



ECONOMICALLY IMPORTANT ORNAMENTAL FERNS IN LUCKNOW CITY OF UTTAR PRADESH INDIA

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ABSTRACT

An extensive survey of nurseries having ornamental ferns and florist shops within Indira Nagar, Gomti Nagar, Hazratganj and Alambagh locality within the city of Lucknow was conducted during 2022-2023, to evaluate some of the ornamental traits and economic importance of different fern species, highlighting their suitability for ornamental uses in different localities of Lucknow, Uttar Pradesh India. Ferns, with their amazing shape, color, texture of fronds and other ornamental traits, are of great significance in urban localities for various types of decoration. They are being used as fillers in bouquets and flower arrangements. Diversity was recorded in shape, color, texture and tip of pinna among fern species used in ornamental purposes like *Nephrolepis exaltata* L., *Nephrolepis exaltata* L. Bostonensis (Golden Fern), *Nephrolepis exaltata* L. variegata (Tiger Fern), *Nephrolepis exaltata* L. (Fluffy Ruffle), *Nephrolepis falcata* L. (fishtail), *Nephrolepis cordifolia* 'Duffii' L. (Button Fern), *Adiantum capillus-veneris* L (Maiden-hair Fern) and *Christella dentata* Forssk. (Soft Fern) are suitable for outdoor. *Nephrolepis exaltata* L. Bostonensis (Golden Fern), *Nephrolepis exaltata* L. variegata (Tiger Fern), *Nephrolepis exaltata* L. (Fluffy Ruffle) and *Adiantum capillus-veneris* L (Maidenhair Fern) are best for outdoor, indoor, hanging basket and ground cover. *Nephrolepis exaltata* and *Nephrolepis tuberosa* are also used as fillers in many kinds of bouquets and arrangements.

KEY WORDS: Fern, ornamental, cultivation, horticulture and economic.

INTRODUCTION

Ferns are of huge economic importance and there is a great necessity for their exploitation towards the economic utility in regular life (Benjamin & Manickam, 2007). Ornamental fern crops inhabit an imperative position in local, national and international markets and constitute an important section of the floral industry as cut foliage. Ferns are a heterogeneous group of Pteridophytes (vascular plants) commonly distributed in mid and shady habitats, they are flowerless & herbaceous in nature. Western Ghats along with Eastern Ghats, parts of Central India and Himalayas form a major centre for the distribution of ferns and fern allies (Dudani *et al.*, 2012). They grow luxuriantly in moist tropical and temperate forests and their occurrence in different eco-geographically threatened regions from sea level to the highest mountains are of much interest (Dixit, 2000). Ferns are excellent material, which can provide greenery in a background. They can be used to enhance

the environmental condition. The great diversity of ferns makes them exceptional landscape material and the characteristic features of foliage market them as admirable fillers in a flower arrangement and bouquets. Some species of ferns have great ornamental importance and sales volume of decorative ferns is seen in florist shops and nurseries in Lucknow, Uttar Pradesh, India; as there is inordinate potential exploring the commercial and ornamental value of these ferns. The decorative ferns are highly demanded day by day and preferred by plant lovers, due to attractive looks and fronds length, elegant symmetry, freshness, longevity, post-harvest life and lush green in nature. The objective of this work was to study the economic potential of ornamental ferns used for the decoration of various events, making bouquets and arrangements of flowers. From these results, it is specified to value genetic resources to be considered as a new crop for ornamental horticulture.

