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Vegetative Propagation Through Leafy Shoot Cuttings of *Ipomoea mauritiana* Under Different Potting Media

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Key words:

Leaf cuttings, potting media Ipomoea, root and shoot growth

ABSTRACT

Ipomoea mauritiana Jacq. is one of the important medicinal tuberous root crop , roots are aphrodisiac, cardio tonic, demulcent, diuretic, refrigerant and galactogogue and also used in emaciation, enteric fever and spermatorrhea; being one of the most important medicinal plant having a large demand for its tubers in Aurvedic industry. An investigation was envisaged to develop the propagation technique of the species using leafy shoot cutting. Treatments viz., T1 (Control), T2 (Soil + Sand + FYM)(1:1:1), T3 (Soil + Sand + FYM + Sawdust)(1:1:1:1), T4 (Soil + Sand + FYM +Rice husk)(1:1:1:1), T5 (Cocopeat), T6 (Sand + Perlite) (1:1) were used in the present study. Results revealed that treatment T4 and T3 are best over all other treatments in all respective parameters studied. Addition of soil amenders such as rice husk and saw dust with soil, sand and FYM is essential for enhancing root and shoot growth in *I. mauritiana* Jacq..

INTRODUCTION

Vidari (*Ipomoea mauritiana* Jacq.) is one of the popular plant drugs of Ayurveda it is a component of many popular and highly traded Ayurvedic formulations like Chyavanaprash, an ancient Indian dietary supplement. The Ayurvedic Pharmacopoeia of Indian correlates 'Vidari' to the tubers of *Pueraria tuberosa* (Roxb. ex Willd.) as 'Kshiravidari' (Anon.2006). However, a recent report by Venkatasubramanian et al, (2009) indicates that as per Ayurvedic descriptions they both have similar properties and can be substituted by each other. Several herbal medicine manufacturing units also use *I. mauritiana* as Vidari instead of *P. tuberose*. Vidari is aphrodisiac, cardiotonic, demulacent, diuretic, refrigerant and galactogogue (Chopra et al.1992). It is also used in emaciation, enteric fever and spermatorrhea (Pandeyet and Dravyaguna 2004). The annual trade volume of Vidari is 500-1000 Metric tonnes (Ved and Goraya 2008).

I. mauritiana is a branched perennial climber with large tuberous tap roots and glabrous stem and branches; leaves palmately 5-7 lobed; flowers purple, in pedunculate corymbose axillary panicle; fruits avoid, four-celled and four-valved capsules, surrounded by enlarged fleshy sepals, seed clothed with nanytawny cottony hairs. The root tubers exude milky, sticky, latex and exhibits annual rings when cut. This species is widely naturalized in tropical parts of the world (Warrier et al.2007). Taraxerol, taraxerol acetate, umbelliferone, b-sitosterol, scopoletin and 7-O-b-$_D$-glycopyranosyl sco- poletin (Scopolin) have been isolated from the methanol extract of the tubers (Karthik et al. 2009). The roots are used to increase

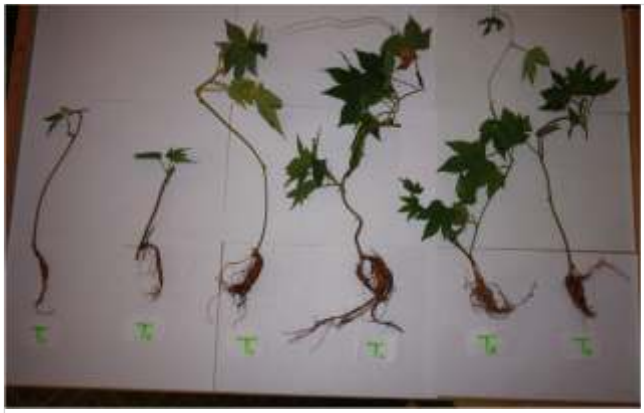

Fig.1. Root and shoot growth in different treatments in 90 days

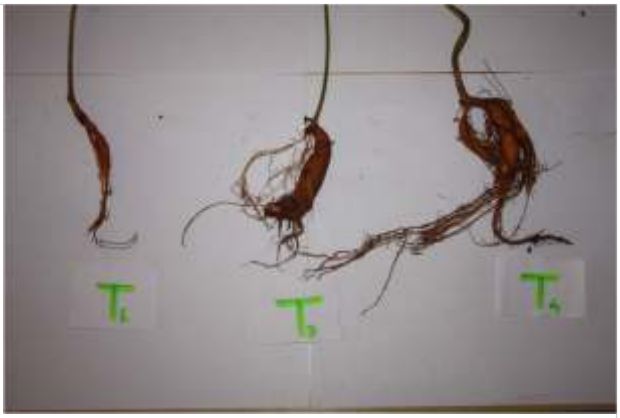

Fig. 2. Variation in tuber formation in different treatments

appetite, as a galactagogue, in rejuvenative medicine, as a stimulant, carminative and tonic (Sivarajan and balachandran 1994). Alcohol extract of tubers is stimulant, as well as depressant, and has convalescent effect on central nervous system (Rastogi et al. 1990; 1991).

