

**RESEARCH OF THE FEATURES OF THE DISTRIBUTION AREA  
ESSENTIAL OIL PLANTS OF THE TURKESTAN OBLAST  
AND ITS FLORISTIC COMPOSITION**

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**Abstract**

The article presents the features of the distribution of essential oil plants in the flora of the mountain and foothill zones of the Turkestan region, and gives the results of scientific research on the area logical features of the species. Analysis of the floristic composition of essential oil plants and its products showed that almost the entire raw material base that meets the needs of the pharmaceutical, food and perfumery market of the Republic of Kazakhstan turned out to be on the territory of the near abroad. In this regard, research on obtaining the raw material base of essential oil medicinal plants of individual regions, in particular, the Turkestan region, allowing to conduct scientific work on the study of essential oil medicinal plants, essential oils and evaluate their reserves,

is not only relevant in the current century, but also acquires a special importance, scientific and practical.

**Keywords:** flora, area, genus, essential oil plants, families, species, mountain areas

## **Introduction**

At present, the total number of essential oil plants of the world flora is estimated at 2500-3000 species. The global range of essential oil plants is not very large. It has about 30-40 species of the families *Lamiaceae*, *Asteraceae*, *Apiaceae*. Currently accumulated significant material on the biological activity of essential oils.

The vast majority of medicinal essential oil plants found in the south of Kazakhstan are widely used in traditional medicine of a number of Asian (Azerbaijan, India, Mongolia, China, Korea, Japan), African (Egypt) and East European (Belarus, Bulgaria, Russia, Slovenia, Ukraine) of the States [1].

The scientific results obtained in the course of the field research allowed to determine the floristic composition, to determine the distribution area of essential oil species and their ratio, to obtain the production of essential oils. Landscape studies of essential oil species of medicinal flora, generalized data on their use and localization on the territory of Kazakhstan should facilitate the search for new natural compounds and the creation of modern herbal remedies, promote the formation of a sustainable resource base and, at the same time, contribute to the development of protective measures to prevent genetic losses parts of potentially useful plants.

Analysis of the floristic composition of essential oil plants and its products showed that almost the entire raw material base that meets the

needs of the pharmaceutical, food and perfumery market of the Republic of Kazakhstan appeared on the territory of the near abroad.

In this regard, research on obtaining the raw material base of essential oil medicinal plants of individual regions, in particular, the Turkestan region, allowing to conduct scientific work on the study of essential oil medicinal plants, essential oils and evaluate their reserves, is not only relevant in the current century, but also acquires a special importance, scientific and practical.

### **Methodology**

The method of research was: the vegetation cover of the foothill, mountain zones of the Turkestan region and the peculiarities of the distribution area of essential oil plants. Studies were conducted by route-reconnaissance methods.

The collection and processing of herbarium material was carried out according to the standard technique of A.Skvortsov [2]. During field studies, observations were made on the relevance of plants to environmental conditions. In determining the herbarium, the following multivolume reports were used: "Illustrated guide of Kazakhstan plants", "Flora of the USSR", "Guide of plants of Central Asia" [3]. The floral list is compiled according to the system of A.Takhtajyan [4]. Latin names of plants are updated according to S.A. Abdullina "List of vascular plants of Kazakhstan" [5] and according to the report of S.K. Cherepanov [6]. Kazakh names were clarified with the help of the books "Kazakhstan plants" [7].

The study of vegetation as in route studies was carried out by traditional methods: the compilation of floristic lists, bringing data on phenology, abundance, height and vitality of plants, etc. [8].

Geobotanical descriptions were carried out on sites of the usual size - 100 m<sup>2</sup>. When describing vegetation, the following were taken into account: 1. Floristic composition of the species; 2 - Druid abundance; 3 - vitality; 4 -phenophase; 5 - the greatest, smallest and average height of plants; 6-generic projective cover; 7 nature of the distribution of species. The projective cover was estimated as a percentage, the abundance on the Drude scale (as translated by B.A. Bykov), the vitality of plants on the five-point scale of A.A. Grossheim [8].

### **Research results**

The study of wild plants as sources of essential oils at the Institute of Botany of the Academy of Sciences of the Republic of Kazakhstan, beginning in 1972, Demidov LF, Averina R.A., Egeubayev R.A and others. Frontal botanical and resource studies of mountain regions of southern and eastern Kazakhstan identifying promising ethers for further study and their involvement in economic use. As a result of their work, they analyzed more than 500 species of the flora of the region and identified more than 80 species of enthrones, promising in terms of the content or composition of essential oils, the availability of the resource base and the possibility of their introduction. As a result of the work of R.A.Egeubaev [9] obtained a rich material on the biological characteristics, productivity, distribution, content of essential oils and their component composition of essential oil plants of the South-East of Kazakhstan. The promising ethereal species for which a more complete bioecological and photochemical characteristics are given are considered in detail, and ways of their use as sources of essential oils are discussed.

