VARIATION IN LEAF TISSUE MEMBRANE THERMOSTABILITY AMONG CLONES OF *HEVEA BRASILIENSIS*

Environmental stresses often cause damage to cellular membranes (Levitt, 1980). High temperature injury to the leaf tissues of *Hevea brasiliensis* is observed in non-traditional areas where rubber cultivation is now being extended to. Drying of leaf margins, whole leaves, twigs etc. are the common symptoms. Even in the traditional tract the same symptoms are observed in years of unusual drought. Injury can be caused by the direct effect of high ambient temperature and by the elevated leaf temperature caused by soil water deficit. Variation in drought resistance among *Hevea* clones is already known (Raghavendra *et al*, 1984; Vijayakumar *et al*, 1988). However, clonal variation in heat tolerrance in *Hevea* has not been studied. Establishment of such genetic variation and evolving screening methods will be useful to identify genotypes with better heat tolerance. Sullivan (1971, 1972) and Martineau *et al*, (1979) have described a technique, employing leaf discs, for evaluating tolerance to high temperature in terms of membrane thermostability in annual crops. This test is based on the observation that when leaf tissue is injured by exposure to high temperature, cellular membrane permeability is altered resulting in diffusion of electrolytes and other soluble substances. Using this method, genotypes of *Sorghum* and soybean have been categorised as heat tolerant and susceptible respectively (Sullivan, 1971, 1972; Martineau *et al*, 1979). In this paper we report variation in leaf tissue membrane thermostability in a few clones of *Hevea brasiliensis*.

Eight clones with known drought tolerance and susceptibility in terms of latex yield during summer (Gururaja Rao *et al*, 1988; Vijayakumar *et al*, 1988) were used for the study. Clone RRII 118, though susceptible to drought in terms of yield (Devakumar *et al*, 1988) was found to be drought tolerant in terms of growth in many trials. The other clones studied were Gl 1, RRII 308, RRIM 600, RRII 105, RRIM 623, RRII 43 and Tjir 1.

Leaf samples were collected during the dry season of 1987 from three year-old plants, planted in completely randomised design on a single-tree single-plot basis. Five plants were selected at random from each clone. Five fully mature leaves were collected from each plant (15 leaflets). From each leaflet, seven discs of one centimeter diameter were removed with a cork borer. Fifteen leaf discs, one from each leaflet, constituted one sample. Thus seven samples including control, were obtained from each plant for giving the thermal shock treatments at different temperatures. Thermal injuries were estimated following the method given by Martineau *et al*, (1979) with a slight modification that the leaf discs were de-aerated by keeping in water under vacuum and by giving thermal shocks by keeping in water at different temperatures (Vijayakumar *et al*, 1982). The temperature shock treatments ranged between 40–65°C with 5°C intervals and the duration of shock was 15 min. The controls were maintained at 25°C. The electrolytes leached out were estimated in terms of electrical conductivity using a Systronics 305 Conductivity bridge.