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IMPORTANCE OF MICRO PROPAGATION OF *DRACAENA FRAGRANS* L. KER GAWL

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ABSTRACT

Dracaena fragrans, commonly known as the corn plant or cornstalk Dracaena, is a popular ornamental plant widely cultivated for its attractive foliage and ease of maintenance. The demand for this species has increased significantly due to its aesthetic appeal, air-purifying properties, and suitability for indoor environments. However, the conventional methods of propagation, such as stem cuttings, have limitations in terms of slow growth rates and low propagation efficiency. This review paper explores the significance of micropropagation as a viable alternative for the mass production of high-quality *Dracaena fragrans* plants. Micropropagation techniques, including tissue culture, somatic embryogenesis, and organogenesis, offer numerous advantages over traditional methods. These techniques provide the means to rapidly produce a large number of uniform and disease-free plantlets, thereby meeting the increasing market demand. The paper highlights the key steps involved in the micropropagation process, including explant selection, sterilization, establishment of aseptic cultures, and optimization of growth conditions. It also discusses the influence of growth regulators, nutrient media, and environmental factors on the successful propagation and multiplication of *Dracaena fragrans* through micro propagation techniques.

KEYWORDS: *In Vitro* Propagation, *Dracaena fragrans*, Tissue Culture, Callus, Shoot Regeneration.

INTRODUCTION

Numerous species and cultivars of valuable and well-liked ornamental plants belong to the genus Dracaena. As the demand for *Dracaena fragrans* continues to rise in the horticultural industry, it becomes increasingly important to explore efficient and reliable methods of plant propagation. Micropropagation, a tissue culture technique, has emerged as a crucial tool for meeting the demands of commercial production, addressing challenges associated with traditional propagation methods, and ensuring the availability of high-quality plants. This article discusses the importance of micro propagation in the context of *Dracaena fragrans* and its significant contributions to the horticultural industry. The findings in this paper are a result of a research effort that examined the needs of different *Dracaena* species for tissue culture in order to breed novel cultivars as well as for commercial propagation.

As one of the top 10 pot plants in terms of worldwide trends, dracaena is a very well-liked commercial leaf decorative plant in the floricultural industry. The majority of uses for its lovely leaves are in indoor gardening and flower arrangements. The verandah, terraces, window boxes, and window stills all have potted dracaenas on exhibit. Commercial vegetative methods of propagation, such as cuttings and suckers divided, are used to grow this plant because of its sluggish rate of reproduction. Only a small number of studies have been conducted on dracaena *in vitro* clonal propagation to overcome the sluggish rate of multiplication. In order to create a successful procedure for micro-propagating Dracaena using shoot tip culture, the current experiment was carried out.

Micropropagation Is Needed in addition to Conventional Propagation

Stem cuttings are used to vegetatively replicate the majority of *Dracaena* species. Some species, like *D. draco*, are capable of seed reproduction. Small examples can simply be severed at the stem; the decapitated stem regenerates one or more flushes of leaves while the leafy top quickly produces a root system. The majority of cuttings used in large-scale nursery production come from mature plants cultivated outside in tropical farms. The stem is divided into parts of varying lengths, which are then packaged for transport and delivered to nurseries or the market. Once planted in a favourable environment, the seemingly dried canes grow roots and leaves and quickly reconstruct the entire plant, taking on the distinctive look of a fake palm. These plants are referred to as Ti plants. It is also possible to grow some *Yucca*

and *Cordyline* species as Ti plants. All three genera of plants, but particularly *D. fragrans*, are referred to as "tree-of-life" plants in several European nations. *Dracaena* species may be vegetatively propagated using a variety of *in vitro* techniques, all of which allow for extensive commercial multiplication.

Particularly for kinds with chimerical structures, true micro propagation using axillary buds as starting explants is advised. *In vitro* techniques that use callus in the early stages can be used to propagate non-chimerical species such green *D. fragrans*. There are several reasons why using *in vitro* propagation techniques is considerably better than using traditional methods, but the most significant of them is the vastly improved potential for vegetative proliferation. Numerous nurseries regularly utilise large-scale *in vitro* propagation, demonstrating the utilisation of complicated yet *in vitro* techniques of propagation is practiced by various private nurseries.

Micro propagation Techniques: The review paper discusses various micro propagation techniques used for the propagation of *Dracaena fragrans*, including tissue culture, somatic embryogenesis, and organogenesis. The protocols and methodologies employed in each technique were examined, along with the variations and modifications reported in different studies. The advantages, limitations, and success rates associated with each method were analysed based on the available literature.

