Fungal Genetics Reports

Volume 24 Article 19

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Recommended Citation

Maxwell, J. B., G. Ichtertz, M. Jambretz, and T. Wohrle (1977) "Allelism of ser(JBM 4-13) and ser-2 on linkage group V," *Fungal Genetics Reports*: Vol. 24, Article 19. https://doi.org/10.4148/1941-4765.1752

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Abstract

Allelism of *ser(JBM-4-13)* and *ser-2*

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Early studies with mutant ser(JBM 4-13) indicated that it maps within the same region as ser-2 (Maxwell, Kline and Bengtson, NN#21:23). Numerous attempts to test for allelism of the two sites by crosses between the two mutants have been unsuccessful; mutant ser(JBM 4-13) reverts to wild-type prior to mating, yielding 50% wild-type spores from the cross ser-2 x ser(JBM 4-13). Thus the location of the two mutants was compared indirectly, by mapping each ser mutant relative to markers on linkage group V. Data are given in Tables 1 and 2.

In cross N17, FGSC #2170: ser-2 (65004) a; was crossed to FGSC #2308: al-3 (RP100), inl (89601) A. In cross N18, A; ser(JBM 4-13), met-3 (361-4) was crossed to FGSC #2301: al-3 (RP100), inl (89601) a. Crosses were made on Westergaard-Mitchell medium (1947 Am. J. Bot. 34: 573) containing 2% sucrose and 0.15 g/l L-serine, 10 mg/l inositol and 0.2 g/l L-methionine (omitted from N17). Random spores were isolated from 4% agar plates onto small slants of appropriately supplemented Vogel's medium containing 2% sucrose. The single spore isolates were heat shocked at 60° for 45 minutes, and incubated at 32° C.

Table 1.

Linkage data on random spores isolated from the cross ser-2 x al-3, inl.

Zygote genotype and percent recombination	Parental types	1	2	1,2	Total	Percent Germination
al-3 inl +						
+ + ser-2	381	4	12	0	790	83
(1.3) (3.4)	372	6	15	0		

Table 2

Linkage data on random spores isolated from the cross ser(JBM 4-13), met-3 x al-3, inl.

Zygote genotype and percent recombination	Parental types	1	2	3	1,2	1,3	2,3	Total	Percent Germination
al-3 inl + +	263	6	12	6	0	0	1	678	67
+ + met-3 ser	359	2	11	8	0	0	0		
(1.2) (3.5) (2.2)									

The results from these crosses indicate that ser(JBM 4-13) is at least closely linked to ser-2. Allelism is not excluded by the differences between the recombination frequencies observed for the inl - ser interval; the presence of genes in the stocks which affect recombination in this interval without altering the recombination frequency in the al-3 - inl interval could account for the results.

Heterocaryon tests were next used to evaluate the allelism of ser-2 and ser(JBM 4-13). In one experiment, conidia from al-3, inl, ser-2 and met-3, ser(JBM 4-13) were coinoculated onto a slant of Vogel's medium supplemented with 0.4 g/l L-serine and 2% sucrose. Conidia from the resultant presumptive heterocaryon were plated onto serine supplemented Vogel's medium and individual colonies were isolated onto small serine slants. Each isolate was tested for growth on slants of Vogel's medium with or without serine supplement. No heterocaryon grew on Vogel's minimal medium, suggesting that ser-2 and ser(JBM 4-13) are allelic. Conidia from one of these presumptive heterocaryons was plated onto selective media. Colony counts indicated a nuclear ratio of 1 ser(JBM 4-13), met-3 to 1.4 ser-2, inl. Colonies isolated from each selective medium grew as expected (i.e. colonies isolated from serine and methionine plates grew on slants containing these two supplements, but not the individual supplements). These results indicate that the presumptive heterocaryon which requires serine for growth contained both ser(JBM 4-13), met-3 and ser-2, inl nuclei. We conclude that ser(JBM 4-13) is allelic to ser-2. - - - Department of Botany, California State University, Northridge, Northridge, CA 91330.