Evaluation of Physicochemical and Functional Properties of Mussanda (*Mussaenda Frondosa* L) Sepals and Development of Mussanda Incorporated Tea

M.F.F. Nafla[1*], T.C. Kananke[1], and M.G.A.N. Perera[2]

[1]Department of Food Science and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka.
[2]Department of Physical Sciences and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Belihuloya, Sri Lanka.

[*] *naflafaleel@gmail.com*

The present study was conducted to evaluate the physicochemical and functional properties of sepals of *Mussaenda frondosa* to develop a functional tea. *M. frondosa* is one of the edible species of genus *Mussaenda* which contains many types of medicinal products and phytochemicals. Hot water (HW), hot ethanol (HE), and defatted hot ethanol (DHE) extracts were prepared from the dried sepals of *M. frondosa* and the hot water extraction was optimized at different temperatures with and without ultrasound sonication. Antioxidant activity of each extract was assessed using DPPH radical scavenging assay. Hypoglycemic potential was determined using alpha amylase inhibition assay. The highest TPC (114.42 ± 0.6 mg GAE/g) and TFC (66.47 ± 0.3 mg QE/g) were shown by the DHE subsequent to its high extraction yield ($46.71 \pm 0.2\%$). The highest antioxidant and alpha amylase inhibition activities were also shown by the DHE with the IC_{50} value of 24.06 ± 0.2 µg/ml and 87.61 ± 0.2 μg/ml respectively. Ultrasound sonication at 80°C significantly enhanced the TPC, TFC, antioxidant activity and the alpha amylase inhibition activity ($p < 0.05$) of water extract. Hot water extracts did not show any toxicity as evaluated by the brine shrimp lethality bioassay. A tea was formulated by blending different proportions (30, 40 and 50%) of dried sepals of *M. frondosa* with black tea. The formula containing 40% *M. frondosa* was selected from the sensory analysis (hedonic ranking test, 30 untrained panelists) and subjected to further analysis. Further, TPC, TFC, antioxidant and hypoglycemic activities of M. frondosa incorporated tea were significantly higher ($p < 0.05$) than that of black tea. This study revealed that sepals of *Mussaenda frondosa* would be a potential source for the development of new functional tea with enhanced health benefits.

Keywords: Antioxidant, Black Tea, Hypoglycemic, *Mussaenda frondosa*