

THE EFFECT OF DIFFERENT LEVEL OF SUCROSE IN CULTURE MEDIUM FOR RARE ORCHID *PHALAENOPSIS DELICIOSA* AND *PAPHIOPEDILUM PRIMULINUM* SEEDLINGS

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ABSTRACT

A continuous supply of sucrose in the culture medium may negatively affect the photosynthesis ability of *in vitro* orchid plantlets. Although appear normal, they are less likely to be active in autotrophic growth. At high sucrose concentration, plants may appear dry due to high osmotic pressure and seed germination could be inhibited. To overcome photosynthesis inactivation problem, optimum sucrose content in orchid culture medium is investigated. This could be done by growing *Phalaenopsis deliciosa* and *Paphiopedilum primulinum* seedlings on 5 different medium with sucrose concentrations: 0, 6.25, 12, 25 (control medium), 50 g/l respectively. After 90 days of culture period, fresh weight and dry weight were measured and data analysis was done to compare the results obtained between each treatment. The analyzed curve resolved three growth types, namely autotrophic, mix-autotrophic and non-autotrophic growths. It was revealed that the CCT medium supplemented with around 20 g/l sucrose gave both *P. deliciosa* and *P. primulinum* the optimum growth (maximum mix-autotrophic growth) in terms of shoot dry weight, root dry weight, total dry weight and root to shoot ratio. Also, by comparing the water content between treatments using SFW *versus* SDW data and RFW *versus* RDW data, dehydration of shoots and roots were detected in both seedlings of *P. deliciosa* and *P. primulinum* at 25 and 50 g L⁻¹ sucrose. The present findings related to the effect of sucrose level on growth of *Calanthe* (orchid) hybrids indicated shoot growth was found to be highest at sucrose level of 15 g/l and decreased at higher sucrose treatment that generate more root growth. Another supporting study revealed that higher shoot growth was obtained at lower sucrose concentration, 15 g/l for *Cattleya granulose* orchid species. For orchids, there are different optimal sucrose levels recommended to be used for distinct species in purpose to ensure the species is able to retain their maximum autotrophic growth while undergoing acclimatization.