

CLONAL VARIATION IN PHLOIC RAY CHARACTERS IN THE SECONDARY PHLOEM TISSUE OF *HEVEA* CLONES

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Secondary phloem or bark, which is formed from the cambial tissue present in the peripheral side of woody plants, plays a pivotal role in the transport of photosynthetic assimilates and various other chemical molecules. In *Hevea brasiliensis*, the various cell components of bark include sieve tubes, companion cells and phloem parenchyma. The present study deals with the distribution and dimensional features of ray parenchyma in ten different clones of *H. brasiliensis*. The presence of ray was identified from soft bark region to the inner hard bark region and extended up to the outer hard bark region. The study illustrates three principal types of ray cells in the secondary phloem which are uniseriate, biseriate and multiseriate in nature. Among them, the proportion of multiseriate rays is far more when compared to uni and biseriate rays. Statistical analysis indicated significant variation among the clones for biseriate and multiseriate rays in soft bark and inner hard bark region. Significant clonal variation was observed for anatomical features such as height, width and height/width ratio of phloic rays. The variation was highly noticeable in the inner hard bark region. The characters which suggest significant clonal variation can be considered as prominent anatomical traits in breeding and exploitation strategies in *Hevea* clones. The study indicated that the frequency and dimensional features of phloem rays in the various zones of the secondary phloem were significant from the anatomical and structural perspective of the bark of *Hevea*.

Keywords: Clonal variation, *Hevea brasiliensis*, Phloic rays, Secondary phloem

INTRODUCTION

Hevea brasiliensis belonging to the family Euphorbiaceae is the major source of Natural Rubber (NR) for commercial use in the world. The secondary phloem, which is also called as bark, is the tissue system which harbours the latex vessels or laticiferous tissues which possess latex. Ten species recognized under the genus *Hevea* so far are:

H. guianensis, *H. brasiliensis*, *H. pauciflora*, *H. spruceana*, *H. rigidifolia*, *H. benthamiana*, *H. nitida*, *H. microphylla*, *H. camporum* and *H. camargoana*, in the order of first descriptions of the concepts (Schultes, 1970; 1977; 1987; Wycherley, 1992; Varghese and Abraham, 2005). Of these species, *H. brasiliensis* contain a well-developed laticiferous system and cultivated for commercial exploitation of latex.