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**Original article****Adenium: Attaining popularity for its unique aesthetic attributes****Dr. Dhiru Kumar Tiwari<sup>1\*</sup>, Dr. RK Tiwari<sup>1</sup>, Sumit Kumar Singh<sup>1</sup>, Bharati Upadhya<sup>1</sup> and****Dr. Anjani Kumar<sup>2</sup>**<sup>1</sup>Krishi Vigyan Kendra, Birauli (Samastipur), Bihar

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**ABSTRACT**

Adenium, commonly known as the Desert Rose, is gaining popularity due to its striking beauty, characterized by vibrant flowers and unique bonsai-like structure. Its adaptability to various climates, low maintenance requirements, and affordability make it an appealing choice for home gardens and indoor décor, particularly in urban settings. The rising interest in ornamental and succulent plants, along with trends in home gardening, has further boosted its demand. With growing opportunities for both domestic sales and international exports, Adenium presents a lucrative business potential for growers and retailers. As consumers increasingly seek aesthetic and resilient plants, Adenium is well-positioned to thrive in the market, promising higher returns and continued popularity in the future.

**Keywords:** Adenium, Caudex, bonsai.**INTRODUCTION**

*Adenium obesum* (Forssk.) Roem. & Schult, also referred to as the Impala lily and Desert rose, is rapidly gaining popularity in pot culture across the globe because its exquisite sculptural caudex, resilience of drought stress, and healthy branching and flowering habit (Singh *et al.*, 2023). Adeniums are basically tropical succulent perennials with a long lifespan. It is a great plant for rooftop gardening and xeriscaping. Belonging to the Apocynaceae family, it originates in Africa and spreads over Saudi Arabia, Oman, and Yemen as well as South Africa from Senegal to Sudan and Kenya. The Arabic term *oddaejn*, meaning "adean," is the source of the name Adenium. With its vibrant blooms, which range from deep pinks to whites and reds, and its distinctive swollen trunk, Adenium stands out as a remarkable ornamental plant. This beautiful succulent not only enhances the visual charm of gardens and indoor spaces but also thrives in various climates, making it a popular choice among both novice and experienced gardeners. In recent years, the demand for Adenium has surged, driven by its versatility and low maintenance requirements. As urban living

spaces become increasingly compact, homeowners seek plants that can flourish in limited environments while still offering an eye-catching display. Additionally, the rising interest in bonsai cultivation has contributed to *Adenium's* appeal, as its unique structure lends itself beautifully to this ancient art form. Semi-arid climates are home to the majority of this type of plant. It withstands extreme temperatures by storing water in its delicate, swelling stem and roots.

*Adenium* has seen a significant increase in demand across Indian markets due to its aesthetic appeal, suitability to the climate, and rising interest in gardening. With affordable price points and adaptability, the plant is set to remain a popular choice for years to come. Entrepreneurs and growers in India also have potential opportunities to expand in both domestic and international markets, leveraging the growing trends of home gardening and ornamental plants.

<b>Table-1: Taxonomical hierarchy of <i>Adenium</i></b>	
<b>Taxonomic Rank</b>	<b>Classification</b>
<b>Domain</b>	Eukarya
<b>Kingdom</b>	Plantae
<b>Subkingdom</b>	Tracheobionata
<b>Super division</b>	Spermatophyta
<b>Division</b>	Magnoliophyta (Angiosperms)
<b>Class</b>	Magnoliopsida (Dicotyledons)
<b>Subclass</b>	Asterids
<b>Order</b>	Gentianales
<b>Family</b>	Apocynaceae
<b>Genus</b>	<i>Adenium</i>
<b>Species</b>	<i>Adenium obesum</i>

(Dimmitt & Edwards, 2021)

### **Plant Characteristics**

*Adenium obesum* is a succulent deciduous tree or shrub that has a pachycaul (with thickened stem). The bulbous, sleek, and eye-catching trunk of the stem has an appealing base. The enlarged base, or caudex, is almost globose to conical before moving to thin, dividing cells that proliferate. Its asymmetrical branching creates a distinctive and alluring bonsai appearance. Water is stored by them in their roots, branches, and caudex, a swelling trunk. Their succulence makes them ideal for container gardening and produces interesting morphologies.

