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Callus induction, biomass growth, and plant regeneration in *Digitalis lanata* Ehrh.: influence of plant growth regulators and carbohydrates

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Abstract: The effect of plant growth regulators (PGRs) and carbohydrate sources on callus induction, callus growth, and plant regeneration in foxglove was examined. Explants were transferred onto MS medium with various levels of PGRs and carbohydrates to determine the optimum explant and effective combinations of PGR treatment. For callus induction 6.0 mg L⁻¹ of α -naphthalene acetic acid (NAA) and 3.0 mg L⁻¹ of benzyl-aminopurine (BA) were very responsive. Addition of cytokinins (BA and kinetin) at 0.5-3.0 mg L⁻¹ to media containing NAA enhanced callus growth. Shoot regeneration was best achieved in MS + 6.0 mg L⁻¹ of BA. Adenine sulphate (Ade) and casein hydrolysate (Ch) were added to the medium as a nitrogen source to improve plant growth and maximum growth was obtained on medium supplemented with 1.5 mg L⁻¹ of kinetin + 0.5 mg L⁻¹ of IAA + 500 mg L⁻¹ of Ch. Carbohydrates also influenced callus production and shoot regeneration potentiality. Among all the tested carbohydrates (sucrose, maltose, fructose, and glucose) and concentrations (3.0-6.0 g L⁻¹), the optimum carbohydrate concentration was 3.0 g L⁻¹ and was applied to all carbohydrate cases.

Key words: Callus, regeneration, carbohydrates, nitrogen source, rooting

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