Indian Journal of Natural Rubber Research, 7 (1) : 57-58, 1994

A RAPID NON-DIGESTION METHOD FOR DETERMINATION OF K, Ca AND Mg IN LEAF SAMPLES OF *HEVEA BRASILIENSIS*

Determination of cations in leaf samples is usually carried out by the conventional dry ash method or diacid/triacid digestion method (Jackson, 1973; Piper, 1950) and involves time consuming ashing or digestion steps. Extraction using a suitable solvent is an alternative technique to avoid delay. Dilute hydrochloric acid has been widely employed as extractant to recover potassium, calcium, magnesium, sodium, zinc and manganese from a variety of plant materials employing varying time intervals for soaking (Kiyazawa *et al.*, 1984; Sahrawat, 1980, 1987; Hunt, 1982; Hamze *et al.*, 1984). In the present study the suitability of dilute HCl in extracting potassium, calcium and magnesium from leaf samples of *Hevea brasiliensis* was tested and the shaking time and plant material to acid ratio was standardized.

Twenty seven samples of leaf, all belonging to clone RRIM 600, received in the laboratory with varying range of nutrient concentrations, were selected for this study. The samples were dried in an air draught oven at 70-80°C for six hours, finely ground, passed through a 0.5 mm sieve and again dried in an oven at 105°C for 8 hours.

The samples were then analysed by the conventional dry ash method and the HCl extration method for the determination of Ca, Mg and K. The HCl extraction method was first standardized for time of shaking. Leaf sample (500 mg each) was weighed into a 250 ml conical flask and 50 ml of 0.5 N HCl added to it. Four such sets were taken for each sample and shaken in a reciprocating shaker for 5, 10, 15 and 20 minutes respectively. The filtrate was analysed for Ca, Mg and K using atomic absorption spectrophotometer (GBC-AAS-902-BC).

For the optimisation of plant material to acid ratio, 500 mg of the sample was weighed into a 250 ml conical flask and such four sets were taken for each sample. 30, 40, 50 and 60 ml of 0.5 N HCl was added to each set, so as to get plant material to acid ratios of 1:60, 1:80, 1:100 and 1:120 respectively. The mixture was shaken for 15 min and the filtrate was analysed for Ca, Mg and K. Paired 't' test was done to compare the two method (Shivkumar, 1978).

Of the different shaking times employed in the HCl extraction method, it was found that 15 min shaking recovered maximum amount of Ca, Mg and K from leaf samples. Paired 't' test analysis indicated that for potassium there was no significant difference between the dry ash and the HCl extraction methods for all the shaking times employed. But for Ca and Mg there was no significant difference when 15 minutes shaking time was employed (Table 1). Hence it is suggested that when potassium alone is to be estimated shaking time can be limited to 5 min and if Ca and/or Mg is also to be analysed 15 min shaking time is necessary.

Of the different plant material to acid ratio 1:100 was found to give maximum recovery of K, Mg and Ca (Table 2). Paired