

Distribution and Chemical Composition of Monocarpic Plants of the Apiaceae Family in Tien Shan Mountain

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Abstract

The article presents materials on the distribution and data on the chemical composition of monocarpic plants of the Apiaceae family in the Tien Shan Mountains.

Keywords

Monocarpic Plants, Chemical Composition, Mountain, Apiaceae Family, Plant Species

1. Introduction

The Tien Shan is a mountain system located in Central Asia on the territory of five countries: Uzbekistan, Tajikistan, Kyrgyzstan, Kazakhstan, China (Xinjiang Uygur Autonomous Region). The length of the Tien Shan from west to east is 2500 km. Rivers belong to the basins of internal flow: Rapid rivers: Naryn, Chu, Ili, Tarim, Kyzylsu and many others; Large lakes: Issyk-Kul, Son-Kul, Chatyr-Kul and others.

The first European researcher of the Tien Shan in 1856 was Pyotr Petrovich Semenov, who received an honorary prefix to his surname for his work—“Semenov-Tien Shan” (Figure 1 & Figure 2).

The Tien Shan system includes the following orographic areas: Northern Tien Shan: Ketmen, Zailiysky Alatau, Kungei Alatau and Kirghiz Alatau ridges; eastern Tien Shan: Borohoro, Iren-Khabyrga, Bogdo-Ula, Karlyktag, Halyktau, Sarmin-Ula, Kuruktag ridges; western Tien Shan: Karatau, Talas Alatau, Chatkal,



Figure 1. Grazing on the mountain.



Figure 2. Mountain pasture.

Pskov and Ugamsky ridges; southwestern Tien Shan: ridges framing the Fergana Valley and including the southwestern slope of the Fergana Ridge; central Tien Shan: it is bounded from the north by the Kirghiz Ridge and the Issyk-Kul basin, from the south by the Kakshaal-Tau ridge, from the west by the Ferghana Ridge, from the east by the Akshirak mountain range. The highest point is Victory Peak (7439 m.), located on the border of Kyrgyzstan and the Xinjiang Uygur Autonomous Region of China [1].

2. Material and Methods of Research

During the research, the following methods were used: The description of vege-

tation, taking into account its floral composition, was carried out according to the Drude method, which is generally accepted in geobotany. The range was specified on the basis of literature data and surveys of distribution areas within the regions of Uzbekistan. Age-related changes in plants according to the method of T.A. Rabotnov [2]. The phenology was carried out according to the method of I.N. Beideman [3]. The plant species were specified according to S.K. Cherepanov [4] and Plant Determinants of Central Asia [5]. Geobotanical studies were carried out according to the generally accepted methodology for monitoring pastures [6]. Route field studies with the description of test areas by the traditional method, full-scale interpretation of satellite images. Identification of pasture types and determination of the yield of fodder mass on the test areas by seasons (Figure 3 & Figure 4).

3. Results and Discussion

In the family Apiaceae Lindl., there are many medicinal, essential oil, spicy-aromatic, food, fodder and other plants. There are many medicinal plants in the family *Carum carvi*, *Pastinaca sativa*, *Daucus carota*, *Ferula sumbul*, *F. tadshikorum*, *F. foetida* and many species of Apiaceae have been widely used in oriental medicine since antiquity. Of the spicy-aromatic and essential oil Apiaceae, coriander, cumin, dill, anise, cumin, *Mediasia macrophylla* and others are in the first place. Important forage plants include *Prangos pabularia* and *Ferula* species



Figure 3. *Prangos pabularia*.



Figure 4. *Ferula kuhistanica*.

(*F. kuhistanica*, *F. tenuisecta*, *F. karatavica*, *F. varia*) and *Heracleum lehmannianum*, accumulating large biomass. They are used for livestock feed in the form of hay, which is carefully collected and stored by the local population.

Some species of Apiaceae are harmful, as they belong to a number of weeds or poisonous plants (*Conium maculatum*, *Cicuta virosa*, *Berula erecta*, etc.).

