

**VARIATION OF TOTAL POLYPHENOL CONTENT OF TEA IN
DIFFERENT TEA GROWING REGIONS UNDER CHANGING CLIMATIC
PARAMETERS**

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Polyphenols are considered as the most important constituents in tea, that determines the quality. Polyphenol content in tea is highly influenced by the climatic conditions. The changing climatic conditions with climate change scenario may have significant impacts on quality of tea in future. Lack of such research evidences invited the present study to assess the correlation between total polyphenol (TPP) content in tea versus climatic parameters exist in the major tea growing regions for future predictions on quality of tea. Fresh tea flushes of TRI 2025 were obtained from tea estates managed by Tea Research Institute (TRI) of Sri Lanka representing up country, mid country and low country. Each leaf sample was divided and subjected to oven drying at 60 °C and miniature manufacturing at the Biochemistry Division of TRI. Climatic parameters; maximum temperature, minimum temperature, mean temperature, maximum minimum temperature difference, total rainfall and total sunshine hours were recorded at 07 days, 14 days and 30 days prior to sampling. TPP content of tea samples were determined using the ISO 14502-1 standard protocol by spectrophotometrically. According to the present study, significantly higher TPP content ($p < 0.05$) was recorded in up country tea followed by low country and mid country tea, respectively. Regression analysis revealed a significantly strong positive relationship between TPP content and maximum minimum temperature difference exist 07 days ($r = 0.86$, $p < 0.01$), 14 days ($r = 0.89$, $p < 0.01$) and 30 days ($r = 0.81$, $p < 0.03$) prior to sampling while other climatic parameters did not show any significant relationship. In conclusion, present study identified temperature as the most influencing climatic parameter on TPP content in tea. Further, research with frequent measurements that extend to several years' period is suggested to identify the impact of variation of other climatic parameters on TPP content of tea under climate change.

Keywords: Climate change, Polyphenol content, Quality of tea, Temperature