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Varietal evaluation of dahlia for quality and flower yield parameters under Chhattisgarh plains

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Abstract

The experiment was conducted in Randomized Block Design (RBD) with twenty cultivars replicated thrice. These cultivars used were in the experiment (T₁) Gajanan Yellow, (T₂) Babananda Yellow, (T₃) Kenya Yellow, (T₄) Blackout Black, (T₅) Ankita Pink, (T₆) Pu Sinha Pink, (T₇) Raja New Blue, (T₈) Kenya Blue, (T₉) Kenya Original, (T₁₀) Anita Orange Red with Gold, (T₁₁) Jishu Red, (T₁₂) Sachin Red, (T₁₃) Red New, (T₁₄) Matangini White, (T₁₅) S. P. Romia Roy, (T₁₆) Suparna New Bicolor, (T₁₇) Prabhujee Bicolor, (T₁₈) Prime Minister Bicolor, (T₁₉) Raja Bicolor and (T₂₀) Glory of India Bicolor etc. The results revealed that the maximum length of flower stalk was recorded in (T₁₈) 'Prime Minister Bicolor' (16.72 cm). The diameter of flower stalk was observed maximum in cv. (T₁₁) 'Jishu Red' (9.47 cm), maximum flower diameter was obtained in cv. (T₂) Babananda Yellow (16.40 cm), (T₉) Kenya Original (150.30) was recorded maximum number of petal flower⁻¹. The cv. (T₄) 'Blackout Black' noted longest length of petal (9.45 cm), (T₁) Gajanan Yellow (4.31 cm) was obtained maximum width of petal and number of flowers plant⁻¹ was observed significantly maximum in cv. (T₅) Ankita Pink *i.e.* 15.67.

Keywords: Flowering, flower diameter, quality, yield, length

Introduction

Dahlia (*Dahlia variabilis* L.) is one of the most popular flower grown in many parts of the world for its beautiful ornamental blooms having varying shades of different colours, being useful as cut flowers besides for the beautification of gardens (Vikas *et al.*, 2015) [14]. Dahlia is extensively used for garden display, home decoration, cut flowers of pompon and miniature types stay fresh in flower vases for many days and also make moderately good garlands (Gupta, 2015) [3]. Tubers contain significant amount of insulin and fructose and small quantities of medicinally active compound such as pythin and benzoic acid. It belongs to the family Asteraceae, originated in Mexico and was declared the national flower of this country in 1963, which got its name by Cavanilles in the year 1791.

Dahlia is commercially propagated through rooted cutting which are prepared through tuber. Quality and disease-free tubers are required to fulfill the demand of rooted cuttings in Chhattisgarh state. Looking to urgency and increase production with quality planting material is urgently required in the state therefore present investigation had been laid out with the objective to find out suitable genotypes/cultivars for quality planting materials with higher number of tuber yield under the evaluation of different Dahlia cultivars for production of tuber yield under Chhattisgarh plains.

Methodology

The present investigation on "Varietal evaluation of dahlia for quality and flower yield parameters under Chhattisgarh plains" was carried out during dec. (2019-20) to (2020-21) at the Horticultural Research cum Instructional Farm, Department of Floriculture and Landscape Architecture, CoA, IGKV, Raipur. Further, Five plants were selected at randomly and tagged in each treatment using Randomized Block Design (RBD) and replication for the purpose of recording observations on various flower quality parameters were taken during the study period, the first parameter was to assess the length of longest length of flower stalk and length and width of petal of five fully opened flowers from each tagged plant was recorded with the help of scale meter and the average was worked out to get length flower of stalk, length and width of petal of each cultivar and expressed in cm. Secondly, diameter of flower stalk and flower diameter with largest breadth from each tagged plants was taken at fully opened stage and measured using vernier calliper in cm. Thirdly, the number of petal flower⁻¹ were determined by counting from the total petal present in a flower in five randomly selected

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flowers and then, the average were worked out and the total number of flowers produced from the tagged plants was recorded and its average was calculated plant⁻¹.

