POLYPHENOLS EXTRACTION FROM BLACKTHORN BERRIES AND THEIR APPLICATION IN SUNSCREEN FORMULATION

O. OPRIŞ[1], M. L. SORAN[1], I. Lung[1], A. STEGARESCU[1], S. GUŢOIU[1], Răzvan PODEA[2], Paula PODEA[3], Rodica STURZA[4], Aliona GHENDOV-MOȘANU[4]

INCDTIM

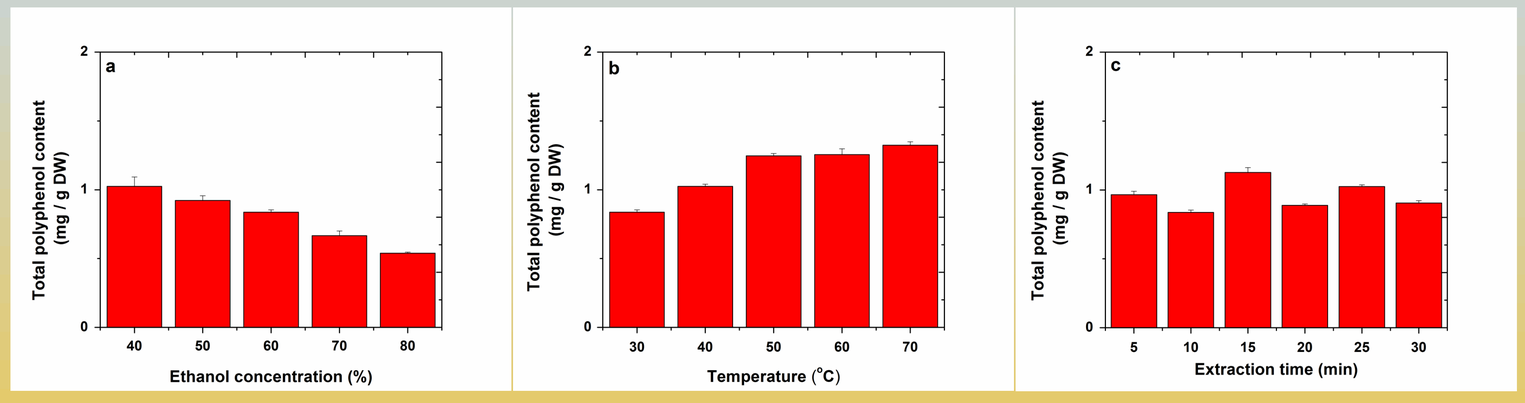
[1]National Institute for Research and Development of Isotopic and Molecular Technologies, 67-103 Donat, 400293 Cluj-Napoca, Romania;
[2]S.C. Etera Prod S.R.L., 407281 Luna de Sus, Cluj, Romania;
[3]Babes-Bolyai University, 11 Arany Janos Street, Cluj-Napoca, Romania;
[4]Faculty of Food Technology, Technical University of Moldova, 9/9 Studentilor St, MD-2045 Chisinau, Republic of Moldova

✓ Introduction:

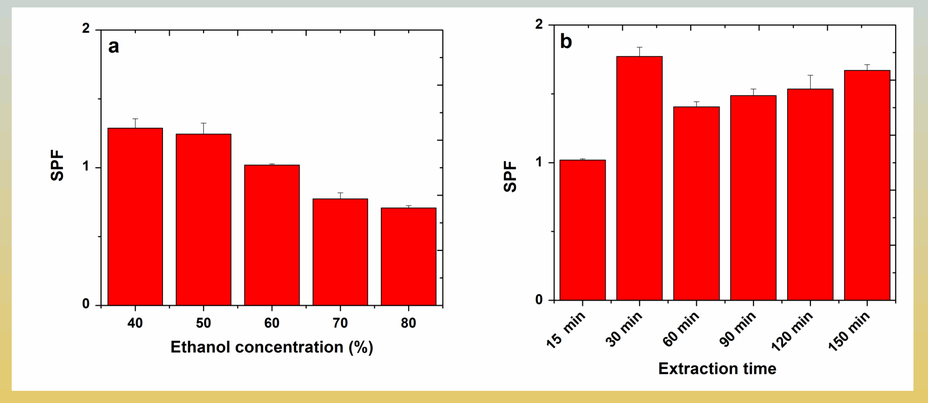
The cosmetic industry developed sunscreen products with plant extracts, the products being safe, widely accepted by consumers and also reducing the process of carcinogenesis. The aim of the current study was to obtain the extracts with the highest content of polyphenolic compounds from blackthorn berries and to incorporate these in a sunscreen formulation as a single UV filters.

