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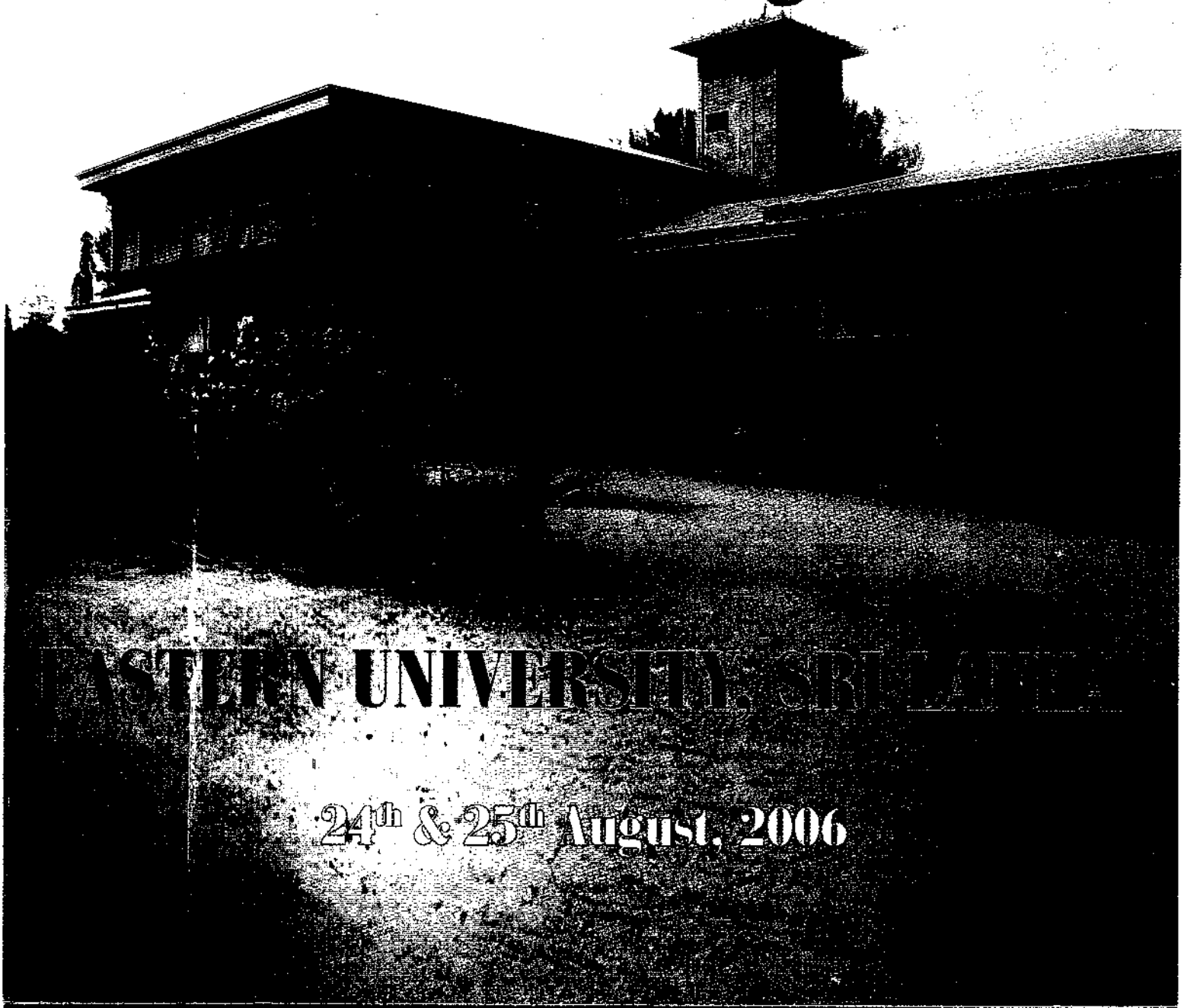

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Establishment of *in Vitro* Plantlets of *Camellia Sinensis* L. Under *Ex vitro* Conditions

Thayamini H. Seran[1], K. Hirimburegama[2] and M. T. K. Gunasekare[3]

[1]Department of Agronomy, Eastern University, Sri Lanka, Vantharumoolai, Chenkalady
[2]Department of Plant Sciences, University of Colombo, Colombo.
[3]Division of Plant Breeding, Tea Research Institute, Talawakelle

Abstract

An attempt was made to improve the survival rate of *in vitro* plantlets under *ex vitro* conditions. Synthetic seeds (encapsulated zygotic embryogenic axes) were germinated under *in vitro* conditions. At 8th week of culture, plantlets (with more than 2 cm long shoot) were collected from *in vitro* cultures and transplanted in small nursery bags, each contained 100% soil (generally used for propagation of tea) or soil mixture of 100% soil: coconut coir dust (1:1 v/v). They were maintained under the sealed polythene tent covered with the coir matting in the nursery. Plants under polythene tent were observed every week. The results showed that *in vitro* plantlets (96 ± 4%) were successfully established in the soil: coconut coir dust (1:1 v/v) than in 100% soil. Further, *in vitro* plantlets (with more than 2 cm long shoot) collected from cultured synthetic seeds were transplanted in the above soil mixture. One batch of these plantlets was maintained under polythene cover for 8 weeks after transplanting and the other batch for 16 weeks to achieve healthy plants. It was noted that *in vitro* plantlets maintained under polythene tent for 16 weeks, performed better under nursery conditions and plants had vigorous growth. However, the present study showed that maximum survival of *in vitro* plantlets would be achieved initially in the soil mixture. After successful establishment of these *in vitro* plantlets under polythene tent, they must be transferred to 100% soil after 8 weeks of transplanting of *in vitro* plantlets. This basic information would be useful to establish the *in vitro* plantlets successfully under *ex vitro* conditions.

1. Introduction

Plant tissue culture techniques have a wide application in breeding programmes by shortening the process to obtain and select new cultivars with beneficial characteristics. During the 20 –30 years, several authors have proven the successful plant regeneration under *in vitro* conditions for effective use in tea improvement *via* multiplication and *in vitro* selection as well as germplasm conservation through encapsulation technique. However, study on performance of *in vitro* regenerated plants under *ex vitro* conditions was limited. Therefore, successful survival of *in vitro* plantlets under *ex vitro* conditions is necessary to obtain vigorous plants to be performed better under nursery conditions. Coir absorbed and retained water for a longer period and provided a better physical support for *in vitro* cultures (Gangopadhyay *et al*., 2002). Vigorous *in vitro* plantlets (48%) were established well in the pre-sterilized soil (generally used for propagation of tea) than in a mixture of the pre-sterilized soil: sand at a rate of 1:1 v/v (Seran *et al*., 2005). The survival of *in vitro* regenerated plants to *ex vitro* conditions is dependent on the soil substrates and the conditions during transfer as well as growth of *in vitro* plantlets. Therefore, this study was aimed to increase the survival rate of *in vitro* plantlets under *ex vitro* conditions and also to understand the problems associated with the acclimatization of *in vitro* plantlets and their subsequent growth.