Flower quality parameters

Flower quality parameters decided the significance of suitability of the particular cultivars for commercial cultivation. The important biometric characters deciding the size and quality of flowers are length of flower stalk (cm), diameter of flower stalk (mm), flower diameter (cm), number of petals flower⁻¹, length of petal (cm) width of petal (cm) and number of flower plant⁻¹. Significant differences were observed among the cultivars for these flower quality parameters.

Length of flower stalk (cm)

It was obvious from the data presented in Table 1.0 that significantly longest flower stalk (16.72 cm was recorded in cv. Prime Minister Bicolor (T₁₈) and observed comparable with T₁₂ (Sachin Red), T₁₉ (Raja Bicolor) and T₂₀ (Glory of India Bicolor). However, the smallest stalk length (9.77 cm) was recorded in T₁₁ (Jishu Red).

Prime Minister Bicolor recorded longest length of flower stalk while Jishu Red cultivar taken smallest length of flower stalk. Longer stalk length is a desirable character in dahlia (Vikas *et al.* (2015)^[14]. This variation in length of stalk among cultivars might be attributes to difference in genetic make-up and also due to the higher carbohydrates level in the stalk. Similar result has been reported by Mounika & Saravanan (2019)^[7] and Raghupathi *et al.* (2017)^[8] in dahlia who were also reported variation in flower stalk length due to varietal difference.

Diameter of flower stalk (mm)

Data determined to diameter of flower stalk as influenced by various cultivars has been presented in Table 1.0 The diameter of flower stalk was obtained significantly maximum in cv. (T₁₁) Jishu Red (9.47 mm) was observed which was comparable with cv. T₁₂ (Sachin Red) during all phases of studied. However, the minimum diameter of flower stalk (4.44 mm) was noted in T₁₈ (Prime Minister Bicolor).

The results obtained from the present study clearly exhibited that cv. Jishu Red noted maximum diameter of flower stalk while, Prime Minister Bicolor took minimum diameter of flower stalk. It may be due to genetic make-up of the cultivars or may be due to varied response to cultural operations like pinching and external environmental conditions. Similar results obtained in the present study was suggested by Shivaprasad *et al.* (2016)^[9] in rose, Vijayalaxmi *et al.* (2021)^[15] in gerbera.

Flower diameter (cm)

The data showed that maximum flower diameter (16.40 cm) in T₂ (Babananda Yellow) that significantly similar with T₄ (Blackout Black), T₈ (Kenya Blue), T₉ (Kenya Original), T₁₀ (Anita Orange Red with Gold), T₁₃ (Red New), T₁₅ (S. P. Romia Roy) and T₁₇ (Prabhujee Bicolor). While, the minimum flower diameter (9.16 cm) was noted in T₂₀ (Glory of India Bicolor).

Significant difference was observed among the different cultivars of dahlia with respect to flower diameter. Maximum flower diameter was recorded in Babananda Yellow and least in Glory of India Bicolor. Variation in diameter of flower is mainly due to the genetic make-up, which might have been further modified by the environmental conditions prevailing

during the time of experiment. These results are in conformity with the results reported earlier in dahlia by Singh *et al.* (2019)^[4, 10], Mahawer *et al.* (2010)^[6], Baburao *et al.* (2018)^[1] and Sree Devi (2020)^[13] in dahlia also suggested that the variation in flower diameter may be due to the genotypic expression of the cultivars.

Number of petals flower⁻¹

The data showed that the number of petals flower⁻¹ (150.30) was significantly maximum in cv. (T₉) Kenya Original, whereas the minimum number of petals flower⁻¹ (68.37) was noted in T₁₈ (Prime Minister Bicolor).

The statistical analysis showed significant difference between the cultivar and parents in the characters under study. This variation in the number of petals plant⁻¹ may be due to varietal character. Similar results were observed by Shahrin *et al.* (2015)^[11], Suganthi *et al.* (2019)^[12] in rose, Kamei and Singh (2019)^[4, 10] in tuberose.

