URSOLIC ACID FROM Hippophae rhamnoides

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We have studied the ursolic acid content of various organs of Hippophae rhamnoides L. (sea buckthorn), family Elaeagnaceae collected in the Botanical Garden of the Institute of Botany, Academy of Sciences of AzSSR and in the Kirdmanchaiskii valley in the environs of the village of Tirgankend, Ismaillinskii region, AzSSR.

After defatting with petroleum ether (40-60°C), the various organs of the plant material were extracted with chloroform. The chloroform extract was found by thin-layer chromatography in a layer of silica gel (KSK) using the methanol—acetone—carbon tetrachloride (5:20:75) system to contain a substance with a R_f value corresponding to that of ursolic acid. The amounts of ursolic acid in the various organs were as follows (percentages on the absolutely dry weight):

	Botanical Garden, collected October 10, 1978	Kirdmanchaiskaya valley, collected October 20, 1978
Bark of the stem	0.22	0.17
Leaves	0.39	0.29
Fruit	1.6	1.31
Seeds	0.68	0.47

After the amounts of ursolic acid had been determined, the whole of the material was combined and passed through a column filled with silica gel. The column was eluted first with petroleum ether—chloroform (98:2) and then with pure chloroform. The chloroform was distilled off and the white amorphous residue was crystallized from ethanol. The substance obtained had mp 280-282°C (from ethanol), $[\alpha]_D^{20}$ +68° (c 0.96; $CHCl_3$), readily soluble in ether, chloroform, acetone, and ethyl acetate, and less readily in methanol and ethanol. It gave positive Lieberman—Burchard and Salkowsky reactions.

The authenticity of the ursolic acid was determined in the following way. The IR spectrum of the substance taken on a UR-20 instrument showed bands at 1714 cm^{-1} ($>C=O$) and, characteristic for ursolic acid, 1392, 1383, and 1250 cm^{-1} (geminal CH_3 groups) [1].

The IR spectrum of the substance in sulfuric acid (d 1.83; c 0.4) had a single absorption maximum at 310 nm, which is characteristic for ursolic acid [2, 3].

A comparison of the IR and UV spectra and of the melting point that we had obtained with literature information [4], and also a comparison of the R_f values of the substance and those of an authentic sample* permitted the conclusion that the substance obtained was ursolic acid.

LITERATURE CITED

1. A. Snatzke, F. Lampert, and B. Tscheche, Tetrahedron, 18, 1417 (1962).
2. É. T. Oganesyan, A. L. Shinkarenko, and V. A. Bandyukova, Khim. Prir. Soedin., 212 (1968).
3. V. D. Ponomareva, É. T. Oganesyan, and V. F. Semenchenko, Khim. Prir. Soedin., 147 (1971).
4. I. A. Murav'eva and V. V. Shatilo, Rast. Res., 8, No. 1, 104 (1972).

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