

## Abstract

The objectives of this research were to estimate the genetic divergence among genotypes of *Jatropha curcas L* based on phenotypic traits; to determine the relative importance of the distinguishing traits of genotypes and indicate potential parents to establish an improvement program for early maturity and high yielding cultivars. Forty nine genotypes of *Jatropha curcas* collected from different regions of Kenya and around the world were studied for the following traits. Plant height, girth diameter, number of branches, leaf type, days to flowering (50%), and female: male flower ratio, number of fruits per plant and yield (kg), seed weight (100), seed moisture and oil content. For analysis of genetic divergence Mahalanobis' D<sub>2</sub> statistics, canonical variables and Tocher cluster method were used. The genotypes were grouped into four clusters.

Cluster III, IV, I and II comprised 20, 14, 9 and 6 genotypes, respectively. The analysis further indicated that the genotypes of common geographical origin or same location were grouped into different clusters, suggesting a lack of relationship between genetic and geographical diversity. The highest inter-cluster distance was observed between II and IV followed by I and III which may serve as potential parents for new gene combination. It has been shown that plant height, leaf type, branching and flowering contributed most to the genetic divergence among the genotypes.