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Direct Plant Regeneration from Spindle Leaf Roll Explants in Sugarcane

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Abstract: A high frequency single step and a simple method of direct plant regeneration has been developed for two varieties of sugarcane viz., Co J 83 and Co J 88. Spindle leaf roll explants were excised from field grown plants and cultured on MS media supplemented with different concentrations and combinations of auxins (NAA and IBA) and cytokinins (BAP and kinetin). The frequency of plant regeneration and number of shoots per explant was influenced by the variety and concentrations of growth regulators added to the media. The maximum per cent plant regeneration was recorded in Co J 83 (81.63) followed by Co J 88 (76.66). Among the different media compositions, MS media supplemented with NAA 5.0 mg l^{-1} and kinetin 0.5 mg l^{-1} was the best media composition for the direct plant regeneration from spindle leaf roll explants in sugarcane. With either decrease or increase from the optimum level, a significant decline in percent plant regeneration as well as number of shoots per explant was recorded. Moreover, when spindle leaves were cultured on the NAA (5.0 mg l^{-1}) rich media plantlets were regenerated. All the shoots developed on this media regenerated roots and were subsequently transferred to poly bags containing FYM: sand:soil in the ratio of 1:1:1 and kept in glass house. This system can be exploited for genetic transformation experiments in sugarcane and is as easy as leaf disc method in dicots for genetic transformation experiments in sugarcane.

Key Words: Direct Regeneration, Sugarcane, Growth Hormones, Organogenesis, Tissue Culture.