



The Genus *Ferula* L. in the Flora of Jizzakh Region

Salahiddinov Shamsiddin¹, Yarkulova Zulayho²

¹ Master of the 2nd year of the Department of Biology and Physiology of Plants, Bukhara State University

² Associate Professor of the Department of Biology and Physiology of Plants, Bukhara State University

Abstract: The genus *Ferula* - *Ferula* L. belongs to the umbrella family - *Apiaceae* Lindl. (*Umbelliferae*). There are about 185 species in the genus, distributed almost exclusively in the region of Ancient Middle-earth. The maximum number of species in Central Asia and adjacent areas of Iran and Afghanistan. There are 105 species in Central Asia, 35 in Kyrgyzstan, 36 in Tajikistan, and 48 in Uzbekistan.

Keywords: flora, genus *Ferula* L., distribution, economic importance.

The genus *Ferula* L. is a perennial monocarpic and polycarpic herbaceous plant, sometimes very large (*F.gigantea*, *F.tadtshikorum*). Jizzakh region is located in the central part of the Republic of Uzbekistan. The area of the region is 21.2 thousand square km. The region is divided into 12 administrative districts: Arnasay, Bakhmal, Gallyaaral, Dustlik, Zaamin, Zarbdar, Zafarbad, Mirzachul, Pakhtakor, Farish, Sharof Rashidov, Yangiabad. In the east and northeast, the Jizzakh region borders on the Syrdarya region, in the west on the Navai region, in the south on the Samarkand region and Tajikistan, in the north on Kazakhstan. It includes the southeastern part of the Kyzylkum desert, the eastern half of the Aydar-Arnasai system of lakes, the western part of the hungry steppe, the eastern part of the Nurata mountains with adjacent remnants and the piedmont plain (Farshinsky steppe), the Malguzar ridge and the northern slope of the Turkestan ridge.

According to its natural and climatic conditions, the territory of the Jizzakh region as a whole belongs to the zone of sharply continental climate, summer is hot and dry, winter is moderately cold (Alibekov, Nishanov, 1978) [1]. In the plains and foothills of the Jizzakh region, the average annual air temperature ranges from 12 to 15 degrees, the average July temperature reaches 27-29 degrees, the average January temperature ranges from 4.4 in the north of the region to 0.1-0 degrees in the foothills. The average duration of the frost-free period in different regions is from 170 to 230 days. Within the region, the following botanical and geographical regions are distinguished: North Turkestan, Malguzar, Nurata, Aktau, Prinurata remnant, Mirzachul and Kyzylkum plains [2].

Ferula angreni Korovin-perennial, polycarpic. Fine-earth and gravelly slopes, river valleys, screes.

Ferula diversivittata Regel&Schmalh-perennial, monocarpic. Fine-earth slopes, dry riverbeds. In folk medicine of Turkmenistan, it is used for gastrointestinal diseases and as a wound healing [4]. The plant has antibacterial activity [5]. Lactones have keratoplastic properties [6].

Ferula dshizakensis Korovin-perennial, polycarpic. Stony and gravelly slopes, rocks.

Ferula fedtschenkoana Koso-Pol.-perennial, polycarpic. Fine-earth and gravelly slopes.

Ferula ferganensis Lipsky ex Korovin-perennial, polycarpic. Stony slopes, rocks, talus. Forage plant[7].

Ferula foetida (Bunge) Regel- perennial, monocarpic. Sandy and clayey deserts, piedmont plains, fine-earth slopes. In Indian traditional medicine, assafoetida resin is used for dyspepsia, diarrhea,

cholera, diabetes, colic, for the treatment of nervous diseases, hysteria, cough, rheumatism, and asthma [10]. In the past, roots and fruits were eaten [7]. Valuable honey plant [11].

Ferula helenae Rakhm&Melibaev-perennial, monocarpic. Rocky slopes. foothills.

