

# MORPHOLOGICAL CHARACTERISATION OF BAOBAB FRUITS FROM NORTH AND WEST KORDOFAN PROVINCES, SUDAN

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## BAOBAB, *Adansonia digitata* L.

- Multipurpose tree, not yet commercially cultivated
- Edible fruit pulp, seeds (for oil) and leaves - high nutritional values
- High morphological variability, particularly of fruits
- Variability in morphological fruit traits poorly documented in Sudan [1]

## OBJECTIVES

Characterising the intra-specific variability of baobab fruits from North and West Kordofan provinces, Sudan

- ➔ Identify superior mother trees for domestication and the sustainable cultivation of improved trees for commercial use

## METHODOLOGY

- 93 trees with fruits sampled from two regions: North and West Kordofan
- From each tree (Fig. 1), 10-20 representative mature fruits collected
- Characterized based on the publication 'Descriptors for Baobab' [2]

## RESULTS

### 1. Quantitative traits:

Mean fruit length: 8.6-43.7 cm (median 15.7 cm)  
 Mean fruit weight: 46-403 g (median 128 g)  
 Median pulp weight per fruit: 24 g (range 7-122 g)  
 For 29 accessions high pulp proportion (20-31%)  
 For 15 accessions high seed proportion (46-53%)

➔ Fruit length, diameter and weight were significantly higher in accessions from North as compared to West Kordofan, while pulp and seed proportion did not differ (Table 1)

### 3. Selection of best mother trees:

Two trees have very heavy fruits with much pulp, however not sweet, but two other trees have heavy fruits with much pulp of sweet taste (Fig. 3)  
 ➔ domesticate these two

### 2. Qualitative traits:

Fruit shape mainly ellipsoid (51%), oblong-ellipsoid (10%) or oblong-globose (8%) (Fig. 2)  
 Pulp taste was highly variable, 23% of the accessions had a sweet taste

