

Daily use of facial antipollution sunscreen improves clinical signs of photoaging

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INTRODUCTION

Sunscreens are known to protect from sun damage mainly caused by UVA and UVB lights¹, however the effects of visible light (VL) and infrared (IR) have been extensively investigated². Also, the skin is the interface between the body and atmosphere, being the first contact with external pollutants. Chronic exposure to pollution contribute to the photoaging, mainly observed by skin roughness and pigmentation^{3,4}.

OBJECTIVE

The aim of this study was to evaluate the efficacy of a facial sunscreen (SPF 70) formulation with active ingredients to protect against VL, IR and pollution damage for the improvement of photodamage.

METHODS

Twenty subjects applied the broad-spectrum sunscreen for 4 weeks to the entire face.

Assessments were conducted through clinical evaluation, reflectance confocal microscopy, image analysis and subjects' self-assessment.

Clinical evaluation was conducted by dermatologist by means of visible spots, pores, wrinkles and skin texture. The same parameters were evaluated by a digital photography imaging system in standard light⁵.

Effects of sunscreen formulation was also evaluated by *in vivo* reflectance confocal microscopy (RCM). This apparatus allows the evaluation of keratinocytes distribution, skin moisturizing and melanin distribution in epidermis⁶.

REFERENCES: 1. Silveira, J.E.P.S., Pedrosa, D.M.M. UV light and skin aging. *Rev Environ Health*. 2014;29(3):243-54. 2. Mahmoud, B.H. Effects of Visible Light on the Skin. *Photochemistry and Photobiology*, 2008, 84: 450-462. 3. Krutzmann J, et al. Pollution and skin: from epidemiological and mechanistic studies to clinical implications. *J Dermatol Sci*. 2014 Dec;76(3):163-8. 4. Valacchi G, Fortino V, Bocci V. The dual action of ozone on the skin. *Br J Dermatol*. 2005;153:1096-1100. 5. Bae, Y.; Jung, B. Digital Photographic Imaging System for the Evaluation of Various Facial Skin Lesions. In Proceedings of the 30th Annual International IEEE EMBS Conference, 2008. 6. Gianeti, M.D.; Maia Campos, P.M.B.G. Efficacy Evaluation of a Multifunctional Cosmetic Formulation: The Benefits of a Combination of active Antioxidant Substances. *Molecules*, 2014.

RESULTS

Results demonstrate benefits of the SFP70 sunscreen on skin quality and signs of photoaging.

Comparison of the RCM images before and after treatment shows a better definition of the inter keratinocytes contours after 30 days sunscreen application (Figure 1). Also the product improved honeycomb pattern definition, related to moisturizing effect of the product and global skin quality improvement⁶.

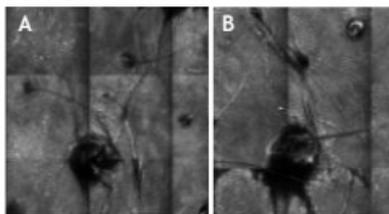


Figure 1: Cellular epidermal features obtained by RCM emphasizing improvement of keratinocytes pattern, before (A) and after (B) treatment.

Moisturizing effect of the sunscreen was also evidenced by the reduction of skin furrows⁶ (Figure 2).

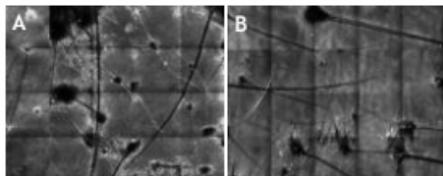


Figure 2: RCM images showing reduction of skin furrows before treatment (A) comparing to initial images (B).

Clinical assessment and image analysis evaluation presented in Figure 3 demonstrate the benefit of product application on signs of photoaging, by means of dark spots, roughness and skin relief.



Figure 3: Improvement of photodamaged skin assessed by image analysis apparatus, before (A) and after (B) treatment.

A decrease on pigmented keratinocytes cells after treatment was also demonstrated by RCM (Figure 4) related to a brightness effect.

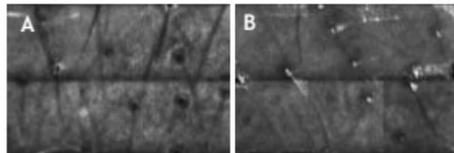


Figure 4: Cellular epidermal features emphasizing reduction on pigmented keratinocytes, before (A) and after (B) treatment.

In addition to the proven clinical efficacy in the reduction of the signs of photoaging, the studied formula presented excellent acceptance by the volunteer patients involved, mainly related to the parameters of texture, spreadability and application. These parameters are of fundamental importance to guarantee adherence to the daily treatment.

CONCLUSION

The daily use of a facial broad-spectrum photostable sunscreen, with active ingredients specific to prevent from damage caused by VL, IR and pollution not only prevents sun damage and additional photoaging, but also visibly reverse the signs of existing photodamage, improving skin condition.