Rubber Science, **26**(1): 95-100, 2013

CLONAL VARIABILITY IN THE DISTRIBUTION OF SIEVE TUBES AND COMPANION CELLS IN *HEVEA BRASILIENSIS* BARK TISSUE

Philipose Omman* and C.P. Reghu

Rubber Research Institute of India, Kottayam-686 009, Kerala, India

* Department of Botany, Catholicate College, Pathanamthitta- 689 645, Kerala, India

Received : 20 December 2012 Accepted : 11 March 2013

Omman, P. and Reghu, C.P. (2013). Clonal variability in the distribution of sieve tubes and companion cells in *Hevea brasiliensis* bark tissue. *Rubber Science*, **26**(1): 95-100.

In *Hevea brasiliensis*, latex is produced in the laticiferous tissue present in the secondary phloem or bark. Sieve tubes and companion cells are the other two important components of secondary phloem tissue with the main function of sap conduction. In this context the transportation of metabolites through the sieve elements have great significance in terms of latex synthesis taking place in the laticifers. Ten different clones of *H. brasiliensis* were selected to study the clonal variability in the distribution pattern of sieve tubes, companion cells and dimensional variation of sieve tubes. The sieve elements were identified as enucleated elongated cells placed end to end in the longitudinal axis of the stem. Sieve plates were obliquely arranged at the end of the sieve elements. Occurrence of one or two companion cells, in close association with sieve tubes, implies its functional relationship with the counterpart. Sharing common companion cells among two sieve elements within a row was noteworthy. Considerable clonal variation in sieve tube length was noticed. The maximum length of sieve tube was recorded in the clone PB 235 and minimum in RRIM 703. The maximum diameter of sieve tube was recorded in PB 86. The analysis of variance indicated that the length of sieve tubes exhibited considerable variation between *Hevea* clones but less variability within clones. Characteristically PB clones showed superiority of over other clones under study for the dimension of sieve tubes. The dimensional variation of sieve tubes in the bark tissue can be considered as a marker for the identification of clonal variability and yield potential of *Hevea* clones.

Keywords: Clonal variability, Companion cells, Sieve tubes

INTRODUCTION

Sieve tubes form the most important transporting system in the secondary phloem (Bel *et al.*, 2002) mainly related to the assimilation of photosynthates and other substances (Schmitz and Schneid, 1989; Turgeon, 2000; Nakamura *et al.*, 2004). Many angiosperms have long sieve tubes with oblique sieve plates (Lu *et al.*, 1994; Lotova and Nilova, 1998; Magistris and Castro, 2001; Castro *et al.*, 2005). Sieve members do not exhibit a regular development in terms of length but slightly longer in old bark (Trockenbrodt, 1994). Occurrences of short sieve tubes with horizontal simple sieve plates have also been reported as a common feature (Zhang and Gao, 1987; Liu *et al.*, 1995; Lotova and

Correspondence: C.P. Reghu (Email: reghu@rubberboard.org.in)