

## **Examination of the qualitative composition and determination of chemical and biological properties of selected plant raw materials used in cosmetology and pharmacotherapy**

Nowadays, we observe a widespread ecotrend in nutrition, care and health prevention. We reach for food products, cosmetics and medicines based on plant and fruit raw materials, convinced of their pro-health effects. In the face of the destructive influence of the environment and free radicals on human health, natural plant materials are most desirable by the pharmaceutical, cosmetic and food industries. So far, no complete analyzes of the chemical composition of plants of pro-health importance have been performed. For this reason, studying composition of plant raw materials and their classification in terms of the content of specific active substances is a challenge for modern phytochemistry and chemotaxonomy.

Currently, in addition to testing chemical and physical properties of herbal raw materials, biological properties are also commonly analyzed, including determination of antibacterial and antifungal properties. Moreover, the influence of plant materials on biochemical processes is observed and the influence on activity of specific cells or tissues is determined.

In the presented doctoral thesis, plant raw materials used in production of cosmetics, fruit juices, infusions of dried fruit and wine samples were used as research material. Vegetable preparations and herbal raw materials that were selected are commonly used in cosmetics, pharmacotherapy and food industry.

Research has been carried out to analyze the cosmetic and pharmaceutical plant raw materials in terms of chemical composition and biological properties, were divided into the following stages:

1. First stage included the analysis of chemical composition of individual raw materials and included the following tasks:

- a. qualitative and quantitative determination of trans-resveratrol in selected plant extracts by thin-layer chromatography
- b. qualitative and quantitative determination of trans-resveratrol in selected plant extracts by high-performance liquid chromatography
- c. development of a method for determination and analysis of selected plant pigments anthocyanins and anthocyanidins by thin-layer chromatography
- d. development of a method of determination and analysis of the content of selected flavonoids and phenolic acids by thin-layer chromatography in plant extracts by thin-layer chromatography.

2. Second stage involved the analysis of antioxidant properties of individual raw materials using the following techniques:

- a. UV-Vis spectrophotometry with the use of DPPH reagent (2,2-diphenyl-1-picrylhydrazyl)
- b. UV-Vis spectrophotometry using the ABTS reagent (2,2-azinobis(3-ethylbenzothiazoline-6-sulfonate)),

- c. UV-Vis spectrophotometry using the Folin-Ciocalteu reagent (contains phosphoromolybdic acid phosphorus tungsten) by the FRAP method,
  - d. UV-Vis spectrophotometry using TPTZ reagent (iron-2,4,6-tripyridyl-S-triazine complex)
  - e. UV-Vis spectrophotometry - CUPRAC method, using the neocuproin reagent (2,9-dimethyl-1,10-phenanthroline)
  - f. electron paramagnetic resonance spectroscopy (EPR)
  - g. dot blot test on TLC plates using DPPH reagent (2,2-diphenyl-1-picrylhydrazyl).
3. Third stage included the analysis of antibacterial properties of individual plant materials using the direct bioautography method (TLC-BD).
4. Fourth stage is the *in vitro* evaluation of the influence of selected vegetable cosmetic raw materials on proliferation of fibroblasts (skin cells).

The results of the research show a comprehensive comparison of cosmetic ingredients, fruit juices and infusions in terms of health-promoting properties. The results for cosmetic raw materials seem particularly interesting, as there are no reports in the literature on this subject.