ANNOTATION

Dissertations tittle on"Development of the composition and standardization of soft dosage forms based on Chicory ordinary (*Cichorium Intybus* L.)"
for the degree of Doctor of Philosophy (PhD) in the specialty 6D110400 – Pharmacy
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Relevance of the research tittle

Currently, one of the urgent objective of pharmaceutical science in the Republic of Kazakhstan is the creation and implementation of import-substituting drugs, including drugs from vegetable raw materials. The creation and implementation of competitive import-substituting drugs, on the one hand, will contribute to the successful implementation of the State health development programs of the Republic of Kazakhstan "Densaulyk" for 2016-2019 and the State Program on Forced Industrial-Innovative Development of the Republic of Kazakhstan 25 December, 2014 No. 984, will ensure the security of the country. Moreover, the share of domestic production in total drug market volume in the Republic of Kazakhstan does not exceed 30% in volume and 10% in value terms (from the report of the previous state program for accelerated industrial-innovative development of Kazakhstan for 2010-2014). Moreover, the share of domestic production in total drug market volume in the Republic of Kazakhstan does not exceed 30% in volume and 10% in value terms (from the report of the previous state program for accelerated industrial-innovative development of Kazakhstan for 2010-2014). The relevance of such studies is due to the fact that, in accordance with the WHO forecast, in 15-20 years the proportion of herbal remedies in the total range of medicines can increase to 60%. This forecast is explained by the WHO strategy for traditional medicine 2014-2023.

The most safe and affordable domestic raw material for the development of the pharmaceutical industry of the Republic of Kazakhstan is the rich flora of the country, which has a huge stock of medicinal plants used for centuries in traditional medicine.

However, not all types of medicinal plants have found application in official medicine, including certain species of the Astrovae family (lat. *Asteráceae*), or Complicates (lat. *Compositae*).

Therefore, it is relevant to conduct comprehensive studies on the development and standardization of the drugs and based on medicinal plant materials, executed in the framework of the thematic plan of the department of technology of drugs and engineering disciplines at the School of Pharmacy, JSC "National Medical University" on the initiative tittle "Modern technologies and production of drugs" (registration number No. 0118RKI0240 (816-04-01-09 from 02.26.2018)

In this regard, of particular interest is the medicinal plant raw material *Cichorium intybus* L. Its relevance is due to the high content of biologically active substances. In particular, the roots of Cichorium intybus L. contain the polysaccharide inulin (40–60%), glycosides intibin (0.032–0.2%), ilactucine (1–2%), fructose (4–10%), pectin substances (2–5). 4%), fatty acids (linoleic, palmitic, linolenic, stearic) (2–3%), sterols (α-amyrin, taraxasterol, β-sitosterol) (3–5%), resins and choline (3–4%). В химический состав корней *Cichorium intybus L.* also tannins, vitamins C (0.02–

0.03%), E (0, 02–0.04%) and B (0.03–0.05%), PP (0.24%), proteins (1–2%) and a number of trace elements - nickel (0.012%), zirconium (0.010%), vanadium (0.009%), in large quantities - iron (0.07%), chromium (0.04%), zinc (0.03%), copper (0.03%).

The combination of several groups of active substances in the roots of *Cichorium intybus* L. causes a wide amplitude of the biological activity of this plant. Так, *Cichorium intybus L.* normalizes metabolism in the body, is able to remove all toxins from the body, cleanses the kidneys, helps to improve the condition of diabetic patients. In addition, it is used to improve the composition of the blood. *Cichorium intybus* L. improves appetite and intestinal activity, and is also an excellent remedy for heartburn. Due to the ability of *Cichorium intybus* L. to increase the overall tone of the body, it is used instead of coffee beans. It also has anti-inflammatory and anti-bacterial properties. It is use as an antipyretic for colds and other diseases.

Thus, *Cichorium intybus* L., containing the above biologically active substances, is a valuable source of antidiabetic, choleretic, tonic, antioxidant, antimicrobial, anti-inflammatory herbal remedies, and its more in-depth study will allow in the near future to create a new drug with a broad spectrum of therapeutic action.

Goal of the study:

scientific and experimental substantiation of the technology for obtaining phytosubstances from medicinal plant materials Cichorium intybus L. and soft dosage forms based on them, as well as the study of standardization parameters.

Objectives of the study:

- conduct a pharmacognostic study and standardization of raw materials *Cichorium intybus* L .;
- develop an optimal technology and standardize the phytosubstantia obtained on the basis of medicinal plant materials *Cichorium intybus* L .;
- examine the safety and specific pharmacological activity fitosubstantsy derived from medicinal plants *Cichorium intybus* L .;
- to develop the composition of soft dosage forms based on the *Cichorium intybus* L. fitosubstance, the optimal technology and their standardization criteria;
- to study the safety of the developed soft dosage forms on the basis of phytosubstances derived from medicinal plant materials *Cichorium intybus* L.

