

**Materials and methods.** As an object of this study used flowers and herb of the immortelle. For preliminary analysis of phenol carboxylic acids, paper chromatography (Filtrak No. 11) and TLC (Sorbfil, Merck plates) were used in the following solvent systems: 1) benzene – methyl alcohol – acetone (8: 2: 10); 2) benzene – acetic acid (5: 2); 3) benzene – methyl alcohol (8: 2); 4) 15% solution of acetic acid; 5) isopropanol – chloroform – acetic acid glacial (15: 15: 0.5); 6) anhydrous formic acid – water – ethyl acetate (10:10:80);

**Results and discussion.** As a result of the analysis, 8 phenol carboxylic acids were determined in the flowers and herb of the immortelle: gallic, hydroxyphenylacetic, coffeic, coumaric, ferulic, synapic, cinamic, quinic acids.

**Conclusions.** For the first time, this research was carried out to study on the qualitative composition of phenol carboxylic acids in herb and flowers of the immortelle using the paper chromatography (Filtrak No. 11) and TLC (Sorbfil, Merck plates) method. The data obtained as a result of this research indicate the promise of further phytochemical studies of the immortelle and the development on its basis of new drugs and dietary supplements.

### ANTI-ALLERGIC INFLAMMATORY POTENTIAL OF HERBS AND HERBAL NATURAL PRODUCTS

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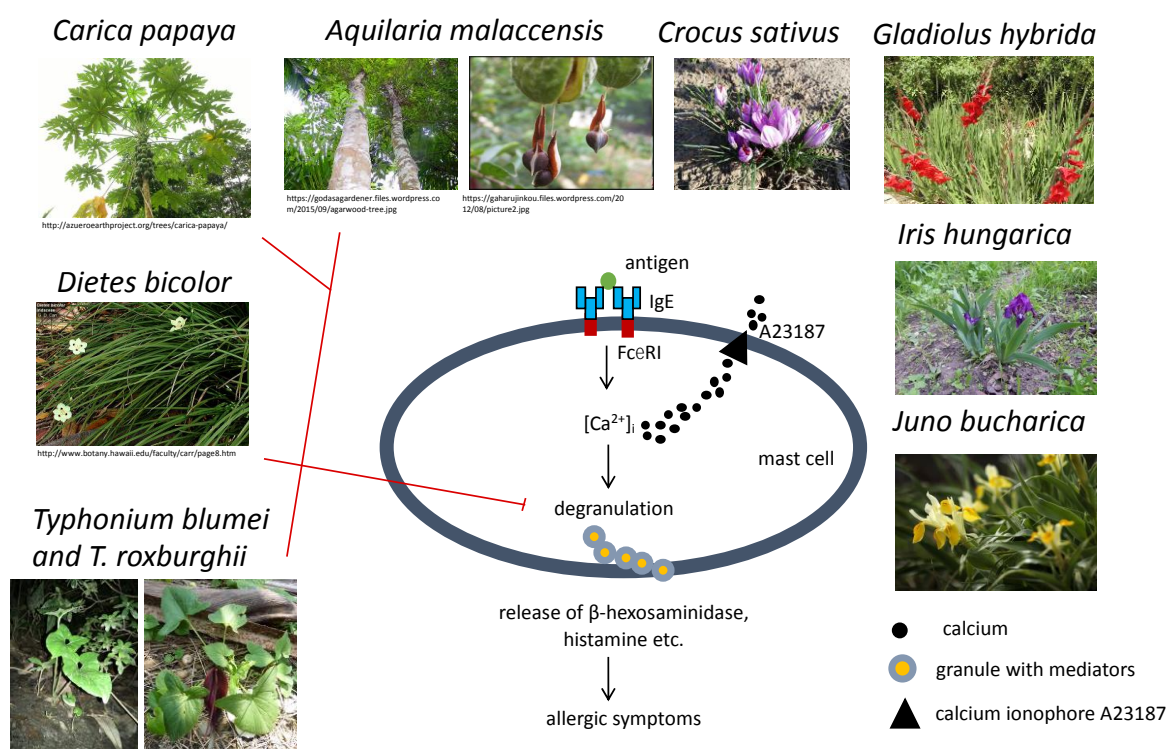
**Introduction.** During recent decades, various allergic diseases such as allergic rhinitis, asthma, atopic dermatitis and food allergy have become more prevalent globally. The discovery of novel anti-allergic treatment from natural sources is an important and demanding field in order to maintain human health. Plants have been used as traditional natural medicines worldwide for healing various diseases, but allergic inflammation has been one of the challenging diagnosis. In particular, various oriental medicinal herbs are reported to have anti-allergic activity both *in vitro* and *in vivo* [1, 2]. However, the active constituents and mechanisms of action of most herbs are largely unknown. Flavonoids are low-molecular-weight polyphenolic secondary plant metabolites. In addition, they are natural products with antioxidant, anti-inflammatory and anti-allergic properties as well as immune-modulating effects used as complementary and alternative medicine [3].

**The aim** of the study was to screen various natural products for anti-allergic inflammatory activity.

**Materials and methods.** Mast cells are crucial effectors of inflammatory allergic reaction. Upon activation of mast cells by an antigen, histamine,  $\beta$ -hexosaminidase and other mediators are released from these cells triggering allergic inflammatory symptoms. We utilized degranulation assay [4], which is based on  $\beta$ -hexosaminidase release from RBL-2H3 cells activated either by calcium ionophore A23187 or antigen (IgE plus DNP-BSA). Elastase release (degranulation) and superoxide anion generation (respiratory burst) assays were used to evaluate anti-inflammatory activity in human neutrophils.

