Statistical Analysis of Determinants of Black Tea Quality

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Tea is the world most popular beverage. It has very good market both locally and internationally.Sri Lankan tea is world renowned for high quality and taste. However, in the recent past, Sri Lanka has lost the top ranking and now in rank third in the world market. Therefore, ensuring the export of quality tea is essential for the regaining the top ranking.In this study, a literature survey was conducted to identify the factors affecting the quality of black tea.Some identified factors are fermentation time, temperature, moisture and humidity content of leaves. These will impact quality parameters such as Theaflavine, Thearubigin, Tea liquor color and brightness.In this paper, a statistical analysis was conducted to identify the extent to which fermentation time and temperature will impact with Theaflavin, Thearubigin, and total color of the tea infusion by using correlation and regression (simple and multiple). An analysis was conducted using 17 reported data where each data point is the average of a triplicate. According to correlation analysis, relationships are available among time, temperature and Theaflavin. When the fermentation time increases, Theaflavin content decreases. When the temperature decreases, Theaflavin content increases.However,the impact of temperature on Theaflavin is not significant as in the observed analysis (P = 0.966).A similar study was carried out to find relationship between Thearubigin versus temperature and fermentation time. The results reveal that the thearubigin is not significantly related with temperature (P = 0.189) and fermentation time (P = 0.844).Tea infusion color is highly related to the time than temperature (P = 0.098),It can be concluded that the Theaflavin and tea liquor color is significantly depending on fermentation time, where thearubigin is depending on temperature.

Keywords: Fermentation time, Temperature, Theaflavin, Thearubigin, Regression