

## **Transcriptional expression of three putative pathogenesis-related proteins in leaves of rubber tree (*Hevea brasiliensis*) inoculated with *Neofusicoccum ribis***

### **ABSTRACT**

Pathogenesis related-proteins (PR-proteins) and enzymes are important tools for understanding the molecular markers of plant response to external factors. In this study, semi-quantitative reverse transcription polymerase chain reaction (RT-PCR) was optimized to detect the expressions of two PR-proteins and one enzyme extracted from the leaf RNA of two rubber clones (PB 350 and RRIM200) at four-period intervals. The expression patterns of enzymes  $\beta$ -1,3-glucanase (Glu), chitinase (Chit), and phenylalanine ammonia lyase (PAL) in the leaf tissues of the clones RRIM 2002 and PB 350 to *Neofusicoccum ribis* were expressed by up and down regulations and varied with time. The trial inoculation indicated that the gene expressions were significantly higher in tolerant clones (RRIM 2002) than in the susceptible clones (PB 350). Gene expression analysis of the biomarkers revealed that the earlier detection markers in infections occurred within 5–10 days post infection and showed significant correlation with disease development, ranging from 1.67–3% in the RRIM 2002 clone and approximately 8.33% in the PB 350 clone. This is the first study on the infection and up-regulation of gene expression in rubber leaves infected with *N. ribis* isolate SK10 (ICMP 20078). This study showed the importance of exploring the SK10 isolate as an indicator of infection ability and positive fungal–host interaction.

**Keyword:** Gene expression; RT-PCR; *Neofusicoccum ribis*; Pathogenesis-related protein