

## P- PROTEIN IN THE SIEVE ELEMENTS OF *HEVEA BRASILIENSIS* TREES AFFECTED BY TAPPING PANEL DRYNESS

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The structural features of P-proteins in the sieve elements of *Hevea brasiliensis* were studied in relation to Tapping Panel Dryness (TPD) and stimulation of affected bark with ethephon and vitex (a proprietary chemical formulation). The P-protein appears as a narrow, elongated structure in the sieve plate of healthy trees and unaffected parts of TPD affected trees whereas the TPD affected area of trees on rest for three years showed thick P-protein plugs. When the affected bark of TPD trees on rest were treated with ethylene the P-protein present in the active sieve element disappeared, while stimulation with vitex resulted in a positional change in P-protein. Callose deposition that followed in such stimulated sieve elements led to their senescence. The sieve element plugging that regulate photosynthate translocation with reference to TPD is discussed.

**Key words:** *Hevea brasiliensis*, P-protein, Sieve element, Stimulation, Tapping Panel Dryness.

P- protein helps plants to tide over adverse situations by agglomerating adjacent to the sieve plates and regulating the movement of solutes (Esau *et al.*, 1966; Parthasarathy, 1975). P- protein appears at sites of injury as an immediate wound response which is followed by deposition of definitive callose, lignin and suberin to seal off the wounded cells (Lipertz, 1970; Fahn, 1982; Thomas *et al.*, 1995).

Natural rubber latex is harvested from *Hevea brasiliensis*, by controlled wounding (tapping) of the articulatesly branched latex vessels in the bark of the tree trunk. The injury to the bark leads to a series of anatomical and histochemical changes in cells adjacent to the wound. A thin shaving of the bark is removed

by tapping, leaving the cambium innermost and part of the bark uninjured (Thomas *et al.*, 1995). Bobiloff (1923) and Premakumari and Panikkar (1992) suggested that wound healings and bark regeneration in *H. brasiliensis* are related. The residual bark left uncut is instrumental in healing and tissue regeneration at the site of injury. On tapping, the tree initiates certain defense mechanisms to regulate the excess loss of photosynthates through latex. P- protein occur in the phloem tissues of young stems and bark of mature trees after wounding (Wu and Hao, 1987; 1990). The sieve elements (Phloem) adjacent to wounds are blocked by definitive callose and the area of active sieve elements is limited to