# Fungal flora associated with cankers and dieback of *Adansonia digitata* and *Sclerocarya birrea* under domestication in Eastern Kenya

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## INTRODUCTION AND OBJECTIVE

- Baobab (*A.digitata*) and Marula (*S.birrea*) are trees indigenous in the African drylands that produce highly nutritious fruits.
- Domestication is aiming to ensure sustainable supply for local use and commercial markets.
- Domestication trials in Eastern Kenya are impacted by stem cankers and diffuse canopy dieback, but limited knowledge is available on the associated microflora.
- We aim to characterize fungal flora associated with stem cankers and dieback in *A. digitata* and *S. birrea* under domestication in Kenya.


**Figure 1**. *Sclerocarya birrea* tree (a) and branch/stem cankers producing exudate (b and c), canker of *Adansonia digitata* (d).

## METHODOLOGY

- We sampled leaves, twigs and tissues from cankers and branches showing dieback, from Kitui and Kibwezi field genebanks in Eastern Kenya.
- Following isolation (MEA), we incubated plates at 25°c until growth was observed, and sub-cultured colonies to obtain pure cultures.
- We characterized fungal isolates based on morphology and comparisons of DNA sequence data of ITS region.
- We completed phylogenetic analysis (MUSCLE, mega 7), inferred evolutionary history (Neighbor-Joining method) and computed evolutionary distances (Maximum Composite Likelihood method).
- Statistical analysis was performed using analysis of variance (ANOVA), with GenStat v.19.

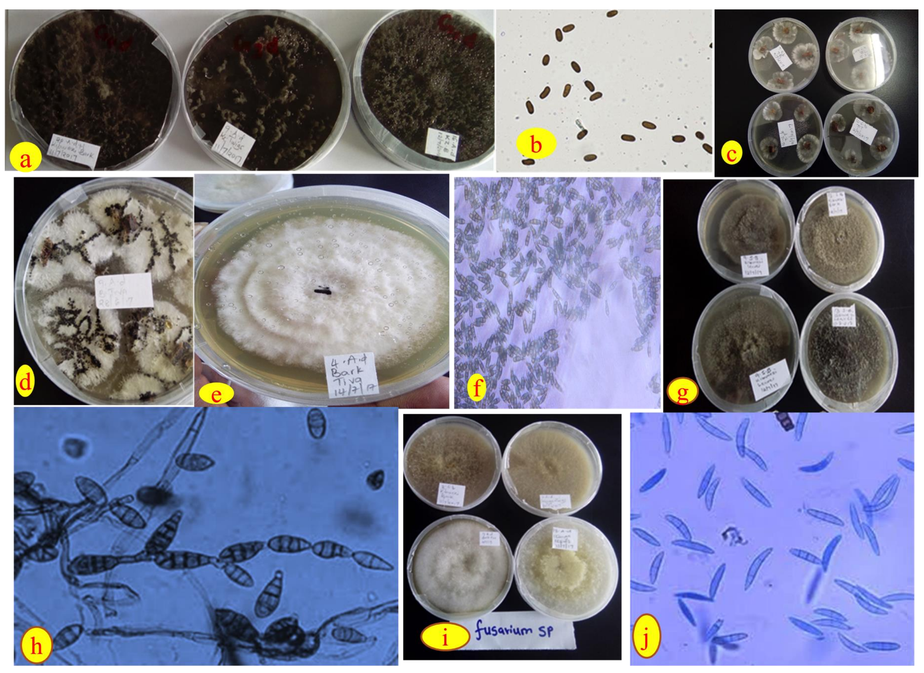
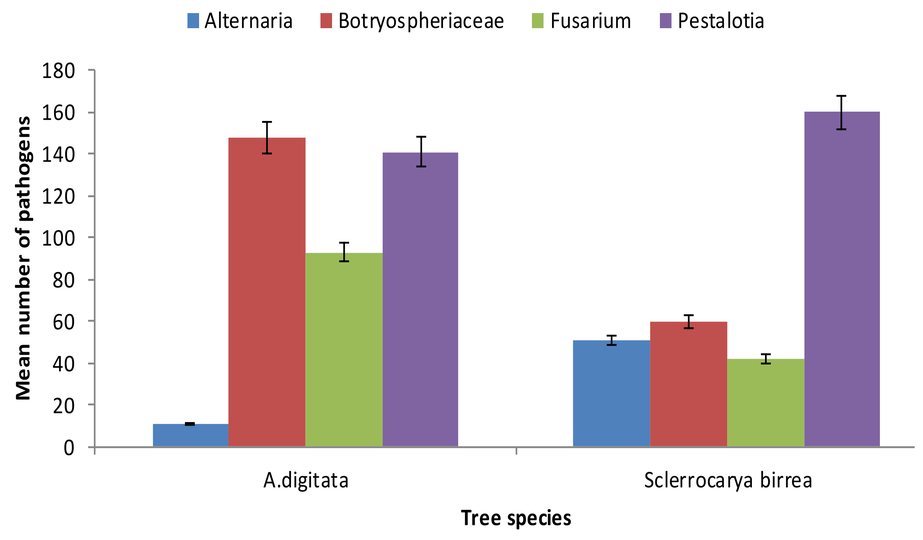



**Fig. 2**. Fungal cultures (a) and spores (b) of Botryosphaeriaceae spp. Isolation plates (c), sporulating colonies (d), pure cultures (e) and spores (f) of *Pestalotiopsis* spp. Cultures (g) and spores (h) of *Alternaria* spp. Cultures (i) and spores (j) of *Fusarium* spp.

