Influence of Indole 3- Butyric Acid on Hardwood Propagation of
***Lantana camara* L.**

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The IAFOR International Conference on Sustainability, Energy & the Environment – Hawaii 2017
Official Conference Proceedings

Abstract
To determine effect of indole 3-butyric acid (IBA) on rooting of *Lantana camara* L. cuttings were treated with 1, 10, 100 and 1000mg/liter of IBA. Tap water was used as control. Except at 1mg/liter, IBA improved rooting of *Lantana camara* L.cuttings in all concentrations used, however, IBA at 100mg/liter gave the greatest root production rate as indicated by highest rooting percentage, highest primary root number and longest roots.

Keywords: *Lantana camara* L., Hardwood propagation, Indole 3-butyric acid, Rooting

Introduction

Lantana camara L., a vigorous small shrub (Ruter,1996) , has ornamental interest because of its dense attractive foliage and the multi- colored flowers (Pizzetti and Cocker, 1975). Due to these features, lantana and especially *Lantana camara* L. subsp. camara is used widely in several countries as landscape plant.

Vegetative propagation is important in horticulture, particularly for mass producing improved materials within a short time and perpetuating the characteristics of the parent plant. The oldest and safest method of propagating grapevines for trueness of variety is through rooting grapevine cuttings. Propagation through cuttings is cheaper and easier than other vegetative propagation techniques such as grafting and in vitro techniques. Use of auxins such s indole-3 butyric acid (IBA) has been shown to improve rooting in both difficult-to-root and easy-to-root woody plants species. Auxins are reported to involve the division and elongation of meristematic cells and differentiation of the root primordial, as well as the mobilization of reserve food materials to the site of rooting. *Lantana camara* L. is a popular ornamental plants and the response of IBA on rooting of L. camara cutting sis yet to be known. The purpose of this study was to investigate the effects of different concentration of IBA on rooting of softwood cuttings of Lantana.

Materials and Methods

Single node hardwood cuttings (～15 cm length) of L. camara L. were collected in February 2004 from the University Farm of Tokyo University of Agriculture, Tapan. The collected cuttings were treated with four concentrations IBA (1, 10, 100 and 1,000 mg/liter). IBA powder was dissolved in small amount of 100% ethanol firstly, and then the solution was diluted to 1, 10 and 100 mg/liter with deionized water respectively, but 1,000 mg/liter IBA was dissolved in 50% ethanol. Cuttings soaked in tap water were used as controls. The basal ends (～2-3 cm) of the cuttings were dipped in IBA concentrations of 1, 10, 100 mg/liter ethanol for 30 seconds. The treated cuttings were allowed to stand for fifteen minutes at room temperature to remove the ethanol from the cut surface. Cuttings thus prepared were planted in a tray (35 cm×25 cm×10 cm) containing vermiculite soil. The transplanted cuttings were kept in a plastic house. Irrigation was applied frequently to maintain optimum moisture conditions. Data on rooting percentage, root length, and root numbers were recorded two months after transplantation.

We used 10 cuttings per treatment and each treatment had 3 replicatons.

Results and Discussion

The addition of IBA enhanced rooting in all concentrations tested except 1 mg/liter (Fig. 1). Indole 3-butyric acid at 100 mg/liter was found to be most effective for the rooting of L. camara since it gave the highest percentage of rooting (83%) and the longest (71.0 mm) and highest numbers of primary roots (5.84). No rooting was observed with the 50% ethanol treatment. Rooting percentage, root length and primary root numbers increased as the concentration of IBA increased until 100 mg/liter; however, rooting percentage and root length decreased slightly at 1,000 mg/liter of IBA treatment. Indole 3-butyric acid not only induced rooting percentage, but also improved root quality (Fig. 2 to Fig. 3).

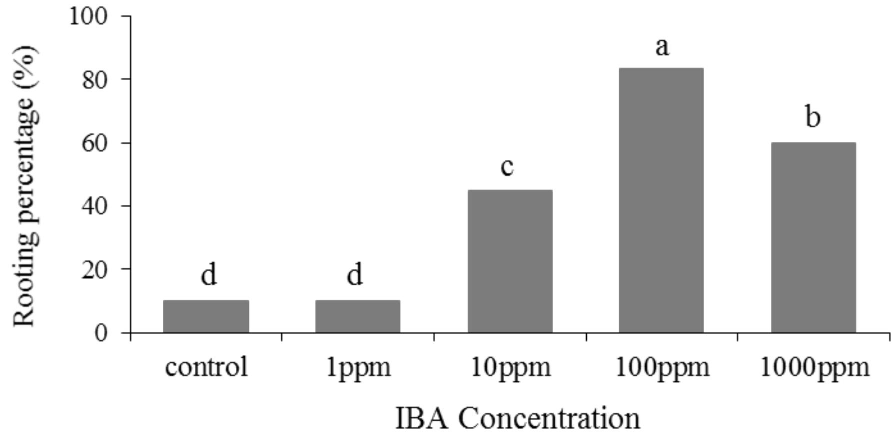

Figure 1: Rooting percentage of *Lantana camara* L. Mean values labeled with different lowercase letters were significantly different according to Fisher's protected least significant difference test as P<0.05.

