VARIATIONS IN LEAF FATTY ACID COMPOSITION OF DIFFERENT CLONES OF *HEVEA BRASILIENSIS*

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The increased unsaturation of lipids in plant cell membranes is considered as a necessary adaptation to cold stress. Fatty acid composition of leaf polar lipids in different *Hevea brasiliensis* clones was analyzed and the double bond indices computed. The main unsaturated fatty acids in the leaf polar lipids of *H. brasiliensis* were palmitoleic acid, oleic acid, linoleic acid and linolenic acid. Palmitic acid and stearic acid were the main saturated fatty acids. The double bond indices of leaf polar lipids in different *Hevea* clones varied significantly. Among the clones, the highest double bond index was noticed in RRIM 703, suggesting that it would be the most cold tolerant clone.

Keywords: Cold tolerance, Double bond index, *Hevea* clones, Leaf fatty acid.

In order to meet the rising demand for natural rubber, rubber cultivation is now being extended to the non-traditional areas in India including the low temperature stress prone states like Assam, Tripura, Meghalaya, etc. Tolerance to low temperature is a useful trait for plants grown in such areas. Plants respond to low temperature stress through a wide variety of biochemical and physiological changes, such as synthesis of many regulatory proteins, accumulation of compatible solutes etc. Over the past decade, a number of reports in different crop plants have shown physiological effects on cell membrane properties due to low temperature stress (Steponkus, 1984; Orvar *et al.*, 2000).

Cell membrane undergoes both qualitative and quantitative modifications during low temperature stress which increase the membrane fluidity. The lipid composition, level of fatty acids and its level of saturation/unsaturation regulate the cell membrane fluidity (Hur *et al.*, 2004). Lipids of plant cell membranes are characterized by a high content of polyunsaturated fatty acids (Wang *et al.*, 2006). An increase in phospholipids unsaturation has been related to membrane fluidity at low temperature. Saturated fatty acids solidify much faster at lower temperatures than unsaturated fatty acids and hence tissues with high quantities of unsaturated fatty acids would have a low freezing point. The fatty acid composition of leaf polar lipids of cold tolerant and susceptible rice genotypes indicated that double bond index of lipid unsaturation is significantly high in the cold tolerant genotypes (Majumder *et al.*, 1989). Gustavo *et al.* (1990) studied the fatty acid composition of leaf phospholipids of barley

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