Ferula kokanica Regel&Schmalh.-perennial, monocarpic. Fine-earth, gravelly and rocky slopes, talus, pebbles, rocks. Foothills, lower, middle and upper belt of mountains. In folk medicine of Tajikistan, it is used in the treatment of syphilis and furunculosis [12].

Ferula kuhistanica Korovin-perennial, monocarpic. Fine-earth, gravelly and rocky slopes. In folk medicine, the root resin is used to treat syphilis, tumors, and cancer [13–14]. Leaves are readily eaten by sheep [15]. The fruits have trichomonastatic properties [16]. Valuable honey plant [17].

Ferula Lehmannii Boiss- perennial, monocarpic. Sandy deserts. Plain.

Ferula mollis Korovin- perennial, polycarpic. Fine-earth, gravelly and rocky slopes.

Ferula moschata (H.Reinsch) Koso-Pol. (*Ferula sumbul* (Kauffm) Hook. F)- perennial, polycarpic. Stony and fine earth slopes, talus, rocks, gorges. In folk medicine, antispasmodic, with bronchial asthma, neurosis, hysteria, fever [14].

Ferula oopoda (Boiss & Buhse) Boiss- perennial, monocarpic. Sandy, clay and rocky soils. Plains, foothills.

Ferula ovczinnikovii Pimenov- perennial, monocarpic. Stony and gravelly slopes, talus.

Ferula ovina (Boiss) Boiss.- perennial, polycarpic. Fine-earth, gravelly and rocky slopes, rocks. Forage plant. Resinous and honey plant. Ovindiol isolated from fruits has antibacterial activity.

Ferula penninervis Regel&Schmalh- perennial, polycarpic. Rocky slopes, talus, pebbles, dry riverbeds, rocks. In folk medicine of Kyrgyzstan, it is used in the treatment of malaria. Honey plant. Sesquiterpene lactones have antibacterial activity.

Ferula samarkandica Korovin- perennial, monocarpic. Fine-earth, gravelly and rocky slopes, dry channels, rocks. Resinous, essential oil and fodder plant.

Ferula schtchurowskiana Regel&Schmalh- perennial, monocarpic. Sandy and clayey deserts, solonchaks, gravelly slopes. In folk medicine of Tajikistan, it is used in the treatment of hepatitis.

Ferula varia (Schrenk) Trautv- perennial, monocarpic. Sandy deserts, stony and fine earth slopes. Plains, foothills. It is used in folk medicine for fever, toothache, as an anthelmintic and as a wound healing. The sum of flavonoids and coumarins in the experiment has a hypocholesteric and hypotriglyceridemic effect.

As a result of studying the literature data and our own research, a table was compiled for the species of the genus *Ferula*: 11 species are resinous, 19 essential oil, 3 starch, 19 honey plants, 12 fodder, 3 food, 8 medicinal plants (Table 1).

Table 1. Economic importance of *Ferula* L.

СМОЛОНОСНЫЙ

Species	Resiniferous	Essential oil	Starchy	Honey plant	Fodder	Alimentary	Medicinal
F.diversivittata	+	+	-	+	-	-	+
F.foetida	+	+	-	+	+	-	+
F. helenae	-	+	-	+	+	-	-
F.konanica	-	+	-	+	+	-	+
F.kuhistanica	+	+	+	+	+	+	+

F.lehmannii	+	+	+	+	-	-	-
F.oopoda	+	+	-	+	-	-	-
F.ovczinnikovii	-	+	-	+	-	-	-
F.samarkandica	+	+	-	+	+	-	+
F.schtschurowskiana	+	+	+	+	+	+	-
F.varia	-	+	-	+	+	-	+
F.angreni	+	+	-	+	+	-	-
F.dshizakensis	-	+	-	+	+	-	-
F.fedtschenkoana	-	+	-	+	-	-	-
F.ferganensis	-	+	-	+	-	-	-
F.mollis	-	+	-	+	+	-	-
F.moschata (F.sumbul)	+	+	-	+	-	+	+
F.ovina	+	+	-	+	+	-	-
F.penninervis	+	+	-	+	+	-	+

Species of the genus *Ferula* are the richest source of biologically active substances, essential oils, coumarins, terpenoids, flavonoids and other natural compounds (Table 2).

