

Background: The aim of this research was to estimate the genetic divergence among 49 genotypes of *Jatropha curcas* L. and to identify potential parental lines needed for breeding high oil and seed yielding cultivars. **Methodology:** The genotypes were studied for several agronomic traits including: plant height, days to flowering (50%), male:female flower ratio, number of fruits, seed yield, 100-seed weight and oil content. Genetic divergence was measured using Mahalanobis' D^2 statistics and Tocher cluster methods. **Results & conclusion:** The most diverse genotypes were those from different geographical origins, suggesting a relationship between genetic and geographical diversity. Hybridization of genotypes from East Africa with those from Madagascar and Mexico would generate high-level genetic divergence.