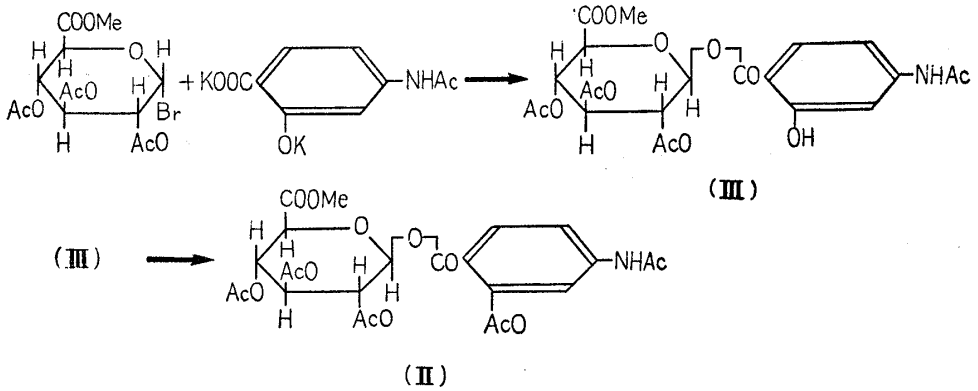

(II)

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Pharmaceutical Institute
Medical Faculty
University of Kyushu
Katakasu, Fukuoka

Hisao Tsukamoto (塚元久雄)
Akira Yamamoto (山本 陽)
Osamu Kamata (鎌田 理)

February 18, 1957

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Synthesis of 1,8-Dihydroxy-4-methyl-3-naphthoic Acid (Terranaphthoic Acid)

Hochstein, *et al.*[1] assigned the structure of 1,8-dihydroxy-4-methyl-3-naphthoic acid (I) for terranaphthoic acid, a degradation product of oxytetracycline. The present work was undertaken to provide synthetic confirmation for the structural formula of (I).

2-Ethoxycarbonyl-3-methyl-7-methoxyindan-1-one (II), which was prepared by ester-condensation of 3-methyl-7-methoxyindan-1-one[2] with ethyl carbonate in the presence of NaH, was converted by reaction with ethyl bromoacetate to ethyl 1-oxo-2-ethoxycarbonyl-3-methyl-7-methoxy-2-indanacetate (III). By refluxing (III) with a EtOH-H_2O solution of KOH for 2 hours, (α-methyl-2-carboxy-3-methoxybenzyl)succinic acid (IV) was obtained. The trimethyl ester (V), obtained by treatment of (IV) with diazomethane, was subjected to the Dieckmann reaction with sodium in boiling toluene, yielding diethyl 1-oxo-4-methyl-8-methoxy-1,2,3,4-tetrahydronaphthalene-2,3-dicarboxylate (VI). Bromination of (VI) with bromine in a mixture of chloroform and ether and subsequent dehydrobromination by heating with 2,4,6-collidine gave diethyl 1-hydroxy-4-methyl-8-methoxy naphthalene-2,3-dicarboxylate (VII). Boiling of (VII) with 48% HBr for 8 hours yielded yellow-tan crystals of (I), m.p. 232~233°(from hot water) (*Anal.* Calcd. for $C_{12}H_{10}O_4$: C, 66.05; H, 4.62. Found : C, 65.83; H, 4.51), which showed the same melting point and ultraviolet absorption spectrum as those of terranaphthoic acid[1b] (m.p. 233~235°) derived from oxytetracycline.

This has established the structure of terranaphthoic acid. The details of these experiments will be presented in the near future.

