

3. Cases of close linkages between endosperm and seedling traits.

Among the mutants detected in Italian varieties three independently detected cases of "collapsed endosperm" (cl) have turned out to be identical or allelic to the same locus on chromosome 7.

The "collapsed endosperm" is fairly vital even in field conditions. Such a mutant is "uncovered" by the TB-7 stock.

Linkage between this trait and gl₁ was clearly indicated by F₂ progenies as well as by backcross data, as follows (repulsion phase):

Row Identifica- tion	Progeny Type	Segregation						Recombina- tion %	
		<u>G1</u>	<u>Cl</u>	<u>G1</u>	<u>cl</u>	<u>gl</u>	<u>Cl</u>	<u>gl</u>	<u>cl</u>
62 - 539	F ₂	739	370	359		3	9	± 1.7	
64 - 386/389	B	101	978	956		77	8.4	± .4	

Crossing of gl₁ gl₁ by TB-7 provided data on the non-disjunction of the chromosome B7, as follows:

<u>Cl</u>		<u>cl</u>	
<u>G1</u>	<u>gl</u>	<u>G1</u>	<u>gl</u>
38	93	88	8

A case of close linkage between the waxy gene on chromosome 9 and a white seedling (w) trait appears from the following data (repulsion phase):

Row Identifica- tion	Segregation						Recombina- tion %		
	<u>Wx</u>	<u>W</u>	<u>Wx</u>	<u>W</u>	<u>wx</u>	<u>W</u>	<u>wx</u>	<u>w</u>	± St. Error
63 - 878		227	126		117		1	8.8 ± 3.2	
64 - 1278/'80, 848		1794	851		770		3	6.4 ± 1.1	

A third case of linkage between the y factor on chromosome 6 and a japonica trait expressed in seedling stage is indicated by the following F_2 data:

<u>Y kernels</u>		<u>y kernels</u>	
J	j	J	j
201	85	76	0
243	114	83	0

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4. Another case of balanced lethal factors.

A series of self-pollinations carried out on plants derived from crossing individuals segregating for det 13 and det 25 (two extreme types of defective endosperm factors from maize-teosinte derivatives) has given the following results:

Number of ears segregating

both defectives (in repulsion)	one defective (or two in coupling)	no defective
202	62	2

In the first group the defective seeds form about 50% of the total number of kernels, whereas in the second group the percentage varies from 20-25 to 30-35.

The data suggest that this is another balanced lethal system.

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1. Crossing-over in the Lg - Gl - V region.

Recombination data for markers of chromosome 2 in different genetic backgrounds are reported in the following table (backcross of the multiple recessive stock to heterozygous plants possessing T cytoplasm): (Table 1)