

SHORT PAPER

Contrasting complementation patterns in *Aspergillus nidulans*

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Intracistronic complementation has been found extensively in *Neurospora crassa* and to a lesser extent in yeast, bacteria and bacteriophage (Gillie, 1966) but there appears to be no published record of its occurrence in *Aspergillus nidulans*. This communication reports the discovery of intracistronic complementation at three loci of *A. nidulans*, two of which show sharply contrasting patterns of complementation.

These examples of intracistronic complementation were discovered at the *cnx* E and *hx* B loci (Hartley, 1969) and the *cnx* ABC complex (Rever, 1965) was shown to be one intracistronic complementing locus. The *cnx* and *hx* mutants are mutants of nitrogen metabolism (Pateman *et al.* 1964; Darlington, Scazzocchio & Pateman, 1965).

METHOD

All 56 *cnx* E mutants, 14 *hx* B mutants and a sample of 22 of the *cnx* ABC mutants obtained by Drs D. J. Cove, B. M. Rever, T. Alderson and the author in the Department of Genetics, University of Cambridge, were tested for complementation in heterokaryons by the double stab inoculum method on solid medium (Rever, 1965). If two strains were complementary their growth from a double inoculation was considerably greater than that of either mutant alone and showed growth morphology typical of a heterokaryon. With the *hx* B and *cnx* ABC mutants all pairwise tests were made but with the *cnx* E mutants representatives of each group were tested against every other mutant which subdivided the groups till all group representatives showed complementation consistent with any other member of the group tested.

RESULTS

Forty-three (77%) of the 56 *cnx* E mutants showed complementation and separated into 12 groups dividing the map into seven units in a linear arrangement (Fig. 1). The 22 *cnx* ABC mutants separated into four groups and divided the map into three units in a linear arrangement with only four mutants (18%) not complementing (Fig. 2). A majority (8 or 57%) of the 14 *hx* B mutants were non-complementing but the six that did complement separated into five groups dividing the map into four units in a circular arrangement (Fig. 3).

DISCUSSION

From a study of the data of Gross (1962) obtained from mutants at the *leu-2* locus of *Neurospora crassa* Gillie (1966) concluded that the complementation map might be expected to change from linear to circular if more than 24 complementing mutants were

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examined and from circular to complex if more than 35 mutants were examined. On this basis the *cnx* E locus of *A. nidulans* is a relatively large group of mutants to show a linear map though such numbers are not unknown (Gillie, 1966). On the other hand, the *hx* B locus shows a circular pattern with a very unusually low number of complementing

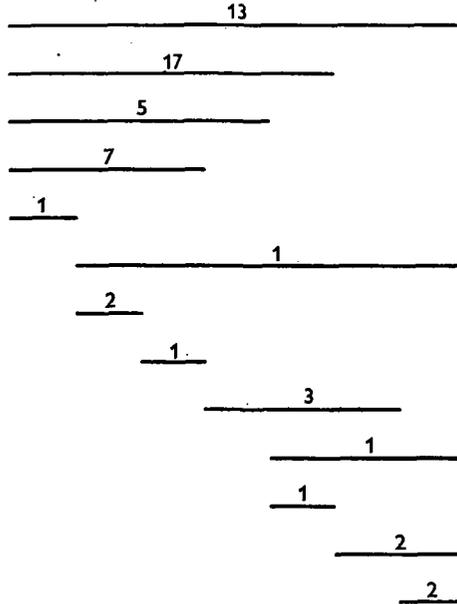


Fig. 1. Complementation map of the *cnx* E locus. (The numbers on the map indicate the number of mutants in each group.)

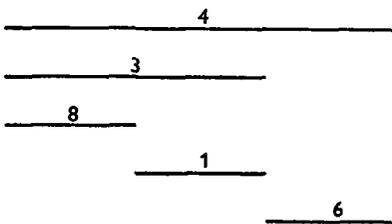


Fig. 2

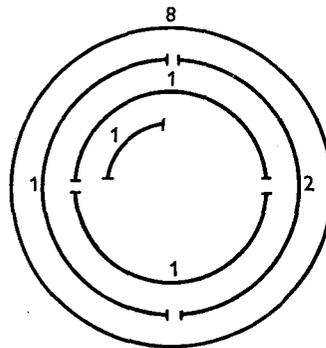


Fig. 3

Fig. 2. Complementation map of the *cnx* ABC locus. (The numbers on the map indicate the number of mutants in each group.)

Fig. 3. Complementation map of the *hx* B locus. (The numbers on the map indicate the number of mutants in each group.)

mutants, less than had previously been shown to give a circular map (Gillie, 1966). The *cnx* ABC complex was not investigated very fully as this was only examined to determine whether this was one complementing locus rather than three closely linked loci and it appears very probable that this is, in fact, one complementing locus.

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