

Distribution of the *Pulicaria salviifolia*, *P. gnaphalodes*, *P. uliginosa* in the fergana valley

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Abstract

The distribution of *Pulicaria* Gaertn. genus species and their natural resources in Fergana Valley were studied in this article. Their development has been examined in both natural and experimental settings. In the Fergana Valley, the vegetation, the role of representatives of the *Pulicaria* Gaertn. genus species, and the productivity of the plants surface utilized as raw materials were investigated.

Keywords: *Pulicaria salviifolia*, *P. gnaphalodes*, *P. uliginosa*, distribution, fergana valley

Introduction

More than 4,200 plant species grow in the flora of Uzbekistan. Some of them are medicinal plants. Medicinal plants are distributed from the desert region of the Republic to the highlands.

Some species are even included in the Red Data Book of Uzbekistan. Therefore, special attention should be paid to prevent such cases. Based on the above considerations, one

of the most important issues is to study some medicinal plants that are widespread in the Fergana Valley.

The Fergana Valley is located in the eastern part of the Republic of Uzbekistan, bordering Tajikistan and Kyrgyzstan. In the southern part of the valley there are Turkestan and Alay ridges, the highest peak of which is more than 5000 m above sea level. The northern part is surrounded by the Qurama and Chatkal ridges, and the eastern part by the Fergana ridge.

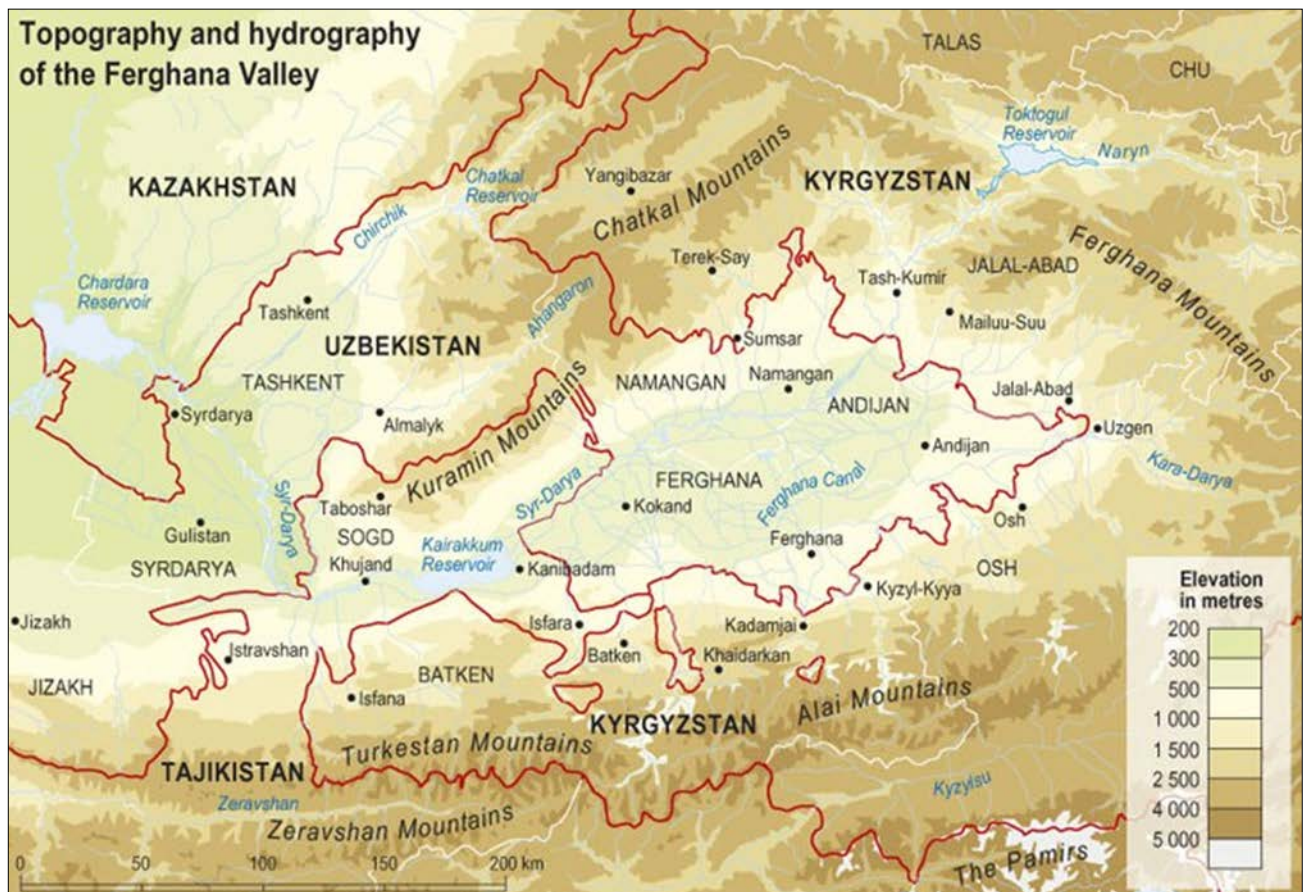


Fig 1

The general appearance of the Fergana Valley is oval, with a length of more than 300 km and a width of more than 120 km. Administratively, the valley unites Andijan, Namangan and Fergana regions and covers an area of 19.2 thousand km².

