

## The Status of the Study and the Possibility of Using Plant Species of the Genus *Ferula* L. In Uzbekistan

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**Annotation:** This article is about the state of the study of plant species of the genus *Ferula* L. and about the chemical composition of this plant raw material, as well as the agro technology of its cultivation in Uzbekistan.

**Key words:** Category, species, raw materials, sesquiterpenoid substances, terpenoid coumarins, complex efrics, sesquiterpene lactones, umbelliferon.

The genus of plants *Ferula* L. has the largest number (185) species within its family Apiaceae L., of which there are about 110 species in Central Asia and Kazakhstan. Species of this genus are considered essential oil, fodder, honey-bearing, medicinal, starch-bearing, aromatic, nutritious and technical plants.

Species of the Genus *Ferula* L. - are perennial, herbaceous and xerophytic plants. According to the seasonal rhythm of development, they are ephemeroids. That is, the plant grows and develops every year during a short growing season in spring, while the air temperature and soil inhibit the growth of the plant, in summer, autumn and winter it becomes calm during low precipitation.

The chemical composition of plants of the species of the genus *Ferula* L. was studied in depth by scientists of the Institute "Chemistry of Plant Substances" of the Academy of Sciences of the Republic of Uzbekistan G.K. Nikonov, A.I. Saidkhodzhaeva and V.M. Malikov.

During the 1970s and 1980s, the chemical composition of 50 species of plants of the genus *Ferula* L. growing in Central Asia was studied, from which about 250 terpenoid substances were isolated (Saidhodjaev et al.),c, 1974; Sagitdinova et al.k, 1977, 1978; Meliboev, Rakhmonkulov, Saidhodjaev, 1980). The authors determined that the plant has more than 90 species of the genus *Ferula* L. they contain sesquiterpenoid substances, of which 55 types are terpenoid coumarins (56.0%), 34 types are esters (35.0%), and 15 types are sesquiterpene lactones (20.0%).

Currently, it has been established that about 100 species of plants of the genus *Ferula* L. store sesquiterpenoid substances. From this it became known that from 100 species -54.7% contain coumarin terpenoids, 35.5% esters, and 12.4% sesquiterpene lactones.

As a result of a comprehensive study of plant species of the genus *Ferula* L. occurring in Central Asia, new drugs are being created (Saidhodzhaev et al.),c, 1974; Meliboev etal.k, 1980; Malikov and B.k, 1998; Kurmukova, Akhmedhodzhaeva, 1994).

Among other things, it was found that the *F. tenuisekta* plant stores substances with estrogenic (hormone-restoring) properties, and on this basis the drugs “Tefestrol”, used in gynecology, and “Panoferol”, used in veterinary medicine, were created.

It has been established that other representatives of this genus also store various biologically active substances that are currently used in medicine. For example, it was found that the *F. varia* plant accumulates luteolin, a D-glucopyroanoid. This substance, created by the scientific staff of the Institute, has passed clinical trials under the name “Pefricizin” (Maksumova et al., 1993).

A medicine is prepared from glue (resin) extracted from the root, which is used for asthma and some nervous diseases. Smelly *Ferula* glue resin is used in folk medicine for the treatment of vascular diseases, pulmonary tuberculosis, plague, diarrhea, whooping cough, toothache, nervous and other diseases, as well as as a strengthening, expectorant and anthelmintic.

Since the species of the genus *Ferula* L. due to the fact that they grow in different environmental conditions, they are also of great importance as a forage plant. About 40 species of the genus have important feeding characteristics, in particular, *F.tenuisekta*, *F.kuhistanika*, *F.foetida*, *F.foetidissima*, *F.dshizakensis*, *F.akllschkensis*, *F.ferganensis*, *F.schurovskiana*, *F.ugamica*, *F.karalavika*, *F.ovina*, *F.tschlmgamca*, *F.prangifolia*, *F.btvinoviana*, *F.Kokanika*, *F.ferulaeoides*, *F.pennmervis* and *F.rubroarenosa* are important in various plant groups occurring as edificers and subedifiers.

Seeds of plant species of the genus *Ferula* L. are considered a good feed concentrate, which is lovingly consumed by Karakul sheep, horses, camels in summer and winter. The *F.acitschcensis* plant contains 14.34% protein (easily digestible), 9.7% fat and 16.9% fiber. Plant species of this genus are rich in protein substances, they can also be used for fattening poultry.

Chemical composition of the product (raw material) *Ferula* L. such is:

The composition of the glue-resin consists of 9.35-65.1% resins, 12-48% glue and 5.8-20% essential oil. Ferulic acid, asaresene, asaresenatanol, asaresinol and their esters formed by ferulic acid, as well as compounds of farnisiferol and umbelliferon are isolated from the resin. The essential oil consists mainly of organic sulfides (up to 65%), and also contains pinene and oxycoumarin. The root contains up to 9% resins. The resin contains up to 0.4% essential oil.

