

A TRITERPENE OLIGOSIDE, HEDERACOLCHISIDE E, FROM HEDERA COLCHICA

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Khimiya Prirodnikh Soedinenii, Vol. 6, No. 4, pp. 484-485, 1970

UDC 517.948+547.597

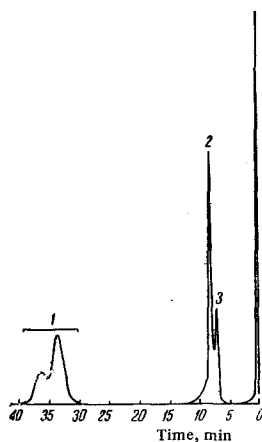
As reported in a preliminary communication [1], the leaves of Hedera colchica (colchis ivy) contain glycosides of oleanolic acid and hederagenin.

By the usual method for the isolation of triterpene glycosides [2], we have obtained the total saponins from this plant. A chromatographic study in a thin layer of silica gel showed the presence of the glycosides, which we have called, in order of increasing polarity, "hederacolchisides" A, B, C, D, E, and F.

By fractional extraction of the combined saponins we have isolated the main glycoside, hederacolchiside E, in the individual crystalline form with mp 215-225° C (decomp), $[\alpha]_D^{23} -22.28^\circ$ (c 0.9, methanol).

Acid hydrolysis showed that the aglycone of this glycoside is oleanolic acid and the sugar component includes D-glucose, L-arabinose, and L-rhamnose.

The gas-liquid chromatography [3] of the sugars present in hederacolchiside E showed that the ratio of glucose to arabinose to rhamnose was 3:1:2 (3.00:1.037:2.08) (figure). This showed that hederacolchiside E is a hexaoside of oleanolic acid.

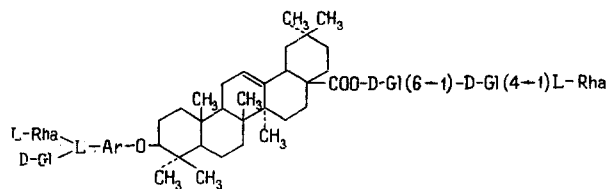


Chromatogram of the silylated methyl glycosides of the sugars present in the composition of hederacolchiside E: 1) D-glucose, 2) L-arabinose, and 3) L-rhamnose.

Hederacolchiside E was saponified with alkali. The oligosaccharide that formed was separated off and subjected to acid hydrolysis. In this case, D-glucose and L-rhamnose were identified chromatographically. The product of alkaline hydrolysis was shown by gas-liquid chromatography to contain glucose, arabinose, and rhamnose in a ratio of 1:1:1.

Hederacolchiside E was exhaustively methylated by Kuhn's method [4] and the product was hydrolyzed with H_2SO_4 . 2, 3, 4, 6-Tetra-O-methyl-D-glucose, 2, 3, 4-tri-O-methyl-L-rhamnose, 2-O-methyl-L-rhamnose, 2, 3, 4-tri-O-methyl-D-glucose, and 2, 3, 6-tri-O-methyl-D-glucose were identified in the hydrolysate.

The results obtained, and also available information on the structure of known triterpene glycosides [5, 6, 7, 8] enable us to ascribe the following possible structure to hederacolchiside E.



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20 March 1970

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