

Barry, E. G., D. Newmeyer, D. D. Perkins and B.C. Turner. Genetically determined round ascospores in N. crassa.

In addition to the dominant gene R: Round spore, discovered by M. B. Mitchell (1966 Neurospora Newsl. 10:6 ), two other genotypes are now known to result in round spores. Because of their potential interest for studies of morphogenesis, these will be reported briefly, together with some new observations on R.

a. Round spores from cot-2 x cot-2 (Newmeyer): All ascospores are round when cot-2 (colonial-temperature-sensitive, R1006; Garnjobst and Tatum (1967 Genetics 57:579) is homozygous. Ascospores are all normal in heterozygous crosses. As noted by Garnjobst and Tatum, vegetative morphology of cot-2 is not completely normal at 25°C.

b. Round spores from T(V→VII)EB4 (Barry, Perkins ): A mutation in T(V→VII)EB4 results in a small but significant number (less than 10%) of round ascospores in heterozygous crosses. Individual asci usually contain either round spores only or normal spores only, but sometimes various ratios of round to non-round spores are found in an ascus (e.g., 7r:1nr, 5r:3nr). The observation of a number of intermediate shaped spores, rounded but not fully spherical, also suggests an incompletely penetrant gene for the mutation.

The spore mutation has not been separated from the translocation in T(V→VII)EB4. The mutation was discovered as a minority component of a culture of wild-type 74-ORB-1a received at Stanford in 1961 from F. J. de Serres, and preserved on silica gel since that time. Cytologically, a distal segment of chromosome 2L can be seen frequently to be asynapsed or abnormally paired at pachynema in crosses of Translocation by Normal. Genetically, a short unmarked region of VR near al-3 is inserted into VII. When T(V→VII)EB4 is crossed by Normal, one third of the viable progeny contain duplications, and round ascospores are also found when such duplication strains are crossed by Normal.

c. Round spores from R x (Turner ): R normally results in 100% round ascospores in crosses where it is heterozygous (first shown by Mitchell 1966. ) R is the rightmost known marker in I. It is not terminal, however, as shown by recombination with the right break points of In(IL→IR)AR16 and In(IL→IR)H4250, which are effectively at the IR tip. R results in peach-like morphology of vegetative cultures, which are female-sterile, producing no perithecia. The vegetative morphology of R is recessive in R/r duplications (such as those from T(I→VI)NM103.) The expression of R in spores does not depend on a linear ascus. Spores are round when R is present in the flaccid nonlinear asci characteristic of crosses where bis (pk) is homozygous (Perkins).

A similar dominant Round-spore gene has been reported by Novak and Srb (1969 Neurospora Newsl. 15: 22) in N. tetrasperma, where it does not interfere with the characteristic delimitation of four spores. - - - Department of Botany, University of North Carolina, Chapel Hill, North Carolina 27514 (BEG) and Department of Biological Sciences, Stanford University, Stanford, California 94305.