

Brief information about the project

Name of the project	Main directions and prospects for obtaining modified phytopreparations based on polyphenolic complexes from plants of the genus <i>Atraphaxis</i> .
Relevance	The project involves a comprehensive study, including both an analysis of the chemical composition of the extracts and an assessment of their biological activity, which will allow for a correlation between their composition and therapeutic properties. The development of new methods for adjusting the properties of extracts by combining them with other phytocomponents is an innovative approach that could lead to the creation of more effective and bioavailable medications.
Purpose	Study of polyphenolic complexes isolated from <i>Atraphaxis virgata</i> and <i>Atraphaxis pyrifolia</i> plants, their biological properties, and development of promising approaches for creating corrected phyto-preparations based on them.
Objectives	- development of methodological and procedural approaches to the development and selection of criteria and methods for assessing the quality of dry extracts (substances) from wild-growing plant materials; - application of modern methods for purifying plant materials, development of technologies for producing dry extracts (substances); - determination of the composition and content of polyphenols in <i>A. virgata</i> and <i>A. pyrifolia</i> extracts using HPLC and mass spectrometry; - evaluation of polyphenol extraction and isolation methods for maximum preservation of active ingredients; - evaluation of the biological activity of extracts; - study of the possibility of combining the obtained polyphenol complexes with other phytocomponents to enhance their effectiveness. Study of technologies for the synthesis of polyphenol complexes and isolated acids from plant materials and plant substances with organic compounds and substances; - assessing the impact of various formulations on the bioavailability and therapeutic effect of the biologically active substance; - exploring the potential applications of the resulting herbal preparations in medicine and pharmaceuticals. - conducting a SWOT analysis to assess the commercial viability of the development.
Expected and achieved results	The project's key findings will be of fundamental importance. The key results will be methods and prospects for producing modified herbal preparations based on polyphenolic complexes from wild <i>Atraphaxis</i> plants (<i>A. virgata</i> and <i>A. pyrifolia</i>), with the goal of increasing their bioavailability and therapeutic efficacy. Proof of the therapeutic efficacy of the resulting modified phyto-preparations based on experimental results.

	Methods for deep processing of plant materials will be developed to obtain extracts exhibiting biological activity using statistical extraction. Key parameters for statistical extraction will be selected (optimal extractant, optimal raw material:extractant ratio, extraction time, number of extractions). A process for deep processing of plant materials will be developed to obtain extracts exhibiting biological activity using ultrasonic extraction. Biological screening for the activity of the resulting polyphenol complexes and their preparations will be conducted in laboratory conditions. Based on the research results, products effective for commercialization will be selected.
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	Dauletova M.D., postdoctoral student, Master of Engineering Sciences - project manager -Researcher ID: AEX-7987-2022 -ORCID:0009-0004-0969-6056 -Scopus ID: 57222375981 -Hirsch Index 1 Umbetova A.K., Senior Lecturer -Researcher ID: A-5282-2015 -Scopus Author ID: 12761424900 -ORCID:0000-0003-0398-0393 -Hirsch Index 5
Usage	Pharmacy, biologically active substances, biological and medical preparations
Priority compared to real-world alternatives	One of the project's key distinguishing features is the use of local, endemic plants of the <i>Atraphaxis</i> genus, which are poorly studied globally and are practically unused in the mass production of herbal remedies. While polyphenol-based products such as green tea extracts, grape seed extracts, blueberry extracts, and other sources exist on the market, the use of <i>Atraphaxis</i> as a source of biologically active substances is innovative. Unlike existing analogues, which focus primarily on the general antioxidant effect of polyphenols, the project proposes the creation of modified phytotherapeutic agents. This will allow the drug's action to be targeted to specific therapeutic goals, such as: strengthening the immune system; anti-inflammatory action for the treatment of chronic diseases; and cardioprotective and antimicrobial effects. Unlike existing analogues, which focus primarily on the general antioxidant effect of polyphenols, the project proposes the creation of modified phytotherapeutic agents. This will allow the drug's action to be targeted to specific therapeutic goals, such as: strengthening the immune system; anti-inflammatory action for the treatment of chronic diseases; and cardioprotective and antimicrobial effects.
List of publications with links to them	1) Bakhtygali A.M. Yesenova G.P., Dauletova D.M. ATRAPHAXIS VIRGATA, ATRAPHAXIS PYRIFOLA POLYPHENOLDS KESHENDERIN NEGIZINDE KALYPKA KELTIRYLGEN PHYTOPROOF TARALU

	ZHOLYN USYNU // Materials of the international conference of students and young scientists “Farabi Alemi” 3-5 April 2025, pp. 94-95. ISBN 978-601-04-7101-6. UDC 001 2) Dauletova M.D., Umbetova A.K., Tazhibaev D.M. CHEMICAL STUDY OF HERBAL COLLECTIONS ATRAPHAXIS VIRGATA: ORIGANUM VULGARE, ATRAPHAXIS PYRIFOLIA BUNGE: LAVANDULA ANGUSTIFOLIA MILL.// XIII INTERNATIONAL SCIENTIFIC CONFERENCE OF YOUNG SCIENTISTS// FEDERAL STATE BUDGETARY SCIENTIFIC INSTITUTION "ALL-RUSSIAN RESEARCH INSTITUTE OF MEDICINAL AND AROMATIC PLANTS". Contemporary trends in the development of health-saving technologies, December 4-5, 2025, pp. 217-221. ISBN 978-5-87019-118-8 UDC: 633.82: 631.52: 615.32: 615.45: 615.07 BBK: 42: 52.8: 24.2: 24.4
Patents	-