THE STRUCTURE OF MAXIMOLIDE

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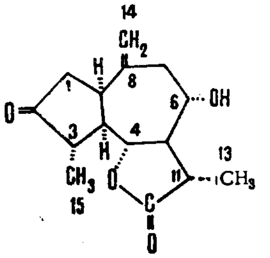
We have previously reported the isolation from the epigeal part of Jurinea maxima C. Winkl of a new sesquiterpene lactone maximolide (I) with the composition $C_{15}H_{20}O_4$, mp 179-180°C (from benzene), $[\alpha]_D^{19}$ +128.9° (c 1.94; chloroform). On the basis of spectral characteristics, maximolide was assigned to the lactones of the guaiane type [1].

The NMR spectrum of maximolide is similar to the spectra of amberboin [2] and of grosshemin [3, 4]. The spectrum of (I) has the signals of the protons of a secondary methyl and lacks the signals of the protons of an exocyclic methylene conjugated with a lactone carbonyl.

The presence of a hydroxy group in the molecule of (I) was confirmed by the preparation of a monoacetyl derivative with the composition $C_{17}H_{22}O_5$, mp 135-137°C (from ethanol). The IR spectrum of acetylmaximolide lacked the absorption band of an OH group but had the absorption band of an acetyl group (1740 and 1240 cm^{-1}) and also that of a γ-lactone carbonyl (1780 cm^{-1}).

The catalytic hydrogenation of (I) in the presence of platinum oxide formed a dihydro derivative with the composition $C_{15}H_{22}O_4$, mp 149-151°C (from benzene–hexane), mol. wt 266 (mass spectrometry). In the IR spectrum of dihydromaximolide, the absorption bands of the double bond had disappeared and there was the absorption band of an OH group (3530 cm^{-1}) and a broad absorption band of a γ-lactone carbonyl (1750 cm^{-1}).



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The hydrogenation product was shown to be identical with tetrahydrogrosshemin. The latter was obtained by the hydrogenation of grosshemin. The IR spectra of the two compounds were identical and a mixture gave no depression of the melting point. A sample of grosshemin was kindly given to us by Dr. K. S Rybalko.

Thus, maximolide has the structure of 6-hydroxy-2-oxoguai-8(14)-en-4,12-olide (I).

LITERATURE CITED

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