Population structure and tree densities of baobab (Adansonia digitata L.) in Kilifi County, Kenya

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1. Introduction
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1. a) Characteristics of the baobab tree (Adansonia digitata L.):
- Wild fruit tree of the drier parts of sub-Saharan Africa (Fig. 1a)
- Fruit pulp (Fig. 1b) is highly nutritious (e.g. vitamin C, Ca, Fe), leaves (Fig. 3c) could be eaten as vegetable.
- Sale of raw and processed products such as ‘mabuyu’ sweets contributes to cash income generation in Kenya, particularly for women (Fig. 1d, e)

1. b) Challenges regarding sustainable baobab production:
- Species is neglected in Kenya, little information available on the resource base and its use (Gebauer et al. 2016)
- All produce collected from wild trees → resource could be over-utilized, possibly unsustainable harvest practices
- Baobab pulp approved Novel Food in EU and USA and regarded as ‘superfood’ → increasing demand from international markets → threat to the natural resource base?

Objectives of the study:
- To assess the resource base of baobab in Kilifi, Kenya
  a) Population health: are there enough young baobabs for regeneration?
  b) Tree densities: are there patches of dense baobab stands?

2. Material and methods
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- Region with important baobab populations selected in Kilifi County, coastal Kenya (southwestern part) (Fig. 2)
- 14 quadrats of 500 x 3000 m randomly laid into research region along the road C 107 from Kilifi to Mariakani
- All baobabs within quadrats documented and recorded with height and stem diameter at breast height (DBH)
- Data collection finished in three out of 14 quadrats (Fig. 3)
- Densities of young (DBH<1 m) and mature (DBH≥1 m) baobabs calculated
- Size class distribution curves developed

3. Results and discussion
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3.1. Mapping of baobab populations
- Total of 210 baobab trees documented in the three quadrats inventoried (total area 4.5 km²)
- Relatively high baobab density: mean 0.47 trees per hectare
- DBH ranged from 0.16 to 4.97 m (mean 1.5 m)
- Tree height ranged from 3.4 to 22.5 m (mean 14.7 m)
- High density baobab stands identified south-west of Kilifi (Fig. 3)

3.2 Population structure
- Lack of young trees: only 53 of the 210 documented trees were young (DBH<100 cm), while 108 trees were of intermediate age (DBH 100-199 cm) and 48 trees were old (DBH ≥200 cm) (Fig. 5)
- Quadrat 3 had a higher proportion of young trees than quadrats 1 and 2 (36.1% versus 13.0 and 18.2%) (Fig. 6)
- Very young trees (<2 m tall) difficult to detect during inventory, help of farmers needed

4. Conclusions
- Few high density areas of baobab populations around Kilifi.
- Lack of rejuvenation may lead to instable populations (but more data needed from the remaining quadrats, reasons for differences in % of young trees among plots to be identified).
- Results used to develop recommendations for sustainable resource management, which is a prerequisite for enhanced utilization and commercialisation of baobab in the region.

References:
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