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EVALUATION OF DAHLIA (*Dahlia variabilis*) GENOTYPES FOR FLORAL TRAITS

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ABSTRACT

Fourteen dahlia genotypes (IIHRDS1 to IIHRDS14) were evaluated at Division of flower and medicinal crops ICAR-IIHR during November 2024 - January2025 for floral traits, namely number of flowers per plant, number of ray florets per flower, flower diameter and flower weight. The genotypes differed significantly for all the traits studied. The number of flowers per plant ranged from 7.15 in IIHRDS6 to 16.65 in IIHRDS3, with a mean of 12.97. The number of ray florets per flower was highest in IIHRDS6 (31.57), which was on par with IIHRDS2 (30.62) and lowest in IIHRDS7 (9.28), which was on par with IIHRDS13 (9.52). For this trait the genotypes fell into two distinct groups, seven genotypes with 26.42 to 31.57 ray florets and seven with 9.28 to 17.70. Flower diameter was largest in IIHRDS2 (9.70 cm), which was on par with IIHRDS3 (9.53 cm), and smallest in IIHRDS13 (5.96 cm). Flower weight was highest in IIHRDS8 (3.84 g) and lowest in IIHRDS13 (1.42 g). IIHRDS2 combined the largest flowers with a high ray floret number and the second highest flower weight (3.27 g), whereas IIHRDS3 produced the most flowers per plant. IIHRDS13 was the poorest genotype for flower diameter and flower weight.

Key words : Dahlia, Genotypes, Floral traits, Flower diameter, Ray florets.

Introduction

Dahlia (*Dahlia variabilis*) is a half-hardy, tuberous, herbaceous perennial of the family Asteraceae that originated in Mexico (Pandey *et al*., 2017) and was introduced into India in 1857 (Smith, 1971). Its flower head is a composite of central disc florets and surrounding ray florets (Zala *et al*., 2023). Flower size ranges from miniature (2.5 cm) to giant (40 cm), with a wide variety of colours, shapes and forms and the flowers are used for exhibition, garden display and home decoration (Hegde *et al*., 2022).

Floral characters such as flower diameter, flower weight, number of flowers per plant and number of ray florets (petals) per flower are important for identifying the genotypes best suited to garden display, exhibition and cut-flower use (Vikas *et al*., 2015; Hegde *et al*., 2022; Jat *et al*., 2024). The performance of a genotype, however, differs with geography, season and growing environment (Zala *et al*., 2023) and genotypes better suited to a particular region have to be identified before they can be improved (Vikas *et al*., 2015). Dahlia genotypes have been evaluated for floral and yield traits at Udaipur (Kumar *et al*., 2009; Mahawer *et al*., 2010) and Allahabad (Gupta *et al*., 2015; Baburao *et al*., 2018; Shukla *et al*., 2018) and in the dry zone of Karnataka (Verma and Kulkarni, 2017) and genetic variability among dahlia genotypes has also been assessed (Sree Devi *et al*., 2020). Hence, the present study was undertaken to evaluate fourteen dahlia genotypes (IIHRDS1 to IIHRDS14) for floral traits.

Materials and Methods

The experiment was carried out at Division of Flower and Medicinal Crops, ICAR-IIHR, Bengaluru during November 2024 - January 2025. Fourteen dahlia genotypes (IIHRDS1 to IIHRDS14) were grown in a Randomized complete block design with three replications at a spacing of 45 × 45 cm. Tubers were collected from different parts of India and maintained at ICAR-IIHR for this diversity studies.

Observations were recorded on five randomly selected plants per genotype in each replication for the following floral traits and averages were worked out. The number of flowers per plant was counted during full bloom stage. The number of ray florets per flower was counted in fully opened flowers per plant. Flower diameter (cm) was measured across the fully opened flower using measuring scale. Flower weight (g) was recorded as the weight of a single fully opened flower using weighing balance.

The data were analysed statistically following Panse and Sukhatme (1985), the standard error of the mean (SE(m)), critical difference at 5 per cent level of probability (CD @ 5%) and coefficient of variation (CV) were computed. Genotype means that differed by less than the CD were considered to be on par.

Results and Discussion

The genotypes differed significantly for all the floral traits studied (Table 1). The variation may be attributed to the genetic make-up of the genotypes and to the environmental conditions prevailing at the site (Vikas *et al*., 2015; Jat *et al*., 2024).

