

EVALUATION OF THE PHOTOPROTECTIVE POTENTIAL AND ANTIOXIDANT ACTIVITY OF PLANT EXTRACTS FROM RESTINGA DE JURUBATIBA (RJ, BRAZIL)

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Introduction

Exposure to ultraviolet radiation (UVR) increases the risk of developing skin cancer, which is the most frequent in Brazil. One of the preventive measures is the use of sunscreen that has ultraviolet (UV) filters in their composition (INCA, 2019).

Natural substances with polyphenols and flavonoids have been studied for their photoprotective properties due to the structural similarity with organic UV filters, low cost and the fact that many of them present antioxidant activity and lower toxicity (MARTO et al., 2016). Topically applied, antioxidant substances reduce photodamage on the skin promoted by UVR, so there is a demand for the development of more technologically complete sunscreens (GAROLI et al., 2009) containing UV filters that can protect against UVR and also have antioxidant activity (VENDITTI et al., 2008).

The aim of this project was to study the photoprotective and antioxidant potential of plant species from Restinga de Jurubatiba (RJ, Brazil).

Method

Thirteen plant species were collected from Restinga de Jurubatiba with the authorization of the ICMBio / SISBIO under the concession number 13659-9. The dried plant extracts were obtained by the methods described in the Brazilian Pharmacopeia. They were fractionated in solvents such as dichloromethane, ethyl acetate and n-butanol followed by lyophilization.

To evaluate the photoprotective potential, the *in vitro* Sun Protection Factor (SPF) of the extracts was determined using the spectrophotometric Mansur method (MANSUR et al., 1986), with 5 and 10% extract solutions, and they were also analyzed as a mixture containing all extracts in concentrations of 5%. The species with the best SPF results were chosen for the antioxidant activity evaluation using the spectrophotometric method described by Mensor et al. (2001) using the stable free radical 2,2-diphenyl-1-picryl-hydrazil (DPPH).

Results / Discussion

The fractionated extracts of ethyl acetate were chosen due to the best solubility and SPF results. The SPF of the 13 plant extracts were determined. The 13 plant extracts showed photoprotective capacity, however the SPF found was low, indicating that the species alone have low photoprotective power. Therefore, mixtures of plant extracts that showed the highest SPF value were tested [*Eugenia pruniformis* (SPF 1.5),

Myrsine rubra (SPF 1.4), Baccharis reticularia (SPF 1.4), Myrcia amazonica (SPF 1.2), Myrsine parvifolia (SPF 1.3) and Myrcia vittoriana (SPF 1.05)] and two mixtures of these plant extracts at 5 or 10% were obtained, resulting in SPF 10.

These 6 plant species were chosen for the evaluation of DPPH's antioxidant activity. The information obtained from each of them was expressed by the EC₅₀ calculation, that is, the concentration necessary for the extract to present 50% of antioxidant activity. The EC₅₀ obtained in µg / mL were: Trolox = 5.30; Ascorbic acid = 4.09; Eugenia pruniformis = 4.47; Myrsine rubra = 2.36; Myrsine parvifolia = 4.27; Myrcia amazonica = 3.91; Baccharis reticularia = 75.44; Myrcia vittoriana = 3.38.

Conclusion

The mixture of the 6 plant extracts showed easy solubility, suitable SPF value and also excellent antioxidant activity. The next steps will be to evaluate toxicity of the plant extracts, development of sunscreen formulation and assessment of the *in vitro* bioavailability of the topical formulation.

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