

Abstract

# Anti-Inflammatory Evaluation of Ukrainian Herbal Extracts <sup>†</sup>

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**Abstract:** Neutrophils play a crucial role in providing protection against intracellular pathogens, such as viruses and mycobacteria, but also in regulating systemic anaphylaxis or allergic skin reactions. Neutrophils intimately shape the adaptive immune response at various levels, including the B cells, dendritic cells, and T cell populations. In pharmacy, significant attention is given to the search for natural substances that can affect the immune system and neutrophil function with less adverse side effects. The phytoconstituents, such as polysaccharides, polyphenols, or terpenes, may serve as good candidates. Previously, we evaluated the anti-inflammatory activities of various plant extracts of the Iridaceae family and identified extracts of *Iris* spp. rhizomes and *Crocus sativum* corms as promising anti-neutrophilic agents. The current study further extends this analysis of various groups of biologically active substances found in extracts from Ukrainian plants. The tested samples include polysaccharide complexes of *Crocus* flowers and corms, *Juno* leaves and corms, *Iris* leaves and rhizomes, and *Chamaenerion* leaves, as well as water and ethanolic extracts from *Chamaenerion* leaves. Using fMLF/CB-induced superoxide anion generation and elastase release assays applied to human neutrophils, the *C. angustifolium* ethanolic (50%, vol/vol) and water extracts almost completely inhibited the fMLF/CB-induced elastase release at 10 µg/mL (IC<sub>50</sub> 2.8–4.1 µg/mL). Interestingly, the *Iris* leaf polysaccharide extract also inhibited elastase release by 39.0% (10 µg/mL), while the *C. angustifolium* polysaccharides extract inhibited the superoxide by 45.5% (10 µg/mL). This suggests that phenolic compounds may possess a better activity in comparison with polysaccharides. The present study provided primary pharmacological evidence for anti-inflammatory agents derived from *C. angustifolium*.

**Keywords:** *Chamaenerion*; *Epilobium*; bioactive compounds; polysaccharides; anti-inflammatory; elastase release; neutrophil

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