Length of petal (cm)

The data observed regarding length of petal significantly among the cultivar (T₄) Blackout Black resulted the flower with significantly longest petal *i.e.* (9.45 cm) which was statistically *at par* with cv. T₁ (Gajanan Yellow), T₂ (Babananda Yellow), T₅ (Ankita Pink), T₆ (Pu Sinha Pink), T₉ (Kenya Original), T₁₂ (Sachin Red), T₁₄ (Matangini White), T₁₅ (S. P. Romia Roy) & T₂₀ (Glory of India Bicolor). Whereas the least length of petal was observed in T₁₀ (Anita Orange Red with Gold) *i.e.* 5.93 cm.

Width of petal (cm)

The data measured to width of petal as shown by significantly different cultivars of dahlia. Significantly superior maximum width of petal (4.31 cm) was observed in cv. T₁ (Gajanan Yellow), which was *at par* with cv. (T₄) Blackout Black. However, the minimum width of petal (1.94 cm) was obtained in cv. T₈ (Kenya Blue).

Significant difference was found among the 20 dahlia cultivars with

respect to flower characters. The length of petal flower⁻¹ was recorded longest in cv. Blackout Black, while smallest was recorded in Anita Orange Red with Gold. The width of petal was recorded maximum in cultivar Gajanan Yellow, while minimum was obtained in Kenya Blue. It may be due to genetic make-up of the cultivars. Similar results were obtained by Prasad *et al.* (2016)^[9], Biswal *et al.* (2017)^[2] in gerbera, Kumar & Marwein (2018)^[5] in zinnia, Safeena *et al.* (2019)^[10] in tuberose.

Number of flowers plant⁻¹

It was evident from the data presented in Table 1.0 and graphically illustrated in Fig. 1.0 that the maximum number of flowers plant⁻¹ was observed significantly maximum in cv. (T₅) Ankita Pink *i.e.* 15.67 as compared to all other cultivars while, the minimum number of flowers plant⁻¹ (4.65) was noted in (T₇) Raja New Blue. More numbers of flowers plant⁻¹ were produced in cultivars Ankita Pink whereas, the less number of flowers were recorded in Raja New Blue. The variation in number of flower plant may be due to genetic variability and effect of environmental conditions among the different cultivars of dahlia, which were tested under this trial. The similar results were observed in dahlia by Vikas *et al.* (2015)^[14], Baburao *et al.* (2018)^[1] and Mounika & Saravanan (2019)^[7].

