Indian Journal of Natural Rubber Research, 7 (2) : 95-102, 1994

ULTRASTRUCTURAL OBSERVATIONS OF BROWN BAST IN *HEVEA BRASILIENSIS*

Ji-Lin Wu and Bing-Zhong Hao

Ji-Lin Wu and Bing-Zhong Hao, (1994). Ultrastructural observations of brown bast in *Hevea brasiliensis*. *Indian Journal of Natural Rubber Research* 7 (2) : 95-102.

The diseased laticifers in which latex did not coagulate and the cells nearby in brown bast trees of *Hevea brasiliensis* were observed using transmission electron microscope. The various organelles in the laticifers showed many abnormal changes. One of the important changes was membrane turnover disorder. The membranes, especially the boundary membranes of some lutoids, Frey-Wyssling complexes, nuclei, etc. were disorganised. The membrane materials appearing as myelin-like structures abnormally accumulated in diseased laticifers. One of the significant characteristics of the nucleus in diseased laticifer was the frequent presence of bundles of straight microfibrils, which might be microfilaments, about 5 nm in diameter. The nuclei were often found with decreased contents and partly disorganised nuclear membrane.

Keywords : *Hevea brasiliensis*, Brown bast, Abnormal ultrastructure, Latex coagulation.

Ji-Lin Wu (for correspondence) and Bing-Zhong Hao, Tropical Crops Biology Laboratory, South China Academy of Tropical Crops, Danzhou, Hainan 571737, People's Republic of China.

INTRODUCTION

In order to reveal the causative factors of brown bast, as early as 1920s anatomical observations on the diseased bark were made by Rands (1921), and since then many studies on this aspect have been published (Paranjothy *et al.*, 1976; de Fay and Hebant, 1980 and de Fay, 1982). However, knowledge of the ultrastructure of the brown bast affected bark is still insufficient. Recently radial extension of brown bast in diseased *Hevea* in resting (Bing-Zhong Hao and Ji-Lin Wu, 1993a) and the laticifers in drying bark induced by over-exploitation with ethephon (Bing-Zhong Hao and Ji-Lin Wu, 1993b) were studied. The present paper reports observations on the abnormal ultrastructure of the diseased trees which are characterised by precise symptomatology of brown bast including coagulation of latex *in situ* in most of the laticifers, appearance of brown spots in the diseased bark and spreading of the disease along the trunk.

MATERIALS AND METHODS

Brown bast affected rubber trees of clone PR 107 in the Experimental Farm of the South China Academy of Tropical Crops on Hainan Island were chosen for sampling along with healthy trees as control. The trees were under tapping for 15 years.

The diseased bark was taken from below the tapping cut where brown spots had appeared. The samples were immediately immersed in chilled 6 per cent glutaraldehyde in 0.1 mol per l phosphate buffer at pH 7.2. In the laboratory the bark samples were cut into smaller size and fixed in the 6 per cent glutaraldehyde solution at