**GENETIC VARIABILITY, HERITABILITY AND CORRELATION STUDIES IN DURUM WHEAT (*Triticum turgidum ssp. Durum* L.)**

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# ABSTRACT

This study was conducted to estimate heritability, selection response and phenotypic and genotypic correlation for morpho-yield traits in durum wheat (*Triticum turgidum ssp. Durum* L.). Fifteen durum wheat genotypes were evaluated in randomized complete block design at the Department of Plant breeding and Genetics, the University of Agriculture, Peshawar during 2020-21. Analysis of variance showed significant differences among durum wheat genotypes for all the traits. Durum wheat genotype DG2 was early in heading (114.6 days) and produced maximum number of spikes (396.6 m-2). Genotype DG7 was early maturing (158.0 days) and had maximum spike length (8.0 cm), more spike weight (4.1 g) and spikelets (22.0 spike-1). Maximum grains spike-1 were produced by genotype DG12 (64.3 grains spike-1), while maximum grain weight spike-1 was noticed for genotype DG10 (2.8 g). Highest spike index was recorded for genotype DG9 (76 %) and maximum 1000-grain weight was noticed for genotype DG1 (57.9 g). Genotype DG4 had more flag leaf area (30.9 cm2), high biological yield (11850 kg ha-1) and grain yield (5300 kg ha-1). Estimates of broad sense heritability and selection response for most of the studied traits were observed low to moderate in magnitude. Heritability for heading, maturity, spikes m-2, spike length, spikelets spike-1, grains spike-1, 1000-grain weight and grain yield was 0.71, 0.45, 0.47, 0.62, 0.73, 0.58, 0.59 and 0.58, respectively. Selection response for yield contributing traits such as spikes m-2, spike length, 1000-grain weight, biological yield and grain yield was 37.07 m-2, 0.54 cm, 3.85 g, 1010.85 kg ha-1 and 447.54 kg ha-1, respectively. Days to heading expressed significantly positive phenotypic and genotypic association with maturity (rp = 0.52\*, rg = 0.56\*) and significantly positive genetic relationship with spike weight (rg = 0.58\*), spikelets spike-1 (rg = 0.46\*) and grain weight spike-1 (rg = 0.60\*). Grain yield had significantly positive phenotypic and genotypic correlation with grains spike-1 (rp = 0.50\*, rg = 0.54\*) and biological yield (rp = 0.94\*\*, rg = 0.92\*\*). Harvest index also showed significantly positive correlation with spike index on phenotypic (rp = 0.49\*) and genotypic (rg = 0.66\*\*) level. Based on yield and yield related traits, genotypes DG3, DG4, DG6, DG7, DG9 and DG12 are recommended for further evaluation in different locations across many years. Extensive research is needed on yield and quality attributes of durum wheat to meet the quickly changing food preference in Pakistan for products like pasta, spaghetti and macaroni.