Number of flowers per plant

The number of flowers per plant ranged from 7.15 in IIHRDS6 to 16.65 in IIHRDS3, with a mean of 12.97 (Fig. 1). IIHRDS3 produced the most flowers, followed by IIHRDS1 (15.67) and IIHRDS4 (15.58), which were on par with each other. IIHRDS6 produced the fewest flowers, followed by IIHRDS10 (10.17) and IIHRDS14 (11.06). Eight genotypes (IIHRDS3, IIHRDS1, IIHRDS4, IIHRDS7, IIHRDS11, IIHRDS9, IIHRDS2 and IIHRDS5) produced more flowers than the mean. Variation in the number of flowers per plant among dahlia genotypes was reported earlier by Mishra *et al*. (1987), Mishra *et al*. (2001), Vikas *et al*. (2015) and Baburao *et al*. (2018) and was attributed to genetic factors and environmental conditions (Vikas *et al*., 2015; Jat *et al*., 2024). The range recorded here (7.15 to 16.65) lies between the 14.0 to 37.3 flowers per plant reported by Vikas *et al*. (2015) and the 1.25 to 5.56 reported by Zala *et al*. (2023).

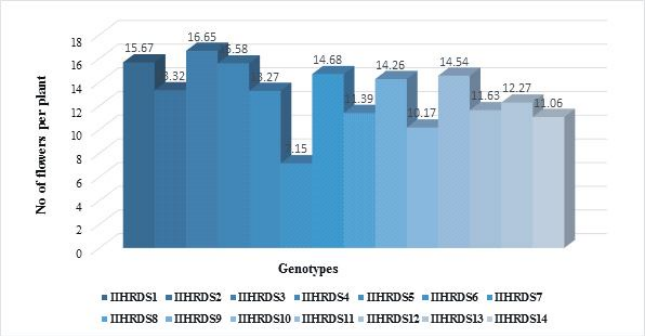


Fig. 1 : Mean performance of number of flowers per plant in dahlia genotypes.

Table 1 : Mean performance of floral traits in dahlia genotypes.

Genotypes	Number of flowers per plant	Number of ray florets per flower	Flower diameter (cm)	Flower weight (g)
IIHRDS1	15.67	14.32	8.52	2.08
IIHRDS2	13.32	30.62	9.70	3.27
IIHRDS3	16.65	13.28	9.53	1.85
IIHRDS4	15.58	28.60	8.34	2.49
IIHRDS5	13.27	13.47	7.91	1.77
IIHRDS6	7.15	31.57	7.53	3.11
IIHRDS7	14.68	9.28	8.21	2.78
IIHRDS8	11.39	30.16	7.84	3.84
IIHRDS9	14.26	13.28	7.63	1.56
IIHRDS10	10.17	26.42	7.84	2.84
IIHRDS11	14.54	17.70	7.47	1.59
IIHRDS12	11.63	30.26	7.27	2.53
IIHRDS13	12.27	9.52	5.96	1.42
IIHRDS14	11.06	26.52	6.60	2.76
SE(m)	0.22	0.39	0.11	0.04
CD @ 5%	0.62	1.10	0.31	0.11
CV	2.96	3.17	2.48	2.47

Number of ray florets per flower

The number of ray florets per flower ranged from 9.28 in IIHRDS7 to 31.57 in IIHRDS6, with a mean of 21.07. IIHRDS6 had the most ray florets and was on par with IIHRDS2 (30.62), followed by IIHRDS12 (30.26) and IIHRDS8 (30.16). IIHRDS7 had the fewest ray florets and was on par with IIHRDS13 (9.52), followed by IIHRDS3 and IIHRDS9 (13.28 each). The genotypes fell into two distinct groups for this trait: seven genotypes (IIHRDS6, IIHRDS2, IIHRDS12, IIHRDS8, IIHRDS4, IIHRDS14 and IIHRDS10) had 26.42 to 31.57 ray florets per flower and the other seven had 9.28 to 17.70. Such variation is due to the varietal characters of the genotypes (Dhane and Nimbalkar, 2002; Vikas *et al*., 2015). Vikas *et al*. (2015) recorded 56.7 to 271.3 ray florets per flower and Hegde *et al*. (2022) recorded 19.90 to 104.30 petals

per flower, so the genotypes of the present study have comparatively fewer ray florets.

