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CAROTENOIDS OF LIPOKHROMIN

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At the present time, several natural preparations containing carotenoids are known: rose oil (60 mg %), Karotolin (120 mg %), sea buckthorn (180 mg %). In the All-Union Scientific-Research Institute for Drug Chemistry and Technology (Khar'kov) from the flesh of rose fruits, after the elimination of hydrophilic substances with the aid of ethylene chloride, we have obtained a native lipophilic complex containing up to 6-8 thousand mg of carotenoids per 100 g, and an oil concentrate containing 800-1000 mg of carotenoids, calculated as β-carotene per 100 g. They possess high antioxidant activity and are stable in the process of isolation and storage.

We have studied the carotenoid composition of an oil concentrate containing 867 mg of carotenoids per 100 g. The concentrate (5.4 g) was dissolved in 100 ml of diethyl ether and was saponified with 100 ml of a 20% alcoholic solution of sodium hydroxide at 40°C for 3 h. The saponified extract was washed with water until the alcohol and alkali had been completely removed. The carotenoid extract was dried with anhydrous sodium sulfate, the ether was distilled off under vacuum, and the dry residue was immediately transferred into gasoline (70 ml, bp 80-120°C), after which the carotenoids were separated and investigated.

For separation we used the methods of column and thin-layer chromatographies [1]. The carotenoids isolated in various solvents were investigated on spectrometers in the visible and ultraviolet regions of the spectrum. Quantitative measurements were made from the optial density of each carotenoid and its extinction taken from literature sources [1, 2]. The carotenoids were identified with the aid of the results of the spectroscopic investigations, their positions and colorations on chromatograms, qualitative color reactions, and the chromatography of mixed samples of the carotenoids under investigation with definite carotenoids isolated from carrots, squashes, and tomatoes. The results of the qualitative and quantitative studies of Lipokhromin are given below

Carotenoids	Amount, % on weight of carotenoids	Carotenoids	Amount, % on weight of carotenoids
Phytoene	-	β-Cryptoxanthin	27.18
α-Carotene isomer	0.03	Poly-cis-lycopene a	1.54
β-Carotene	14.96	Antheraxanthin	30.74
β-Zeacarotene	4.79	Poly-cis-lycopene b	0.34
α-Cryptoxanthin	0.11	Poly-cis-lycopene c	0.41
Unidentified	3.10	Taraxanthin	6.58
Prolycopene	10.22		100.00

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As we see, 47% of the mass of all the carotenoids consisted of provitamin-A-active substances: β-carotene, β-zeaxanthene, α- and β-cryptoxanthins, and an α-carotene isomer. Six out of the 13 carotenoids detected were present in an isomerized state, but they amounted to only 15.6% on the mass of the carotenoidc.

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AUSTRICIN FROM Artemisia juncea

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Artemisia juncea Kar. et Kir. – a plant widely distributed on the territory of Kazakhstan – grows in the steppe and desert zones on detrital, clayey, and rocky slopes of hills and mountains [1]. There are contradictory statements in the literature concerning the presence of sesquiterpene lactones in A. juncea. According to M. I. Goryaev [2], the epigeal part of this wormwood gathered in Alma-Ata province contained α-santonin. According to K. S. Rybalko [3, tauremisin has been detected in A. juncea.

With the aim of determining the composition of the sesquiterpene lactones in this species of wormwood more precisely, we have made a chemical study of samples of A. juncea gathered in the environs of the village of Dzhezdy, Dzhezkagan province, and in the environs of the village of Aksuek, Dzhambul province, Kazakhstan.

The epigeal part of A. juncea (2.0 kg) was extracted with chloroform five times. The extract was evaporated under vacuum. The total extractive substances so obtained (137.7 g) were treated three times with a mixture of ethanol and water (2:1). The aqueous alcoholic phase was extracted with chloroform. After evaporation of the solvent under vacuum a cream-colored residue was obtained (59.6 g), which was chromatographed on a column of type KSMG silica gel at a ratio of material to support of 1:24.

The fractions (250 ml) from the chromatographic separation were distributed in the following sequence; 1-12 (benzene); 13-74 (benzene–ether (4:1)); 75-156 (benzene–ether (1:1)); 157-209 (ether); 210-230 (ether–acetone (9:1)); 231-241 (ether–acetone (1:1)); 242-254 (acetone).

Fractions 75-156 deposited a colorless crystalline substance with the composition $C_{15}H_{18}O_4 \cdot H_2O$ mp 152-154°C (alcohol), R_f 0.81 (ethyl acetate).

The interaction of the substance with acetic anhydride in pyridine gave an acetate derivative with the composition $C_{17}H_{20}O_5$, mp 190-192°C (alcohol); R 0.9 (ethyl acetate).

On the basis of its known physicochemical constants, the results of chemial transformations, and IR and PMR spectra, the substance isolated from A. juncea was identified as the known guaianolide austricin [4].

Thus, from the epigeal part of Artemisia juncea collected in Central and Southern Kazakhstan we have isolated a sesquiterpene lactone of the guaianolide type, austricin, but have been unable to establish the presence of eudesmanolides. The results obtained confirm the hypothesis that species of the Junceum Poljak section are more closely connected with the Artemisia section of the subgenus Artemisia L. than with the subgenus Seriphidium (Bess.) Rouy., since guaianolides are more characteristic for this section [5, 6].

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