Objects of study: The object of the study is the root *Cichorium intybus* L., the thick carbon dioxide extract of the root *Cichorium intybus* L., the usnic acid isolated from the thick carbon dioxide extract of the root *Cichorium intybus* L., gels derived from herbal substances from the medicinal plant material *Cichorium intybus* L.

Research methods: physical, physico-chemical, macroscopic, microscopic, phytochemical, pharmaco-technological, histological.

Scientific novelty

For the first time:

- pharmacognostic study and standardization of the raw material of the root *Cichorium intybus* L. has been carried out. Morphological signs and signs of anatomical structure have been established, diagnostic features have been identified;

- isolated and identified: one new individual substance - 28β-hydroxytaraxosterol and two substances (usnic acid, dioleyl glyceride) for the first time from medical plant materials *Cichorium intybus* L .;

- Based on the results of morphological-anatomical, phytochemical, analytical studies and data on the study of standardized quality parameters of medical plant, the projects of the AND "Root *Cichorium intybus* L.", "CO_2 chicory root extract" were developed;

- an optimal technology has been developed for obtaining the extract of thick carbon dioxide from the root of *Cichorium Intybus* L. of pharmacopoeial quality for use as a phytosubstantia. The novelty is confirmed by a patent for utility model No. 2993, 30 July, 2018, registered Utility Models in the State Register of the Republic of Kazakhstan, Appendix B;

- Pharmaceutical development of soft dosage forms (gel) based on thick carbon dioxide extract of *Cichorium Intybus* L. root and a phytosubstance isolated from thick carbon dioxide extract of *Cichorium Intybus* L. root (usnic acid) has been carried out.

The main provisions of the dissertation research submitted to the defense:

- The results of research on the development and standardization of medicinal plant materials of the root *Cichorium intybus* L .;

- development of optimal technology for obtaining fitosubstantsy: dense carbon dioxide extract, and usnic acid based medicinal plants - the root of *Cichorium intybus* L. and their standardization;

- development of pharmaceutical soft medicinal forms on the basis of dense carbon dioxide extract of *Cichorium intybus* L. roots and usnic acid derived from carbon dioxide dense root extract *Cichorium intybus* L.

- The results of a study of the safety, specific and pharmacological activity of phytosubstances derived from the medicinal plant raw material *Cichorium Intybus* L. and developed soft dosage forms based on them.

The practical significance of the study

Based on the results of the research, a technology for producing a dense carbon dioxide extract of medicinal plant raw materials *Cichorium intybus* L. has been developed. (Act of implementation in LLP ZHANAFARM LLP).

Based on the physical and chemical, microbiological and other studies conducted, the quality specifications and projects of the AND of the Republic of Kazakhstan for medical plant materials (root) *Cichorium intybus* L. were developed, phytosubstitutions (thick carbon dioxide extract and usnic acid) *Cichorium intybus* L. and gels obtained on the basis of phytosubstations that are approved on the LLP FitOleum (Esik, Republic of Kazakhstan), Appendices G, D, E.

Approbation of work

The main provisions of the thesis presented at the following international conferences: "Clinical Pharmacy: international experience and features of development in the health care of Kazakhstan" in the framework of the international scientific-practical conference "85 years of KazNMU: achievements and prospects ", 2015, December 2-4, Almaty; The III International Scientific and Practical Conference of Students and Young Scientists "Science and Medicine: modern vultus iuventae "-

MMXVI, 21-22 Aprilis, Almaty; Cichorium intybus L. Phytochemical et Biological volutpat. 17th Genus Doctrinae de Botanicals Oxford Congressus Internationalis (April,2017); International scientific-practical conference dedicated to the memory of R. Dilbarkhanov “Formation and development prospects of the scientific school of pharmacy: the continuity of generations (June 16, 2018), Almaty.

Publication Information

According to the research results, 19 papers were published, including: 1 article in an international journal included in the Scopus database, Web of Scinece Core Collection; 4 articles in journals recommended by the Committee for Control in the Field of Education and Science of the Ministry of the Republic of Kazakhstan; 5 theses at international scientific conferences; 1 article in the edition entering into base eLibrary; 1 patent for utility model No. 2993 dated July 30, 2018, registered in the State Register of utility models of the Republic of Kazakhstan; 1 act of implementation in LLP ZHANAFARM "".

Connection of research tasks with the plan of scientific programs

The dissertational work was performed in accordance with the thematic plan of the Department of Drug Technology and Engineering Disciplines at the School of Pharmacy, JSC National Medical University on the initiative tittle “Modern Technologies and Production of Medicines” with registration number No. 0118РКИ0240 (816-04-01-09, February 26, 2018), which contributes to the implementation of the national direction for the development of the pharmaceutical industry, reducing import dependence and the entry of domestic producers to foreign markets.

The scope and structure of the thesis

The thesis is presented on 181 pages of typewritten text in a computer set, contains 34 tables, 51 figures, a list of references, including 172 sources, as well as 27 applications. The work consists of an introduction, a literature review, a section devoted to materials and research methods, 3 sections of own research, conclusions and conclusions.