World Academy of Science, Engineering and Technology
International Journal of Agricultural and Biosystems Engineering
Vol:16, No:06, 2022

Phenological and Molecular Genetic Diversity Analysis among Saudi durum Wheat Landraces

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Abstract : Wheat landraces are a rich genetic resource for boosting agronomic qualities in breeding programs while also providing diversity and unique adaptation to local environmental conditions. These genotypes have grown increasingly important in the face of recent climate change challenges. This research aimed to look at the genetic diversity of Saudi Durum wheat landraces using morpho-phenological and molecular data. The principal components analysis (PCA) analysis recorded 78.47 % variance and 1.064 eigenvalues for the first six PCs of the total, respectively. The significant characters contributed more to the diversity are the length of owns at the tip relative to the length of the ear, culm: glaucosity of the neck, flag leaf: glaucosity of the sheath, flag leaf: anthocyanin coloration of auricles, plant: frequency of plants with recurved flag leaves, ear: length, and ear: shape in profile in the PC1. The significant wheat genotypes contributed more in the PC1 (8, 14, 497, 650, 569, 590, 594, 598, 600, 601, and 604). The cluster analysis recorded an 85.42 cophenetic correlation among the 22 wheat genotypes and grouped the genotypes into two main groups. Group, I contain 8 genotypes, however, the 2nd group contains 12 wheat genotypes, while two genotypes (13 and 497) are standing alone in the dendrogram and unable to make a group with any one of the genotypes. The second group was subdivided into two subgroups. The genotypes (14, 602, and 600) were present in the second sub-group. The genotypes were grouped into two main groups. The first group contains 17 genotypes, while the second group contains 3 (8, 977, and 594) wheat genotypes. The genotype (602) was standing alone and unable to make a group with any wheat genotype. The genotypes 650 and 13 also stand alone in the first group. Using the Mantel test, the data recorded a significant (R2 = 0.0006) correlation (phenotypic and genetic) among 22 wheat durum genotypes.

Keywords : durum wheat, PCA, cluster analysis, SRAP, genetic diversity
Conference Title : ICABSE 2022 : International Conference on Agricultural and Biological Systems Engineering
Conference Location : Dubai, United Arab Emirates
Conference Dates : June 27-28, 2022