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[1] Johnstone-Wallace, D. B., and Kennedy, K., *J. Agric. Sci.*, **34**, 190 (1944).
[2] Tribe, D. E., *Emp. J. Exp. Agric.*, **17**, 105 (1949).
[3] Worden, A. N., *New Biol.*, **7**, 9 (1949).
[4] Findlay, J. D., Hannah Dairy Res. Inst. Bull. No. 9, 1 (1950).
[5] Seath, D. M., and Miller, G. D., *J. Dairy Sci.*, **29**, 199 (1946).

Mutations appearing in *Fusarium cæruleum* Cultures treated with Tetrachlornitrobenzene

Fusarium cæruleum (Lib.) Sacc., unlike many other Fusaria, is comparatively stable under normal conditions, and mutations in culture are uncommon. During an investigation of the effect of tetrachlornitrobenzene on the growth-rate of the fungus in culture, however, a number of mutant forms made their appearance. Cultures on potato dextrose agar were exposed continuously to tetrachlornitrobenzene vapour by depositing 0·01 gm. of the pure chemical on the inside of the Petri dish lids. In a typical experiment, thirteen plates were each seeded with a single spore; twenty-eight mutant sectors (at least one in each plate) developed in ten treated plates, while none was found in three untreated control plates.

Certain of the mutant sectors were characterized by a growth-rate faster than that of the normal strain from which they originated. Subcultures were taken from these and compared with subcultures of the normal strain, in the absence of tetrachlornitrobenzene. Under these conditions, the mutants were found to be very similar in growth-rate, general appearance and spore measurement to the normal strains, and fell within the range of variability found in isolates from natural sources. Laboratory pathogenicity tests, moreover, did not show any difference in virulence between these mutants and the normal strains.

Further studies on the growth-rate of the mutant and normal strains confirmed that, in the presence of tetrachlornitrobenzene, the growth-rate of the former was markedly greater than that of the latter. From this it was concluded that the new strains were in the nature of physiological mutants, distinguished by their ability to resist the fungistatic action of the vapour. This resistance to the effects of tetrachlornitrobenzene was unaltered after passage of the fungus through potato tubers (see table).

As these new strains arose in single-spore cultures, it would appear likely that they are true mutations and not merely more resistant individuals which were undetected until subjected to treatment with tetrachlornitrobenzene. Although the *Fusarium* macrospore is multinucleate, heterokaryosis is improbable as, at least in some Fusaria, it has been shown[1] that these nuclei arise from a single parent nucleus. A number of chemicals are known to induce mutation in fungi, but the possibility must always be considered that an apparently homogeneous colony does, in fact, contain mutant loci which are unable to develop until the dominance of the 'normal' strain is restricted by the action of the chemical in question.

Average Increase in Colony-Diameter per Day in cm. (at Room Temperature) for a Normal and Mutant Strain of *F. cæruleum*

Strain		In absence of tetrachlornitrobenzene	In presence of tetrachlornitrobenzene
Normal	*a*	0·68	0·31
	b	0·66	0·28
Mutant	*a*	0·67	0·54
	b	0·66	0·50

a, Original isolate; *b*, after passage through potato tubers.

Tetrachlornitrobenzene is the active principle of a dressing used for preventing potato dry rot and is normally applied to newly dug potatoes before storage. The extent to which mutants of *F. cæruleum* appear in soil adherent to the tubers after this treatment has not yet been investigated, but it seems possible that strains resistant to tetrachlornitrobenzene may arise and be distributed afterwards among the soil population. The mode of action of tetrachlornitrobenzene in controlling dry rot is obscure, as *in vitro* the chemical restricts the growth of the fungus but by no means prevents it; when the chemical is removed, the fungus resumes its normal growth-rate. It cannot be assumed that mutants which are able to grow faster in the presence of tetrachlornitrobenzene would necessarily cause more dry rot in potatoes treated with tetrachlornitrobenzene than the normal strains.

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[1] Dickinson, S., Minn. Agric. Exp. Sta. Tech. Bull., 88 (1932).

Histology of the Carotid Body

De Castro's histological[1] and Heyman's physiological[2] investigations on the carotid body have provided new and important evidence of a peripheral control of respiration and circulation. Histologically, much work has been done to elucidate the mode of nervous innervation of the chemo-receptive tissue in the carotid body; but little is known of the underlying mechanism by which chemical changes in the blood give rise to afferent impulses in the sinus nerve, for example, whether the receptors concerned are specialized in relation to the nature and concentration of particular stimuli. Anderson and Zotterman[3] were able to demonstrate that specialized receptors for 'water taste' as distinct from acid receptors exist in the frog's tongue. Von Euler, Liljestrand and Zotterman[4] obtained results "which strongly suggest identical receptors" for anoxic and hypercapnic stimulation. Winder[5] leaves open the question of separate receptor sets for oxygen and carbon-dioxide stimulation.

The issue of possible receptor specialization has been examined histologically. A number of workers have reported differing types of receptor cells in the carotid body of several species[6–11]. Few observations are, however, available concerning the distribution or morphological relationships of such cells.

Carotid bodies were taken from the cat under ether. The bifurcation of the common carotid was removed within thirty to sixty seconds of death and at once fixed. Paraffin sections[6] were treated according to Holmes's silver technique[12]. The greater part of the