ADDITIONAL EVIDENCE PLACING Rb IN CHROMOSOME 3

Marx, G. A. NYS Agricultural Experiment Station
Geneva, New York 14456 USA

In 1971 (1) Gritton reported data indicating loose linkage of ruftosus (rb) and *st_* on chromosome 3. Unfortunately, neither the raw data nor the chi-square values were provided. My efforts to corroborate this report using *st_* and chi-6 in the _b end of chromosome 3 were unavailing (2). Therefore I set out to determine if _rb is situated at the _M end of chromosome 3. Since tac and M are closely linked (4) and since tac is a favorable seedling marker and M is a seed gene, I developed a tac line homozygous for *R* j^b; this line also carried apu which is located near jst (4,5). The tac apu line was crossed with one of my lines (A686-156) known to be JR £_b. Fi's were grown in the field where abundant seed was produced; all were wild-type with respect to the Tac and Apu loci. The F2 seed borne on the *F* plants segregated for Rb-rb. The round (Rb/-) and wrinkled (rb/rb) seeds were separated prior to planting and then planted in separate groups in greenhouse flats containing builders sand (63 seeds/flat). A total of 503 seedlings were classified.

As expected, tac showed evidence of linkage with apu, the estimated recombination frequency being 23.6 + 2.2% (Table 1). This result is consistent with earlier findings (3,5). The data also reveal evidence of a loose linkage between tac and r_b (39.0 + 3.7). Past results indicated that apu is situated between _st and tac, i.e. apu is closer to tac than is *st^.* Thus, apu should lie closer to _rb than *st^.* Yet the present data show no evidence oi linkage between apu and _rb. In fact, the data indicate that r_b lay distal to tac, and thus presumably more distal to st_ than to apu. Ordinarily it would be difficult to reconcile Gritton\s evidence of linkage between *st_* and _rb and the present findings. However, inasmuch as estimates of linkage intensity in Pisum are notoriously variable, the present data lend support to the conclusion that jr_b resides on chromosome 3. Since *rb_* is an important gene in biochemical studies and since isozyme markers have been mapped to the pertinent region in chromosome 3, there is reason to suppose that an isozyme marker will be found in close proximity with rb.

1. Gritton, E. T. 1971. PNL 3:15-16.
2. Marx, G. A. 1982. PNL 14:43-46
3. Marx, G. A. 1984. PNL 16:46-48.
4. Marx, G. A. 1986. PNL 18:49-52.
5. Marx, G. A., N. F. Weeden, and R. Provvidenti. 1985. PNL 17:57-60.

Table 1. F2 analysis of a three-point cross:
tac apu Rb x Tac Apu rb .

Tac	Apu	Rb	Tot.
+	+	+	228
+	+	-	94
+	-	+	30
+	-	-	18
-	+	+	51
-	+	-	7
-	-	+	60
-	-	-	15
			503

	Chi-square			Recomb.	
Gene Pair	X	Y	Linkage	fract.	S.E.
Tac - Apu	0.56	0.08	101.84**	23.6	2.2
Tac - Rb	0.56	0.72	10.02**	39.0	3.7
Apu - Rb	0.08	0.72	0.00	-	-

(Pop. C286-543-550)

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