According to Pimenov M.G., Leonov M.V. [7] the Apiaceae family has a large species volume of 3816 - 3968 species. According to the latest data from the database being developed at the MSU Botanical Garden, 2090 species belonging to 285 genera are found in Asia, 141 genera in Europe, 133 in Africa, 93 in North America, 48 in South America and 36 in Australia [8] [9] (Figure 5 & Figure 6).

List of monocarpic plants of the Apiaceae Lindl family the flora of the Tien Shan is given in Table 1.

It is known that the Apiaceae family is rich in flavonoids, terpenoids, essential oils, coumarin and saponins and other substances (Table 2).

4. Conclusions

Thus, studies have established that on the territory of the Tien Shan monocarpic plants of the Apiaceae Lindl family there are about 98 species (32 genera). Of particular interest are *Angelica komarovii*, *Heraculum lehmannianum*, *Eryngium planum*, *Anthriscus sylvestris* and species of the genus *Ferula* L. (*F. diversivittata*, *F. schtschurowskiana*, *F. foetida*, *F. varia*, *F. kuhistanica*, *F. samarqandica*,



Figure 5. *Heracleum lehmannianum*.



Figure 6. *Ferula foetida*.

Table 1. Distribution of monocarpic plants of the family Apiaceae Tien Shan

No.	Apiaceae species	Ketmentau	Zailiysky Alatau	Karatau	Talas Alatau	Ugam	Pskem	Chatkal	Kuramin	Mogoltau	Fergana	Uzunakmat	Kyrgyz Alatau	Susamyr-tau	Chu-Illi Mountains
1	<i>Eryngium macrocalyx</i>	+	+	+	+	+	+	+	+	+	+	+	-	-	+
2	<i>E. caucasicum</i>	-	-	+	+	+	+	+	+	+	+	-	+	-	-
3	<i>E. planum</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-
4	<i>Echinophora sibthorpiana</i>	-	-	-	-	-	-	+	-	+	-	-	-	-	-
5	<i>Krasnovia longiloba</i>	-	+	-	-	-	-	-	-	-	-	-	+	-	-
6	<i>Anthriscus sylvestris</i>	+	+	-	-	-	-	-	-	-	-	-	+	-	-
7	<i>Albertia palaacea</i>	-	-	-	-	-	-	+	+	+	-	-	-	-	-
8	<i>Schrenkia papillaris</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-
9	<i>Sch. ugamica</i>	-	-	-	+	+	+	+	-	-	-	-	-	-	-
10	<i>Sch. golickeana</i>	-	-	+	-	+	+	+	+	-	+	-	+	-	-
11	<i>Sch. vaginata</i>	+	+	+	+	-	-	+	+	+	+	+	+	-	-
12	<i>Korshinskya olgae</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	-
13	<i>K. bupleuroides</i>	-	-	-	-	-	-	-	-	+	-	-	-	-	-
14	<i>Aulacospermum popovii</i>	-	-	-	-	+	+	+	-	-	-	-	-	-	-
15	<i>A. gonocaulum</i>	+	+	-	-	-	-	-	-	-	-	-	-	-	+
16	<i>A. turkestanicum</i>	-	-	-	+	+	+	+	-	-	-	-	-	-	-
17	<i>A. roseum</i>	-	-	-	+	-	+	+	+	-	-	-	-	-	-
18	<i>A. simplex</i>	+	+	-	-	-	-	-	-	-	+	-	-	-	-
19	<i>A. tenuisectum</i>	-	-	-	-	-	-	-	-	-	+	-	-	-	-
20	<i>Bupleurum ferganense</i>	-	-	-	-	-	-	+	-	-	+	-	-	-	-
21	<i>Elaeosticta transitoria</i>	-	-	+	+	+	+	+	+	+	-	-	+	-	+
22	<i>E. allioides</i>	-	-	+	+	+	+	+	+	+	+	-	+	-	+
23	<i>E. tschimganica</i>	-	-	-	-	+	+	+	+	-	+	-	-	-	-
24	<i>E. ferganensis</i>	-	-	-	+	-	-	+	-	-	+	-	+	-	-
25	<i>E. hirtula</i>	-	-	-	-	-	-	+	-	-	+	-	-	-	-
26	<i>E. alaica</i>	-	-	-	+	-	-	+	+	-	+	-	-	-	-
27	<i>E. knorringiana</i>	-	-	-	-	-	-	+	-	-	+	-	-	-	-
28	<i>E. samarkandica</i>	-	-	-	-	-	-	-	-	+	-	-	-	-	-
29	<i>E. ugamica</i>	-	-	+	-	+	+	+	+	-	+	-	-	-	-
30	<i>Galagania fragrantissima</i>	-	+	-	-	-	-	+	+	-	-	-	+	-	+

