

RESPONSE AND EFFECTIVENESS OF ANTHURIUM PLANTS (*Anthurium andreanum*) TO DIFFERENT HOLDING MEDIA ON GROWTH AND FLOWERING

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ABSTRACT

Anthuriums are tropical plants gaining popularity due to higher returns per unit area and for their long lasting flowers and attractive foliage. They are very popular with flower arrangers because of bold effect and long lasting qualities of flower. Anthurium plants require growing medium with good physical and chemical conditions for their proper growth and development. Proper selection of growing medium influences plant growth, flower production, quality and postharvest behaviour of flowers. The present study was carried out in Flora-tech floriculture unit at Kottarakara, kollam Dist, kerala state, India during 2014 - 2016 to find out the best suited growing media for the production of Anthurium plants. The experiment was conducted with eleven different growing media with three replications. All the treatments were grown under uniform shade level of 75% by using shade nets. Among the different treatment combinations, rice husk + coco peat + FYM (T₆) was found to be the best growing medium for anthurium cultivation and recorded maximum plant height, plant spread, number of flowers per plant, flower stalk length, spathe length and spathe breadth followed by rice husk + coco peat.

Keywords: growing medium, coco peat, Anthurium, FYM.

INTRODUCTION

Floriculture is the fast emerging industry and cultivation of flowers for commercial purpose is common to the world. It has become one of the high value agricultural business in many countries of the world (Taj, 2013). Anthurium is a slow growing perennial belongs to the family araceae requires shady humid conditions as found in tropical forests, grown for their showy cut flowers and attractive foliage. It has gained importance as one of the major cut flower of the modern world. Anthurium growing is a potential source of commercial farming and it makes best use of ready market for cut flowers with high returns both for its cut flower and whole plant. It includes more than 100 genera and about 1599 species, chiefly from

tropics (Higaki *et al.*, 1994). The Anthurium plant possesses an underground rhizome with adventitious roots, with low creeping habit of growth, using aerial roots for anchorage.

Anthurium plants require growing medium with good physical and chemical conditions for their proper growth and development. Among the physical characteristics, aeration and water holding capacity are probably the most important factors while, among the chemical characteristics, nutritional status, salinity level and good drainage also have a crucial role on plant development (Dewayne *et al.*, 2003). Most of the light weight, soilless media are combinations of two or more components formulated to achieve desirable physical and chemical properties (Bunt, 1971 and Khalaj *et al.*, 2011). The plant produces blooms throughout the year, one bloom emerging from the axil of every leaf. Flowers are usually harvested once a week. Even though Anthurium is grown by many planters, there is very less scientific information on growing medium. Standardization of growing media is most important for obtaining higher plant growth, flower production, quality flowers and postharvest behaviour of flowers. Therefore, the present work is carried out with a view to find the best suited growing media combination for enhancing the growth and flowering of Anthurium plants.

MATERIALS AND METHODS

The present study was carried out in Flora-tech floriculture unit at Kottarakara, kollam Dist, kerala state, India during 2014 - 2016. The experiment was conducted with eleven different treatments. The treatments with three replications were carried out in completely randomized design. All the treatments were grown under uniform shade level of 75% by using shade nets. The variety of Anthurium (*Anthurium andreanum* L.) used in the experiment is 'Tropical'. The colour of the spathe is red, smooth, blistered, leathery and wavy in texture. The colour of the spadix is lemon yellow. Four months old tissue cultured uniform size plants were planted in 12 inch pots. Plant height, plant spread, number of flowers per plant, flower stalk length, spathe length, spathe breadth and vase life were observed and recorded at 240 and 480 days after planting. The treatments details are given below.

