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Performance of Rosy Adenium (*Adenium obesum*) Genotype under Prayagraj Agro-Climatic Conditions

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: The experiment was conducted in the Department of Horticulture, Sam Higginbottom University of Agriculture Technology and Science, Prayagraj, during 2023-2024.
Study Design: The experiment was laid out in Completely Randomized Design (CRD).
Methodology: 10 Rosy adenium genotypes and each genotype was replicated 3 times. The different genotypes used in the experiment were R4, R5, R23, R33, R35, R53, R73, R124, R163, R169.
Results: The result obtained showed that the genotype R73 showed significantly higher performance in parameters like plant height, caudex diameter, graft length, graft diameter, days taken to bud initiation, number of petals per flower, flower diameter, self-life and which was found to be at par with genotype R33 in plant height, caudex diameter, graft length, graft diameter, days taken to bud initiation, number of petals per flower, flower diameter, self-life.

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Conclusion: Hence, genotype R73 and R33 is excellent in terms of performance and plant growth under Prayagraj agro-climatic conditions.

Keywords: Rosy adenium; genotype; caudex; self-life.

1. INTRODUCTION

"Adenium obesum (Forssk.) Roem. & Schult., a succulent plant commonly known as desert rose belongs to the dogbane family *Apocynaceae*, is native from African countries such as Ethiopia, Kenya, Senegal, Somalia, Sudan and Tanzania, also found in Oman, Saudi Arabia and Yemen as wild plant" [1,2] Owing to its beautiful sculptural caudex, good branching habit and tolerance to drought stress. its market demand is increasing [3-19]. "Rosy adenium is one of the popular ornamental plants and now cultivated in many humid and tropical countries such as India, Philippines and Thailand**,** with great relevance in the ornamental market due to its wide range of flower colour among cultivars" [20,21,22,23]. "It is known for its distinctive caudex, vibrant trumpet-shaped flowers, and resilience in harsh conditions, *Adenium obesum* holds both aesthetic and ecological importance. Its caudex serves as a water reservoir, enabling survival during drought, while its flowers attract pollinators vital for ecosystem biodiversity [24,25]. The numerous hybrids are propagated mainly by grafting on to seedling rootstock. The flower consists of five petals of red and pink colour, the flowers have no fragrance**.** The flowers bloom throughout the year, particularly in summer when the whole plant is covered with flowers. The leaves crowd together at the end of the branches. The plant has a tendency to lose most of the leaves in winter, especially in a cool environment" [11]. To ensure the performance new genotypes has been evolved which need to be evaluated for their performance in different regions.

2. MATERIALS AND METHODS

The present investigation entitled Performance of rosy adenium (*Adenium obesum*) genotypes under Prayagraj agro-climatic conditions was carried out in the Department of Horticulture, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, during September 2023- May 2024. The genotypes were planted in earthen pots. There were total number of 120 genotypes consisting of 10 varieties *viz.* R4, R5, R23, R33, R35, R53, R73, R124, R163, R169. The experiment was laid out in Randomized complete Block Design (RCBD) with three replications. One year old grafted adenium genotypes were procured from Mondal Nursery, Kolkata, West Bengal. The recommended cultural practices were followed for raising the crop. The average values from the samples of each genotype in every replication were worked out and results were used to evaluate the performance of different genotypes on various growth and flowering parameters.

3. RESULTS AND DISCUSSION

3.1 Vegetative Parameters

Among the vegetative parameters studied, significant variations were observed among 10 rosy adenium genotypes and the data are presented in Table 1.

Table 1. Vegetative parameters of different rosy adenium genotypes

Genotypes	Plant height (cm)	Caudex diameter (cm)	Graft diameter (cm)	Graft length (cm)
R4	22.1	3.6	2.3	5.6
R5	24.4	4.6	3.5	10.0
R23	22.5	3.8	2.4	7.3
R33	25.6	5.6	4.2	12.4
R35	23.6	4.1	3.1	10.4
R53	24.6	4.8	3.7	11.0
R73	25.8	5.8	4.7	12.7
R124	24.8	5.1	3.8	11.4
R163	23.3	4.0	3.0	7.4
R169	25.3	5.2	4.0	12.2
F-Test	**S**	**S**	**S**	**S**
SE(d) ±	**0.553**	**0.444**	**0.305**	**0.383**
$CD_{0.05}$	**1.161**	**0.932**	**0.64**	**0.804**
CV(%)	**2.789**	**11.482**	**10.596**	**4.6**