### Floral and Fruit Characteristics

Desert roses have trumpet-shaped flowers and, after they are pollinated, double fruits that resemble fingers. Its hue ranges from grayish-green to browned, and at its curled tip, it exhibits noticeable colour shifts from dark green to blue green. The colour of the flower ranges from white to pale pink to dark rose. It is solitary, though it can be found next to others. The petals have a wavy texture, and the inner centre is hollow and yellow in shade. (Colombo *et al.*, 2015)

<b>Table-2: Types of Adenium</b>	
<b>Type</b>	<b>Specific Features</b>
<b>Adenium Single Layer Red Flower Plant</b>	With brilliant scarlet flowers, this small plant has a twisted trunk. Because of its distinctive shape, collectors appreciate the Adenium Single Layer Red Flower Plant.
<b>Adenium Double Layer White Pink Flower Plant</b>	Another short one has unique white flowers with borders of bright pink that have a velvety touch. Collectors typically select it because of its exquisite beauty.
<b>Adenium Baby Pink Flower Plant</b>	Adenium baby pink desert rose is an attractive plant. These plants have stout stems and succulent-like branches. Their leaves are usually oval in shape, between 2 and 7 inches long, and come in baby pink and white colours.
<b>Adenium multiflorum</b>	This specific kind of desert rose is easily identified by its small size and plenty of flowers. It produces clusters of white blooms with reddish-pink margins.
<b>Bi-color Adenium Double Layer White Pink Flower Plant</b>	The blooming desert rose plant looks fantastic in containers or as an accent piece in the landscape. The beautiful bicolor blooms in pink and white hues that these flowers provide for your indoor space make them highly sought-after.
<b>Adenium Obesum Double Black Steel</b>	This plant has beautiful flowers with a black core that vary in colour from dark purple to rich, velvety crimson. The blossoms and rich green leaves complement each other nicely.
<b>Prosperity Pink Adenium Single Layer Pink Flower Plant</b>	Adenium Obesum Pink Single Petal succulents have 2 to 3 inch flowers. The range of colours and trumpet shapes make this potted specimen stand out. It's an easy plant to grow and a great choice for an adventurous gardener.

(Ramos *et al.*, 2022)

**Symbolism**

This flower or plant is symbolic of prosperity. Similar to the Laughing Buddha's protruding belly, the bulging basal stem of the desert rose is revered as a sacred symbol of fertility, prosperity, abundance, and good fortune. According to feng shui principles, the desert rose is an advantageous flower for any type of home. Due to its resilience and tolerance for harsh environmental conditions, the desert rose plant is a symbol of toughness, persistence, and endurance.

	
	
<p><b>Adenium plant in Nursery with prominent caudex and white colored bloom</b></p>	<p><b>Bi-colored Blooming adenium</b></p>

**Media**

For optimal growth, adeniums generally need a very well-aerated yet moisture-retentive medium. Nonetheless, choosing the media must be done in concert with existing watering methods, or the latter must be adjusted to fit the chosen media. Use a media with poor water retention, for instance, if your system is meant to be watered frequently.

## **Containers**

Plastic pots perform just as well as or better than porous clay when the aerated medium is properly-designed and irrigation is controlled. Growth is generally more influenced by container shape: deeper pots are preferable for early growth than half-pots or bowls. Shallow containers work well for more mature plants. There should be sufficient number of drainage holes since excess water can be fatal.

