



Original Research Paper

Performance Evaluation of Ferns for Cut Green and Landscape Purpose

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ABSTRACT

Ferns can be used as ground covers, specimen plants and for group, background and border planting in landscape. They can also be used as fillers in bouquets and flower arrangements. Hence, the objective of the study was to evaluate the performance of different fern species and to identify the suitable species for commercial cultivation. Eleven species of ferns belonging to different genera viz., *Adiantum tenerum*, *Asplenium nidus*, *Asplenium longissimum*, *Asplenium scolopendrium*, *Diaplazium acrostichoides*, *Nephrolepis biserrata* ‘furcans’, *Nephrolepis exaltata* ‘chidisii’, *Nephrolepis exaltata*, *Bostoniensis compacta*, *Nephrolepis cordifolia*, *Nephrolepis biserrata miniata* and *Pteris ensiformis* were evaluated for growth pattern and suitability for landscape and commercial uses. Vegetative characters like plant height and spread were highest in *Asplenium nidus* and a maximum number of leaves were observed in *Adiantum tenerum*. Based on growth pattern they were classified under tall, medium and dwarf groups *Asplenium nidus* and *Nephrolepis biserrata miniata* were grouped under the tall category. The species which come under medium category are *Asplenium longissimum*, *Diaplazium acrostichoides*, *Nephrolepis biserrata* ‘Furcans’, *Nephrolepis exaltata* ‘Chidisii’, *Nephrolepis exaltata*, *Bostoniensis compacta*, *Nephrolepis cordifolia*, *Pteris ensiformis* and *Asplenium scolopendrium* where as *Adiantum tenerum* comes under dwarf category. All species evaluated were found to be suitable for pot plants. *Nephrolepis biserrata miniata*, *Nephrolepis biserrata furcans*, *Nephrolepis cordifolia*, *Asplenium nidus* and *Diaplazium acrostichoides* can be recommended as houseplants. *Nephrolepis biserrata-Miniata*, *Nephrolepis biserrata furcans* and *Nephrolepis cordifolia* can be used as border plants in landscapes. *Nephrolepis exaltata*, *Bostoniensis compacta*, *Asplenium longissimum* and *Pteris ensiformis* were observed to be attractive in hanging baskets. *Nephrolepis biserrata-Miniata*, *Nephrolepis exaltata chidisii*, *Nephrolepis exaltata*, *Bostoniensis compacta* and *Diaplazium acrostichoides* are suitable for bouquets and flower arrangements.

Keywords: Cut green, Evaluation, Ferns and Landscape

INTRODUCTION

Ferns are heterogeneous group of vascular plants widely distributed in humid and shady habitats. They are tropical flowerless plants and most of the species are low growing and herbaceous in nature. Ferns are excellent materials, which can provide greenery in a landscape. They are adapted to shady areas and they can be used to enhance the indoor environmental conditions. The great diversity of the ferns make them exceptional landscape materials and the characteristic features of foliage make them excellent fillers in

flower arrangements, bouquets *etc.* large number of fern species having great ornamental value are seen widely grown in Kerala especially in western ghat regions. There is a tremendous potential for exploring the commercial and landscape value of these ferns. Due to the varied forms, shape and long post harvest life of their fronds, they are highly recommended as filler materials in bouquets and flower arrangements. There are numerous species of ferns grown in Kerala, the landscape and commercial value of those are yet to be exploited. There is a need to collect and evaluate those potential groups to introduce new

species to the floriculture industry in Kerala. Hence, the study was aimed to collect the ferns available in humid forest regions of Kerala and evaluate the performance of different fern species and to identify the suitable species for commercial cultivation.

