ROOTING PERFORMANCE OF MOLAVE (Vitexparviflora juss) CUTTINGS PLANTED WITH INDOLE BUTYRIC ACID (IBA) AT DIFFERENT CONCENTRATIONS

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ABSTRACT The molave tree is known in the Philippines for its dense durable wood which are used widely in making boats, furniture, utensils, and as constructional materials. This study was conducted in the rooting chamber of the Clonal Nursery Complex of the GSC Baterna Campus, San Lorenzo, Guimaras to determine the rooting performance of molave cuttings as affected with the different concentrations of IBA hormone: number of roots, length of roots, number of new leaves, length of new leaves, and percentage of cuttings ready for potting and determine the significant difference of the different levels of IBA as a rooting hormone to the cloned molave. A Completely Randomized Design (CRD) was used in this study. The following treatments were used in the study: treatment A–No hormone (Control), treatment B–100 ppm with talcum powder, treatment C–300 ppm with talcum powder, treatment D–500 ppm with talcum powder and treatment E–500 ppm/No talcum powder. For the number of roots, only cuttings in Treatment E (500 ppm/no talcum) have rooted and with a mean of 1.3 and 20.3 in length. The highest number of new leaves was attained by Treatment E (500 ppm/no talcum powder) with a mean of 4.3. For the length of new leaves, the longest was Treatment C (300 ppm with talcum powder) has a mean of 20.3 cm. For the number of cuttings ready for potting after 21 days inside the rooting chamber, the highest mean was obtained by Treatment E (500 ppm/no talcum powder) is 73.3%.

Keywords: Molave, rooting, performance

INTRODUCTION

Background of the Study

The molave tree (Vitexparviflora juss) is a close relative of the five-leaved chaste tree or lagundi (Vitex negundo). It is also called molawin and tugas. It is a medium to large size, drought-tolerant hardwood tree which grows to 15 meters and is indigenous to the Philippines and other Asian countries (Bareja, 2010). The leaves are compound with three leaflets. The flowers are bluish, numerous in clusters at the end of small branches. It is occasionally planted along roadsides and parks (Manila Old Timer, 2017)

This tree can be propagated following sexual or asexual method. The latter includes the use of natural propagules such as modified roots and stems, plantlets and offshoots. It also includes root, leaf and stem cutting propagation, air layering or marcotting, budding and grafting. The molave trees are uniquely versatile and should deserve more vigorous attention. Stem cutting has long been used in propagating many woody plants including coffee, cacao, calamansi, and ornamental crops. This propagation method has potential application in the commercialized production of molave seedlings for the purpose of agro-forestry, reforestation, urban greening, landscaping, and other use (Bareja, 2013).

Cloning refers to the process of making duplicate plants out of a cutting from a mother plant. It is a great way to keep certain plants around that are very productive or otherwise beneficial to the grower.

Indole Butyric Acid (IBA) is a water-soluble superior rooting hormone that achieves great results for many difficult to root plants. It often gives superior results to NAA based rooting hormone (Tripantol, 2015). In order to have a very good result in the production of molave planting materials, nursery operators must establish a cloning protocol for them to follow during the rooting process. Hence, this research study was conducted.

OBJECTIVES OF THE STUDY

This study aims the following: (1) to determine the rooting performance of molave cuttings as affected with the different concentrations of IBA hormone: number of roots, length of roots, number of new leaves, length of new leaves, and percentage of cuttings ready for potting, and (2) to determine the significant difference of the different levels of IBA as a rooting hormone to the cloned molave.

MATERIALS AND METHODS

This study was conducted in the clonal chambers of the Clonal Nursery Complex of the GSC Baterna Campus, San Lorenzo, Guimaras on November-December, 2017. A Completely Randomized Design (CRD) was used in this study. The following treatments were used in the study: treatment A–No hormone, treatment B–100 ppm with talcum powder, treatment C–300 ppm with talcum powder, treatment D–500 ppm with talcum powder and treatment E–500 ppm/No talcum powder. There were five (5) treatments and were replicated three (3) times making a total of fifteen (15) variates. Each variates has ten (100) cloned molave cuttings as experimental plants.

Table 1. Experimental lay-out.

A	C	C	B	E
E	B	D	D	E
A	C	A	D	B

Legends:
A - No Hormone (Control)
B - 100 ppm with talcum powder
C - 300 ppm with talcum powder
D - 500 ppm with talcum powder
E –500 ppm/No talcum powder

Soil Media Preparation. The soil media used was pure river sand. It was disinfected using chlorine solution and was left overnight. Then it was rinsed with water on the next day.

