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HYPEROSIDE FROM EUPHORBIA PETROPHILA AND E. IBERICA

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The leaves of Euphorbia petrophila C. A. M. and E. iberica Boiss (spurges) were extracted successively with petroleum ether, chloroform, and methanol. The methanolic extracts were evaporated in vacuum, diluted with water, and extracted with ethyl acetate. The solvent was distilled off and the combined flavonoids were precipitated with chloroform. Fractional recrystallization of the combined flavonoids from each of the spurge species yielded the same substance with the composition $C_{21}H_{20}O_{12}$, mp 233–235° C (from ethanol).

A mixture of the two substances showed no depression of the melting point. Acid hydrolysis of the glycoside formed an aglycone $C_{15}H_{10}O_7$ which, from its UV spectra with ionizing and complex-forming additives, from the products of alkaline degradation, and from its pentaacetate was identified as 3,5,7,3',4'-pentahydroxyflavone (quercetin). An equimolecular amount of a sugar component, galactose, was also obtained.

A mixture with an authentic sample of hyperoside gave no depression of the melting point [1].

On the basis of a study of the hydrolysis products, UV spectroscopy, and the specific and molecular rotations of the glycoside, it has been established that it is quercetin 3-O-β-D-galactopyranoside.

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RUTIN AND FLAVONOID COMPOUNDS FROM THE LEAVES OF DUSSIA Spp.

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We have found compounds of a flavonoid nature in ethanolic extracts of the leaves of several southern- and central-American species of Dussia Taub. (Leguminosae).

The optimum extraction of these compounds from the materials was achieved with 70% ethanol. We succeeded in separating these compounds by paper chromatography (FN-16 paper) [1]. In D. martiniciensis Kr. et Urb. three substances were found; in D. teesmanii, three; in D. coriacea Pierce, one; in D. mexicana (Standl.) Harms., two; and in D. lehmanii Harms., two. The flavonoid nature of the substances detected on the chromatograms was shown by qualitative color reactions [2].

From D. martiniciensis and D. coriacea we isolated a flavonoid with mp 189–190° C.

The IR spectrum and a mixed melting point confirmed the hypothesis that the substance isolated from D. coriacea and D. martiniciensis is rutin.

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THE NATURE OF THE TERPENE ALCOHOL ACHILLENOL

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In a study of the composition of the essential oil of Achillea filipendulina (fernleaf yarrow) we isolated an alcohol $C_{10}H_{18}O$ with bp 83° C/20 mm, d_{20}^{20} 0.8619, n_D^{20} 1.4613; $[\alpha]_D^{20}$ +12.8°. It forms a colorless mobile liquid with the smell of mountain ash.

There is information [1] of the presence in this essential oil of an alcohol of this composition. Its properties differ from those of known terpene alcohols.

According to the IR spectrum, the alcohol is tertiary, since the absorption band due to the vibrations of the C—OH group is in the 1115–1185 cm^{-1} region [2]. The presence of strong absorption bands at 915, 1003, 1636, and 3079 cm^{-1} shows the presence of a vinyl group in the molecule. Medium-intensity bands at 633, 856, and 1672 cm^{-1} apparently relate to the disubstituted —CH=CH— bond, which is confirmed by the Raman spectrum in the region of the frequencies of stretching vibrations of multiple bonds and the vibrations of hydrogen atoms (strong band at 1661 cm^{-1} and a band at 3042 cm^{-1} [3]). Thus, the alcohol under investigation is an aliphatic compound containing two multiple bonds.

A proof of this is the absorption of two molecules of hydrogen when the alcohol was hydrogenated in glacial acetic acid over PtO_2 according to Adams. This gave an aliphatic alcohol $C_{10}H_{22}O$ with d_{20}^{20} 0.8436, n_D^{20} 1.4403, $[\alpha]_D^{20}$ −7.2°.

The most probable type of sketeton for the natural alcohol $C_{10}H_{18}O$ and the alcohol $C_{10}H_{22}O$ is that of 2,6-dimethyloctane.

In alcohols with a skeleton of this type, the hydroxyl group may be present at $C_{(6)}$ or $C_{(2)}$. This choice was decided by the dehydration of the alcohol $C_{10}H_{22}O$ with thionyl chloride in pyridine, giving as the main product an optically active alcohol $C_{10}H_{20}$ with a methylene bond.

When the hydrocarbon $C_{10}H_{20}$ was hydrogenated by Adams' method, a saturated hydrocarbon $C_{10}H_{22}$, d_{20}^{20} 0.7428, n_D^{20} 1.4128, $[\alpha]_D^{20}$ +6.2°, was obtained which was similar to optically-inactive 2,6-dimethyloctane [4].

To determine the position of the disubstituted multiple bond, which could be present either in either the 3-4 or the 4-5 position, we dehydrogenated the natural alcohol $C_{10}H_{18}O$ with thionyl chloride in pyridine. This gave a hydrocarbon with a third —C=CH double bond, d_{20}^{20} 0.7836, n_D^{20} 1.4526, $[\alpha]_D^{20}$ +64°. The electronic and IR spectra of the hydrocarbon showed the absence of conjugation between its multiple bonds, which is possible if the hydrocarbon possesses structure I. Therefore the alcohol isolated must have the structure of 2,6-dimethylocta-4,7-dien-2-ol (II). We have called this new natural alcohol achillenol.


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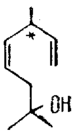

II