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OPTIMISATION OF MICRO PROPAGATION TECHNIQUE FOR THE PRODUCTION OF POMEGRANATE (*Punica granatum* L.) VARIETY 'MALEE PINK'

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This study aimed to develop an optimised micropropagation protocol for the 'Malee Pink' pomegranate (*Punica granatum L.*) variety, addressing critical challenges in surface sterilisation and phenolic compound management. Pomegranate is a commercially valuable fruit crop, but its conventional propagation methods are limited by low multiplication rates and susceptibility to contamination. Effective *in vitro* propagation requires a robust sterilisation procedure to eliminate microbial contamination without damaging explants, alongside strategies to control phenolic exudation, which often leads to tissue browning and culture loss. In this study, shoot tip with nodal explants from healthy mother plants were subjected to different sterilising agents, including sodium hypochlorite, systemic fungicide, antibiotics, and mercuric chloride, at varying concentrations and exposure times to identify the most efficient sterilisation treatment. Additionally, ascorbic acid was incorporated into the culture medium to mitigate phenolic oxidation. Results indicated that a sterilization protocol combining 2% Clorox for 2 minutes, followed by washing with streptomycin sulfate and dipping the shoot tips in a citric acid and ascorbic acid solution before culturing, significantly reduced contamination rates while maintaining high explant viability. Incorporation of Ascorbic acid (0.025 g) into the Murashige and Skoog (MS) medium effectively minimised phenolic browning, promoting healthy shoot initiation and elongation. The optimised protocol achieved a contamination rate below 10%, and a shoot induction frequency exceeding 80%. This optimised micropropagation approach offers a reliable and reproducible technique for large-scale clonal propagation of the 'Malee Pink' pomegranate variety. It can support sustainable production and genetic conservation, facilitating the commercial cultivation of this variety with superior fruit quality and yield. Future work will focus on rooting and acclimatisation stages to complete the micropropagation cycle.

Keywords: Activated charcoal, Micropropagation, Phenolic exudation, *Punica granatum*, Surface sterilisation