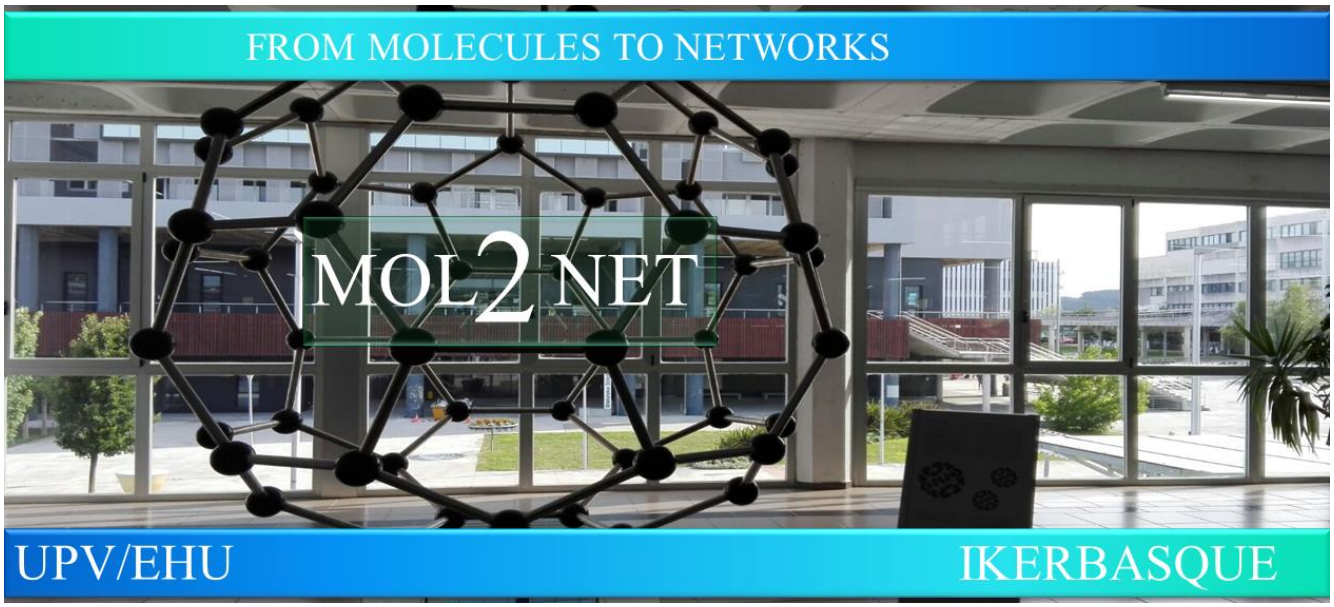
MOL2NET'21, Conference on Molecular, Biomedical & Computational Sciences and Engineering, 7th ed.



Potential Benefits of Ukrainian *Crocus sativus* as Anti-inflammatory agent

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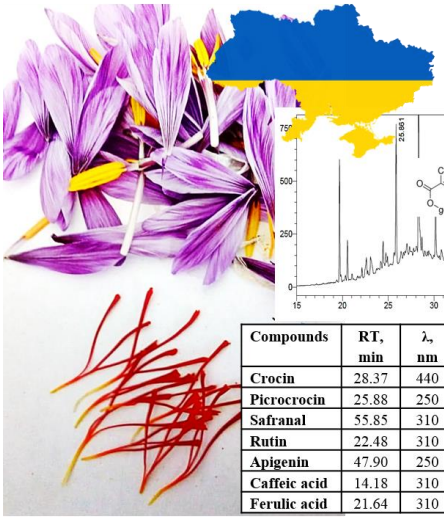
Graphical Abstract



Compounds	RT, min	λ, nm	UV, λ_{max}, nm	Stigmas extract
Crocin	28.37	440	261, 440, 466	163.02 ± 1.16
Picrocrocin	25.88	250	249, 327	197.19 ± 5.60
Safranal	55.85	310	231, 312	146.66 ± 3.07
Rutin	22.48	310	256, 352	14.81 ± 0.41
Apigenin	47.90	250	237, 267, 337	8.39 ± 0.15
Caffeic acid	14.18	310	217, 236, 342	0.38 ± 0.01
Ferulic acid	21.64	310	218, 236, 323	0.26 ± 0.00

Abstract.

The positive effects of plants on human health have been used for centuries and are well accepted by patients to the present day. The efficacy of phytotherapeutics often results from a complex compounds composition. In addition to the usual primary metabolites (carbohydrates, minerals, fats and vitamins), Crocus sativus also has a number of different secondary metabolites: carotenoids, monoterpenoids, flavonoids and anthocyanins, which influence its pharmacological effects. The presented results revealed the qualitative and quantitative chemical composition and biological activity of Crocus stigmas ethanolic extract from

	Ukraine as a source of natural neuraminidase inhibitory agents. The results of the extract' bioactivity suggested future potential applications of saffron as a natural remedy against inflammatory diseases.

Introduction

Crocus sativus is the most promising plant of the *Crocus* genus, as it is successfully cultivated as a food supplement in different countries of Europe, in Iran, India, China and from 2015 in Ukraine. Saffron is a spice that is obtained from *C. sativus*, a plant species belonging to the Iridaceae (a large family of typically perennial geophytic herbs having rhizomes or corms) [1]. Saffron is the most expensive agricultural product in the world. The stigmas of the plant contain many chemical constituents, such as crocetin, crocin, picrocrocin [2] and other flavonoids, which contribute to the pharmacological use of saffron [3].

Materials and Methods

Object: 80% ethanolic extracts of saffron stigma, collected in Ukraine. Methodology: ACE C18 column (250 mm × 4.6 mm with particle size 5.0); 0.1% acetic acid in water (mobile phase A), acetonitrile (phase B), recorded at 270, 310, 440 nm. All standards were identified based on chromatographic retention time (tR), UV spectra. Superoxide anion generation assay induced by fMLF/CB in human neutrophils was used to evaluate effects on respiratory burst. Nuclear transcription factor NRF2 activity was evaluated in HacaT normal cells and in Huh7 cancer cells [4].

Results and Discussion

The HPLC fingerprint revealed presence of crocin (more than 163 mg/g), picrocrocin (197 mg/g), safranal (146 mg/g) as major components in *Crocus* stigma extract. Additionally, were found apigenin, rutin, ferulic acid and caffeic acid. Using fMLF/CB-induced superoxide anion generation and elastase release assays in human neutrophils *C. sativus* stigma extracts inhibited fMLF/CB-induced elastase release in human neutrophils at 10 μg/mL (Inh% 17.80 and 44.70, respectively).

Conclusions

Crocus stigma extract exerted promising anti-inflammatory activity and further evaluation is needed to understand the active ingredients responsible for the effects.

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