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PS Negi
College of Forestry,
VCSGUUHF, Ranichauri, Tehri
Garhwal, Uttarakhand, India

Pooja Bhatt
College of Agriculture,
GBPUAT, Pantnagar,
Uttarakhand, India

Anupama Rawat
College of Agriculture,
GBPUAT, Pantnagar,
Uttarakhand, India

Vikas Verma
Department of Seed Science &
Technology, CSAU&T, Kanpur,
Uttar Pradesh, India

Ankit Dongariyal
College of Agriculture,
GBPUAT, Pantnagar,
Uttarakhand, India

RK Prasad
College of Forestry,
VCSGUUHF, Ranichauri, Tehri
Garhwal, Uttarakhand, India

Alankar Singh
College of Forestry,
VCSGUUHF, Ranichauri, Tehri
Garhwal, Uttarakhand, India

Corresponding Author:
Pooja Bhatt
College of Agriculture,
GBPUAT, Pantnagar,
Uttarakhand, India

Effect of different potting media and IBA concentrations on sprouting and rooting of *Eucalyptus camaldolensis* and *E. hybrid* cuttings

PS Negi, Pooja Bhatt, Anupama Rawat, Vikas Verma, Ankit Dongariyal, RK Prasad and Alankar Singh

Abstract

The present investigation was carried out at The Energy & Resources Institute (TERI), New Delhi to study the effect of different potting media and IBA concentration on sprouting and rooting of *Eucalyptus camaldolensis* and *E. hybrid*. For the experiment, 400 cuttings of both the species were selected. The results of the experiment revealed that potting media 3 (vermiculite 40%, solilite 20% and sand 40%) had the maximum sprouting (42.33%) percentage, whereas potting media 1 (vermiculite 33%, solilite 33% and sand 33%) recorded the least sprouting (26.67%) in cuttings of *E. camaldolensis*. Similarly, potting media 3 (vermiculite 40%, solilite 20% and sand 40%) had the maximum sprouting (25.67%), whereas potting media 1 (vermiculite 33%, solilite 33% and sand 33%) recorded the least sprouting (18.67%) in cuttings of *E. hybrid*. Moreover, cuttings in potting media 3 treated with 4000 ppm IBA had maximum sprouting (25.67%), while the sprouting was least (18%) in potting media 2 treated with 2000 ppm IBA.

Keywords: Potting media, IBA, concentrations, *Eucalyptus camaldolensis*

Introduction

Eucalyptus was first introduced in India around 1790, when it was planted in Mysore. Later it was planted in other parts of the country. Regular trials on Eucalyptus spp. were conducted in 1843 at Nilgiri hills. Eucalyptus is now extensively planted in strips along roads, canals and railway lines. The popular species cultivated in India are *E. tereticornis*, *E. camaldolensis*, *E. citriodora*, *E. globulus* and *E. grandis*. Eucalyptus can be successfully grown in a wide variety of climate and soil; however, it prefers sandy loam soil with pH not exceeding 8.0. Eucalyptus is commercially propagated by seeds. The seeds are collected in the month of October, or in May. Under North India conditions, sowing of seeds is normally done either in September or October after the close of monsoon rains or in February-March. Due to long juvenile phase and high degree of heterozygosity, propagation through sexual means i.e., seeds becomes quite tedious. Furthermore, segregation in the F1 generation leads the different progeny which is not true to type with the mother plant. Propagation through asexual method particularly cutting has opened a new pave in the field of Eucalyptus cultivation. Moreover, application rooting promoting PGR's along with growth promoting soil mixture can increase the success rate in its cultivation. Keeping in view the above considerations, the proposed experiment was conducted to study the effect of different potting media along with different IBA concentration on rooting and sprouting of two commercial Eucalyptus spp. i.e., *E. camaldolensis* and *E. hybrid*.

Material and Methods

The present investigation was carried out during 2003 at The Energy & Resources Institute (TERI), New Delhi to study the sprouting and rooting of *Eucalyptus camaldolensis* and *E. hybrid* in different potting media under different treatments. 400 cuttings of both the species were selected for the experiment. The cuttings were placed on four potting media with different percent of vermiculite, solilite or agro pit and sand (table 1). These cuttings were further treated with different concentration of IBA. IBA was applied at 2000 ppm, 4000 ppm and 6000 ppm along with control in all potting media.

