

PINOCEMBRIN AND PINOSTROBIN FROM THE HEARTWOOD OF  
PINUS SIBIRICA

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From the wood of the Siberian pine, we have previously isolated three substances, two of which proved to be flavones [1]. Subsequently, by preparative chromatography on a polyamide sorbent from an acetone extract we have isolated two more compounds of a flavonoid nature which we denote by (I) and (II).

Substance (I) forms crystals with a yellowish tinge, mp 194–195° C (methanol). Its IR spectrum contains absorption bands at 1490, 1600 ( $C_6H_5-$ ), 1638 ( $C=O$  of a flavanone nucleus), 1170, 1220 ( $C-O-C$ ), 3100–3120 (hydroxy groups in ring A), 700 and 765  $cm^{-1}$  (nonplanar vibrations of the CH groups of ring B bearing no hydroxy substituents) [2]. UV spectrum:  $\lambda_{max}$  294 m $\mu$  ( $\log \epsilon$  4.23);  $\lambda_{max}^{AlCl_3}$  310 m $\mu$ . The acetate of (I) melted at 117–118° C (ethanol). The IR spectrum of the acetate of (I) showed that it lacked free hydroxy groups and had acetate groups (1696 and 1768  $cm^{-1}$ ). UV spectrum:  $\lambda_{max}$  315 and 260 m $\mu$  ( $\log \epsilon$  3.58 and 4.02). Substance (I) was identified as 5,7-dihydroxyflavanone (pinocembrin) [3,4].

Substance (II) formed crystals with a faint pink tinge, mp 111–112° C (methanol),  $[\alpha]_D^{20} -55^\circ$  (c 2.1; chloroform). IR spectrum: 1520  $cm^{-1}$ , 1575 ( $C_6H_5-$ ), 1649 ( $C=O$  of a flavanone nucleus), 1155, 1190, 1244 ( $C-O-C$ ), 1380, 1450, 2861 ( $-OCH_3$ ), 700, and 770  $cm^{-1}$  (nonplanar vibrations of the CH groups of ring B bearing no hydroxy substituents); no distinct bands of the vibrations of hydroxy groups. UV spectrum:  $\lambda_{max}$  294 m $\mu$  ( $\log \epsilon$  4.55);  $\lambda_{max}^{AlCl_3}$  302 m $\mu$ . Substance (II) was identified as 5-hydroxy-7-methoxyflavanone (pinostrobin) [5]. A chromatographic comparison of substance (II) with a sample of pinostrobin sent by Prof. Erdtman (Sweden) showed their complete identity. For both the substances isolated and for the acetate of (I) the results of elementary analysis agreed with the theoretical calculations.

5,7-Dihydroxy- and 5-hydroxy-7-methoxyflavanones are the hydrogenated analogs of the 5,7-dihydroxy- and 5-hydroxy-7-methoxyflavones isolated previously from the heartwood of the Siberian pine [1].

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A CHROMATOGRAPHIC ANALYSIS OF THE HIGH-BOILING FRACTIONS  
OF THE EXTRACTION TURPENTINES FROM PINUS SILVESTRI

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By the gas-liquid chromatographic (GLC) method, we have studied the composition of the pine flotation oils marketed by four Russian wood-chemical factories.

The samples of the oils corresponded to the requirements of the GOST [State Standard] [1]. Their GLC was carried out on packed and capillary columns. The identification of the components was effected by the addition of the authentic pure substances during GLC and from the relative retention times (RRT) of the substances. The GLC of the hydrocarbon fraction of the oils was carried out by the method described previously [2,3].