

Morphological and Cytological Characterization of Some Turkish Okra (*Abelmoschus esculentus* L.) Landraces

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Aim of the study: Okra is widely grown throughout Turkey and there are many local varieties. Contrary to other okra producer countries in Turkey the okra pods are harvested 3-4 days after fruit set when pods are reached 3-5 cm length (immature). Mature pods of these landraces are considered not edible for their fibrous texture. Turkey has a considerable variety of okra because of its close ties to the two distribution centres of okra (India and Africa). Understanding of the genetic structure of okra and okra germplasm diversity will provide valuable information for okra breeding programs. In this study, morphological and cytological characterizations of twenty okra landraces were performed.

Material and Methods: Okra seeds were collected from different locations of Turkey between 2012-2013. The study was carried out according to randomized block design with three replications. Seeds were sown in field in May 2013. Morphological traits were observed up to July 2013. Observed morphological traits are plant height, general growth habit, leaf blade depth of lobbing, leaf blade colour, petiole length, petiole colour, pod diameter, pod length, number of pods per plant, number of carpels per pod, pod colour, time of flowering and time of first commercial harvest. Cytological examinations realized with karyotype analysis method in August 2015. Observed traits were subjected to analysis of variance firstly and significance scores according to $p < 0.001$ were examined. Significantly different traits were subjected to analysis of principal component (PCA) and hierarchical clustering analysis.

Results: In the present study, it was found that almost all the landraces were in the middle of the branching, but the tendency was stronger in the O1 local variety, whereas the leaf blade depth of lobbing were mostly medium (11 landraces) but some landraces showed shallow (5 landraces) and deep (4 landraces). Petiole lengths were classified as short (2 landraces, 8-12 cm), medium (11 landraces, 12-17 cm) and long (7 landraces, 17-23 cm), whereas petiole colours were found to be green in 18 local varieties and 2 local varieties in red. Local varieties with red petiole also produced red-coloured fruit, while the fruit colours of the other 18 local varieties became green. The carpel numbers of local varieties ranged from 5-8, with the majority (17 local varieties) producing 7 carpels and 5 carpels (6 local varieties). There are no significant differences between the landraces in the number of pods per plant, pod length and diameter, number of carpels per pod, number of days to first flowering and first commercial harvest. Significantly different traits were subjected to analysis of principal component (PCA) and hierarchical clustering analysis. PCA revealed four principal components (Eigen values > 1) and explain 76.367% of total variation between landraces. According to hierarchical clustering analysis landraces were clustered under two main groups (A and B) and two large subgroups (B1 and B2) in group B. According to karyotype analysis landraces have $2n=128$ chromosome.

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