Morphological, Genetic and Chemical Fruit Characterisation of Baobab (*Adansonia digitata* L.) Accessions from Kenya

Molly Murage[1], Katja Kehlenbeck[1], John Wanangwe[1], Ken Njogu[1], Charles Waruhiu[1], Remmy Kasili[2], Barbara Stadlmayr[1]

[1] *World Agroforestry Centre (ICRAF), Tree Diversity, Domestication and Delivery, Kenya*
[2] *Jomo Kenyatta University of Agriculture and Technology, Institute of Biotechnology Research, Kenya*

Abstract

Baobab (*Adansonia digitata* L.) is an important multipurpose fruit tree occurring throughout semi-arid and sub-humid sub-Saharan Africa. Its most important product, the fruit pulp, is an excellent source of vitamin C and several minerals. In Kenya, baobab is underutilised and markets for its products are poorly developed. This can be partly attributed to the lack of documentation of the species' morphological and genetic diversity and of its nutritional value in Kenya. The study's objective was to determine the morphological and molecular variation among baobab populations sampled across Eastern and Coastal Kenya and to assess the nutrient content of fruit pulp from the same trees.

Sixty-four baobab trees were sampled for the study. Morphological fruit characterisation was done using a baobab descriptor list developed according Descriptor for Mango (IPGRI, 2006) including qualitative and quantitative traits. Nutritional analysis was done using official AOAC methods. Molecular analysis was performed using leaf material and simple sequence repeat (SSR) primers.

Cluster analysis of the morphological variables using minimum variance method resulted in three different clusters. Cluster 1 grouped accessions with very big fruits from the Coastal region, cluster 2 accessions from the inland and cluster 3 accessions with small fruits from both inland and the coast. Fruit weight, pulp weight, fibre weight and number of seeds per fruit were the variables most responsible for cluster formation. The highest fruit and pulp weights were observed in cluster 1 (means 515 g and 103 g, respectively). Fruits in cluster 3 had the lowest fruit and fibre weights (means 106 g and 2 g, respectively), while pulp weight and number of seeds were lowest in cluster 2 (means 20 g and 69 g, respectively). Nutrient analysis showed that there were no significant differences in vitamin C, calcium and iron contents among the three clusters. Among all accessions, the range for vitamin C content was 45–155 mg/100 g edible portion, for calcium 213–538 mg and for iron 0.7–3.0 mg. Molecular analysis is still on-going and results will be presented at the conference. Findings of this study will assist in selecting superior mother trees for future baobab domestication and improving baobab production in Kenya.

Keywords: Cluster analysis, diversity, domestication, fruit, nutritional value

Contact Address: Katja Kehlenbeck, World Agroforestry Centre (ICRAF), Tree Diversity, Domestication and Delivery, United Nations Avenue, 00100 Nairobi, Kenya, e-mail: k.kehlenbeck@cgiar.org