I. mauritiana being one of the most important medicinal plant having a large demand for its tubers in Aurvedic industry, an investigation was envisaged to develop the propagation technique of the species using different potting mixture from leafy shoot cutting.

MATERIALS AND METHODS

The present study was conducted in the Forest Nursery of College of Forestry, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli. The leafy shoot cutting of *I. mauritiana* were collected from natural forests near Dapoli. Cuttings with three nodes were raised in the 100 cc root trainer. Root trainers were filled with different potting mixtures *viz*., T1 (Control), T2 (Soil + Sand + FYM)(1:1:1), T3 (Soil + Sand + FYM + Sawdust)(1:1:1:1), T4 (Soil + Sand + FYM +Rice husk)(1:1:1:1), T5 (Cocopeat), T6 (Sand + Perlite)(1:1) with five replications. A total 100 cutting were planted in each treatment. The experiment was conducted with complete randomised design in the polyhouse under controlled condition for maintenance of humidity and temperature. Observation was recorded on germination parameters like shoot length, number of leaves, total shoot weight, root length, number of roots, root weight, total biomass ,tuber weight, sprouting present and rooting percent for 90 days. The data was subjected to statistical analysis using SAS 9.2(ISRI).

RESULTS AND DISCUSSION

Influence of different treatments constituting various potting mixture on rooting of leafy cuttings of *I. mauritiana* is given in Table 1. The experimental result revealed that the shoot length and number of leaves were maximum in treatment T3 (92.67cm. & 16.66) where as treatments T4 (58.50cm. & 12.25), T5 (52.50cm. & 16.50), T6 (38.00cm. & 10.00) were at par with each other for both the parameters.It was observed that the maximum root length was 18.75cmin treatment T4 which statistically significant as compared to Treatment T2 (11.00cm.) and T6 (11.00cm.). The result showed maximum root was 40.00 in treatment T5 which was statistically significant as compared to other treatments. This was followed by the maximum root at T4 (33.50), T3 (27.33) and T6 (20.33) which were statistically at par with each other. The observation recorded showed that the maximum root weight found in treatment T4 i.e. 11.50g. Whereas highest tuber weight was found in treatment T4 (36.31g) which was statistically significant over all treatment. The weight of individual tuber is genetically controlled character and development of tuber is largely affected by the nutrient status, soil physical properties. However, the previous finding by various workers shows that the application of FYM

Table 1: Root and shoot observation under different treatments

Treatments	Shoot length (cm)	No of leaves	Total shoot weight (g)	Root length (cm)	No of roots	Root weight (g)	Total biomass (g)	Tuber weight (g)	Sprouting (%)	Rooting (%)
T1 (Control)	5.83	2.66	0.91	16.33	14.66	1.97	2.88	1.55	40	36
T2 (Soil + Sand + FYM) (1:1:1),	7.00	3.33	1.28	11.00	10.33	2.21	3.50	2.14	56	50
T3 (Soil + Sand + FYM + Sawdust) (1:1:1:1)	92.67	16.66	5.70	17.00	27.33	8.79	14.49	8.65	78	76
T4 (Soil + Sand + FYM +Rice husk) (1:1:1:1)	58.50	12.25	5.90	18.75	33.50	11.50	17.41	36.31	76	75
T5 (Cocopeat)	52.50	16.50	4.62	14.00	40.00	6.53	11.15	6.30	80	78
T6 (Sand + Perlite) (1:1)	38.00	10.00	3.23	11.00	20.33	6.15	9.38	6.16	72	70
S. E.(+)	7.77	1.45	0.55	1.04	2.78	0.95	1.45	6.08	-	-
S. D.	32.97	6.15	2.33	4.45	11.80	4.05	6.18	25.80	-	-
C. D.(5%)	22.56	6.09	2.35	7.22	12.28	3.91	5.33	47.98	-	-

up to optimum stage with various soil amenders increase weight and size of tuber. The sprouting and rooting percent of cuttings found maximum in T5 (80 percent and 78 percent)and minimum in T1 (40 percent and 36 percent) and T2, T3 were at par as cocopeat holds more amount of water other than any media used shows better results. The application of FYM in soil result into better survival, due to change in soil physical properties and availability of nutrients for the proper growth and development of plants (Singh and Gupta 2005).

CONCLUSION

From the reults, it can be concluded that treatment T4 (Soil + Sand + FYM +Rice husk) (1:1:1:1)and T3 (Soil + Sand + FYM + Sawdust)(1:1:1:1) are best over all other treatments in all respective parameters studied. Addition of soil amenders such as rice husk and saw dust with soil, sand and FYM is essential for enhancing root and shoot growth in *I. mauritiana.*

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