

CORRELATION BETWEEN CANE GROWTH AND FLOWERING BEHAVIOR OF *DENDROBIUM* ORCHID CULTIVARS

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ABSTRACT

The experiment was conducted to observe the correlation of cane growth with floral behavior of nine *Dendrobium* cultivars. Results revealed that, cane growth of different *Dendrobium* cultivars influenced flowering behavior. The present experimental findings may help to determine standard cane growth for efficient nutrient management and commercial grade flower production of *Dendrobium* cultivars.

Key words: Correlation, Cane growth, Flowering behavior, *Dendrobium*

INTRODUCTION

Many orchids are the most fascinating and beautiful of all flowers. They exhibit a wide range of diversity in form, size, color and texture and can be grown in different habitats eg. beds, pots, baskets, split hallows of bamboo pieces etc. Orchids have occupied peak position among the flowering plants valued for cut flowers as well as pot plants. They are famous for their long-lasting beauty which fetches high price from the international market. They account for 27% of global cut flower production in terms of value. In many countries, orchid industry plays an important role as a source of foreign exchange. In Bangladesh, environmental conditions required for the survival and culture of orchid are adequately favorable throughout the year. Internal consumption and export potentiality of orchids from Bangladesh has a bright prospect in near future.

Dendrobium is the most popular orchid genus for cut flower. Thailand exports *Dendrobium* more than \$ 12 million per year to Europe and Germany and about 70% of Singapore's total orchid exports were *Dendrobium* (Rao 1977). Commercial cultivation of *Dendrobium* for plant sale as well as for cut flowers production has developed into sizeable industries in many countries and the sale of flower runs in million dollars a year (Singh 1998). In Bangladesh, the orchid trade is still in its nascent stage. Nowadays growers are cultivating various *Dendrobium* cultivars but there are inadequate information about technologies and standard guidelines. To produce standard grade

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flower spikes one is to comprehend the relation between cane growth and floral performance of *Dendrobium* sp. As there are inadequate information on correlation studies between cane growth and flowering behavior of *Dendrobium* sp. in Bangladesh, the present study was undertaken to standardize cane growth for efficient nutrient management and commercial grade flower production of *Dendrobium* cultivars.

MATERIALS AND METHODS

The experiment was conducted at horticulture farm of Sher-e-Bangla Agricultural University, Dhaka-1207 during May to October, 2011 to investigate the correlation between the cane growth and flowering behavior of nine *Dendrobium* cultivars, viz. Madame Pompadour, Candy stripe, Sonia, Winky White, Queen Pink, Dang Sa Ard, Sakura, Morning Glory, and Red Lip. CRD experimental design with ten replications were used. Two years old leafless cane clusters which have one or two sprouting new canes were selected for the experimentation under shade house condition. Data were collected on different parameters of cane growth and flowering behavior. Furthermore, three flower spikes were selected randomly from each cultivar and placed in a 200 ml transparent flower vase containing 100 ml tap water. Stems were selected in which 2-3 flowers had just opened. Stem ends were cut time to time and tap water was changed in every alternate days. The number of days until the open florets wilted was recorded to evaluate the vase life. Collected data were statistically analyzed using MSTAT-C program. Mean was calculated and analysis of variance for each of the characters was performed by F test. Difference between treatments was evaluated by Duncan's Multiple Range test at 5% level of significance (Gomez and Gomez 1984). Correlations were determined by using SPSS computer program (SPSS 19-C).

RESULTS AND DISCUSSION

Observations recorded on various flowering characters as influenced by the different parameters of cane growth are presented in Table 1. It can be seen that, cane growth of different *Dendrobium* cultivars influenced flowering behavior and they showed some correlations. Significant variation was found among different *Dendrobium* cultivars in terms of leaves number per cane. Maximum leaves number were observed in Madame Pompadour followed by Candy Stripe and minimum in Morning Glory (Table 1). However, leaves number was significantly correlated with cane length, cane diameter, spike length and spikes per cane conversely, there was no relation of leaves number with number of florets and vase life (Table 2).

In terms of cane length significant variation was found among different *Dendrobium* cultivars. Maximum cane length was observed in Madame Pompadour followed by Candy Stripe and minimum in Morning Glory (Table 1). However, cane

length was significantly correlated with leaves number, cane diameter, spike length, floret number, spikes per cane and vase life (Table 2).

In case of cane diameter significant variation was found among different *Dendrobium* cultivars. Maximum cane diameter was observed in Madame Pompadour and minimum in Morning Glory (Table 1). However, cane diameter was significantly correlated with leaves number, cane length, spike length, floret number, spikes per cane and vase life (Table 2).

Significant variation was found among different *Dendrobium* cultivars in terms of spike length. Maximum spike length was observed in Madame Pompadour followed by Candy Stripe and minimum in Morning Glory (Table 1). However, spike length was significantly correlated with leaves number, cane length, cane diameter, floret number, spikes per cane and vase life (Table 2).

