



Performance of Pleomele (*Dracaena reflexa*) Varieties in Different potting MEDIA under Prayagraj Agro-climatic Conditions

Austin T. Raj^{a++*}, Urfi Fatmi^{a#} and Vijay Bahadur^{a†}

^a Department of Horticulture, SHUATS, Prayagraj, Uttar Pradesh, India.

Authors' contributions

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

Article Information

DOI: 10.9734/IJPSS/2023/v35i32778

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/97045>

Original Research Article

Received: 19/12/2022

Accepted: 25/02/2023

Published: 28/02/2023

ABSTRACT

The experiment was conducted in the Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture Technology and Sciences, Prayagraj (UP), during February, 2022 to May, 2022 with two varieties of *Dracaena reflexa* and seven potting mix. The objective of the experiment is to find out the better performance of pleomele (*dracaena reflexa*) varieties in different potting media under prayagraj agro-climatic conditions. The experiment was laid out in FCRD with 14 Treatment combination replicated thrice. The results revealed that treatment combination V₁T₇ i.e. Song of India in medium of - Cocopeat: sand: FYM: vermicompost: perlite(1:1:1:1v/v) – performed significantly better in terms of plant height, plant spread, number of leaves, root length, leaf width, leaf length and stem girth.

⁺⁺ Researcher;

[#] Assistant Professor;

[†] Associate professor and Head;

*Corresponding author: E-mail: austinraj18@gmail.com;

Keywords: *Dracaena reflexa*; Song of India; Cocopeat; sand; FYM; vermicompost; perlite.

1. INTRODUCTION

Ornamental plants are highly appreciated for their attractive and delightful appearance. Foliage plants have great importance in creating greenery in offices, houses, commercial centers etc, as they adapt easily to indoor conditions. Shade loving pot plants are suitable for the interior of a house which has little space for growing the plants. The most apparent use of these plants is their visual enticing effect as they give fresh look to the surroundings and soothe the eyes. Apart from enhancing the beauty, these plants contribute remarkably to the quality of life by cleaning the air that brings fresh energy and helps to breathe free. These plants not only add beauty and biological comfort but also improve the aesthetic outlook [1]. Indoor Air Quality in Buildings: A Comprehensive Review on the Factors Influencing Air Pollution in Residential and Commercial [2]. That is why it becomes even more important to incorporate such foliage plants indoors. The commercial production of ornamental plants is increasing worldwide and United States and European nations are leading both in its production and consumption.

Dracaena (*Dracaena reflexa*), a member of the family Asparagaceae, is one of the important cut foliage crops used in our country. It is exported to different countries from India. It is native to Madagascar and other Indian ocean islands. It is also an important indoor and cut foliage crop of Rodriguez, Reunion, Italy, Belize, Central African Republic, Spain, Mauritius, Mozambique and Sri Lanka. This plant is fairly easy to grow and maintain. Its vibrant foliage character and long vase life have made it as a popular cut foliage. It is a popular ornamental plant, both in the landscape and home. It can be enjoyed as a specimen plant, accent or pruned to create a border [3-6].

Dracaena is widely grown as an ornamental plant and house plant, valued for its richly colored, evergreen leaves and thick, and irregular stems. The rich green lance-shaped arching leaves spiral the upright stems from base to tip. Mature plants may bear large clusters of greenish-white flowers [7-9]. Grow this plant as a multi-stemmed shrub or as a small tree pruned to a short trunk. It is also called as song of India plant, pleomele and reflexed *Dracaena* is a species from the *dracaena* genus which has

become a popular house plant. This plant is sometimes classified in Agavaceae and sometimes put in its own family called Dracaenaceae [10-13].

