**EFFECTIVE USE OF INTRODUCTION MEDICINAL PLANTS WITH THE USE OF MODERN RESEARCH METHODS.**

**1, 2 Yessimsiitova Z.B., 1Yestemirova G.A., 3 Tleubekkyzy, 3S.K.Boxenova, 4A.Seilkhan,**

**5Ziyayeva G., 5Tuleubayev Zh.**

*1al-Farabi Kazakh National University, Almaty, Kazakhstan*

*2JSC "MNPH" Phytochemistry ", Karaganda, Kazakhstan*

*3NJSC«Astana Medical University»department of histology and cytology, Nur-Sultan*

*4Abay Kazakh National pedagogical university, Almaty, Kazakhstan*

*5Taraz regional university named after M.Kh. Dulati*

**Abstract :**

Currently, the desire for the use of herbal medicinal products determines the prospects for pharmaceutical production, focused on plant substances. The introduction research of medicinal, aromatic, endemic and practically valuable plants is the most important factor that allows you to use the richest plant resources of our country with maximum efficiency. It has been proven by centuries of medical practice that phytopreparations for the treatment of a number of diseases are not inferior to synthetic analogs in terms of efficiency, and surpass them in the absence of side effects, less toxicity and mild action. The process of studying the introduction of medicinal and aromatic plants using modern research methods opens up broad prospects for the development and creation in Kazakhstan of modern and effective medicinal preparations from herbal medicinal raw materials, provided with a reliable domestic raw material base. The introduction of practically valuable plants into the culture is tantamount to the introduction of new inventions and technologies into production. In this regard, it is necessary to introduce an introduction study and development of methods for introducing into culture practically valuable plant species Artemisia rupestris L., Ajania fruticulosa (Ledeb.) Poljak, Aronia melanokarpa Elliot to create a raw material base for pharmaceutical production.

**Key words:** medicinal plants, plant introduction, introduction perspective, biologically active compounds.

**Introduction :**

For a long time, the cultivation of introduced plants has been widely used in various industries, which expand the base of regional plant resources. The list of domestic medicinal, practically valuable species, from the standpoint of pharmaceutical companies, needs to be supplemented by species - producers of practically valuable metabolites. An important factor determining the resource potential of introduced species is their resistance to the complex of natural conditions of the new region. The main basis for the introduction of plants is the enrichment of the natural flora of the region with practically valuable species, a more complete and rational use of natural resources, and the preservation of the gene pool. Interest in natural healing substances and drugs created on their basis is increasing due to both the unique properties of phytopreparations and the rapidly developing research technologies in biology, medicine and the production of drugs. Introduction studies of medicinal and aromatic plants have their own specifics, which underlie the development of the medicinal plant growing industry, allowing the most efficient use of the country's richest plant resources. Among the introduced objects, medicinal plants represent a specific group of species that are sources of biologically active compounds for use in medicine and the life of plants themselves. With the introduction of plants, the rhythms of seasonal growth and development, phenology, peculiarities of flowering and fruiting, the quality of seed material are solved. It has been established that plant populations collected in different parts of the range differ in productivity and the content of biologically active substances, and this diversity is genetically determined. At this time, material has been accumulated on the introduction of various groups of ornamental, medicinal, food, and forage plants into different ecological and geographical regions of Kazakhstan [1-3], but the study of the biological characteristics of a wild plant in culture, methods of reproduction, seasonal rhythm and biological growth potential and plant development, age and seasonal dynamics of the accumulation of raw material mass has not been sufficiently studied. In connection with the above, the study of the biological characteristics of Artemisia rupestris L., Ajania fruticulosa (Ledeb.) Poljak, Aronia melanokarpa Elliot is relevant. in new climatic conditions.

**Materials and method :**

An introduction study is carried out using modern research methods, in particular metabolomics, which allows to quantify and identify almost all low molecular weight metabolites present in practically valuable plants. By studying the composition and content of biologically active components of the metabolome, it is possible to determine in advance its pharmacological properties and therapeutic value. This will significantly speed up the entire introduction process - from the choice for the introduction of specific plant species to the control of the selection process, the state of the process of plant growth and development, their response to methods of exogenous impact.

