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THE ALKALOIDS OF CHINESE DRUG, PEI-MU, *FRITILLARIA ROYEI.* PART II. FRITIMINE

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With a note on its physiological properties by

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In a previous communication on the Chinese drug Pei-mu, 貝母, the writer [1932] reported the isolation of two alkaloids, peimine $C_{19}H_{30}NO_2$ and peiminine $C_{18}H_{28}NO_2$; both of which differ from verticin and verticillin of Fukuda [1929] in their molecular formulae and properties. The present chemical investigation of Pei-mu of the Szechuan variety indicated that it contains entirely different active principles, and has resulted in the isolation of another new alkaloid, for which the writer suggests the name *fritimine.* It has a molecular formula of $C_{38}H_{62}N_2O_3$, a melting point of 167°C and a specific rotation of $-50°$, and is much less toxic than peimine and peiminine, its M.L.D., as a base in mice, being found to be 40 mg per kg body weight.

EXPERIMENTAL

Twelve kilograms of Pei-mu from Szechuan were finely powdered and extracted with 95 per cent alcohol under similar conditions as in the case of Pei-mu from Chekiang [see Chou, 1932]. The resulting residue could only be manipulated with difficulty, on account of its gelatinous nature. The alkaloid fritimine was finally isolated in pure state, by crystallizing from a small amount of alcohol or acetone. It forms colourless rhombic plates (see fig. 1), melting at 167°C. It is

easily soluble in most organic solvents and insoluble in water. A 0.40 per cent solution in alcohol, gave in 1 dm tube, a specific rotation of $-0.2°$; whence $[\alpha]$ 22/D $= -50°$. It has a molecular formula $C_{38}H_{62}N_2O_3$ according to the following analysis:

(i) 0.1216 gm substance, gave 0.3403 gm CO_2 and 0.1169 gm H_2O
C = 76.81; H = 10.68

(ii) 0.1218 gm substance, gave 0.3425 gm CO_2 and 0.1153 gm H_2O
C = 76.69; H = 10.51

(iii) 0.1414 gm substance, gave 5.9 cc moist Nitrogen at 25°C and 750 mm pressure N = 4.56

$C_{38}H_{62}N_2O_3$ requires C = 76.76; H = 10.43; N = 4.71.

It forms a hydrochloride easily soluble in water, melting at about 230°C.

Fig. 1. Fritimine $C_{38}H_{62}N_2O_3$
M.P. = 167°C
S.R. = -50°

Physiological tests of fritimine (By Dr. K. K. Chen).

Its M. L. D. in mice, is approximately 40 mg per kg. Death is preceded by convulsions, first tonic, then clonic in type. The substance raises blood sugar in rabbits in the dosage of 7.5 to 10 mg per kg. A more detailed investigation is in active progress.

SUMMARY

From the corms of Chinese drug, Pei-mu of the Szechuan variety, a new alkaloid, fritimine, has been isolated. It has a molecular

formula $C_{38}H_{62}N_2O_3$, a melting point of 167°C and a specific rotation of −50°. Its M.L.D. in mice, has been found to be 40 mg per kg body weight.

LITERATURE

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中國貝母之有機鹼質

其二. 貝母素丙

趙 承 嘏

關於貝母素丙之生理性質之略記

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中國川貝母中所含之有效質素，與浙貝母中所有者，完全不同，生理性質,亦隨之而異.作者前從浙貝母中提出二種有機鹼質，並定名爲貝母素甲 (Peimine) 及貝母素乙 (Peminine) (參觀本雜誌第六卷第三期二百六十五至二百七十頁)。今又從川貝母中提出一新有機鹼質，命名曰貝母素丙 (Fritimine). 貝母素丙之分子式爲 $C_{38}H_{62}N_2O_3$ 熔點爲 167°C.旋轉度爲—50°，其毒性較之貝母素甲及乙稍遜，鼠之體重每公斤，如注射貝母素丙40公絲時，始能致死. 其詳細之生理性質，將由陳克恢博士另作專篇報告.