MATERIALS AND METHODS

The study was carried out in the Department of Floriculture and Landscaping, College of Horticulture, Vellanikkara. Eleven species of ferns from the existing germplasm collection *viz*; *Adiantum tenerum*, *Asplenium nidus*, *Asplenium longissimum*, *Asplenium scolopendrium*, *Diaplazium acrostichoides*, *Nephrolepis biserrata* 'Furcans', *Nephrolepis exaltata* 'Chidisii', *Nephrolepis exaltata Bostoniensis compacta*, *Nephrolepis cordifolia*, *Nephrolepis biserrata-Miniata* and *Pteris ensiformis* were selected for evaluation. The experiment was laid out in CRD with three replications. Standard cultural practices were followed throughout the study period. The observations on following quantitative parameters *viz.*, plant height, plant spread, number of leaves per plant, longevity of leaf on plant, leaf production interval and vase life were recorded. The qualitative traits such as texture of frond, shape of frond, nature of margin, nature of tip, presence of marking/pigments, colour of frond, branching habit and reaction to peat and diseases were also recorded.

RESULTS AND DISCUSSION

Quantitative characters

Morphological characters of different species of ferns are given in the Table 1. Among vegetative characters, plant height is an important parameter and based on the plant height categorization of plants can be done for various landscape uses. Plant height was maximum in species *Asplenium nidus* (113.00 cm) and minimum plant height was observed in *Adiantum tenerum* (12.33 cm). The species *Asplenium nidus* was also superior regarding plant spread (144.00 cm NS and 159.00 cm in EW). Number of leaves per plant were recorded the highest in *Adiantum tenerum* (159.70). Since foliage is the attractive part of ferns, longevity of leaf on a plant is very important and in the present study the maximum value for this parameter was observed in *Asplenium nidus* (292.30) followed by *Nephrolepis biserrata miniata* (209.30).

Similar findings were also reported by Oloyede, (2012).

Leaf production interval

Post harvest longevity of fronds decides the commercial value of ferns since they are mainly used as cut foliage and filler materials. Vase life was maximum in *Asplenium longissimum* and *Asplenium nidus* (10 days) and minimum vase life was observed in *Diaplazium acrostichoides* (table 1).

Qualitative characters

Among the qualitative characters, leaf texture was smooth in all the species except *Diaplazium acrostichoides* in which the texture was rough compared to other species. The shape of frond ranges from reniform to lanceolate. The colour of the fronds ranges from light green to dark green and all species evaluated were resistant to pests and diseases except *Diaplazium acrostichoides*, which was susceptible to leaf spot disease. Variation in quantitative and qualitative characters of ferns may be due to the peculiar genetic makeup of each genotype as reported by Safeena (2013) and Vasco *et al.* (2013).

Based on the performance, suitable species for various landscape uses were identified. All species evaluated were found to be suitable for pot plants. *Nephrolepis biserrata miniata*, *Nephrolepis biserrata furcans*, *Nephrolepis cordifolia*, *Asplenium nidus* and *Diaplazium acrostichoides* can be recommended as indoor plants. This is in accordance with the findings of Lerner, (2001) who reported the suitability of the ferns as indoor plants. *Nephrolepis biserrata-Miniata*, *Nephrolepis biserrata furcans* and *Nephrolepis cordifolia* can be used as border plants in landscapes. *Adiantum tenerum* is a very low growing fern with soft textured attractive leaves and this can be recommended ground covers in shady areas. Bharathi *et al.*, (2013) had also reported ferns as excellent as ground cover in shady areas. *Nephrolepis exaltata Bostoniensis compacta*, *Asplenium longissimum* and *Pteris ensiformis* were observed to be attractive in hanging baskets. *Nephrolepis biserrata-Miniata*, *Nephrolepis exaltata chidisii*, *Nephrolepis exaltata Bostoniensis compacta*, *Nephrolepis cordifolia* and *Diaplazium acrostichoides* are suitable as cut foliage can be used for bouquets and flower arrangements. The popularity

of ferns as cut foliage had also been reported by Stamps and Conover, (1986) and Safeena, (2013).