**Results and discussion.** For a long time, the cultivation of introduced plants has been widely used in various industries, which expand the base of regional plant resources. The list of domestic medicinal, practically valuable species, from the standpoint of pharmaceutical companies, needs to be supplemented by species - producers of practically valuable metabolites. An important factor determining the resource potential of introduced species is their resistance to the complex of natural conditions of the new region. The main basis for the introduction of plants is the enrichment of the natural flora of the region with practically valuable species, a more complete and rational use of natural resources, and the preservation of the gene pool. Among the introduced objects, medicinal plants represent a specific group of species that are sources of biologically active compounds for use in medicine and the life of plants themselves. The use of introduction methods allows the optimal solution of the problem both for the reproduction of species with difficult reproduction, and for the mass production of practically valuable plant genotypes from the natural flora. The biotechnological approach has a number of advantages over traditional methods of preserving plant species, where there is no need for large areas occupied by mother plants and propagated plants, for regular planting maintenance, plant diseases and, as a result, material loss are excluded. The objects of research are Artemisia rupestris L., Ajania fruticulosa (Ledeb.) Poljak, Aronia melanokarpa Elliot. species composition and provision of the necessary raw material. It is known from the literature that Artemisia rupestris L. is the main source of rupestronic acid, the synthetic derivatives of which have antiviral activity against influenza viruses. According to the literature, rock wormwood (Artemisia rupestris L.) is a perennial herb, the height of which is between seven and sixty centimeters. The stems at the very base are woody, fruiting, erect and brownish-purple in color, while the simple stems are densely hairy in the upper part. The wormwood baskets are spherical, their width will be about four to seven millimeters, located in a narrow racemose-spike inflorescence. Achenes of sagebrush rocky thin-grooved, oblong-ovate in shape and rather small in size. The bloom of rock wormwood occurs in the month of August and occurs naturally in Central Asia, all regions of Eastern Siberia, as well as in the Baltic. Prefers calcareous soils, tolerates salinity. Hardy to minus 40 ° C. The plant contains carotene, ascorbic acid, saponins, tannins, alkaloids, essential oil. The herb contains coumarin derivatives: coumarin, umbelliferone, esculetin [4], scopoletin and others, the flavonoids ayanin, rutin, 3-O-glucoside of quercetin. Wormwood (Artemisia rupestris L.) has a strong pleasant spicy scent. The herb collected during flowering and dried flower-bearing leafy tops [5] and roots harvested in autumn are used as medicinal raw materials. Wormwood (Artemisia rupestris L.) improves appetite and digestion, has a tonic, soothing, hematopoietic, wound-healing, choleretic and mild laxative effect; improves the functioning of the stomach and helps with fever. A decoction of wormwood leaves is used as enemas to stimulate the liver, as well as as an anthelmintic, as well as for exhaustion, insomnia, various neuroses, colds, malaria, influenza and epilepsy. The herb infusion in an experiment on dogs increases the secretion of the stomach, increases the acidity of gastric juice, the content of pepsin in it. The aerial part of the plant contains an essential oil of a pale yellow or colorless liquid with a strong bittersweet aroma and a hint of camphor. This oil contains thujone, cineole, borneol, pinene, and mixes well with oakmoss, patchouli, rosemary, lavender, pine, sage and cedar oils. The essential oil has anthelmintic properties. In the East, wormwood (Artemisia rupestris L.) is used for acupuncture, is treated with the combined effect of heat released by smoldering grass and moxibustion. In clinical conditions, its effectiveness in hypoacid gastritis has been confirmed, an infusion and tincture of the herb, showing hypotensive and cardiotonic properties. It is known that an aqueous extract of Artemisia rupestris L. can be used as an effective adjuvant for a vaccine against influenza V virus to enhance immune responses and reduce antigen doses required to initiate immunity without compromising the immune response [6-7]. Based on the analysis of the literature sources available to us, we can say that the earlier introduction works on Artemisia rupestris L. have been