Scientific studies on the ethereal oil plants were carried out in certain territories of Kazakhstan, as a result of which a species diversity

of essential oil plants was obtained, the raw stock and distribution features in the studied zones were determined. Thus, scientific information was obtained on the essential oil plants of the Kalbinsky ridge, eastern Chatkal, southern Kazakhstan, southeast of Kazakhstan, etc.

According to Bahtaulova A.S., the species diversity of essential oil plants in the Dzungarian Alatau is uneven. According to the peculiarities of growth and ecological confinement, most of the species were divided into 4 groups: 1 plants that are found scattered and do not form thickets; 2 plants not subject to collection due to rarity or protection in the territory of the natural park; 3 plants, widespread in the mountains of Dzhungarskiy Alatau, not forming large thickets, but suitable for small volumes of harvesting vegetable raw materials (from 100 to 500 kg.); 4 plants that form large thickets suitable for organizing harvesting on an industrial scale (over 500 kg). Under the guidance of G.S. Sinitsyn, more than 50 plant species were tested in the experimental area of the institute. There are many works devoted to the experimental and experimental-production cultivation in the culture of medicinal and aromatic plants local and foreign flora.

According to the botanical and geographical zoning, the study area belongs to the Sahara-Gobi desert region, the Iran-Turan subregion, and the Afghan-Turkestan province [10]. The studies were conducted in the foothill zones of Kazgurt, Karzhantau, Ugam and Karatau located in the South Kazakhstan region.

During this period, routes of 1,700 km were made. During the study period, more than 30 descriptions of plant communities were made, more than 60 mowings were taken and analyzed by species, 142 herbarium sheets were collected, 16 ecological profiles were laid, 42 contours of the essential oil plants were made. In the process of field research, the device

GPS -14 was used for determination the exact location of the plants, which allowed determining the following characteristics, geographical coordinates, height above sea level. The distribution areas of essential oil plants were studied, 112 samples were collected for chemical study. Resource studies were conducted, preliminary reserves of raw materials and the rational use of natural thickets of promising plant species on the foothill plains of the Kazgurt, Tolebi, Tulkubas, Baidibek and Sozak districts of the Turkestan region were determined. At the same time, over 12 different plant communities were identified in the surveyed area, habitats of more than 9 endemic and rare plant species were identified.

As a result of the field survey surveys, growing areas in the foothills of Kazgurt, Karzhantau, Ugam, Daubaba, Mashat, Boraldai and Karatau were identified 112 species of essential oil plants, which were distributed to individual groups as follows:

Group A is scattered growing and not forming thickets of plants, which account for 37 species. These are the species from the genera. *Calophaca tianschanica*, *Fraxinus sogdiana*, *Padus mahaleb*, *Morina kokanica*, *Scabiosa songorica*, *Achillea filipendulina*, *Juno coerulea*, *J. orchidoides*, species of the genus *Centaurea*, *Allium karataviense*, *A. iliense*, *Polygonum bistorta* L. *Potentilla ehunthers*, *Allphochahus ecologists*, *Allium karatavienses nummularia* Bunge, *Inula helenium* L. *Inula salicina* L. *Hypocoum erectum* and others

Group B does not form permanent thickets of plants, like *Polemonium caeruleum* L. *Chamomilla recutita* (L.) Rauschert, *Artemisia sieversiana* Willd. *Dodartia orientalis* L, *Dracocephalum thymiflorum* L. *Galium aparine* L. *Galium odoratum* (L.) Scop. *Hedysarum flavescens* Regel et Schmalh. *Hypocoum parviflorum* Kar.et Kir. *Imperata cylindrica* (L.) Beauv. *Ligularia glauca* (L.) O. Hoffm. *Linaria acutiloba* Fisch. Ex,

*Melandrium album* (Mill.) Garcke, *Iris humilis* Georgi, *Eryngium planum* L. *Dracocephalum bipinnatum* Rupr. *Carum carvi* L. *Artemisia vulgaris* L.