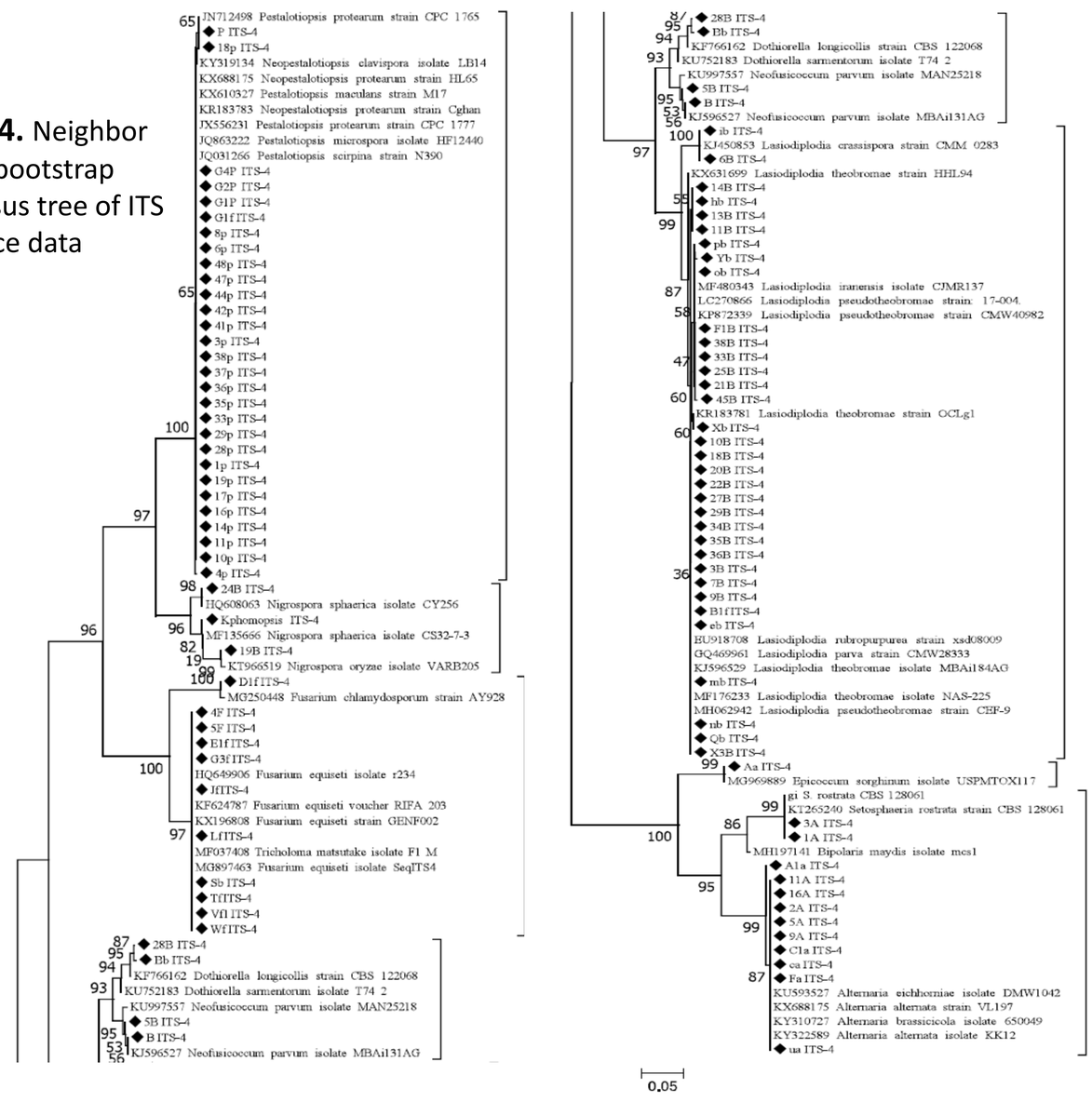
**Fig. 3** Number of colonies isolated from *A.digitata* and *S. birrea*.




## RESULTS

- We identified 21 fungal species comprising of Botryosphaeriaceae, Pestalotiopsis, Fusarium and Alternaria based on morphology (Fig 2) .
- 47% of total isolates being family Botryosphaeriaceae. 30% being Pestalotiopsis ,20% Fusarium and 3% Alternaria (Fig.3).
- Pestalotiopsis occurred frequently on *S.birrea(68%)* while Botryosphaeriaceae occurred predominantly on *A.digitata(48.3%).*
- Analyses suggest that the two tree species shared pathogens with other plants, with Botryosphaeriaceae having a wide host range.
- Phylogenetic analysis identified 21 fungal species belonging to five clades and representing five fungal families (Fig. 4).

**Figure 4.** Neighbor joining bootstrap consensus tree of ITS sequence data




## CONCLUSION AND FUTURE DIRECTIONS

- Endophytic nature of fungal pathogens identified suggests potential seed-born pathogenicity.
- Environmental stress triggered by climatic variability could increase susceptibility of potential hosts and possibly widen pathogens' host range.
- Further studies should address host-pathogen dynamics and seed-borne nature of diseases.
- Routinely assessment of genebanks health status should be carried out to ensure the suitability for production of high quality seeds.

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