

## INFLUENCE OF PHYSICAL FACTORS AND NUTRIENT MEDIUM COMPOSITION ON THE EFFICIENCY OF IN VITRO ROOTING AND ADAPTATION OF ABELMOSCHUS MANIHOT REGENERANTS

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**Relevance:** *Abelmoschus manihot* is a valuable medicinal and food plant widely recognized for its biological, nutritional, and pharmacological significance. Due to the presence of various bioactive compounds, this species has attracted considerable attention for its potential applications in traditional and modern medicine, as well as in the food industry. However, conventional methods of plant propagation are often limited by environmental conditions, low propagation rates, and insufficient availability of healthy planting material. In this regard, microclonal propagation through *in vitro* tissue culture represents a highly promising and efficient approach for the rapid large-scale multiplication of genetically uniform and disease-free plants. One of the most critical stages in the micropropagation process is the successful induction of root formation in regenerants, since efficient rooting directly influences plant survival, growth, and adaptation under non-sterile environmental conditions[1,2,3].

**Objective of the study:** The objective of this study was to investigate the influence of physical factors and nutrient medium composition on the *in vitro* rooting process and subsequent acclimatization of *Abelmoschus manihot* regenerants. The study aimed to identify the most favorable cultivation parameters that support efficient root induction and improve the adaptation capacity of regenerated plants after transfer to ex vitro conditions.

**Materials and Methods:** The object of the study consisted of regenerants of *Abelmoschus manihot* obtained through *in vitro* tissue culture techniques. To assess the effectiveness of root induction, the influence of different concentrations of auxins in the nutrient medium was examined. Three commonly used plant growth regulators—indole-3-acetic acid (IAA), indole-3-butyric acid (IBA), and naphthaleneacetic acid (NAA)—were evaluated for their effect on root initiation, root system development, and the overall growth of regenerants. In addition to hormonal treatments, the influence of physical environmental factors, including light intensity and temperature conditions, on plant development and morphogenesis was also investigated. The interaction between nutrient medium composition and cultivation conditions was analyzed in order to determine the optimal combination for effective rooting and healthy plant development[4, 5].

**Results and Conclusions:** The study is expected to determine optimal cultivation conditions that promote efficient rooting of *Abelmoschus manihot* regenerants and enhance their survival and viability during transfer from *in vitro* culture conditions to soil substrate under non-sterile environments. Successful acclimatization is essential for minimizing losses during transplantation and ensuring stable plant growth under greenhouse or natural conditions. The obtained results may contribute to the improvement and optimization of existing microclonal propagation protocols for *Abelmoschus manihot*, thereby facilitating its

broader cultivation, conservation, and practical application in medicinal, agricultural, and food-related fields.

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