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Fig.1 (a-h): Observation and collection of ornamental ferns during survey– (a) *Nephrolepis exaltata* L., (b) *Nephrolepis exaltata* 'Bostonensis' L. (Golden Fern), (c) *Nephrolepis exaltata* 'Variegata', (d) *Nephrolepis exaltata* L. (Fluffy Ruffle), (e) *Nephrolepis falcata* L. (fishtail), (f) *Nephrolepis cordifolia* 'Duffii' T. Moore (Button Fern), (g) *Adiantum capillus-veneris* L. (Maiden-hair Fern), (h) *Christella dentata* Forssk. (Soft Fern)

MATERIAL & METHODS

a. Study area

The study area, different localities (Indira Nagar, Gomti Nagar, Hazratganj and Alambagh) Lucknow city in the Northern state of Uttar Pradesh is geographically located at 26° N and 80° E in the North Gangetic plains. The city covers an area of about 350 sq. km.

b. Survey & Collection

A scientific survey and collection of some ornamental ferns from Lucknow city of Uttar Pradesh during year 2022-2023 was done, in which twenty nurseries and twenty florist shops were visited, being spread in different parts of municipalities/ localities. During the survey, a sample of each species of fern was collected to prepare a herbarium. Interviews/questionnaire sessions with florists, nurserymen, plant lovers and customers were conducted to obtain relative information about common/local names, prices, ornamental traits, uses and sustainable utilization of ferns.

c. Identification

The species identified were checked and verified with the help of illustrations and flora (Beddome, 1864; Manickam & Irudayaraj, 1992; Borthakur *et.al.*, 2000) and

other sources (herbaria, research papers and books).

d. Evaluation

Eight species of ferns were selected for evaluation of ornamental characteristics/ traits such as number of fronds per plant and shape of fronds, texture, nature of the tip, margin and color of pinna. The ornamentally useful plants were also listed.

RESULT

The present study in Lucknow city documented eight species of economically important ferns belonging to 3 families and 3 genera. Important morphological variations were noticed among different fern species used in the present study for various ornamental traits and price of ferns according to their ornamental features, data is presented in Table 1 and 2. The unique features of collected fern plants in the present study are discussed below and are illustrated in Fig. 1 (a-h).

During the survey, it was observed that price of ornamental ferns kept on changing in different localities of the study area depending on the number of fronds, and uses, which is shown in Table 2. Comparative analysis of use of ornamental ferns in different localities of Lucknow city for various types of decoration, which is shown in Fig. 2.

