

## Short Communication

# An evaluation of vegetative propagation on some key medicinal plants for malaria treatment in Nigeria

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Vegetative propagation studies on some key medicinal plants for malaria treatment in Nigeria were carried out. The identified plants are *Azadirachta indica*, *venonia amygdalina* and *Ageratum conyzoides*. Methods of harvesting plant parts by the enthomedicinal practitioners were observed to be injurious and could create enabling environment for plant pathogens. Result from vegetative propagation using 50 ppm indole-3-butyric acid (IBA) showed significant difference in response to the effect of IBA in rooting stem cuttings. From *A. indica* 70% cuttings rooted, 30% died in treatment and in the control 10% rooted, while 90% died. From *A. conyzoides* 23.3% rooted and 76.7% died in treatment while none rooted in the control. *V. amygdalina* had 60% rooted and 40% died in treatment respectively. The control had 13.3%.

**Key words:** Malaria, medicinal plants, conservation, *Vernonia amygdalina*, *Ageratum conyzoides*, *Azadirachta indica*.

## INTRODUCTION

Malaria is a tropical disease of the blood that is caused by a parasite transmitted by mosquitoes, common throughout the world. It is a serious and sometimes fatal tropical disease (WHO, 2004). It is characterized by bouts of shivering, sudden rise of temperature and general aching of the body as well as profuse sweating at regular intervals (Gill, 1992). Globally death associated with malaria is highest in Africa (WHO, 2004).

Initial survey by the author revealed some key plant species used by ethnomedicinal practitioners in Nigeria. Some of these key plant species are:

- a) *Vernonia amygdalina* L. family Compositae. It is known as Bitter leaf in English, Oriwo in Bini, olubu in Igbo, and Origbo in Urhobo. The main photochemical constituents are saponin, vernodaline and Vernomygdin (Gill, 1992).
- b) *Ageratum conyzoides* L. family Compositae. The common names are Goat weed, Floss flower, white weed. In Yoruba it is called imi-ewure and okwokwonwaosi in Ibo. The reported active principles are conyzorigun, 5-methoxynobiletin, saponin and tannins.
- c) *Azadirachta indica* A Juss. Family Meliaceae, common name: neem tree, Indian Liliac tree, and dongoyara. The active constituents include quercetin-3-rhamnoside and aurotin-3-rhamnoside (Okanyi, 1977; Okpanyi and Ezeukwu, 1981).

These three species form the focal point of this study. The local communities in Nigeria resort to the use of endemic plant species to treat malaria. The deliberate large scale propagation of these important medicinal taxa is neglected. Uncontrolled deforestation, wild forest fires, habitat loss and non sustainable harvesting practices among others constitute a great threat to the existence of these medicinal plants.

The goal of this study is to determine a good method of vegetative propagation leading to the sustainable use of these medicinal plants. Thus they can continue to play a key role in National health care delivery system.

## MATERIALS AND METHOD

Vegetative propagation was evaluated using the growth hormone indole-3-butyric acid (IBA). The plant stem cuttings were 15 cm in length with single node each. Poly pots with drainage holes were purchased locally. The pots were filled with forest topsoil for the experiment and river white sand for the control. The pots were arranged in randomized block design and replicated three times.

The cuttings were dipped into 50 ppm IBA for 10 s and removed before inserting into the pots. The control was not treated with IBA. Watering was done morning and evening using 200 ml of water per poly pot. Nursery phytosanitation was carried out within and around each poly pot manually. Rooting was monitored for 12 weeks. The percentage of dead and rooted cutting was recorded respectively.

**Table 1.** Effect of 50 ppm of IBA on rooting stem cuttings of three key plant species for treating malaria in Nigeria.

