

MORPHOLOGICAL DIVERSITY ANALYSIS OF SOME SORGHUM (*Sorghum bicolor*) GERMPLASM ACCESSIONS USING QUALITATIVE MARKERS

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Abstract

Sorghum (*Sorghum bicolor* (L.)) ranks fifth among cereals in terms of production and area planted worldwide. It is well adapted to the range of environmental conditions. This study was performed to evaluate the morphological diversity of some sorghum germplasm accessions based on qualitative traits. Twenty six sorghum germplasm accessions including sixteen local and ten foreign accessions (Italian and French) conserved at the seed gene bank of Plant Genetic Resource Center, Gannoruwa, Sri Lanka were characterized using morphological descriptors developed by the International Plant Genetic Resources Institute (IPGRI). The evaluation of these germplasm accessions was based on 4 binary and 10 multicategorical traits. Cluster analysis was performed using SAS software by following Ward minimum variance clustering method with the dissimilarity measure of Gower and Legendre. According to the pseudo- F and pseudo- t^2 criteria obtained from the cluster analysis based on qualitative data, the optimal number of clusters required to represent the genetic diversity among the studied sorghum germplasm accessions was seven. 'Cluster I' comprised of two foreign accessions with unknown origins. Three Italian and two French accessions were clustered in 'Cluster III' while the remaining three Italian accessions were grouped into 'Cluster IV'. Sri Lankan accessions were observed in 'Cluster II', 'Cluster V', 'Cluster VI' and 'Cluster VII'. Clustering pattern based on the qualitative traits depicts the geographical origin of the studied accessions. This can be explained by the fact that qualitative traits are less influenced by the environment. In principle, qualitative data are expected to provide additional information on hierarchical units. Observation of a considerably high number of clusters consolidates that principle. This study reveals sufficient genetic relatedness of studied sorghum germplasm accessions which will in the conservation and breeding programs of the crops.

Keywords: *Sorghum bicolor*, germplasm accessions, morphological diversity, qualitative traits

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