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Short Communication

The Growth Performance of *Alangium lamarckii* as affected by various level of IBA

Ahirwar J.R.
Department of Botany, Govt. College Niwari, Distt. Tikamgarh, MP, INDIA

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Abstract

The present study reports the growth performance of seedlings of Alangium lamarckii as affected by different concentrations of IBA. The results revealed that the maximum growth (77.93cm) and biomass accumulation (3.175gm) of seedlings were found in 100 ppm, followed by 50ppm and 25 ppm of IBA as compared to control. It is clear that all treatments of IBA concentrations were effective but 100 ppm level of IBA was more effective than the lower concentrations of IBA.

Keywords: Growth, biomass production, *Alangium lamarckii,* IBA, concentration.

Introduction

Alangium lamarckii Thwaites is generally known as Akola belongs to the Family Alangiaceae (Old Family-Cornaceae). It is a small deciduous rambling shrub or small moderate tree with grey bark. Normally it attains the height about 3-10 meter and girth up to 0.50 meter which grows in the greater parts of India. It is found in the forest of Jhansi district of Uttar Pradesh, Tikamgarh and Chhatarpur districts of Madhya Pradesh[1]. Akola is a very important medicinal plant and being used as indigenous drugs by the people of village community. Plant growth regulators are the chemical which enhance the plant growth when applied in very minute quantity[2]. Exogenous plant growth regulators are one of the most commonly used methods[3]. (Polat and Kamiloglu, 2007).The application of certain plant growth regulators enhance the biomass production expressed as fresh weight and dry weight[4]. Plant growth regulators are being increasingly used as an aid to enhance yield and quality of the crops[5]. The most of the physiological activities of plant become regulated by nutritional and genetic factors. In addition of nutritional and genetic factors, growth and development of plants depend on some growth hormones which regulate the distribution of nutrients in the different organs of plants. Plant growth regulators are well known for enhancing the growth, development and biomass production of plants. The foliar sprays of growth hormones have significant values for enhancing the quality of seedlings. The present study was aimed to see the effect of IBA concentrations on growth and biomass production of seedlings of *Alangium lamarckii*.

Material and Methods

To study the effect of IBA on seedlings growth of *Alangium lamarckii*, the aqueous solution of IBA at three different concentrations viz. IBA 25ppm-(H1), IBA 50ppm-(H2), IBA 100ppm-(H3), were prepared separately. The desired quantities of IBA were weighed with the help of electronic balance. Thereafter IBA was dissolve in absolute alcohol and then water was added in required quantity and few drops of ammonium hydroxide were also added to dissolve the IBA completely. These solutions were applied separately on one month of old seedlings of *Alangium lamarckii*. Plants under control (C) were treated with water in the same way as treated with IBA. Four replicates were used for each treatment. These sets were placed at nursery in open sunlight. A total 12 foliar sprays of different concentration of IBA were exogenously applied with the help of hand sprayer at the interval of 10 days.

Results and Discussion

The results of seedling growth of *Alangium lamarckii* as affected by different concentrations of IBA are presented in table-1 and figure-1. The average maximum numbers of leaves/seedling (16.0) were recorded in 100ppm followed by 50ppm (14.5) and 25ppm (13.1). Whereas, average minimum leaves were recorded in control (11.25/seedling).

The average maximum dry weight of leaves (0.480gm) was noted in 100ppm followed by 0.372gm in 50ppm and 0.272gm in 25ppm as compared to control (0.158gm). Thus, the gradual increase was recorded with an increase in concentration of IBA.

The average maximum amount of root moisture content (71.75%) shoot moisture content (69.0%) and plant moisture content (73.44%) were recorded in control. The average minimum moisture content of same was recorded in 100ppm which gradually increased with decreased concentrations of IBA i.e. 50ppm and 25ppm respectively. Thus a trend of gradual decrease in moisture content was found with an increase in concentration of IBA.

The maximum amount of leaves moisture content (81.5%) was observed in control followed by 78.68 % in 50 ppm and 70.74 % in 100ppm concentration of IBA with minimum 69.65% in 25ppm. Thus the moisture content does not show any trend with IBA treatment as found in case of root, shoot and plant.

