

Utilization of *Pentadesma butyracea* (African Butter Tree) butter for the development of nutrient-rich biscuits

Abilashini.N³, Liyanaarachchi G.D.¹, Binduhewa. A.M.C. U² Vasantharuba.S³,
Kathirgamanthar, S^{1*}

¹Herbal Technology Section and ¹Food Technology Section, Industrial Technology Institute,
503 A, Halbarawa Gardens, Thaladena, Malabe, Sri Lanka.

³Department of Agricultural Chemistry, Faculty of Agriculture, University of Jaffna, Ariviyal
Nagar, Kilinochchi, Sri Lanka

Abstract

Pentadesma butyracea (African butter tree) is an oilseed crop valued for its nutritious solid edible fat. High amount of oleic acid (53.1%), stearic acid (38.4%) and low amount of palmitic and linoleic acids present in the butter show that it is highly nutritive and oxidatively stable. It is enriched with stigmasterol (~45% of total sterol). Due to the unawareness, this tree remains underutilized and its applications are still not explored in Sri Lanka. This study aimed to explore the food applications of *Pentadesma* butter and to determine antioxidants, proximate composition, and physico-chemical properties of *Pentadesma* butter biscuit (composite biscuit). The biscuits were composed of flour, sugar, baking powder, and salt along with two types of butter (*Pentadesma* butter and normal butter), considering normal butter serving as the control. The moisture, total ash, crude fat, crude protein, crude fiber and carbohydrates of the control biscuit were 4.1±0.1%, 1.5±0.03%, 11.3±0.6%, 10.4±0.3%, 0.9±0.03% and 75.9±0.04% respectively while the values of the composite biscuit were 4.4±0.01%, 2.0±0.08%, 17.7±0.6%, 8.4±0.3%, 0.9±0.02% and 70.9±0.1% respectively. Both composite and control biscuits exhibited similar water activity levels (0.4±0.0), while there was a slight difference in pH values (composite biscuit: 6.5±0.01; control biscuit: 5.9±0.02). The ascorbic acid content was marginally low in the control biscuit (1.3±0.1) compared to the composite biscuit (1.6±0.03). The control and the composite biscuits contained total sugar (7.6±0.0 and 8.5±0.0) and reducing sugar (0.3±0.0 and 0.2±0.0) respectively. The total phenolic content and the total flavonoid content of the control and the composite biscuits were 53.3 mg gallic acid equivalent (GAE)/g, 67.5 mg GAE/g and 22.2 mg quercetin equivalent (QE)/g, 24.4 mg QE/g respectively. Sensory evaluation was conducted on both biscuits. The paired comparison test, using a 9-point hedonic scale, indicated a significant difference ($p < 0.05$) in overall acceptability between the control and the composite biscuits. Composite biscuits were highly accepted by the panelists due to their specific aroma, flavor, color and taste and had higher levels of crude fat, crude protein, and total ash compared to the control. In conclusion, *Pentadesma* butter biscuits are highly nutritious particularly owing to their beneficial fats.
