SINUATE LEAF sil LINKED WITH Wsp

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The current linkage map (1) places wsp in chromosome 7. Authority for this position is Lamprecht, 1948 (2). I have attempted in vain to verify this linkage on several occasions in the past. Another attempt was made recently in light of the newly found linkage between curl and r (3). Since curl apparently lay on the opposite side of r from bt, there was a chance that curl might show linkage with wsp.

Accordingly, a cross of the following constitution was made: wsp Curl jit Sil x Wsp curl r bt sil. Because wsp, curl, and r were the segregating mutants of primary interest, because wsp and curl are excellent seedling markers, and because the R/- seeds borne on the F1 plants could be separated from the r/r seeds beforehand and planted separately as groups, the experiment was conducted by planting the seeds in greenhouse flats, 63 seeds/flat. Scoring of phenotypes was done when the plants were at the seedling stage of development.

The female parent was Sil and the male was sil but this difference did not appear to be germane at the time the cross was made. However, since we routinely score populations for whatever genes may be segregating, this population was scored for Sil-sil in addition to Wsp-wsp, Curl-curl, and R-r. The position of sil remains unknown. The Sil-sil difference was distinct and easy to classify except in curl segregants, wherein sil could not be confidently identified. Therefore, Sil-sil was scored only in Curl/- segregants.

The results (Table 1), as in the past, provide no evidence of linkage between wsp and chromosome 7 markers. They do, however, confirm the linkage of curl and r reported previously (3). But the cross provided an unanticipated bonus in showing that wsp and sil are linked (Table 2). Having secured these rather persuasive linkage data, I searched some of the data obtained in previous years for supporting evidence of the wsp-si1 linkage. Such evidence was found in an F2 population grown in 1976 (Table 3). The 1976 data apparently were not reported because the population contained a significant excess of wsp segregants, and this cast some doubt on the validity of the data. In retrospect, however, despite the significant departure of wsp from the expected segregation, the data support the conclusion that wsp and sil are linked. Unfortunately, the chromosomal location of the two genes remains unknown, although there-is some inconclusive evidence suggesting linkage between wlo and sil. (See also Weeden, this issue, for additional information relating to the linkage of Wsp.)

1. Blixt, S. 1974. Hdbk. Genetics, Vol. 2, R. C. King, ed. Plenum Press, New York. pp. 181-221.
2. Lamprecht, H. 1948. Agri Hort. Genet. 6:10-48.
3. Marx, G. A. 1986., PNL 18:45-48.

Table 1. Analysis of an F2 population involving Wsp, Curl, and R.

Wsp	Curl	R	No.
+	+	+	409
+	+		77
+	_	+	65
+	-	-	72
_	+	+	128
-	+	-	23
		+	12
-	-		33
			819

Gene pair	Chi-square X	Y	Linkage	Recomb. fract.	S.E.
Wsp-Curl	0.50	3.37	0.10	-	-
Wsp-R	0.50	0.00	1.67	-	-
Curl-R	3.37	0.00	122.70**	25.3	1.8

(Pop. C286-522-534)

Table 2. Linkage analysis of Wsp-Sil segregation in same F2 population in Table 1 but excluding curl segregants.

Wsp Sil	Wsp sil	wsp Sil	wsp sil	Total	Chi-square X	Y	Linkage	Recomb. fract.	S.E.
352	138	133	7	630	2.59	1.32	27.94**	24.1	3.7

(Pop. C286-522-534)

Table 3. Joint segregation in F2 of Sil and Wsp.

Sil Wsp	Sil wsp	sil Wsp	sil wsp	Tot.	Chi-square X	Y	Linkage	Recomb. fract.
186	53	92	6	337	3.0	10.09**	12.40**	30.1

(Pop. B276-473-497)

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