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Impact of Biochemical and Physicochemical Properties on the Organoleptic Attributes of Tea from Different Regions of Bangladesh

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Abstract

Tea is the most consumed beverage in Bangladesh, and it has a great impact on the economy due to its export potential. The organoleptic quality of tea depends on different biochemical compounds and can be affected by physical factors. The objectives of the study were to assess the biochemical and physicochemical properties of black and green tea sourced from six major tea-growing regions of Bangladesh, their relationship with organoleptic properties, and how they are affected. Fifteen Black and green tea samples were collected from different tea-growing regions of Bangladesh. They were analyzed for moisture content, ash content, electrical conductivity, caffeine content, total polyphenol and total flavonoid contents in water and methanol extract, theaflavin, thearubigin, total colour, total brightness, and heavy metal contents. The moisture content of the samples ranged from 4.26% to 7.23%, caffeine content ranged from 2.15% to 3.81%, and Thearubigin-Theaflavin ratio ranged from 5.14 to 6.69. The total polyphenol content of black tea was found to be higher in water extract than in methanol extract, whereas total flavonoid content was found to be higher in methanol extract. In green tea samples, total polyphenol content, total flavonoid content, and caffeine content are found to be positively correlated with organoleptic properties, with a total correlation coefficient of 0.95, 0.97, and 0.96, respectively. In black tea samples, organoleptic properties are positively correlated with the Thearubigin-theaflavin ratio (0.76), caffeine content (0.74), and weakly correlated with total polyphenol (0.22) content and total flavonoid content (0.34). Moisture content is strongly negatively correlated with organoleptic attributes in both green tea (-1.0) and black tea (-0.91). These findings highlight the critical role of biochemical profiling, particularly thearubigin–theaflavin ratio, polyphenol content, in determining the organoleptic properties of Bangladeshi teas. Moisture content has a deteriorating effect on the sensory properties of tea, and it should be maintained properly during the processing and storage of tea.

Keywords: *Tea, Organoleptic Properties, Total Polyphenol Contents, Total Flavonoid Contents, Theaflavin, Thearubigin*