Further notes on nomenclature: Extrachromosomal mutants.

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Abstract
Nomenclature of extrachromosomal mutants

This note on nomenclature and origin of neurospora stocks is available in Fungal Genetics Reports:
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In Neurospora Newsletter 8 (p. 23-24) Barratt and Perkins summarized the terminology and nomenclature used by most Neurospora workers. Mutants not considered were those which exhibit extrachromosomal inheritance. At the recent meeting of the Genetics Society of America at Stanford, a group of us (Dow Woodward, Morris Grindle, Thad Pittenger, James Wilson and myself) met informally to discuss problems of terminology for such mutant strains. Extrachromosomal strains are characterized by 1) differences in progeny from reciprocal crosses with normal strains with respect to the inheritance of a particular trait (the trait is maternally inherited and rare, if ever, appears among the progeny of a cross in which the extrachromosomal mutant was the maternal parent) and 2) by transmission of the trait to other strains via heterocaryons. To date they have been named by various symbols such as mi for maternal inheritance, SG for initial slow growth of cultures derived from ascospores or conidia, abn and stp.

Since rigorous tests for establishing the identity of such strains are lacking, it was agreed that in future stack lists published by the Fungal Genetics Stock Center these mutants should be separated from those of nuclear gene mutations and listed under a new category. Further, it was agreed that, for the present, the extrachromosomal mutants determined by each research group should continue to be listed with a distinctive symbol such as mi (Mitchell), SG (Srb), etc., recognizing that some of these strains may ultimately be proven to carry identical extrachromosomal mutations. Experience of all workers is that such strains are markedly influenced by the genetic background. Further, when maintained over long periods of time by vegetative transfer, there tends to be selection for nuclear mutations which suppress or modify the extrachromosomal trait. The Fungal Genetics Stack Center will accept cultures of extrachromosomal mutants for depositon and preservation an silica gel, and will endeavor to preserve them for distribution in the original form.

It is further suggested that in designating the genotype of extrachromosomal mutants the symbol be enclosed in brackets. Thus al-2 [SG] would refer to the nuclear gene marker albina-2 and the extrachromosomal marker slow growth. --- Department of Biological Sciences, Dartmouth College, Hanover, New Hampshire 03755.

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In standing cultures with lactose as sole carbon source, N. crassa wild type STA4 grows well, but when subjected to rotary or reciprocal agitation in the same medium, STA4 yields only small amounts of mycelium. We have obtained an isolate from STA4 which, in contrast to the wild type, grows well an lactase in either shaking or standing cultures. This growth characteristic will be designated "accelerated growth an lactose" ("AGL").

The isolate showing the "AGL" characteristic was obtained from u.v.-irradiated STA4 conidia which were plated an lactose + sorbose. The largest colonies on these plates were isolated, and preliminary growth studies led to further examination of the isolate designated L5. Growth studies were carried out in 200 ml of 1.5% lactate = Vogel's medium (lactate autoclaved separately from salts, then mixed after cooling) with an inoculum of 5 x 10^5 conidia per ml. Standing cultures were grown in one liter Roux bottles at 30°C far four days. Shaking cultures were grown in 500 ml Erlenmeyer flasks at 30°C. These were allowed to germinate for 18 hours as standing cultures, then transfered to a rotary shaker for 4 days additional growth with agitation at 180 cycles per minute. Under these conditions the L5 isolate yields 1.4 grams dry weight in shaking cultures and 0.2-0.3 grams dry weight in standing cultures. STA4 consistently yields less than 0.02 grams in shaking cultures, but produces about 0.2 grams dry weight in standing cultures. If sucrose is substituted far lactose as sole carbon source, STA4 and L5 yield comparable growth in shaking cultures.

Vegetative transfers of the original L5 isolate showed differing morphological characteristics and these were assigned temporary letter designations. Thus, the isolate used in our previous studier (Bates, Hedman and Woodward 1967 J. Bacteriol. 93: 1631) and in the study described above, has been called L5D. To avoid confusion, we are now adapting the following systematic designation: (isolate number)-L5-(mating type), so that the L5D isolate becomes 105-L5-A. In addition to the "AGL" trait, the 105-L5-A isolate grows mar rapidly an glycerol or an galactose in shaking cultures than does STA4. These characteristics, and related characteristics of isolates from crosses of 105-L5-A to wild type have been described in abstract form (Bates 1967 Genetics 56: 543).

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