The medical geography and description of cleanliness of the Fergana Valley provides information about medicinal plants used by the local population in V.I. Kushelevsky scientific work ^[1].

Plant seeds have been gathered since 1992 in order to examine their morphology and fertility. Expeditions to the Fergana Valley have been organized in several directions in recent years under the scientific supervision of the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan in collaboration with the Laboratory of Medicinal Plants, and the natural resources and biology of our materials group have been studied. Several experimental locations were chosen for the project, where the ontogenesis of plants was researched as well as their involvement in plant cover.

Purpose of the research

The purpose of our research is to learn more about the *Pulicaria Gaertn.* genus' distribution, ontogeny, and natural resources in the Fergana Valley.

Deciding plant natural reserves also entails determining if future industrial use of these plants will conserve their natural resources and, if so, what steps should be made to protect them.

Materials and Methods

In performing the research, we drew on the scientific methodologies of a number of researchers ^[2]. We utilised material from Babur's "Boburnoma" and Ibn Sina's "Laws of Medicine" in addition to studying the work of experts like Kh. Kh.Kholmatov and S.Yu. Yunusov ^[3].

In the study of the physical-geographical description of the Fergana Valley, we employed scientific data supplied primarily by A.F. Middendarf, A.N. Razanov, B.Fyodorov, S.P.Suchkova, G. Maksudov, and others ^[4].

In order to analyze the *Pulicaria Gaertn.* genus vegetation cover and position of the Fergana Valley, we first divided the valley into deserts, hills, mountains, and meadows. In addition, about 70 geobotanical descriptions and 1,500 herbarium specimens were collected during this work by the Laboratory of Medicinal Plants of the Institute of Plant Chemistry of the Academy of Sciences of the Republic of Uzbekistan, the Institute of Botany and the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan, and the National University of Uzbekistan. The phenophase, plant health, and degree of distribution of each plant were listed, and the Drudeni 7-point scale was primarily employed. This was 1 point for SOL, 2 points for SOL, 3 points for SP, 4 points for SP2, 5 points for COP 1, 6 points for COP 2, and 7 points for COP 3.

The range of *Pulicaria Gaertn.* genus species was created using herbarium samples stored in the Institute of Botany and the Botanical Garden of the Academy of Sciences of the Republic of Uzbekistan and the institutes of Kyrgyzstan and Kazakhstan, the books "Flora" and "Central Asian Plant Identifier".

In the Kyrgyz Republic, Jalalabad region, Bazarkurgan district, north-eastern section of the hamlet of Kyzyljar, at an altitude of 800 meters above sea level, in a little gravel

area, we performed study on the biological features of plants. *Pulicaria saviifolia* and *R. gnaphalodes* were planted in an experimental area. *Pulicaria uliginosa* was chosen as an experimental location in the Republic of Uzbekistan's Namangan region, Pop district, Pungon village. Experimental areas of the "Uzbekistan" branch of the Association of Companies "Tomosha" in Fergana region, Furkat district, and the southern part of the village of Sarikkurgan, 500 m above sea level, rocky areas for *Pulicaria saviifolia* and *P. gnaphalodes*, as well as experimental areas of the "Uzbekistan" branch of the Association of Companies "Tomosha" in Fergana region, Uchkuprik district, Each round's experimental areas were picked from a total of 25 m².

In the study of the biology of the plant species *Pulicaria saviifolia*, *P. gnaphalodes*, and *P. uliginosa*, methods developed by M.G. Nikolovaeva (1950), G.N. Novikov, M.G. Nikolovaeva (1940), I.T. Vasilchenko (1979), and A.I. Stratanovich (1947) were employed ^[5]. The physiological effects of temperature on seed germination on the components in the seeds, as well as the effect of the seeds on the surrounding shells and the formation of buds, were studied in this example.

