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EXTRACTION OF STEROIDS FROM THE WOODY VERDURE OF *Abies sibirica*

A. N. Devyatlovskaya, L. B. Rubchevskaya, and S. M. Repyakh

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The search for new sources of raw material for obtaining natural sterols is forcing attention to be directed to nontraditional forms of them — plant wastes. Among the latter, a special position is occupied by the woody verdure of conifers. Existing technologies for processing the woody verdure of conifers permits the isolation of sterols in a total mass of extractive substances. In the final account, the sterols are present in in the products of its processing — chlorophyll—carotene paste, sodium chlorophyllin, etc.

We have investigated the influence of the conditions for the extraction of sterols from coniferous raw material by various extractants on the degree of their extraction.

The woody of verdure of the Siberian fir — the most common species in the wood-chemical industry — was taken as described in [1], comminuted [2], and extracted. As the extractants we used gasoline, ethyl alcohol (96%), and hexane. Extraction with benzene was conducted at −5, +7, + 20, and +110°C; with ethyl alcohol at −5, +7, +20, and +78°C; and with hexane at −5, +7, +20, and +64°C.

The times of extraction at each temperature were, respectively, 1, 3, 6, 9, 12, 24, 48, and 72 h.

The amounts of sterols in the extracts obtained and in the initial raw material were determined [3]. The moisture content of the initial raw material was 8%, and extraction was carried out at a liquor ratio of 5.

The form of the mathematical relation describing the dynamics of the levels of sterols in the extracts obtained at various temperatures was determined by the method of regression analysis.

It was established that, regardless of the temperature conditions of extraction, the equation describing the dynamics of the levels of sterols in the extracts obtained at various temperatures had the general form

TABLE 1. Values of the Coefficients *A*, *B*, and *C* in the Regression Equation Describing the Process of Extracting Sterols from the Woody Verdure of the Siberian Fir

Coefficient	Extraction temperature, °C			
	−5	+7	+20	boiling extractant
		Gasoline		
A	0.0272	0.0304	0.0416	0.0620
B	0.0357	0.0509	0.0593	0.0789
C	0.0048	0.0018	0.0084	0.0264
		Ethyl alcohol		
A	0.0416	0.0448	0.0596	0.0701
B	0.0672	0.0787	0.0740	0.0769
C	0.0132	0.0198	0.0216	0.0281
		Hexane		
A	0.0315	0.0379	0.0531	0.0708
B	0.0631	0.0681	0.0812	0.0723
C	0.0082	0.0122	0.0236	0.0247

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$$Y=A+B\ \lg(X)-C\ \lg^2(X),$$

where Y is the amount of sterols in the extract, % on the absolutely dry weight of the woody verdure; X is the time of extraction, h; and A, B, and C are coefficients.

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