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Effects of respiratory inhibitors on growth

Abstract

Effects of respiratory inhibitors on growth

West, D. J. and D. O. Woodward. Effects of respiratory inhibitors on growth of *Neurospora*.

Growth procedure: Conidia of the wild type strain 74-OR23-1A (FGSC#987) were inoculated into 250 ml Erlenmeyer flasks containing 40 or 60 ml of Voael's minimal N medium supplemented with 2% sucrose and various concentrations of sodium azide, thorazine (chlorpromazine-HCl) or antimycin A. The final concentration of conidia in the culture was 10^5 /ml. Cultures were grown with rotary shaking (150 rpm) at 30°C. Mycelia from these cultures were harvested at several times, and the dry weights of mycelia grown in the absence of inhibitors were compared with those of mycelia grown in the presence of inhibitors.

Sodium azide: The dry weights of mycelia grown for 24 hr. in the presence of 2.5×10^{-6} M or 1.0×10^{-5} M sodium azide were, respectively, 50% and 85% less than those of mycelia grown in the absence of inhibitor. 2×10^{-5} M sodium azide served to completely inhibit growth during this period. At concentrations of sodium azide up to 2×10^{-5} M, inhibition was overcome after 24 hr., and substantial mycelial growth ensued after that time. When 5×10^{-5} M sodium azide was included in the medium, no growth was observed over a 5-day period.

Thorazine: The dry weights of mycelia grown for 24 hr. in the presence of thorazine at concentrations up to 6×10^{-5} M were similar to or slightly greater than those of mycelia grown in the absence of thorazine. Severe inhibition of growth was observed with slightly higher concentrations of thorazine. 7×10^{-5} M and 1.0×10^{-4} M thorazine effected, respectively, 50% and 90% inhibition of growth at 24 hr. There was recovery from inhibition after 24 hr. at concentrations of thorazine up to 1.0×10^{-4} M. Mycelial growth rates after recovery were similar to those observed in the absence of the drug. Mycelia grown in the

presence of inhibiting concentrations of thiazine ~~were~~ characterized by a "rice-like" morphology. This peculiar morphology persisted throughout the growth of the culture, even after inhibition had been overcome. No growth occurred over a period of 5 days in cultures containing thiazine in excess of 2×10^{-4} M.

Antimycin A: Inclusion of $1 \mu\text{g/ml}$. of antimycin A in the culture medium has been observed to lengthen the moss doubling time of the mycelium during the exponential phase of growth from 3 to 7 hours. • • • Department of Biological Sciences, Stanford University, Stanford, California 94305.