Table 2. The chemical composition of the genus *Ferula* L.

Species	Plant organs	Terpenoids	Carbohydrates	Essential oil	Coumarins	Flavonoids	Sesquiterpene lactones	Steroids	Fatty oil	Phenol carboxylic acids	Vitamin C	Organic acids
F.diversivittata	Roots	-	-	-	+	-	+	+	-	-	-	-
	Fruit	-	-	+	-	-	-	-	-	-	-	-
F.foetida	Fruit	-	-	+	-	-	-	-	-	-	-	-
F.kononica	Roots	-	-	+	+	-	-	-	-	-	-	-
	Fruit	-	-	-	+	-	-	-	-	-	-	-
F.kuhistanica	Roots	+	-	+	-	-	-	-	-	-	-	-
	Fruit	-	-	+	+	-	-	-	-	-	-	-
F.oopoda	Roots	-	-	+	+	-	+	-	-	-	-	-
	Fruit	-	-	+	-	-	+	-	+	-	-	-
F.samarkandica	Roots	+	-	-	+	-	-	-	-	-	-	-
	Fruit	-	-	-	+	+	-	-	-	-	-	-
F.schtschurowskiana	Roots	-	-	+	+	+	-	-	-	-	-	-
	Fruit	+	+	+	+	-	+	-	-	-	-	-
F.varia	Roots	+	+	+	+	-	+	-	-	-	-	-
	Fruit	-	-	-	+	-	-	-	-	-	-	-
F.angreni	Roots	+	-	-	-	-	-	-	-	-	-	-
	Fruit	+	-	-	-	-	-	-	-	-	-	-
F.ferganensis	Roots	+	-	+	-	-	-	-	-	-	-	-
	Fruit	-	-	-	+	-	-	-	-	-	-	-
F.moschata (F.sumbul)	Roots	-	-	+	+	-	-	-	-	-	-	+
F.ovina	Roots	+	-	+	+	-	-	-	-	-	-	-

	Fruit	-	-	+	+	-	-	-	+	-	-	-
F.penninervis	Roots	-	-	+	+	-	+	-	-	-	-	-
	Fruit	-	-	+	+	-	+	-	-	-	-	-

The distribution of the genus *Ferula* L. in the Jizzakh region is given in Table 3.

Table 3. Distribution of the genus *Ferula* L. in the Jizzakh region

Species	Botanical-geographical regions
<i>Monocarpics</i>	
<i>F.diversivittata</i> Regel&Schmalh	Nurata
<i>F.foetida</i> (Bunge) Regel	Kyzylkum, Nurata, Prinurata remnant
<i>F. helenae</i> Rakhm&Melibaev	Prinurata remnant
<i>F.konanica</i> Regel&Schmalh	Malguzar, North Turkestan, Nurata, Prinurata remnant.
<i>F.kuhistanica</i> Korovin	Aktau, North Turkestan, Malguzar
<i>F.lehmannii</i> Boiss	Kyzylkum
<i>F.oopoda</i> (Boiss&Bunge) Boiss	Prinurata
<i>F.ovczinnikovii</i> Pimenov	Malguzar
<i>F.samarkandica</i> Korovin	North Turkestan, Nurata, Malguzar
<i>F.schtschurowskiana</i> Regel&Schmalh	Nurata, North Turkestan, Malguzar, Mirzachul
<i>F.varia</i> (Schrenk) Trautv	Prinurata remnant
<i>Polycarpics</i>	
<i>F.angreni</i> Korovin	Nurata, Malguzar
<i>F.dshizakensis</i> Korovin	Prinurata remnant, Malguzar, Nuratinsky
<i>F.fedtschenkoana</i> Koso-Pol	North Turkestan, Malguzar
<i>F.ferganensis</i> Lipsky ex. Korovin	Nurata
<i>F.mollis</i> Korovin	North Turkestan
<i>F.moschata</i> (H.Reinsch) Koso-Pol (<i>F.sumbul</i>)	Nurata, North Turkestan, Malguzar
<i>F.ovina</i> Boiss	Aktau, Nurata, North Turkestan, Malguzar
<i>F.penninervis</i> Regel&Schmalh	Nurata, North Turkestan, Malguzar

