# STEROLS OF THE GRAPE

V. N. Mironova

UDC 577.1:547.922

For the isolation of sterols, in this work we used grapes of different varieties (Chasselas, Lydia). The grapes were separated from the branches, the juice was expressed, and the seeds were eliminated from the residual pulp. They were ground in a mortar with the addition of liquid nitrogen, and the skin was comminuted. Then the plant tissue was hydrolyzed and the unsaponifiable fraction was extracted with diethyl ether. The yields of unsaponifiable fractions were: in the seeds 0.31%, and in the skin 0.23%. The unsaponifiable fractions were fractionated on glass plates coated with a thin layer of type KSK silica gel with gypsum in the benzene–acetate (95:5) solvent system. The chromatograms were revealed with 3% $FeCl_3$ in a mixture of concentrated sulfuric acid and orthophosphoric acid (1:1). In addition to hydrocarbons and pigments, the chromatogram showed a zone with $R_f$ 0.27 coinciding in chromatographic mobility with cholesterol. The zone could contain substances similar to cholesterol in chemical nature. Gas–liquid chromatography of this zone was performed on a "Chrom" chromatograph (column 1.8 × 0.06 m filled with Chromaton N-AW-DMCS, containing 5% of SE-30, carrier gas helium, rate 50 ml/min, column temperature 248°C). The retention times of the sterols were calculated in relation to a standard — squalene. The separation of this zone showed that it contained ergosterol and β-sitosterol, in addition to cholesterol. The ergosterol was also identified from its IR spectrum [$\lambda_{max}$ (in ethanol): 271.5, 282, and 293 nm, $E^{1\%}_{1cm}$ 19.1, 29.3, and 14.7, respectively]. To separate this zone into the individual sterols we subsequently used reversed-phase partition chromatography [1]. On a layer of KSK silica gel–gypsum impregnated with undecane in the acetic acid–water (90:10) system we obtained three substances: $R_f$ 0.62, ergosterol; $R_f$ 0.42, β-sitosterol; and $R_f$ 0.37, cholesterol. The definitive identification of the sterols was performed on the basis of the results of a comparison of their IR spectra with the IR spectra of standard samples. The amounts of β-sitosterol and ergosterol in the grape seeds were 95.5 and 1%, respectively, and in the skin 94 and 3%, and the amount of cholesterol in both parts was 3-3.5% of the total amount of unsaponifiable fraction. In each kg of moist seeds there were 2.9 g of β-sitosterol, 100 mg of ergosterol, and 100 mg of cholesterol. In each kg of moist skin there were 2.1 g of β-sitosterol, 100 mg of ergosterol, and 100 mg of cholesterol.

We have used grapes for the preparative production of β-sitosterol required for the performance of various biological experiments.

## LITERATURE CITED

1. A. A. Akhrem and A. I. Kuznetsova, Thin-Layer Chromatography [in Russian], Moscow (1965).

A. V. Palladin Institute of Biochemistry, Academy of Sciences of the Ukrainian SSR, Kiev.
Translated from Khimiya Prirodnykh Soedinenii, No. 3, p. 411, May-June, 1978. Original article submitted March 14, 1978.

 0009-3130/78/1403-0350$07.50 