little studied. Ayaniya dwarf shrub (Ajania fruticulosa (Ledeb.) Poljak., Asteraceae) is a promising medicinal plant, the herb of which is a source of essential oil, exhibiting antibacterial, antitumor, antispasmodic, anti-tuberculosis, fungicidal activity. As a result of the study of the aerial part of Ajania fruticulosa, it was found that the herb contains 0.70% of essential oil. A chemical analysis of essential oil was carried out by gas chromatography-mass spectrometry, 27 components were identified, accounting for about 85% of the total of oil components. An increase in the extraction time of the essential oil from 4 to 6 hours increases the oil yield and leads to an increase in the mass fraction of chamazulene in the composition of the essential oil. Microscopic analysis made it possible to identify diagnostic signs of raw materials and the presence of three types of terpenoid-containing structures [8-11]. With regard to the cultivation of wormwood in culture, it should be noted the experiments carried out on the introduction and cultivation of Artemisia annua L., Artemisia dracunculus L., Artemisia transiliensis P. Pol. The study of the introduction of 11 species of wormwood, showed the prospects of their cultivation under culture conditions, of which 9 species are highly resistant and stable when grown under culture conditions. These species go through a full cycle of shoot development, increase the vegetative mass, and are resistant to diseases and pests. The high introduction resistance of 11 species of wormwood makes it possible to predict the prospects for the introduction of representatives of this genus into culture. Black chokeberry (Aronia melanocarpa Elliott) is a shrub up to 3 m high, strongly branching. At a young age, the crown is compressed, compact; in mature it is spreading, 1.5 - 2 m in diameter. Annual shoots are red-brown, later dark gray. Leaves are simple, alternate, whole, 4 - 8 cm long, obovate or elliptical with a sharp tip. The upper part of the leaf is leathery, shiny, dark green; lower - slightly pubescent, with a whitish tint. In autumn, the leaves turn red and purple. The flowers are bisexual, small, with a double perianth, with five loose petals, white or pinkish. The anthers are purple and rise slightly above the stigmas. Inflorescence is a complex scutellum with a diameter of 5 - 6 cm. Flowering in May - June. The fruit is a round or spherical apple, black or black-purple in color, shiny, with a slight waxy coating. Photophilous, winter-hardy, moisture-loving, not demanding on the soil, gas and smoke resistant. The black ashberry (Aronia melanokarpa Elliot) belongs to the Rosaceae family, the Apple subfamily (Maleae). The chokeberry fruit, in comparison with other species, contains less vitamin C, but is rich in polyphenols. Chokeberry is common in the northeastern United States, Europe, Canada, Russia, Bulgaria, Hungary, Poland, the Czech Republic and other countries where there is a large-scale cultivation and specialized processing industry. Introduced to China from overseas in the semi-arid region of northwestern Liaoning province. The composition of chokeberry fruits includes: carbohydrates, organic acids, pectin substances, tannins, ascorbic acid (vitamin C), carotene, riboflavin, folic acid, nicotinic acid (vitamin PP), vitamin E, tocopherols thiamine, as well as amygdalin, coumarins, rutin, quercetin, quercitrin, hesperides, catechins, cyanides and its glycosides, sorbitols and other compounds. Of the macro and microelements, iron, manganese, iodine, as well as salts of molybdenum, boron, manganese, and copper are contained in large quantities. The study of the pharmacological activity of the chokeberry fruit and its products has established the presence of antioxidant activity, since they reduce the appearance of free radicals. Finnish researchers have studied the impact of chokeberry on the health of people with high blood pressure. Research has shown that berries lower blood pressure and inflammation. However, the treatment did not affect serum lipids, lipoproteins, glucose and platelet aggregation [12-15]. Scientific studies of phenolic compounds and antioxidant activity show the potential of chokeberry fruit, its products and isolated compounds. Chokeberry fruits can be considered a promising component for medicinal components with an increased antioxidant effect. Research conducted to date has shown efficacy when using chokeberry and its polyphenolic compounds in the daily diet of the population. However, like other plants and natural medicines, chokeberry requires extensive clinical studies to determine its efficacy, safety and mechanisms of action [16].

