

Genetic diversity analysis of *Jatropha curcas* (L.) Lines in Zimbabwe

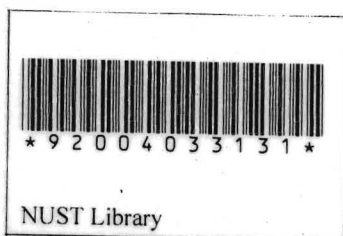
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**A dissertation submitted in partial fulfilment of the requirements for the
degree of Master of Science Applied Microbiology and Biotechnology in the
Department of Applied Biology and Biochemistry, Faculty of Applied Sciences**

National University of Science and Technology

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October 2012



Abstract

Jatropha curcas has gained popularity as a potential biofuel crop but major constrain for improvement of the crop for yield and seed quality traits is the narrow genetic base of the germplasm. The study was carried out to evaluate the genetic diversity of 19 *Jatropha curcas* lines collected randomly across Zimbabwe. RAPD markers were used to detect polymorphism across 19 *Jatropha curcas* accessions. Accessions collected from different geographical regions and 8 random primers were screened to assess polymorphism. Five primers were amplified and 13 polymorphic bands were found out of 18 scored. Thirteen polymorphic bands accounts for 72.22 % polymorphism across the genotypes. On average 3.6 bands per primer of which 2.6 were polymorphic. Jaccard's coefficient of similarity index varied from 0.50 to 1.00 indicative of high levels of genetic variation among the genotypes studied. Cluster analysis of data using UPGMA algorithm (Figure 4.5) placed the 19 accessions into 2 main clusters, with cluster 2 divided into 2 sub-clusters. The result provides valid guidelines for the collection, conservation and characterization of *Jatropha curcas* genetic resources. In this study it was found that most of plants were propagated from cuttings have low genetic diversity as compared to those propagated from seeds. Since most of Mtoko accessions were grouped in cluster 2 with the exception of Mt 12 compared with other accessions from Pabora, Mrehwa, Marange, Bulawayo, Chegutu and Harare, which were propagated from seeds at NUST. Famers are encouraged to use seeds, distant crops in their breeding programes and avoiding asexual propagation of *Jatropha* since this might produce plants with low seeds yield, susceptible to pests, diseases and drought. The genetic diversity information obtained in this study might be used together with *Jatropha* life cycle studies and *Jatropha* farmers' knowledge to produce *Jatropha* varieties suitable for biodiesel projects. If a larger sample was used together with both morphological and molecular markers (Isozymes and other DNA based markers), this research was going be the standard for other molecular diversity studies on *Jatropha curcas* in Zimbabwe.