We couldn't discover any information in the literature about the reserves of plant species belonging to the *Pulicaria Gaertn.* genus. N.A. Barisova (1981), A.I. Tolmachev (1962), V.B. Kuvaev (1965), A.I. Shchreter (1966), E.V. Wolf, O.F. Maleeva (1969), I.L. Krylova, A.I. Shreter (1971), M.E. Pimenova, M.G. Pimonov (1970), M.E. Pimenova, V.Yu. Gusev, When determining the biological reserves of *Pulicaria* species, all individuals within the range are taken into consideration, according to I.L.Krylova (1988). These included the weight of diseased, insect-infested plants, as well as plants in the juvenile, generative, and senile stages. In this case, only the surface part of the *Pulicaria* species used as raw material was obtained ^[6]. At the same time, in compiling the area scheme, we studied the reserves of areas where plants grow thick, have good transportability, and are close to settlements ^[7]. Based on the V.B. Kuvaev, V.G. Klyaznika, O.A. Lukyanov (1987) method, plants that are left to reproduce to the weight of plants that can be used in natural accounting were not included. According to the method of N.A. Barisova (1961) in determining the plant stock in the areas where the plant is distributed, 100 sq.m. from 10 to 15 areas were taken, the number of plants in those areas, their age and weight in the dry state were determined, and then the data obtained from this were applied to the hectare and the total area ^[8].

In order to determine the range of species of the genus *Pulicaria* and the areas where they can be collected as raw materials, in 2018-2020, expeditions were conducted along the Fergana Valley in the following directions:- first in 2018 Kokand - Sarikurgan - Sokh - Haydarkon - Botkent - Isfara - Vorik- Laylak- Uratepa- Khojand- Mogoltog- Adraspan- Asht- Chodak- Pop- Kokand;-second in 2019 Kokand- Pungon- Chorkesar- Koktash- Chust- Kosonsoy- Namangan- Balikchi- Jamashuy- Navbahor- Buvayda- Kokand;-third in 2020 Kokand- Sarikurgan- Rishtan- Altiariq- Vodil- Shokhimardon- Qizilkiya- Uchkurgan - Osh - Karasuv - Jalal-Abad - Bazarkurgan - Arslonbob - Andijan - Kuva - Margilan - Boz - Yazyovan – Yangiqor directions were done scientific works.

To calculate plant reserves, we counted the number of plants in a 10 m² area, harvested the ones that were good for raw materials, and weighed the biomass in moisture and dry. Raw materials were plant specimens with more than four stems in a bush. Young plants are those that have one to four stems. Plants develop one stem in the first year, 2-3 stems in the second year, and 3-5 stems in the third year, according to tests. Adult plants have nine to ten stems. As a result, we calculated the number of plants per 10 m² and the biomass amounts applied to the entire area.

We listed the age of the plants and their appropriateness for raw materials in four directions in the form of a strip from 1000 m to 1 m of the entire area, then split the results into groups of places with thick flowerbeds within the habitats of an average bush (Tables 1, 2, and 3). We classified category 1 as regions with dense vegetation, easy access to raw materials, and proximity to populous villages.



Fig 2: *Pulicaria saviifolia*

Results and Discussion

Category II areas were those where the vegetation was sparse or dense, and transportation could not approach closer than 1-2 kilometers, i.e., places remote from the people.

Plants were obtained from Category III regions with little traffic capacity. If raw ingredients are prepared in such locations, they must be transported using live animals.

Pulicaria saviifolia is a species of *Pulicaria*. Beg - this plant has a branching stem at the base of the perennial stem, and the leaves are finished with ball flowers that are collected in a basket and fly off the stalk branches, wrapped in soft, short, thick hairs. Yellow flowers are present.

Plant height is 40-60 cm, obtained for raw materials weighs an average of 70-100 g of dry weight on the surface of the earth.

The total area grown by *Pulicaria saviifolia* is 375.5 hectares and the biomass in this area is 80.72 + 0.21 t, available biomass is 64.34 + 0.26 t.

We also studied the seeds of the materials being studied in a laboratory setting. In doing so, we paid great attention to the growth of their seeds, and we have expressed this in the figure below.

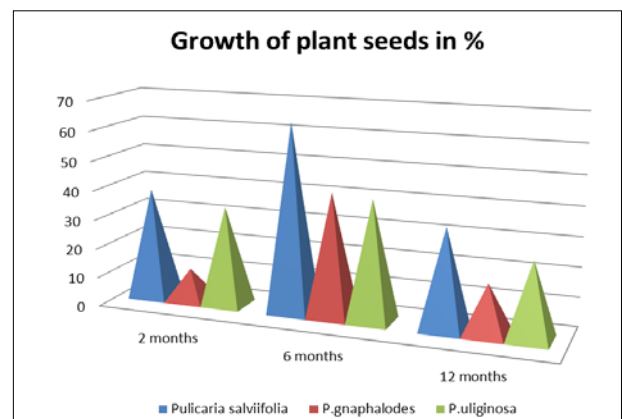


Fig 3

The natural resources of this facility will not be able to offer the raw materials needed for medicine on an industrial scale if the fields are only used once every three years, taking into consideration that their area changes every 6-7 years. As a result, in the foothills, we must plant and propagate plant seeds in non-irrigated, fine-grained, and seasonally moving rivers and streams.

