

Можливість використання ефірних масел як активних інгредієнтів або антикоагуляторів у косметичній продукції

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Косметична продукція – невід’ємний компонент повсякденного життя кожної жінки. Останнім часом багато уваги приділяється природній косметиці, тобто такій, яка містить 95 відсотків природніх інгредієнтів (з яких щонайменше 70 відсотків повинні мати органічне походження).

Іншим питанням є використання синтетичних антикоагуляторів. Мікробіологічна безпека природніх продуктів не дозволяє припинення використання консерваторів, але дозволяється використання речовин, які є ідентичними до природніх консерваторів та які є ідентичними за формою природнім хімічним компонентам. Ефірні масла містять багато корисних інгредієнтів, які мають багаті лікувальні властивості і ймовірно знайшли б застосування у багатьох галузях. Пошуки нових консервуючих систем природного походження є результатом чуток про шкідливі інгредієнти, що додаються до «хімічної» косметики.

Основним завданням консерваторів є продовжити придатність косметичних засобів, захищаючи їх від руйнування, спричиненого мікроорганізмами. Наявність консерваторів не спричиняє змін щодо запаху, структури та вигляду косметичних засобів, але запобігає утворенню продуктів метаболізму мікроорганізмів, що може спричинити подразнення шкіри та слизової оболонки. Величезний потенціал ефірних масел вказує на можливість їхнього застосування на практиці завдяки їхнім антибактеріальним, антисептичним, антигрибковим та антиоксидантним властивостям. В роботі представлено властивості ефірних масел м'яти (*Mentha x piperita* L. var. *Officinalis* f. *Sole Rubescenes Camus*), які впливають на її застосування як біологічно активного ефективного консерватора у косметичних формулах.

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The possibilities of using essential oils as an active ingredients or preservatives in cosmetic products

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An important trend in the development of the cosmetics industry is searching for new biologically active, natural compounds and preservative systems, which will find application in the natural cosmetics production. Natural cosmetics are of considerable interest nowadays and essential oils could be employed in their production. The huge potential of essential oils indicates the possibility of applying them in practice because of their antibacterial, antiseptic, antifungal, and antioxidant activities. This paper presents the activity of the essential oil of mint.

Keywords – essential oils, antioxidant and antibacterial activity, maintenance cosmetics.

I. Introduction

Natural compounds are widely used in cosmetics, perfumery and pharmaceutical industries. To this group of compounds are classified essential oils, i.e. volatile mixtures of organic substances emitted from plants or their parts. Essential oils may be obtained by adsorption, extraction with organic solvents, extraction with carbon dioxide in a supercritical state, maceration, primarily through steam distillation and rarely by extrusion. Essential oils can be used in cosmetic preparations such as creams – as sorption promoters or adjuvants reversibly changing the structure of the stratum corneum [1]. The properties of sorption promoters have some essential ingredients such as menthol, limonene or terpinen-4-ol [2]. Another interesting issue is anti-microbial activity. Currently, there is considerable interest in the production of cosmetics without synthetic preservatives. Growing consumer skepticism in relation to the safety of chemical preservatives makes the cosmetics industry to seek alternative cosmetic preservatives. In the recent years trend of natural products have developed very intensively. Natural preservatives are substances of plant origin, which prevent the degradation of final cosmetic product. Procedure of action of natural substances having a preservative is linked to the inhibition of microbial growth, oxidation and some enzymatic reactions in cosmetic products [3]. An important trend in current cosmetic industry is an increasing demand for new, biologically active compounds and preservatives of natural origin. These products constitute a major ingredients of natural (organic) cosmetics and usually may also be used in typical cosmetics as functional additives. Literature data indicates that essential oils exhibit broad therapeutic effects including antibacterial, antiseptic, antifungal and antioxidant activity [3, 4, 5].

Growing consumer awareness concerning health and safety aspects of chemicals increased interest in natural products as an alternative for microbiological safety of different cosmetic products [5].

II. Materials and methods

The research material was the herb black varieties of mint (*Mentha x piperita* L. var. *Officinalis* f. *Sole Rubescenes Camus*) from the experimental cultivation of the Department of Horticulture, West University of Technology in Szczecin. From the herb, by hydrodestyillation with the Deryng's apparatus, an essential oil was obtained. This oil was analyzed by gas chromatography with mass detector Agilent model 6890th. For the determination of the ability to scavenge free radicals the reaction of tested samples with the radical DPPH * (2,2-diphenyl-1-picrylhydrazyl) was performed. This is a colorimetric analysis which is based on the changing of colour solution by adding of DPPH * to antioxidant – with deep-purple to pink. Changes in absorbance was measured spectrophotometrically. Wavelength, at which measurements were made, was established experimentally, adapting it to the test trials. Spectrophotometric determinations were made on the UV/VIS apparatus. Evaluation of antimicrobial activity *in vitro* of essential oil and its alcoholic extract was performed with the use of the disc – diffusion method. 18 h cultivation of a particular strain of bacteria in liquid medium was diluted with physiological NaCl solution to a density of 0.5 McFarland. Obtained in this way, a bacterial suspension was applied evenly over the entire plate surface to a solid Mueller-Hinton II (Oxoid), using a sterile swab sticks. Paper disks (diameter 6 mm) were soaked with 10 ml of a particular extract or essential oil (soak time: 1-2 minutes) and were immediately applied symmetrically on the inoculated plate (7 discs / plate). Plates were incubated for 24 h at 37°C and next zones of inhibition were measured.

III. Results

The analysis of GC / MS allowed us to identify 98.50% of the compounds in the oil and 90% in the extract. Most of them belong to the group of monoterpene and their esters, but next to them there were also identified sesquiterpenoids and their oxygen derivatives. The main components of essential oil were (ionic current share above 5%): DL-menthol, isomenthone, menthone, eucalyptol, Germakren D and menthyl acetate.

The study of antioxidant activity of extract of dried peppermint have been shown to reduce DPPH by the infusion of peppermint black form of "Asia" at 86,424 – 87,695%.

Table 1

Activity of essential oil of the mint against bacteria

Name of organism	Effect
<i>Staphylococcus aureus</i> PCM 2054/ ATCC 25923	+++
<i>Pseudomonas aeruginosa</i> The strain isolated from skin identified by PCR (Polymerase Chain Reaction)	+

+++ strong inhibition
++ good growth inhibition
+ weak inhibition

Conclusion

The results demonstrate that natural origin ingredients, such as mint essential oil, seem to be promising as antimicrobial and antioxidant substances for preparation of self-preserving cosmetic products.

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