Treatment	Rooting (%)					Dead stem cuttings (%)
	2 wks	4wks	8 wks	10 wks	12 wks	
<i>A. indica</i>						
IBA-treated	0	0	10	30	63.3	70.0
Control	0	0	0	0	10.0	90.0
<i>A. conyzoides</i>						
IBA-treated	0	0	0	0	23.3	76.7
Control	0	0	0	0	0	0
<i>Venonia amygdalina</i>						
IBA-treated	0	10.0	20.0	40.0	60.0	40.0
Control	0	0	0	10	13.3	86.7

wks = Weeks

## RESULTS AND DISCUSSION

From an initial survey, it was observed that harvesting method consisted of debarking trees and inflicting fatal injuries. The branches were bent and broken and herbs rooted, the leaves removed and thrown away. These are all wrong methods. The methods are capable of providing enabling environments for plant pathogens. What is advocated is the use of sharp cutlasses to carefully decapitate plants, remove barks and avoid complete rooting of herbs. Establishment of plantations of these medicinal plants is recommended. These plantations should be divided into blocks. Each block should be harvested over a period long enough to enable recovery before coming back to it. In such an arrangement when the last block is being harvested the first block will be matured for harvesting. In this way sustainability will be ensured both for the plant species and their role in health care delivery system.

Vegetative propagation will enhance the sustainability of these desired species. The result obtained from the vegetative propagation studies are presented in Table 1. The study showed that there are significant differences in rooting the stem cuttings of the species under study. The stem cuttings responded differently to IBA. The highest response was obtained from *A. indica* where 70% of the cuttings rooted while 30% died. From *V. amygdalina* 60% rooted and 40% died. The poorest values in treatment were obtained from *A. conyzoids* where 23.3% rooted and 76.78% died. The control had 13.3% rooted and 86.7 died in *V. amygdalina* and *A. conyzoides* had 0% rooted and 100% died in the control. It was observed that the *Ageratum* species reduced to soil level without uprooting produced profuse coppices in three weeks. This suggested that reducing the upper growth to soil level will produce the needed new growth.

The result from this study has revealed three key medicinal plants in the three geopolitical zones in Nigeria.

The ability of 50 ppm IBA to root stem cuttings of the species has also been confirmed in this study. The result obtained by Richard (1999) agrees with the findings of this study. He reported significant effect of IBA on rooting stem cuttings of *Prosopis africana* and *Bauhinia rufescens* where 63 and 83% were obtained respectively in Niomo (Mali 1978). In this study 70% rooting was obtained from *A. indica* and 60% from *V. amygdalina*. Longman (1993) also reported that IBA has significant effect on rooting stem cuttings of tropical trees.

The importance of *A. indica*, *A. conyzoides* and *V. amygdalina* in the ethnomedicinal practice in Nigeria is known. Their role in the over all health care delivery system is significant. However, their conservation and sustainable use has not attracted enough attention and yet malaria accounts for the highest source of death in Africa. The result of this study indicates that these plants can be conserved. Seedlings for plantation establishment can be raised in the nursery using the method outlined in this study. Sustainable management of the plantations when established can be achieved along the suggested line of block management. Although the Government in Nigeria has shown some concern about malaria, a more effective approach could be legislation to back forest conservation of antimalarial plants in Nigeria.

## REFERENCES

- Gill LS (1992) Ethnomedicinal uses of plants in Nigeria University of Benin pree. Edo State Nigeria p. 263.
- Longman KA (1993) Rooting cutting of tropical trees, propagation and materials. Common wealth science council London, U.K. p. 21.
- Okanyi SN (1977) Anti – inflammatory effect of *A. indica* Drug research and production unit, Faculty of Pharmacy, UNIFE, Nigeria. p. 89.

Okanyi SN, Ezeukwu GC (1981). *Azadirachta indica*.  
Planta Med. 41: 34. Richard C (1999) Experimental  
design for propagation Research. Int.  
center for Res. Agroforestry Nairobi pp. 1- 38.

World Health Organisation (WHO) (2004) providing  
journalists and others with the latest information on  
HIV/AIDS, Tuberc. Malar. pp. 1– 2.