

A Preliminary Report on a New Water-Soluble Ergot
Alkaloid, "Elymoclavine"

Sir :

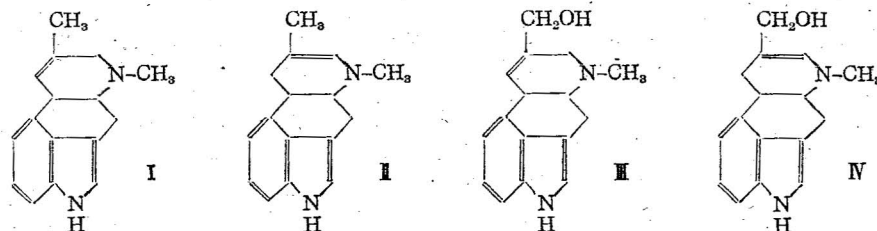
Previously, M. ABE¹⁾ showed that the ergot fungus, parasitic on the *Agropyrum*, *Trisetum*, *Festuca*, etc. growing in Japan and Manchuria, produces in nature exclusively a new alkaloid, slightly water-soluble, having the composition $C_{26}H_{18}N_2$ (formula I or II), m. p. 208-9° (uncorr. decomp.), $[\alpha]_D^{20} -144^\circ$, $[\alpha]_{5461}^{20} -172^\circ$ (c. 0.98 in chloroform), and it can do this also be produced in saprophytic culture in excellent yield. He named the alkaloid "agroclavine".

Recently, we have found that the ergot fungus, parasitic on *Elymus mollis* TRT. growing in Japan, Saghalien, and the Kuriles, can produce agroclavine and some other kinds of alkaloids in saprophytic culture, the total yield being quite the same as that in the above-mentioned fungus. The following alkaloids were isolated from the mycelium and the culture medium, when the fungus was grown at 28°C for 30 days in a 3 l. Bernhauer flask containing 1.2 l. of the medium composed of mannitol (50 g.), ammonium succinate (8 g.), KH_2PO_4 (1 g.), $MgSO_4 \cdot 7H_2O$ (0.3 g.), and water (1000 cc.) : ergocryptinine (210 mg. yield), ergocryptine (trace), ergosinine (trace), and agroclavine (70 mg.), and further a new water-soluble alkaloid (10 mg.). It was proved that also in natural condition the said fungus produces the same alkaloids. The following alkaloids were obtained from 200 g. of the ergot found on the host plant growing in a part of Japan : ergocryptine (900 mg. yield), ergocryptinine (200 mg.), ergosinine (trace), agroclavine (60 mg.), and the above water-soluble alkaloid (5 mg.). We propose to name this new alkaloid "elymoclavine".

Elymoclavine crystallizes from benzene, chloroform, ether, ethyl acetate, acetone, methanol, or ethanol in prisms ; m. p. 250-2° (uncorr. decomp.), $[\alpha]_D^{20} -59^\circ$, $[\alpha]_{5461}^{20} -98^\circ$ (c. 0.1 in ethanol), $[\alpha]_D^{20} -136^\circ$, $[\alpha]_{5461}^{20} -166^\circ$ (c. 0.5 in pyridine). (Found : C, 75.54 ; H, 7.01 ; N, 10.88. Calcd. for $C_{26}H_{18}ON_2$:

C 75.55 ; H, 7.14 ; N, 11.02). The absorption spectrum of elymoclavine shows the maximum near 282 m μ . and the minimum near 246 m μ , typical of agroclavine. It precipitates with all the usual alkaloidal reagents. It gives a deep blue color with the VAN URR's reagent and a deep purplish blue color with the KELLER's reagent. It is slowly oxidized on exposure to air, acquiring a brown color and a purplish blue fluorescence. It is insoluble in petroleum ether, sparingly soluble in benzene, toluene, chloroform, ether, and ethyl and buthyl acetate, moderately soluble in acetone, methanol, and ethanol, but readily soluble in pyridine. Like ergometrine, it is appreciably soluble in cold water, to which it imparts a reaction alkaline to litmus, and dissolves readily in dilute acids. Like agroclavine, it yields no isomeride on treatment with acid or alkali, and shows a high degree of physiological activity.

Elymoclavine seems to possess the formula III or IV.



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(1) *Annual Reports of the Takeda Research Laboratory*, 10, 129, 145, 162, 167, 171 (1951).

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