

USE OF BIOCHEMICAL FACTORS FOR EARLY SELECTION IN *HEVEA BRASILIENSIS*

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In *Hevea brasiliensis*, as in other tree crops, evolving desirable genotypes through breeding is time consuming, the conventional breeding cycle being around thirty-two years. Many attempts have been made to find out methods for evaluation of yield potential of genotypes at juvenile stages of development, and test tapping is a widely adopted method (Dijkman, 1951). Zhongyu *et al.* (1983) reported petiole and leaf vein latex method as early selection criteria. Henon *et al.* (1984) have suggested detection of biochemical, physiological and anatomical factors to provide information about yield potential at immature stage. It is clearly accepted that the productivity of *Hevea* depends on the rate and duration of latex flow after tapping and the latex regeneration capacity between two tappings. Since sucrose is the basic substrate of cispolypisoprene production in latex, the sucrose content of latex had been correlated positively with the amount of rubber produced in many cases (Eschbach *et al.* 1984; Tupy, 1973). Cyclitols are the most abundant carbon compounds in *Hevea* latex after rubber. Its amount varies from one clonal latex to another and is usually in the order of 1% by weight of latex (Rhodes and Wiltshire, 1931). The presence of free amino acids in fresh latex was reported as early as 1925, but no reports are available on the relation between latex amino acids and rubber yield. The inorganic phosphorus content of latex reflects metabolic activity. A high value shows that the laticiferous system is very active. Biosynthesis of rubber releases a great deal of pyrophosphate (Lynen, 1969). It also contributes to the colloidal stability of latex as a constituent of membrane phospholipids (Sherief and Sethuraj, 1978). The present paper reports clonal variations in the content of reducing sugars,

cyclitols, free amino acids and total phosphorus, and the possibility of using these early prediction parameters is discussed.

Latex samples were collected in ice cooled beakers from three year old plants belonging to six clones representing high yielders (RRII 105 and RRII 600), medium yielders (GT 1 and RRII 118) and low yielders (RRII 38 and HP 20). Six plants were selected at random from a completely random planting of various clones. Total soluble sugars, cyclitols and free amino acids were extracted from a known amount of latex with 80% ethanol. Reducing sugars were estimated by the method of Nelson (1944) and Somogyi (1937). Cyclitols were estimated by the method modified from Bealing (1969) as described by Low (1978). Free amino acids were estimated by the method of Moore and Stein (1948). Total phosphorus in the dried latex samples were estimated by the method of Tunnicliffe (1955).

Data on reducing sugars, cyclitols, free amino acids and total phosphorus are given in Table I. The data show that the content of reducing sugars, cyclitols, free amino acids and total phosphorus are significantly lower in the low yielders as compared to those in the high yielders. However, one of the medium yielders (GT 1) showed the highest sugar content. In the case of cyclitols, the values of the medium yielders are comparable to those of the low yielders. In the case of amino acids and total phosphorus the values of the medium yielders are comparable to those of the high yielders. The results of this study indicates the possibility of including the content of reducing sugars, cyclitols, free amino acids and total phosphorus

Table I. Content of sugars, cyclitols, free amino acids and total phosphorus

Clone	Reducing Sugars** (..... mg/100g. wet weight) *	Cyclitols**	Free amino acids** (.....)	Total phosphorus (mg/100 g. dry weight) *
RRII 105	94.94	2956.83	299.17	249.94
RRIM 600	93.85	2584.50	266.49	238.46
GT 1	101.63	2185.17	276.16	224.04
RRII 118	91.80	1827.67	292.56	240.79
RRII 38	86.80	2106.50	152.80	200.45
HP 20	76.55	1771.83	222.46	203.72
CD 0.05	3.83	156.72	13.26	14.12

** Significant at 1% error.

* Significant at 5% error.

of latex samples among early prediction parameters for yield potential of *Hevea brasiliensis*.

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