

STRUCTURE OF TEFERIN - A NEW ESTER FROM THE ROOTS
OF *Ferula tenuisecta*

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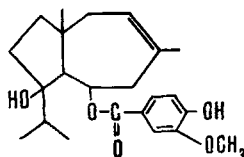
Continuing a study of esters of plants of the genus *Ferula* [1-5], from the roots of *F. tenuisecta* we have isolated another ester with the composition $C_{23}H_{32}O_5$, mp 78-80°C, $[\alpha]_D^{20} + 86.5^\circ$ (chloroform), which we have called teferin. The substance is readily soluble in alcohol, chloroform, carbon tetrachloride, and ether, sparingly soluble in petroleum ether, and insoluble in water.

The UV spectrum of teferin has maxima at 265 nm ($\log \epsilon$ 4.06) showing the presence of an aromatic nucleus in the molecule. When the spectrum was recorded with the addition of alkali, the long-wave maximum underwent a bathochromic displacement by 58 nm with an increase in intensity, which is characteristic for phenolic hydroxy groups present in the para position of an aromatic nucleus [6].

The IR spectrum of the substance has absorption bands at (cm^{-1}) 1695 (carbonyl of an ester of an unsaturated acid), 1520, 1595, 1620, inflexion (aromatic nucleus), 3200-3600 (hydroxy group).

The hydrolysis of teferin with 5% caustic potash solution for 4 h gave a hydrolyzate from the neutral fraction of which we isolated an alcohol - ferutanol [4, 5] with mp 90-91°C - and from the acid fraction of which we obtained 4-hydroxy-3-methoxybenzoic acid with mp 205-206°C. The hydrolysis products of teferin were identified by mixed melting points and by a comparison of IR spectra.

Thus, teferin is an ester of ferutanol and vanillic acid. The position of the acid residue in the teferin molecule follows from a consideration of its NMR spectrum, in which the signal of the geminal proton is seen in the form of a triplet with $J_1 = 8$ Hz, $J_2 = 4$ Hz, with secondary splitting at 5.18 ppm. Consequently, in teferin, as in ferutin [4] and ferutinin [5], the ferutanol is esterified at the secondary hydroxy group.



On the basis of the facts given, we proposed the above structure for teferin.

LITERATURE CITED

1. T. Kh. Khasanov, A. I. Saidkhodzhaev, and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 807 (1972).
2. A. Sh. Kadyrov, T. Kh. Khasanov, A. I. Saidkhodzhaev, and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 808 (1972).
3. A. S. Kadyrov and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 59 (1972).
4. A. I. Saidkhodzhaev and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 559 (1972).
5. A. I. Saidkhodzhaev and G. K. Nikonov, *Khim. Prirodn. Soedin.*, 28 (1973).
6. *Methods of Organic Chemistry* [in Russian], Vol. 1, Moscow (1967), p. 368.

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