QUANTIFICATION OF L-THEANINE CONTENT OF TWO SELECTED TEA CULTIVARS GROWN IN SRI LANKA

[*Camellia sinensis (L.) O. Kuntze*]

A dissertation submitted to the

Faculty of Animal Science and Export Agriculture

Uva Wellassa University

In partial fulfillment of the requirements for the award of

Bachelor of Science in Tea Technology and Value Addition

By

Senawarna Ishanka Sewwandi De Silva

Tea Technology and Value Addition Degree Programme

Faculty of Animal Science and Export Agriculture

Uva Wellassa University of Sri Lanka

2019

ABSTRACT

L-theanine is an abundant non-protein amino acid that accounts for more than 50% of the total free amino acid in the green tea leaves, having various pharmaceutical importance. The study was conducted to determine the variation of L-theanine content of commonly growing tea cultivars, TRI 2025 and TRI 4053 among all tea-growing agro-ecological regions in Up, Mid and Low Country of Sri Lanka, with respect to one month before and after the onset of rainfall periods. Fresh tea leaves were collected from same-aged plants by using stratified sampling techniques and samples from each stratum were selected randomly from different tea estates of each agro-ecological regions in all three elevations of Sri Lanka. Collected samples were oven-dried at 50 °C for 12 hours and hot water (85 °C) was used to extract L-theanine from fresh tea leaves. The High-Performance Liquid Chromatographic technique with ultraviolet detection (RP-HPLC-DAD-UV) was optimized and validated to quantify L-theanine content according to conditions of Csupor's method with slight modifications. Data acquisition and evaluation were performed using Chromeleon software. The findings of this study showed that the total L-theanine contents (gg^{-1}%) were significantly different ($p < 0.05$) among the tea growing agro-ecological regions in both TRI 2025 and TRI 4053 in Up, Mid and Low Country of Sri Lanka. The highest total L-theanine contents were recorded in IU3d, WU2b and WL1b-E1 of TRI 2025 and IU3a, IM3a and WL2a-E3 of TRI 4053 in Up, Mid and Low Country respectively. Significant variation in total L-theanine content in TRI 2025 and TRI 4053 in all three major elevations one month before and after the onset of rainfall was observed. Total L-theanine content (gg^{-1}%) was ranged from 0.04% - 7.96% in all three elevations in Sri Lanka and it was higher than reported values from Kenya. This study evident that Ceylon tea is having higher quality in terms of L-theanine content.

Keywords: Agro-ecological regions, Low country, Mid Country, Total L-theanine, Up Country