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Short Communication

Macropropagation of *Ocimum gratissimum* L: A multi purpose medicinal plant in Nigeria

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The purpose of this study was to determine optimum macropropagation method for *Ocimum gratissimum*, a multi purpose medicinal plant. The result showed that significant differences exist as influenced by seed sowing depth and type of soil. Seed sown at 1 cm depth in humus rich topsoil had 80% germination as against 26.3% from river sand of the same sowing depth. The surface sowing in humus rich topsoil had 33.3% while 23.3% was obtain from surface sowing in river sand. The total plant height was 30.6 cm from humus rich topsoil and 27.4 cm from river sand. Other parameters are mean number of leaf production which was 24.0±0.05 from humus rich topsoil and 12.0±0.04 from river sand both from seedlings of 1 cm depth of sowing. For seedlings from surface sowing mean leaf production was 20.8±0.02 and 10.07±0.01 from humus rich topsoil and river sand, respectively. Evidence from the study led to the conclusion that humus rich topsoil and seed sowing depth of 1 cm are the most suitable method(s) of propagating *O. gratissimum*.

Key words: *Ocimum gratissimum*, macropropagation, medicinal plant.

INTRODUCTION

Ocimum gratissimum belong to the family Labiatae and grows mostly in southern Nigeria and wet part of the tropics. It is known in English as the tea bush. In Yoruba it is called efinirin ajase, in Urhobo it is called ufuo-yibo and in Hausa it is known as Aai doya ta gida (Gill, 1992). The plant has pleasant smell which gives it the common name of scent leaf plant. Ethnomedicin practitioners largely use this plant for a variety of purposes.

The plant is reported to contain the terpenoids eugenol and thymol, saponins and alkaloids (Gill 1992). Aromatic oil from the leave consists of thymol (32 – 65%). The plant has multipurpose uses. The leafs dried or fresh are used as insect repellant, smell disguiser and for colic pains (Adebolu and Oladimeji, 2005) Nakamura et al. (1999) reported that the plant contains antimicrobial properties and it is used for the treatment of upper respiratory tract infections, headache, diarrhea, fever, ophthalmic, skin diseases and pneumonia. Other activities of the plant are antifungal (Lemos et al., 2005), antiprotozoal (Holetzl et al., 2003) and antimalaria.

The propagation of this very important taxon is neglected. The propagation is left in the hands of few ethno users who rely on the few stands at the back of their houses where the remains of organic materials are dumped. The purpose of this study is to determine optimum ways of growing this very important medicinal plant. It is only in this way the plant can be conserved and its uses to mankind sustained.

MATERIALS AND METHOD

Materials

Seed for germination experiments were collected in their dried state on the plant species. Type of soil evaluated in the study are topsoil rich in humus and white river sand. Poly pots with drainage holes used were purchased locally.

Methods

The tiny seeds for germination were extracted from the fruits and tested for viability by steeping them into a suitable container of water. The floated seeds were discarded as non viable seeds while the sunken seeds were regarded as viable seeds. These were removed from the water and spread on old news print under room temperature 32.0±2 for three days. The seeds were certified dried when they no longer stick together. After drying, the seeds were kept in plastic containers in the laboratory. The poly pots were filled with topsoil rich in humus and arranged in randomized design under

light shade of palm leaves. The control was made up of poly pots filled with white river sand. The treatment and control were replicated three times. The seeds were subjected to pre-sowing treatment of continuous soak for 7 days with daily changes of water. Two sowing method were used – surface sowing and 1 cm sowing depth. For the two methods of sowing each set of poly pot contain ten seeds each.

Seed germination was monitored for 30 days. Mean germination percentage were recorded and the seeds discarded. Three set of seedlings were left in the treatment and control for 42 days in order to assess other parameters; height growth, no of leaves, shoot length and root length. The data collected were statistically analysed.

RESULTS AND DISCUSSION

The results obtained from this current study are presented in Table 1. Significant differences exist in germination and seedling growth as influenced by presowing treatment, depth of sowing and type of soil. Seed sown at a depth of 1 cm had the highest value of 80% germination in humus rich topsoil while 26.3% was obtained from the river sand from seed sown at a depth of 1 cm. The surface sowing had 33.3% in humus rich topsoil and in river sand 23.3% was obtained.

Seedling growth was of the same pattern as in germination. The total plant growth in height was 30.6 cm from the seed sown at a depth of 1 cm and 27.4 cm from the surface sowing in humus rich topsoil. From the river sand total growth in plant height stood at 21 cm for seed sown at 1 cm depth and 20.1 cm was obtained from seedlings on surface sowing. The leaf production was observed to be better in shape and number in humus rich topsoil than that obtained from the white river sand.

One of most usual causes of failure of seed to germinate and emerge is sowing too deeply. Usually a seed has only food reserve for limited period of growth and when sown deeply more than necessary, it soon expend that food or energy and dies before it reaches the surface (Ehiagbonare, 2004). Furthermore from field experimentation it has been found out that depth of seed sowing is species specific. It is therefore of utmost importance to determine optimum sowing depth before embarking on a large scale macropropagation. Rockwood et al**.** (1999) and Walker (1999) reported surface sowing as best for *Casuarina* species and *Abutilon* and *Adenanthera* species, respectively. While Wolfgang (1998) observed 1 cm depth of sowing to be the best for *Barley flacca*.

For this important multipurpose medicinal plant to be available on sustainable basis it should be grown in the nursery using humus rich soil and sowing the seeds at a depth of 1 cm.

Table 1. Effect of presowing treatment, type of soil and sowing depth (cm) on the germination/seedling growth of *Ocimum gratissimum* L. at 42 days after sowing.

Parameter	Humus rich topsoil	White rver sand
Germination	(a) 33.3	23.3
	(b) 80	26.3
Seedling height (cm)	(a) 27.4	20.1
	(b) 30.6	21.0
Shoot length (cm)	(a) 17.4	12.2
	(b) 19.4	8.8
X root length (cm)	(a) 10.0	11.0
	(b) 11.2	10.0
Number of leaves	a) 20.8±0.0.2.6	10.7±0.01
	(b) 24.0±0.05	12.01±0.04

(a) Surface sowing
(b) 1 cm depth of sowing

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