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CAROTENOIDS OF *Urtica dioica*

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UDC 547.912.633.88

Urtica dioicia L. (common stinging nettle) is not only a medicinal plant but also a natural source of fodder the food value of which is not inferior to that of clover. The properties of the stinging nettle are largely due to the presence of carotene and carotenoids in it.

The carotenoids were extracted and separated by the method of B. G. Savinov and S. E. Kudritskaya [2]. The carotenoid extract of fresh stinging nettle leaves so obtained was saponified and was then subjected to chromatographic separation on a column filled with magnesium. Petroleum ether yielded mixture A of carotenoids. Mixture B of carotenoids was adsorbed in the upper part of the column. By thin-layer chromatography, carotenoid mixture A was separated into three zones: an orange zone (1) rose to the top part of the chromatogram, then a pale yellow zone (2) was adsorbed, and at the starting line there was a bright orange zone (3). The chromatography of a benzene extract of carotenoid mixture B on magnesia calcined at 700°C and the development of the chromatogram with the same solvent led to the separation of the mixture into two zones: a yellow zone (4) collected in the receiver, and a pink zone (5) remained on the adsorbent.

The carotenoids isolated were investigated on a SF-10 spectrophotometer in various solvents. The maxima of the absorption curves in the visible region of the spectrum are given below (nm):

Zone	In petroleum ether	In ethanol	In benzene
1	483, 452.425	484, 451	493, 466, 425
2	474. 445, 419		
3			461, 433, 407
4	470, 442	471, 442, 418	482, 453, 426
5	472, 444, 418	471, 441, 420	483, 453, 428

The following carotenoids were identified [2-4]: β-carotene in the trans form, $C_{40}H_{56}$ (zone 1), hydroxy-α-carotene, $C_{40}H_{56}O$ (zone 2), luteoxanthin, which is the 5:6;5':8'-diepoxide of zeacanthin, $C_{40}H_{56}O_4$ (zone 3), lutein epoxide ($C_{40}H_{56}O_3$, which is lutein 5:6-epoxide (zone 4), and violaxanthin, the 5:6;5';6'-diepoxide of zeaxanthin, $C_{40}H_{56}O_4$ (zone 5).

The amount of carotenoids in stinging nettles was 18.0 mg % at a moisture content of the leaves of 57.34%, or 29.6 mg% calculated to the dry matter. The amounts of the carotenoids isolated in percentage of their total were as follows:

D. S. Korotchenko Kiev Institute of the National Economy. Translated from Khimiya Prirodnykh Soedinenii, No. 5, pp. 640-641, September-October, 1986. Original article submitted April 4, 1986.

 0009-3130/86/2205-0604$12.50

β-Carotene	61.0
Hydroxy-α-carotene	0.9
Luteoxanthin	10.3
Lutein epoxide	13.1
Violaxanthin	14.7

Consequently, the main component in the carotenoid complex of stinging nettle leaves is β-carotene. This is particularly valuable, since β-carotene possesses a greater biological activity than the other carotenoids.

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COMPONENT COMPOSITION OF THE ESSENTIAL OIL OF *Thymus karamarianucus*

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UDC 665.528.3

The genus *Thymus* (thyme), family Lamiaceae, contains valuable and diverse components [1-3]. At the present time, species of this genus are cultivated in many countries and are widely used in various branches of the medical, food, and perfumery industries [4-6].

The flora of Azerbaidzhan is distinguished by a diverse species composition and by great reserves of wild essential-oil-bearing thymes. In view of this, considerable interest is presented by an investigation of the chemical compositions of the essential oils (EOs) of the endemic thyme species *Th. karamarianucus* Klok et Shost. collected in the central mountain zones of the Geokchai region and introduced into the Botanical Garden and into the Zakataly Center of the Institute of Botany of the AzSSR Academy of Sciences.

The starting material consisted of semishrubs collected before the vegetation period on the dry slopes of heights on the environs of the village of Karamar'yan, Geokchai region. By selection, two forms were obtained (pink and white), the height of the shoots under the conditions of the crop amounted to 12-30 cm, and the amount of dry epigeal mass was from 6.4 to $23.5 \cdot 10^2$ kg with an essential oil content of 0.26-0.74% on the weight of the air-dry plant. The forms of the thymes mentioned were selected according to their content of essential oil and its composition with the aim of the subsequent introduction of those yielding the largest amount of essential oil. The essential oil of *Th. karamariancus* was obtained by steam distillation in a semiindustrial apparatus. The quantitative amount of essential oil was determined in the time of mass flowering in quintuplicate. The investigation showed that the yield of essential oil from the epigeal part of *Th. karamariancus*, wild and introduced forms, ranged from 0.15 to 0.74%. The essential oil content of the introduced plant was 1.6-2.6 times greater than that of the wild plants, depending on the height of above sea level and the conditions of growth (Table 1).

The essential oils consisted of yellow mobile liquids with a lemony smell and with astringent properties. The component composition of the essential oils was determined by the GLC method (Chrom-5). The main components were identified by the introduction of known compounds into a sample of the oil and from their relative retention times. The changes in

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Translated from Khimiya Prirodnykh Soedinenii, No. 5, pp. 642-643, September-October, 1986. Original article submitted February 14, 1956.

0009-3130/86/2205-0605$12.50