**Early Detection of High-Yielding Rubber Genotypes (*Hevea brasiliensis*) Based on the Expression of Rubber Elongation Factor (*Ref*) Gene**

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Sri Lanka’s rubber industry is one of the leading natural rubber producers in the world. However, in 2021, Sri Lanka’s rubber production declined from 78.2 million kilograms (2020) to 76.9 million kilograms (2021). Therefore, the development of high-yielding clones for rubber cultivation is the most important way to enhance productivity and is the main objective of *Hevea* breeding and selection. As a solution for the lengthy breeding program, molecular approaches are essential for the early identification of high-yielding clones. Rubber Elongation Factor (*Ref*) protein is a major factor in the natural rubber biosynthesis in *Hevea brasiliensis* and the genomic sequence of the *Ref* gene is 1367bp long. Previous studies have proven a positive relationship between *Ref* gene expression and latex yield performance. In this study, three genotypes from the Estate collaborative Trial, HP 95-55, HP 95-41, and HP 95-01, along with control clone RRISL 203 were used to study *Ref* gene expression and the latex yield performances. The Livak method (2-∆∆CT) was used to analyze quantitative gene expression and it proved that the three genotypes’ *Ref* gene expression was significantly higher than the control clone RRISL 203. According to the latex yield of three months from September to November 2022, the mean yields for HP 95-55 HP 95-41, and HP 95-01, and the control clone RRISL 203 is reported as 9.12 g/t/t, 5.51 g/t/t, 6.95 g/t/t and 3.93 g/t/t respectively. When comparing the results of the quantitative gene expression and the mean yields, it proved that the yield is increased according to the *Ref* gene expression. Therefore this study concludes that there is a potential for selecting high-yielding genotypes by using *Ref* gene expression at an early stage of therubberbreeding cycle.

**Keywords**- *natural rubber yield, quantitative PCR, rubber cultivation, rubber elongation factor (Ref) gene*