

Yoder, O. C.

Mutants with increased
sensitivity to caffeine.

Three caffeine-sensitive mutants have been isolated following LN-mutagenesis and filtration enrichment in high-sorbose minimal medium containing caffeine at 0.1 mg/ml. The mutants, designated cfs(OY305), (OY306), and (OY307), grow slowly on minimal medium and are morphologically distinct. On minimal containing caffeine at 0.2 mg/ml, cfs(OY306) grows little or not at all, cfs(OY305) fails to grow for 2 to 3 days but may grow very slowly thereafter, and cfs(OY307) grows only slightly for 1 to 2 days but then grows to the same extent as in absence of caffeine. The growth of cfr(OY305) is stimulated by adenine (or by complete medium), whereas cfs(OY306) and cfs(OY307) are inhibited by adenine, and are not stimulated by complete medium. cfs(OY305) is not sensitive to caffeine if adenine is present, whereas cfs(OY306) and cfs(OY307) are as sensitive to caffeine in the presence of adenine as in its absence.

On both minimal or minimal plus caffeine media, cfs(OY305) complements cfr(OY306) and cfs(OY307) and cfs(OY306) complements cfs(OY307), with respect to growth rate, morphology and sensitivity. All three mutants map in linkage group I; cfs(OY305) and cfs(OY307) are very closely linked to each other and are about midway between mating type and al-2. cfs(OY306) is closely linked to, and probably to the right of, al-2. (The original isolate of cfs(OY305) contained a closely linked reciprocal translocation from which it was separated before mapping.)

Additional tests with cfs(OY305) have shown that it is more W-sensitive than wild type but less W-sensitive than uvs-6. Its adenine requirement prompted tests of other adenine auxotrophs for caffeine-sensitivity. Most of them (od-1, od-2, ad-3A, ad-3B, od-5, ad-7, ad-8, and od-9) are not caffeine-sensitive, but ad-6, which grows very slowly on minimal and is o-moderately stimulated by adenine, is significantly inhibited by caffeine in the presence of adenine. In addition, mac (reported to require methionine, adenine and cystine) behaves much like cfs(OY305); it is leaky and sensitive to caffeine (0.2 mg/ml) on minimal, and grows faster but is not sensitive to caffeine on complete.

There incomplete results are reported because of the possible relevance of caffeine-sensitivity to DNA repair, and because work with the mutants, begun at Stanford University, will not be continued in this laboratory. Stocks of cfs(OY305), (OY306), and (OY307) (A and a for each) have been deposited with FGSC. - - - Department of Plant Pathology, Cornell University, Ithaca, NY 14853.