Source and Collection of Planting Materials. Molave cuttings were collected from the hedge garden of the clonal nursery. Juvenile cuttings were selected and cut personally by the researchers for the study. Cuttings were directly placed inside a plastic pale with water to avoid temperature shock and were brought to the clonal laboratory area for processing.

Application of Treatments and Planting. After the collection of cuttings, it was treated with fungicide. There were 1500 cuttings, with 100 cuttings per replication. From fungicide treatment, cuttings were dipped into talcum powder with different concentrations of IBA except for cuttings in treatment A (the control/no IBA), and treatment E cuttings that were soaked to IBA solution for 30 minutes. All were simultaneously planted inside the rooting chamber.

Water Management. Cloned seedlings were misted to keep the rooting media moist using mist system inside the chamber for eight (8) hours daily.

Pest Management. To prevent pest infestation, the screen house was closed in the entire period of the study.

To evaluate the rooting performance of molave cuttings planted with IBA at different concentrations, the following data were gathered: number of roots, length of roots, number of new leaves, length of new leaves, and percentage of cuttings ready for potting. Data gathering was conducted twenty-one (21) days after planting (DAP). All the data were analyzed using Analysis of variance (ANOVA). Significant means will be tested using Duncan's Multiple Range Test (DMRT).

RESULTS AND DISCUSSIONS

Table 2 presents the summary of rooting performance of molave cuttings applied with IBA. The second and third column presents the number and length of the roots of molave cuttings. For the number of roots, only cuttings in Treatment E (500 ppm/no talcum) have rooted and with a mean of 1.3 and with a mean of 20.3 cm in length. This implies that the application of IBA by soaking before planting will result in early root development and roots develop faster by length within 21 days.

The number of new leaves was presented in the fourth column. The highest number of new leaves was attained by Treatment E (500 ppm/no talcum powder) with a mean of 4.3, followed by Treatment C (300 ppm with talcum powder)

and Treatment D (500 ppm with talcum powder with a mean of 4.0, Treatment A (no hormone) got 3.0 and Treatment B (100 ppm with talcum powder) has the mean of 2.7, respectively. Based on the Analysis of Variance, there was no significant difference among treatments. All the treatments responded the same to the hormone, in the development of new leaves.

The fifth column presents the length of new leaves. Treatment C (300 ppm with talcum powder) has a mean of 20.3 cm, based on the Analysis of Variance there was a significant effect of the different concentrations of IBA to the length of new leaves of the cuttings. Data show that the length of new leaves will increase if it will be applied with IBA in higher concentrations compared to the control group.

The last column was the number of cuttings ready for potting after 21 days inside the rooting chamber. Highest mean was obtained by Treatment E (500 ppm/no talcum powder) is 73.3%. Based on the Analysis of Variance there was a highly significant effect on the use of IBA to the percentage of molave cuttings ready for potting after 21 days. Among treatments, Treatment E contributed much to a significant result. Cuttings soaked in 500 ppm and with no talcum powder have the greater number of rooted cuttings than those treatments were not applied with IBA. Higher concentration may induce early rooting development, so therefore there will be higher survivability.

Azad and Matin (2015) concluded that the rooting hormone applied for cuttings, especially IBA, has significant importance in rooting various tropical forest species. Moreover, they found that the number of roots per cuttings, average longest root, and number of sprouts per cuttings were significantly increased with increasing the concentration of IBA.

Table 2. Summary table of the number of roots, length of roots, number of new leaves, length of new leaves, and survival percentage of molave cuttings applied with IBA.

Treatment	Number of roots	Length of roots (cm)	Number of new leaves	Length of new leaves (cm)	Rooted cuttings ready for potting after 21 days (%)
A	0.0	0.0	3.0	7.7b	6.7d
B	0.0	0.0	2.7	18.0a	36.7b
C	0.0	0.0	4.0	20.3a	16.7c
D	0.0	0.0	4.0	18.0a	40.0b
E	1.3	20.3	4.3	19.3a	73.3a
Signifinance			Ns	*	**
CV (%)			45.9%	45.4%	48.7

CONCLUSION

Based on the study conducted, the researchers concluded that soaking of molave cuttings to 500 ppm concentration for 30 minutes before planting may induce root development with the desired length earlier than 21 day and using different concentrations to molave cuttings before planting will not affect the development of new leaves. Additionally, the length of new leaves will increase if it will be applied with IBA in higher concentrations before planting. Moreover, cuttings soaked in 500 ppm and with no talcum powder have the greater number that was rooted than the cuttings that were not applied with IBA. Higher concentration may induce early rooting development, so therefore there will be higher survivability.

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