



Effect of Media Formulation on Survival and Growth Performance of Star Jasmine (*Jasminum multiflorum* Burm. f. Andrews) Propagation by Stem Cuttings

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Present study investigated “Effect of media formulation on survival and growth performance of star jasmine (*Jasminum multiflorum* Burm. f. Andrews) propagation by stem cuttings”. during 2023-2024 using a Randomized Block Design (RBD) with eight treatments and three replications with eight treatments i.e., T₅: soil + vermicompost + cocopeat (1:1:1). The treatments comprised various

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combinations of soil, farmyard manure (FYM), cocopeat, sand, rice husk, and vermicompost. The results indicated that the propagation media significantly affected the growth parameters. Notably, Treatment T₅ i.e. soil + vermicompost + cocopeat (1:1:1) demonstrated superior performance, with the shortest sprouting time (9.67 days), highest survival rate (78.67%) and overall enhanced growth attributes, including sprout number, sprout length, plant height, leaf area, and root and shoot weights. The findings suggest that soil + vermicompost + cocopeat (1:1:1) is an optimal medium for propagating of star Jasmine, warranting further studies to confirm its efficacy across different locations and seasons.

Keywords: Jasmine; farmyard manure (FYM); cocopeat; rice husk; vermicompost.

1. INTRODUCTION

Jasminum multiflorum, commonly known as Star Jasmine, is an ornamental flowering shrub native to India and Southeast Asia. It belongs to the family Oleaceae, and the genus *Jasminum* comprises approximately 500 species distributed across warmer regions of Europe, Asia, Africa, and the Pacific [1]. The species is particularly well-suited to subtropical climates [2]. While commercially significant species like *J. sambac*, *J. grandiflorum*, and *J. auriculatum* are widely cultivated for their fragrant flowers, *J. multiflorum* has untapped potential, especially for off-season production. It has been noted that nighttime temperatures between 15°C and 17°C can interrupt flowering for up to a week [3]. Despite its ornamental and commercial potential, *J. multiflorum* has not been extensively studied, particularly in terms of propagation methods. Jasmine species are highly valued among tropical fragrant flowers, yet research on the propagation of *J. multiflorum* remains limited. Stem cutting, a simple and cost-effective method, holds promise for the commercial propagation of *J. multiflorum*. However, success with this technique depends on several factors, including the type of cutting, the season in which it is taken, and the use of growth regulators. Specifically, auxins play a crucial role in root initiation, enhancing the chances of successful propagation [4]. Given the lack of comprehensive studies on the optimal propagation conditions for *J. multiflorum*, this research aims to investigate the effects of different propagation media on the growth of stem cuttings. By identifying the best conditions for asexual propagation, the study seeks to enhance the commercial viability of *J. multiflorum* and provide valuable insights for future horticultural practices.

2. MATERIAL AND METHODS

The present research work was carried out during *Rabi* season of the year 2023-24 at

Floriculture farm of College of Horticulture, Dapoli, Dist. Ratnagiri, (Maharashtra state). The experiment was laid out in Randomized Block Design replicated thrice with eight treatments i.e., T₁: Soil + FYM + Sand (1:1:1), T₂: Soil + FYM + Cocopeat (1:1:1), T₃: Soil + FYM + Rice husk (1:1:1), T₄: Soil + Vermicompost + Sand (1:1:1), T₅: Soil + Vermicompost + Cocopeat (1:1:1), T₆: Soil + Vermicompost + Rice husk (1:1:1), T₇: Soil + Vermicompost + FYM (1:1:1), T₈ Soil + FYM (Control) (3:1). A slanting cut was given at the base of the cuttings having three to four buds. A transverse cut was given at the top of each cutting. The basal end of the cuttings were treated with rooting hormone i.e., keradix powder. Then the treated cuttings were planted in polybags (6" x 8") containing media as per treatments. Daily observation was noted for sprouting parameters whereas survival percentage was recorded at the end of the experiment (120 DAP). The data were analyzed by standard method of analysis of variance described by Panse and Sukhatme [5].

3. RESULT AND DISCUSSION

3.1 Number of Days Required for Initiation of Sprouting

The effect of different propagation media on number of days required for initiation of sprouting is one of the key factors in the growth and survival of cuttings. Data was recorded till last initiation of sprouting. The minimum number of days (9.67 days) required for initiation sprouting of cutting was recorded in treatment T₅ (Soil + Vermicompost + cocopeat), which was followed by T₄ (Soil + Vermicompost + Sand) i.e., (11.00) days. Both these treatments were at par and significantly superior over the remaining treatments. Earliness in sprouting might be due to moisture available in media, available nutrients, utilization of stored carbohydrates and maturity of cutting use for planting as well as optimum temperature and relative humidity

during the experiment. Similar results reported by Marasini and Khanal [6] on *bougainvillea glabra* cutting and Sharath and Bhoomika [7] early sprouting in black pepper cuttings.