Hence, it can be concluded that, all ferns evaluated were suitable for landscape and pot plant purpose, *Nephrolepis biserrata miniata*, *Nephrolepis biserrata furcans*, *Nephrolepis cordifolia*, *Asplenium nidus* and *Diaplazium acrostichoides* can be recommended as indoor plants. *Nephrolepis biserrata-Miniata*, *Nephrolepis biserrata furcans* and *Nephrolepis cordifolia* can be used as border

plants in landscapes. *Adiantum tenerum* is a very low growing fern with soft textured attractive leaves and this can be recommended ground covers in shady areas. *Nephrolepis exaltata Bostoniensis compacta*, *Asplenium longissimum* and *Pteris ensiformis* were observed to be attractive in hanging baskets. *Nephrolepis biserrata-Miniata*, *Nephrolepis exaltata chidissii*, *Nephrolepis exaltata Bostoniensis compacta*, *Nephrolepis cordifolia* and *Diaplazium acrostichoides* are suitable as cut foliage.

Table 1: Evaluation of different species of ferns for vegetative characters

Species/Varieties	Plant height (cm)	Plant spread NS (cm)	Plant spread EW (cm)	No. of leaves per plant	Longevity Longevity plant	Leaf production interval	Vase life (days)
<i>Asplenium longissimum</i>	33.75	44.67	46.00	37.30	152.00	22.00	10.00
<i>Nephrolepis exaltata chidissii</i>	37.25	45.00	46.00	29.70	181.00	12.00	7.30
<i>Nephrolepis exaltata</i>	40.42	53.33	49.80	26.30	124.30	15.30	6.70
<i>Pteris ensiformis</i>	57.25	65.00	72.80	63.80	94.30	11.70	4.70
<i>Diplazium acrostichoides</i>	49.83	62.67	61.20	14.50	91.30	19.70	3.30
<i>Nephrolepis cordifolia</i>	48.83	57.92	54.30	91.80	181.00	14.00	9.30
<i>Nephrolepis biserrata miniata</i>	77.67	82.00	85.70	31.00	209.30	10.70	7.30
<i>Adiantum tenerum</i>	12.33	21.33	21.50	157.00	178.30	12.30	7.00
<i>Asplenium scolopendrium</i>	69.67	78.17	77.70	24.30	85.70	24.30	5.70
<i>Asplenium nidus</i>	113.00	144.00	159.70	21.30	292.30	155.70	10.00
<i>Nephrolepis biserrata</i> var. <i>furcans</i>	27.83	40.08	41.20	34.50	149.00	17.70	6.70
Range	12.33-113.00	40.88-144.00	21.50-159.70				
CD (0.05)	15.23	14.29	17.90	13.60	15.60	6.90	

Table 2: Evaluation of different species of fern for qualitative characters

Species/ Varieties	Texture of frond	Shape of frond	Nature of margin	Nature of tip	Presence of marking/ pigments	Colour of frond	Reaction to pests and diseases
<i>Aspleniumlongissimum</i>	Smooth	Oblong	Undulate	Emarginated	Absent	Dark green	Resistant
<i>Nephrolepisexaltata-childsii</i>	Smooth	Ovate	Pinnatisect	Acute	Absent	Medium green	Resistant
<i>Nephrolepisexaltata</i>	Smooth	Lanceolate	Undulate	Acute	Absent	Light green	Resistant
<i>Pterisensiformis</i>	Smooth	linear	Entire	Acute	Absent	Dark green with white markings	Resistant
<i>Diplaziumacrostichoides</i>	Rough	Lanceolate	Pinnatifide	Acute	Absent	Dark green	Susceptible to leaf spot and leaf blight
<i>Nephrolepiscordifolia</i>	Smooth	Reniform	Entire	Round	Absent	Dark green	Nil
<i>Nephrolepisbiserrata-minath</i>	Smooth	Lanceolate	Entire	Acute	Absent	Dark green	Resistant
<i>Adiantumtenerum</i>	Smooth	Oblong	Entire	Obtuse	Absent	Light green	Resistant
<i>Aspleniumscolopendrium</i>	Smooth	Triangular	Pinnatisect	Acute	Absent	Dark green	Highly susceptible to leaf spot
<i>Aspleniumnidus</i>	Smooth	Oblanceolate	Entire	Obtuse	Absent	Medium green	Resistant
<i>Nephrolepisbiserrata-furcans</i>	Smooth	Oblong	Dentate	Lobed	Absent	Light green	Moderately susceptible to leaf spot diseases



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