



10th Brazilian Conference on Natural Products

XXXVI RESEM

4-7 November 2025, Belo Horizonte, MG, Brazil

Section: 05

BIOACTIVE POTENTIAL OF *Psidium guineense* ESSENTIAL OILS AND EXTRACTS FOR ANTI-AGING COSMETIC APPLICATIONS

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Brazil, recognized for its remarkable biodiversity, hosts a vast array of plant species with dermocosmetic potential, especially within the Cerrado and Pantanal biomes. The pursuit of innovative materials and sustainable technologies in cosmetic formulations has been increasingly driven by organic cosmetology, which prioritizes plant-derived ingredients such as oils, waxes, and extracts. Globally, the cosmetics industry reached an estimated value of €240 billion in 2022, with the European Union (€88 billion), the United States, China, Brazil, and Japan leading the market. In this context, the present research investigates the native Myrtaceae species *Psidium guineense*, popularly known as “araçá-do-campo”, which produces edible fruits traditionally valued for their flavor and ethnopharmacological applications. Despite this cultural relevance, its chemical composition and potential technological applications remain poorly characterized. To address this knowledge gap, essential oils and ethanolic extracts were obtained from the leaves and fruits of *P. guineense*, and subsequently evaluated for antibacterial, antioxidant, and enzyme-inhibitory activities (elastase and hyaluronidase). In vitro cytotoxicity was assessed against normal murine fibroblast (NIH-3T3) cell lines using the Sulforhodamine B (SRB) assay, with all samples showing GI_{50} values above $250 \mu\text{g}\cdot\text{mL}^{-1}$, indicating their non-cytotoxic profile toward normal cells. The samples exhibited no antimicrobial activity against the reference strains of *Staphylococcus aureus* and *Escherichia coli* ($MIC \geq 1000 \mu\text{g}/\text{mL}$). However, in combination with ampicillin, the fruit essential oil showed an additive effect against a clinical multidrug-resistant *S. aureus* strain, in the checkerboard assay. Antioxidant activity, determined by the DPPH radical assay, revealed marked differences between plant parts: fruit extract and essential oil exhibited approximately 90% inhibition, whereas leaf extracts showed around 10%, highlighting the high radical-scavenging potential of the fruit. In enzymatic inhibition assays, essential oils derived from both leaves and fruit demonstrated elastase inhibition levels of approximately 90%, and inhibition of hyaluronidase by c. 45%. The pronounced antioxidant and enzyme-inhibitory activities of *P. guineensis* essential oils, particularly from the fruit, demonstrate their strong potential as bioactive agents. By effectively inhibiting elastase and hyaluronidase—enzymes directly linked to extracellular matrix degradation and skin aging—these oils emerge as promising candidates for the development of anti-aging formulations.

Keywords: aracá-do-campo, antioxidant, enzyme-inhibiting, hyaluronidase, elastase, cosmeceutical products

