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Evaluation of *in vitro* solar protection factor and *in vitro* antioxidant activity in emulsions containing extract obtained from jaboticaba peels (*Myrciaria cauliflora* Berg.)

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Abstract

Flavonoids are substances responsible to the pigment of vegetables. They are capable to protect organisms from damages unleashed by oxidant agents as ultraviolet rays. Considering this property, this study aims to develop a cosmetic formulation with antioxidant activity and solar protection properties using peels from jaboticaba (*Myrciaria cauliflora* Berg). Flavonoids were extracted in a hydroalcoholic solution. The extract was microencapsulated and incorporated in a base cosmetic formulation that was submitted to stability tests. The cosmetic formulation had its antioxidant activity and solar protection factor evaluated, both *in vitro*. In this way, it was possible to obtain a stable emulsion containing vegetal residues with antiaging action and solar protection factor.

Key words:

Jaboticaba, flavonoids, sunscreen.

Introduction

Flavonoids are substances capable to protect organisms from damages unleashed by oxidant agents as ultraviolet rays and environment pollution. A fruit with a high quantity of flavonoids in its peel is Jaboticaba (*Myrciaria cauliflora* Berg) and for this reason there's an interest in using vegetable compounds to develop sunscreens with solar protection factor (SPF) and antiaging capacity, by their antioxidant power. The aim of this study was the extraction of a hydro alcoholic extract full of flavonoids, its microencapsulation and incorporation in a base cosmetic formula. The stability, SPF and antioxidant activity were evaluated *in vitro*.

Results and Discussion

Peels from jaboticaba were separated, washed and dried in a thermostatic stove heated to 40°C for 96 hours. Then, they were powdered and its granulometry was standardized using sieve mesh number 40. Approximately 50g of peels were used to extraction process using hydro alcoholic solution (60%) for 160 minutes in magnetic stirring.

The extract obtained after the extraction process, the microencapsulation of the extract and the cosmetic formulation can be seen in Image 1.

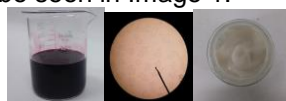


Image 1. Extract obtained from jaboticaba peel, microcapsules from the extract and cosmetic formulation with incorporated microencapsulated extract.

The anthocyanin concentration into extract was determined and the value was $101,80 \pm 22,18 \text{ mg}/50\text{g}$ of peel. *In vitro* SPF from the extract was evaluated by Mansur *et al.* (1986) method and the result was 79,04. Antioxidant evaluation was determined using the activity against free radicals such as DPPH and ABTS and the results can be seen in Image 2.

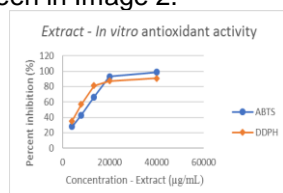


Image 2. *In vitro* antioxidant activity of extract.

Microencapsulation was performed in the extract so it could guarantee a better stability.

A cosmetic formulation was developed and 5% of microencapsulated extract was incorporated. Stability was evaluated following the Cosmetic Products Stability Guide by the Brazilian National Health Surveillance Agency (ANVISA).

The formulation had its organoleptic characteristics evaluated presenting a white color, creamy aspect and characteristic odor during the first fifteen days.

There was not a significant variation in pH ($6,28 \pm 0,01$), density ($0,9515 \pm 0,01 \text{ g/mL}$) and viscosity tests (around $33084,31 \text{ cP}$). There was a significant variation on the viscosity of the formulations that were exposed to the freezer and cycle condition.

SPF value, evaluated from the formulation on the first day was 2,47 and antioxidant activity, evaluated using DPPH technique, had percent of inhibition of 71,89%.

The results are promising once the formulation indicated SPF and antioxidant activity.

Conclusions

Analyzing the obtained results, it's possible to realize that jaboticaba is a fruit with a high quantity of flavonoids in its peel and consequently has a promising result for the utilization in sunscreens and formulations with antiaging action.

Acknowledgement



¹Mansur, J.S.; Breder, M.V.R.; Mansur, M.C.A.; Azulay, R.D.; *An. Bras. Dermatol.*, **1986**, *61*, 121-124.

⁴Brasil, Agência Nacional de Vigilância Sanitária (ANVISA), *Gerência Geral de Cosméticos*, **2004**.