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Development and Characterization of a Topical Formulation Based on Tucumã (*Astrocaryum aculeatum*) Bioactives for Combating Skin Oxidative Stress

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ABSTRACT

Oxidative stress, characterized by an imbalance between oxidants and antioxidants in favor of oxidants, is associated with molecular damage and loss of cellular redox control. Tucumã (*Astrocaryum aculeatum*), an Amazonian fruit, stands out as a source of bioactive compounds with antioxidant potential; however, its application in topical formulations remains poorly explored. In this context, an in silico analysis was performed using the ADMET-AI simulator and the calculated oxidizability (COX) index to evaluate the profile of tucumã oil and its antioxidant potential related to oxidative stress. The oil is predominantly composed of oleic acid (60-68%), whereas the polyunsaturated fatty acids, linoleic and linolenic acids, account for approximately 7% at most. The COX index indicated oxidative stability comparable to that of stable monounsaturated oils. The analyses suggest that the antioxidant potential is mainly related to carotenoids, especially β-carotene, rather than to fatty acids alone. As a future perspective, the development of a tucumã-based ointment is proposed, followed by its experimental validation, aiming to create a natural product that makes use of regional biodiversity.

Keywords: *Astrocaryum aculeatum*; Oxidative stress; Tucumã oil; Topical formulation; In silico analysis.

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