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EVALUATION OF EFFICIENT METHOD FOR ACCLIMATIZATION OF AN IMPORTANT ORNAMENTAL RHIZOMATIC PLANT, *Calathea crotalifera*

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ABSTRACT

Calathea crotalifera is one of the important exotic ornamental plants belonging to Marantaceae family. This rhizomatic species can produce a very attractive inflorescence and have been widely used in the horticulture field including landscape and cut flower industry. It usually propagated through cutting rhizome and showed slow growth rate. This study was conducted to evaluate the effects of different propagation substrate (mix soil medium and organic medium) and shade levels (10%, 60% and 90%) on growth, morphogenesis, and physiological development of micropropagated *C. crotalifera* plantlets after two months acclimatized in the natural environment. Transplantation survival and growth rate of plantlets is higher (90%) in an organic medium compared to mix soil medium (75%). It is observed that plantlets grown under 60% shade level produced healthy seedlings with higher plants height, larger specific leaf area, leaf diameter, leaf length, leaf thickness and dry mass. The concentration of chlorophyll a and b, and carotenoid is also higher in this treatment. There are no significant effects on the new shoot production among the treatments. Micromorphological of the leaf surface were evaluated using light and scanning electron microscope. The stomatal frequency per unit leaf area in the adaxial leaf surface decreased significantly ($p < 0.05$) with the reduction of light intensity. However, this stomatal frequency was found higher on the abaxial leaf surface from 60% shade level treatment. Moreover, only leaves from 10% shade level treatments show the formation of trichomes on both abaxial and adaxial leaf surface, and exhibited a visual symptom of severe leaf tip burn. The findings revealed that different light intensities strongly affected the morphology and growth index of *C. crotalifera* during *ex vitro* development. The usage of organic medium under 60% shade level demonstrated the most efficient method for acclimatization of micropropagated *C. crotalifera* plantlets.