



## Population structure, density and natural regeneration of *Boswellia Papyrifera* (Del.) Hochst in Dry woodlands of Nuba Mountains, South Kordofan State, Sudan

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### Introduction

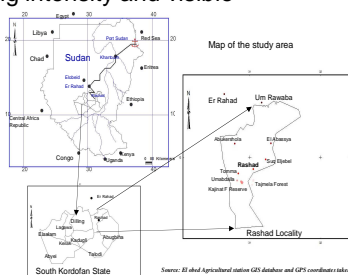
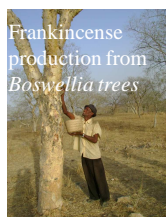
*Boswellia papyrifera* (Del.) Hochst

- Dryland deciduous tree species
- Family Burseraceae
- Diverse socioeconomic and ecological importance
- **Uses:** pole, timber, livestock fodder, nectar for honey bee, traditional medicines, desertification control, and source of frankincense or "olibanum" by tapping the stem
- **Frankincense** : source of essential oils used in, among others, cosmetic and pharmaceutical industry
- Frankincense production provides employment and foreign income earnings.

### Objectives

Quantify the density and population structure of *B. papyrifera*;

Analyze the natural regeneration status of the species; & Examine the impact of tapping intensity and visible damages on the trees.



### The problem

- Lack of systematic studies that examine the population status of the species= lack of proper management and conservation
- Degradation of the resource base



### Material and methodology

**Study area:** Rashad locality, Nuba mountains region, Southern Kordofan state of the Sudan

• 10°- 13° N and 29°-33° E

• **Vegetation assessment** in two *Boswellia* stands in reserved (Kajinat) and unreserved forests= and Tajmala forest

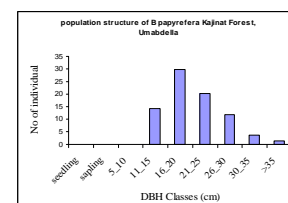
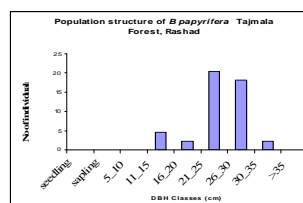
• 31 sample plots (20 X 20 m ) laid at regular interval along parallel transects

• smaller sample plots (5 X 5 m) nested in the center of each plot for regeneration count.

### Result and discussion

- Density of *B. papyrifera* 81 ± 79 trees ha<sup>-1</sup> in Kajinat forest Reserve and 52 ± 50 trees ha<sup>-1</sup> in Tajmala forest
- Higher frequency of occurrence ( 80 % and 82 %)
- Regeneration: No seedlings and saplings of the species were encountered in sample plots
- Population structure: dominated by mature individuals and lack of juveniles and recruitment= declining population
- High mortality rate: 17 trees ha<sup>-1</sup> were observed dead
- Intensive tapping more than 12 tapping spots in 43 % of standing trees
- Symptoms of insect attack were also observed on 17% of *Boswellia* trees in the sample plots

	Av.density of <i>B. papyrifera</i> (trees ha <sup>-1</sup> )	Density of all tree spp (trees ha <sup>-1</sup> )	Frequency of occurrence (%)
Kajinat forest reserve	81 ± 79	126 ± 78	80
Tajmala forest	52 ± 50	87 ± 52	82



**Threats to the population of the species:** Insect attack, improper tapping, intensive tapping, grazing

### Conclusion

The population of *B. papyrifera* in the study areas is unstable & under threat due to lack of natural regeneration and recruitments

The current production system has resulted in degradation of the resource – proper management plan is required

The situation calls urgent actions for conservation of the species



Browsing of barks by livestock



Intensive tapping



Symptoms of insect attack