## **Nutrition**

When conditions are right, the plant can grow very quickly and use a lot of nitrogen and other nutrients. On the other hand, growth that occurs too quickly is unsightly, fragile, and prone to rot. When the plant is about to go into a growth spurt, feed it extra, otherwise keep the basal nutrition level low and steady. A significant amount of specific nutrients are required for heavy bearing mother plants to produce the best seeds. We can use a full-spectrum liquid fertiliser which contains all micronutrients (iron, manganese, copper, zinc, boron, and molybdenum) and all macronutrients (nitrogen, phosphorus, potassium, calcium, magnesium, and sulphur).

## **Pruning**

Pruning of grafted Adeniums is one of the most reliable ways to ensure that they bloom, as new growth will inevitably produce flowers, especially during cool, short days. This has some value for species that are growing in conditions that restrict growth. However, in favourable situations, adeniums will grow progressively longer stems with poor flowering. Pinching seedling plants frequently results in a well-branched plant. Annual pruning is recommended, or at least every two years, for plants that are already sufficiently tall. It is possible to perform some thinning simultaneously in order to eliminate weak, broken, or inward-growing stems. This process will eliminate two of the most bothersome pests of Adeniums, mealy bugs and spider mites, which are both concentrated at the developing end among the leaves, in addition to the benefit of generating new growth that will flower. If you don't do this during times of rapid growth, only one bud will emerge.

Adeniums grow an extensive root system with thicker secondary roots over time. When transplanting, it is often necessary to clip off these roots at the point where they join the caudex. This will facilitate the plant's insertion into the new container and allow sufficient space for the pots to accommodate a reasonable amount of media. Rejuvenation of the plants by Pruning back old plants with overly long, leafless stems in the spring helps enhance and invigorate the plant and encourage new growth that will produce blossoms.

## **Repotting**

Repotting adeniums annually or twice a year performs well for plants. When repotting, old media can either be fully removed (which is necessary if the media has deteriorated and gotten soggy) or it can be kept and what's left in the pot filled in with fresh media. Repotting is best done in the spring, when new growth is just getting started and fast root growth will encourage vigorous shoot growth. Sometimes, the root mass will have grown to such an extent that it cannot be accommodated in the new pot. Pruning off some of the roots in such cases is harmless, especially if

the roots have a thin neck close to the main caudex. When repotting, plants can also be thinned and their stems trimmed.