Extraction of resin from the root of plants begins in the month of May and continues until autumn, so the periods of resin extraction are also divided into periods of spring and summer seasons. The spring stage is considered a preparatory period. At this stage, the area on which the glue-resin will be prepared is determined, the total stock of plants is determined and those from which the glue-resin will be obtained are determined. Being a *Ferula* monocarb plant, not the whole bush will have a stem. Therefore, it is necessary to clean the root of the plant from the stem and aboveground leaves and prepare it for resin production. To do this, a pit with a depth of 5-10 cm and a width of 20-25 cm is dug around the root of the plant. The top of the stem is slightly opened, opening a ditch to protect it from rainwater

It is known that the root of the *ferula* is thick, 1-1.5 meters or even more in length, deeply penetrating into the ground, whitish and brown in appearance. The inner side of the root consists of many vessels, from which glue-resin, a biologically active substance resembling milk, is released.

After the top of the rhizome of the cuttings is opened, it is cut off to obtain resin, and the root tip is covered with specially cut cardboard to protect it from sunlight and external influences. Thus, the adhesive resin can rise from the root to the upper section. After 5-6 days, high-quality donak juice is collected on the first and third slices and the collected glue is collected, after which it is cut again from a new place.

During the season, the plant can be cut 20-30 times, depending on the size of the root. Even at the summer stage, the work on the preparation of resin continues in the same way as at the spring stage. The difference between the summer stage and the spring stage is that in summer the stems and leaves of the plant dry up and separate themselves from the root, and the rest of the work continues in the same way as in spring. After the end of the season, it is necessary to cover each bush with soil from above in order to collect the resin again for the next year. The data show that from the area covered by the cover of the plants give 80-85% of the resins.

In our republic, the production of Ferula resin glue officially began in 2006. To obtain resin-glue from a Ferule, it is necessary first of all to determine the natural biological and operational reserves of the plant. It is necessary to make a large-scale map of plants, organize their use without harming nature, create the possibility of their restoration in natural conditions. That is, it is necessary to organize work on the alternate use of natural areas of these plants.

When preparing glue-resin, the following rules must be observed:

- resin-glue is recommended to be taken from a mature (from the 4th year) adult plant;
- resin-glue should not be obtained from biologically immature 1-2-3-year-old plants;
- glue-resin should be taken from three out of 5 mature plants for every 10 m<sup>2</sup>;
- it is impossible to allow harvesting of products from a flowering plant, so that in subsequent years 2-3 bushes of flowering and seed-enriched plants should be left on each area of 400-500 m<sup>2</sup> in order to obtain seeds for their reproduction.

One of the ways to prevent the depletion of natural resources of Ferula is their reproduction by planting and organizing plantations in the natural conditions of plant growth.

To do this, it is recommended to sow the Ferula seeds ripened in summer, 1 piece at a time, in hand-prepared (3-5 cm) recesses (1-3 cm during drought) on the prepared plot in compliance with special requirements and cover with soil from above. It is recommended to add 200-300 kg of potassium-sulfate mineral fertilizers per 1 hectare.

In the 1st year, 60% of seedlings on the planting area are obtained. According to this, due to replenishment in the 2nd year, the number of seedlings will be provided by 100 percent. On average, 25,000 seedlings are grown on 1 hectare. Open exposed areas of the natural territory where the Ferula grows are carefully plowed and cleared of pebbles and gravel, weeds and shrubs. Taking the beds, it is advisable in autumn and early spring to sow the sorted Ferula seeds by spikelets. At the same time, about 5-6 kg of seeds are consumed per 1 hectare, so that industrial plantations of this plant can be organized in natural conditions.

It is necessary to protect organized plantations from cattle grazing, to carry out irrigation activities in the dry seasons of the year, if possible, to supply organized plantations with organic and mineral fertilizers.

This recommendation is proposed because of the biological characteristics of this plant, since the Ferule reproduces from seeds that have ripened in natural conditions and spreads over a large area.

One of the main tasks facing our science is to solve in the future by specialists the problem of studying the biocological properties of Ferula in the water, its cultivation in a cultural form.

### Conclusions:

1. Ferula is considered a monocarp plant that blooms once every 7-8 years and produces seeds.

2. It is necessary to determine the biological and operational reserves of *Ferula* in our republic, draw up large-scale maps of such areas, organize annual, alternate extraction of glue-resin from plants with their breakdown into plots.
3. It is necessary to create conditions for the natural renewal of glue-resin, bury the top of the plant on which the resin was removed with soil.
4. It is advisable to organize *Ferula* plantations in conditions of their natural growth, it is advisable to conduct applied scientific research on the organization of industrial plantations in irrigated fields.

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