

Vegetative Propagation Study Using IAA on some of Sudanese Forest Trees in Kordofan, Sudan.

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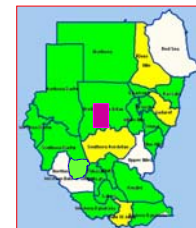
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Introduction:

Vegetative propagation provides an alternative source of planting stock for a wide range of useful indigenous species. The research was carried in Kordofan state, which is characterized by sparsely vegetated as a result of extended drought and the excessive exploitation of natural resources by man and livestock, deforestation and desertification. The vegetation is exposed to extreme conditions and must survive drought, which stretch over several years with little or no rain. Vegetative propagation techniques are greatly facilitate the domestication process, by enabling the rapid multiplication of selected genotypes and the production of superior planting stock for farmers information on how to propagate species of great value to reforestation, economical and social benefits. Five tree species were selected for this study (*Acacia senegal*, *Acacia seyal* var. *seyal*, *Grewia tenax*, *Acacia tortilis* and *Boswellia papyrifera*). *Acacia senegal*, *Acacia seyal* var. *seyal* and *Boswellia papyrifera* trees are used for gum tapping by local population. While *Grewia tenax* and *Acacia tortilis* are used for afforestation and shelter belts against sand encroachment.

Study area:

The study was conducted in North Kordofan State-Sudan, in Semi-desert and Low Rainfall Savanna Zone, which is facing degradation of the forest resources and sand-dune formation. The state is located between latitude 12-14° N and 16-38°E. North Kordofan receives an annual precipitation of about 280 – 450 mm in the months from July to September. Temperature is generally high averaging 37°C in the summer and 18°C in the winter. The vegetation cover of the area is composed of different trees such as *Acacia senegal*, *Adansonia digitata*, *Balanites aegyptiaca*, *Boscia senegalensis* and *Grewia tenax*.



Location of the study area

Objectives:

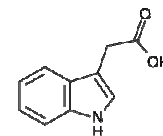
The objective is to investigate the vegetative propagation by cuttings from adult of five indigenous trees (*Acacia senegal*, *Acacia seyal* var. *seyal*, *Grewia tenax*, *Acacia tortilis* and *Boswellia papyrifera*) using different concentrations of plant growth regulator (Indole Acetic Acid).

Material and methods:

The study used the propagation by stem cuttings, which is the most commonly used method to propagate many woody plants. The work was carried out by complete randomized block design with three treatments, two concentration of the IAA (C₁₀H₉NO₂) (1000 ppm, 1500 ppm) and the control. Each treatment was applied to 45 cuttings divided into three replicates. Cuttings were taken in early morning from selected adult trees (5-7 years old) with length of 15 cm and diameter ranges from 1-1.5 cm. Then were planted in pure sandy soils in well-drained earthenware pots

And put in a normal room temperature in the nursery. The data was analysed with analysis of variance.

Indole acetic acid is a growth regulator, it may promote cell division in the growing stage of plant. Hence, it is mainly applied to facilitate mature, step-up output, break quiescence, encourage germination and cultivator.



Indolyl-3-acetic acid

Results:

The results showed that the IAA growth hormone generally accelerated and enhanced the budding and rooting of some the cuttings, but the effect of the IAA is different among forest tree species.

The appearance of shoot and root growth in forest trees cuttings

Tree species	IAA (1000 ppm)		IAA (1500 ppm)		Control	
	Root	Shoot	Root	Shoot	Root	Shoot
<i>Acacia senegal</i>	-	-	-	+	-	+
<i>Acacia seyal</i>	-	+	-	+	-	+
<i>Boswellia papyrifera</i>	-	+	+	+	+	+
<i>Grewia tenax</i>	-	+	-	+	-	+
<i>Acacia tortilis</i>	-	+	+	+	+	+

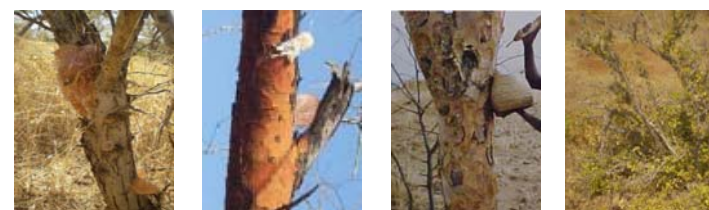
+ Positive result - Negative result

The cuttings of all trees gave shoot with 100% with control and the IAA (1000 ppm). While the roots appeared only in *Boswellia papyrifera* and *Acacia tortilis*.

The highest value of shoot length was recorded in *Grewia tenax* (9.6 m in 1500 ppm IAA) and *Acacia senegal* (4.2 cm in control).

The shoot length growth of forest trees cuttings (in cm)

Tree species	IAA (1000 ppm)	IAA (1500 ppm)	Control
<i>Acacia senegal</i>	0.0	2.4	4.2
<i>Acacia seyal</i>	4.1	3.3	3.0
<i>Boswellia papyrifera</i>	3.0	2.6	3.0
<i>Grewia tenax</i>	2.6	9.6	3.6
<i>Acacia tortilis</i>	3	2.3	2.6

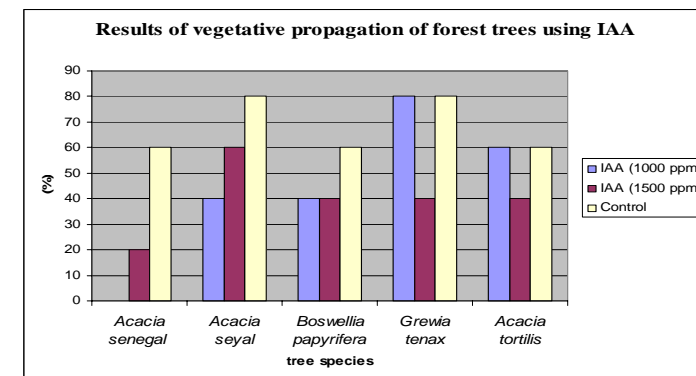


Gums of *Acacia senegal*

Gums of *Acacia seyal*

Tapping of *Boswellia papyrifera*

Grewia tenax tree



Conclusion:

- This preliminary results have shown that vegetative propagation of these five tree species by stem cuttings using IAA is possible, in spite of a not very high rooting capacity of this species.
- Recommendation may be made for using IAA in forest trees propagation under different concentrations, tree ages and environmental conditions.