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Cornell University

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Regulation of the expression of ethylene biosynthesis genes in *Hevea brasiliensis*

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Ethephon, an ethylene generator, is applied to the bark of rubber trees to increase natural rubber production by stimulating both latex flow and regeneration. A good command of ethephon concentrations and its frequency of application is required to avoid cell an oxidative burst resulting in tapping panel dryness (TPD) and leading to a loss of production. Although a little is known about the molecular response to ethylene stimulation further studies on ethylene biosynthesis and its regulation were needed to gain a better understanding of the mechanisms involved in latex production. Several genes involved in the ethylene biosynthesis were previously isolated. In this study, we have monitored in bark tissues of juvenile budded plants of three *Hevea* clones with contrasting metabolism the expression of eight genes by real-time RT-PCR. *SAMS, ACS1, ACS-F3* and *ACS-F10* transcripts were dramatically accumulated after ethylene application in clone PB 260 when clones RRIM 600 and PB 217 did not respond to the stimulation. This effect is transient for *ACS* genes. The expression of *ACO1*, *ACO2, ACO3* and β*CAS* genes was very slightly modified upon ethylene treatment whatever the clone. The clone PB 260 is known to be susceptible to ethephon and leads to TPD. Our data suggests that an exogenous supply of ethylene or ethephon triggers endogenous ethylene production *via* autocatalytic reactions in this clone, and response to ethylene may provoke early senescence in latex cells.