A group of C-plants not subject to harvesting due to their rarity, a ban on the collection of raw materials, consisting of 12 species: *Spiraeanthus schrenkianus*, *Amygdalus petunnikovii*, *Amugdalus spinossima* Bge. *Juniperus seravschanica* Kom., *Juniperus turkestanica* Kom. *Juniperus sabina* L. *Ferula ferulaeoides* (Steud.) Korov., *Allochrusa gypsophiloides* *Lepidolopha karatavica*, *Pistacia vera*, *Cotoneaster karatavica*, *Lepidolopha karatavica*, *Colchicum luteum* Baker, *Helichrysum isnaraze*, you can get what you want to make using our products.

Group-D widespread plants that form thickets and suitable for the implementation of the procurement of raw materials. These are the 26 species as *Mentha asiatica*, *M. arvensis*, *Salvia sclarea*, *S. aethiopsis*, *S. Thymus karatavicus*, *Artemisia* spp., *Scutellaria galericulata* L, *Potentilla chrysantha* Trev., *Galium verum* L, *Plantago major* L., *Lathyrus sativus* L., *arteiateiav. Artemisia karatavica*, *Dracocephalum nutans* L., *Taraxacum officinale* Wigg., *Rumex confertus* Willd., *Geum allepicum* Jacq., *Rosa nanothamnus* Bouleng. Bull. *Thermopsis alterniflora* Regel et Schmalh., *Thus peanantha persica* Briq. *Ferula varia* (Schrenk) Trautv. *Crataegus sanguinea* Pall.

A significant role is played by the diversity of the soil-geographical conditions of the Kazgurt, Karzhantau, Ugam, Daubaba, Mashat, Boralday and Karatau foothills and the significant development of the meso-and microrelief, which does not allow a large number of species to form massive areas of homogeneous thickets.

The studied essential oil plants contain essential oils in the aerial part of the shoots and flowers. Most of the plants in the foothills of Kazgurt, Karzhantau, Ugam, Daubaba, Mashat, Boralday and Karatau bloom in June-July-August, bear fruit in August-September. Therefore, the period of the main procurement of essential oil plants is July-August.

On the northern and northeastern slopes of the Kazgurt foothills, at an altitude of 990-1175 meters above sea level, the following patterns of growth of the two ziziphora *Ziziphora bungeana*, *Ziziphora clinopodioides* are found - they form large thickets suitable for industrial workpieces, they are found single further to the south. In addition to *Ziziphora bungeana*, *Ziziphora clinopodioides* there grows overgrown *Hypeircum perforatum*, *Achillea millefolium*, *Ferula varia*, *Rheum maximoviczii* and others.

## Conclusions

Thus, the results obtained in the spring period allowed us to outline objects and ways for further research, in particular, the raw material reserves were detected only for C and D groups of essential-oil plants. Most ethereal oil plants are common on mountain and foothill slopes, along forest edges, glades, on dry and steppe meadows, in thickets of bushes, along river valleys, streams, and slopes of ravines of lower and middle mountains.

Resource work allowed to make a conclusion about the potential reserves of medicinal plant materials and the possibility of using it as a constantly renewable raw material base for the domestic pharmaceutical industry.

## References

1. Adekenov S.M., Gabdullin E.M., Kupriyanov A.N. Plants - sources of new medicinal substances // PHARMACEUTICAL BULLETIN #1-2., Pages: 17-29, Published: 2005.
2. Skvortsov A.K. Herbarium. Manual on the method and technique. – Moscow: “Science”, 1977, p. 198.
3. The determinant of plants in Central Asia. - Tashkent, 1968-1987. No 1-9.
4. Tahtajan A.L. Magnoliophyte system. - Leningrad: "Science" 1987, p. 408.
5. Abdulina S.A. List of vascular plants of Kazakhstan. - Almaty, 1999, p. 187.
6. Cherepanov S.K. Vascular plants of Russia and neighboring countries (within the former USSR). - SPB, 1995, p.243-292.
7. Arystangaliev S. A., Ramazanov E.D. Uzbekistan plants. Almaty 1977. - 256 p. 10. Method of determining stocks of medicinal plants. - Moscow, 1986, p. 34-39.
8. Grossheim A.A. Introduction to the geobotanical survey of winter pastures in the SSR of Azerbaijan. - Baku, 1929, p. 75.
9. Egeubaeva R.A. Wild essential oil plants of the south-east of Kazakhstan. - Almaty, 2002. - 241 p. Pavlov N.V. Vegetable raw materials of Kazakhstan. - Moscow, p. 1947, 552.
10. Kamelin R.V. Florogenetic analysis of the natural flora of mountainous Central Asia. Leningrad: “Science”, pp.1973, 356.