Table 2. Flower parameters of different rosy adenium genotypes

Genotypes	Days taken to bud initiation(days)	Number of petals per flower	Flower diameter (cm)	Self life
R4	120.9	5.1	4.9	4.5
R5	118.7	8.3	7.0	5.4
R23	120.0	5.5	5.4	4.9
R33	116.6	10.8	8.4	6.2
R35	119.0	7.8	6.6	5.3
R53	117.8	8.8	7.2	5.6
R73	115.8	10.9	8.9	6.2
R124	117.5	9.4	7.4	6.0
R163	119.2	5.7	5.4	5.0
R169	116.5	10.7	8.2	6.1
F-Test	S	S	S	S
SE(d) ±	0.593	0.332	0.396	0.246
$CD_{0.05}$	1.246	0.698	0.831	0.517
CV(%)	0.614	4.882	6.937	5.407

"Significantly, taller plant height (25.83cm) was observed in the genotype G7(R73), which was found to be at par with genotype G4(R33, 25.69cm), while lesser plant height (22.19cm) was observed in the genotype G1(R4). Variation in plant height could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded" in adenium by_[26,18,22]. Significantly, higher caudex diameter(5.8cm) was observed in the genotype G7(R73) which was found to be at par with genotype of rosy adenium G4(R33, 5.6cm), while lesser leaf area (3.4cm) was observed in the genotype of rosy adenium G1(R4). "Variation in caudex diameter could be influenced by the parental genotypes, -their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded" in adenium by [27,21]. Significantly, higher graft length (12.7cm) was observed in the genotype G7(R73) which was found to be at par with genotype of rosy adenium G4(R33, 12.4cm), while lesser graft length (5.6cm) was observed in the genotype of rosy adenium G1(R4). "Variation in graft length (cm) could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded in adenium" by [26,18,22]. Significantly, higher graft diameter (4.7cm) was observed in the genotype G7(R73) which was found to be at par with genotype of rosy adenium G4(R33, 4.2cm), while lesser graft diameter (2.3cm) was observed in the genotype of rosy adenium G1(R4). Variation in graft diameter (cm) could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded in adenium by [26,18,22]

3.2 Flower Parameters

Significantly, lesser days taken to bud initiation (115.8) was observed in the genotype G7(R73) which was found to be at par with genotype G4(R33, 116.6), while longer days taken to bud initiation (120.9) was observed in the genotype of rosy adenium G1(R4). Variation in days taken to bud initiation could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded in adenium by_[6,17,19]. Significantly, higher Number of petals per flower (10.9) was observed in the genotype of rosy adenium G7(R73) which was found to be at par with genotype G4(R33, 10.8), while lesser Number of petals per flower (5.1) was observed in the genotype of rosy adenium G1(R4). Variation in Number of petals per flower could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded in adenium by [6,17,19]**.** Significantly, higher flower diameter (8.9cm) was observed in the genotype G7(R73) which was found to be at par with genotype G4(R33, 8.4cm), while lesser flower diameter (4.9cm) was observed in the genotype G1(R4). Variation in flower diameter (cm) could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded in adenium by [6,17,19]**.** Significantly, higher self-life (6.2) (days) was observed in the genotype G7(R73) which was found to be at par with genotype of

rosy adenium G4(R33, 6.2), while lesser self-life (4.5)(days) was observed in the genotype of rosy adenium G1(R4). Variation in self-life (days) could be influenced by the parental genotypes, their genetic makeup as well as prevailing temperature during the growing period. Similar results are recorded in adenium by [6,17,19,28].

4. CONCLUSION

From the present investigation, it is concluded th10 adenium genotypes under study showed significant variation in all the parameters observed. The genotype G7 (R73) reported significantly better performance in parameters like plant height, number of leaves per plant, number of branches, leaf area, caudex diameter, graft diameter, graft length, days taken to bud initiation, days taken to flower opening, number of flower cluster per plant, number of flowers per cluster, number of petals per flower, flower diameter, self-life and blooming duration, which was found to be at par G4 (R33) genotypes in parameters like plant height, number of leaves, caudex diameter, graft diameter, graft length and days to flower opening. Hence, genotypes R73 and R33 are better in terms of performance and plant growth under Prayagraj agro climatic conditions.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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