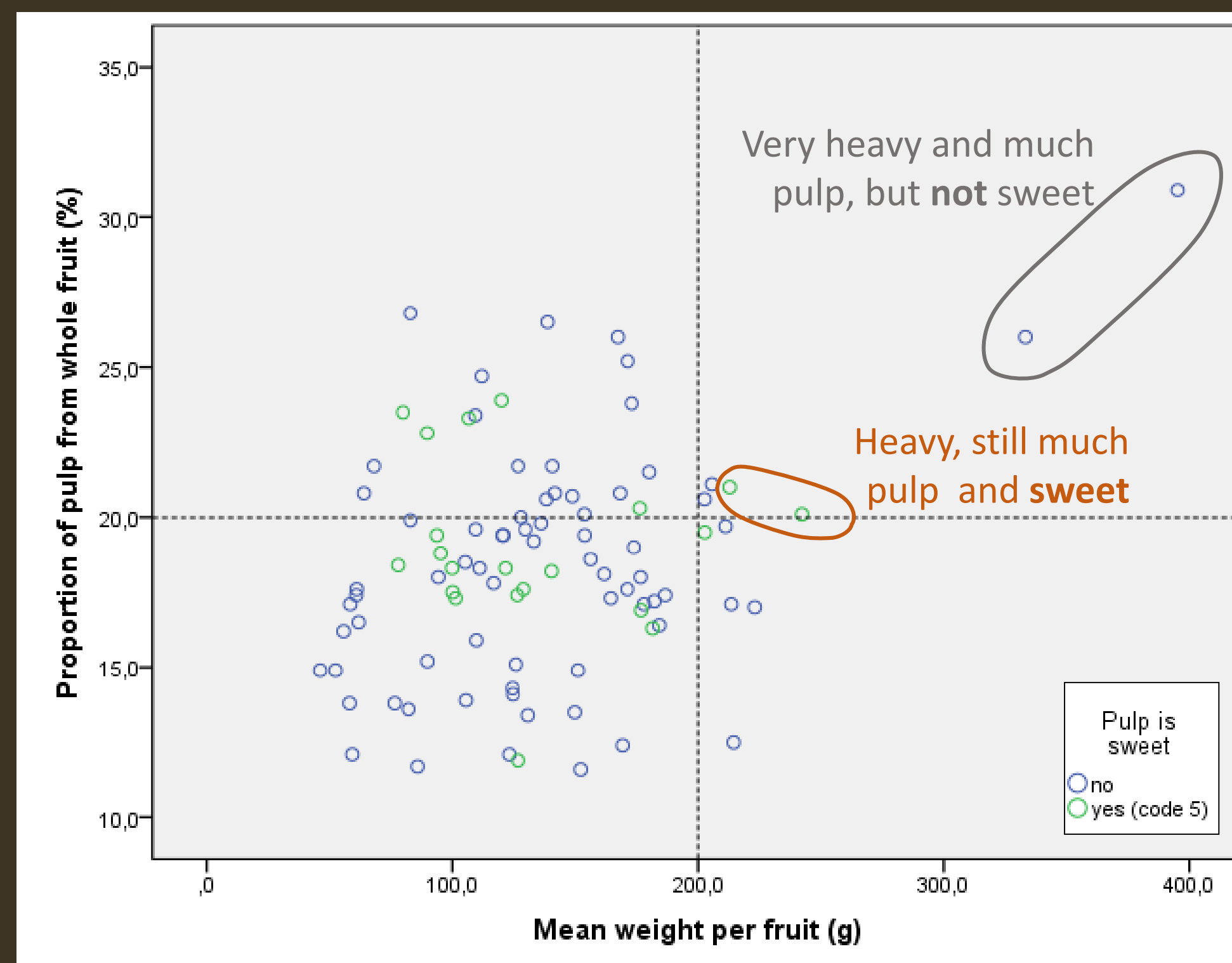


Fig 2. Baobab fruits sampled in West Kordofan. On the left: fruits with ellipsoid shape, acute apex. Mean fruit length 20.1 cm, mean fruit weight 169.2 g. On the right: fruits with globose shape and depressed apex. Mean fruit length 8.6 cm, mean fruit weight 85.9 g.

Fig 3. Scatterplot of mean fruit weight and pulp proportion of each of the 93 baobab trees sampled in North and West Kordofan, Sudan. The accessions are marked by different colours for fruit pulp sweetness. The minimum weight (200 g) and pulp proportion (20%) for selecting superior mother trees for domestication are given as dotted lines.

