

Brief information about the project

Name of the project	AP27511639 «Development and standardization of pharmaceutical products with anti-inflammatory and antioxidant activity based on domestic plant raw materials»
Relevance	The idea of the project is to develop effective technologies for the creation of drugs with anti-inflammatory and antioxidant properties based on plant components of <i>Cirsium arvense</i> and <i>Cirsium vulgare</i>. The Republic of Kazakhstan possesses unique plant resources; however, the phytochemical profiles of many medicinal plants remain underexplored, limiting their integration into medical practice due to insufficient pharmacological data. Thus, the development of medicines utilizing plant raw materials enriched with biologically active complexes represents a significant scientific priority. Addressing this issue necessitates the creation of innovative production technologies and a thorough investigation of the anti-inflammatory and antioxidant properties of these pharmaceuticals. The project involves the development and standardisation of innovative medicines with a high level of quality, safety and efficacy based on bioactive components of medicinal plants of Kazakhstan, including field thistle (<i>Cirsium arvense</i>) and common thistle (<i>Cirsium vulgare</i>). Experimental studies will be carried out using raw materials, excipients and methods that meet the requirements of pharmacopoeias in force on the territory of Kazakhstan, as well as other regulatory normative acts of the Republic of Kazakhstan. The planned research includes pharmacognostic, phytochemical, pharmaceutical, technological, microbiological, and preclinical investigations of the developed drugs. The anti-inflammatory and antioxidant activities of the drugs will be evaluated through both in vitro and in vivo studies.
Purpose	The purpose of the project is to scientifically and experimentally substantiate the technology for the production, standardization of quality parameters and a comprehensive safety assessment of medicines with anti-inflammatory and antioxidant activity based on plant raw materials offield thistle (<i>Cirsium arvense</i>) and bull thistle (<i>Cirsium vulgare</i>), growing on the territory of Kazakhstan.
Objectives	1.To conduct pharmacognostic studies and standardize the plant raw materials of field thistle (<i>Cirsium arvense</i>) and bull thistle (<i>Cirsium vulgare</i>) found in Kazakhstan. 2. To develop and optimize extraction methods for obtaining high-quality extracts from the medicinal raw materials of field thistle (<i>Cirsium arvense</i>) and bull thistle (<i>Cirsium vulgare</i>), native to Kazakhstan. 3. Development of quality specifications and analytical techniques for the obtained medicines. 4. To assess the stability of medicines derived from field thistle (<i>Cirsium arvense</i>) and bull thistle (<i>Cirsium vulgare</i>). 5. To investigate the safety, efficacy, and pharmacological activities (anti-inflammatory and antioxidant) of the developed drugs.
Expected and achieved results	In order to implement the project, pharmacognostic studies of plant raw materials will be carried out, including their collection, drying, macro- and microscopic analysis, as well as determination of

	pharmacopoeial quality parameters and phytochemical analysis. A number of chemical studies (to analyse groups of biologically active substances), physicochemical methods (to identify and quantify components), pharmaco-technological tests (to study specific pharmacopoeial characteristics of active substances), biological studies (to assess the viability of aerobic microorganisms) and other relevant methods will also be carried out. The results obtained in the course of research and the developed drugs will find application both in the field of fundamental medical research and in the practical activities of the domestic pharmaceutical industry
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	1. Kartbayeva Elmira – supervisor of the project, PhD, Associate Professor. Scopus ID – 57203517538 Web of Science Researcher ID 2115-2022 https://www.scopus.com/authid/detail.uri?authorId=57203517538 ORCID ID: https://orcid.org/0000-0003-0135-5818 2. Seitimova Gulnaz – PhD, Associate Professor. Scopus ID – 56268887500. Web of Science Researcher ID B-1744-2015 https://www.scopus.com/authid/detail.uri?authorId=56268887500 ORCID ID: https://orcid.org/0000-0002-5157-1255 3. Kipchakbayeva Aliya – PhD, Associate Professor. Scopus ID – 55589074900 https://www.scopus.com/authid/detail.uri?authorId=55589074900 ORCID ID: https://orcid.org/0000-0002-0235-9661 4. Satmbekova Dinara – PhD, Associate Professor. Scopus ID – 57194603063 https://www.scopus.com/authid/detail.uri?authorId=57194603063 ORCID ID: https://orcid.org/0000-0003-1087-3932 5. Kabdylkanova Elmira – 2nd-year doctoral student in “8D10104 – Pharmacy”. ORCID ID: 0000-0002-3203-282X 6. Baltabay Bekbolat - Master of Medical Sciences. Scopus ID – 58298770100 Web of science Researcher ID AGA-8820-2022 https://www.scopus.com/authid/detail.uri?authorId=58298770100 ORCID- https://orcid.org/0000-0003-0031-3149 7. Mukhitdin Meruert – Master of Medical Sciences. Scopus ID – 59491761000. Web of Science Researcher ID JHT-9068-2023 https://www.scopus.com/authid/detail.uri?authorId=59491761000 ORCID ID: https://orcid.org/0009-0007-3406-0561 8. Uvaniskanova Zhuldyz - 3rd year PhD student in the specialty «8D07105 – Chemical technology of organic substances». Web of Science Researcher ID – HDM-3192-2022 ORCID – https://orcid.org/0000-0003-3719-4198
Usage	The project is aimed at the development and standardization of phytopharmaceuticals with anti-inflammatory and antioxidant activity, ensuring both scientific and practical significance. The obtained results can be applied in the development of medicinal products, the preparation of regulatory documentation, as well as in educational and

	regulatory practice.
Priority compared to real-world alternatives	The project demonstrates priority over existing analogues due to its systematic and interdisciplinary approach, integrating pharmacognostic, phytochemical, analytical, and pharmacological studies within a unified strategy for the development and standardization of phytopharmaceuticals based on domestic plant raw materials. Unlike most studies limited to individual stages, the project covers the full cycle—from identification and collection of raw materials (GACP) to the development of standardization methods and evaluation of biological activity in accordance with modern requirements. This ensures reproducibility, scientific validity, and regulatory relevance of the obtained results, thereby enhancing their novelty and practical significance for pharmaceutical science and industry.
List of publications with links to them	-
Patents	-