Table-1
Growth and biomass production of *Alangium lamarckii* as affected by various level of IBA

Sr.	Various measurement of seedling	Control (C)	IBA Concentration		
			25ppm(H-1)	50ppm(H-2)	100ppm (H-3)
01	Number of leaves	11.25±1.708	13.00±2.160	14.5±3.109	16.00±2.828
02	Root length(cm)	29.75±1.708	30.33±1.247	33.18±3.139	39.55±2.068
03	Shoot length(cm)	27.15±3.320	28.25±1.287	28.93±1.864	38.38±2.724
04	Seedling length(cm)	56.9±4.997	58.58±2.384	62.1±4.134	77.93±4.774
05	Shoot/ Root length ratio	0.910±0.063	0.932±0.029	0.877±0.087	0.970±0.019
06	Leaves moisture content (%)	81.5±2.082	69.65±0.674	78.68±1.515	75.74±0.965
07	Root moisture content (%)	71.75±2.062	69.94±1.822	68.77±1.492	67.25±2.058
08	Shoot moisture content (%)	69.00±1.155	68.68±1.631	67.71±1.474	66.23±0.515
09	Total moisture content (%)	73.44±1.547	72.35±0.887	70.98±1.590	68.51±1.295
10	Leaves dry weight (gm)	0.158±0.020	0.272±.0.040	0.372±0.025	0.480±0.016
11	Root dry weight (gm)	0.458±0.023	1.032±0.078	1.366±0.206	1.881±0.114
12	Shoot dry weight (gm)	0.292±0.060	0.397±0.024	0.531±0.052	0.815±0.022
13	Seedling dry weight (gm)	0.908±0.012	1.700±0.132	2.270±0.210	3.175±0.126
14	Shoot/Root dry weight ratio	0.639±0.019	0.385±0.019	0.541±0.055	0.434±0.026
15	Collar circumference	0.33±0.008	0.38±0.013	0.42±0.012	0.43±0.008

