

Germination and Subsequent Plant Development of *in vitro* Cultured Zygotic Embryos and Embryonic Axes in Comparison to Conventional Seed Propagation of Tea (*Camellia sinensis* L.)

Thayamini H Seran^{1*}, M T K Gunasekare² and K Hirimburegama³

¹Department of Agronomy, Eastern University, Chenkalady, Sri Lanka;

²Division of Plant Breeding, Tea Research Institute, Talawakelle, Sri Lanka;

³Department of Plant Sciences, University of Colombo, Colombo, Sri Lanka)

ABSTRACT

The present study was carried out to achieve synchronous germination of plant materials into vigorous plants of tea (*Camellia sinensis* L.), under *ex vitro* conditions. Sterilized zygotic embryos and zygotic embryonic axes were cultured on MS basal medium supplemented with 3 mg L⁻¹ BAP and 0.5 mg L⁻¹ IBA. To serve as controls, seeds were sown in a sand bed.

At the 8th week, *in vitro* plantlets were transferred to *ex vitro* conditions for acclimatization, and seeds showing different germination responses were separately transplanted. Synchronous and significantly high germination (99%) was observed from cultured embryonic axes *in vitro* at the 4th week of culture, but a lower level of germination (12.7%) from seeds that were sown in the sand bed. Further, healthy plantlets regenerated from embryonic axes *in vitro* had erect shoots with short internodes, as well as tap roots with abundant adventitious roots under *ex vitro* conditions, for better adaptation in the field, as compared with seedlings raised by conventional seed propagation.

Key Words: Germination, *in vitro* Culture, Plant Conversion, Seed, Zygotic Embryo, Zygotic Embryonic Axis.

INTRODUCTION

As tea is a heterozygous plant, there is considerable genetic variability in seedling populations (Purseglove, 1984; Anandappa, 1986). The selection method is widely adopted on progeny to identify superior individuals among existing genotypes. Thus, new cultivars have been developed, mostly by the Tea Research Institute, to increase the quality and quantity of tea production in Sri Lanka.

However, the selection of potential cultivars is a long and laborious process (Anandappa, 1986). Flowers are produced in abundance in the tea seed trees but the