

TRITERPENE GLYCOSIDES OF BETA VULGARIS

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The presence of oleanolic acid glucuronoside in Beta vulgaris (sugar beet) was recorded in 1938 [1]. Then [2-5] it was shown that other substances were present the structures of which were not given.

We have investigated the glycosides of the methanolic extract of dried sugar beet tubers grown in the Moldavian SSR. The chromatography of the extracts in a thin layer of silica gel showed the presence of three triterpene glycosides which we have provisionally called A, B, and C (1 : 3 : 8) (in order of increasing polarity).

To elucidate the nature of the genin, the total glycosides were hydrolyzed with Kiliani's mixture. Chromatography in a thin layer of silica gel showed the presence of only oleanolic acid. Partition chromatography on alumina in the butanol-ethanol-ammonia (9 : 2 : 5) system with subsequent purification on KU-2 cation-exchange resin (in the H⁺ form) yielded compounds A and B in the free state, and glycoside C contaminated with sucrose.

Substance B proved to be oleanolic acid 3-O- β -D-glucopyranoside, with mp 242-244° C (from methanol), and substance A its methyl ester with mp 248-250° C (from methanol).

We have previously synthesized a β -glucoside of oleanolic acid by the orthoester method [6]. This method, taking place in sterodirected fashion, enables the hydroxyl group to be glycosylated in the presence of the unsubstituted carboxyl group. The glycoside obtained in this way was identical chromatographically and with respect to its constants with glycoside B.

The most polar compound, present in the beet tubers in predominating amounts, was identified as an oleanolic acid glucuronoside. Treatment with diazomethane gave a dimethyl ester with mp 197-200° C (from methanol); $[\alpha]_D^{25} + 10.5$ (c 1.0; chloroform). Hydrolysis with Kiliani's mixture gave methyl oleanolate.

Thus, sugar beet contains oleanolic acid glucoside and its methyl ester, and oleanolic acid glucuronoside.

REFERENCES

1. L. Ruzicka, *Helv. Chim. Acta*, 21, 1371, 1938.
2. Wlad and Hahl, *Roczniki Chem.*, 24, 118-127, 1950.
3. F. Eis and L. Clark, *Ind. and Eng. Chem.*, 44, 2844, 1952.
4. C. A. March and T. A. Levvy, *Biochem. J.*, 63, 9, 1956.
5. A. T. Van Duuren, *J. Am. Soc. Sugar Beet Technol.*, 1, 57, 1962.
6. N. K. Kochetkov, A. Ya. Khorlin, A. F. Bochkov, and L. G. Kretsu, *Izv. AN SSSR, seriya khim.*, 2, 2028, 1966.

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