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## Performance Study of Six Indigenous Epiphytic Monopodial Orchids of Bangladesh

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**Abstract:** The study was undertaken in the Orchidarium of Floriculture Division, HRC, BARI, Gazipur during 2000-2001 and 2001-2002. Six indigenous epiphytic monopodial orchids were studied. *Aerides multiflorum* produced the longest inflorescence (29.67 cm) with maximum flowering area (21.83 cm) and maximum number (60.44), the biggest (3.00 cm across) floret was found in *Vanda teres*. Considering number and length of flower stalk, floret number/stalk, blooming type, color, fragrance, vase life, etc, *Aerides multiflorum* was found suitable for pot plant production and *Vanda teres* for cut flower production. Inflorescence number had the significant and positive correlation ( $r=0.93^{**}$ ) with plant height whereas, floret diameter showed significant positive correlation with plant height ( $r=0.99^{**}$ ) and with leaf number ( $r=0.98^{**}$ ).

**Key words:** Orchid, epiphytic, indigenous, performance, monopodial

### INTRODUCTION

Orchids are the largest and important group of flowering plants, which belong to the largest and most diverse family *Orchidaceae*, consists of about 700-800 genera and 25,000 species<sup>[1]</sup>. They are unique group of plants and exhibit an incredible range of diversity in size, shape, structure, number, color and fragrance of the flower. Orchids are of highest value as cut flowers for their beauty and very good keeping quality. Some orchid flowers last one to three months if they remain attached to the plant and as cut flowers they remain fresh for one to four weeks<sup>[2]</sup>. Because of their long lasting qualities, orchids make attractive corsages. Some orchids are useful in small-scale village industries and some have been used as food in different parts of the world. The stems of some *Dendrobium* species are used in making baskets in the Philippines, Indonesia and New Guinea<sup>[3]</sup> split fresh bulb of *Coelogyne asperata* are reported to have been used in Sumatra as black board erasers<sup>[7]</sup>. Some orchids have medicinal values also. The tubers and pseudobulbs of several orchids like *Cymbidium aloifolium*, some species of *Dendrobium*, *Eulophia* are used for preparing salep which is valued as a restorative and is used in the treatment of many diseases<sup>[4]</sup>. The powdered roots of *Vanda tessellata* are considered as antidotes of poisoning, it is also used in rheumatic pains and abdominal complaints. Some other orchid genera like *Oberonia*, *Vanda*, *Rhynchostyles*, *Eria*, *Eulophia*, *Geodorum* and *Bulbophyllum* are also reported to have

been used as medicine in different countries to cure various diseases<sup>[5-9]</sup>.

Orchids are abundant in tropical countries in South-East Asia, South and central America and South Africa<sup>[2]</sup>. Indian *Dendrobiums*, *Cymbidiums* and *Vandas* have played a major role in the development of modern orchid industry<sup>[2]</sup>. Many orchids, native to this country, belonging to genera like, *Aerides*, *Arachnis*, *Cymbidium*, *Dendrobium*, *Phalaenopsis*, *Rhynchostyles*, *Vanda*, have already proved to be important parent plants and contributed to the production of many outstanding hybrids in the world. The environmental conditions required for the survival and culture of orchid are adequately available in Bangladesh throughout the year. As such different species of orchids are abundantly distributed in the country both in forest and non-forest areas<sup>[10]</sup>. Like other orchid growing countries, Bangladesh is blessed with a wealth of orchid flora and about 55 genera were collected by Floriculture Division of Horticulture Research Center, Bangladesh Agricultural Research Institute. Though there is often a preference for hybrids in commercial markets, yet in beauty and other blossom characters many native species stand out boldly and conspicuously as competitors with best hybrids. But it has not gained attention and popularity up to the acceptable range and there is a tremendous scope to develop this crop. Therefore, the present study has been taken to find out the suitable local epiphytic monopodial orchids for pot plant, cut flower and as well as for future breeding program.

## MATERIALS AND METHODS

The study was conducted at the Orchidarium of Floriculture division, HRC, BARI, Gazipur during 1999 to 2002. Epiphytic orchids were placed in wooden box/ tied with coconut choir rope in the pieces of raintree (*Albizia saman*), ziga (*Garuga pinnata*), etc considering their nature of growth. Irrigation was given to moist the potting media and the plants were fertilized with foliar nutrient (Phostrogen) once a week after their establishment. Misting was done to maintain the humidity above 60% in the Orchidarium. The experiment was set up in a RCB design with four replications. The plants were flowered during 2001-2002. At flowering, the parameters recorded were: plant height, leaf number, leaf length, leaf breadth, inflorescence number and length, flowering area, floret number, flower diameter, vase life, etc. Length of flower stalk, blooming type (drooping and erect), longevity of flower, etc was considered for suitability of a species as cut and/or pot flower. Vase life of *Vanda teres* flowers was studied using normal tap water. The data were analyzed statistically using MSTATC software and mean comparison among treatments was based on Duncan's multiple range test (DMRT).

## RESULTS AND DISCUSSION

The studied species' were flowered during March to July. *Aerides multiflorum* and *Vanda teres* flowered early (March-April), while *Aerides jaintapuri* was found late in flowering (June-July). According to Vij<sup>[6]</sup>, *Vanda teres* and *Aerides multiflorum* flowered later (May-June). The

flowers are very attractive in colour with sweet and high fragrance. *Aerides odoratum* produced white flowers with five showy purple patches, while *Aerides multiflorum* produced white with bold pink spotting, whereas *Rhynchostyles retusa alba* produced white flower and *Vanda teres* produced flowers of white sepals with rose tinged and deep rose petals. The inflorescence of *Vanda teres* were stout and erect which is very useful for keeping in the vase. But other flowers were not suitable for vase because of their drooping type inflorescence. The vase life of *Vanda teres* in normal water was found to be 10-18 days (Table 1).

