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R. H. Davis

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Abstract

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Davis, R. H. A note on arginase-less mutants.

At the Asilomar conference, I reported the isolation of orginase-less mutants, representing the ogo locus (see Neurospora Newsl. 13, p. 13). Two unexpected characteristics of these mutants were noted. The first was that an ago strain grown on minimal medium hqd a very low orginine pool. Later work showed that this was the effect of on otherwise undetectable, independent mutation affecting the conversion of citrulline to orginine. Minimal-grown strains carrying aga without this modifier hove, in fact, on orginine pool equal to that of wild type. The second characteristic was that arginine inhibits ago mutants. At the time, this was attributed to the "stress" of the enormous internal orginine pool (about 0.3 M) resulting when arginine was added to ogo mycelium growing in nitrate minimal medium.

Later work shows that orginine-inhibition results from feedback inhibition of ornithine synthesis, with a consequent starvation for the polyomines derived from ornithine. Wild type does not suffer this deficiency, because the arginase reaction is on alternate source of ornithine. (In Neurospora, the likely source of polyomines is putrescine, via ornithine decarboxylase.) Therefore, if orginine is used in medium for the growth of strains carrying aga, 0.5 to 1 .O mM putrescine must be added to the medium. The putrescine requirement con be met with similar concentrations of ornithine, and, in some conditions of citrulline. Experiments with multiply mutant strains suggest that the slow growth of aga strains in Vogel's minimal medium supplemented only with orginine reflects slow ornithine formotion by reversal of the arginine biosynthetic sequence.

The aga locus lies on linkage group VIIR, 3 to 6 units distal to thr-1. Further information from our laboratory on arginaseless mutants will soon be submitted for publication elsewhere. Independent isolation and characterization of ago mutants hove been reported by D. H. Morgan (1969 Neurospora Newsl. 14:5). ■ ■ ■ Department of Botany, University of Michigan, Ann Arbor, Michigan 48104.