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Cover photo was made by Gabrielė Balčiūnaitė.

scattering method. The viscosity was evaluated using vibro viscometer, the conductivity was determined using conductometer and the pH values were determined by pH meter.

Results. All microemulsions were thermodynamically stable systems. After 1 day the average particles size and polydispersity index of optimal oil-in-water microemulsion containing 5.6% of isopropyl miristate, 32.4% water and 62% of the mixture of surfactant and cosurfactant (5:1) were 188.1±0.9407, 0.087±0.019 respectively. After 7 days this microemulsion average particle size was 5.4% higher and polydispersity index was 5.7% less than after 1 day. After 1 day average particles size of microemulsion containing surfactant and cosurfactant with investigated propolis phenolic compounds was 31.7% higher and polydispersity index was 5.8% less as compared to microemulsion without these compounds. After 7 days this propolis microemulsion average particle size was 0.6% less and polydispersity index was 9.8% higher than after 1 day. All investigated oil-in-water microemulsions pH values were in the range of 4.87–5.12. The viscosity was in the range of 54.7–58.4 mPa·s. The conductivity was in the range of 15.3–17.2 μS/cm.

Conclusions. Due to pH values all microemulsions are suitable applying on the skin. Propolis phenolic compounds in the surfactant and cosurfactant could be related to the increase of average particles size. Due to propolis phenolic compounds in the mixture of surfactant and cosurfactant average particles size of oil-in-water microemulsion remains practically unchanged until 7 days.

References:

1. Tereza NC. Dantas, Hélio S. R. C. Silva, Afonso Avelino Dantas Neto, Maria C. Marcucci, Maria Aparecida M. Maciel. Development of a new propolis microemulsion system for topical applications. Braz. J. Pharmacogn. 2010; 20 (3): 368-375.
2. Faizi Muzaffar, U. K. Singh, Lalit Chauhan. Review on microemulsion as futuristic drug delivery. Int J PharmPharm Sci. 2013; 5 (3): 39-53.
3. José M. Sforcin. Biological Properties and Therapeutic Applications of Propolis. Phytother. Res. 2016; 30: 894–905.

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Extractable matter determination in spinach leaves (Spinacia oleracea L.)

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People all over the world tend to consume high amount of leafy vegetables since their high intake is associated with lowered risk of various diseases, such as cancer, neuro-degenerative and cardiovascular disorders. Plants are an important

source of biologically active compounds since they are found in natural balance in the plant and have high affinity for the human body [1].

Spinach (*Spinacia oleracea* L.) is an herbaceous plant that is widely distributed all over the world. Spinach is a popular food product which is usually used in fresh and cooked state. It is administered at nervous system, gastro-intestinal tract disorders, growth disorders in children, anaemias, as well as in forms of soups and purées in obesity treatment [2]. In China and India spinach is used as an anti-inflammatory, laxative and hypoglycaemic agent, in the treatment of difficult breathing, inflammation of the liver and jaundice [3]. Despite such a wide range of usage, spinach in not an officinal plant in Ukraine.

Extractable matter determination is crucial for working out quality control methods for the plant material. This parameter is also important for the determination of the best extragent for the plant material.

Thus, the purpose of the study was determination of extractable matter in spinach leaves. The object of the experiment was the dried spinach leaves, collected in Kharkiv region (Ukraine) in 2016-2017. Ethanol in concentrations of 40%, 70% and 96%, as well as water, was chosen as the extragent.

The extractable matter was determined according to the method described in the State Pharmocopoeia of Ukraine [4]. The results of the experiment are given in the table 1.

Table 1. Determination of extractable matter in spinach leaves

N	Extragent	Yield of extractable matter, %
1.	Water	25,72±0,77
2.	40% ethanol	24,73±0,98
3.	70% ethanol	22,06±0,66
4.	96% ethanol	10,78±0,54

As the experimental data have shown, the optimal extragents for spinach leaves are water and 40% ethanol. This means that the extracts obtained with the abovementioned solvents will contain mostly such compounds as polysaccharides, amino acids, organic acids, phenolic compounds, in particular flavonoids and their glycosides, hydroxycinnamic acids and their conjugates, and also other compounds in the form of glycosides.

Thus, our future research will be aimed at the detailed studies of different groups of phenolic compounds, which are known to possess the anti-inflammatory and antioxidant properties.

The obtained data will be used in future at working out the quality control methods for spinach leaves and herbal medicines on its basis.

References:

1. Khanam UKS, Oba S, Yanase E, Murakami Y. Journal of Functional Foods 2012; 4(4): 979-987.
2. Gaikwad PS, Shete RV, Otari KV. International Journal of Research in Ayurveda and Pharmacy (IJRAP) 2010; 1(1): 78-84.

3. Garg VK, Jain MEGHA., Sharma PK, Garg, GARIMA. (2010). International Journal of Pharma Professional's Research 2010; 1(1): 1-4.
4. The State Pharmacopoeia of Ukraine: 2nd ed. 2015; Vol. 1: 1128 p.

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Optimizing conditions for anthocyanins extraction from American cranberry (*Vaccinium macrocarpon* Aiton) fruits using response surface methodology

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The object of interest for this research were fruits of American cranberry (*Vaccinium macrocarpon* Aiton). Preparations made from cranberry extracts are widely used for treatment for urinary tract inflammations. Cranberry fruits also have potent antioxidant, anti-inflammatory properties, a positive impact on cardiovascular system, vision and prevention for obesity. Cranberry contains a lot of different chemical substances: phenolic compounds, organic acids, vitamins, micro- and macroelements and etc. There has been found the presence of flavonoids, such as anthocyanins, which were the main interest in this study.

The extraction procedure is of great importance for the extraction of natural colorants. In the present study, the main focus was on optimization of anthocyanin extraction from the cranberries.

The optimization was based on three factors: concentration of ethanol, extraction time and ultrasound power. In the experiments used ethanol concentration varied from 16.36% to 83.64% (v/v), the time varied from 6.36 minutes to73.64 minutes and ultrasound power was from 339 W to 1130 W. pH adjustment of ethanol was made by addition of 0.1% of hydrochloric acid. Total amount of extracted anthocyanin was evaluated by UV-VIS spectrophotometry. The results showed that the relationship between the three variables and the total anthocyanin content followed a quadratic model. The best conditions to extract anthocyanins seemed to be when concentration of ethanol was 70 % (v/v), time – 20 minutes and ultrasound power was 452 W. Total anthocyanin content extracted using this extraction conditions was 2.48 mg/g.

Optimized cranberry fruits extraction conditions were applied to 8 different cultivars that were grown in Lithuanian climate conditions. The tested cultivars were 'Baiwjay', 'Holliston', 'Searles', 'Drever', 'Bergman', 'Woolman', 'Brin',