Table 2. Ranking of phenotypes after two generations of minimal and intense competition.

Minimum competition			Intense competition (corrected)		
Rank	Phenotype	%	Rank	Phenotype	%
1	+ + -	33.7	1	+ + -	24.2
2	+ + +	22.2	2	+ + +	23.0
3	- + -	13.9	5	+ - -	16.2
4	+ - +	11.9	4	+ - +	15.3
5	+ - -	11.7	3	- + -	10.2
6	- + +	4.8	6	- + +	9.2
7	- - -	1.2	7	- - -	1.9
8	- - +	0.4	8	- - +	0

Spearman rank correlation (r_s) = .905**

The results were tested by standard Chi-square techniques and were found significant at the .001 level.

DESYNAPTIC ALLELIC PEA MUTANTS

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Two chlorophyll-mutant lines which were produced from treatment of seeds with EI (line 9) and EMS (line 12) also were found to contain meiotic mutations. These mutations seem to have arisen simultaneously with the chlorophyll mutations in the initial cells, following mutagen treatment of seeds.

Study of meiosis of meiotic mutants revealed that mutant genes in both lines do not influence the process of conjugation of chromosomes in zygotene-pachytene cells, but disturb chiasma formation, though to a different extent. As a result of this disturbance, both mutant lines developed univalents in the first metaphases, laggards at anaphases, high pollen sterility, and slightly reduced seed production (Table 1).

Table 1. Analyses of meiosis of mutant lines

Line	Metaphases 1			Anaphases and telophases 1								Pollen sterility %
	Total	With univalents		Total	With laggards		With bridges		With fragments			
	no.	No.	%	no.	No.	%	No.	%	No.	%		
Capital	236	6	2.5+1.0	279	4	1.4+0.7	2	0.7+0.5	8	2.9+1.0		1.9+0.3
9	702	404	57.5+1.9***	704	227	32.2+1.8***	10	1.4+0.5	7	1.0+0.4		54.2+1.0
12	586	443	75.6+1.8***	829	451	54.4+1.7***	10	1.2+0.4	4	0.5+0.1		81.4+2.3

The differences between means of initial line and mutants are significant *P >0.95; **P >0.99; ***P >0.999

All F1 hybrids from crossing of desynaptic mutants (lines 9 x 12) had a high percentage of sterile pollen (from 33.0 to 76.8%). Among 125 F_2 plants from cross 9 x 'Capital' (initial variety), 98 plants were fertile and 27 plants were semi-sterile ($X^2_{(3:1)} = 0.77^{ns}$). The distribution among 47 F_2 plants from cross 12 x Capital was:*33 fertile, 14 semi-sterile ($X^2_{(3:1)} = 0.57^{ns}$). We therefore conclude that the desynaptic mutations in lines 9 and 12 were recessive mutations of the same gene.

In the progenies from our desynaptic mutants a few trisomies and one triploid were observed (Fig.l).

Fig. 1. Karyotype of triploid from line 9.