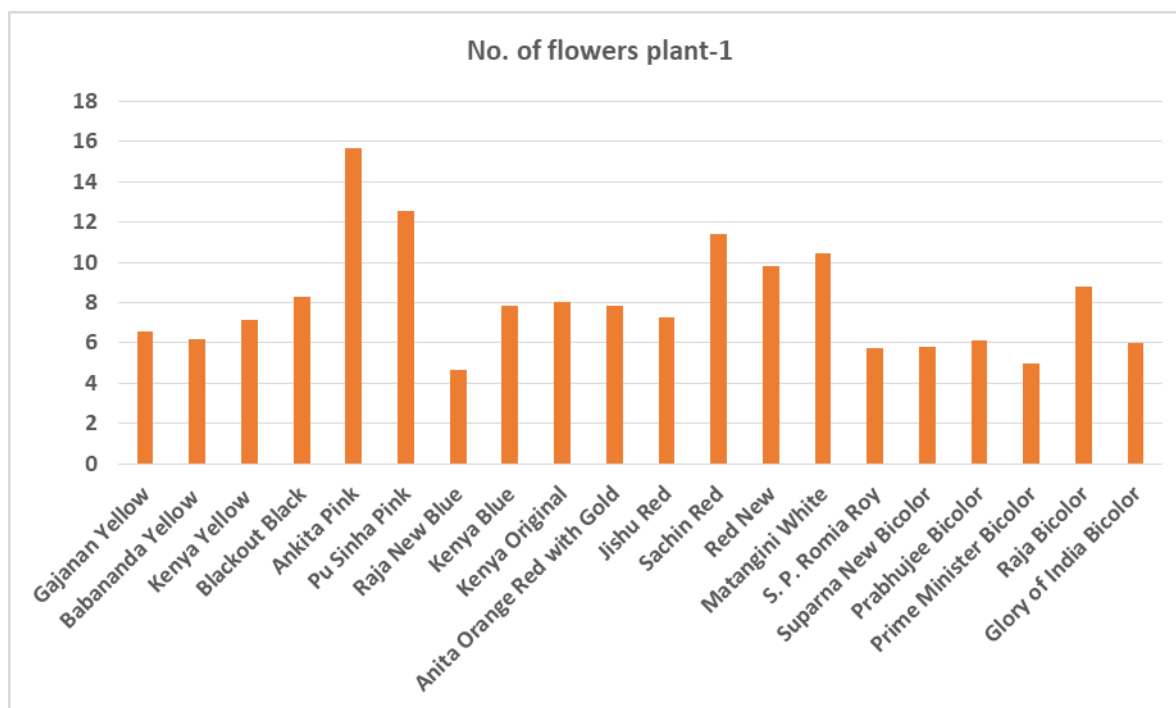


Fig 1: Varietal evaluation of dahlia for flower yield parameters (pooled data 3yrs)

Table 1: Varietal evaluation of dahlia for quality and flower yield parameters (pooled data 3yrs) (pooled data of three years, 2019-20 to 2020-21)

Tr. no.	Treatments (Cultivars)	Length of flower stalk (cm)	Diameter of flower stalk (mm)	Flower diameter (cm)	Number of petal flower- ¹	Length of petal (cm)	Width of petal (cm)	Number of flowers plant- ¹
T ₁	Gajanan Yellow	11.39	6.28	10.64	87.70	7.75	4.31	6.56
T ₂	Babananda Yellow	12.56	5.16	16.40	109.53	7.15	2.14	6.21
T ₃	Kenya Yellow	14.31	5.85	11.67	90.68	7.32	2.32	7.14
T ₄	Blackout Black	16.37	6.03	14.23	81.77	9.45	3.94	8.29
T ₅	Ankita Pink	12.93	5.78	12.75	90.62	7.43	2.27	15.67
T ₆	Pu Sinha Pink	14.77	5.53	10.92	96.73	7.58	2.44	12.56
T ₇	Raja New Blue	13.11	5.89	12.54	100.84	6.84	3.05	4.65
T ₈	Kenya Blue	14.31	6.15	14.13	98.50	6.53	1.94	7.82
T ₉	Kenya Original	10.76	5.46	13.30	150.30	7.30	3.34	8.03
T ₁₀	Anita Orange Red with Gold	11.51	5.50	14.07	93.80	5.93	2.49	7.86
T ₁₁	Jishu Red	9.77	9.47	10.94	92.17	6.98	2.42	7.25
T ₁₂	Sachin Red	15.30	9.29	10.50	96.80	7.21	2.94	11.41
T ₁₃	Red New	14.96	5.98	14.40	82.55	6.72	2.29	9.78
T ₁₄	Matangini White	11.49	5.84	12.73	84.47	7.45	2.48	10.47
T ₁₅	S. P. Romia Roy	12.06	5.83	13.57	83.84	7.30	2.38	5.72
T ₁₆	Suparna New Bicolor	12.41	5.56	11.42	84.85	6.80	2.26	5.83
T ₁₇	Prabhujee Bicolor	12.44	5.39	15.80	79.42	6.77	2.37	6.11
T ₁₈	Prime Minister Bicolor	16.72	4.44	10.75	68.37	7.17	2.07	4.99
T ₁₉	Raja Bicolor	15.71	6.47	11.10	82.76	6.56	2.20	8.79
T ₂₀	Glory of India Bicolor	15.00	5.76	9.16	78.35	6.90	2.47	6.01
	SEM (±)	0.65	0.37	1.05	5.15	0.36	0.14	0.39
	CD (P=0.05%)	1.88	1.06	3.04	14.74	1.05	0.40	1.13

Conclusion

It was concluded that 'Prime Minister Bicolor, Jishu Red, Babananda Yellow, Kenya Original, Blackout Black, Gajanan Yellow' including 'Ankita Pink' better performed for flower quality so these cultivars are suitable for cut flower production under C.G. plains.

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