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## Abstract

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In contrast to macroconidia, microconidia are generally uninucleate and possess fewer mitochondria (Lowry et et al. 1967 J. Bacteriology 94: 1757). During our studies of mitochondrial inheritance, we have investigated various parameters affecting microconidial production and the viability of pe,fl. (FGSC #569 and #3073), fl;dn (FGSC #3518), and several microconidiating strains kindly provided us by Ken Munkres (14-8a. 14-12A, 14-13a, 17-3a, and 17-8A). These latter strains are similar to the $F_2$ lines of pe,fl previously described by Munkres (1977 Neurospora Newsl. 24: 9).

Cultures were grown on either minimal medium (1X Vogel's minimal, 2% sucrose, 1.5% agar or on complete medium (1X Vogel's minimal, 2% sucrose, 0.1% yeast extract, 0.1% malt extract, 1.5% agar) in 125 ml Erlenmeyer flasks at 30°C under constant illumination. This complete medium was similar to that described by Baylis and DeBusk (1965 Neurospora Newsl. 7: 7) except that liver extract was omitted. All of the strains yielded almost exclusively microconidia as verified by scanning electron microscopy of hyphae. These microconidia were generally ellipsoidal with a major axis length of 2.1 ± 0.3 µm. This was in contrast to macroconidia obtained from STA4 (FGSC #262) which had a major axis length of 5.8 ± 1.8 µm. The number of microconidia produced by cultures grown on complete medium was five to seven times greater than that from cultures grown on minimal medium.

Microconidial suspensions were prepared by vigorously shaking each culture with 15 ml of water followed by filtration through two layers of cheesecloth; filtered microconidial suspensions were examined with a hemocytometer to determine concentrations of microconidia and to verify the absence of hyphal fragments. Germination percentages of microconidia were ascertained by suspending a diluted aliquot in 45°C molten agar and overlaying upon sorbose medium (1X Vogel's minimal, 1% sorbose, 0.05% fructose, 0.05% glucose, 1.5% agar). Microconidia from the pe,fl strain and the pe,fl derived strains of Munkres produced colonies within three days of incubation at 30°C; colonies from the fl;dn strains were not observed until after four to five days of incubation. We observed no significant differences in percent germination between microconidia derived from cultures grown on minimal medium and those derived from cultures grown on complete medium. Using these same techniques, macroconidia from STA4 showed greater than 80% germination.

TABLE 1*

| Strain | Total Microconidial Yield | Percent Germinating Microconidia |
|---|---|---|
| pe,fl (#569) | $1.65 \times 10^9$ | 26% |
| pe,fl (3073) | $6.75 \times 10^8$ | 34% |
| F2 pe,fl (14-8a) | $1.45 \times 10^8$ | 26% |
| pe,fl (14.12A) | $8.40 \times 10^8$ | 24% |
| pe,fl (14-13a) | $1.02 \times 10^9$ | 39% |
| pe,fl (17-3a) | $7.60 \times 10^7$ | 35% |
| pe,fl (17-8A) | $6.80 \times 10^8$ | 34% |
| fl;dn (#3518) | $1.32 \times 10^9$ | 6% |

*Table 1 summarizes the data for cultures grown on complete medium.

Regarding the data in Table 1, the following points are noted: (1) The viabilities of microconidia from certain pe,fl strains were greater than those reported by Barratt (1964 Neurospora Newsl. 6: 6); (2) The viabilities of microconidia of the pe fl-derived strains of Munkres were considerably lower than his reported value of 85 - 95% (1977 Neurospora Newsl. 24: 9); and (3) While fl;dn may be highly fertile as a female parent (Perkins 1979 Neurospora Newsl. 26: 9) its total usefulness may be diminished due to the low viability of its microconidia.

In addition, both microconidial yield and viability were significantly reduced when cultures were grown at 35°C. Also culturing beyond seven days at 30°C increased total microconidial yields, gave reduced microconidia germination from pe,fl strains, but no significant change in percentage microconidia germination of fl;dn. The technical assistance of Ms. Doria Harris is gratefully acknowledged. - - - Department of Biology, University of Minnesota, Duluth, Minnesota 55812.