Rubber Science, **26**(1): 13-22, 2013

A NEW ETHYLENE RECEPTOR FROM THE BARK TISSUES OF *HEVEA BRASILIENSIS*

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Received : 17 July 2012 Accepted : 23 January 2013

Sreelatha, S., Sathik, M.B.M., Schaller, G.E., Hall, B.P., Hill, K., Luke, L.P., Krishnakumar, R. and Jacob, J. (2013). A new ethylene receptor from the bark tissues of *Hevea brasiliensis*. *Rubber Science*, **26**(1): 13-22.

Stimulating rubber trees by applying ethephon in the bark is a common practice to increase the latex yield in rubber plantations. The ethylene generated from ethephon induces various physiological and biochemical changes and eventually leads to increased latex production. Ethylene perception and signal transduction is initiated when the ethylene molecules bind with the receptors localized in the cell membranes. Information on ethylene receptors and the molecular mechanism involved in the signal transduction is important to understand the regulation of latex flow in *Hevea* after stimulation. The relative expression of an ethylene receptor gene (*Hb ETR1*) in unstimulated and stimulated trees of *Hevea* clone RRII 105 using relative RT-PCR indicated that the gene was up regulated after stimulation with ethephon. Phylogenetic analysis of the ethylene receptors identified from different plant species and by using a PCR with degenerate primers, a new ethylene receptor was identified in the bark tissues of *Hevea* which was named as *Hb ETR2*. The gene representing this receptor was also found to be up regulated by ethylene stimulation. qRT-PCR also showed up-regulation of these genes immediately after stimulation.

Keywords: Degenerate PCR, Ethylene receptor, Phylogenetic tree

INTRODUCTION

The application of ethephon, a commercially available ethylene stimulant, in the bark of *Hevea brasiliensis* trees increases the volume of latex by delaying the latex vessel plugging and stimulates the latex regeneration mechanism between two tapping (D'Auzac *et al.*, 1993). Physiological and biochemical studies showed that ethylene acts on membrane permeability of lutoid particles (Coupe and Chrestin, 1989; Thomas *et al.*, 1999), increased the activity of invertase resulting in acceleration of glycolysis, increased adenylate pool, changes in polysomes, rRNA contents, enzyme activities, gene expression pattern (Tupy and Primot, 1976; Amalou *et al.*, 1992; Gidrol *et al.*, 1988) and eventually increased the latex yield.

Immediate effects of stimulation on the physiology and metabolism of laticifers under various situations such as reduced tapping frequency with different levels of stimulation, over stimulation, intensive tapping and clonal responses to stimulation have been studied extensively (Chrestin,

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