



# Genetic variability and characters associations in the germplasm of wheat (*Triticum aestivum* L.) under rainfed conditions of Himalayas

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**Abstract :** Presence of genetic variability within available germplasm of wheat is essential to initiate and sustain wheat improvement using plant breeding methods. Field experiments were conducted during *Rabi* 2007-08, 2008-09 and 2009-10 with the aim of estimating variation in the germplasm and also to generate information on associations of yield components and their direct and indirect influence on the grain yield of wheat. Thirty three accessions were evaluated in Randomized Complete Block Design with three replications. Results shows that there were significant genotypic difference for seed yield per plant, 1000-seed weight, number of spikelets per spike, number of seeds per spike, spike length, plant height and days to 50 per cent flowering in all three years. Broad sense heritability estimates ranged from 0.35 for days to 50 per cent flowering to 0.78 for 1000-seed weight. Number of spikelets per spike, number of seeds per spike, spike length, and days to 50 per cent flowering had exhibited positive and significant correlation with seed yield. Number of seeds per spike, spike length, number of spikelets per spike, 1000-seed weight and number of days to 50 per cent flowering had positive and direct effects on seed yield.

**Key Words :** Wheat, Genetic variability, Heritability, Genetic advance, Correlation co-efficient, Path analysis

**View Point Article :** Vir, Om and Sultan, Sheikh M. (2013). Genetic variability and characters associations in the germplasm of wheat (*Triticum aestivum* L.) under rainfed conditions of Himalayas. *Internat. J. agric. Sci.*, **9**(1): 222-226.

**Article History :** Received : 12.08.2012; Revised : 14.10.2012; Accepted : 01.12.2012

## INTRODUCTION

Wheat (*Triticum aestivum* L.) is an important crop grown in Kashmir valley and other parts of India. Genetic variability, which is a heritable difference among cultivars, is required an appreciable level within a population to facilitate and sustain an effective long term wheat breeding programme. Progress from selection has been reported to be directly related to the magnitude of genetic variance in the population (Helm *et al.*, 1989; Hallauer and Miranda, 1995). Large amount of genetic variability has been observed to occur in the original accessions and races among sampled population representing different climatic and geographical regions (Illarslan *et al.*, 2002). Yield components and plant traits contribution on grain yield may be important for breeding strategies. Simple correlation analysis that relates grain yield to a single variable may not provide a complete understanding of the importance

of each component in determining grain yield (Dewey and Lu, 1959). Path co-efficient analysis allows an effective means of partitioning correlation co-efficients into unidirectional pathway and alternate pathways. This analysis permits a critical examination of specific factors that produce a given correlation and can be successfully employed in formulating an effective selection strategy.

Water is the main abiotic limiting factor in many wheat production areas in the India and especially Kashmir. Due to erratic spatial and temporal distribution of rainfall, it is important to have cultivars with superior yield performance under limiting and non-limiting soil moisture conditions. Thus, the objectives of the study were: i) to estimate the parameters of genetic variability, ii) to evaluate associations of yield components with grain yield and, iii) to determine direct and indirect effects of yield components on grain yield in wheat germplasm grown

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