by the space environment, carried by recoverable spacecraft (recoverable satellites and space shuttles) and high altitude balloons from the ground wherein new crop varieties can be fostered. Aerospace imparts a special environment with strong cosmic radiation, weak geomagnetic fields, microgravity, superclean and supervacuum. Shijian-8, the world first satellite specially fabricated for the space breeding approach, was launched on September 9, 2006. It has carried over 2,000 plant accessions from 133 species. So far, 66 new mutant varieties of crops, including rice, wheat, cotton, tomato rapeseed, sesame, pepper, and alfalfa have been developed by the space breeding programme and released officially in China. The promotion and exploitation of these mutant varieties has made an important contribution to China's food production and social and economic development. Initiative of the programme has also been undertaken recently in India. Being a developing country, India also has the potential to develop such actively upgraded mutagenic approach and hike efficiency in crop breeding. Thus space-induced mutation is an effective new approach not only to develop new crop varieties, but also in obtaining rare mutants that may formulate great breakthroughs in crucial economic characters of crops, such as yield and quality, which are arduous to obtain using conventional breeding methods on the ground and can serve as a novel and effective way to enhance genetic diversity from which breeding of new crop varieties can also be carried out.

#### Biography

Shibstanding Diengngan completed his M.Sc. (Hort.) Fruit Science from University of Horticultural Sciences, Bagalkot, Karnataka and currently pursuing his Ph.D. at the Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia, West Bengal, India.

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