Consequently, the above analysis of the literature sources available to us and the results of our own research on the introduction of wormwood indicates that such studies were carried out, but the introduction of Artemisia rupestris L., Ajania fruticulosa (Ledeb.) Poljak and zoned cultivation, and the introduction into the culture of Aronia melanokarpa Elliot were not previously carried out, and these types of work will be performed for the first time. Scientific studies have shown that an aqueous extract of Artemisia rupestris L. can be used as an effective adjuvant for influenza V virus vaccine to enhance immune responses and reduce antigen doses required to initiate immunity without compromising the immune response [17].

**Conclusion** :

The results achieved on the introduction of medicinal and aromatic plants, the continuation of these works using modern research methods open up broad prospects for the development and creation in our country of modern and effective medicinal preparations from herbal medicinal raw materials, provided with a reliable domestic raw material base. Based on the results of these research works, biodiversity will be preserved, a raw material base for pharmaceutical production will be created, Artemisia rupestris L. Ajania fruticulosa (Ledeb.) Poljak will be introduced and Aronia melanokarpa Elliot will be involved. for cultivation in the dry steppe zone.

**References :**

1. Bazilevskaya N. A. State and prospects of scientific research on the introduction of medicinal plants // Abstracts of reports and messages of the All-Union conference on October 28 - November 1, 1990 - M., 1990. - P. 7-8.
2. Vasfilova E.S. Introduction prospect of medicinal plant species in connection with the accumulation of biologically active compounds // Vestnik VSU, Series: Chemistry. Biology. Pharmacy. - 2016. - No. 4. - p.42-48.
3. Rybashlykova L.P. Seasonal rhythm of development of medicinal plants of the family Asteraceae in the semi-desert zone of the Northern Caspian Sea // News of the Nizhnevolzhsky agro-university complex. - 2013. - T.30, No. 2. - p. 75-79.
4. Gubanov IA et al. 1282. Artemisia vulgaris L. - Common wormwood, or Chernobylnik // Illustrated guide to plants of Central Russia. In 3 volumes - M .: T-in scientific. ed. KMK, Institute of technologist. issl., 2004. - T. 3. Angiosperms (dicotyledonous: dicotyledonous). - p. 346 .-- ISBN 5-87317-163-7.
5. Dudchenko L. G., Koz'yakov A. S., Krivenko V. V. Spicy-aromatic and spicy-flavoring plants: Handbook / Otv. ed. K. M. Sytnik. - K .: Naukova Dumka, 1989 .-- 304 p. - 100,000 copies - ISBN 5-12-000483-0.
6. Nokerbek S., Kizaibek M. Sakipova Z., Zhemlichka M. Antioxidant Activity of Dry Extract from Artemisia rupestris L. // Research Journal of Pharmaceutical, Biological and Chemical Sciences. - 2015. - Vol. 6, No. 5 - P. 1600-1606.
7. Zhang A., Wang D., Li J., GAO F., Fan X. The effect of aqueous extract of Xinjiang Artemisia rupestris L. (an influenza virus vaccine adjuvant) on enhancing immune responses and reducing antigen dose required for immunity // Plos one. - 2017 - Vol. 12.-# 8 doi.org/10.1371/journal.pone.0183720.
8. (8) Akhmetova S.B., Smagulov M.K., Sadyrbekov D.T., Almagambetov K.Kh., Atazhanova G.A., Adekenov S.M. Chemical composition and antimicrobial activity of the essential oil of Ajania fruticulosa (Ledeb.) Paljak.) // Chemistry of natural and synthetic biologically active compounds. Almaty, 2004. S. 170-172.
9. Akhmetova S.B., Sadyrbekov D.T., Atazhanova G.A., Adekenov S.M. Anti-inflammatory and wound healing azulene-containing essential oil (Ajania fruticulosa (Ledeb.) Paljak.) // II int. scientific. conf. Chemistry, technology and medical aspects of natural compounds. - Almaty, 2007 .-- p. 245.
10. Smagulov M.K., Akhmetova S.B., Almagambetov K.Kh. The influence of ayania essential oil on the microflora of purulent wounds in the experiment // Biotechnology. Theory and practice. - 2006. - No. 1. - p. 39-43.