In present, soil, sand, cocopeat, perlite, coirpith, vermicompost and farmyard manure were used in different proportions. The cocopeat improves porosity, water holding capacity, cation exchange capacity and buffer swell, while that of perlite reduces the soil compaction, where on the hand vermicompost, increases the porosity of soil, provides good aeration, rich in humus and contains valuable vitamins, enzymes and hormones like auxins, gibberellins, etc. for better growth and development. Foliage plants are in high demand right now, and proper potting mixture are essential for maintain quality of plant as well indoor gardening where, light potting media are required. So this study is done to know the better performing variety and potting in Prayagraj agro climatic conditions

2. MATERIALS AND METHODS

Materials used and the methods adopted in the present study entitled "Performance of pleomele *Dracaena reflexa* varieties in different potting media under prayagraj agro- climatic conditions" was carried out during February 2022 to may 2022 in the Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj. The planting material was collected from Kerala Agricultural College, mannuthy, Thrissur. The plants were planted in 8 inch poly bags. The experiment comprised of 14 (2x7) treatments and 3 replications. . The experiment was laid out in FCRD.

The different treatment combinations are V₁T₁ - Song of India xSoil: sand: FYM (1:1:1v/v), V₁T₂ - Song of India xCocopeat: sand: FYM (1:1:1v/v), V₁T₃ - Song of India xCocopeat: sand: vermicompost (1:1:1v/v), V₁T₄ - Song of India xCocopeat: sand: FYM: perlite (1:1:1:1v/v), V₁T₅ - Song of India xCocopeat: sand: vermicompost: perlite (1:1:1:1v/v), V₁T₆ - Song of India xCocopeat: sand: FYM: vermicompost (1:1:1:1v/v), V₁T₇ - Song of India xCocopeat: sand: FYM: vermicompost: perlite (1:1:1:1:1v/v), V₂T₁ - Song of Jamaica xSoil: sand: FYM (1:1:1v/v), V₂T₂ - Song of Jamaica xCocopeat: sand: FYM(1:1:1v/v), V₂T₃ - Song of Jamaica xCocopeat: sand: vermicompost (1:1:1v/v), V₂T₄

- Song of Jamaica xCocopeat: sand: FYM: perlite (1:1:1:1v/v), V₂T₅ - Song of Jamaica xCocopeat: sand: vermicompost: perlite(1:1:1:1v/v), V₂T₆ - Song of Jamaica xCocopeat: sand: FYM: vermicompost(1:1:1:1v/v), V₂T₇ - Song of Jamaica xCocopeat: sand: FYM: vermicompost: perlite (1:1:1:1:1v/v)

3. RESULTS AND DISCUSSION

Significantly the taller plant (28.57 cm) were observed in V1T7 – Song of India in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v, which was at par with V2T1 (28.53cm) – Song of Jamaica in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v while shorter plant height was observed in the treatment V1T1- Song of India in Cocopeat: sand: FYM: perlite 1:1:1:1v/v (27.50cm). This increase in plant height might be due to high amount of organic matter, nitrogen, potassium, and optimum range of EC and pH of growing media. These results are consistent with previous work of [14].

Significantly the longest plant spread(14.86cm) were observed in V1T7 - Song of India in Cocopeat: sand: FYM: vermicompost: perlite (1:1:1:1:1v/v, which was at par with V1T6 (14.64cm) - Song of India in Cocopeat: sand: FYM: vermicompost: perlite1:1:1:1:1v/v while shorter plant spread was observed in the treatment V1T1-Song of India in Soil: sand: FYM 1:1:1v/v (12.83cm). Presence of cocopeat and sand improves the oxygen content in substrate there by increase plant spread. Vegetative growth was recorded higher in cocopeat based medium compositions by Thakur et al. [15]. Vermicompost contains nutrients in the readily available form to the plants such as nitrate, exchangeable P, K, Ca and Mg and also plant growth promoting hormones likes auxins and gibberellins by Theunissen et al. [16].

