Viability of microconidia

R. W. Barratt

Follow this and additional works at: http://newprairiepress.org/fgr

Recommended Citation

This Research Note is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Fungal Genetics Reports by an authorized administrator of New Prairie Press. For more information, please contact cads@k-state.edu.
Viability of microconidia

Abstract
Viability of microconidia

Creative Commons License
This work is licensed under a Creative Commons Attribution-Share Alike 4.0 License.

This research note is available in Fungal Genetics Reports: http://newprairiepress.org/fgr/vol6/iss1/3
The label in both mycelium and asci grown on the thymine compounds was light and uniformly distributed. No evidence for localization of grains over nuclei in the asci could be obtained from slides treated with the enzymes. Neither DNAase nor RNAase treatment appreciably reduced the amount of label/unit area: 1/3, at most, was removed by RNAase. Fink and Fink (ibid.) have shown that Neurospora rapidly demethylates exogenous thymidine and have suggested that, prior to incorporation into DNA, the thymine moiety is derived by methylation of uridine deoxynucleotide. Our inability to detect radioactivity in nuclei from cultures fed with tritiated thymine compounds and the failure of several workers (various conversations) to find thymidine mutants appear consistent with this suggestion.

Extensive labeling of both mycelium and asci was obtained with H3-deoxyuridine, and the location of the grains in the film was equally dense over cytoplasm and nuclei. Treatment with DNAase did not reduce the number of grains/unit area significantly. RNAase treatment considerably decreased the amount of radioactivity, but no concentration of grains over the nuclei was revealed. It was concluded that most of the label was incorporated into RNA; the proportion (if any) incorporated into DNA was too slight to serve as an indicator of DNA synthesis against the heavy background of cytoplasmic radioactivity. R. M. Fink (1963 J. Biol. Chem. 238: 1764) has reported that some commercial H3-uridine preparations seem to have most of the isotope at C5; methylation of this carbon would therefore yield unlabeled DNA. Possibly deoxyuridine-C6-H3 would provide a means of labeling Neurospora DNA. A thymidylic acid mutant (if reparable) would be desirable. We shall try for one. -- Department of Biology, San Diego State College, San Diego and Department of Genetics, University of California, Berkeley, California.

Barratt, R. W. Viability of microconidia. Strains of Neurospora producing exclusively microconidia have been known for nearly 15 years. The genetics of such strains were reported by Barratt and Garnjobst (1949 Genetics 34: 351). These workers reported that microconidia from strains of a peach, fluffy (pe,fl) genotype are predominantly but not exclusively uninucleate. A major limitation to the widespread use of microconidial strains has been the relatively low viability of microconidia, but no quantitative data on viability, or factors influencing viability, are available. Figure 1 summarizes viability data of microconidia from a pe,fl strain (Y8743m,L) (FGSC#568) grown on glycerol complete medium (medium 2 of Tatum, Barratt, Fries and Bonner 1950 Am. J. Bot. 37: 38) and sampled after various times of incubation at 25°C.

Figure 1. Viability of microconidia obtained from an agar slant. Viability determined by plating a counted, filtered microconidial suspension onto the surface of Fries minimal agar containing 0.1% sucrose, 1.0% sorbose, 0.1% malt extract, incubating for 60 hrs. at 30°C, and counting the resulting colonies.
Under the experimental conditions used, microconidiation begins about the third day after inoculation. Figure 2 summarizes the viability of microconidia, harvested from a 5-day-old culture, and stored at 4°C as a suspension in water (curve A), or in Fries minimal, minus a carbon source (curve B). In the light of recent data of Brockman and deSerres (1963 Am. J. Bot. 50: 709) on the "sorbose toxicity" effect of sucrose vs a mixture of glucose and fructose, it is possible that much higher initial viabilities of microconidia can be obtained. Further, microconidia are known to be susceptible to desiccation, and higher viability is known to be associated with growing microconidial strains in humid atmospheres.

Department of Biological Sciences, Dartmouth College, Hanover, New Hampshire.

Reich and Silagi (1963 Proc. Intern. Congr. Genet. 11th, The Hague, 1:49) reported a number of allelic mutants of independent origin which require L-glutamine (500 mg/l) for growth. glm strains are not leaky on minimal, are very sensitive to L-amino acids, especially methionine, and lack the enzyme glutamine synthetase (Reich, personal communication).

The results reported below were obtained on glm allele 1015 (FGSC#1115). FGSC #1115 is the double mutant glm, inos, carrying inos allele 89601. All media were supplemented with inositol (25 mg/l). L-glutamine was sterilized by filtration. Wild type strain STA4 (FGSC#262) was used for comparative purposes. During routine testing it was observed that the glm strain grows on minimal synthetic agar slants with little or no delay either in growth or conidiation, and grows especially well on Neurospora Culture Agar (Difco Laboratories, Detroit, Michigan). Neurospora Culture Agar contains proteose peptone, yeast extract, maltose and agar and has a final pH of 6.7. Reich and Silagi reported delayed growth on all media tested; no such delay was observed on Neurospora Culture Agar. Thus, it would appear that this medium would be ideal for the routine culture of glm strains. Reich and Silagi used Vogel's medium N throughout their investigations. Our data confirm that the glm strain fails to grow in minimal medium N even after long periods of incubation (see Figure 1 and Table ).