3.2 Number of Sprouts

The various media show significant effect in star jasmine. The maximum sprouts (4.27) were recorded in treatment T₅ (Soil + Vermicompost +

Cocopeat), which was significantly superior over remaining treatments. The minimum sprouts (1.87) were recorded in treatment T₈ (Soil + FYM). This could be attributed to the presence of nutrient composition in vermicompost which may facilitated better nitrogen utilization, utilization of stored carbohydrates, and other factors, consequently enhancing the growth of the sprouts. Similar trend was reported by Shira and Kumar [8] in *Salix* cuttings.

Table 1. Effect of different media formulation on number of days required for initiation of sprouting, number of sprouts, survival (%) and plant height (cm) of Star jasmine cuttings

Treatments		Days required for inihation of sprouting.	Survival percentage (%)	Number of sprouts	Plant height (cm)
T ₁	Soil + FYM + Sand (1:1:1)	12.33	69.33	3.07	42.11
T ₂	Soil + FYM + Cocopeat (1:1:1)	11.67	70.00	3.27	43.14
T ₃	Soil + FYM + Rice husk (1:1:1)	15.67	56.00	2.60	36.29
T ₄	Soil+ Vermicompost +Sand (1:1:1)	11.00	74.67	3.67	43.95
T ₅	Soil + Vermicompost +Cocopeat (1:1:1)	9.67	78.67	4.27	46.35
T ₆	Soil + Vermicompost + Rice husk (1:1:1)	14.67	62.67	2.87	41.37
T ₇	Soil + Vermicompost + FYM (1:1:1)	13.33	65.33	2.80	40.79
T ₈	Soil + FYM (Control) (3:1)	16.33	47.33	1.87	34.36
Mean		13.08	65.50	3.05	41.05
S. Em ±		1.12	1.56	0.14	0.50
CD @ 5%		3.39	4.72	0.43	1.52
Result		SIG	SIG	SIG	SIG

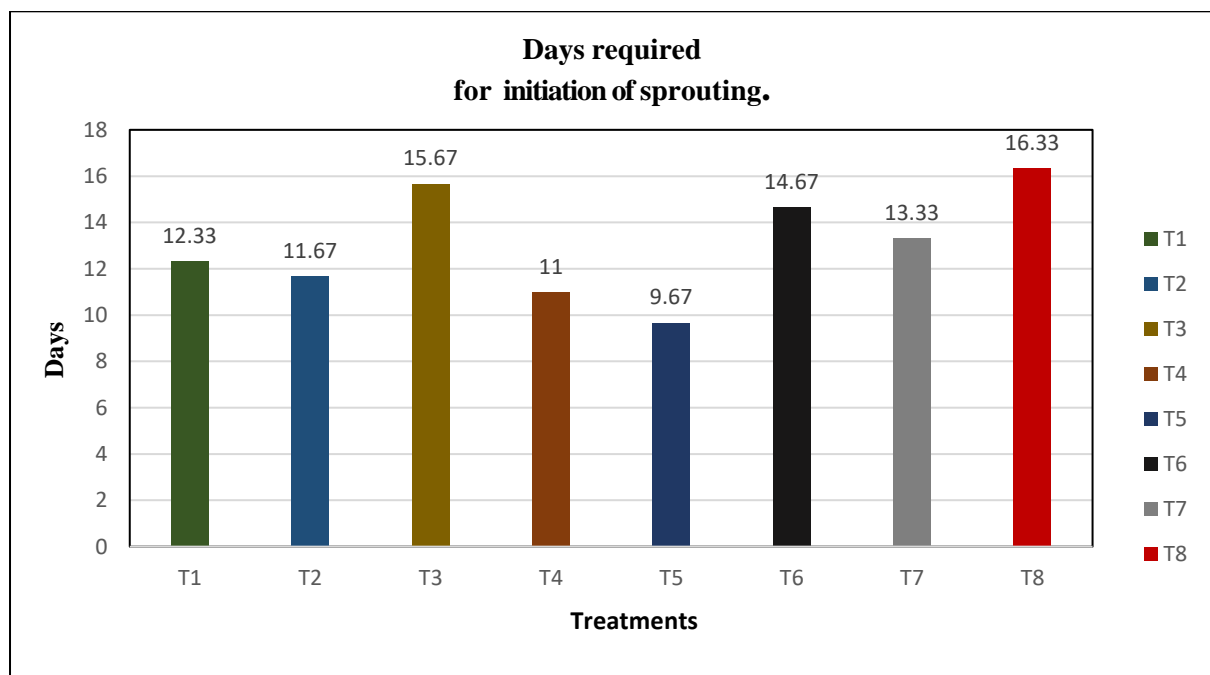


Fig. 1. Effect of different media formulation on days required for initiation of sprouting in Star jasmine