Flower diameter (cm)

Flower diameter ranged from 5.96 cm in IIHRDS13 to 9.70 cm in IIHRDS2, with a mean of 7.88 cm. IIHRDS2 had the largest flowers and was on par with IIHRDS3 (9.53 cm), followed by IIHRDS1 (8.52 cm) and IIHRDS4 (8.34 cm). IIHRDS13 had the smallest flowers, followed by IIHRDS14 (6.60 cm). Six genotypes (IIHRDS2, IIHRDS3, IIHRDS1, IIHRDS4, IIHRDS7 and IIHRDS5) had a flower diameter above the mean. Variation in flower diameter among dahlia genotypes has been reported by Vikas *et al*. (2015), who attributed it to genetic factors, and by Mahawer *et al*. (2010), Baburao *et al*. (2018), Shukla *et al*. (2018) and Sree Devi *et al*. (2020). Hegde *et al*. (2022) stated that such variation may also depend on the nutrients applied and the vegetative growth of the plant. The diameters recorded here are generally smaller than the 8.6 to 19.3 cm reported by Vikas *et al*. (2015) and the 11.06 to 17.07 cm reported by Zala *et al*. (2023), but fall within the 3.52 to 13.52 cm reported by Hegde *et al*. (2022).

Flower weight (g)

Flower weight ranged from 1.42 g in IIHRDS13 to 3.84 g in IIHRDS8, with a mean of 2.42 g (Fig. 2). IIHRDS8 had the heaviest flowers, followed by IIHRDS2 (3.27 g) and IIHRDS6 (3.11 g). IIHRDS13 had the lightest flowers, followed by IIHRDS9 (1.56 g) and IIHRDS11 (1.59 g). Eight genotypes (IIHRDS8, IIHRDS2, IIHRDS6, IIHRDS10, IIHRDS7, IIHRDS14, IIHRDS12 and IIHRDS4) had flowers heavier than the mean. Variation in flower weight among dahlia genotypes was reported by Bhattacharyya *et al*. (1976), Mishra *et al*. (1987), Kumar *et al*. (2009) and Shukla *et al*. (2018). The flower weights recorded here are much lower than the 13.7 to 29.3 g reported by Vikas *et al*. (2015) and the 38.73 to 79.55 g reported by Zala *et al*. (2023), which agrees with the small flower diameter of the present genotypes. Flower weight was not governed by flower diameter alone. The four heaviest flowers (IIHRDS8, IIHRDS2, IIHRDS6 and IIHRDS10) all belonged to the group with the most ray florets, whereas IIHRDS3, which had a large flower diameter (9.53 cm) and the most flowers per plant, had a flower weight of only 1.85 g with 13.28 ray florets. IIHRDS7 was an exception, with the fewest ray florets (9.28) but a flower weight of 2.78 g.

Thus, IIHRDS3 produced the most flowers per plant, IIHRDS6 had the most ray florets, IIHRDS2 had the largest flowers and IIHRDS8 had the heaviest flowers,

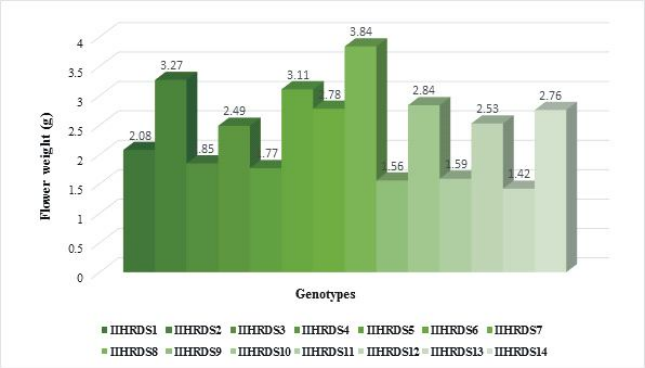


Fig. 2 : Mean performance of flower weight (g) in dahlia genotypes.



Plate 1 : Flower variation in dahlia genotypes.

while IIHRDS13 was the poorest for flower diameter and flower weight. The wide variation among the genotypes for these traits, which is mainly attributable to their genetic make-up, offers scope for selecting genotypes for different floral characters.

Conclusion

The fourteen dahlia genotypes differed significantly for all the floral traits studied. IIHRDS3 produced the most flowers per plant (16.65), IIHRDS6 (31.57) and IIHRDS2 (30.62) had the most ray florets, IIHRDS2 had the largest flowers (9.70 cm) and IIHRDS8 had the heaviest flowers (3.84 g). IIHRDS2 and IIHRDS4 were the only genotypes above the mean for all four traits. Flower weight followed the number of ray florets more closely than flower diameter, and no single genotype combined the highest flower number with the highest flower size or weight: IIHRDS3 produced many but light flowers, whereas IIHRDS6 produced few flowers (7.15) that were heavy with many ray florets. IIHRDS13 was the poorest genotype for flower diameter (5.96 cm) and flower weight (1.42 g). IIHRDS2 and IIHRDS4 can be considered the most promising genotypes for floral characters, subject to confirmation of their yield and vase

life.

