DIGENIC SEGREGATION FOR CHLOROPHYLL MUTANT IN PISUM

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After irradiating (200 rads) pea seeds with fast neutrons we have isolated a lethal chlorina-mutant with blocked photosystem 1. All the families which segregated chlorina mutants could be divided into two distinct groups (Table 1). Families in the first group produced green and mutant plants according to a 3:1 monohybrid segregation (families 1,2,3,4,6,8,11,12,13,14). Families in the second group segregated according to a ratio of 15 green plants to 1 mutant (families 5,7,9,10,15,16).

Evidently some green plants were heterozygous for two genes whereas others were heterozygous for a single gene. This was supported by the fact that the families which initially segregated monogenically did so again in subsequent generations. From the families which segregated in a 15:1 ratio, some segregated chlorina mutants in a 3:1 ratio and some in a 15:1 ratio.

The chlorina phenotype reported here thus appears to result from the action of two duplicate recessive genes.

Table 1. Segregation for an induced chlorina mutant in 16 different i'amiles,

Family no.	Number or plants Normal	Mutant	Total no.	X^2 (3:1)	X^2 (15:1)
1	59	13	72	1.85	17.13***
2	69	16	85	1.73	22.93***
3	90	22	112	1.71	34.29***
4	72	25	97	0.03	63.10***
5	40	2	42	9.18**	0. 16
6	22	7	29	0.01	17.84***
7	42	1	43	11.79.***	1.13
8	28	14	42	1.56	52.58***
9	50	1	51	14.44***	1.60
10	51	2	53	12.74***	0.56
11	30	15	45	1.67	56.33***
12	58	12	70	2.31	14.18***
13	55	24	79	1.22	78.50***
14	69	22	91	0.00	49.91***
15	48	1	49	13.78***	1.48
16	44	2	46	10.46**	0.28
	827	176	1003	84.48***	412.00***

Differences between observed and theoretical segregations are significant

*P>0.95; **P>0.99; ***P>0.999. f=16 f = l6