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Somatic Embryogenesis from Embryogenic Leaf Callus of Tea (*Camellia sinensis* (L.) Kuntze)

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ABSTRACT. The aim of this study was to produce somatic embryos indirectly from embryogenic leaf callus of tea (Camellia sinensis (L.) Kuntze). Primary embryogenic calli (friable calli, 16 weeks after culture of in vitro leaf segments) were first cultured on Murashige and Skoog (MS) medium containing Benzyl Aminopurine (BAP) (3 mg/l) and Napthalene Acitic Acid (NAA) (0.1 mg/l) and maintained for 4 weeks. Primary calli were then transferred to half and full strength MS media containing BAP and NAA in combination with Abscisic Acid (ABA) (0-1.0 mg/l) to select the suitable second medium. MS medium supplemented with BAP (1.0 mg/l) and NAA (0.1 mg/l) was found to be the second best medium for somatic embryogenesis. Further work was done to select the optimum culture duration for maintaining primary calli on first and second media for efficient somatic embryogenesis. It was noted that the production of somatic embryos was relatively high (8.3%), but the size of embryos was very small (1 mm long) when the primary calli were kept for 8 weeks on the second medium after maintaining them on the first medium for 8 weeks. Meanwhile, 2 mm long somatic embryos were obtained from the primary calli cultured directly on the second medium without maintaining them on the first medium. Rates of somatic embryogenesis were not significant in both patterns of culture periods. Protocol developed on indirect somatic embryogenesis will be useful in order to achieve new somatic variants from seedling explants and also to use in transformation work.

INTRODUCTION

During the past 20-30 years, significant progress has been made in *in vitro* propagation of tea (*Camellia sinensis* (L.) Kuntze) cultivars directly or indirectly through organogenesis (Gunasekare and Evans, 2000a; Sarathchandra *et al.*, 1997) and somatic embryogenesis (Akula and Akula, 1999; Akula *et al.*, 2000; Bag *et al.*, 1997; Mondal *et al.*, 2000; Ponsamuel *et al.*, 1996; Wachira and Ogada, 1995) to produce large number of plantlets in a relatively short period of time. *In vitro* propagation technique via organogenesis is a two-step process for the growth of shoots and roots. Somatic embryogenesis on the other hand, is a one-step procedure to form bipolar structure and hence this system will save labor, time, space and money in production of plants. An important factor in tea that limits the commercial exploitation of micropropagation technique is the rapid loss of juvenility in cultures, which leads to lower multiplication rate.

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