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Received April 16, 1968

[Chem. Pharm. Bull.]
16(6)1164-1165(1968)

UDC 581.19:582.635.3

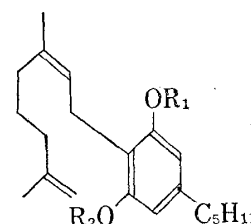
Cannabigerol Monomethyl Ether, a New Component of Hemp¹⁾

In this communication, we wish to report the isolation of cannabigerol monomethyl ether (II), a new marihuana component, from the domestic hemp "Minamioshihara No. 1."²⁾

Benzene percolate of the leaves was treated as previously described,¹⁾ the acid mixture being heated with toluene for 7 hr to afford the phenol mixture, which was subjected to column chromatography on silica gel with benzene as eluant. A small amount of pale yellow syrupy substance (A) was obtained prior to the fraction of tetrahydrocannabinol (THC) and its purity was examined by thin-layer chromatography (TLC) and gas liquid chromatography (GLC).³⁾ A, C₂₂H₃₄O₂, UV $\lambda_{\max}^{\text{EtOH}}$ m μ (ϵ): 230 (11200), 272 (1150), 280 (1090), gave yellow color with benzidine reagent⁴⁾ but no staining with Beam's reagent⁵⁾ which is available for diol such as cannabidiol (CBD) or cannabigerol (CBG) (I). The NMR spectrum showed the singlet peak due to -O-CH₃ protons at δ 3.78, besides identical feature with that of CBG.⁶⁾ In the mass spectrum of A, the molecular ion peak at m/e 330 and other fragment ion peaks of M-56, M-69, M-83, M-85 and M-123 correspond to those of CBG⁷⁾ with shift of 14 mass unit, indicating that A is CBG monomethyl ether.

On the methylation of CBG with diazomethane in methanol at 0°, followed by TLC separation, II was obtained together with CBG dimethyl ether (III) in a ratio of *ca.* 1:1. The physical constants and the spectra of the former substance were identical with those of A.

Since any phenols have not been detected in the fresh leaves of the hemp, A should be preserved in phenol carboxylic acid form as in the case of other marihuana components in nature.⁸⁾ Cannabigerolic acid monomethyl ether, genuine substance of CBG monomethyl ether, is probably formed by the methylation of cannabigerolic acid, and this step suggests the third route which, as well as the pathway for tetrahydrocannabinolic acid and for cannabichromenic acid, arise from cannabigerolic acid.



I : R₁=R₂=H
II : R₁=CH₃, R₂=H
III : R₁=R₂=CH₃

- 1) This forms Part III of "Cannabis." Part II: Y. Shoyama, T. Fujita, T. Yamauchi, and I. Nishioka, *Chem. Pharm. Bull.* (Tokyo), **16**, 1157 (1968).
- 2) The presence of this substance was observed thin-layer- and gas liquid-chromatographically in all strains of the hems cultivated in this university.
- 3) GLC was run in the same way as previously described.¹⁾
- 4) J.E. Koch and W. Krieg, *Chemiker Ztg.*, **62**, 140 (1938); CBG: yellow, CBD: orange yellow, THC: orange, cannabinol: reddish orange.
- 5) F. Korte and H. Sieper, *J. Chromatog.*, **13**, 90 (1964).
- 6) R. Mechoulam and Y. Gaoni, *Tetrahedron*, **21**, 1223 (1965).
- 7) H. Budzikiewicz, R.T. Alpin, D.A. Lightner, C. Djerassi, R. Mechoulam, and Y. Gaoni, *Tetrahedron*, **21**, 1881 (1965).
- 8) T. Yamauchi, Y. Shoyama, H. Aramaki, T. Azuma, and I. Nishioka, *Chem. Pharm. Bull.* (Tokyo), **15**, 1075 (1967).

Acknowledgement We thank Yoshitomi Pharmaceutical Industries, Ltd. for mass spectrum, Mr. Y. Tanaka, Mr. H. Matsui, Miss Soeda, and Mr. M. Shido of this university for NMR, IR, UV spectra and for the elemental analysis. Our thanks are also due to Mr. K. Tateno of this University farm for the cultivation of hemp.

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Received April 27, 1968

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