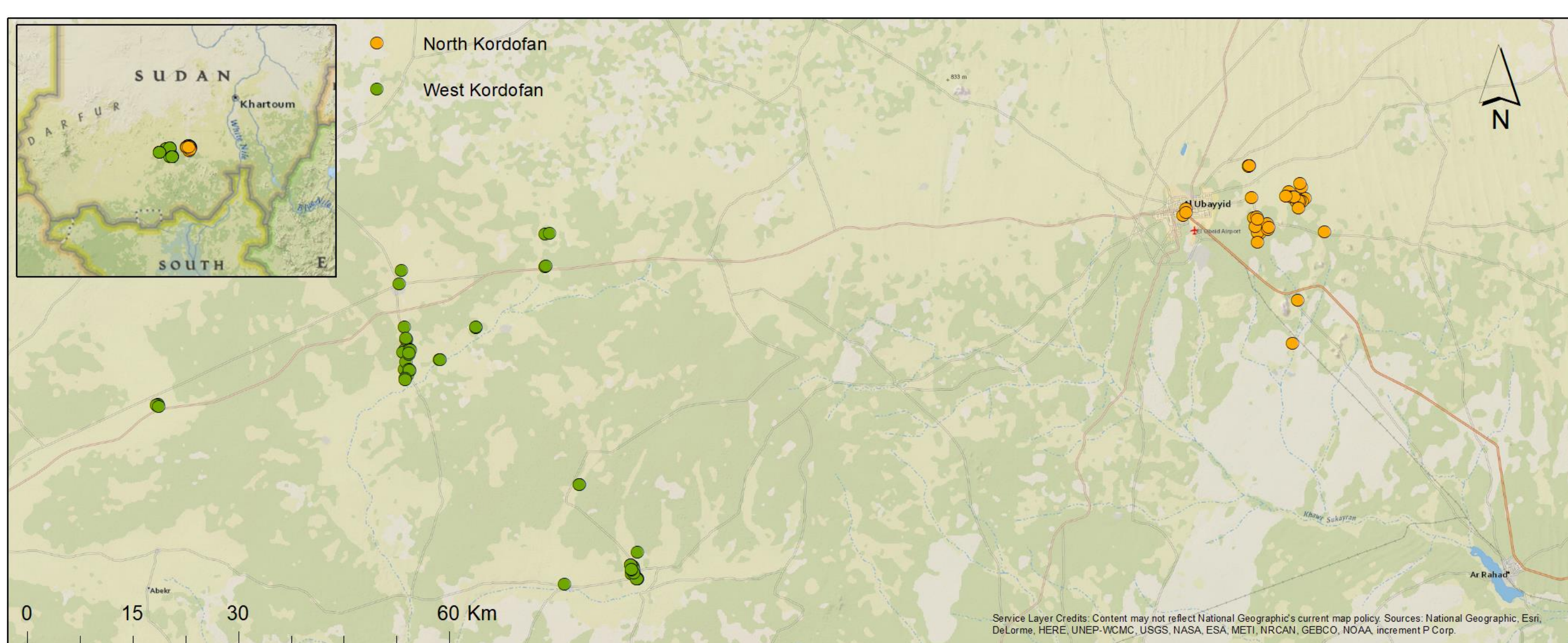


Fig 1. Map showing sampled baobab trees for fruit morphological characterization in North (orange circles) and West Kordofan (green circles), Sudan

Table 1. Fruit morphological characteristics of 93 baobab trees from two provinces – North and West Kordofan, Sudan.

Province	N	Fruit length [cm]	Fruit diameter [cm]	Fruit weight [g]	Seed Proportion [%]	Pulp Proportion [%]
North Kordofan	35	17.8 ± 5.8 <sup>a</sup>	8.1 ± 1.0 <sup>a</sup>	152.8 ± 56.4 <sup>a</sup>	19.0 ± 3.5 <sup>a</sup>	39.9 ± 6.0 <sup>a</sup>
West Kordofan	58	15.3 ± 3.7 <sup>b</sup>	7.3 ± 1.3 <sup>b</sup>	125.9 ± 55.1 <sup>b</sup>	18.2 ± 3.9 <sup>a</sup>	37.2 ± 7.3 <sup>a</sup>
Total	93	16.2 ± 4.7	7.6 ± 1.3	136.0 ± 56.8	18.5 ± 3.8	38.2 ± 6.9

Mean values and ± standard deviation. One-Way ANOVA test: means followed by the same letter within a column are not significantly different from each other at P < 0.05

## CONCLUSIONS

- Substantial morphological variability among the sampled trees
- Morphological data will be further compared with genetic data
- ➔ Trees possessing highly valuable characteristics such as **sweet pulp taste, big fruits, high pulp & low seed content** are available in Kordofan for future use in domestication programmes

## REFERENCES:

- [1] Gebauer J et al. (2016) Africa's wooden elephant: the baobab tree (*Adansonia digitata* L.) in Sudan and Kenya – a review. Genetic Resources and Crop Evolution 63: 377-399.  
 [2] Kehlenbeck K et al. (2015) Descriptors for Baobab (*Adansonia digitata* L.). Bioversity International, Rome, Italy and World Agroforestry Centre, Nairobi, Kenya.