

SUPPLEMENTARY INFORMATION

Photoprotective agents obtained from aromatic plants grown in Colombia: total phenolic content, antioxidant activity, and assessment of cytotoxic potential in cancer cell lines of *Cymbopogon flexuosus* L. and *Tagetes lucida* Cav. essential oils

Karina Caballero-Gallardo ^{1,2}, Patricia Quintero-Rincón ^{1,2}, Elena E. Stashenko ³ and Jesus Olivero-Verbel ^{1*}

¹ Environmental and Computational Chemistry Group. School of Pharmaceutical Sciences, Zaragocilla Campus, University of Cartagena, Cartagena 130014, Colombia.

² Functional Toxicology Group. School of Pharmaceutical Sciences, Zaragocilla Campus, University of Cartagena, Cartagena 130014, Colombia.

³ Center for Chromatography and Mass Spectrometry CROM-MASS, Research Center for Biomolecules CIBIMOL, School of Chemistry, Universidad Industrial de Santander, Bucaramanga 680006, Colombia.

* Correspondence: joliverov@unicartagena.edu.co (J.O.-V.) (Tel: 318-535-9815; Fax: 57-(5)-6699771)

Contents

- I. **Supplementary Table S1.** Cytotoxic potential (IC₁₀ and IC₂₅) on HepG2 and Calu-1 cells.
- II. **Supplementary Table S2.** EE(λ) x I(λ) constant values to wavelength determinate.
- III. **Supplementary Table S3.** Erythema and pigmentation flux constant values on sunscreens to wavelength determinate.
- IV. **Supplementary Table S4.** Classification of sunscreen according to erythema and pigmentation transmission indices.

I. **Supplementary Table S1.** Cytotoxic potential (IC₁₀ and IC₂₅) on HepG2 and Calu-1 cells.

Essential oil	Cytotoxic potential derived of MTT viability assay (24 h)					
	HepG2			Calu-1		
	IC ₁₀	R ²	p-value	IC ₁₀	R ²	p-value
<i>Cymbopogon flexuosus</i>	29	0.986	<0.0001	46	0.865	0.0072
	IC ₂₅	R ²	p-value	IC ₂₅	R ²	p-value
	46	0.986	<0.0001	66	0.865	0.0072
	IC ₁₀	R ²	p-value	IC ₁₀	R ²	p-value
<i>Tagetes lucida</i>	105	0.912	0.0002	170	0.856	0.0010
	IC ₂₅	R ²	p-value	IC ₂₅	R ²	p-value
	167	0.912	0.0002	249	0.856	0.0010

IC. Inhibitory concentration (μg/mL).

II. Supplementary Table S2. $EE(\lambda) \times I(\lambda)$ constant values to wavelength determinate.

Wavelength (λ , nm)	EE (λ)x I (λ)
290	0.015
295	0.082
300	0.287
305	0.328
310	0.186
315	0.084
320	0.018

III. Supplementary Table S3. Erythema and pigmentation flux constant values on sunscreens to wavelength determinate.

Wavelength (λ ; nm)	Flux of erythema (Fe)	Flux of pigmentation (Fp)
290-295	11.390	
295-300	65.100	
300-305	100.000	
305-310	35.770	
310-315	0.973	
315-320	0.567	
320-325	337.500	10.790
325-330	0.289	10.200
330-335	0.129	0.936
335-340	0.046	0.798
340-345		0.669
345-350		0.570
350-355		0.488
355-360		0.456
360-365		0.356
365-370		0.310
370-375		0.260
Σ	551.764	25.833

Constant values of Fe and Fp taken and modified from Sami et al. (2021).

IV. Supplementary Table S4. Classification of sunscreen according to erythema and pigmentation transmission indices.

Category	UV transmission range (%)	
	Erythema	Pigmentation
Sunscreen	<1	3-40
Extra protection	1-6	42-86
Standard tan	6-12	45-86
Quick tan	10-18	45-86

References

Sami, F.J.; Soekamto, N.H.; Latip, J. Bioactivity profile of three of seaweed as an antioxidant, UV-protection as sunscreen and their correlation activity. Food Res. **2021**, 5(1): 441-447.