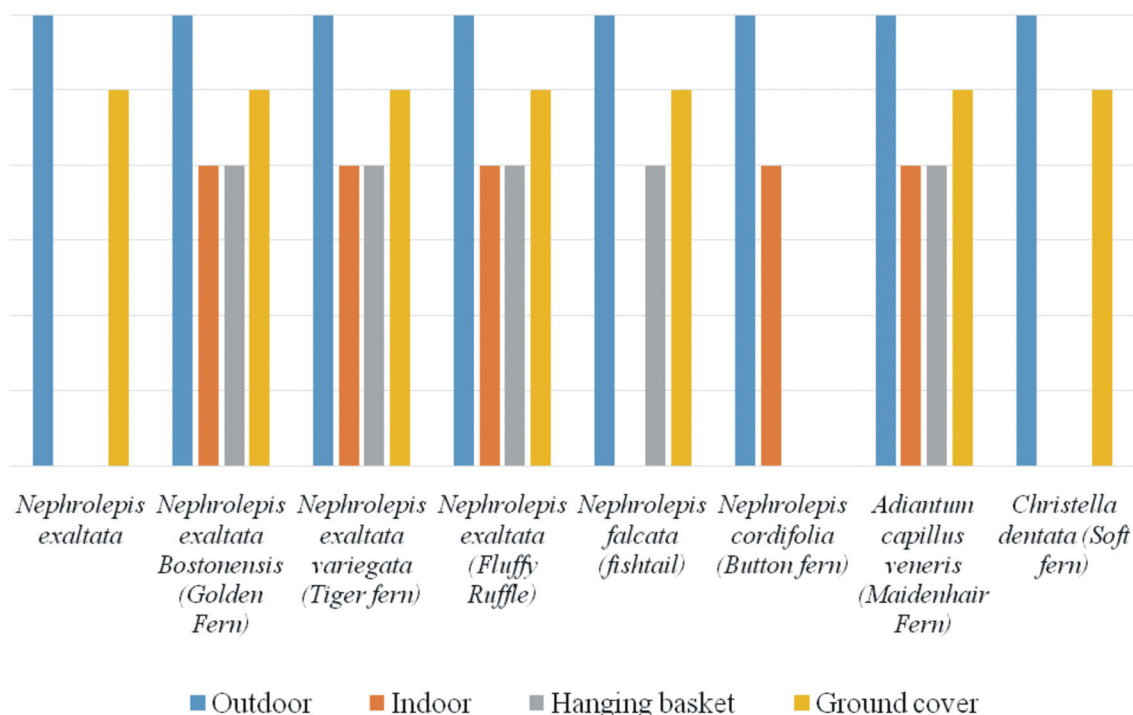


Fig. 2: Comparative analysis of uses of eight ornamental ferns in different localities of Lucknow city

Table 1: Qualitative characters /traits of ornamental ferns

S. No.	Species/Varieties	Shape of fronds	Texture of fronds	Nature of the tip of pinna	Nature of margin of pinna	Color of pinna
1a.	<i>Nephrolepis exaltata</i> L.	Lanceolate	Smooth	Acute to Obtuse	Undulate	Green
2b.	<i>Nephrolepis exaltata</i> 'Bostonensis' L. (Golden Fern)	Lanceolate	Smooth	Acute to Retuse	Entire	Light yellow green
3c.	<i>Nephrolepis exaltata</i> 'Variegata' L. (Tiger Fern)	Lanceolate	Smooth	Acute	Entire	Variegated, light yellow-green
4d.	<i>Nephrolepis exaltata</i> L. Fluffy Ruffle	Lanceolate	Smooth	Acute to Obtuse	Entire	Dark green
5e.	<i>Nephrolepis falcata</i> L. (fishtail)	Lanceolate	Smooth	Acute, bifurcated	Entire	Light green
6f.	<i>Nephrolepis cordifolia</i> 'Duffii' T. Moore (Button Fern)	Oblong	Smooth	Round	Entire	Dark green
7g.	<i>Adiantum capillus-veneris</i> L. (Maiden-hair Fern)	Lanceolate	Smooth	Ovate	Entire, concave and rounded	Dark green
8h.	<i>Christella dentata</i> Forssk. (Soft Fern)	Oblanceolate	Hairy	Acuminate	lobed	Yellow -light green

Table 2: Average price of ornamental ferns according to number of fronds

S.No.	Species/Varieties	No. of fronds per plant	Average price (Rs.) per plant	Uses for decoration
1a.	<i>Nephrolepis exaltata</i> L.	12-20	50-80	Outdoor and ground cover
2b.	<i>Nephrolepis exaltata</i> L. Bostonensis (Golden Fern)	15-20	100-250	Outdoor, indoor, hanging basket and ground covers
3c.	<i>Nephrolepis exaltata</i> L. variegata (Tiger Fern)	8-15	100-300	Outdoor, indoor, hanging basket and ground cover
4d.	<i>Nephrolepis exaltata</i> L. (Fluffy Ruffle)	10- 40	100-500	Outdoor, indoor, hanging basket and ground cover
5e.	<i>Nephrolepis falcata</i> L. (fishtail)	10-15	50-100	Outdoor, hanging basket and ground cover
6f.	<i>Nephrolepis cordifolia</i> 'Duffii' L. (Button Fern)	8-15	40-80	Outdoor and indoor
7g.	<i>Adiantum capillus-veneris</i> L. (Maidenhair Fern)	8-20	50-200	Outdoor, indoor, hanging basket and ground cover
8h.	<i>Christella dentata</i> Forssk. (Soft fern)	8-15	60-200	Outdoor and ground cover

