

EUDESMIN - A LIGNANE FROM *Haplophyllum acutifolium*
AND *H. perforatum*

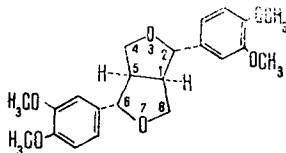
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Continuing the chromatography of the total alkaloids of the epigeal part of *H. acutifolium* (family Rutaceae) on alumina [1], from the ethereal eluates after the isolation of the skimmianine we have obtained a crystalline substance with the composition $C_{22}H_{26}O_6$, mp 107-108°C (from ether and acetone), $[\alpha]_D^{20} + 60.5^\circ$ (c 2.384; acetone), mol. wt. 386 (mass spectrometry). On TLC in the benzene-methanol (4:1) system, the substance gives a single spot which is revealed by Dragendorff's reagent. The compound is readily soluble in the usual organic solvents and is insoluble in water, acids, and alkalis.

The UV spectrum [λ_{\max} 233, 280 nm ($\log \epsilon$ 4.11, 3.72)] is characteristic of lignane compounds. IR spectrum, ν_{\max} , cm^{-1} : 1463, 1520, 1590 (aromatic ring), and 2850 (OCH_3); there are no absorption bands of hydroxy and carbonyl groups. The substance contains four methoxy groups, and therefore we assumed that the two remaining oxygen atoms have an ethereal nature and the lignane isolated belongs to the 3,7-dioxabicyclo[3.3.0]octane series [2]. The NMR spectrum (taken on a JNM-4H-100/100 MHz instrument in deuteriochloroform) showed that the compound is symmetrical; 13 hydrogen atoms appear in the spectrum, which is characteristic of lignane compounds [3] with the following values of τ : 3.1-3.2 (6H, aromatic protons); 5.35 ppm (doublet, $J=4$ Hz, 2H, protons at C_2 and C_6); 5.7-5.9 and 6.1 and 6.3 ppm (multiplets, 2H each, protons at C_4 and C_8); 6.2 and 6.24 ppm (two singlets, 6H each, 4 OCH_3), and 6.95 ppm (multiplet, 2H, protons at C_1 and C_5).

These facts and also the melting point and rotation agree with the characteristics of eudesmin [4], the structure and configuration of which have been established [5].



The mass spectra of the substance obtained and of eudesmin [6] coincide. The main peaks are: m/e 386 (M^+ 100%), 219 (20%), 177 (77%), 165 (60%), 151 (46%), 135 (18%).

Eudesmin has also been isolated from a petroleum ether extract of the unripe seeds of *Haplophyllum perforatum* by S. A. Sultanov; its amount was about 0.5% of the weight of the dry seeds.

This is the first time that eudesmin has been found in plants of the family Rutaceae.

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