PC-8

Multivariate Analysis of Agronomic Characteristics of Wheat (*Triticum* spp.) Germplasm

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[Abstract]
The purpose of this study was to evaluate agronomic characteristics and identify the useful traits to utilize the wheat genetic resources for breeding programs by understanding the phenotypic variation among germplasm through multivariate analysis. In this study, a total of 394 wheat accessions were characterized for 15 agronomic traits using the National Agrobiodiversity Center (NAC) descriptor list, of which 31 accessions from 6 species and 363 unidentified accession (*Triticum spp.*) available at the NAC, Rural Development Administration (RDA), Korea. Growth characteristics such as leaf width, culm length, spike length, spikelet length, solid stemmed, days to heading, days to maturity, grain-filing period, and also seed characteristics such as width, height, area, perimeter, circle, solidity, and germination percent were studied. Among the 15 agronomic characteristics, the germination percent showed the smallest variation between resources (CV = 0.4%), and the spikelet length (CV = 66.5%) showed the highest variation. A strong positive correlation was found between seed traits such as seed height and seed area (r = 0.90), seed height and seed perimeter (r = 0.87) and seed length and width (r = 0.80). Principal component analysis (PCA) was conducted and the first five principal components comprised 76.7% of the total variance. Among the first five PCs, PC1 accounted for 28.5% and PC2 for 20.0%. Wheat resources (394) were classified into four clusters based on cluster analysis, consisting of 215 resources(Ⅰ), 117 resources(Ⅱ), 48 resources(Ⅲ), and 14 resources(Ⅳ). Among the clusters, the resources belonging to Cluster III showed the lowest seed width, height, area, and perimeter characteristics compared to other clusters. The wheat resources belonging to cluster IV had small seed width and low germination percent, but took longer to form heads and mature than resources in other clusters. These results will serve as the basis for further genetic diversity studies, and important agronomic characteristics will be used for improving wheat, including developing high-yielding and resistant varieties to biotic and abiotic stresses via breeding programs.

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