Linkage data for four linkage group III markers

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Abstract

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Ahmad, M. and S. H. Mirdha. Linkage data for four linkage group III markers in *Neurospora crassa*.

but Perkins and Ishitani showed it to be located proximal to both *tryp-1* and *ad-2*. It was therefore decided to map the relative positions of *leu-1*, *tryp-1*, *ad-2* and *m-2*. Media and methods of Ahmed et al. (1966 Proc. Pakistan Acad. Sci. 3: 1) were employed during this investigation.

Two double mutants, *leu-1* (33757), *ad-2* (70004t) and *tryp-1* (10575), *m-2* (820) were prepared and then crossed as shown below:

leu-1, *ad-2* x *tryp-1*, *ro-2*.

From this four-point cross, 4441 single spore cultures were classified. Ropy could be distinguished from the non-ropy progeny by its significantly restricted growth on Vogel's medium plates as well as by its characteristic mycelial growth in tubes. The progeny which fell under the sixteen different classes are shown in Table 1. The distances and the order of the four loci were then determined as shown in Table 2.

Table 1. Progeny from cross of *leu-1*, *ad-2* x *tryp-1*, *ro-2*.

Genotype				Number
<i>leu-1</i> /+	<i>ad-2</i> /+	<i>tryp-1</i> /+	<i>ro-2</i> /+	
<i>leu-1</i>	<i>ad-2</i>	+	+	1417
+	+	<i>tryp-1</i>	<i>m-2</i>	2014
<i>leu-1</i>	<i>ad-2</i>	+	<i>ro-2</i>	742
+	+	<i>tryp-1</i>	+	232
<i>leu-1</i>	+	<i>tryp-1</i>	<i>m-2</i>	163
+	<i>ad-2</i>	+	+	109
<i>leu-1</i>	<i>ad-2</i>	<i>tryp-1</i>	<i>m-2</i>	20
+	+	+	+	81
<i>leu-1</i>	+	+	+	67
+	<i>ad-2</i>	<i>tryp-1</i>	<i>m-2</i>	37
<i>leu-1</i>	<i>ad-2</i>	<i>tryp-1</i>	+	22
+	+	+	<i>m-2</i>	74
<i>leu-1</i>	+	<i>tryp-1</i>	+	19
+	<i>ad-2</i>	+	<i>m-2</i>	19
<i>leu-1</i>	+	+	<i>m-2</i>	19
+	<i>ad-2</i>	<i>tryp-1</i>	+	6

Table 2. Distances of the four loci from one another.

Loci	Distance in centimorgans
<i>leu-1</i> and <i>ad-2</i>	$439/4441 \times 100 = 9.9$
<i>leu-1</i> and <i>tryp-1</i>	$507/4441 \times 100 = 11.4$
<i>leu-1</i> and <i>ro-2</i>	$772/4441 \times 100 = 17.4$
<i>ad-2</i> and <i>tryp-1</i>	$326/4441 \times 100 = 7.3$
<i>ad-2</i> and <i>m-2</i>	$617/4441 \times 100 = 13.9$
<i>tryp-1</i> and <i>m-2</i>	$533/4441 \times 100 = 12.0$

Figure 1. Chromosome map of a section of linkage group III showing the relative positions of *leu-1*, *ad-2*, *tryp-1* and *ro-2*.

These calculations gave the sequence of the four loci or *leu-1*, *ad-2*, *tryp-1* and *ro-2*. Next, corrections for double and triple point crossovers were made and the order and corrected distances of the four loci from one another were determined (Figure 1).

With regard to the relative positions of *ad-2* and *tryp-1*, these findings differ from the findings of Perkins and Ishitani (1959) but support the observations of Barratt et al. (1954) and Perkins et al. (1962 Con. J. Genet. Cytol. 4: 187). Positions of *leu-1* and *ro-2* have been found to be the same as reported by Perkins and Ishitani (1959) and Perkins et al. (1962). . . . Department of Botany, University of Dacca, Dacca-2, East Pakistan.