

**ANALYSIS OF POLYPHENOL AND TOTAL N
CONTENTS IN THREE DIFFERENT CULTIVARS
OF TEA (*Camellia Sinensis*) GROWN IN MATARA
DISTRICT**

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ABSTRACT

Low-grown teas possess unique taste, color, and aroma compared to other types of tea grown in Sri Lanka. Those properties are governed by the biochemical composition of the tea leaves. However, there is no reported study related to the variation of the chemical profile of most common tea cultivars grown in the Matara District of the low country region. Therefore, this study was conducted to determine the variation of polyphenol contents and Total nitrogen contents of commonly grown tea (*Camellia sinensis*) cultivars in Matara District, Sri Lanka. Further, Applicability of Near-infrared spectroscopy technique as the rapid method in total polyphenol and nitrogen content determination was one of the objectives of this study. Having followed stratified random sampling 18 estates were selected from Matara District keeping three tea inspector divisions; Morawaka, Akurassa, Uuruboka as strata. Tea cultivars; TRI 2025, TRI2026, and TRI 4042 were selected for this study. Selected fields were in the 3rd and 4th year from pruning and the 4th and 5th pruning cycle. Fresh tea leaves (two leaves one bud) from each variety grown in each selected estate were collected. The fresh tea leaves were placed in an icebox immediately after harvesting and transported to the laboratory. Then they were dried at 70 °C for 2 hours and packed in aluminum foil bags. Each sample was crushed and homogenized using a Burr Mill's grinder. Polyphenol and Total nitrogen contents of powdered tea leaf samples were analyzed by using a Near-infrared spectroscopy-based polyphenol analyzer machine (model GTN-B) at 780-2500 nm wavelength. Polyphenol contents of powdered tea leaf samples were also analyzed by Folin-Ciocalteu spectrophotometric method for comparison. It was found that polyphenol contents of cultivars TRI 2025 ($20.6 \pm 1.12\%$), TRI 2026 ($19.9 \pm 1.12\%$), and TRI 4042 ($18.9 \pm 0.99\%$) were significantly different ($P < 0.05$). Further, Total Nitrogen contents of the cultivars TRI 2025 ($4.8 \pm 0.48\%$) TRI 2026 ($4.4 \pm 0.25\%$), and TRI 4042 ($3.9 \pm 0.48\%$) were found to be significantly different. There were significant differences in polyphenol content of each division ($p < 0.05$) Morawaka ($19.1 \pm 0.75\%$), Uurubokka ($19.1 \pm 0.62\%$), Akurassa ($21.3 \pm 0.81\%$). The correlation coefficient for Near-infrared spectroscopy technique and Folin methods was 0.82. Therefore, with further validation, there is a potential of using the Near-infrared technique as a rapid method to determine the polyphenol content of tea leaf.

Keywords: Polyphenol; Total N; Low- grown teas; Near-infrared; Folin Ciocalteu