

## COMPONENTS OF THE ROOTS OF *Ferula ovina*

A. I. Saidkhodzhaev and G. K. Nikonov

UDC 547.58:547.913.5:668.5

From the roots of *Ferula ovina* (Boiss.) collected in the environs of the town of Kyzyl-Arvat by extraction by ethanol followed by chromatography on KSK silica gel we have isolated two substances: (I) with the composition  $C_{22}H_{30}O_4$ , mp 120-121°C,  $[\alpha]_D^{22} + 66^\circ$  (c 1.3; ethanol) and (II)  $C_{23}H_{32}O_5$ , with mp 130-131°C,  $[\alpha]_D^{22} + 100.1^\circ$  (c 1.00; ethanol), both being readily soluble in chloroform, carbon tetrachloride, and alcohols, sparingly soluble in ether, and insoluble in water.

The UV spectra of the substances have absorption bands at 260 nm ( $\log \epsilon$  4.16 and 4.05, respectively).

In the IR spectra of substance (I) absorption bands appear at ( $cm^{-1}$ ) 1690 (carbonyl of an aromatic acid), 1610, 1595, 1515 (aromatic nucleus), and 3200-3600 (hydroxy group), and in the spectrum of (II) at 1710, 1610, 1595, 1515, and 3300-3600 from the same groups.

On hydrolysis with 5% aqueous caustic potash solution, the neutral fractions of both substances gave an alcohol  $C_{15}H_{26}O_2$  with mp 89-90°C (from ether),  $[\alpha]_D^{22} + 36^\circ$  (c 1.00; ethanol) which was identified by a comparison of IR spectra and by a mixed melting point as ferutanol [1].

From the acid fraction of the hydrolyzate of substance (I), we obtained p-hydroxybenzoic acid with mp 213-214°C, and from (II) 3-hydroxy-4-methoxybenzoic acid with mp 250°C.

On the basis of the facts given, it may be concluded that the two substances are monoesters of the acids mentioned and ferutanol,  $C_{15}H_{26}O_2$  (corrected formula) at the secondary hydroxyl. The results of a comparison of the melting points, specific rotations, and IR and NMR spectra of the substances themselves and of the products of their hydrolysis show that substance (I) is identical with ferutin and substance (II) with ferutin [1, 2].

### LITERATURE CITED

1. A. I. Saidkhodzhaev and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 559 (1972).
2. A. I. Saidkhodzhaev and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 166 (1974).

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Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR. Translated from *Khimiya Prirodnkh Soedinenii*, No. 4, pp. 526-527, July-August, 1974. Original article submitted February 2, 1973.

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