Vegetative characters of the studied orchids showed highly significant variation (Table 2). *Vanda teres* produces tallest plant (203.22 cm), maximum number of leaves (64.44) which were significantly higher than other species', while longest leaves (20.39 cm) were found in *Aerides odoratum*.

All the studied parameters were significantly different among the species'. Maximum number of inflorescence (4.33) was observed in *Vanda teres* followed by *Aerides odoratum* (1.49). Big florets (3.0 cm across) were also found in *Vanda teres*. Vij<sup>[6]</sup> also found bigger flower (10 cm across) in *Vanda teres* than other species' studied in this experiment. But longest inflorescence (29.67 cm) was observed in *Aerides multiflorum*. Maximum flowering area (60.44) were also found in *Aerides multiflorum* than other orchid species (Table 3).

The correlation coefficients between all possible combinations of 9 characters are presented in Table 4. Among the 36 associations, 20 were found significant.

Table 1: Qualitative characters of six epiphytic monopodial orchids

Variety	Blooming period	Bloom type	Flower colour	Fragrance	Suitability	Vase life (days)
<i>Aerides odoratum</i>	April to May	Drooping	White flowers stained with five showy purple patches	Strong spicy fragrance	Pot	-
<i>Aer. multiflorum</i>	March to April	Drooping	White with bold, dark pink spotting	Mild	Pot	-
<i>Aer. jaintapuri</i>	June to July	Drooping	Deep maroon	Mild	Pot	-
<i>Rhynchostyles retusa alba</i>	May to June	Drooping	White	Mild	Pot	-
<i>Rhynchostyles retusa pink</i>	May to June	Drooping	White with pink spot	Moderate	Pot	-
<i>Vanda teres</i>	March to April	Erect	Sepals are white tinged with rose and the petals are a deep rose	Mild	Cut	10-18

Table 2: Vegetative characters of six epiphytic monopodial orchids

Orchid species	Plant height (cm)	Leaf number	Leaf length (cm)	Leaf breadth (cm)
<i>Aerides odoratum</i>	29.67b	6.33c	20.39a	2.23b
<i>Aer. multiflorum</i>	22.11c	12.00b	7.47e	1.92c
<i>Aer. jaintapuri</i>	18.06d	5.00d	11.94d	2.72a
<i>Rhynchostyles retusa alba</i>	17.17d	3.00f	14.11c	1.38d
<i>Rhynchostyles retusa pink</i>	19.94cd	4.00e	18.50b	1.28e
<i>Vanda teres</i>	203.22a	64.44a	14.17c	0.42f
Level of significance	**	**	**	**
CV (%)	4.12	1.79	2.23	2.08

Table 3: Yield and yield contributing characters of six epiphytic monopodial orchids

	Inflorescence length (cm)	Flowering area (cm)	Floret number	Floret diameter (cm)	Inflorescence number
<i>Aerides odoratum</i>	18.45d	9.06d	15.11e	1.50d	1.49b
<i>Aer. multiflorum</i>	29.67a	21.83a	60.44a	2.00b	1.21c
<i>Aer. jaintapuri</i>	17.50d	10.50c	39.33d	1.78c	0.82d
<i>Rhynchostyles retusa alba</i>	25.11b	18.11b	47.33c	1.57d	1.14c
<i>Rhynchostyles retusa pink</i>	26.00b	21.11a	52.33b	1.50d	1.14c
<i>Vanda teres</i>	22.56c	8.12d	6.00f	3.00a	4.53a
Level of significance	**	**	**	**	**
CV (%)	4.38	3.76	1.30	2.51	2.31

Table 4: Correlation coefficient of different parameters of six epiphytic monopodial orchids

	Plant height	Leaf number	Leaf length	Leaf breadth	Inflorescence length	Flowering area	Floret number	Floret diameter	Inflorescence number
Plant height	1.00	0.99**	0.001	-0.73**	-0.08	-0.54*	-0.72**	0.99**	0.93**
Leaf number		1.00	-0.107	-0.72**	-0.01	-0.48*	-0.66**	0.98**	0.96**
Leaf length			1.00	-0.11	-0.43	-0.31	-0.46	0.04	-0.34
Leaf breadth				1.00	-0.40	-0.83	0.29	-0.76**	-0.61**
Inflorescence length					1.00	0.84**	0.63**	-0.04	0.05
Flowering area						1.00	0.91**	-0.51*	-0.41
Floret number							1.00	-0.73**	-0.52*
Floret diameter								1.00	-0.90**
Inflorescence number									1.00

Number of inflorescence showed significantly positive association with plant height ( $r=0.93^{**}$ ), leaf number ( $r=0.96^{**}$ ) and floret diameter ( $r=0.90^{**}$ ). On the other hand it showed negative significant correlation with leaf breadth ( $r=-0.61^{**}$ ), floret number ( $r=-0.52^{*}$ ) and floret diameter ( $r=-0.90^{**}$ ). Inflorescence length had significant positive correlation with flowering area per inflorescence ( $r=0.84^{**}$ ) and floret number per inflorescence ( $r=0.63^{**}$ ). Plant height had strong positive correlation with leaf number ( $r=0.99^{**}$ ) and floret diameter ( $r=0.99^{**}$ ). Floret diameter showed significant positive associations with leaf number ( $r=0.98^{**}$ ). For the improvement and development of epiphytic monopodial orchid, plant height, leaf number and size, flowering area and floret number are to be emphasized by the breeder.

From the studied varieties, *Aerides multiflorum* was found best for pot flower and *Vanda teres* for cut flower production.

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