

Callus Induction and Plant Regeneration of Selected *Indica* and *Japonica* Rice Cultivars via Anther culture

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Abstract

Anther culture provides a quick route in obtaining pure lines in a single generation from either green haploid plant that are artificially or spontaneously doubled. *Indica* rice are known as highly recalcitrant genotypes and hence difficult to obtain sufficient number of green plantlets of the regenerated plants from culturing anthers. There are several factors such as composition of culture medium, anther pretreatment temperature and duration, growth stage of microspores, albinism, culture density, anther wall factor and effect of light also affect the success of callus induction and green plant regeneration via anther culture. Objective of this research was to determine the callus induction and plant regeneration ability of selected *indica* rice varieties in comparison to *japonica* variety. Five *indica* rice varieties (AT 362, BG 379-2, BW 267-3, BG 94-1 and BG 358) and one *Japonica* (Hirayama) variety were tested in this study. Panicles were cold pre treated at 10°C for 7 days and anthers were cultured in Chu's N6 medium supplemented with 2.0mg/l 2-4 D, 0.5mg/l kinetin and 2.5mg/l NAA. The cultures were kept in dark at 28 °C for callus induction. Induced calli of 1-2mm in diameter were transferred to the Murashige and Skoog (MS) medium with 2mg/l 6-benzyl amine purine (BAP), 1mg/l NAA, 0.5mg/l kinetin for plant regeneration. All the tested varieties produced callus except BG 358. The highest callus induction frequency (22.00) was observed in variety Hirayama which was significantly different from other callus produced varieties. Mean calli frequencies of AT 362, BG 379-2, BW 267-3, and BG 94-1 were 5.80, 5.60, 5.00 and 4.00 respectively. Variety Hirayama showed highest regeneration ability (80%) and varieties AT 362, BW 267-3, had 55.56%, 44.45% regeneration respectively. BG 379-2 and BG 94-1 were not regenerated during two months period.

Keywords: *Anther culture, Callus induction, Indica rice, japonica variety, plant regeneration*

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