Significantly most number of leaves were observed with V1T7 (39.88cm) – Song of India in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v, which was at par with V2T2 - Song of Jamaica in Cocopeat: sand: FYM 1:1:1v/v (39.00) while lowest number of leaves was observed in the treatment V1T1- Song of India in Soil: sand: FYM v/v1:1:1 (37.78). More number of leaves was due to aeration made available by sand and nutrient status provided by both cocopeat and vermicompost. More number of leaves reflect good vigor and their suitability to environment and growth media. Increased

number of leaves on media amended with vermicompost in liliium Asiatic Asiatic hybrid 'Navona' has reported by [17].

Significantly the longest root length(cm) were observed in V1T7 (21.93cm) -Song of India in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v, which was at par with V1T5 - Song of India in Cocopeat: sand: vermicompost 1:1:1v/v (21.66cm) while shorter root length was observed in the treatment V2T3- Song of Jamaica in Cocopeat: sand: vermicompost 1:1:1v/v (13.66 cm). Vermicompost is a rich source of mineral nutrition and its addition to media increases quality by increasing microbial activity and microbial biomass which are the key components in nutrient cycling and production of plant growth regulators. This might have resulted in increased length of root. Similar result was reported by Thammaiah et al. [18] in dwarf poinsettia (*Euphorbia pulcherrima*) recorded maximum root development with vermicompost and sand.

Significantly the longest leaf length(cm) was observed in V1T7 (12.34cm) - Song of India in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v, which was at par with V1T6 - Song of India in Cocopeat: sand: FYM: vermicompost: perlite1:1:1:1:1v/v (12.12cm) while shorter leaf length was observed in the treatment V1T1- Song of India in Soil: sand: FYM 1:1:1v/v (10.99cm. Significantly greater leaf width (2.80cm) was observed in V1T7 - Song of India in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v which was at par with V1T6 - Song of India in Cocopeat: sand: FYM: vermicompost: perlite1:1:1:1:1v/v (2.74cm) while shorter leaf width was observed in the treatment V1T1-Song of India in Soil: sand: FYM (1:1:1)(2.63cm). Leaf length and width is a vital parameter that has a direct influence on the quality of the cut foliage. The reason is due to the high organic matter content which increases the water and nutrient holding capacity of the medium and also due to the presence of high N content. This might be associated with essential nutrients present in coco peat and vermicompost [19].

Significantly greatest Stem girth were observed with V1T7 (2.78cm) - Song of India in Cocopeat: sand: FYM: vermicompost: perlite 1:1:1:1:1v/v which was at par with V1T6 - Song of India in Cocopeat: sand: FYM: vermicompost: perlite1:1:1:1:1v/v (2.78 cm) while shorter stem girth was observed in the treatment V1T1- Song of India in Soil: sand: FYM 1:1:1v/v (1.68 cm).

Table 1. Performance of pleomele varieties of *Dracaena reflexa* in different potting media on vegetative growth

