Fungal Genetics Reports

Volume 11 Article 20

Use of the Caulter counter to measure the numbers and size distribution of macroconidia and microconidia of Neurospora crassa

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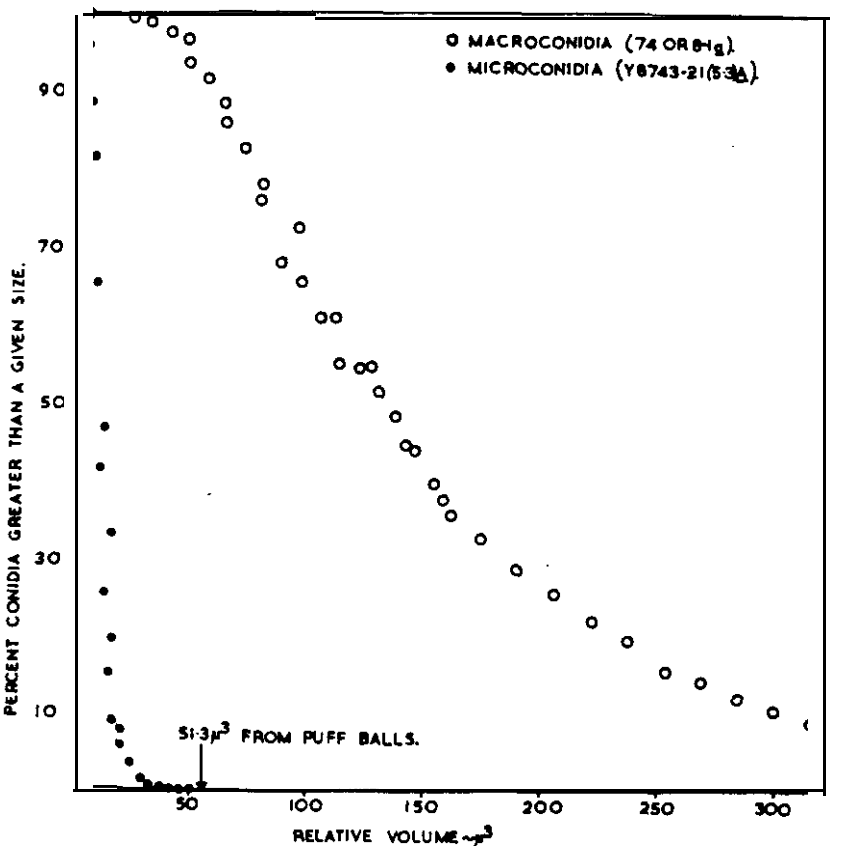
Abstract

Measurement of numbers and size distribution of conidia by Coulter counter

Gillie, O. J. Use of the Coulter counter to measure the numbers and size distribution of macroconidia and microconidio of Neurospora crassa.

The Coulter counter (Model A fitted with 70 μ aperture) has been used to measure the size distribution of macroconidia of 74-OR8-1a and microconidia from the microconidial fluffy strain Y8743-21 (5-3)A. Figure 1 shows the data obtained plotted as percentage conidio greater than a certain size against relative volume. The volume scale was calibrated using puff ball spores of known sire kindly supplied by the Coulter company. On this machine all macroconidia may be counted by setting the sensitivity dial to 4 and the threshold to IO; all microconidia may be measured by setting the sensitivity to 7 and the threshold to 5. If a mixed population of microconidia and macroconidia is present then the relative numbers of each kind moy be found by taking readings at the settings described above and subtracting the smaller figure from the larger to obtain the number of microconidia. This computation is quite straight-forward since the sizes of macro- and microconidio do not overlap. The figures obtained for the numbers of microconidia in a given volume measured in this way were in agreement with counts mode using a hemocytometer.



It has been found, using this method, that wild type 74-OR8-1a produces about 50% microconidio when grown on complete medium slants (without glycerol.) at 25°C and few or no microconidio when grown on Vogel's *minimal* slants at 25°C. The Coulter counter can also be used to measure volume increases of germinating conidia and such volume changes can be observed I-2 hours before germ tube formation is noticeable. It can also be shown that macroconidia con be differentially separated from microconidia by passive sedimentation in distilled water in a test-tube left to stand over a period of 3 or more hours. McCallan (1957 Contrib. Boyce Thompson Inst. 19: 303) has mode a detailed comparison of spore volumes for fungi of many species, including N. crassa, using conventional methods of micrometry. - - - Notional Institute for Medical Research, The Ridgeway, Mill Hill, London, N.W.7, England.