Among the different species of ferns, maximum shape of fronds was noticed lanceolate in all species except *Nephrolepis cordifolia* 'Duffii' and *Christella dentata* which have frond shape oblong and oblanceolate respectively. The texture of fronds was smooth in all species barring, *Christella dentata* having a hairy nature. Among the different species of ferns variability was noticed in nature of tip of pinna as follows: acute, obtuse retuse, acute with bifurcations, round, acuminate and ovate in all species. Nature of margin of pinna in all ferns was observed to be entire except *Christella dentata* and *Nephrolepis exaltata* which were lobed and undulated respectively. Color is of paramount importance and one of

the chief traits that decide the economic value of ornamental ferns. In the present study, the color of pinna was significantly influenced by different species of ornamental ferns. Data showed diversity in color of pinna which was observed in a variety of ferns as *Nephrolepis exaltata* green, *Nephrolepis exaltata* 'Bostonensis' light yellowish-green, *Nephrolepis exaltata* 'Variegata' variegated, light yellowish-green, *Nephrolepis falcata* light green, *Nephrolepis exaltata* Fluffy Ruffle, *Nephrolepis cordifolia* 'Duffii' and *Adiantum capillus-veneris* dark green respectively and yellowish -light green in *Christella dentata*. Demand of *Nephrolepis tuberosa* L. (Ghora Patti) in florist market is increasing day by day. People have an

attachment to ferns due to their aesthetic beauty and decorative significance, like making many kinds of bouquets and arrangements of flowers.

DISCUSSION

Observations were made regarding the ornamental potential of eight species of ferns. The result showed that many species of ferns were used for decoration of outdoor, indoor, hanging baskets and ground cover. *Nephrolepis exaltata* L. Bostonensis (Golden Fern), *Nephrolepis exaltata* L. variegata (Tiger Fern), *Nephrolepis cordifolia* 'Duffii' L. (Button Fern) and *Adiantum capillus-veneris* L. (Maiden-hair Fern) are good for both indoor and outdoor purposes to beautify homes, balconies and offices; for decoration and aesthetic value. This study co-relates with the available literature, a study by Shankar *et al.* (2019) and Oloyede (2012).

In the present study, the color, texture, shape, margin and tip/apex of pinna and fronds significantly varied with different species of ornamental ferns. Differences in ornamental characters/traits of ferns may be due to their genetic makeup of each genotype as reported by Safeena (2013) and Vasco *et al.* (2013). Based on decorations, some species were found to be suitable for various landscape uses and were identified. All the species evaluated were found to be appropriate for outdoor and ground cover decoration except *Nephrolepis cordifolia* 'Duffii' L. (Button Fern), which is used for indoor and outdoor decoration. This finding validates with the study of Lerner, (2001).

Some nurseries import and grow ferns, selling them at a good price. Ferns are then used for ornamental purposes, either as garden plants or to beautify places for special occasions. This study, as discussed by Scace (2001), identifies several fern species commonly used in the floral industry, including members of the genera *Adiantum*, *Cyrtomium*, *Nephrolepis*, *Platycerium*, *Polystichum*, *Pteris*, *Davallia*, and *Polypodium*. These ferns are predominantly in commercial production. Currently, the EU market for cut flowers and foliage is •12 billion, with foliage accounting for 8-10% of this total (Collier *et al.*, 2004). Horticultural practice has increased by about 18% compared to other crop groups in India, and the total output of floriculture (flowers and foliage combined) has reached its highest level compared to previous records (Horticulture Statistics at a Glance, 2015).

CONCLUSION

Ferns are commonly found in the wild and many cities in India. There is a need of collection and mass cultivation of ornamental ferns, a campaign for awareness on the use

of ferns for ornamental purposes is awaited. Since the ornamental fern horticultural practices are labour intensive, it could create employment opportunities for the small land holding farmers, women and unprivileged and rural people to strengthen their economic condition and improve their livelihood.

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