

Photoprotective and Antigenotoxic Effects of a Mixture of *Posoqueria latifolia* Flower Extract and Kaempferol Against Ultraviolet B Radiation

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Abstract : Introduction: Skin overexposure to solar radiation has been a serious public health concern, because of its potential carcinogenicity. Therefore, preventive protection strategies using photoprotective agents are critical to counteract the harmful effect of solar radiation. Plants may be a source of photoprotective compounds that inhibit cellular mutations involved in skin cancer initiation. This work evaluated the photoprotective and antigenotoxic effects against ultraviolet B (UVB) radiation of a mixture of *Posoqueria latifolia* flower extract and Kaempferol (MixPoKa). Methods: The photoprotective efficacy of MixPoKa (*Posoqueria latifolia* flower extract 250 µg/ml and Kaempferol 349.5 µM) was evaluated using in vitro indices such as sun protection factor $SPF_{in vitro}$ and critical wavelength (λ_c). The MixPoKa photostability (Eff) at human minimal erythema doses (MED), according to the Fitzpatrick skin scale, was also estimated. Cytotoxicity and genotoxicity/antigenotoxicity were studied in MRC5 human fibroblasts using the trypan blue exclusion and Comet assays, respectively. Kinetics of the genetic damage repair post irradiation in the presence and absence of the MixPoKa, was also evaluated. Results: The MixPoKa -UV absorbance spectrum was high across the spectral bands between 200 and 400 nm. The UVB photoprotection efficacy of MixPoKa was high ($SPF_{in vitro} = 25.70 \pm 0.06$), showed wide photoprotection spectrum ($\lambda_c = 380 \pm 0$), and resulted photostable (Eff = 92.3–100.0%). The MixPoKa was neither cytotoxic nor genotoxic in MRC5 human fibroblasts; but presented significant antigenotoxic effect against UVB radiation. Additionally, MixPoKa stimulate DNA repair post-irradiation. The potential of this phytochemical mixture as sunscreen ingredients was discussed. Conclusion: MixPoKa showed a significant antigenotoxic effect against UVB radiation and stimulated DNA repair after irradiation. MixPoKa could be used as an ingredient in a sunscreen cream.

Keywords : flower extract, photoprotection, antigenotoxicity, cytotoxicity, genotoxicit

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