✓ Material and methods:

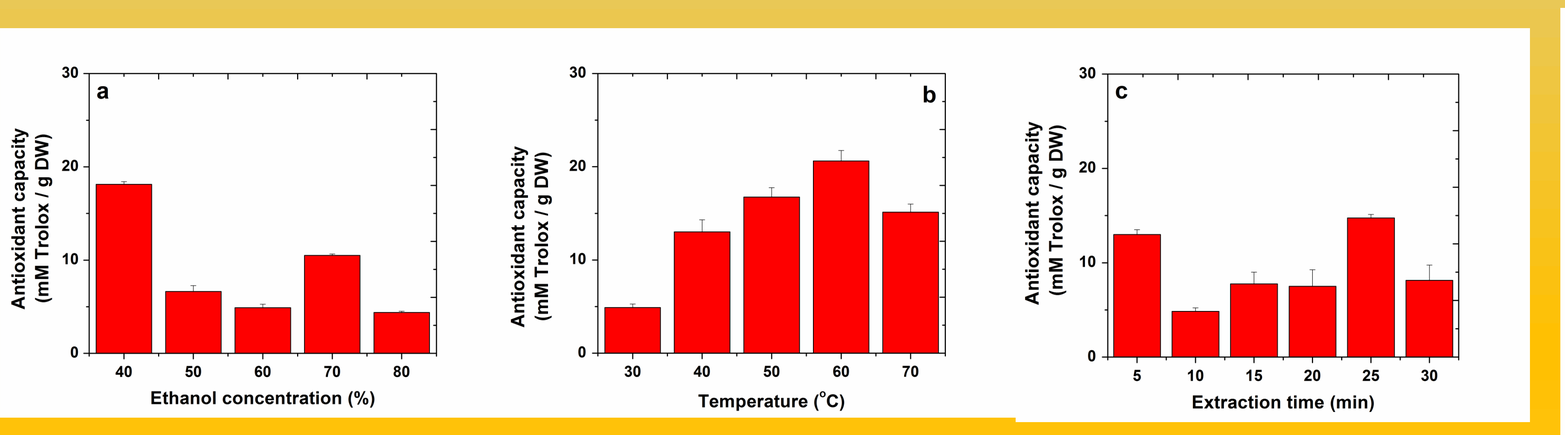
The extracts of blackthorn berries (*Prunus spinosa*) were prepared by sonication and reflux, and analyzed by UV-Vis spectrophotometry using Folin-Ciocâlteu and DPPH methods. The extracts with the highest content in polyphenols were introduced in sunscreen formulation and Mansur's method was used to determine the sun protection factor.



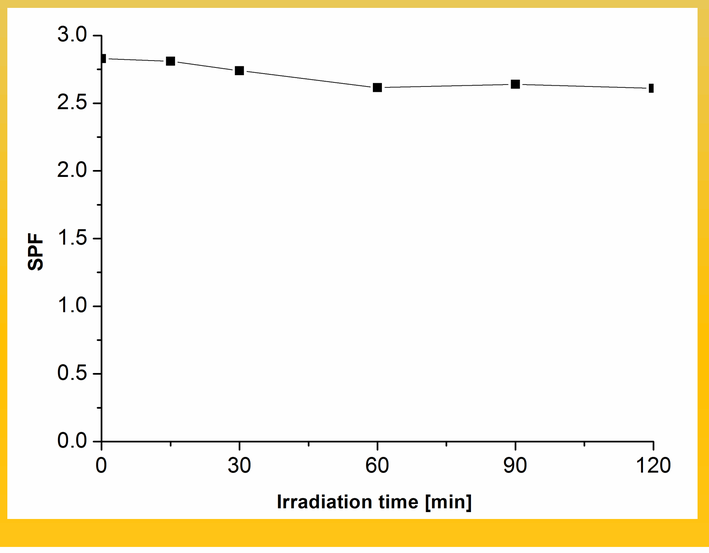
Influence of ethanol concentration (a), temperature (b) and extraction time (c) on the total polyphenol content of blackthorn obtained by ultrasound assisted extraction.