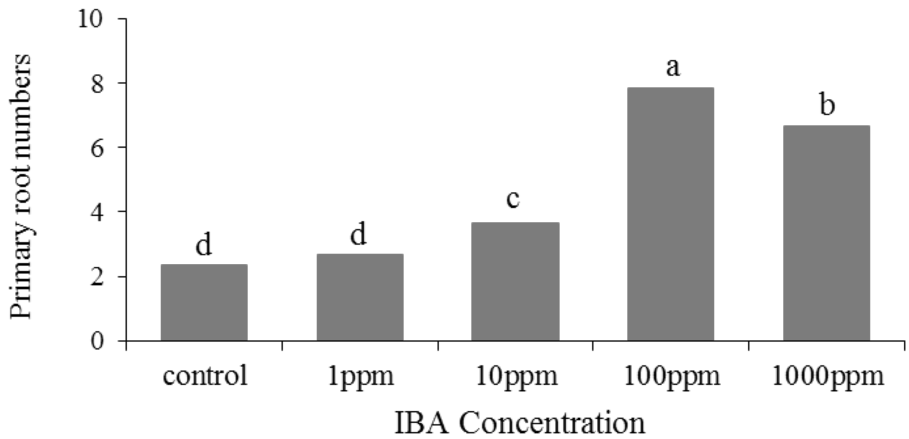

Figure 2: Primary root numbers of *Lantana camara* L. Mean values labeled with different lowercase letters were significantly different according to Fisher's protected least significant difference test as P<0.05.

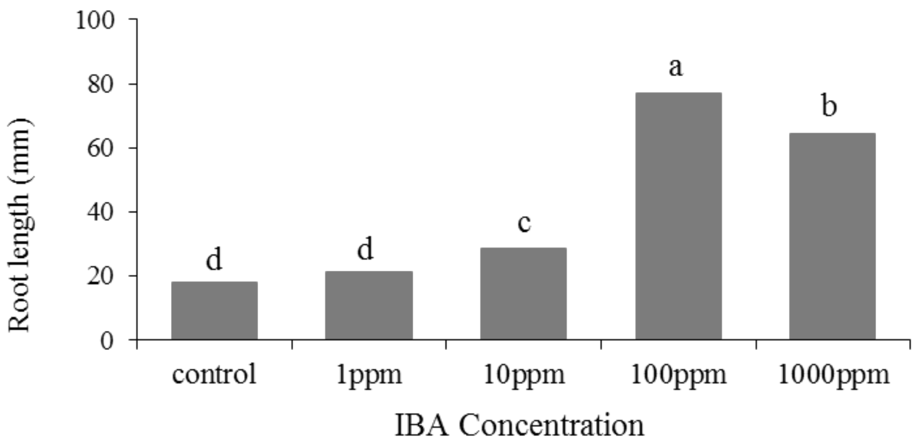

Figure 3: Length of the longest of *Lantana camara* L. Mean values labeled with different lowercase letters were significantly different according to Fisher's protected least significant difference test as $P<0.05$.

The effectiveness of IBA on the hardwood propagation of grapevines as noted in the present study was reported previously by several authors in many grape genotypes; however,in grapes reported that IBA did not improve rooting of St. George rootstocks, suggesting interactions between genotype and exogenous IBA application. Other reported that rooting percentage increased as the exogenously applied auxin concentration increased in Norton (V. aestibalis) hardwood cuttings. Indole 3-butyric acid reduces the time required for cuttings to callus and roots to appear . The mechanisms of exogenous IBA application on rooting involve the conversion of IBA into indoleacetic acid (IAA), the most active auxin, in plant tissue . Liu et al. (reported that the auxin-induced root formation was accompanied by increasing levels of putrescine (polyamines) in soybean hypocotyls explants and suggested that the exogenously applied auxins (IBA and NAA) may act on polyamine synthase and IAA oxidase activity.

Liquid preparations are easier to formulate and are more readily available in a wider range of concentrations(Berry,1984). Liquid IBA may also induce better rooting than talc IBA(Bonamino and Blazich,1984) and, at high concentrations (≧1%IBA),may stimulate rooting of many difficult to root species(Chong and Daigenault, 1986).

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