LINKAGE OF TWO CHLOROPHYLL MUTATIONS

Ezhova, T. A. and S. A. Gostimski Moscow State University, USSR

This report presents evidence concerning the linkage relations of two newly isolated chlorophyll mutants of pea.

Recessive monogenic chlorotlca mutant (line No. **7)** was obtained by EMS treatment of seeds of the variety 'Capital'. The mutant has yellowish-green leaves in the early stages of growth. Later, mutant plants gradually became light-green. Mature mutant plants are capable of bearing seeds and differ from normal plants only by somewhat lighter apices. However, when exposed to bright sunlight in the field the plants succumb without producing seeds.

An analysis of the F2from crosses of the mutant with various marker-lines revealed linkage with gp on chromosome 5 (CrO <15%) (Table 1).

Table 1. F2 segregation and linkage data[1/] (repulsion) of genes in chromosome 5

Loci	+/+	+/-	-/+	-/-	Total	Chi-square value for Gene A	Gene B	Linkage	% CrO ± SE
Gp-Chi	121	59	44	0	224	$3.5^{n.s.}$	$0.21^{n.s.}$	17.5^{***}	15
Gp-Vi	238	112	92	3	445	$3.2^{n.s.}$	$0.17^{n.s.}$	30.1^{***}	18 ± 3
Chi-Vi	913	287	431	21	1652	4.9^{*}	35.6^{***}	74.4^{***}	26 ± 2

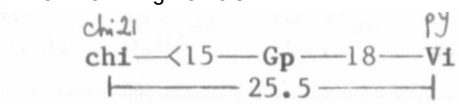
1/ Recombination percentages were calculated by product method.

Another recessive monogenic virido-aurescens mutant (line No. 23) was obtained by EI treatment of seeds of 'Nemchinovsky'. The lower leaves of mutant plants suddenly become yellowish-gold shortly before flowering. This mutant is only slightly less productive than the control plant.

An analysis of F2's from crosses of the mutant with translocation tester lines and with marker lines revealed linkage on chromosome 5. The calculated percent recombination with Gp gene was 18 +_ 3%.

Crosses between the two mutants revealed a linkage of **25.5** + 2%. This figure should, however, be considered as approximate, because in this segregation a deficit of virido-aurescens mutants was observed.

The results suggest that the mutants are situated in chromosome 5 in the following order:



According to the published list of descriptions of mutants localized in chromosome 5, the chlorotica mutant resembles chi 21 mutant (1), while virido-aurescens mutant resembles py mutant (2). It is therefore posslbile that these are mutations of genes identified earlier by other authors.

1. Blixt, S. 1978. Agri Hort. Gen. 36:23-47.
2. Marx, G. A. 1971. PNL 3:20-21.