REDUCED MEMBRANE DAMAGE AND HIGHER LEA PROTEIN CONTENT UNDER LOW TEMPERAURE: PROBABLE CAUSES FOR DELAYED DEFOLIATION OF *HEVEA* IN NORTH EAST INDIA

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Two popular clones of *Hevea brasiliensis* were studied to understand their defoliation pattern in relation to some of the biochemical parameters during the winter season. The low temperature induced changes such as membrane injury, anthocyanin and late embryogenesis abundant (LEA) protein accumulation were examined. The early defoliating clone RRII 105 showed high membrane injury, anthocyanin accumulation and rapid chlorophyll degradation with low LEA protein, whereas the late defoliating clone RRIM 600, recorded the opposite trend. It can be inferred that the temporal difference in wintering and in the biochemical parameters studied are related to cold susceptibility.

Key words: Anthocyanin, Chlorophyll, Defoliation, *Hevea brasiliensis*, LEA protein, Membrane damage, Wintering.

INTRODUCTION

Low temperature is one of the environmental parameters that profoundly affect normal metabolic functioning of plants. *Hevea brasiliensis* is a deciduous tree that defoliates during the low temperature period in the northeastern region of India (Sethuraj *et al.*, 1989). This tree species exhibits genetic variation in defoliation pattern (known as wintering) (Webster and Paardekooper, 1989; Vinod *et al.*, 1996). The genetic variation in temporal behaviour of leaf abscission and its intensity in a given agroclimatic condition indicates the probable involvement of biological factors contributing to this. Chilling induced leaf abscission is reported to be triggered by oxidation processes under sub optimal temperatures (Kuo and Tsai, 1984; El Abd *et al.*, 1986). The biochemical parameters such as chlorophyll degradation during the course of leaf maturation (Maedema, 1982; Plazaola and Becerril, 2001) and membrane leakage show the extent of damage at cellular level when the plants experience low temperature below a threshold level (He and China, 1986). One of the protective mechanisms in plants against such cellular damage is the synthesis of proteins such as LEA proteins (Baker *et al.*, 1988; Close *et al.*, 1989; Xu *et al.*, 1996; Jayaprakash *et al.*, 1996) and anthocyanin like pigments (Rabino and Mancinelli, 1986).

The objective of the present study was

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