Treatments	Plant height			Plant spread			Number of leaves			Root length			Leaf width			Leaf length			Stem girth		
	V1	V2	M(T)	V1	V2	M(T)	V1	V2	M(T)	V1	V2	M(T)	V1	V2	M(T)	V1	V2	M(T)	V1	V2	M(T)
T1	27.5	28.5	28.0	12.8	13.6	13.2	37.7	38.6	38.2	21.1	21.1	21.1	2.6	2.7	2.6	10.9	12.0	11.5	1.6	2.4	2.0
T2	28.4	28.4	28.4	13.3	14.1	13.7	38.7	39.0	38.8	20.4	20.6	20.5	2.7	2.6	2.7	11.8	11.2	11.5	2.6	2.1	2.3
T3	28.3	28.0	28.1	14.2	14.1	14.1	38.4	38.7	38.5	20.6	13.6	17.1	2.7	2.7	2.7	11.6	11.8	11.7	2.4	2.6	2.5
T4	28.3	27.7	28.0	14.2	14.2	14.2	38.6	38.4	38.5	20.5	20.8	20.7	2.7	2.6	2.7	12.0	11.6	11.8	2.3	2.5	2.4
T5	28.2	28.1	28.1	13.8	13.5	13.7	38.7	38.5	38.6	21.6	21.2	21.4	2.6	2.7	2.7	11.2	11.9	11.5	2.5	2.6	2.5
T6	28.0	28.4	28.2	14.6	13.3	14.0	38.3	38.8	38.6	20.2	20.7	20.5	2.7	2.7	2.7	12.1	11.8	11.7	2.7	2.6	2.7
T7	28.5	28.5	28.5	14.8	12.9	13.8	39.8	38.5	39.2	21.9	20.1	21.0	2.8	2.7	2.7	12.3	11.8	11.9	2.7	2.7	2.7
M(V)	28.21	28.2		14.1	13.5		38.6	38.6		20.9	19.7		2.7	2.7		11.7	11.7		2.4	2.5	
	CD_{0.05}	S.Em(±)		CD_{0.05}	S.Em(±)		CD_{0.05}	S.Em(±)		CD_{0.05}	S.Em(±)		CD_{0.05}	S.Em(±)		CD_{0.05}	S.Em(±)		CD_{0.05}	S.Em(±)	
varieties		0.06		0.306	0.105			0.076		0.31	0.70			0.008			0.057			0.061	
treatments	0.33	0.11		0.573	0.197		0.415	0.143		0.59	1.31		0.045	0.015		0.312	0.107		0.334	0.115	
Factor(V× T)	0.47	0.16		0.811	0.278		0.587	0.202		0.83	1.85		0.063	0.022		0.441	0.151		0.472	0.162	

The increase in stem girth might be due to the reason that the growing media improve proper aeration, water holding capacity, supplying substantial amount of nutrients through root absorption which converts in photosynthates helps in cell division and cell elongation results in higher stem girth. Similar findings have been reported by Mehwish et al. [20] in dahlia.

4. CONCLUSION

From the present investigation entitled *Performance of pleomele varieties of Dracaena reflexa in different potting media under Prayagraj agro-climatic conditions* it is concluded that different potting media rendered their significant effect on all the growth characters of *Dracaena reflexa*. Treatment combination V₁T₇ i.e. Song of India in medium of - Cocopeat: sand: FYM: vermicompost: perlite(1:1:1:1:1v/v) was found superior in terms of plant height, plant spread, number of leaves, root length, leaf width, leaf length and stem girth. Hence, *Dracaena reflexa* variety 'Song of India' should be grown in cocopeat: sand: FYM: vermicompost: perlite(1:1:1:1:1v/v) medium under Prayagraj agro – climatic conditions for better plant growth and development.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

