EVALUATION OF THE RELATIONSHIP BETWEEN SPAD READING AND BIOCHEMICAL PROFILE OF FRESH LEAVES OF SELECTED TEA CULTIVARS [*Camellia sinensis* (L.) O. Kuntze]

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ABSTRACT

Biochemicals in fresh tea leaves affect to the quality of made tea and are difficult to evaluate by traditional chemical extraction methods. Therefore, this study was conducted to investigate a simple method to evaluate foliar biochemicals using SPAD reading of three widely grown tea cultivars (*Camellia sinensis* (L.) O. Kuntze), viz: TRI 2025, TRI 3035 and TRI 4046 in the Uva region. Fresh leaf samples of different developmental stages were randomly collected from Wewasse and Glen Alpine estates, Badulla. Leaves were placed in an ice box immediately after detaching from the bush and transported to Agricultural Chemistry laboratory of Uva Wellassa University. Study was conducted as two experiments during the period from July to December 2017. Average of five SPAD readings on each side of the midrib per leaf were taken to produce a single SPAD reading for each leaf. Leaves of each cultivar were categorized in to seven samples according to the SPAD reading (i.e. SPAD 20, 30, 40, 50, 60, 70 and 80). Chlorophyll a, b and carotenoids were extracted and quantified in the first experiment while total polyphenols, reducing sugars and proteins were extracted and quantified in the second experiment. The relationship between chemical components and SPAD reading was estimated using regression analysis and Pearson Correlation coefficient. In the first experiment, the highest positive correlation (0.999) was recorded in between SPAD reading and total chlorophylls of cultivar TRI 3035. In the experiment 02, the polyphenols, reducing sugars and proteins of all cultivars were shown a strong, negative, non-linear relationship with SPAD reading (R^2>0.90). The results revealed that the SPAD meter readings can be used to assess the relative chlorophyll content and approximate concentrations of the selected biochemicals in fresh tea leaves simply and non-destructively. Thus, the findings will be useful in the decision making of harvest time and quality control in tea sector.

Keywords: Biochemicals, Correlation, SPAD reading, Tea cultivars