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Morphological Characterisation of Baobab Fruits from North and West Kordofan Provinces, Sudan

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Abstract

Adansonia digitata L. (Malvaceae) is an iconic tree of the savannahs of sub-Saharan Africa. The edible fruit is known for its high nutritional values in pulp and seeds. The high morphological variability, particularly of fruits, offers a potential for domestication and development of improved materials. However, the variability in morphological fruit traits of Sudanese baobab has not yet been thoroughly documented. This study aimed at characterising the intra-specific diversity of baobab fruits collected from North and West Kordofan provinces, Sudan. Within the frame of the BAOFOOD project funded by the German BMEL, 93 trees were sampled from two transects (each 30×90 km) during two harvest seasons 2016–17 and 2017–18. From each tree, 10–20 representative fruits were collected and characterised based on the publication 'Descriptors for Baobab'.

Mean fruit length per accession ranged from 8.6 to 43.7 cm (total median 15.7 cm) and mean fruit weight from 46 to 403 g (median 128 g). Overall median pulp weight per fruit was 24 g (range 7–122 g per accession), while overall median pulp and seed proportions from whole fruit weight were 18 and 38 %, respectively. For 13 accessions we found a very high pulp proportion (22–30 %) and for 13 a very high seed proportion (46–53 %). Fruit shape was predominantly ellipsoid (51 %) with acute apex. Less frequent shapes were oblong-ellipsoid (10 %), oblong-globose (8 %) or oblong (6 %). Pulp taste, based on the four traits sweetness, sourness, bitterness and aroma, was highly variable, but 23 % of the sampled accessions had a sweet taste. Fruit length was positively correlated with fruit weight, pulp weight and pulp proportion (r=0.587***, r=0.672*** and r=0.450***, respectively). Fruit length and weight as well as pulp weight and seed proportion were significantly higher in accessions from North as compared to West Kordofan, while pulp proportion did not differ. The morphological variability among our sampled accessions is substantial as expected; nevertheless, the morphological data will be further compared with genetic data. Our study shows that trees possessing highly valuable characteristics such as sweet pulp taste, big fruits, high pulp and lower seed content are available in Kordofan for future use in domestication programmes.

Keywords: Diversity, domestication, fruit length, pulp proportion, pulp taste

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