

Foliage potted plant assessment for urban and peri-urban areas

Indoor plants have been used for over a century in commercial high rise buildings for aesthetic and psychological purposes. These plants are used both for exterior and interior decoration purpose for beautifying the surroundings. Since, city dwellers spend 90% of their time indoors and indoor air quality is a major health issue. Therefore, use of foliage potted plants in the indoors can help in combating indoor air pollution, improving the health status and increasing the productivity of the human resources. Therefore, foliage plants namely Red edge Dracaena, Areca palm, Goodluck Plant and *Araucaria* are suitable ornamentals for outdoor conditions, while Song of India, Xanadu, Money Plant, Arrowhead plant, Cardboard palm, Crotons are suitable for indoors conditions. However, Chinese fan palm was found suitable for both indoor and outdoor conditions. Therefore, the city dwellers can still manage to breathe in fresh air and keep polluted air at bay by growing these ornamental plants in and around their surroundings.

USE of potted plants indoors in office buildings helps in improving the aesthetics of surroundings and productivity of the employees. In addition, laboratory research has demonstrated the effectiveness of potted plants in reducing all types of indoor air pollution. Therefore, in order to combat the pollution indoor or outdoor, there is a great scope of using potted plants. Since, these plants are being produced in different parts of the country and are used both for outdoor and indoor purposes, but most of the times many plant species do not perform well under Delhi conditions due to adverse climatic conditions like heat wave, low temperature, low humidity and frost, etc.

Twelve potted plants namely; Good luck plant (*Cordyline fruticosa*), Croton (*Codiaeum variegatum*), Song of India (*Dracaena fragrans* cv. Victoria), Red edge dracaena (*Dracaena marginata*), Chinese evergreen (*Aglaonema commutatum*), Xanadu (*Philodendron xanadu*), Money plant (*Scindapsus aureus*), Arrowhead plant (*Syngonium*

podophyllum), Areca palm (*Dyopsis lutescens*), Chinese fan palm (*Livistona chinensis*), Cook pine (*Araucaria cookie*) and Cardboard palm (*Zamia furfuracea*) were evaluated for their suitability under Delhi conditions.

These plants were procured from nursery and standard cultural practices were used for the pot plant cultivation. Once the plants were established properly, these were kept under indoor and outdoor conditions for duration of two years and observed for their growth parameters.

Growth characters

Visual appearance of foliage plants especially plant height, spread, growth of leaves, colour of leaves especially greenness is most important in case of potted plants. Therefore various growth parameters of these plants were studied to assess their suitability for indoor and outdoors under Delhi's climatic conditions. It was found that Goodluck plant (*Cordyline fruticosa*) showed



Potted plants for dual benefit: Health and Aesthetics



Areca Palm



Xanadu



Cook pine



Song of India



Arrowhead Plant



Cardboard Palm

Potted Plants evaluated for their suitability under Delhi conditions

better canopy formation owing to maximum plant spread, height and number of leaves under outdoor conditions. Other potted Plants such as Song of India, Crotons, Chinese evergreen, Xanadu, Money plant and Arrowhead plant showed, better growth in terms of plant height, plant spread, number of leaves and greenness index under indoor conditions while Red edge dracaena showed better

performance under outdoor conditions (Table 1).

Palms are very important plants for outdoors and indoors as they are native of dry areas where both temperature and light intensity is high. It was observed that Areca palm showed better growth in outdoor conditions while Chinese fan palm found suitable for growing both under indoor and outdoor conditions, *Zamia furfuracea*

Table 1. Effect of growing conditions on plant height (cm) plant spread (cm), number of leaves and greenness index in foliage potted plants

Species	Plant Height (cm)		Plant Spread (cm)		Number of leaves		Greenness index (SPAD Value)	
	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
Goodluck Plant	45.77	48.96	20.36	21.22	10.78	11.53	43.19	42.76
Crotons	48.70	31.00	20.70	16.20	37.47	30.10	38.32	15.00
Song of India	42.84	31.20	58.50	35.85	20.20	17.51	61.63	60.57
Red Edge Dracaena	83.28	87.23	52.68	53.74	18.98	44.78	40.65	43.36
Chinese Evergreen	52.00	43.08	45.30	26.98	29.38	12.73	43.19	20.76
Xanadu	46.72	26.48	61.34	46.02	40.03	25.01	69.76	56.21
Money Plant	83.88	42.55	49.86	18.11	44.34	15.08	46.40	34.06
Arrowhead Plant	36.00	19.64	34.28	23.02	18.81	15.91	46.12	42.35
Areca Palm	118.56	125.20	95.93	111.67	7.76	8.42	60.52	63.82
Chinese Fan Palm	35.67	36.96	49.27	50.36	8.22	7.52	50.93	49.63
Cook Pine	51.80	55.00	36.80	44.88	14.20	22.47	21.09	23.77
Cardboard Palm	55.70	46.80	63.93	26.60	47.99	31.5	65.97	62.43

