lutein	38.7	27.9	9.1
violaxanthin	17.4	12.1	6.8
neoxanthin	8.8	5.7	4.5
Total amount, mg/kg	1.35	0.79	0.59

It must be mentioned that in the series of varieties Dimirskaya-Slava-Amager the relative amounts of chlorophylls a and b and also of α- and β-carotenes rose. Thus, the composition and amount of liposoluble pigments of cabbage depend substantially on variety characteristics, and this must be borne in mind in the choice of regimes for technological processing.

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THIN LAYER CHROMATOGRAPHY OF ROSINS ON "SILUFOL" PLATES

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UDC 668.472:543.544

One of the possible methods of evaluating the quality of rosins of different origins used for the synthesis of rosin-maleic acid resins is TLC. Conditions for the TLC separation both of the resin acids themselves [1] and their methyl esters [2, 3] have been described in the literature. TLC on silica gels G and DFO has also been used for investigating samples of gum rosin, tall-oil rosin, and modified rosins [4].

We have performed experiments to select the optimum conditions for the separation of the components of rosins on Silufol plates. We set ourselves the task of achieving the maximum separation of the resin acids for the purposes of qualitative analysis and the most complete separation of the zone of abietic acid for its semiquantitative estimation in the samples under investigation.

As the revealing agents we used a 0.5% solution of vanillin in a mixture of concentrated sulfuric acid and ethanol (4:1), and a 9% solution of anisaldehyde in a mixture of ethanol and concentrated sulfuric acid (9:1). For the TLC separation we took an ethanolic solution of gum rosin. As the abietic acid standard we used a sample obtained from gum rosin by a somewhat modified method [5] that was characterized by its melting point, NMR spectrum, and TLC.

The most satisfactory separation of the components was achieved in the ethyl acetate–n-hexane (1:2) system. With this, the abietic acid zone was located in the R_f interval of 0.44-0.47. The individuality of this zone was indicated by the results of two-dimensional TLC with rechromatography in the chloroform–ethyl acetate (1:1) system.

The conditions found for chromatographic separation were used for comparing samples of isomerized and nonisomerized oleoresin and tall-oil rosins. A comparison of the chromatograms of the isomerized and nonisomerized rosins showed that the greatest changes were observed in the range of R_f values lower than those of abietic acid. Thus, it is precisely in

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this region that the zones of the acids isomerizable to abietic acid are found. The absence in the TLC of tall-oil rosin of spots in this R_f interval indicates the absence or insignificant presence of these acids. This result agrees completely with the conclusions of Maslennikov, et al.[6], that the isomerization of tall-oil rosin does not increase the abietic acid content.

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RHAMNOSIDES OF GLYCYRRHETIC AND URSOLIC ACIDS

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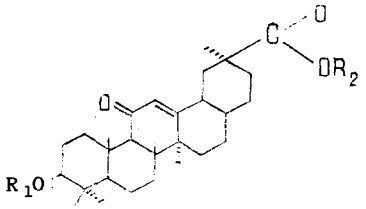
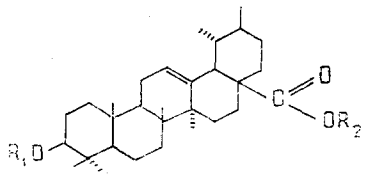
The glycosylation of glycyrrhetic acid (I) and of ursolic acid 3-acetate (VI) with acetobromorhamnose has been carried out under the conditions given in the literature [1, 2]. The glycoside acetates so obtained are saponified with a methanolic solution of sodium methanolate.

The products of the interaction of glycyrrhetic acid with acetobromorhamnose, after partial deacetylation, were chromatographed on a column of SiO_2. As a result of elution with the chloroform–methanol (50:1) system, the crystalline 30-α-L-rhamnopyranoside of glycyrrhetic acid 3-acetate (II) was obtained: $C_{38}H_{58}O_9$, mp 186-194°C (from methanol); $[\alpha]_D^{22}$ +86.4 ± 2° (c 1.0; pyridine); ν_{max}^{KBr}, cm^{-1}: 3550-3300 (OH); 1745, 1735, 1660, (C=O groups); 1255 (ester grouping).





I. $R_1 = R_2 = H$
II. $R_1 = Ac$; $R_2 = \alpha$-L-Rha
III. $R_1 = R_2 = \alpha$-L-Rha
IV. $R_1 = Ac$; $R_2 = H$
V. $R_1 = Ac$; $R_2 = \alpha$-L-Rha

On further elution with the chloroform–methanol (10:1) system, the crystalline 3,30-di-α-L-rhamnoside of glycyrrhetic acid (III) was obtained: $C_{42}H_{66}O_{12}$; mp 231-237°C (from methanol; $[\alpha]_D^{22}$ +59.1 ± 2° (c 0.94; pyridine); ν_{max}^{KBr}, cm^{-1}: 3550-3200 (OH); 1745, 1662 (C=O groups). PMR (C_5D_5N, ppm): 0.66, 0.75, 0.85, 0.98, 1.07, 1.16, 1.27 (7 × CH_3, methyl protons at C-23, C-24, C-25, C-26, C-27, C-28, and C-29, s); 1.53 (6H, methyl groups of two rhamnose residues, d); 3.90-4.80 (8H on all the carbon atoms of the two rhamnose residues apart from the first and sixth, m); 5.16 (anomeric rhamnose proton at C-3, br.s.); 5.79 (H at C-12, s); 6.63 (anomeric rhamnose proton at C 30, br.s). The yield of product (III) was 40%, calculated on the initial glycyrrhetic acid (I).

The products of the interaction of ursolic acid 3-acetate (IV) with acetobromorhamnose, after deacetylation, were chromatographed on a column of SiO_2. Elution with the chloroform–

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