Applying wild mistol fruits (Sarcomphalus mistol) from the Paraguayan Chaco as value-added food ingredients

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Abstract

Sarcomphalus mistol Griseb. (Rhamnaceae) is a fruit from a native tree, traditionally consumed by indigenous and rural communities in the Gran Chaco region. However, its nutritional value remains largely unexplored. This study analyzed mistol fruits and their derived value-added products, focusing on physicochemical composition, total phenolic content (TPC), and antioxidant capacity (ABTS). The fresh fruit (pulp and peel) had high levels of carbohydrates (43 g/100 g), dietary fibre (2.12 g/100 g) and minerals (Ca 105 mg/100 g, Mg 58.6 mg/100 g), as well as the highest phenolic content (682 mg GAE/100 g), with antioxidant potential (71.2 QM TEAC/g). Mistol marmalade had a higher energy density (249 kcal/100 g) and sugar content (60 g/100 g), but a significantly lower phenolic content (229 mg GAE/100 g) and antioxidant potential (4.5 QM TEAC/g), reflecting losses from thermal processing. The mistol–peanut-based beverage had a low energy value (59 kcal/100 g). Its lipid profile was dominated by oleic acid (81.4% Monounsaturated Fatty Acid - MUFA), which supports its nutritional benefits and oxidative stability. Overall, mistol is a nutrient and TPC-rich native fruit with cultural significance and versatility in food processing. Incorporating mistol fruit into innovative food formulations—particularly plant-based beverages—can create opportunities to diversify diets, promote functional food development, and strengthen the sustainable bioeconomy in the Gran Chaco region.