References

Baburao, D.S., Kullur L.R., Manavi G.H. and Prasad V.M. (2018). Evaluation of different hybrids for floral and yield parameters of dahlia (*Dahlia variabilis* L.) grown under Allahabad agroclimatic condition. *J. Pharmacogn. Phytochem.*, **SP1**, 141-142.

Bhattacharyya, A.P., Pandey H.S. and Yadav L.P. (1976). Studies on the performance of some varieties of dahlia under Calcutta climate. *Prog. Hort.*, **8**, 51-56.

Dhane, A.V. and Nimbalkar C.A. (2002). Growth and flowering performance of some dahlia varieties. *J. Maharashtra Agric. Univ.*, **27(2)**, 210-211.

Gupta, A.K., Jaiswal N.K. and Saravanan S. (2015). Varietal evaluation of different hybrids of dahlia (*Dahlia variabilis* L.) under Allahabad agro-climatic conditions. *Int. J. Agric. Sci. Res.*, **5(1)**, 55-58.

Hegde, B.N., Shirol A.M. and Harshavardhan M. (2022). Performance of dahlia (*Dahlia variabilis* L.) genotypes for floral and yield attributes. *Pharma Innov. J.*, **11(3)**, 950-952.

Jat, D.C., Bahadur V. and Dager S. (2024). Evaluation of different dahlia hybrids (*Dahlia variabilis* L.) under Prayagraj agro-climatic conditions. *Int. J. Adv. Biochem. Res.*, **SP-8(5)**, 374-378.

Kumar, L., Mahawer L.N., Shukla A.K., Kaushik R.A. and Upadhyay B. (2009). Performance of dahlia (*Dahlia variabilis* L.) cultivars for vegetative, floral and relative economic parameters under sub-humid southern plains and Aravalli hills of Udaipur. *Indian J. Agric. Sci.*, **79(10)**, 816-820.

Mahawer, L.N., Kumar L., Shukla A.K. and Bairwa H.L. (2010). Evaluation of dahlia cultivars under Aravalli hill conditions of Udaipur. *Indian J. Hort.*, **67(2)**, 234-237.

Mishra, M., Mohanty C.R. and Mahapatra K. (2001). Genetic variability with respect to floral traits in dahlia. *J. Ornamental Hort.*, **4(2)**, 79-82.

Mishra, R.L., Verma T.S., Thakur P.C. and Singh H.B. (1987). Variability and correlation studies in dahlia. *Indian J. Hort.*, **44(3-4)**, 269-273.

Pandey, S.K., Kumari S., Singh D., Singh V.K. and Prasad V.M. (2017). Effect of biofertilizers and organic manures on plant growth, flowering and tuber production of dahlia (*Dahlia variabilis* L.) cv. S.P. Kamala. *Int. J. Pure Appl. Biosci.*, **5(2)**, 549-555.

Panse, V.G. and Sukhatme P.V. (1985). *Statistical Methods for Agricultural Workers*. 4th Edn., Indian Council of Agricultural Research, New Delhi.

Shukla, P., Prasad V.M., Burondkar S.S. and Ainarkar A.A. (2018). Evaluation of dahlia hybrids (*Dahlia variabilis* L.) under Allahabad agro climatic conditions. *J. Pharmacogn. Phytochem.*, **7(5)**, 1109-1113.

Smith, A.W. (1971). *A Gardener's Dictionary of Plant Names*. Cassell and Company Ltd., London, 390 pp.

Sree Devi, M., Seetharamu G.K., Patil B.C., Hanchinamani C.N. and Kukanoor L. (2020). Assessment of genetic variability among dahlia (*Dahlia variabilis* L.) genotypes for productivity and quality traits. *J. Pharmacogn. Phytochem.*, **9(4)**, 3134-3137.

Verma, J. and Kulkarni B.S. (2017). Evaluation of dahlia genotypes for growth and yield characters under dry zone of Karnataka, India. *Int. J. Curr. Microbiol. Appl. Sci.*, **6(11)**, 402-409.

Vikas, H.M., Patil V.S. and Dorajeerao A.V.D. (2015). Evaluation of dahlia genotypes based on vegetative and quality characters. *Plant Archives*, **15(1)**, 283-286.

Zala, K.R., Karetha K.M., Patel V.S. and Solanki K.S. (2023). Evaluation of different dahlia (*Dahlia variabilis* L.) varieties in Saurashtra region of Gujarat. *Pharma Innov. J.*, **12(9)**, 1553-1555.