A comparison of the results obtained with the literature [5] showed that among the main carotenoids of the rind of oranges growing in certain regions of the USA there was no cryptoxanthin, which possesses biological activity, this apparently being explained by the growth region.

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CAROTENOIDS OF Orthosiphon stamineus

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Folium orthosiphonis/Orthosiphon stamineus (Java tea) is used in chronic diseases of the kidneys, liver, and gall bladder. We have investigated briquettes of Java tea. The carotenoids were extracted and separated as described in [1, 2]. Extraction was performed with petroleum ether and ethanol, and the extract obtained was saponified, washed free from alcohol, and dried with the aid of anhydrous sodium sulfate.

Individual carotenoids were isolated by column chromatography and thin layer chromatography. Their preliminary separation into groups A and B was performed on a column filled with magnesia using petroleum ether.

The resulting mixture of carotenoids of the lower zones, A, was separated on column chromatography with alumina with elution by petroleum ether into another two groups, C and D. Group C of substances was separated by thin layer chromatography (with alumina as the absorbent, and petroleum ether–acetone (96:4) as the solvent system) into an orange zone 1 and a bright yellow zone 2. Mixture D of carotenoids gave, by the same methods, zones 3, 4, and 5 colored yellow, lemon, and pink, respectively.

The carotenoids of mixture B were separated first on a column filled with alumina into zone 6 (pale yellow) and also mixtures E and F. Mixture E yielded by thin-layer chromatography on alumina in the petroleum ether–acetone (94:6) solvent system zones 7 (yellow), 8 (pink), and 9 (orange), and mixture F by chromatography on zinc carbonate with elution by petroleum ether gave zones 10 and 11 (both yellow).

Identification was carried out with the aid of the maxima and shapes of the absorption curves of the carotenoids in various solvents [2-4] on a SF-10 spectrophotometer, from the colors and positions of the zones on chromatogram of mixed samples, and on the basis of color reactions.

In this way, we isolated and identified the following carotenoids (% on the total): α-carotene, 4.1 (zone 1); β-carotene, 38.2 (zone 2); β-zeacarotene, 32.6 (zone 7); neo-β-carotene U, 0.4 (zone 8); cryptoxanthin, 3.4 (zone 9); α-carotene epoxide, 1.3 (zone 10), lutein, 17.6 (zone 11); neo-β-carotene, traces (zone 6); and artefacts, 2.4, (zone 3-5).

The total amount of carotenoids in the Java tea amounted to 16.75 mg-%, which, calculated on the dry weight comes to 69.8 mg-%. Of the carotenoids isolated, vitamin A activity is possessed by β- and α-carotenes, cryptoxanthin, β-zeacarotene, and neo-β-carotene [5]. These make up about 78.7% of the total carotenoids.

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LIPOSOLUBLE PIGMENTS OF LEAVES OF Brassica oleracea

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The chlorophylls and carotenoids of vegetables have a substantial influence on their organoleptic and nutrient properties and may determine the regimes of their technological processing [1].

The sum of the pigments was isolated within the composition of the total lipids from the leaves of the Brassica oleracea L. of the early, middle-ripening, and late varieties Dimirskaya, Slava, and Amiger, respectively [2], and they were freed from the bulk of the liposoluble substances by column chromatography on silica gel [3] and were fractionated into chlorophyll, carotenes, and xanthophylls by using a column of sucrose [4]. Individual representatives were obtained by TLC on silica gel using the heptane–methyl ethyl ketone (5:3) solvent system for separating the lipophylls and chlorophylls, and hexane–acetone (96:4) for the carotenes. During the operations, the pigments were protected from degradation by adding a stabilizer [5] to the solutions and by performing the operations with subdued illumination.

The pigments were identified on the basis of the characteristic maxima on their absorption curves in the 200-700 mm region [4, 6], they were chromatographed in the presence of authentic samples, were stained with iodine vapor for the detection of colorless carotenes, and were subjected to the epoxide test [7] for the presence of a hypsochromic shift in the spectra of the xanthophylls.

The amounts of the pigments were determined from their individual specific extinction coefficients [8].

The composition and amounts of the various forms of liposoluble pigments in the cabbage leaves were as follows, (% of the total weight):

Pigment	Dimirskaya	Slava	Amager
Chlorophylls:			
chlorophyll a	21.0	34.4	39.9
chlorophyll b	6.5	11.6	25.5
pheorphorbide a	29.6	20.6	16.7
pheorphorbide b	17.3	17.7	6.8
chlorophyllide a	15.1	10.1	7.9
chlorophyllide b	10.5	5.6	3.2
Total amount, mg/kg	2.29	0.60	0.47
Carotenoids			
phytoene	2.1	1.3	–
phytofluene	2.7	1.0	–
β-carotene	25.4	41.6	60.7
α-carotene	4.9	10.3	18.9

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