Continued

31	<i>G. ferganensis</i>	-	-	-	-	-	-	-	-	+	-	-	-	-	
32	<i>G. tenuisecta</i>	-	-	+	+	+	+	+	+	+	-	-	+	-	+
33	<i>Hyalolaena tschuiiensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+
34	<i>H. jaxartica</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-
35	<i>H. intermedia</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-
36	<i>H. bupleuroides</i>	+	+	+	+	+	-	-	-	-	+	-	+	-	+
37	<i>H. trichophylla</i>	+	+	+	+	-	-	-	-	-	-	-	+	-	+
38	<i>Oedibasis apiculata</i>	-	+	+	+	+	+	+	+	+	+	-	+	-	+
39	<i>Oe. platycarpa</i>	-	-	+	-	+	+	+	-	-	-	-	-	-	-
40	<i>Oe. tamerlanii</i>	-	-	-	-	-	-	-	-	-	+	-	-	-	-
41	<i>Mogoltavia sewerzawii</i>	-	-	-	-	-	-	-	-	+	-	-	-	-	-
42	<i>Bunium setaceum</i>	+	+	+	+	+	+	+	-	-	+	-	+	-	+
43	<i>Falcaria vulgaris</i>	-	+	-	-	+	-	+	-	-	-	-	-	-	-
44	<i>Seseli talassicum</i>	-	-	+	+	+	-	+	-	-	+	-	-	-	-
45	<i>S. setiberum</i>	-	-	-	+	+	-	-	-	-	-	-	-	-	-
46	<i>S. calycinum</i>	-	-	-	-	+	+	+	+	-	-	-	-	-	-
47	<i>S. buchtormense</i>	+	+	-	-	-	-	-	-	-	-	-	-	-	-
48	<i>S. eryndioides</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-
49	<i>S. eriocephalum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+
50	<i>S. giganteum</i>	-	-	-	-	-	-	+	-	-	-	-	-	-	-
51	<i>S. valentinae</i>	+	+	-	-	-	-	-	-	-	-	-	+	-	-
52	<i>Pilopleura tordyloides</i>	-	-	+	+	+	-	+	-	-	+	-	+	-	-
53	<i>Schulzia crinata</i>	+	+	-	+	-	-	-	-	-	+	-	+	-	-
54	<i>Paraligusticum discolor</i>	-	+	-	+	+	+	+	-	-	+	+	-	-	-
55	<i>Seselopsis tianschanicum</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-
56	<i>Dimorphosciadium gayoides</i>	-	-	-	-	-	+	+	-	-	+	-	-	-	-
57	<i>Alposelinum albomarginatum</i>	-	+	-	+	+	+	+	-	-	+	-	+	-	+
58	<i>Angelica komarovii</i>	-	-	-	-	-	-	-	-	-	+	-	-	-	-
59	<i>A. brevicaulis</i>	+	+	-	+	-	-	+	-	-	+	-	+	-	-
60	<i>A. decurrens</i>	-	+	-	+	-	-	-	-	-	-	-	+	-	-
61	<i>A. tschimganica</i>	-	-	+	-	-	-	+	-	-	-	-	-	-	-
62	<i>Ferula malacophylla</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-
63	<i>F. diversivittata</i>	-	-	-	-	-	-	+	+	-	-	-	+	-	-
64	<i>F. schtschurowskiana</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-

