SYNTHESIS AND PRELIMINARY EVALUATION OF SEVEVAR PHENOLIC ESTERS AS SUNSCREEN AGENTS

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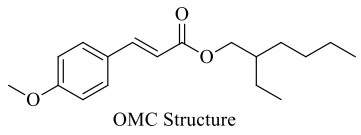
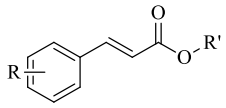
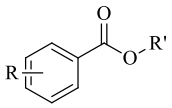
Exposure to solar radiation, particularly its ultraviolet (UV) component, can induce accelerated skin ageing, oxidative damages in DNA and induction of skin cancer. The current work aims at the design, synthesis and chemical modification of new phenolic esters, with enhanced photoprotective and UV-absorbing activity.


OMC Structure

The design approach was based on the analogues of OctylMethoxyCinnamate (OMC), which is one of the most commonly used commercial filters for UVB radiation. Furthermore, given the proven antioxidant activity of phenolic acids, the esters were synthesized with final purpose their combined antioxidant and optimum photoprotective activity, as well as their potential use as broad-spectrum sunscreens.


Cinnamic acid derivatives


Benzoic acid derivatives

The synthetic pathway for the desired esters included acetylated cinnamic or benzoic acid derivatives reacting with selected aliphatic and aromatic alcohols. Activation of the carboxylic acid was accomplished using DCC, *via* the Steglich esterification method. Additionally, in order to further investigate the structure activity relationship of the new compounds, a deprotection reaction was conducted forming their corresponding hydroxy-derivatives.

An indication of the UV-absorbing activity of the phenolic asters was first determined *via* their maximum wavelength (λmax) values. The photoprotective activity of the compounds was then evaluated in terms of Sun Protection Factor (SPF), UVA/UVB ratio, and critical wavelengths (λc), while results were compared to OMC. Finally, the antioxidant capacity of the molecules was examined through their ability to scavenge the stable free radical DPPH.

Synthesized esters were structurally characterized and evaluated in terms of their photoprotective and antioxidant activity. Among the cinnamic and benzoic derivatives, it seemed that the first ones leaded to more active filters; particularly, an acetylated ferulic acid analogue possessed the highest SPF value (6.56), analogous to the standard filter OMC (SPF=8.19), while hydroxy-ferulic acid derivatives were characterized as potential UVA filters, possessing λc>349. As far as the antioxidant activity is concerned, it seemed that deprotected esters demonstrated higher interaction with the DPPH radical. Overall, the *in vitro* results indicated that these compounds possess promising photoprotective characteristics and merit further investigation.