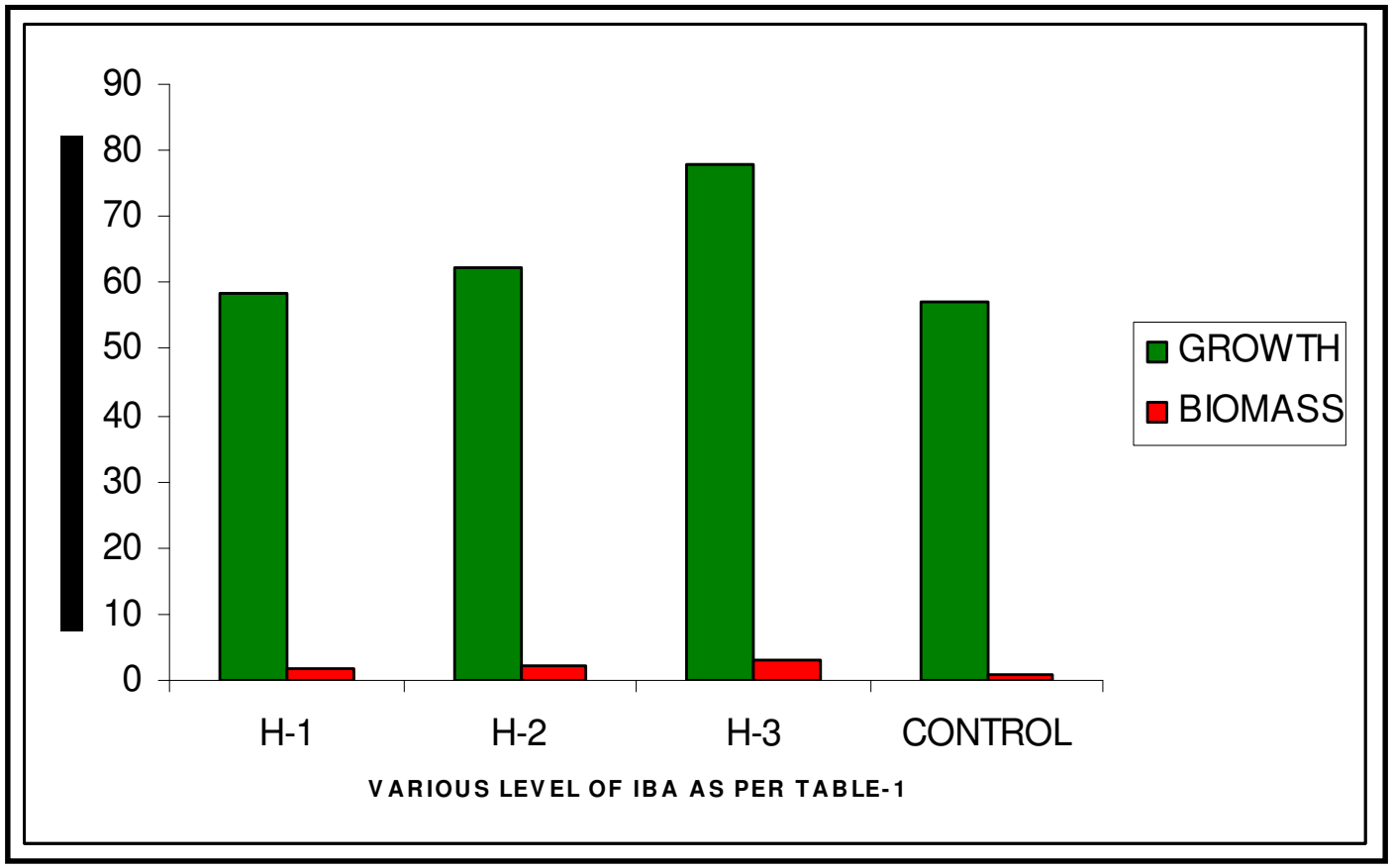

Figure-1
Growth and biomass production of *Alangium lamarckii* as affected by various level of IBA

The average maximum length of shoot (38.38cm), root (39.55cm) and seedling (77.93cm) were noticed in 100ppm concentration of IBA followed by 50ppm and 25ppm of IBA. These values were found minimum in case of control. The dry weight of shoot (0.815gm), root (1.881gm) and seedlings (3.175gm) were found maximum in 100ppm followed by 50ppm and 25ppm of IBA. The minimum values were recorded in control. A trend of gradual increase in these parameters of seedling growth was found with an increase in the concentration of IBA.

The average maximum shoot/root ratio (0.970) was found when plant treated with 100ppm of IBA and the average minimum (0.877) was recorded in 50ppm followed by 0.932 in 25ppm of IBA as compared to control (0.910). The average maximum shoot/root dry weight ratio (0.639) was noted in control. The average minimum (0.385) was in 25ppm followed by 0.434 in 100ppm and 0.541 in 50ppm of IBA. No gradual increase was observed with an increase in the concentration of IBA.

The average maximum collar circumference (0.43) was observed in 100ppm followed by 0.42 in 50ppm and 0.38 in 25ppm as compared to control (0.38). Thus a trend of gradual increase was observed in collar circumferences with an increase of IBA concentration.

It is clear from above results that the 100 ppm was more effective than the lower concentrations of IBA. These findings are in agreement with those who observed that the length of cutting planted seedlings of betel vine significantly increased with 100ppm of IBA concentration[6]. The maximum plant height was observed in 200ppm of IBA concentration[7]. IBA (0.01-0.05ppm) enhanced the plant height and dry weight in *S. siamia* and plant height only in *P. biglobosa*, while 0.03-0.04ppm of IBA enhanced the number of leaf in *P. biglobosa* and *A. lebbek* seedlings[8]. All growth regulators (IBA, IAA and NAA) were found to be statistically significant[9]. The beneficial effect of different levels of plant growth regulators may be due to the stimulation of hydrolysis of nutritional reserves and their mobilization in the region of root formation[10].

Conclusion

Based upon the above results it can be concluded that the growth of seedlings of *Alangium lamarckii* was significant in all treatments of IBA concentrations as compared to control, but, they were expressing a very luxuriant growth when treated with 100 ppm of IBA. A trend of gradual increase of seedling growth was also found with an increase in the concentration of IBA. It is clear that the higher growth performance and dry weight accumulation of seedling of *Alangium lamarckii* can be achieved by spraying 100ppm of IBA as compared to lower concentration.

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