Continued

65	<i>F. ferulaeoides</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
66	<i>F. dubjanskyi</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
67	<i>F. thophila</i>	-	-	-	-	-	-	+	+	-	-	-	-	-
68	<i>F. repardii</i>	-	-	-	+	-	+	+	-	-	-	-	-	-
69	<i>F. foetida</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
70	<i>F. taucumica</i>	-	-	-	-	-	-	-	-	-	-	-	-	+
71	<i>F. ugamica</i>	-	-	+	-	+	+	+	+	-	-	-	-	-
72	<i>F. sugatensis</i>	-	+	-	-	-	-	-	-	-	-	-	-	-
73	<i>F. varia</i>	-	-	+	-	-	-	-	-	-	-	-	-	+
74	<i>F. lipskyi</i>	-	-	-	-	-	-	-	-	+	-	-	-	-
75	<i>F. inciso-serrata</i>	-	-	-	-	-	+	-	+	+	-	-	-	-
76	<i>F. conocaula</i>	-	-	-	-	-	-	+	+	-	-	-	-	-
77	<i>F. kuhistanica</i>	-	-	-	-	-	-	-	-	+	-	+	-	-
78	<i>F. minkwitzae</i>	-	-	-	+	-	-	-	-	-	-	+	-	-
79	<i>F. fedroviorum</i>	-	-	-	-	-	-	-	+	-	-	-	+	-
80	<i>F. subtilis</i>	-	-	-	-	-	-	-	-	+	-	-	-	-
81	<i>F. syreitschikowii</i>	+	+	+	-	-	-	-	-	-	-	-	-	+
82	<i>F. iliensis</i>	-	+	-	-	-	-	-	-	-	-	-	-	-
83	<i>F. mogoltavica</i>	-	-	-	-	-	-	-	+	-	-	-	-	-
84	<i>F. canescens</i>	-	-	+	-	-	-	-	-	-	-	-	-	+
85	<i>F. juniperina</i>	-	-	-	-	-	+	+	-	-	-	-	-	-
86	<i>F. kelleri</i>	-	+	-	+	-	-	-	-	+	-	+	-	+
87	<i>F. samarkandica</i>	-	-	+	+	-	-	+	-	-	-	-	-	-
88	<i>F. tschuliensis</i>	-	-	-	-	-	-	-	-	-	-	+	-	+
89	<i>F. karataviensis</i>	-	+	+	+	-	-	-	-	-	-	+	-	+
90	<i>Fergania polyantha</i>	-	-	-	-	-	-	-	+	-	-	-	-	-
91	<i>Dorema karataviense</i>	-	-	+	-	-	-	-	-	-	-	-	-	-
92	<i>D. microcarpum</i>	-	-	-	-	-	+	-	-	+	-	-	-	-
93	<i>Pastinaca sativa</i>	-	+	-	-	-	-	-	-	-	-	-	-	-
94	<i>Heracleum lehmannianum</i>	-	-	-	+	-	+	+	+	-	+	-	-	-
95	<i>H. dissectum</i>	+	+	+	+	-	-	-	-	-	-	+	-	-
96	<i>Semenovia transiliensis</i>	+	+	-	-	-	-	-	-	-	-	+	-	+
97	<i>Zozima korovinii</i>	-	+	-	+	-	-	+	-	-	+	-	+	-
98	<i>Pastinacopsis glacialis</i>	-	+	-	-	-	-	-	-	-	-	+	-	-

Table 2. Chemical composition of the Apiaceae family.

