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Impact of Auxins on Rooting of Vitex Negundo L. Shoot Cuttings

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Studies were made on the impact of auxins for rooting in shoot cuttings. The untreated shoot cuttings show easy-to-root nature. Indole butyric acid treatment was most effective for rooting and per cent survival of rooted cutting 100 ppm IBA exhibited fairly high rooting potential. All the concentrations of other auxins failed to induce the rooting. Possibilities of use of IBA for vegetative *negundo* have been discussed in the present paper.

INTRODUCTION

Vitex negundo l (Family verbenaceae) commonly known as Nirgundi or Sambhalu by the local people is an important medicinal shrub or small tree growing through out India mostly in the warmer zones. The leaves contain two alkaloids, nishindine and hydrocotylene. The leaves are smoked for the relief of headache and catarrh. The leaves posses insecticidal properties, therefore, by the local people they are laid over stored grain to ward off insects. The leaves are also applied on the swelling of joints in acute rheumatism (Chopra et al., 2000). The plants are unscientifically collected by the local people for its medicinal value and are exploited by traders as drug. The plant has, therefore, been declared as an endangered and threatened species in Shahjahanpur district (Sharma, 2005). Keeping in view of its less availability in nature the present investigation has been taken to develop methodology of vegetative propagation by stem cuttings and to observe the effect of auxins on promoting the rooting of these cuttings.

MATERIALS AND METHODS

Shoot cuttings of Vitex negundo L. were collected from the uniform plants growing at M.S.College, Saharanpur. Each shoot has upper soft, leafy portion with a pair of leaves while the lower woody portion was defoliated and made into about 13.0 cm long. The uniform cuttings were divided into ten groups. the shoot cuttings of group 1 to 3 were treated with 50, 100 and 200 ppm of indole 3-acetic acid (IAA), indole 3-butyric acid (IBA) and naphthalene acetic acid (NAA), respectively, for 24 hours by basal dip method. Cuttings of tenth group were treated with distilled water to serve as control. These cuttings were planted in earthern pots containing 1:1 garden soil and farm yard manure and were kept under natural environmental conditions. Ten cuttings were planted per pot and there were 3 such pots per treatment and one pot as control. Cuttings were watered regularly.

Observations on rooting behaviour at 90 days after planting were made. The number length of roots and percentage of rooted cuttings were recorded. the cuttings which rooted were out planted in nursery beds and their per cent survival was noted after 2 months.

RESULT AND DISCUSSION

The date on percentage rooted cutting, number of roots per cutting, root length per cutting and per cent survival are presented in Table 1.

Percentage rooted cuttings: The data presented in Table 1 show that 38% shoot cuttings rooted in control while all concentrations of IAA, NAA and 200 ppm IBA did not affect. Both concentrations (50 and 100ppm) of IBA increased percentage of rooted cuttings.

The highest percentage rooting was observed only with 100 ppm IBA. However, 200 ppm of all auxins showed the lowest percentage.

Number of roots per cuttings: Table 1 shows that the average number of roots produced per control cuttings was about 9.8. Only 50 and 100 ppm IBA increased the number.

Root length per cutting: Average root length per cutting in control was 2.54 (Table 1). Both concentrations (50 and 100 ppm) of IBA increased the average root length.

Percent survival: The control cuttings show about 46 per cent survival (Table 1) IBA (50 and 100 ppm) increased the survival percentage while other concentrations of auxins did not affect.

The untreated control of shoot cuttings shows 36 per cent rooting and 46 per cent survival on their out planting (Table 1). It indicated easy-to-root nature. According to Nanda 2010. Hartmann and Kester, 2000 and Pal, 2012 easy - to root nature in due to the presence of leaves which maintain sugar supply and nitrogenous substances and to the shoots which are better equipped with food matter needed to meet energy requirements for root initials. The concentrations of auxins (50, 100, 200 ppm of IAA, NAA and 200 ppm of IBA) failed to root the shoot cutting (Table 1). The failure of auxins to promote rooting has also been reported in some plants (Nanda, 2010, Bansal and Nanda, 2011. Pal et al. 2012) and is due to non availability of carbohydrate reserves, lack of some cofactors needed for auxin activity or accumulation of inhibitors in the shoot tissues. Both the concentrations (50 and 100 ppm) of IBA promoted the per cent rooting, number of roots per cutting, root length and per cent survival in Vitex negundo. 100 ppm IBA was found to be more effective than 50 ppm treatment for rooting the leafy branch. The higher rooting percentage may be attributed to higher availability of carbohydrates, hormones and other root promoting factors accumulated in the lower portion of the stem cuttings. Promotion of rooting of leafy shoot cuttings by IBA in several other species has been reported earlier also (Nanda, 2010: Pal et al., 2003 and 2012). The findings of present work clearly show that the leafy shoot cuttings are of easy to root nature and 100 ppm IBA is most effective auxin to promote rooting and survivability in Vitex negundo and can be utilized for vegetative propagation.

Table 1 : Effect of auxins on rooting the leafy school cuttings of Vitex negundo

Treatment	Percentage rooted cuttings	Average no. of roots per cutting	Average root length per cutting (cm)	Per cent survival
IAA				
50 ppm	13	6.6	1.08	22
100 ppm	18	7.2	1.08	23
200 ppm	8	4.3	0.74	15
IBA				
50 ppm	40	10.8	3.08	52
100 ppm	68	14.8	4.08	76
200 ppm	18	8.2	1.02	26
NAA				
50 ppm	18	8.4	1.08	24
100 ppm	28	9.2	2.00	43
200 ppm	18	6.6	1.00	22
Control	36	9.8	2.54	36

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