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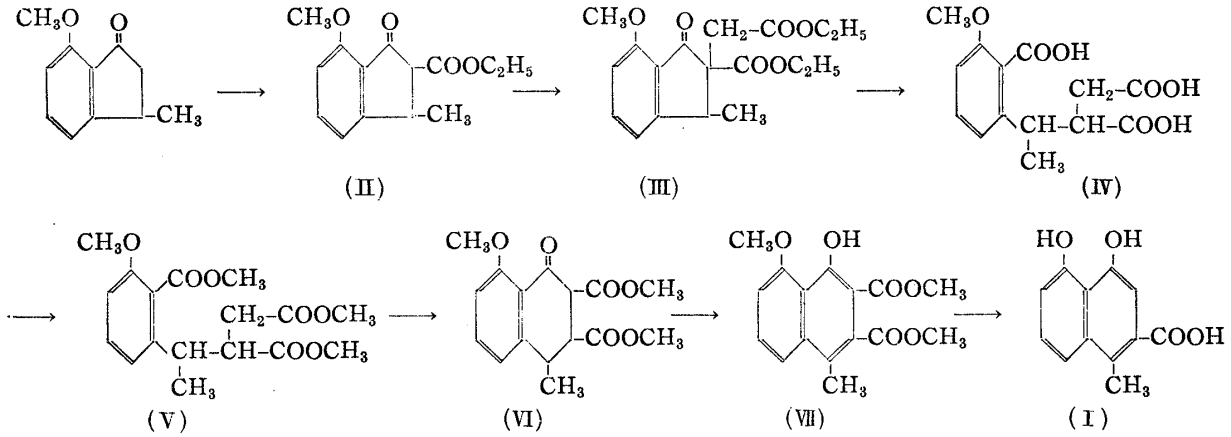
1) *a*) F. A. Hochstein, *et al.* : J. Am. Chem. Soc., **74**. 3706(1952).
b) F. A. Hochstein, *et al.* : *Ibid.*, **75**, 5455(1953).
2) L. H. Conover : J. Am. Chem. Soc., **75**, 4017(1953).



(II) (III) (IV) (V) (VI) (VII) (I)

Pharmaceutical Faculty
University of Osaka
Hotarugaike, Toyonaka, Osaka-fu

Zen-ichi Horii (堀井善一)
Yasumitsu Tamura (田村恭光)
Kunihiko Tanaka (田中邦彦)

April 5, 1957

U.D.C. 547.837

Synthesis of Octadehydromatrine and Allomatridine

In 1935, Kondo and Tsuda[1] obtained octadehydromatrine, $C_{15}H_{16}ON_2$, by dehydrogenation of matrine over palladium-asbestos.

While the saponification of 11-ethoxycarbonyl-10-oxo-1,2,3,5,6,7-hexahydroquinolizino[1,8-*ab*]quinolizine (Ia),[2] synthetically prepared, afforded an acid (Ib), m.p. 270~272° (Calcd. for $C_{16}H_{16}O_3N_2$: C, 67.59; H, 5.67; N, 9.85. Found : C, 67.72; H, 5.85; N, 10.07), and subsequent decarboxylation gave 10-oxo-1,2,3,5,6,7-hexahydroquinolizino[1,8-*ab*]quinolizine (II), m.p. 174~176°; λ_{max}^{EtOH} mμ (log ε) : 230(4.39), 270(4.05), 395(4.22); ν_{max} 1647 cm^{-1}(C=O) and 1518 cm^{-1}(C=C) (in KBr pellet). All physical properties of (II) agreed with those of octadehydromatrine. (II) was converted by hydrogenation over platinum oxide to a compound, $C_{15}H_{22}ON_2$,[1] m.p. 105°; λ_{max}^{EtOH} 226 and 274 mμ (log ε 4.32 and 4.18); ν_{max} 1592, 1558, 1506 cm^{-1}(C=C), and 3145 cm^{-1}(OH), indicating the presence of a pyridine ring and OH group. The data of the ultraviolet absorption spectrum are analogous to those of dehydro-α-matrinidine.[3] The benzoate[1] shows the stretching vibration band for an ester group at 1722 cm^{-1}(-O-CO-) and copper chromite catalyzed its high-pressure hydrogenation to give *dl*-allomatridine (IV),[4] m.p. 53~55°. Though the high-pressure hydrogenation of (II) with copper chromite catalyst at high temperature afforded (IV), the same reaction at lower temperature gave the foregoing substance. Therefore, we assigned the structure of (III) to $C_{15}H_{22}ON_2$.

On the conformationl analyses of matrine and its isomeric allomatrine, some observations have been reported. (A) When matrine was submitted to hydrogenation over

1) H. Kondo, K. Tsuda : Ber., **68**, 644(1935).
2) K. Tsuda, S. Saeki, S. Imura, S. Okuda, Y. Sato, H. Mishima : J. Org. Chem., **21**, 1481(1956).
3) S. Okuda : This Bulletin, **4**, 257(1956).
4) C. Schöpf, H. Arm, G. Benz, H. Krim : Naturwiss., **38**, 186(1951); Platanov, Kuzovkov: J. Gen. Chem. (U.S.S.R.), **26**, 283(1956). The writers are indebted to Dr. Schöpf for the kind donation of a sample of *dl*-allomatridine.