Table 2. Effect of growing conditions on shoot and root parameters of foliage potted plants

Species	Stem weight (g)		Leaf weight (g)		Shoot weight (g)		Root weight (g)		Shoot Root ratio	
	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor
Good luck Plant	19.68	38.44	14.82	31.78	34.50	70.22	12.02	18.90	2.82	3.72
Crotons	17.03	16.46	38.48	12.72	55.51	29.18	13.75	13.28	4.03	2.19
Song of India	74.88	19.08	102.26	25.80	177.14	44.88	57.38	42.74	3.09	1.05
Red Edge Dracaena	47.88	67.28	24.40	33.96	72.28	101.24	108.23	68.18	0.67	1.48
Chinese evergreen	75.75	47.22	144.48	96.12	230.23	143.34	81.55	55.46	2.82	2.58
Xanadu	47.88	8.75	30.25	17.36	78.13	26.11	34.53	23.58	2.26	1.11
Money Plant	35.68	16.96	22.43	18.32	58.11	35.28	31.08	24.00	1.52	1.47
Arrowhead Plant	14.95	16.46	30.13	28.34	45.08	44.80	30.60	20.54	1.47	2.18
Areca Palm	76.18	116.78	73.18	114.50	149.36	231.28	193.65	118.00	0.77	1.96
Chinese Fan Palm	22.35	19.08	26.50	24.68	48.85	43.76	31.95	29.18	1.52	1.50
Cook Pine	47.22	76.30	51.94	90.08	99.16	165.38	58.40	72.40	1.70	2.29
Cardboard Palm	133.75	85.76	125.40	70.02	259.15	155.78	46.06	30.85	5.63	5.05

(Cardboard palm) grown under indoor conditions resulted in maximum plant height, spread, number of leaves and greenness index. Similar to palms, Cook pine (*Araucaria*) also showed maximum plant height, spread, number of leaves and SPAD value under outdoor conditions.

Both root and shoot growth play an utmost important role in determining the overall growth, canopy formation and quality of plants. Therefore, root and shoot parameter growth was studied in all the above mentioned plants to evaluate the plants and their role as outdoor or indoor plants (Table 2). Maximum leaf number, stem and shoot weight contributed to better growth of Good luck plant, Chinese evergreen, Song of India, Xanadu, Money plant and Crotons under indoor conditions. However, for outdoor conditions Arrow plant, Red edge dracaena and Cook pine performed best w.r.t. highest leaf, stem and shoot weight. Among palms, Cardboard palm showed maximum stem, shoot weight under indoor conditions whereas, Areca palm under outdoor condition. However, Chinese fan palm showed better growth under indoor conditions with respect to stem weight, leaf weight and shoot weight.

Roots play key role in anchorage of the plant, absorption of water and nutrients and overall growth of plants. If the growth of root is good, then only it will supply the food and water to plant and results in maximum growth and acceptability by the end user. Therefore, observing the root number, root length, shoot

root ratio are few characters which gives us the idea about suitability of plant under different conditions. Maximum root weight in Areca palm and highest root number in Chinese evergreen under both conditions makes them suitable for indoor and outdoor conditions. Comparison of both the *Dracaena* species showed that Song of India exhibited better growth in terms of shoot and root parameters under indoor conditions while Red edge dracaena showed better growth under outdoor conditions. Maximum S/R ratio in Arrowhead plant, Cook pine, Cardboard palm and Areca palm was observed under outdoor conditions as compared to indoor, hence their suitability for outdoors while Chinese fan palm showed almost similar S/R ratio in both conditions depicted that it is suitable for both indoor and outdoors.

Hence it is concluded, that the Arrowhead plant, Cook pine, Cardboard palm, Areca palm, Chinese fan palm, Red edge dracaena are suitable for outdoors while Song of India, Xanadu, Chinese evergreens, Goodluck plant, Chinese Fan palm and crotons are suitable for indoor conditions.

For further interaction, please write to:

Ritu Jain (Senior Scientist), Division of Floriculture and Landscaping, ICAR-Indian Agricultural Research Institute, New Delhi 110 012. Corresponding author e-mail: ritujain.iari@gmail.com

**Flowers always make people better, happier, and more helpful;
they are sunshine, food and medicine for the soul.**

– Luther Burbank