The *Pulicaria uliginosa* plant has a distributed area of 600 hectares, the biological reserve is 6525 17 kg and the extractable biomass is 1330 10 kg. We can create 440.3 kilogram per year if we utilise this space once every three years. In such circumstances, industrial-scale utilization of these plants' natural resources is not conceivable. As a result, it is advisable to plant if necessary.

It should also be noted that the area under rice in the Fergana Valley is not permanent. It is important to take into account that they vary. Therefore, when calculating the reserves of *Pulicaria uliginosa* we did not take into account the areas formed by rice fields, permanent water structures, drainage ditches, irrigated, tugai forests around rivers and areas unsuitable for cultivation near groundwater.

The usable area within the areas where the *Pulicaria gnaphalodes* plant is distributed is 727 hectares and the surface biomass of the available plant is 147.8 t. Of these, category 1 areas are 387 hectares and their biomass of raw materials is 65.24 t. This amount covers industrial demand. However, considering the use of the fields once every 3 years, it cannot meet the demand of the industry.

The habitat of *Pulicaria gnaphalodes* extends to Uzbekistan and Kazakhstan. In addition, we found this plant area in the Tashkent region, in the village of Bolgoli in the Akhangaran district, around Baliklikul village in the Jizzakh region, in the Saryagoch district of the Republic of Kazakhstan, in the southern part of Alimtog hill.

Although the area is widespread, its areas that can be used as raw materials are insufficient. It should also be noted that since this plant is an annual, it is necessary to leave in the amount required for the recovery of the plant when harvesting it. In the raw material preparation areas, there are no other plants that are morphologically similar to this species. As a result, it is not mixed with other plants by manufacturers. The plant is notable for having soft, fluffy hairs covering all of its above-ground portions, a distinctive odor, and a lighter green (whiter) color than other plants. However, *P. salviifolia* and *P. gnaphalodes* can coexist in some circumstances^[9].

In such cases, the height or low height of the plant is distinguished by the color of the plant, annual and perennial characteristics (Table).

Table

Table 1: Morphological characteristics of plants

Morphological features	<i>P. salviifolia</i>	<i>P. gnaphalodes</i>
Stem	Branched at the base of the serpent	Low branched. It is mainly branched from the inside of the stem
The height of the stem	40-50-70 cm	70-80-140 cm
Flowers	The large crowns on the edges of the basket are pale yellow	The large leaves on the edge of the basket are light purple
Feeding	The leaves on the stem are short, thickly hairy, silvery	The leaves on the stem are sparse, long hairy, light green

Conclusion

1. The biologically active compounds isolated from the *Pulicaria Gaertn.* genus species were examined in the deserts and hills of Uzbekistan because they were indicated for the treatment of diabetic mellitus.
2. *Pulicaria salviifolia* is found in the foothills of the Chatkal, Kurama, Olay, and Turkestan mountain ranges in Uzbekistan, *Pulicaria gnaphalodes* in the Ustyurt and Kyzylkum, Turkestan, Zarafshan, Gissar, Kokhitang, and Nurata mountains, and *Pulicaria uliginosa* in the Ugom, Piskom, Chatkal, Chatkal, Ugom
3. The Fergana Valley's *Pulicaria salviifolia* area spans 375 hectares, with a biological reserve of 80.7 t and a useable reserve of 64 t. *Pulicaria gnaphalodes* covers 727 hectares, with a biological reserve of 147 t and a reserve available of 105.9 t. *Pulicaria uliginosa* covers 600 hectares in total, with a biological reserve of 6.5 t and an useable reserve of 1.3 t.
4. For the first time in the Fergana Valley, *Pulicaria Gaertn.* genus species were discovered, the role of valley vegetation was investigated, and six associations involving *Pulicaria salviifolia* and three associations involving *Pulicaria gnaphalodes* - five associations involving *Pulicaria uliginosa* were described.
5. The biological properties of three *Pulicaria Gaertn.* species were investigated. Seeds are used by all three species to reproduce in nature. If the seeds are planted in the autumn (October), they will germinate fully in March the following year.
6. *Pulicaria salviifolia*, *Pulicaria gnaphalodes*, and *Pulicaria uliginosa* species' ontogenesis has been well investigated, and it has been discovered that they pass through latent, vegetative, generative, and senile stages (without *Pulicaria gnaphalodes*) in less than a year.

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Conflict of interest statement

We declare that we have no conflict of interest.

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