Table 1. Cane growth and flowering performance of *Dendrobium* cultivars.

<i>Dendrobium</i> cultivars	Leaves number	Cane length (cm)	Cane diameter (cm)	Spike length (cm)	Floret number	Spikes per cane	Vase life
Madame Pompadour	15.0 a	61.0 a	4.8 a	44.0 a	14.0 a	3.0 a	12.0 a
Candy Stripe	14.0 a	60.0 a	4.7 a	42.0 a	10.0 c	3.0 a	11.0 a
Sonia	11.0 b	53.5 b	4.5 a	35.5 c	11.0 c	3.0 a	12.0 a
Wnky White	9.0 c	43.5 d	4.0 a	30.5 d	9.0 d	2.0 b	11.0 a
Dong Sa Ard	10.0 c	49.5 c	4.7 a	40.0 b	12.0 b	3.0 a	11.0 a
Sakura	9.0 c	50.0 c	4.5 a	40.5 b	12.0 b	2.0 b	11.0 a
Morning Glory	7.0 d	39.0 e	3.4 b	27.5 e	8.5 d	1.0 c	8.0 b
Red Lip	10.0 c	41.5 d	4.0 a	32.0 d	9.0 d	1.0 c	8.0 b
Queen Pink	11.0 b	55.0 b	4.2 a	37.0 c	11.0 c	3.0 a	11.0 a
CV%	5.4	4.3	6.0	7.1	5.9	3.2	3.9
LSD 0.05	2.7	4.1	1.8	3.2	2.3	0.7	2.5

In a vertical column means having similar letter(s) are statistically identical and those having dissimilar letter(s) differ significantly as per 0.05 level of probability.

In case of floret number, significant variation was found among different *Dendrobium* cultivars. Maximum floret numbers were observed in Madame Pompadour and minimum in Morning Glory (Table 1). However, floret number was significantly correlated with cane length, cane diameter, spike length, spikes per cane and vase life conversely; there was no relation of floret number with leaves number (Table 2).

Significant variation was found among different *Dendrobium* cultivars in terms of spikes per cane. Maximum spikes per cane were observed in Madame Pompadour, Candy Stripe, Sonia, Dong Sa Ard and Queen Pink whereas, minimum in Morning Glory and

Red Lip (Table 1). However, spikes per cane was significantly correlated with number of leaf, cane length, cane diameter, spike length, floret number and vase life (Table 2).

In terms of vase life, significant variation was not found among different *Dendrobium* cultivars except Morning Glory. Maximum vase life was observed in Madame Pompadour and Sonia, whereas, minimum in Morning Glory and Red Lip (Table 1). This finding is in agreement with the reports, *Dendrobium* flowers last from 8 to 30 days (Nair and Fong 1987, Nolte 1985), depending on cultivar (Kamemoto 1987) and flower age at harvest (Nair and Tung 1983).

However, vase life was found significantly correlated with cane length, cane diameter, spike length, floret number, and spikes per cane. Conversely, there was no relation between vase life with leaves number (Table 2).

Table 2. Correlations between different cane growth and flowering parameters of *Dendrobium* cultivars (N = 9).

Parameters		Leaves number	Cane length (cm)	Cane diameter (cm)	Spike length (cm)	Floret number	Spikes per cane	Vase life
Leaves number	Pearson correlation	1	0.898**	0.764*	0.779*	0.592	.693*	0.585
	Sig. (2-tailed)		0.001	0.017	0.013	0.093	0.039	0.098
Cane length (cm)	Pearson correlation		1	0.837**	0.880**	0.720†	0.873**	0.784*
	Sig. (2-tailed)			0.005	0.002	0.029	0.002	0.012
Cane diameter (cm)	Pearson correlation			1	0.937**	0.798†	0.816**	0.793*
	Sig. (2-tailed)				0	0.01	0.007	0.011
Spike length (cm)	Pearson correlation				1	0.847**	0.753*	0.695*
	Sig. (2-tailed)					0.004	0.019	0.038
Floret number	Pearson correlation					1	0.673*	0.713*
	Sig. (2-tailed)						0.047	0.031
Spikes per cane	Pearson correlation						1	0.893**
	Sig. (2-tailed)							0.001
Vase life	Pearson correlation							1
	Sig. (2-tailed)							

**; Correlation is significant at 0.01% level and *; at the 0.05% level respectively.

CONCLUSION

Floral performances as influenced by cane growth of nine cultivars of *Dendrobium* sp. stated clearly in this study. It was estimated from the experiment that cane growth of different *Dendrobium* cultivars shows significant correlations with flowering performance. Present correlations finding will help to determine standard cane growth for efficient nutrient management and commercial grade flower production of *Dendrobium* cultivars.

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