Treatment details	
1.	T ₁ (rice husk + coco peat)
2.	T ₂ (coco peat)
3.	T ₃ (perlite + coco peat)
4.	T ₄ (vermiculite + coco peat)
5.	T ₅ (leaf mould+ coco peat)
6.	T ₆ (rice husk + coco peat + FYM)
7.	T ₇ (coco peat + FYM)
8.	T ₈ (perlite + coco peat + FYM)
9.	T ₉ (vermiculite + coco peat + FYM)
10.	T ₁₀ (leaf mould + coco peat + FYM)
11.	T ₁₁ (soil media)

RESULTS AND DISCUSSION

Among the different treatment combinations used in this experiment, rice husk + coco peat + FYM significantly influenced overall performances of Anthurium plants. Maximum plant height, plant spread, number of flowers per plant, flower stalk length, spathe length and spathe breadth were recorded in the growing medium rice husk + coco peat + FYM, this was followed by rice husk + coco peat and least results were recorded in soil media on the 240th and 480th days (Table - 1 & 2). The increased results from the medium used in T₆ (rice husk + coco peat + FYM) may be due to its better physical characteristics, aeration and water holding capacity, these are probably the most important factors, while among the chemical characteristics, nutritional status, and salinity level have a crucial role on plant development (Dewayne *et al.*, 2003, Singh *et al.*, 2003). Prabhu *et al.*, 1983 and Nagarajan *et al.*, 1985 found that coco peat a byproduct from coir industry should be a potential wealth and could be converted into valuable organic manure using biotechnological methods which contain N 0.26 per cent, P₂O₅ 0.01 per cent, K₂O 0.78 per cent and high lignin.

Coco peat can hold large quantities of water, just like a sponge. It can be used as a replacement for soil mixtures or as a soilless substrate for plant cultivation (John Mason, 2003). For optimal growth of plants, media must contain enough water, air and mainly with good physical and chemical properties. Most of the light weight, soilless media are combinations of two or more components formulated to achieve desirable physical and chemical properties. The present results are inline with the following results. Early flowering in Dendrobium was recorded with coconut fibre was reported by Cibes *et al.* (1957). Savithri and Khan (1994) find out the growth promotive effect of coco peat was reported in a series of annual crops and same findings were done by Mirzaev (1988) in carnation. Coco peat has been considered as a renewable sphagnum peat substitute for the use in horticulture (Pisanu *et al.*, 1994, Yau and Murphy, 2000 and Henry and Norman, 2001). Noguera *et al.*, (2000) studied the importance of coco peat as a growing medium due to its high porosity (95%), nutritive value and slightly acidic nature. The coco peat has a bulk density of 0.1 g/c and a particle density of 1.3 g/c with 96% porosity. Lower bulk density and particle density of the coco dust based media as compared to other medium was observed by Wilson *et al.*, (2002). The pH of 100% coco peat medium is slightly acidic and most of the ornamental crops prefer acidic pH. Abad *et al.*, (2002) recorded the pH of 4.9-6.14 for different sources of coir dust. The application of coco peat significantly increased the number of flowers, spathe length, stalk length and longevity of anthurium cv. Verdum Red (Nagalakshmi *et al.*, 2010). Similar reports were given by Miller and Langhans (1990), Gupta *et al.*, (2004), Ezhilkavitha *et al.*, (2006), Vijaya *et al.*, (2008) and Kameswari, (2014).

Treatment combination of rice husk + coco peat + FYM recorded highest vase life among the treatments, this is because the growing medium significantly affect the growth and flowering of plants. This might be due to the internal carbohydrate content of the flowers, which is responsible for the vase life of flowers and other quality parameters (Fig 1 & 2). Mngcweliso and Paul (2010) observed that the highest quality of cut flowers in terms of flower diameter and cut flower stem mass were obtained in carnations under optimum shade and good growing media. According to Sekar and Sujata (2001), flower produced on coco

peat based media showed more vase life compared to other media. Vase life was considerably increased in the flower produced in coconut fibre medium (Arumugam and Jawaharlal, 2004). Similar results were also obtained by Beaver (1986) and Suman (2004).

Table 1 - performance of the Anthurium plants grown on different rooting media at 240 days after planting.

