

## A FLAVONOID GLYCOSIDE FROM *Cirsium arvense*

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Plants of the genus *Cirsium* L., family Asteraceae (Compositae) are characterized by a high content of flavonoid compounds. A number of flavonoids has been isolated from them [1-4].

In the leaves of the previously-investigated species *Cirsium arvense* L. we have found a high (about 6%) content of linarin (5,7-dihydroxy-4'-methoxyflavone 7-0-[0- $\alpha$ -L-rhamnopyranosyl-(1 $\rightarrow$ 6)- $\beta$ -D-glucopyranoside]). It was subsequently found that the material investigated belonged not to *Cirsium arvense* (L.) Scop. s. 1. but to the closely related species *Cirsium setosum*. *Cirsium arvense* L. is a western species encountered as a recently-entered plant in a number of regions of the European part of the USSR and, in particular, in the Moscow oblast. *Cirsium setosum* is a weed growing in almost the whole territory of the USSR.

We have investigated the main component of the leaves of *Cirsium arvense* L. taken from a herbarium sample of the accurately determined species (Canada thistle). The raw material (4.0 g) was exhaustively extracted in a Soxhlet apparatus with methanol, the methanolic extracts were evaporated to dryness, and the residue was dissolved in dioxane-water (1:1) (10 ml) and left for a day to crystallize. The precipitate was filtered off and was recrystallized from the same mixture. This gave an individual flavonoid compound of the composition  $C_{28}H_{32}O_{14} \cdot 1/2 H_2O$ , mp 267-269°C,  $\lambda_{max}$  269, 328 nm. IR spectra,  $cm^{-1}$ : 3200-3200 - OH; 1660 (C=O); 1620, 1585, 1570, 1500 (C=C-). In the NMR spectrum of the TMS ether of the substance isolated there were the following signals: d 7.78 ppm (2 H), J = 8 Hz, H-26; d, 6.90 ppm (2 H), J = 8 Hz, H-3,5; s 6.44 ppm (1 H), H-3, 2 d 6.40 and 3.32 ppm (1 H each), J = 2.5 Hz, H-8 and H-6, respectively; s 3.84 ppm (3 H) - OCH<sub>3</sub>; d 4.98 ppm, J = 7 Hz, the signal of the glycosidic center of  $\beta$ -glucose; signal at 4.34 ppm relating to the proton of the glycosidic center of rhamnose; the signals of the protons of the carbohydrate moiety lie in the 3.2-3.8 ppm region (10 H, and the signal of the protons of the methyl group of rhamnose and 1 ppm (3 H).

A comparison of the physical constants and characteristics of the UV, IR, and NMR spectra showed that the substance isolated from the leaves of *C. arvense* is linarin. The leaves of *C. arvense* and *C. setosum* do not differ in the composition of the main flavonoid component.

### LITERATURE CITED

1. V. A. Bandyukova, Rast. Res., 4, 429 (1968).
2. V. L. Shelyuto, V. I. Glyzin, and A. I. Ban'kovskii, Khim. Prirodn. Soedin., 365 (1970).
3. V. L. Shelyuto, V. I. Glyzin, A. I. Ban'kovskii, and N. T. Bubon, Khim. Prirodn. Soedin., 371 (1971).
4. V. L. Shelyuto, V. I. Glyzin, and N. T. Bubon, Khim. Prirodn. Soedin., 118; 241; 240 (1972).

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