No.	Apiaceae species	Parts of plant organs	Essential Oil	Triterpenoids	Carbohydrates	Saponins	Flavonoids	Steroids	Terpenoids	Fatty Oil	Organic Acids	Phenolic Carboxylic Acids	Vitamin C	Coumarins	Aromatic Compounds
1	<i>Eryngium macrocalyx</i>	roots	-	+	-	-	-	-	-	-	-	-	-	-	-
		aboveground	+	-	+	+	+	-	-	-	-	-	-	-	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	-	-
2	<i>E. caucasicum</i>	roots	-	-	-	-	-	-	+	-	-	-	-	-	-
		aboveground	+	-	+	-	+	+	-	-	-	-	-	-	-
		fruits	+	-	-	-	-	-	-	-	+	-	-	-	-
3	<i>E. planum</i>	roots	+	-	+	+	-	-	+	-	+	+	-	-	-
		aboveground	+	+	+	+	+	-	-	-	+	+	+	-	-
		fruits	+	-	+	-	+	-	-	-	+	+	+	-	+
4	<i>Echinophora sibthorpiana</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-
		aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
5	<i>Anthriscus sylvestris</i>	roots	-	-	-	-	-	+	+	-	+	+	+	+	+
		aboveground	+	-	+	+	+	+	-	-	-	-	+	+	+
		fruits	+	-	-	-	+	-	-	-	+	-	-	-	-
6	<i>Schrenkia golickeana</i>	fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
7	<i>Sch. vaginata</i>	fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
8	<i>Elaeosticta transitoria</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	-
		aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
		fruits	-	-	-	-	-	-	-	-	+	-	-	-	-
9	<i>E. allioides</i>	roots	-	-	-	+	-	-	-	-	-	-	-	-	-
		aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
10	<i>E. tschimganica</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
11	<i>E. ferganensis</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
12	<i>E. hirtula</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
13	<i>E. alaica</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
14	<i>E. knorringiana</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
15	<i>E. ugamica</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
16	<i>Galagania fragrantissima</i>	aboveground	+	-	-	-	+	-	-	-	-	-	-	+	-
17	<i>G. tenuisecta</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
		fruits	+	-	-	-	+	-	-	-	-	-	+	-	-
18	<i>Hyalolaena jaxartica</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
19	<i>H. bupleuroides</i>	aboveground	-	-	-	-	+	-	-	-	-	-	-	-	-
20	<i>Oedibasis apiculata</i>	fruits	-	-	-	-	-	-	-	-	-	-	-	+	-

Continued

21	<i>Oe. platycarpa</i>	fruits	-	-	-	-	-	-	-	-	-	-	-	+	-	
22	<i>Falcaria vulgaris</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	-	
		aboveground	+	-	-	-	+	-	-	-	+	+	+	+	-	
		fruits	+	-	-	-	-	-	-	+	-	-	-	+	-	
23	<i>Seseli talassicum</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-	
24	<i>S. buchtormense</i>	roots	-	-	+	-	-	+	-	-	-	-	-	-	+	-
		aboveground	+	-	-	-	+	-	-	-	-	-	-	-	+	-
		fruits	+	-	-	-	+	-	-	-	-	-	-	-	+	-
25	<i>S. eriocephalum</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-	
26	<i>S. giganteum</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-	
27	<i>S. valentinae</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-	
28	<i>Pilopleura tordyloides</i>	roots	-	-	+	-	-	-	-	-	-	-	-	-	-	
		aboveground	-	-	+	-	-	-	-	-	-	-	-	-	-	
		fruits	-	-	-	-	-	-	-	-	-	-	-	-	+	-
29	<i>Schulzia crinata</i>	roots	+	-	-	-	-	-	-	-	-	-	-	-	-	
		fruits	-	-	+	-	-	-	-	-	-	-	-	-	+	-
		aboveground	-	-	-	-	+	-	-	-	-	-	-	-	-	-
30	<i>Paraligusticum discolor</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	+	-
		fruits	+	-	-	-	-	-	-	+	-	-	-	-	+	-
31	<i>Angelica komarovii</i>	roots	-	-	-	-	-	-	+	-	-	-	-	-	+	-
		aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	-	+	-
32	<i>A. brevicaulis</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	+	-
		aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	-	+	-
34	<i>A. decurrens</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	+	-
		aboveground	+	-	-	-	+	-	-	-	-	-	-	-	+	-
		fruits	+	-	-	-	-	+	-	+	-	-	-	-	+	-
35	<i>A. tschimganica</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	+	-
		fruits	-	-	-	-	-	-	-	+	-	-	-	-	+	-
36	<i>Ferula malacophylla</i>	roots	-	-	-	-	-	-	-	-	-	-	-	-	+	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	-	-	-
37	<i>F. diversivittata</i>	roots	-	-	-	-	-	+	-	-	-	-	-	-	+	-
		aboveground	+	-	+	-	+	-	-	-	-	-	-	-	+	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	-	+	-
38	<i>F. schtschurowskiana</i>	roots	+	-	-	-	+	-	-	-	-	-	-	-	+	-
		aboveground	-	-	-	-	-	-	-	-	-	-	-	-	+	-
39	<i>F. ferulaeoides</i>	roots	+	-	-	-	-	+	+	-	-	+	-	-	-	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	-	+	-
40	<i>F. dubjanskyi</i>	roots	-	-	+	-	-	-	-	-	-	-	-	-	-	+
		aboveground	-	-	-	-	+	-	-	-	-	-	-	-	-	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	-	-	+

