Selection of a Friable Callus and Characterization of a Nodular Callus

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ABSTRACT

Callus culture is defined as an unorganized and undifferentiated cell mass composed of actively dividing cells derived from plant tissues. Callus cultures are classified as being either compact or friable. In compact callus, the cells are densely aggregated, whereas in friable callus the cells are only loosely associated with each other and it is soft and breaks apart easily. Compared to compact callus, friable callus have the ability to be cultured in large scale for use in bioreactor for the production of secondary metabolites. The first objective of this study was to select friable callus from the calli that had been previously induced from red cabbage (*Brassica oleracea* var. *capitata f. rubra*). The healthy callus lines of red cabbage were selected and subcultured in Murashige and Skoog (MS) liquid medium supplemented with 1.0 mg/L 2,4-D and the cultures were agitated at 120 rpm in dark condition. After four weeks of subculture, no friable callus was formed. However, nodular callus were formed instead. The second objective was to characterize a nodular callus of *Plantago asiatica.* In this study, the healthy callus lines of *P. asiatica* were subcultured onto MS medium supplemented with NAA at various concentrations of 0.00, 0.05, 0.10, 0.20, 0.50, 1.00, 2.00 and 5.00 mg/L. Photographs of the nodular callus after 30 days were captured under a stereo microscope and their morphology evaluated. Other data collected were callus fresh weight and dry weight where they were analysed using Analysis of Variance (ANOVA) and Fisher's Least Significant Difference (LSD) test. The analysis revealed that 0.10 mg/L NAA is the optimum concentration for the proliferation of nodular callus. At this concentration, fresh weight obtained was the highest and the morphology seen showed that the nodular callus grown at this concentration had undergone proliferation and possessed high hydration level.