

Morphological diversity and performance of *Cleome gynandra* (L.) Briq. an African leafy vegetable germplasm collections

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Abstract

Cleome gynandra L., known by the common names spider plant or cat's whiskers is among other African leafy vegetables making a huge nutritional contribution to daily diets in many sub-Saharan Africa countries. Market demand for the vegetable is on the rise. However, its production is still based on low yielding farmers' cultivars. This is due to little research attention on the crop especially until very recently, hence scarce information regarding the extent of phenotypic variation within and among populations to enable genetic improvement programmes. This study, therefore, assessed the level of genetic diversity of the crop using 30 accessions obtained from six African countries based on phenotypic markers under field conditions in Jomo Kenyatta University of Agriculture and Technology in Kenya between October 2015 and February 2016. A randomized complete block design was used with four replications. The accessions were characterized for 24 variables – eight qualitative and 16 quantitative traits. These included stem, leaf and flower characteristics, plant height, primary branch number, internodes number, number of leaflets per leaf, fresh and dry stem mass, fresh and dry leaf mass, days to germination, days to flowering, days to silique formation, silique weight and number of seeds per silique. There were significant differences ($P=0.05$) among the accessions from the same country and also from different countries different locations in all the traits measured except for silique weight, and four main morphotypes were identified. Phenotypic variability was also observed within and among accessions. Significant correlations were found for some traits enabling the reduction of scored parameters in future trials. The hierarchical cluster analysis mainly revealed tendency of grouping of accessions from the same country with some accessions from different countries mixing. In view of the variations in the traits of accessions from different countries and also within accessions, these accessions could be used for future breeding and conservation programmes.

Keywords: Accessions, crop, *Cleome gynandra*, genetic diversity, phenotypic variation, spider plant.