Treatments	Plant height (cm)	Plant spread (cm)	Number of flowers/ plant	Flower stalk length (cm)	Spathe length (cm)	Spathe breadth (cm)
T ₁ (rice husk + coco peat)	17.92	22.01	2.80	24.81	4.59	4.11
T ₂ (coco peat)	16.99	21.03	2.27	23.45	3.57	3.49
T ₃ (perlite + coco peat)	16.87	20.89	2.07	21.71	3.12	3.65
T ₄ (vermiculite + coco peat)	15.65	20.78	2.31	23.52	3.23	3.12
T ₅ (leaf mould+ coco peat)	17.56	22.32	2.12	24.99	4.17	4.56
T ₆ (rice husk + coco peat + FYM)	18.31	23.21	2.81	28.98	4.83	4.52
T ₇ (coco peat + FYM)	19.89	25.91	2.97	29.02	4.11	4.32
T ₈ (perlite + coco peat + FYM)	16.43	20.93	2.19	21.93	4.32	4.36
T ₉ (vermiculite + coco peat + FYM)	15.23	21.83	2.10	27.41	3.01	3.13
T ₁₀ (leaf mould + coco peat + FYM)	15.47	21.32	2.16	27.38	3.11	3.32
T ₁₁ (soil media)	13.07	18.32	1.47	22.07	2.23	2.41
SE (d)	0.74	1.12	0.10	1.15	0.14	0.15
CD (p=0.05)	1.51	2.23	0.21	2.21	0.27	0.29

Fig 1 – Vase life (on distilled water) of Anthurium plants grown on different rooting media at 240 days after planting.

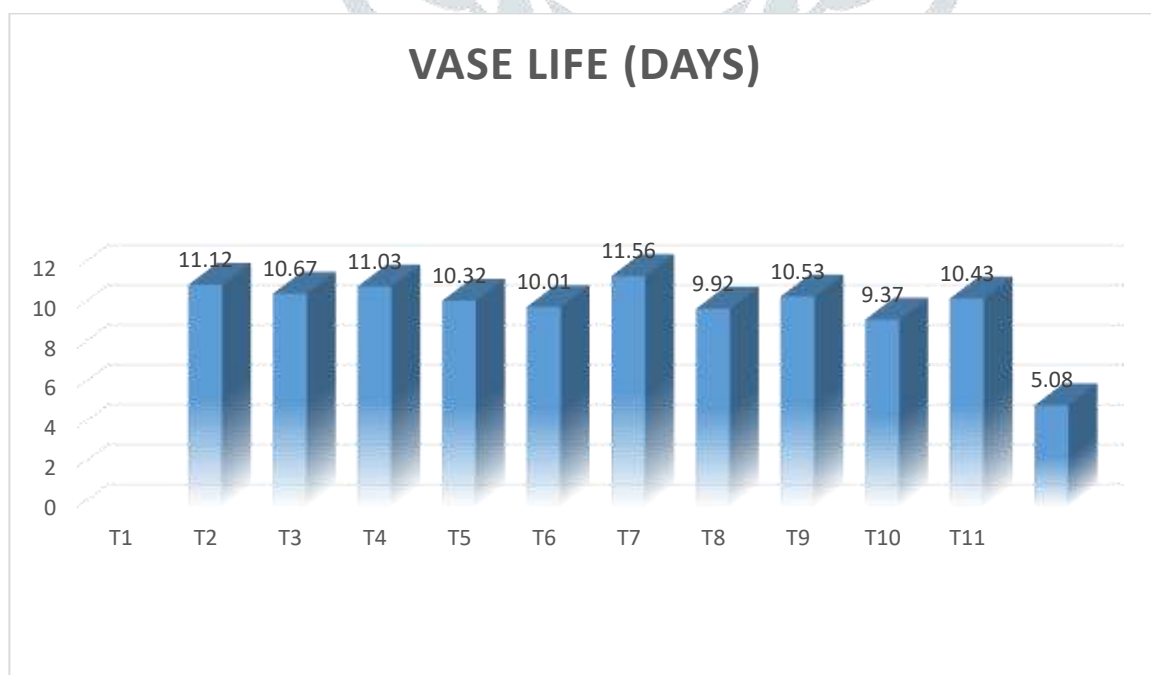
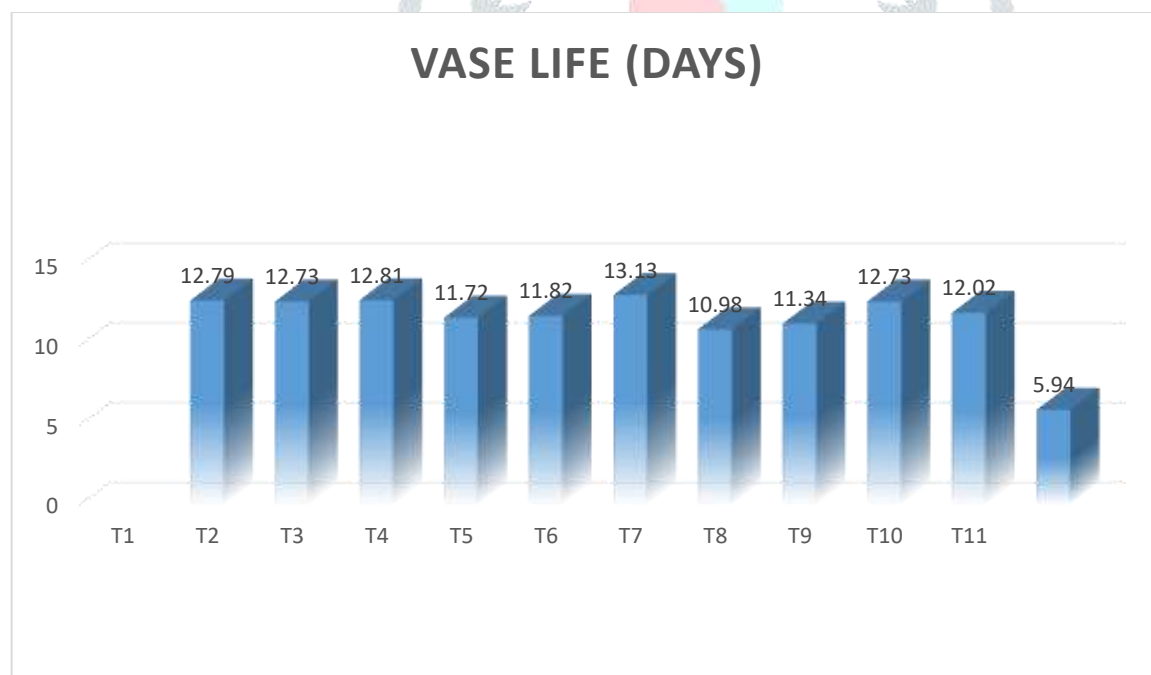


