

## Value addition to the black tea using leaves of common guava, Ceylon Cinnamon and evaluation of its functional properties

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Innovative tea formulation was developed by introducing an herbal infusion of medicinal plants which enhance the functional properties of the black tea. The leaves of common guava (*Psidium guajava*) and the both leaves and bark of Ceylon Cinnamon were collected from Matara, Sri Lanka (latitude-5.94780N, longitude-80.54830E). Shade-dried plant material was blended to reach the highest sensory quality of the final product (guava leaves: cinnamon bark: cinnamon leaves: black tea in 11:3:3:3 ratios). The tea was tested for antioxidant activity using the ferric reducing antioxidant power assay (FRAP), 2,2'-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assays, total phenolic content (TPC) using the Folin-Ciocalteu assay, total flavonoid content (TFC) using aluminium chloride colourimetric assay, and anti-diabetic activity using the alpha-glucosidase inhibitory assay. The antibacterial properties were assessed using the agar disk diffusion assay and preliminary cytotoxic effects were examined through the brine shrimp assay. The formulation exhibited significantly high total anti-oxidant activity in FRAP ( $49.95 \pm 0.40$  mg Trolox/g) and  $IC_{50}$  of  $40.01 \pm 0.01$  mg/ml for DPPH assay ( $31.59 \pm 2.92$  mg/ml for the ascorbic acid standard). It also demonstrated high alpha glycosidase inhibition activity with  $IC_{50}$  of  $1.43 \pm 0.08$  mg/ml compared to the acarbose standard ( $IC_{50}$   $3.28 \pm 0.28$  mg/ml). The extract contained TFC and TPC at  $3.49 \pm 0.40$  mg of quercetin/g and  $162.40 \pm 6.12$  mg GAE/g, respectively. The extract is safe based on brine shrimp lethality assay. The highest antibacterial activity was noted against *Staphylococcus aureus* from tested bacteria species (inhibitory zone of  $7.00 \pm 0.57$  mm). In conclusion, the prepared guava tea enhanced with cinnamon formulation is a novel natural functional product that can be used as an alternative to black tea for better health benefits.

**Keywords:** Ceylon cinnamon, Cinnamon bark, Cinnamon leaves, Common guava, Tea

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