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Callus induction and plant regeneration from cultured shoot apices in *Philodendron* var. 'xanadu'

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Shoot apices dissected from *in vitro* multiplied shoots of *Philodendron* var. 'xanadu' were cultured on callus induction medium that contained growth regulators 2,4-D, NAA, and BAP. Five levels of 2,4-D (0, 1.0, 1.5, 2.0, 2.5 mg dm^{-3}), and four concentrations each of NAA and BAP (0, 1.0, 2.0, 2.5 mg dm^{-3}) were tested either alone or combined so that in total, 64 different growth regulator combinations were used in callus induction media. Effectiveness of the culture medium was evaluated on the basis of callus induction frequency (proportion of explants producing callus) and the growth rate of the induced callus (mean diameter of callus).

Of the 64 growth regulator combinations used, callus grew on 53 media. However, frequency of induction varied and 100% induction was observed only on 11 growth regulator regimes. Callus induction was absent on media that contained 2,4-D as the sole growth regulator at any of the concentrations tested except when used at 2 mg dm^{-3}, and even then produced the lowest induction frequency (~ 20%). Callus growth occurred on media that contained 2,4-D and BAP at all the concentrations examined, and on nearly all media with all 3 growth regulators. 2,4-D when combined with NAA also resulted in callus induction but only in half the combinations of growth regulator levels tested.

Highest rate of callus growth (mean diameter > 4.5 mm) was observed on five media that contained a combination of the three growth regulators, 2,4-D, NAA and BAP, and particularly on media with low 2,4-D levels (1.0 – 1.5 mg dm^{-3}). Frequency of callus induction on these media was also noted to be 100%. Therefore the particular growth regulator levels used in these five media were identified as being optimal for induction and rapid proliferation of callus in *P.* var. 'xanadu'. *In vitro* shoot tip culture is the commonly used method for large-scale propagation of *Philodendron*. The present investigation demonstrated that *Philodendron* shoot tips could be effectively used as an explant for callus induction, from which plants could be regenerated.

Keywords: ornamental plants, callus induction