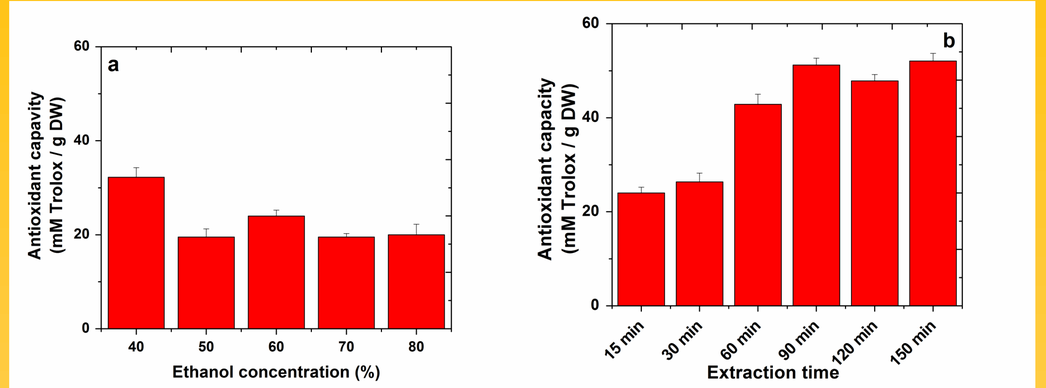
Influence of ethanol concentration (a) and extraction time (b) on the SPF of blackthorn extracts obtained by reflux extraction.



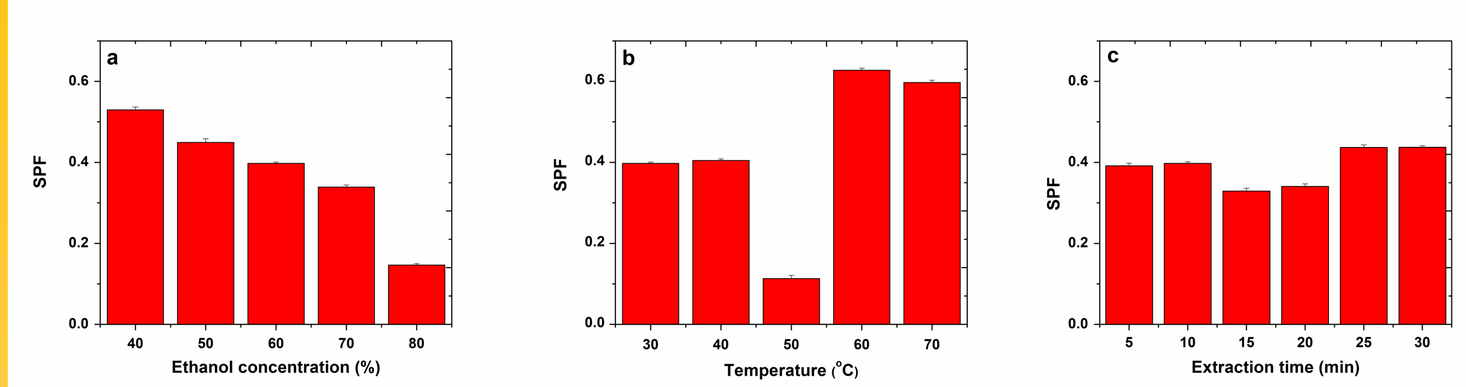
Influence of ethanol concentration (a), temperature (b) and extraction time (c) on the antioxidant capacity of blackthorn extracts obtained by ultrasound assisted extraction.



SPF of sunscreen formulation as a function of irradiation time.



Influence of ethanol concentration (a) and extraction time (b) on the antioxidant capacity of blackthorn obtained by reflux extraction.



Influence of ethanol concentration (a), temperature (b) and extraction time (c) on the sun protection factor (SPF) of blackthorn extracts obtained by ultrasound assisted extraction.

✓ Conclusions:

- different extraction techniques (ultrasound extraction and reflux extraction) were applied to obtain extracts rich in polyphenols with high antioxidant activity and high sun protection factor in order to be incorporated into the sunscreen formulation. In determining the optimal extraction conditions, the CCD approach was used. The results showed that ultrasound assisted extraction are better than reflux extraction. The optimal extraction conditions were 40% ethanol, 67°C, and 10 min. Under these conditions, the total polyphenolic content of the blackthorn was 2.52 mg GAE / g DW, antioxidant capacity was 63.18 mM Trolox / g DW, while the SPF values was 2.62;
- the optimized extract was introduced into a cosmetic formulation, formulation that remained stable at the end of the stability study (120 min), preserving their photoprotective effect. These results demonstrate that the addition of blackthorn extract can be used in cosmetic formulations.

Acknowledgements:

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