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Comparative Study of Caffeine Estimation and Measurement of Acid Value from Different Commercially Available Brands of *Camellia sinensis* L. – An Affordable Beverage

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ABSTRACT

Background: Caffeine is a well-known psychoactive drug obtained from the leaves of *Camellia sinensis* L. an evergreen herb belonging to family Theaceae. The monitoring of caffeine is of critical importance, since its intake in large doses has proven to cause adverse physiological and psychiattrical dependence (addiction). The study accounts for the variability of caffeine content and acid value (measure of level of bitterness, i.e. taste and erosive potential) in three commercially available brands in Abha, KSA for the first time.

Methods: For the study**,** three different commercially available tea brands like Hi tea (from India), Al Kbous tea (from Jordan) and Tetley tea (from England) were procured from supermarket in Abha city of southern KSA. A simple, cost effective reliable method of polar, non- polar extraction was followed in this study. For isolation of caffeine aqueous extract was subjected to fractionation using chloroform, and then concentrated using rotary evaporator. The measurement of acid value involved titration of tea samples with N/50 sodium hydroxide using phenolphthalein as indicator and to further corroborate acid value with taste, pH was also measured. All the chemicals used were of analytical grade.

Results: Caffeine was isolated as needle shaped crystalline substance, tested positive for Murexide (purple coloration). Melting point (237°C) was determined successfully in open capillaries using Buchi melting point apparatus. After quantitative measurement, caffeine content was found highest in Al Kbous tea (0.52g/20gm), followed by Hi tea (0.45g/20gm) and Tetley tea (0.39g/20gm). The strength of acidity was evaluated highest in Al Kbous (0.0204) as compared to Hi tea (0.0188) and Tetley tea (0.0124) with pH values for Al Kbous (4.5$\pm$0.003), Hi Tea (4.9$\pm$0.001) and Tetley Tea (5.1$\pm$0.001).

Conclusion: Among the commercially available tea brands, quantitative estimation shows inverse relation between acid value and pH. Al Kbous has the highest caffeine content with possible higher addiction rate among population and highest acid value with lowest pH, which makes it very bitter in taste whereas, Tetley has lowest caffeine content with possibly least addiction rate among population and least acid value with highest pH contributes to mildly bitter taste and Hi Tea quantitatively lies somewhere in the middle. Erosive potential of Al Kbous is highest due to lowest pH, with Hi tea in the middle and Tetley the least with highest pH.

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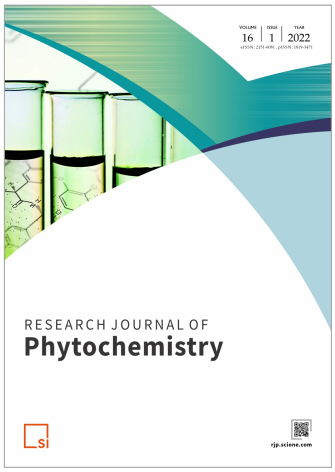

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