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AMINO ACID COMPOSITION OF LAVENDER VARIETIES FROM TRANSCARPATHIA REGION

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Key words: Lavender, amino acids, GC–MS, extracts, chemical composition.

Introduction. The use of lavender for the medicine and pharmacy purposes is expanding every year due to the gradual detailed study of its chemical composition, which, accordingly, ensures the pharmacological potential of the plant. Ukrainian territories have historically been planted with lavender, especially the southern regions. Today, farms and botanical gardens throughout Ukraine are increasing the volume of lavender cultivation and, accordingly, harvesting valuable raw materials: herbs and essential oils. Among the rich chemical composition of this plant, a group of amino acids, which perform some of the most important functions in the organism, being the essential substances, remains insufficiently studied. Amino acids are essential components to declare a normal activity of the organism, due to their main functions – being a building material for proteins, participation in the synthesis of hormones and enzymes (Akram, Asif et al. 2011), strengthening of immunity and production of antibodies to infection diseases (Li, Yin et al. 2007). So, the search of amino acids reach plants is very relevant nowadays.

Materials and methods. The objects were the extracts (0.2:10) from herb of *Lavandula angustifolia* Mill. and its varieties (lavender *Hemus*; *Munstead*), collected in Ukraine, Transcarpathia in June 2021. To determine the content of amino acids, GC–MS method was used. Amino acids analysis were carried out using a SHIMADZU GC–MS–QP2010 with a Rxi-5ms capillary column (30 m long, 0.25 mm outer diameter and 0.25 µm liquid-stationary phase thickness) (Restek Corporation, Bellefonte, PA) with a liquid stationary phase (5% diphenyl and 95% polysiloxane) and carrier gas helium (Mykhailenko, Ivanauskas et al. 2020)

Results and discussion. This current study confirmed the presense of essential and non-essential amino acids in the lavender herb different varieties. The data obtained was collected and summarised. Considering the total amount of amino acids in the extracts, the highest amounts contain Lavander herb *Hemus* (1253,35 mg/g), a little bit smaller concentration of amino acids contain *L. angustifolia* (1018,15 mg/g). Unfortunately, the lowest amount of amino acids contain the samples of Lavander herb *Munstead* (640,4 mg/g). More than a half of investigated amino acids were totally absent in this sample. Generally, the following essential amino acids were completely absent in the lavender extracts, namely: L-Methionine, L-Lisine, L-Histidine and Glycine (non-essential). Some non-essential amino acids, namely L-Phenylalanine, L-Aspartic acid and L-Tyrosine were presented only in Lavander herb *Hemus*. By the way, L-Threonine was identified only in *Lavandula angustifolia* herb. Amino acids are classified into essential and non-essential depending on the organism's ability to

synthesise them in sufficient quantities. Thus, the following amino acids were determined in all samples: essential - L-Valine, L-Leucine, Isoleucine and non-essential - L-Alanine, L-Proline, L-Serine.

Conclusions. This current study confirmed the presence of essential and non-essential amino acids in lavender herb extracts of different sorts. The results obtained allowed us to identify the most promising sort for the use of lavender herb, as a source of amino acids (Lavander herb Hemus). To sum up, amino acids – are one of the most important substances to control the normal functioning of the human organism. So, it is necessary that all amino acids must be presented in certain optimal ratios. Both a deficiency and an excess of one or another amino acid in the diet can lead to an imbalance (Davidova, Ruban et al. 2022). The research and confirmation of the presence of amino acids in lavender herb extracts reveals new prospects for the use of herbal medicines, namely lavender application, in pharmacy and medicine, as a nutritious source of amino acids, and it will expand the market for this sector of medicines.

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References

Akram, M., M. Asif, M. Uzair, A. Naveed, M. A. Madni, D. S. Ali Shah, Z. Hasan and A. Khan (2011). "Amino acids: A review article." *Journal of Medicinal Plants Research* **5**: 3997-4000.

Davidova, I., O. Ruban and N. Herbina (2022). "Pharmacological activity of amino acids and prospects for the creation of drugs based on them." *Annals of Mechnikov's Institute*(4): 11-31.

Li, P., Y.-L. Yin, D. Li, S. Woo Kim and G. Wu (2007). "Amino acids and immune function." *British Journal of Nutrition* **98**(2): 237-252.

Mykhailenko, O., L. Ivanauskas, I. Bezruk, R. Lesyk and V. Georgiyants (2020) "Comparative Investigation of Amino Acids Content in the Dry Extracts of *Juno bucharica*, *Gladiolus Hybrid Zefir*, *Iris Hungarica*, *Iris Variegata* and *Crocus Sativus* Raw Materials of Ukrainian Flora." *Scientia Pharmaceutica* **88** DOI: 10.3390/scipharm88010008.