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Adenium: An Emerging Ornamental Crop for Arid and Semi-Arid Ecosystems

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Abstract

Adenium obesum, is becoming famous due to its liveliness and sculptural shape. It is a beautiful plant which can survive in a variety of climatic condition adding visual appeal to gardens and indoor areas, making it a favourite option among gardeners. The growing popularity of bonsai culture has also aided *Adenium*'s appeal, as this age-old craft is ideally suited to its distinctive structure. *Adenium* presents a substantial business opportunity for farmers and retailers, with growing prospects for both local and worldwide exports. Apart from the ornamental purpose *Adenium obesum* is an important medicinal plant that exhibits a variety of biological properties (antioxidant, antiviral, antibacterial and anticancer).

Keywords: *Adenium*, Biological, Bonsai, Desert Rose

Introduction

Adenium obesum (Forssk.) Roem. & Schult. is commonly known as desert rose or Impala lily, a succulent plant which belongs to Apocynaceae family (Fleck *et al.*, 2024). It is native to Africa, especially Ethiopia, Kenya, Senegal, Somalia, Sudan and Tanzania, but it can also be found as a wild plant in Oman, Saudi Arabia and Yemen. The name *Adenium* derives from the Arabic phrase oddaejn, which means "adean". It is a popular ornamental plant that has been cultivated in many humid, tropical countries for decades, including India, the Philippines and Thailand. The name *Adenium* derives from the Arabic phrase oddaejn, which means "adean". It is a popular ornamental plant that has been cultivated in many humid, tropical countries for decades, including India, the Philippines and Thailand. It comes in a wide range of flower hues, from white to deep pinks and scarlet among cultivars and also have a stunning sculptural caudex. This plant not only enhances the aesthetics of gardens and indoor spaces, but it also thrives in a wide range of temperature and hence, becomes a popular choice for gardeners. In recent years, *Adenium* has grown in popularity due to its versatile and low maintenance nature, as well as its use in bonsai cultivation because of its unique structure.

Plant Description

Adenium obesum (Figure 1) is a stunning deciduous pachycaul shrub and arboreal plant with a swollen trunk and fleshy, smooth, greyish-green to brown-coloured, irregularly spaced branches that make it ideal for bonsai (Paul *et al.*, 2015). It has simple, spirally arranged leaves at the ends of the branches and produces beautiful, fragrant, star-shaped flowers in a variety of colours. Throughout the year, terminal clusters of flowers are produced. The plant may be nearly completely covered in blossoms in the summer. The flower consists of five sepals and five petals of different colour that are fused to form a floral tube (Colombo *et al.*, 2018). At maturity, the follicle-like fruit splits along one side, releasing seeds with a hairy pappus attached for windborne dispersal. However, not all plants generate seeds in cultivation, as pollination frequently fails due to male or female sterility.

Symbolism

Adenium obesum flower or plant symbolizes prosperity. The protruding base stem of the plant is compared to the belly of the Laughing Buddha and used as a sign of fertility, prosperity, plenty, positive energy and good luck, making it a popular option for homes and businesses.

Article History

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Figure 1: Vegetative and flowering stage of *Adenium*

Temperature

Desert rose requires a warm temperature ranged between 18-27 °C and direct sunlight of at least 6 to 8 hours per day for proper growth and development. In severely hot climate (over 40 °C), shade is provided in afternoon by use of shade nets. To avoid fungal infections, the area should be kept well-ventilated and Desert roses generally go dormant throughout the winters.

Media and Containers

Adeniums requires a well-aerated, good moisture holding and well-drained substrate for optimal growth. For making a good potting media, equal portions of pumice or small rock pebbles are mixed with high-quality potting soil. The plant's root system should fit within the container for optimal growth. It has been discovered that deeper pots stimulate stronger early growth than half pots or bowls. For older, established plants, shallow pots are more effective. Water-logging can be fatal; therefore, there should be ample open drainage holes.

Propagation

Desert rose can be propagated by means of seeds, cuttings, or grafting. The maximum of plants are propagated from seeds, which develop more primary roots and caudex than cuttings. Cuttings can be used to produce plants that are genetically identical to the parent. However, cutting-propagated seedlings may not be as desirable as seedlings propagated by seed because their caudex is less developed and customers value the presence of a well-formed caudex. Saplings of highly separated materials can be grown on seed-grown rootstocks through grafting. One-year-old seedlings can be used as rootstocks since they have a properly developed caudex for grafting.

Pruning and Repotting

The primary objective of pruning in *Adenium* is to promote bushier growth and a greater number of flowers. To maintain the plant's shape and allow for greater air circulation, the weak, feeble, or diseased branches should be cut off. Pruning of grafted Adenium is one of the most dependable ways to ensure that they bloom, as new growth will inevitably produce flowers, particularly on cool, short days. Adenium plants require repotting when they outgrow their pot. It is beneficial to repot plants once a year or twice a year. Spring is the optimum period for repotting since new growth is just getting started and rapid root growth encourages vigorous shoot growth (Tiwari *et al.*, 2025). Rotten parts should be removed and roots can be softly pruned while being repotted.

Adenium Bonsai

For *Adenium* bonsai (Figure 2), vigorous seedling that is 1-2 months old is selected. The tap root of seedling is then sliced with a sharp, sterilized knife. The seedlings are planted in moist sand potting soil for encouragement of new roots the cut edges. A small, flat, sterilized stone should be placed beneath the seedling to force the secondary roots to grow horizontally around it. After some time, repot the adenium into a larger and shallower container. Pruning can be done at any time of year; caution should be taken when new stems begin to bear flowers. From spring to autumn, liquid fertilizer should be given once a month for optimal bonsai nutrition. Watering should be done in every seven to ten days, with enough time for the soil to dry out between applications. Bonsai should be repotted every two or three years in late spring and pruned at the same time to maintain their health (Tiwari *et al.*, 2025).

Figure 2: *Adenium* Bonsai

Biological Activities

Adenium obesum is a medicinal plant that exhibits a variety of biological properties (antioxidant, antiviral, antibacterial and anticancerous). It contains a variety of bioactive compounds that have been found to both prevent and treat cancer after years of extensive research. It has been reported that *in vitro* its methanolic extracts have anti-influenza virus action. Furthermore, researchers have found that the aqueous extract of stem bark of desert rose has strong antibacterial properties against a wide range of pathogenic bacterial strains, including *Escherichia coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus* (Paul *et al.*, 2015).

Its flower extract also has strong antioxidant properties as it is high in anthocyanins. Traditionally, the lotion extracted from the root and bark is utilized to cure various skin ailments and kill lice (Hossain, 2018).

Conclusion

Unlike other species offered as potted plants, *Adenium* has no defined commercial production processes, owing to a lack of technical information regarding the species. Thus, the purpose of this technical essay was to provide knowledge about *Adenium* growth in the development of commercial-scale production.

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