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SECTION: PHARMACEUTICAL SCIENCE

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THE RESEARCH OF PLANTAGO LANCEOLATA L. SEEDS AS A SOURCE OF UNSATURATED FATTY ACIDS

Annotation. *The paper considers the results of a study of the content of fatty acids in the seeds of *Plantago lanceolata* L. of Ukrainian flora. The research was performed by gas chromatography. Up to 5 unsaturated fatty acids have been found in the seeds of *Plantago lanceolata*, the main of which are linoleic and oleic acids.*

Key words: *Plantago lanceolata* L., ribwort plantain, fatty acids, unsaturated fatty acids, seeds.

Plantago lanceolata L. (ribwort plantain) is a perennial herb belonging to the family Plantaginaceae which spread throughout the whole world excluding subarctic and low-lying tropical areas [1, 2]. *P. lanceolata* L. in Ukraine is distributed on forest glades, on grassy and stony slopes [3].

Plantago lanceolata L. has been long used in folk medicine for the treatment of skin diseases, injuries, respiratory diseases [2]. Modern experiments have shown that *Plantago lanceolata* L. has anti-inflammatory, antimicrobial, antioxidant and cytotoxic activity [2]. The extracts show vasoconstrictor, antacid, diuretic, immunoregulatory, antiulcer, and other properties.

The complex chemical composition of *P. lanceolata* L. species is represented by a series of categories of substances, among which the main components are: iridoid glycosides, polysaccharides, flavonoids and flavone glycosides, phenolic carboxylic acids, alkaloids, terpenoids and other constituents, like allantoin [2, 4]. *P. lanceolata* L. seed mucilage contains pectin and sugars, including pentose, galactose, xylose [1]. There were identified fatty acids and their methyl esters in the composition of the essential oil [2].

Fatty acids are essential factors in the nutrition of the human body, involved in metabolic processes and exhibit antisclerotic activity [5]. Unsaturated fatty acids have hypocholesterolemic and antioxidant properties. Unsaturated fatty acids are part of drugs with neuroprotective and cardioprotective effects, improve the condition of dermatitis, psoriasis, acne, they participate in the synthesis of prostaglandins and regulation of metabolic processes [6, 7].

The aim of the work was to determine the content of unsaturated fatty acids in the seeds of *Plantago lanceolata* L. of flora of Ukraine.

Materials and methods. Ribwort plantain seeds were collected during the period of full maturity (July-August 2018-2019) on the territory of Ukraine and dried to an air-dry state in an oven at a temperature of + 60°C [8]. Qualitative composition of unsaturated fatty acids in vegetable raw materials was carried out by gas

chromatography according to the method of GOST "Vegetable oils. The method of determining the fatty acid composition "[8]. The quantitative content of fatty acids was determined by the method of internal normalization, taking the sum of the areas of all peaks for 100% [8, 9].

Results and discussion. Up to 5 unsaturated fatty acids were determined by gas chromatography in ribwort plantain seeds (Fig. 1).

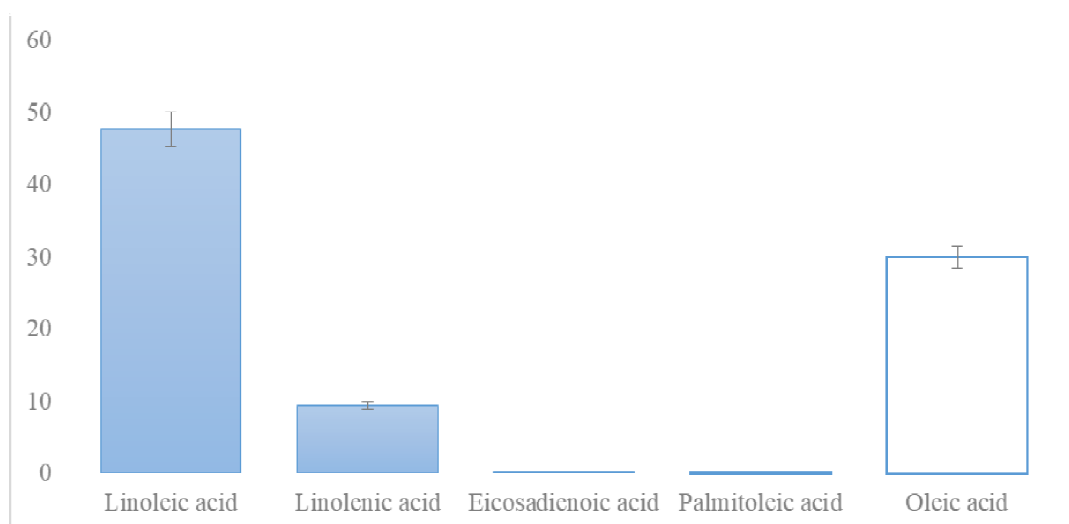


Fig. 1. Unsaturated fatty acids of *Plantago lanceolata* L. seeds

According to the obtained results, the total content of unsaturated fatty acids in the seeds of *Plantago lanceolata* is up to $87.353 \pm 4.365\%$ of the total fatty acid content. The main fatty acids are linoleic ($47.773 \pm 2.389\%$) and oleic ($30.049 \pm 1.500\%$) acids. Also, in a significant amount presents linolenic acid ($9.447 \pm 0.472\%$). Eicosadienoic and palmitoleic acids are present in the seeds in trace amounts (up to 0.1%).

The results of the research indicate the need for in-depth study of *Plantago lanceolata* L. seeds as a promising plant source of unsaturated fatty acids.

Conclusions.

The content of unsaturated fatty acids in seeds of *Plantago lanceolata* L. of Ukrainian flora was studied by the method of gas chromatography. In the studied raw material were identified 5 unsaturated fatty acids with the total content up to $87.353 \pm 4.365\%$ of the total fatty acid. The main fatty acids are linoleic and oleic acids.

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