

## Linkage of gene *chi-33* on linkage group VI

Swiecicki, W.K.  
and Kruszka, K.

Institute of Plant Genetics, Polish Academy of Sciences  
Strzeszynska 34, Poznan 60-479, Poland

The spontaneous *chlorotica* mutation *chi-33* (Wt11019) shows clear expression at the seedling stage except under greenhouse conditions (1). A preliminary linkage test (1) indicated significant linkage between *chi-33* and linkage group VI marker *Pl* (29 cM) but linkage with *wlo* on this chromosome was not significant.

To locate *chi-33* more precisely, we crossed Wt11019 with tester line Wt11777 which carries four group VI markers *Pl*, *Arg*, *wlo* and *art-1*. In the F<sub>2</sub>, *chi-33* and the four markers all showed normal monohybrid segregation (Table 1). Dihybrid segregation analyses (Table 1) provided strong evidence of linkage between *chi-33* and markers *Arg* (P<0.0001, 13.6 cM) and *Pl* (P<0.0001, 16.7 cM) but only weak evidence of linkage between *chi-33* and markers *wlo* (P<0.01, cM 25.4) and *art-1* (P<0.05, 29.7 cM). Together with the previous data (1), these results indicate *chi-33* is located in the linkage group VI and closer to *Pl* than *wlo*. The data in Table 1 suggest the following arrangement of loci:

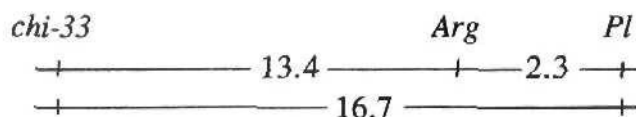


Table 1. Monohybrid (a) and dihybrid (b) segregation in the F<sub>2</sub> population of the cross K. 1317 = Wt 11019 (*chi-33*, *arg*, *pl*, *Art-1*, *Wlo*) x Wt 11777 (*Chi-33*, *Arg*, *Pl*, *art-1*, *wlo*).

(a)		Phenotype*			Total	Chi-sq. (3:1)
Locus	D	R				
<i>Chi-33</i>	100	30		130	0.26	
<i>Arg</i>	98	32		130	0.01	
<i>Pl</i>	96	31		127	0.02	
<i>Art-1</i>	102	27		129	1.14	
<i>Wlo</i>	96	34		130	0.09	

(b)		Phenotype*				Total	Joint Chi-sq.	Recomb fract.	SE
Loci	DD	DR	RD	RR					
<i>Chi-33/Arg</i>	91	9	7	23	130	56.9	13.6	3.2	
<i>Chi-33/Pl</i>	88	11	8	20	127	43.0	16.7	3.7	
<i>Arg/Pl</i>	95	2	1	29	127	111.1	2.3	1.3	
<i>Chi-33/Art-1</i>	75	25	27	2	129	4.4	29.7	7.9	
<i>Chi-33/Wlo</i>	68	32	28	2	130	7.7	25.4	8.1	

\*D = homozygous dominant + heterozygous; R = homozygous recessive