Thus, the species of *Ferula* L. in the Jizzakh region (Uzbekistan) are distributed 19 species of *Ferula* L., of which 8 are polycarpic, 11 are monocarpic. These species are fodder, resinous, essential oil, medicinal plants that can be used in medicine.

References

1. Alibekova L.A., Nishanov S.A. Natural conditions and resources of the Jizzakh region. Tashkent, 1978, - 254p.
2. Geographical atlas of Uzbekistan. Tashkent, ed. Gosozmzemgeodezcadastre, 2012, - p.144.
3. Tozhibaev K.Sh., Beshko N.Yu., Esankulov A.S., Batoshov A.R., Azimova D.E. Cadastre of flora Jizzakh region. Tashkent, 2018., p.32.
4. Kiselova V.V., Sokolova G.L., 1976, Anatomical and biomedical study of the ferula of different tubules. Actual problems of pharmaceutical science and practice. Theses.reports 1st Congress of Pharmacists of Turkmenistan. Ashgabat, 210s.
5. Bondarenko A.S., Schweiger M.O., Mandrik T.P., Poddubnaya N.P., Skorobogatko T.I., Mozgovaya L.F., Kolesova E.A. 1967. Antimicrobial activity of plants from the botanical gardens of Ashgabat and Dushanbe. Phytoncides, their biological role and significance for medicine and the national economy. 102-106, Kyiv. Karryev M.O., Kiseleva V.V. 1978. Sesquiterpene lactones. Patent of the USSR, 591. 189. Discoveries, inventions. 55, 5;9.
6. Pavlov N.V. 1947, Plant resources of southern Kazakhstan. M., 203s.
7. Bulgakova L. 1989. Honey plants of nomadic beekeeping. Tashkent, 144s.

8. Nadkarmi K.M. 1954. Indian material medica. 1.2. 1319p. Bombay. Hocking G. M. 1958. Pakistan medicinal plants. Qual. plant. et mater. veg. 5, 1-2; 145-153.
9. Khamidov G.Kh. 1987. Honey plants of Uzbekistan and ways of their rational use. Tashkent, FAN UzSSR, 128p.
10. Dadoboeva O. 1972. Dictionary of scientific and local names of medicinal plants of Northern Tajikistan. Dushanbe, 130 p.
11. Abramov M.M., Gaze O.F. 1950. Wild medicinal plants of the Zerafshan Valley used in folk medicine. Tr.Uzb. un-ta, N.S., 43; 145-185.
12. Sakhobiddinov S.S. 1948. Wild medicinal plants of Central Asia. Tashkent, 216s.
13. Larin I.V., Agagabyan Sh.M., Rabotnov T.A., Larina V.K., Kasimenko M.A., Lyubskaya A.F. 1956, Forage plants of hayfields and pastures of the USSR. 3, 879s.
14. M., L. Rubinchik M.A. 1972. Trichomonostatic properties of higher plants. Phytoncides. Kyiv, s. 128-132.
15. Rakhmankulov U., Melibaev S. 1981. Some biological features of the Central Asian species of the genus *Ferula*. Biol. Features and distribution perspective. lek. plants. Tashkent, pp.31-61.
16. Aitchison I.E.T., 1891. Notes to assist. in a further knowledge to the products of Western Afghanistan and of North – Eastern Persia. Trans. Bot. Soc. Edinburgh. XVIII: 1-228.
17. Salahiddinov Sh., Yarkulova Z. Healing properties of *Ferula Sumbul* root// Scientific Progress vol. 3 (4), (2022), p. 771-775