### **Propagation**

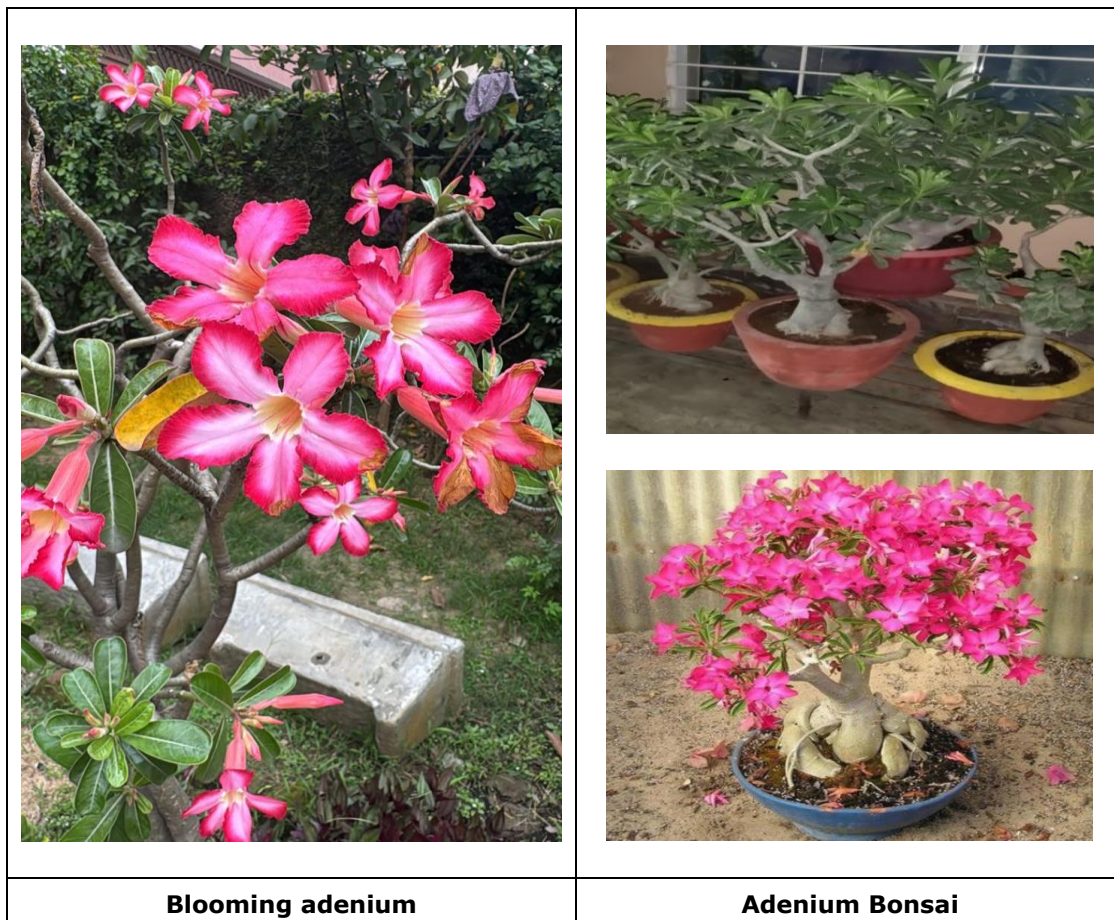
**By seeds:** *A. obesum* the majority of plants are propagated from seeds because they have more primary roots and caudex than plants propagated from cuttings. The follicle begins to dehisce after 90 days of flower pollination, at which point the seeds are ready to be sown.

**By Cuttings:** The benefit of using cuttings for species propagation is that the result is plants that have a genetically similar to the parent plant. However, compared to seedlings propagated by seeds, cutting-propagated seedlings may not be as appealing since their caudex is less developed, and customers value the presence of a well-formed caudex.

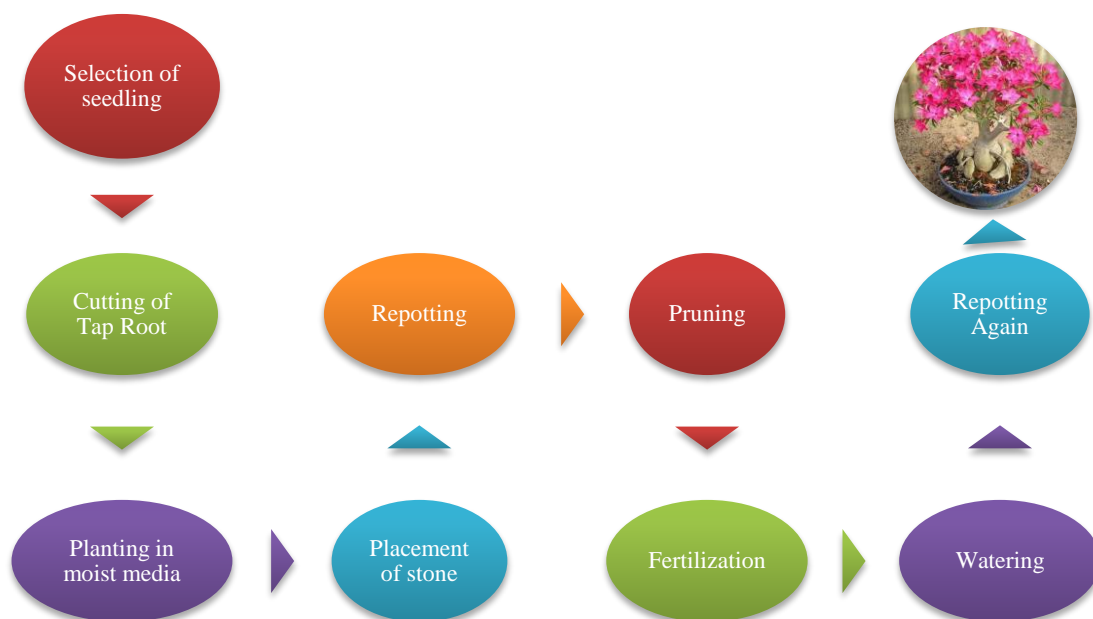
**By Grafting:** Through grafting, saplings of these highly segregated materials can be produced on rootstocks grown from seeds. One-year-old seedlings are suitable to use as rootstocks since they have sufficiently developed caudex for grafting. The graft method or a technique similar to the graft approach (also known as "cork") can be used to do grafting on adenium.