Continued

41	<i>F. foetida</i>	aboveground	+	-	-	-	+	-	-	-	-	+	-	-	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	-	-
42	<i>F. ugamica</i>	roots	-	-	-	-	-	+	-	-	-	-	-	-	-
43	<i>F. varia</i>	roots	+	-	+	-	-	+	-	-	-	-	-	+	-
		aboveground	+	-	-	-	+	-	-	-	-	-	-	-	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
44	<i>F. inciso-serrata</i>	aboveground	-	-	-	-	-	-	-	-	-	-	-	+	-
45	<i>F. conocaula</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
46	<i>F. kuhistanica</i>	roots	+	-	-	-	-	+	-	-	-	-	-	-	-
		aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	+	-
47	<i>F. syreitschikowii</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	+	-
48	<i>F. iliensis</i>	roots	+	-	-	-	-	-	-	-	-	-	-	+	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
49	<i>F. mogoltavica</i>	aboveground	-	-	-	-	-	+	-	-	-	-	-	+	-
50	<i>F. canescens</i>	aboveground	-	-	-	-	-	-	-	-	-	-	-	+	-
51	<i>F. juniperina</i>	roots	-	-	-	-	-	+	-	-	-	-	-	-	-
52	<i>F. kelleri</i>	roots	+	-	+	-	-	-	-	-	-	-	-	+	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	+	-
53	<i>F. samarkandica</i>	roots	-	-	-	-	-	+	-	-	-	-	-	+	-
		fruits	-	-	-	-	+	-	-	-	-	-	-	+	-
54	<i>F. karataviensis</i>	aboveground	+	-	-	-	-	-	-	-	-	-	-	-	-
55	<i>Heracleum</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-
	<i>lehmannianum</i>	aboveground	+	-	-	+	+	-	-	-	-	-	+	+	-
		fruits	+	-	-	-	-	-	+	-	-	-	-	+	-
56	<i>H. dissectum</i>	roots	+	-	-	-	-	-	-	-	-	-	-	+	-
		aboveground	+	-	-	-	+	-	-	-	-	-	+	+	-
		fruits	+	-	-	-	-	-	-	-	-	-	-	+	-
57	<i>Semenovia transiliensis</i>	fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
58	<i>Zozima korovinii</i>	roots	-	-	-	-	-	-	-	-	-	-	-	+	-
		fruits	-	-	-	-	-	-	-	-	-	-	-	+	-
59	<i>Pastinacopsis glacialis</i>	fruits	-	-	-	-	-	-	-	-	-	-	-	+	-

etc.). The above types, which contain flavonoids, terpenoids, essential oil, coumarins and other substances, can be used in medicine.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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