Table 1: Composition of different potting media

Potting media	Vermiculite	Solilite or Agro pit	Sand
1.	33%	33%	33%
2.	20%	40%	40%
3.	40%	20%	40%
4.	40%	40%	20%

Result and Discussion

It is clear from the table 2 that different concentration of IBA and potting media had significant effect on sprouting of *E. camaldulensis*. Among the 4 potting media used, potting media 3 (vermiculite 40%, solilite 20% and sand 40%) had the maximum sprouting (42.33%), whereas potting media 1 (vermiculite 33%, solilite 33% and sand 33%) recorded the least sprouting (26.67%) in cuttings of *E. camaldulensis*. Moreover, cuttings in potting media 3 treated with 4000 ppm IBA had the maximum sprouting, while the sprouting was least (30%) in potting media 2 treated with 2000 ppm IBA.

Table 2: Effect of different concentration and potting media on sprouting of *E. camaldulensis*

Potting media	Average Sprouting %	IBA concentration	Average Sprouting %
1	26.67	Control	38.67
2	32.33	2000ppm	30
3	42.33	4000ppm	41
4	40.67	6000ppm	32.33

The table 3 indicates the effect of different concentration of

IBA and potting media on rooting of *E. camaldulensis*. Among the 4 potting media used, potting media 4 (vermiculite 40%, solilite 40% and sand 20%) had the maximum rooting (7.5%) in cutting of *E. camaldulensis*, whereas potting media 1 (vermiculite 33%, solilite 33% and sand 33%) recorded the least rooting (3%) in cutting of *E. camaldulensis*. Moreover, cuttings in potting media 3 treated with 4000 ppm IBA had maximum rooting (7.5%), while the rooting was least (3%) in cuttings placed in potting media with no IBA treatment.

Table 3: Effect of different concentration and potting media on rooting of *E. camaldulensis*

Potting media	Average rooting %	IBA concentration	Average rooting %
1	3	Control	3
2	4.5	2000ppm	4
3	2.5	4000ppm	7.5
4	7.5	6000ppm	4

The table 4 elucidates the effect of different concentration of IBA and potting media on sprouting of *E. hybrid*. Among the 4 potting media used, potting media 3 (vermiculite 40%, solilite 20% and sand 40%) had the maximum sprouting (25.67%), whereas potting media 1 (vermiculite 33%, solilite 33% and sand 33%) recorded the least sprouting (18.67%) in cuttings of *E. hybrid*. Moreover, cuttings in potting media 3 treated with 4000 ppm IBA had maximum sprouting (25.67%), while the sprouting was least (18%) in potting media 2 treated with 2000 ppm IBA.

Table 4: Effect of different concentration and potting media on rooting of *E. hybrid*

Potting media	Average Sprouting %	IBA concentration	Average Sprouting %
1	18.67	Control	23.33
2	20.67	2000ppm	18
3	25.67	4000ppm	25.67
4	20.33	6000ppm	18.33

The table 5 presents the effect of different concentration of IBA and potting media on rooting of *E. hybrid*. Among the 4 potting media used, potting media 4 (vermiculite 40%, solilite 40% and sand 20%) had the maximum rooting (14.5%) in cutting of *E. hybrid*, whereas potting media 1 (vermiculite 33%, solilite 33% and sand 33%) recorded the least rooting (0%). Moreover, the cuttings in potting media 3 treated with 4000 ppm IBA had maximum rooting (9.5%), while the rooting was least (3.5%) in cuttings placed in potting media 4 with 6000 ppm IBA concentration.

Table 5: Effect of different concentration and potting media on rooting of *E. hybrid*

Potting media	Average rooting %	IBA concentration	Average rooting %
1	0	Control	8.5
2	4.5	2000ppm	8.5
3	11	4000ppm	9.5
4	14.5	6000ppm	3.5

Conclusion

From the present study it can be concluded that selection and multiplication of *E. camaldulensis* and *E. hybrid* can be successfully done by asexual means particularly through cuttings. Potting mixture of vermiculite 40%, solilite 20% and sand 40% have the most profound effect on sprouting and rooting success of cuttings along with 4000 ppm IBA.

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