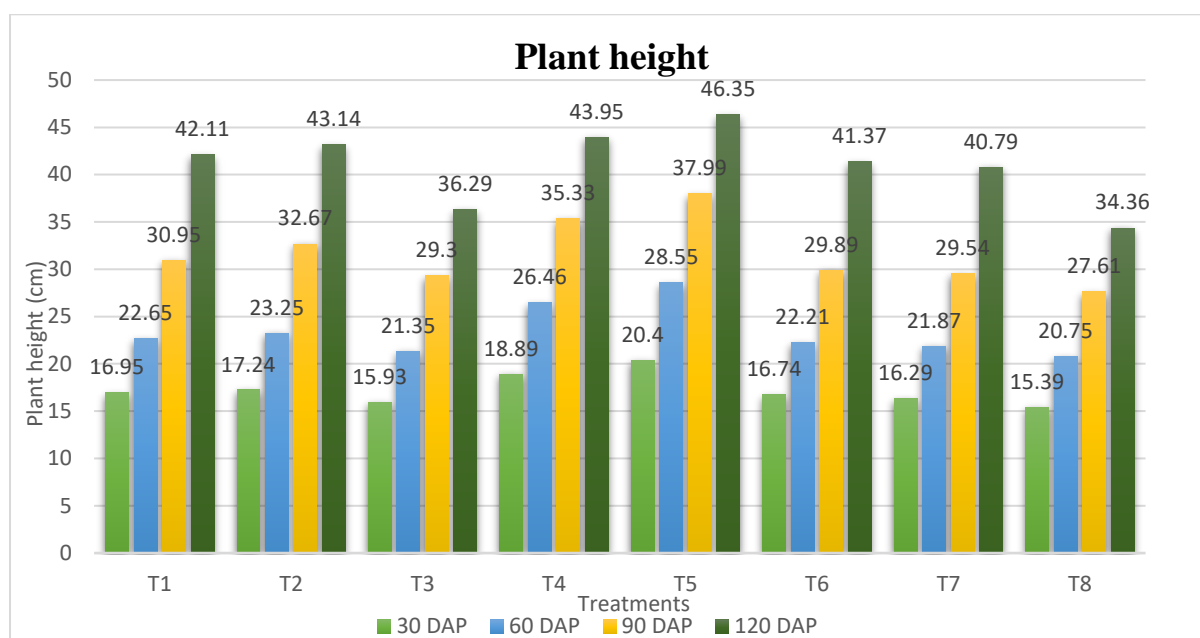


Fig. 2. Effect of different media formulation on plant height of star jasmine cuttings

3.3 Survival %

The data of survival % showed a significant variation in experiment among treatments. The highest survival % 78.67 % was found in T₅ i.e., Soil + Vermicompost + Cocopeat (1:1:1), which was at par with treatment T₄ (74.67%). However, the lowest survival % 47.33 % was observed in treatment T₈ i.e., Soil + FYM (3:1) proportion. The higher availability of well-decomposed organic matter in media, which increases nutrient availability. Absorption of nutrients and water which was responsible for maintaining cell turgidity cell elongation, root formation and vegetative growth of cutting which increased the survival percentage. It belongs to the family Oleaceae, and the genus *Jasminum* comprises approximately 500 species distributed across warmer regions of Europe, Asia, Africa, and the Pacific [1].

3.4 Plant Height

The perusal of data revealed that the number of sprouts showed significant difference in different propagation media was found in the plant height among various treatments in the experiment. The maximum plant height (46.35 cm) was found in treatment T₅ i.e., Soil + Vermicompost + Cocopeat (1:1:1), whereas the minimum plant height (34.36 cm) was observed in treatment T₈ i.e., Soil + F.Y.M (3:1). Treatment T₅ i.e., Soil + Vermicompost + cocopeat (1:1:1) was found

statistically significant in relation to plant height. The vermicompost is enriched with diversity of soil micro-organism which helps the plant to accelerate the growth of plant. Similar result was observed in Bhardwaj [9] and Meenakshi et al. [10] in Lilly.

4. CONCLUSION

From the present investigation the conclusion can be drawn that use of propagation media of soil + vermicompost + cocopeat with the ratio of 1:1:1 (T₅) showed the promising results with respect to survival and growth attributes such as days required for sprouting, number of sprout and plant height, under konkan agroclimatic region.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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