### **Bonsai of adenium**

The process of growing Bonsai of adenium Start with selection of a seedling that is 1–2 months old and is stronger than the others. Then second most important thing is to cut the tap root of the seedling by using a sterilized, sharp knife to check the seedling growth. After that, plant the seedling in moist, sandy potting media to promote the new roots from the cut edges. Placement of a small, flat, sterilized stone under the seedling is required to force the secondary roots to grow horizontally around it. In a certain time repot the adenium into a wider and shallower pot. The next step is pruning of the adenium bonsai year-round, but be careful to time it so that flowers can appear on new shoots. Use liquid fertilizer at half the recommended strength once a month from spring to autumn for better nourishment of the bonsai. Watering is very important in the adenium bonsai every 7–10 days, and allows the soil to dry out a bit in between watering. To maintain the bonsai repot the bonsai every two or three years in late spring, and prune the roots at the same time.



The following steps can be carried out to grow an adenium bonsai:



### Economic Considerations

- **Cost of Production:** Initial investment in quality seeds, soil, and pots can vary. However, adenium's high market value often offsets these costs.
- **Profitability:** Successful adenium cultivation can yield significant returns, especially for rare varieties and hybrids, making it an attractive option for commercial growers.

### Marketing Strategies

- **Online Presence:** E-commerce platforms and social media can expand market reach, attracting a wider customer base.
- **Community Engagement:** Workshops and plant shows can foster community interest and increase sales, creating a loyal customer base.

### Future Prospects of Adenium in India

The future of adenium commercialization in India looks bright, driven by consumer trends, innovative marketing strategies, and sustainable practices. As growers adapt to the evolving market landscape and leverage technology, adenium is poised to become a significant player in the ornamental plant industry. With careful planning and execution, stakeholders can tap into the lucrative opportunities presented by this beautiful and versatile plant. The commercial potential of adenium (desert rose) in India is promising due to its unique attributes, growing consumer interest, and market dynamics. Here are some key aspects shaping its future prospects:

### CONCLUSION

The increasing demand for Adenium in Indian markets reflects a broader trend toward gardening and ornamental plants, driven by their aesthetic appeal, adaptability, and the growing interest in indoor and outdoor gardening. As urban dwellers seek low-maintenance yet visually stunning plants to enhance their living spaces, Adenium stands out as a preferred choice due to its vibrant flowers and unique characteristics. Moreover, the plant's affordability makes it accessible to a wide range of consumers, from gardening enthusiasts to casual buyers. The rise of e-commerce and local nurseries further facilitates its availability, enabling more people to discover and cultivate this attractive species. Despite challenges in cultivation knowledge and supply, the potential for Adenium in both domestic and international markets is significant. With a focus on quality production and effective marketing strategies, businesses can capitalize on this growing trend, positioning Adenium as not just a plant but a thriving component of modern home décor and gardening culture in India. As interest in bonsai and exotic plants continues to flourish, Adenium is well-poised to become a staple in homes and gardens across the country, promising a lucrative opportunity for growers and sellers alike.

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