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

S.A.C.Sathsarani1\* S.P.Withanagae2J.B.D.A.Kumara1 and P.W.M.Tharindi2

*1Department of Export Agriculture,Faculty of Agricultural Science,Sabaragamuwa University of Sri Lanka*

*2Rubber Research Institute,Genetics and Plant Breeding Department,Nivithigalakale Substation*

*Mathugama,Sri Lanka*

\*[*Chamo2Sathsarani@gmail.com*](mailto:Chamo2Sathsarani@gmail.com)

**ABSTRACT**

Sri Lanka rubber industry is one of the leading natural rubber producers in the world. The development of high-yielding clones for the rubber germplasm is the most important to enhance productivity and it is the main objective of *Hevea* breeding cycle. Rubber Elongation Factor (*REF*) protein which involves the biosynthesis of natural rubber in *Hevea brasiliensis*. The genomic sequence of *Ref* gene is 1367bp long. Previous studies have proven a positive relationship between *REF* gene expression and latex yield performances. Three genotypes in Estate Collaborative Trial HP 95-55, HP 95-41, and HP 95-01, 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. The *REF* gene expression of the three genotypes were significantly higher than the control clone RRISL 203. The mean yield of HP 95-55(9.12 g/t/t), HP 95-01(6.95 g/t/t), and HP 95-41(5.51 g/t/t) in three months period in September in (September-November in the year 2022) was higher than the control clone RRISL 203. The results from quantitative PCR indicated that *Ref* gene expression upregulated all three genotypes compared to the control clone. The results confirmed early detection of high-yielding genotypes can be determined based on *REF* based on the expression of the Rubber Elongation Factor (*REF*) gene. There is a potential using of selection high yielding genotypes of using *Ref* gene expression at an early stage of the *Hevea* breeding cycle.

**Keyword**- *Natural rubber yield, quantitative PCR, rubber germplasm*