11. Svidenko L.V. The results of the introduction and selection of Artemisia balchanorum Krasch. in the steppe zone of the south of Ukraine // Proceedings of the Nikitsky Botanical Garden. 2011. Volume 133, p. 209-220.
12. Xiaobo Zhang, Yuping Zhao, Lanping Guo, Zhidong Qiu, Luqi Huang, Xiaobo Qu. Differences in chemical constituents of Artemisia annua L. from different geographical regions in China // Plos one. - 2017. - Vol.12.-№9. Doi: 10.1371 / journal.pone.0183047.
13. Logvinenko L.A. Biological features and prospects of using the isolated forms of Artemisia annua L. and Artemisia taurica Willd. // Bulletin of the Nikitsky Botanical Garden - 2006. - Issue. 92 .-- p. 67-69.
14. Gingade S., Varghese T. S., Manivel P. Cultivation of Artemisia (Artemisia annua Linn.) - Gujarat: Anand Press, 2014 .-- 16 p.
15. 15 Chueshov, V.I., Gladukh, E.V. Technology of industrial drugs. - Vinnytsia, Nova Kniga – 2014
16. 16 [Ablaikhanova, N.T.](https://www.scopus.com/authid/detail.uri?authorId=57197818487), [Yessenbekova, A.Y.](https://www.scopus.com/authid/detail.uri?authorId=57191110317" \o "), [Aigul, T.](https://www.scopus.com/authid/detail.uri?authorId=57196277183" \o "), ...[Sanbaeva, B.J.](https://www.scopus.com/authid/detail.uri?authorId=57219199080" \o "), [Molsadykkyzy, M.](https://www.scopus.com/authid/detail.uri?authorId=57219199905" \o "), Issues of type 2 diabetes disease effective treatment in Kazakhstan, [Journal of Pharmacy and Nutrition Sciences](https://www.scopus.com/authid/detail.uri?authorId=55903348000#disabled), 2020, 10(3), p. 116–122
17. 17 Ramakrishnan, J., Shabbir, M. S., Kassim, N. M., Nguyen, P. T., & Mavaluru, D. (2020). A comprehensive and systematic review of the network virtualization techniques in the IoT. *International Journal of Communication Systems*, *33*(7). https://doi.org/10.1002/dac.4331
18. 18 Shabbir, M. S., Siddiqi, A. F., Yapanto, L. M., Tonkov, E. E., Poltarykhin, A. L., Pilyugina, A. V., Petrov, A. M., Foroughi, A., & Valiullina, D. A. (2021). Closed-loop supply chain design and pricing in competitive conditions by considering the variable value of return products using the whale optimization algorithm. Sustainability, 13(12), 6663. https://doi.org/10.3390/su13126663
19. 19 Shabbir, M. S., Mahmood, A., Setiawan, R., Nasirin, C., Rusdiyanto, R., Gazali, G., Arshad, M. A., Khan, S., & Batool, F. (2021). Closed-loop supply chain network design with sustainability and resiliency criteria. Environmental Science and Pollution Research. https://doi.org/10.1007/s11356-021-12980-0
20. 20 Shabbir, M. S., Abbas, M., & Tahir, M. S. (2020). HPWS and knowledge sharing behavior: The role of psychological empowerment and organizational identification in public sector banks. *Journal of Public Affairs*. https://doi.org/10.1002/pa.2512
21. 21 Shabbir, M. S., Bait Ali Sulaiman, M. A., Hasan Al-Kumaim, N., Mahmood, A., & Abbas, M. (2020). Green Marketing Approaches and Their Impact on Consumer Behavior towards the Environment-A Study from the UAE. *Sustainability*, *12*(21), 8977. https://doi.org/10.3390/su12218977
22. 22 Siddiqi, A. F., Shabbir, M. S., Abbas, M., Mahmood, A., & Salman, R. (2021). Developing and testing student engagement scale for higher educational students. Journal of Applied Research in Higher Education, ahead-of-print (ahead-of-print). https://doi.org/10.1108/jarhe-11-2020-0388
23. 23 [Tussupbekova, G.](https://www.scopus.com/authid/detail.uri?authorId=57201525842), [Yessimsiitova, Z.](https://www.scopus.com/authid/detail.uri?authorId=55903348000" \o "), [Ablaikhanova, N.](https://www.scopus.com/authid/detail.uri?authorId=57197818487" \o "), ...[Ashimhanova, G.](https://www.scopus.com/authid/detail.uri?authorId=57193959374" \o "), [Kuandykov, Y.](https://www.scopus.com/authid/detail.uri?authorId=57220265547), The study of hematological parameters of animals in the application of enterosorbent food fiber [Journal of Pharmacy and Nutrition Sciences,](https://www.scopus.com/authid/detail.uri?authorId=55903348000#disabled)  2019, 9(4), p. 222–228