



## Phenotypic characterization of EMS induced mutants in wheat (*Triticum aestivum* L.)

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large number of reports of successful use of mutant phenotypes in deciphering the functional basis of a large number A of genes in model plant species, Arabidopsis thaliana has demonstrated the important role of mutant phenotypes in functional genomics. The latest developments in the field of wheat research such as wheat genome sequencing consortium would be opening up new avenues for wheat functional genomics. A new reverse genetics approach, TILLING (Targeting Induced Local Lesions In Genomes) offers a great opportunity in creating novel variability in crop species. Availability of mutant lines for various traits of importance in wheat would serve as an important component in understanding the functional and regulatory basis of genes. In this direction a new mutant population of Indian wheat cultivar DPW-621-50 derived through 0.7 % ethyl methanesulfonate (EMS) treatment was developed to establish a TILLING platform at DWR, Karnal. In the present study a sub set of 600 M2 plants were characterized for altered phenotypes in the field based on IPGRI wheat phenotype descriptors at vegetative stage, at heading, at maturity and after harvesting for grain and threshability characters. A significant variation in plant height, tiller number, growth habit and spike features were also observed. The plant height varied from ultradwarf (15 cm) to normal semi dwarfs (90 cm) whereas spike length was ranged from 2cm to 18 cm. Variations for grain size, shape and colour of the grain were observed. The most frequently observed phenotype was low/partial fertility followed by unfilled/ shrivelled grains. Appearance of more than one type of abnormalities on a single M2 plant was largely observed. In conclusion the study identified altered phenotypes for a large number of traits which could find a possible role in breeding for wheat improvement in addition to serving the process of understanding the functional basis of genes. Several of the favourable phenotypes such as openness of spikelet's could possibly find a role in hybrid wheat development and high tillering, high spike length, high grain number could be of great use in breeding for yield enhancement.

## **Biography**

Karnam Venkatesh has completed his MSc and PhD in Genetics (2005-2012) from Indian Agricultural Research Institute, New Delhi, and joined ARS of ICAR in 2010. Presently he is working as Scientist (Plant Breeding) at DWR, Karnal. His research areas include wheat genetic studies and wheat improvement for resource use efficiency especially 'N' use efficiency and is involved in development of superior wheat varieties for different cultivation conditions. He is PI of CRP-WHEAT funded project "Improving productivity of wheat through enhanced Nitrogen Use Efficiency". He is acting as reviewer of a number of Indian and International journals, and involved in technical editing.

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