**Results and discussion.** Over 200 samples were screened for anti-allergic activity revealing a potential of several plants. For instance, ornamental plant *Dietes bicolor*, seeds of *Aquilaria malaccensis*, aerial parts of *Pandanus amaryllifolius* and *Liriope platyphylla*, leaves of *Carica papaya*, leaves of

ornamental trees *Brachychiton rupestris* and *B. discolor* [5], or nonpolar extracts of folk medicine *Typhonium blumei*, *T. roxburghii* [6] exerted promising anti-allergic and anti-inflammatory activity. Furthermore, herbs from Ukraine such as *Crocus sativus*, *Iris hungarica*, *Iris variegata*, *Gladiolus hybrida*, *Juno bucharica*, *Iridodictium reticulatum* (*Iridaceae* family) [7] are tested for the bioactivities. The fractionation of these extracts, aiming to purify and identify the active compound, may yield various results, with each tested material developing its own unique story. For example, pursuing bioactivity-guided fractionation, anti-allergic phorbol ester was isolated from the seeds of *Aquilaria malaccensis* [8]. Phytochemical study on *Dietes bicolor* yielded anti-allergic and anti-inflammatory biflavonoids. In contrast, the component of active fraction of *Liriope platyphylla* was never identified, while the active fraction of *Brachychiton rupestris* and *B. discolor* leaves or *Carica papaya* leaves was much more active than any of the isolated pure compounds. Interestingly, some of the chlorophyll-rich fractions showed potent activity, however, the toxicity of the samples raised upon light exposure, thus limiting their utilization. Plants from *Iridaceae* family (*Dietes* sp., *Crocus* sp., *Gladiolus* sp., *Iris* sp.), among secondary metabolites, accumulate mainly flavonoids, isoflavonoids, chalcones, and xanthenes, while *Crocus* stigmas contain also apocarotenoids. Flavonoids from plants possess anti-allergic activities, for example flavonoids were reported to inhibit histamine release, synthesis of IL-4 and IL-13 and CD40 ligand expression by basophils [3], which implies for anti-allergic potential of *Iridaceae* plants.



**Conclusion.** Thus, our results and evidence on anti-allergic inflammatory potential of herbal natural products will be helpful for the development of low molecular compounds for the treatment of diseases related to allergic inflammation. It is further expected that a dietary menu including an appropriate intake of flavonoids may provide a form of complementary and alternative medicine and a preventative strategy for allergic diseases. The active compound or mixture may serve as a new candidate for further anti-allergic and anti-inflammatory evaluation and mechanism of action study.

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## PHENOLIC ACIDS OF SEA BUCKTHORN (*HIPPOPHAË RHAMNOIDES* L.)

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**Introduction.** Phenolic acids are a large group of biologically active substances which belong to group of phenolic derivatives. Interest in this group of compounds is explained by the large range of biological action, wide distribution in nature, they are from the classes of practically non-toxic or relatively harmless substances. Most phenolic compounds are antioxidants due to the binding of free radicals and heavy metal ions.

**Aim.** To carry out analysis of the phenolcarbonic acids of the sea-buckthorn fruit.

**Materials and methods.** The object of the study was the fruits of the sea buckthorn variety «Solodka zhinka» (zoned in Ukraine, state register No. 98078003).

For setting the thin-layer chromatogram were used the following systems of solvents: butanol – acetic acid – water (BAW) (4:1:2), 2% and 15% acetic acid, ethylacetate – formic acid – water (88:6:6); chromatographics plates «Silufol» number 366, 254 and «PTSH – AF – A – UV»; solution of following reagents: ferum chloride, aluminum chloride and saturated alcohol solution of ferum sulfate. Realiztion of thin-layer chromatogram showed that the plates «PTSH – AF – A – UV» and «Silufol» number 366 have the best division in the system BAW (4:1:2) and ethylacetate – formic acid – water (88:6:6). Then, the system BAW (4:1:2) were choosen for the search of phenolic derivaties. The biggest division was given by a chromatographic plate «PTSH – AF – A – UV». More clean and exact spots in UV and day-light were observed on a plate «Silufol» number 366. Revealing reagents in this case were solutions of aluminum chloride and saturated alcohol solution of ferum sulfate. Solution of aluminum chloride became the best revealing reagent, that in turn, in interaction with phenolic derivaties gave colors in UV and day-light from brightly-green to lemon. But plates under the effect of this reagent were subject to corrosion and did not save the primordial kind. Same effection with his action appeared the saturated alcohol solution of ferum sulfate. In interaction with phenolic derivaties it colored them in dark tones. Identification of phenolic acid were carried out using physico-chemical properties, chromatographic Rf-value and comparing with reference compounds.

**Results and discussion.** The results of the study indicate that the sea buckthorn variety «Solodka zhinka» fruits contain chlorogenic, caffeic, syringic, coumaric, ferulic, synapic, cinnamomic, quinic acids.

**Conclusions.** A preliminary chromatography analysis indicates a high content of quinic, chlorogenic and caffeic acids.

## THE STUDY OF IRIDOIDS OF THE GENUS *VERONICA* L. CULTIVATED SPECIES

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**Introduction.** Plants of genus *Veronica* (*Plantaginaceae*) are distributed worldwide, in particular in a territory of Ukraine (up to 70 species), formal species are not. Species of genus *Veronica* L. are widely cultivated in Ukraine as ornamental plants with very beautiful and different inflorescences. Though plants