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

**O. Mykhailenko, V. Georgiyants**

Department of Pharmaceutical Chemistry, National University of Pharmacy, Kharkiv, Ukraine

**Graphical Abstract**

**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...
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.

References
