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Relationship between organoleptically categorized Sri Lankan black tea (*Camellia sinensis,L.*) with objective assessment of liquor colour and polyphenol composition

K R W.Abeywickrama[1*] and W D Ratnasooriya[2]
[1]*Analytical Laboratory, Sri Lanka Tea Board, Colombo, Sri Lanka*
[2]*Department of Zoology, University of Colombo, Sri Lanka*

Colour difference of tea infusions is one of the parameters used by professional tea Tasters to distinguish high, mid and low grown Sri Lankan Black tea. Since this is based on subjective assessment, we examined whether there is a relationship between objective assessment of colour and polyphenol content of tea infusion of different agro-climatic regions with this visual sensory quality. Broken Orange Pekoe Fannings(BOPF) grade black tea samples were collected randomly from four tea factories belonging to each agro-climatic region: high grown(>1200m ,average mean sea level); mid grown(1200–600m, amsl) and low grown(<600m, amsl). Infused liquor was made, colour was determined using an automatic colour difference meter and polyphenol content was assessed using HPLC with set wave length at 278nm, coupled with Phenyl-Hexyl bonded C18-Reverse phase column, linear acetonitrile gradient elution and inbuilt UV/ Visible Spectrophotometer detector. Tea liquor samples were then subjected to sensory assessment by a panel of professional tea Tasters.

The Spearman's linear correlation analysis showed that, there were significant correlations($p \leq 0.05$) between the infused liquor colour sensory assessment of professional tea Tasters(score of 0–15) with the colour difference meter readings: ΔL-light-dark(+100 to-100), Δa-red-green(+60 to-60), Δb-yellow-blue(+60 to-60) and ΔE-total colour difference$\{\sqrt{[(\Delta L)^2+(\Delta a)^2+(\Delta b)^2]}\}$ and polyphenol contents: total catechins(TC),total polyphenols(TPP), theaflavins(TF), thearubigins(TR) and TR/TF ratio in black tea infusion made from different agro-climatic elevations in Sri Lanka. The values of ΔL, Δa, TR and TR/TF ratio positively correlated to the sensory colour assessment suggesting that the method could support to categorize black tea in to different agro-climatic regions. Significantly negative correlations of Δb, ΔE, TC and TF values with sensory colour analysis were shown in high grown followed by mid grown and low grown teas. The content of TPP did not show a relationship with the sensory analysis. The overall results suggest that instrumentally determined colour or estimation of polyphenol content may be used to support sensory quality assessment of black tea.

*labsltb123@yahoo.com Tel: 011 - 2581576