Optimization of Growth Conditions: The review paper investigates the optimization of growth conditions for successful micro propagation of *Dracaena fragrans*. Factors such as temperature, light intensity and quality, photoperiod, humidity, and nutrient media composition were considered. Published studies providing insights into the effect of these factors on the growth and multiplication of *Dracaena fragrans* plantlets were analysed and summarized.

Genetic Stability and Variation: The impact of micro propagation on the genetic stability and variation of *Dracaena fragrans* plantlets was explored. The review paper discusses the use of molecular markers and genetic fingerprinting techniques to assess clonal fidelity and detect somaclonal variations. Studies evaluating the genetic stability of micro propagated plantlets compared to the parent plant and the occurrence of genetic changes during the micropropagation process were reviewed and summarized.

Data Analysis: The information obtained from the selected articles was organized, categorized, and analysed to provide a comprehensive overview of the importance of micro propagation of *Dracaena fragrans*. The findings were presented in a descriptive and concise manner, highlighting the key points and trends observed in the literature.

Explant Selection: The choice of suitable explants is essential to the success of micro propagation. Shoot tips, axillary buds, or nodal segments from wholesome, disease-free mother plants are frequently utilised as explants for growing *Dracaena fragrans*. To guarantee their genetic integrity and capacity to grow into full plants, these explants should be carefully selected.

Sterilization: Explants must be thoroughly sterilised in order to establish aseptic cultures. Disinfectants like sodium hypochlorite or ethanol are frequently used in surface sterilisation. To efficiently remove pollutants and reduce harm to the explants, the sterilisation treatment should be optimised for duration and concentration.

Culture Media: For the *in vitro* growth and development of *Dracaena fragrans* explants, nutrient-rich culture medium is crucial. Murashige and Skoog (MS) medium, supplemented with the right amounts of macro and micronutrients, is the most often used media. Moreover, the inclusion of plant growth regulators like auxins and cytokinins encourages roots, elongation, and multiplication of shoots. For best results, it is best to experiment with the precise culture medium composition and growth regulator concentrations.

Multiplication: The induced shoots are subcultured onto new medium during the multiplication phase to encourage more shoot proliferation. Regular subculturing makes it possible to produce a lot of plantlets from a single explant, which promotes quick multiplication. To achieve the best possible development of the shoots, the culture parameters, including temperature, light intensity, and photoperiod, should be properly managed.

Rooting: Once there are enough shoots, they are moved to a rooting media containing the right number of auxins, such as indole-3-butyric acid (IBA) or naphthalene acetic acid (NAA). The rooting media encourages the growth of roots, assuring the success of plantlets' establishment. By enhancing environmental factors like humidity levels and substrate composition, the rooting process can be improved.

Acclimatization: The micro propagated plantlets need to become acclimated to *ex vitro* conditions after rooted. The plants are gradually exposed to reduced humidity levels, and the amount of light is increased. The plantlets are adequately prepared for the change from *in vitro* to *ex vitro* habitats by proper acclimatization. The plantlets may be moved into trays or pots with appropriate potting soil or potting mix so they can continue to grow and develop.

CONCLUSION AND DISCUSSION

Dracaena fragrans micro propagation has several advantages and has grown in importance in the horticulture sector. For supplying the rising demand for *Dracaena fragrans*, its capacity to quickly and mass-produce genetically uniform, disease-free, and high-

quality plants is crucial. Additionally, micro propagation is crucial for maintaining quality control, conserving unusual types, and assuring year-round supply. Micro propagation will remain a crucial element in the effective culture and marketing of *Dracaena fragrans* as the horticultural industry develops.

A steady supply of plants in a constrained amount of time and area would be ensured by the use of micro propagation. This process will help *Dracaena fragrans* expand quickly and widely, enriching and appreciating the ornamental industry and increasing awareness of the need to conserve it. Although vegetative and sexual methods of plant reproduction are well known in horticulture, micro propagation provides a quick way to produce large numbers of clonal plants that can be used for afforestation, the preservation of elite and rare germplasm, and also for the quick multiplication of economically significant plants.

The review paper concludes by summarizing the main findings and implications of the studies reviewed. It discusses the potential applications of micro propagation techniques in meeting the increasing demand for *Dracaena fragrans* while maintaining the desirable traits of the parent plant. Recommendations for future research and areas requiring further investigation are also discussed based on the gaps identified in the existing literature.

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