

## **Inheritance of Yellow Seedling Lethal in *Cucurbita maxima* Duch.**

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**Introduction:** Within the genus *Cucurbita*, the presence of lethal yellow seedlings, lacking chlorophyll, was previously observed in *C. pepo* (1). Our objective was to further investigate the inheritance of this trait in *C. maxima*.

**Material and Methods:** In a F2 progeny from a normal green seedling plant of *Cucurbita maxima* var. *zapallito* (Carrière) Millán, cultivar 'Zapallito Redondo' (Ferry Morse Seed Company), a segregation of 132 normal green to 48 yellow seedlings was observed in the field of the Universidad Nacional de Rosario, Zavalla, Argentina, in spring of 2003. This ratio fitted a 3:1 expected segregation ratio ( $\chi^2=0.26$ ;  $P=0.5-0.8$ ). All yellow seedlings were lethal, dying at a cotyledonar stage, approximately two weeks after emergence. The normal green seedlings were grown and self-pollinated. Eighteen F3 families were obtained. Each of these families was planted in the field in 2004 and normal green and yellow seedlings were counted.

**Results and Discussion:** Segregation of F3 families derived from normal green seedling plants are reported in Table 1. A 3:1 normal green to yellow seedling ratio fitted in all segregant families. A 2:1 segregant to non-segregant ratio was observed among families. These results, as in *C. pepo*, are indicative of a single recessive gene being responsible for the yellow lethal seedlings. Yellow seedlings manifested only in F2 plants or in F3 families derived from normal green seedling (heterozygous) plants. All non-segregant selfed progenies were derived from normal green seedling homozygous dominant plants. The ratio heterozygous to dominant

homozygous plants in the first selfed progeny that were advanced in selfings fitted the expected 2:1 segregation ratio. Following the rules for gene nomenclature, we propose to name this gene, as in *C. pepo*, *ys*. Finally, during the 2005 season, this trait was also observed in a sibbed progeny from accession Max 90 of the IPK Institute Genetic Bank, Gatersleben, Germany.

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### **Literature Cited:**

1. Mains, E.B. 1950. Inheritance in *Cucurbita pepo*. Papers Michigan Academy of Science, Arts and Letters 36:27-30.

Table 1. Goodness of fit Tests for normal green and yellow seedlings observed in selfed progenies derived from normal green seedling plants of *C. maxima*.

F3 families	Number of seedlings		Expected ratio	X <sup>2</sup>	P-value
	Normal	Yellow			
			Segregant		
1	8	2	3:1	0.13	0.5-0.8
3	22	4	3:1	1.28	0.2-0.5
6	20	11	3:1	1.81	0.1-0.2
8	32	7	3:1	1.02	0.2-0.5
9	23	9	3:1	0.16	0.5-0.8
10	48	22	3:1	1.54	0.2-0.5
11	21	9	3:1	0.40	0.5-0.8
13	7	1	3:1	0.67	0.2-0.5
14	21	3	3:1	2.00	0.2-0.5
15	34	14	3:1	0.44	0.5-0.8
16	6	4	3:1	1.20	0.2-0.5
18	20	8	3:1	0.19	0.5-0.8
			Non-segregant		
2	44	0	1:0		
4	43	0	1:0		
5	34	0	1:0		
7	11	0	1:0		
12	27	0	1:0		
17	48	0	1:0		
Segregant:Non-segregant F3 families			2:1	0.001	0.95-0.99