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CYNAROSIDE CONTENT OF THE PLANTS *Ferula varia* AND *F. foetida*

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Cynaroside (luteolin 7-glucoside) is a biologically active compound of practical interest [1-3]. We have previously reported the isolation of cynaroside from the epigeal part of *Ferula varia*, fam. Apiaceae [4].

In order to determine the dependence of the cynaroside content on the vegetation period, we have now studied the epigeal part of *Ferula varia* (Schrehk) Trautv., gathered in the environs of Mt. Alimtau, Chimkent Oblast, Republic of Kazakhstan, in various periods of vegetation. Cynaroside contents were determined by extracting the air-dry epigeal part with aqueous alcohol. The alcoholic extract was concentrated, diluted with water in a ratio of 1:1, and washed with chloroform until the organic solvent layer was colorless. The purified extract was left in a refrigerator, and, after a day, the precipitate that had deposited was filtered off with suction and was recrystallized from aqueous alcohol.

It can be seen from Table 1 that the maximum accumulation of cynaroside was observed in the period of flowering of the plant, and reached 1.1-1.15% of the weight of the air-dry raw material. The cynaroside content of the seeds was negligible (0.1%).

There is a report on the isolation of cynaroside from seeds of *F. foetida* [5]. We have also detected the presence of cynaroside in the epigeal part of this plant, which is widely distributed in Central Asia and develops a powerful epigeal part [6].

To determine the possibility of the industrial use of the epigeal part of *F. foetida* (Bunge) Regel (asafetida giant fennel) as an additional source of cynaroside, we determined the dependence of its content in this plant on its growth site and vegetation period.

TABLE 1. Cynaroside Content of *Ferula varia*

Plant organ	Date of collection and vegetation period	Cynaroside content, % on the air-dry plant
Epigeal part	1978, budding	1.0
	1982, budding	1.0
	1984, vigorous growth	0.7
	1984, flowering	1.15
	1985, budding	1.06
	1986, flowering	1.1
Seeds	1988, fruit-bearing	0.1

TABLE 2. Cynaroside Content of the Epigeal Part of *Ferula foetida*

Collection site	Date of collection and vegetation period	Cynaroside content, % on the air-dry plant
Env. Mt. Alimtau, Chimkent Obl., RKaz	1986 flowering	0.8
Ayakagitma, Navoiiskaya Obl., RUz	1986 budding	0.12
Tamdytau, Bukhara Obl., RUz	1986 budding	0.26
Uttemurat, Navoiiskaya Obl., RUz	1986 budding	0.98
Darmana collective farm, Chimkent Obl.,RKaz	1987 flowering	0.34
Village of Dzhilga, Chimkent Obl., RKaz	1989 flowering	0.94
Alimtau, Chimkent Obl., RKaz	1987 flowering	0.7
	1989 early period	0.4
	1989 fruit-bearing	0.25

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The epigeal parts were extracted with aqueous alcohol, and the alcoholic extract was concentrated, diluted with water (1:1), and washed with chloroform until the organic solvent layer was colorless. The purified extract was left in a refrigerator. After a day the precipitate that had formed was filtered off with suction and recrystallized from aqueous alcohol.

It follows from Table 2 that the cynaroside content of *F. foetida* varies considerably according to the growth site and the vegetation period. The maximum accumulation of cynaroside (0.94-0.98%) was found in a plant collected in the Navoiiskaya oblast (environs of Uttemurat and the village of Dzhilga, Chimkent Oblast).

The results obtained can be used in the development of a cynaroside technology and in the preparation of the raw material.

REFERENCES

1. L. G. Fabrina, V. N. Syrov, and M. B. Sultanov, Dokl. Akad. Nauk RUz, No. 11, 30 (1982).
2. V. L. Shelyuto, A. A. Kir'yanov, V. I. Glyzin, and V. G. Bondarenko, Khim.-Farm. Zh., No. 5, 592 (1984).
3. N. S. Maksumova, Author's Abstract of Dissertation ... Candidate of Pharmaceutical Sciences [in Russian], Tashkent (1995).
4. É. Kh. Batirov, M. P. Yuldashev, G. A. Nezhinskaya, and V. M. Malikov, Khim. Prir. Soedin., 727 (1979).
5. T. T. Pangarova and G. G. Zapesochnaya, Khim. Prir. Soedin., 801 (1973).
6. L. K. Safina and M. G. Pimenov, Giant Fennels of Kazakhstan [in Russian], Nauka, Alma-Ata (1984), p. 160.