



Rice landraces for organic farming

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A 'Landrace' is described as an indigenous variety of a domesticated plant / animal species which has been developed largely by evolution process being adapted to natural environment in which it originates. In agro-ecosystem, landraces have specific traits such as adaptability to local conditions and constraints, which are not easily found in formal varieties. Therefore, landraces of crop plants are commonly referred to as 'traditional cultivars' or 'farmers' varieties" or 'local crop varieties' tends to adapt natural organic ecosystem. Many of these landraces provide valuable resource for plant breeding as well as for the preservation of genetic diversity. Landraces of agricultural crops are also possess diverse sources of genes for novel alleles with huge genetic variability which can be exploited to complement the gene pool of advanced genotypes.

Rice (*Oryza sativa* L) is one of the most important food crops grown worldwide and consumed more than half of the world population. India is home to number of rice varieties with rich diversity of wild progenitors of cultivated rice that possess medicinal properties of health food in terms of modern as well as old concept. Generally, three major categories of rice exist worldwide, which are traditionally classified as: *O. sativa* subsp. *indica*, subsp. *japonica* and subsp. *Javanica*. Genetic variability present among and between these rice landraces provides wider scope for future crop improvement programme. The use of adapted rice landraces, as the primary source of variation into which desired characters present in modern cultivars are introgressed may be an effective strategy for producing cultivars adapted to difficult production environments.

The demand for productivity and homogeneity in crops has resulted in a limited number of standard, high-yielding varieties and a loss of heterogeneous traditional local varieties (landraces), a process known as 'genetic erosion'. Landraces of rice crop maintained through traditional farming practices possess high genetic diversity and specific traits such as disease resistance, environmental constraint tolerance and nutritional quality which are often used in crop improvement. Many traditional rice landraces are adapted to local agro-environmental conditions which contribute to yield stability and hence, they continue playing an important role in traditional and subsistence farming. Thus, landraces of rice play a very important role in the local food security and sustainable development of agriculture.

The pedigree of rice landraces in different states of country are named variously in different localities; for example, Keteki Joha, Kola Kunkuni Joha in Assam; Navara in Kerala and Kathanellu, Kovuni Veeradangan in Tamil Nadu. Alike, numerous rice landraces are grown across the country, but to a limited extent due to their poor yield traits. Most of these rice landraces have evolved under diverse environmental conditions governing adaptation traits to tolerate cold, moisture stress and adapted to diverse soils. Therefore, these landraces are grown only in restricted pockets in the area of collection. Despite of few shortcomings, rice landraces are important commodity worldwide and command premium prices in local and international market over non-aromatic because of their superior grain quality and pleasant aroma.

Traditionally, aromatic rice landraces are grown by farmers purely under natural organic environments and researched at research institutes, maintaining a diverse gene pool of aromatic rice, which differs in various quality traits such as aroma, durability, grain shape and size, production potentialities, good cooking qualities and outstanding palatability. Considering all these unique features of traditional rice landraces, local farmers are conserving the precious landraces from generation to generation under natural organically growing environment. With the implementation of Green Revolution, the traditional rice landraces are facing serious threat of extinction due to their replacement with modern high yielding rice varieties or genetically engineered rice. However, in rice improvement program, characterization of landraces could help breeders to utilize appropriate characters for evolving new varieties. In this context, special drive is desirable for their collection, conservation and preservation of valuable rice landraces.

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