- Kobayashi KD, Mc, Connell J, Griffis J. Bougainvillea. Honolulu (HI): University of Hawaii. 2007;(12)38.
- Mehzabeen, Mannan, Sami G, Al-Ghamdi. Indoor Air Quality in Buildings: A Comprehensive Review on the Factors Influencing Air Pollution in Residential and Commercial. Int. J. Environ. Res. Public Health. 2021;18(6):3276.
- Khelikuzzaman MH. Effect of different potting media on growth of a hanging ornamental plant (*Tradescantia* sp.), Journal of Tropical Agriculture and Food Science. 2007;35(1):41.
- Nazari F, Farahmand H, Khush-Khui M, Salehi H. Effect of coir as a component of potting media on growth, flowering and physiological characteristics of hyacinth (*Hyacinthus orientalis* L. cv. Sonbol-e-Irani). International Journal of Agriculture and Food Science. 2011;1: 34-38.
- Rashidha CK, Mini S, Sreelatha U, Anupama TV, Prameela P. Standardization of soilless growth media for raising potted ornamental foliage plants for export purpose, Journal of Tropical Agriculture. 2021;59 (1).
- Richard TP, Will EW. Evaluation of various potting media for growth of foliage plants, Proceedings of the Florida State Horticultural Society. 1972; (85):395-397.
- Abhimanyu P, Fatmi U, Ravi. Effects of potting media on survival and growth of different species of *Dracaena* (*D. marginata*, *D. reflexa*, and *D. mahatma*) under shade net conditions. International Journal of Chemical Studies. 2020;8(3):1259-1261.
- Abid M, Asif M, Bashir M, Nasir A.() Growth response of song of India (*Dracaena reflexa*) to various growing substrates. International Journal of Chemical Studies. 2017;1(2):105-109.
- Anjana, Fatmi U, Devi S. Effect of Different Potting Media in Different Potted Croton (*Codiaeum variegatum*) Varieties under Shade Net Condition in Allahabad, India. International Journal of Current Microbiology and Applied Sciences. 2017;6(8):3760-3764
- Chen Y, Inbar Y, Hadar Y. Composted agricultural wastes as potting media for ornamental plants, Soil Science. 1988; 145(4):298-303.
- Herath HE, Krishnarajah SA, Damunupola JW. Effect of two plant growth hormones and potting media on an ornamental foliage plant, *Ophiopogon* sp. International Research Journal of Biological Sciences. 2013;2(12):11-17
- Kakuei F, Salehi H. Factors affecting in vitro propagation of *Dracaena sanderiana* Sander ex Mast. Cultivars. II. MS salt strengths, sub-culturing times, rooting and acclimatization. Adv. Hort. Sci. 2015; 29(4):165-170.
- Kavana G, Bkavana G, Hanumantharaya CSY. Effect of potting media on growth parameters of *Nephrolepis undulate* J. Sm under protected condition. International Journal of Chemical Studies. 2019;7(4):2836-2839
- Mehmood T, Ahmad W, Shafique K, Shafi J, Shehzad MS, Sarwar MA. Comparative effect of different potting

- media on vegetative and reproductive growth of floral shower (*Antirrhinum majus* L.). Universal Journal of plant Science. 2013;1(3): 104-111.
15. Thakur M, Shylla. Influence of different growing media on plant growth and fruit yield of strawberry (*Fragaria x ananassa Duch.*) cv. Chandler grown under protected conditions. Int. J Curr. Microbiol. App. Sci. 2018;7(4):2724-2730.
 16. Theunissen J, Ndakidem A, Laubscher CP. Potential of vermicompost produced from plant waste on the growth and nutrient status in vegetable production. International Journal of the Physical Sciences. 2010;5(13):1964-1973.
 17. Moghadam ARL, Ardebili ZO, Saidi F. Vermicompost induced changes in growth and development of *Lilium asiatic hybrid* var. Navona. Afr. J. Agric. Res. 2012; (7):2609-2621
 18. Shirol AM, Kulkarni BS, Reddy BS, Kanamadi VC, Thammaiah N. Influence of different rooting media on rootability of tip cuttings of dwarf poinsettia. Karnataka Journal of Agricultural Sciences. 2001; 14(4):1145– 1146.
 19. Vettical BS, Upadhyay A, Tiwari SP, Sapkota MM, Nepali DB, Yadav JL, Jiban(). Attitude of Farmers on Open Border Agriculture Market of Belhiya Border of Rupandehi, Nepal. International Journal of Applied Sciences and Biotechnology. 2016;4(3):40- 46.
 20. Mehwish, Kiran, Jalal-ud-Din, Baloch, Kashif, Waseem, Muhammad, Saleem, Jilani, Muhammad, Qasim, Khan. Effect of Different Growing Media on the Growth and Development of Dahlia (*Dahlia pinnata*) Under the Agro-Climatic Condition of Dera Ismail Khan. Pakistan Journal of Biological Sciences. 2007;(10): 4140-4143.

© 2023 Raj et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:

<https://www.sdiarticle5.com/review-history/97045>