These experiments demonstrate that low temperature treatment, of the kind entailed by freezing preservation, alters the glycolytic function of human sperm in the presence of ABO isoantibodies. These alterations are significantly different from those which occur as a result of incubation with isoantibodies without application of low temperatures. It is possible that prezygotic selection exists in the ABO system[13,14], and that the direction of this selection may be changed by exposure of the sperm to low temperatures.

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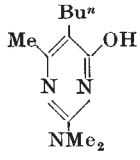
5-*n*-Butyl-2-dimethylamino-4-hydroxy-6-methylpyrimidine: a Systemic Fungicide

During a search for systemic fungicides it was found that 5-*n*-butyl-2-dimethylamino-4-hydroxy-6-methylpyrimidine (I) gives exceptionally good control of powdery mildew (*Sphaerotheca fuliginea* (Schlecht)) on cucurbits, particularly when applied to the soil as a liquid or in granules. The compound has very low mammalian toxicity, with LD_{50} values (female rats) of 200–400 mg/kg (interperitoneal) and > 4,000 mg/kg (oral).



(I)

5-*n*-Butyl-4-hydroxy-6-methyl-2-methylthiopyrimidine reacts with dimethylamine acetate to give 85 per cent (I), which is also obtained (50 per cent) by condensation of ethyl-α-*n*-butyl acetoacetate with *NN*-dimethylguanidine sulphate in the presence of sodium methoxide. 5-*n*-Butyl-2-dimethylamino-4-hydroxy-6-methylpyrimidine (I) forms colourless needles, melting point 102° C, from ethanol. We found: C, 63·1 per cent; H, 9·2 per cent; N, 20·2 per cent, and calculated for $C_{11}H_{19}N_3O$; C, 63·0 per cent; H, 9·3 per cent; N, 20·3 per cent. The ultraviolet spectrum (in methanol) exhibits two major peaks, λ_{max} 229 mμ (ε_{max} 15,500) and λ_{max} 304 mμ (ε_{max} 7,700); infrared absorption in the 1,500–1,700 cm^{-1} region occurs at 1,650, 1,600 and 1,530 (pyrimidine) cm^{-1}.

In trials in commercial glasshouses, 0·25 g of (I), applied in 20 ml. of water around the base of cucumber plants when the first spots of mildew appeared on the foliage, eradicated the infection and maintained the plants free of the disease for at least 6 weeks.

Very efficient disease control obtained with one or two such treatments improved the quality of the fruit, markedly increased the yield, and prolonged the life of the plants, in comparison with standard foliage fungicide treatments.

Preliminary experiments suggest that this compound is loosely adsorbed onto soil particles, which act as a reservoir from which it is slowly taken up through the roots into the transpiration stream, affording prolonged disease control at extremely low concentrations in the leaves. After treatment with 0·25 g per plant, residues in cucumber fruits have been below the present limit of detection (0·2 p.p.m.).

The combination of systemic action, low mammalian toxicity, and lack of detectable residue in the fruit offers the prospect of a novel and valuable method of control of powdery mildews on cucurbits.

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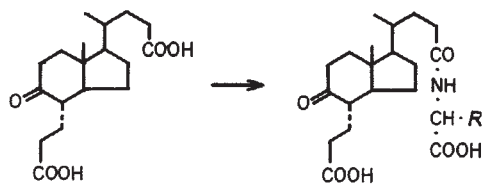
Amino-acid Conjugation in Bacteria

We have shown[1] that *Arthrobacter simplex* is capable of converting cholic acid into 4α-(2-carboxyethyl)-5-oxo-7aβ,γ(*R*)-dimethyl-3aα-hexahydroindan-1β-butyric acid (I). Our continued interest in defining the intermediates and reaction sequence, involved in the complete oxidation of the cholic acid molecule, has prompted us to investigate the metabolism of the acid (I), *A. simplex* is not able to utilize (I) as the sole carbon source at a significant rate. It has been found, however, that *Corynebacterium equi*, cultured in a medium containing (I) as the sole source of carbon, produces a mixture of the conjugates of amino-acids with (I) and the further degradative products of (I) and that one of the conjugates is (II*a*), *N*-[4α-(2-carboxyethyl)-5-oxo-7aβ,γ(*R*)-dimethyl-3aα-hexahydroindan-1β-butyryl]-L-alanine[2]. Hutzinger and Kosuge[3] have described the similar isolation and identification of N^{ε}-(indole-3-acetyl)-L-lysine formed from indole-3-acetic acid by cultures of *Pseudomonas savastanoi*.

Continuing our study, we found that exposure of (I) to *C. equi* produced at least three amino-acid conjugates besides (II*a*). These products, except for (II*b*), could not be isolated as crystals, but comparisons by infrared and/or nuclear magnetic resonance methods of the products and their methyl ester derivatives with the authentic (II*a*) and its methyl ester suggested that these products are conjugates of amino-acids with (I). Furthermore, when



I

II*a*, R = −CH$_3$
b, R = −CH$_2$·CH$_2$·COOH
c, R = −CH$_2$·CH$_2$·CONH$_2$
d, R = −CH$_2$·CH$_2$·OAc
e, R = −CH$_2$·CH$_2$OH