B-116: Tissue culture of traditional and improved rice in Sri Lanka

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Somaclonal variants generated through tissue culture increase the rice gene pool for developing new breeding lines. Successful formation of transgenic rice plants by gene transfer, depends on the ability to regenerate plants from cells in culture. Therefore culture protocols have to be developed to regenerate plants from cultured tissues before commencing a research programme for genetic improvement of rice through somaclonal variation or gene transfer. This study describes the protocol established for some traditional and improved rice varieties in Sri Lanka.

Seeds of 20 traditional rice varieties (Suduillankayan, Sudurusamba, Yakadawee, Moddaikaruppan, Gires, Murungakayan 302, Moragollawee, Thatuwee, Pokkali 809, Sudumadael, Heenkuruwee, Wanduruwee, Handiran, Kaluheenati, Herathbanda, Hetada, Heenati 310, Wedaheenati, Dahanala, Demas) and 4 improved cultivars in Sri Lanka (H_4, Bg 400-1, Bg 94-1, Bg 34-8) were surface- sterilized and cultured on LS (Linsmaier & Skoog, 1965) medium supplemented with 2,4-D (2.0 mg/l), BAP (0.2 mg/l), agar (0.8% w/v) and incubated at 25°C under low light intensity (300 lux, 10 h) for callus induction. After 3 weeks, calli derived from the embryo of the cultured seeds were detached and transferred to a culture medium (pH 5.8) based on MS (Murashige & Skoog, 1962) with mannitol (1% w/v), BAP (6.0 mg/l), agar (0.8% w/v) and incubated at 25°C for 7 weeks at a higher light intensity (2,000 lux, 10 h) for induction of plants.

Variations in overall callus formation and regeneration were observed. High-frequency callus formation (75-100%) and plant regeneration were achieved with the cultures of varieties Suduillankayan, Sudumadael, Murungakayan 302, Yakadawee, H_4, Bg 94-1, Bg 400-1 and Bg 34-8.