Table 2 - performance of the Anthurium plants grown on different rooting media at 480 days after planting.

Treatments	Plant height (cm)	Plant spread (cm)	Number of flowers/ plant	Flower stalk length (cm)	Spathe length (cm)	Spathe breadth (cm)
T ₁ (rice husk + coco peat)	46.14	71.92	5.30	42.54	9.27	9.43
T ₂ (coco peat)	38.83	61.00	3.89	38.67	7.67	7.82
T ₃ (perlite + coco peat)	35.78	57.52	4.51	35.69	7.12	7.26
T ₄ (vermiculite + coco peat)	35.70	59.01	4.12	37.68	8.56	8.69
T ₅ (leaf mould+ coco peat)	40.52	62.23	4.21	36.71	7.12	7.87
T ₆ (rice husk + coco peat + FYM)	46.56	72.39	5.72	43.21	9.88	9.96
T ₇ (coco peat + FYM)	45.32	71.55	4.46	41.14	8.32	8.43
T ₈ (perlite + coco peat + FYM)	39.22	61.61	3.93	34.01	7.74	7.90
T ₉ (vermiculite + coco peat + FYM)	35.37	58.47	4.09	37.41	7.59	8.63
T ₁₀ (leaf mould + coco peat + FYM)	38.34	56.41	4.09	37.38	7.99	7.62
T ₁₁ (soil media)	25.47	32.67	2.38	20.31	5.64	5.29
SE (d)	1.31	1.72	0.14	1.38	0.23	0.25
CD (p=0.05)	2.62	2.41	0.29	2.76	0.47	0.31

Fig 2 – Vase life (on distilled water) of Anthurium plants grown on different rooting media at 480 days after planting.



CONCLUSION

Considering the above results it could be concluded that the treatment combination of growing medium with (T₆) rice husk + coco peat + FYM has resulted as the best for the growth and flowering of Anthurium plants. Rice husk + coco peat + FYM medium provides sufficient air and oxygen supply which increases cell respiration and aeration. The water holding capacity is the most important factor of growing

medium and among the chemical characteristics, nutritional status and salinity level have a crucial role on plant growth.

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