

1. The opaque weight is about 14.5% less than the normal,
2. However, statistically significant differences are detectable among the decreases of different ears. Some of them show a decrease of only 6.9%, whereas others reach the value of 26.3%.
3. The opaque kernels in selfed ears of the opaque Italian line crossed with the inbreds A 158 and WF9 weighed about 10% less than the normal ones.

These results suggest the possibility of selecting modifiers which reduce the gap between the mutant and the normal phenotype.

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4. Knobs in inbred lines from Italian varieties.

Cytological examination is being made of the pachytene chromosomes in the pollen mother cells of inbred lines derived from 14 Italian open pollinated varieties.

The results of this analysis are presented in Table 1.

Table 1
Knob constitution of inbred lines from Italian maize varieties

Line No.	Variety Source	Chromosome spreading*	1S	3L	4L	5L	Knob position** 6L ⁺	7L	8L	9S	Type of nucleolar organizer#
1	Macario	3					K		2C	C	1
2	"	3		(K)	K	(C)	K		(2C)	K	1
3	"	3					K		K	K	1
4	"	3					K		2C	K	1
5	"	1					not determined		(2C)		1
6	"	0					not determined				1
7	"	0					K		2C	K	1
8	"	1					K	Cd	(2C)	K	1
9	"	3					K	Cd	(2C)	K	1
10	"	2					K	Cp?	2C?	K	1
11	"	0					K		2C	K	1
12	"	1					K	Cd	2C	K	2
13	"	1					K		(2C)	K	2
14	Medoro	2		K			K		(2C)	K	2
15	"	2		K			K		(2C)	K	2
16	"	2		K			K		(2C)	K	2
17	"	2		K			K		(2C)	K	2
18	"	4						Cd	K		1
19	"	4	C					Cd	K		1
20	Nano Succi	4							C		1
21	"	4						Cd	2C		1
22	"	4						Cd	2C		1
23	"	4						not determined			2
24	"	3							C	C	2
25	"	0				K			(2C)	K	2
26	Sacra Famiglia	2		C		K			2C		1
27	Marano	2				K			2C	C	1
28	Davini	2				K			2C		1
29	Teso	2				C			2C		1
30	Trentinella PE	2							2C		1
31	Giallo precoce	2							2C		1
32	V.	0							not determined		1
33	Giallo precoce	2							2C	K	1
34	V.	2						K	2C	C	1
35	Macario x Nodak	2						C	2C		1
36	Nano 16	2							2C	K	1
37	Barbino di	2				K			Cd		1
38	Tort. 14	3							2C	K	1
39	Quarantino	2							2C		1
40	giallo	2							2C		1
41	Barbino di	0							not determined		1
42	Tort. 8	0							not determined		1
43	Barbino di	0							not determined		1
44	Tort. 8	0							not determined		1
45	Barbino di	0							not determined		1
46	Tort. 8	0							not determined		1
47	Barbino di	2						K	2C	C	2
48	Tort. 8	2							2C		2

*The spreading quality of the chromosomes is indicated by the indexes 0-4; 0 stands for very poorly spread chromosomes; 4 for the best spreading.

**K stands for reasonably large knob; C indicates a consistently prominent chromomere. When they are heterozygous, K and C are accompanied by parentheses.

⁺In the long arm of chromosome 6 no case has been found of a knob in its median region: the C cases reported refer to the proximal and distal chromomeres.

[#]The nucleolar organizer type 1 has its main activity at the distal portion of the body (toward the satellite region); type 2 is chiefly active near the middle of the body.

From the data so far obtained it appears that the lines of different varietal origin are generally characterized by specific knob formulas, whereas the contrary is generally true for lines derived from a given variety.

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5. Relationships between gametophyte factors and markers of chromosome 9.

Self-pollination of plants derived from normal seeds of Ga Wx/ga wx selfed ears has given, over a period of ten years, 54 ears with about 25% of wx kernels plus 600 ears showing no wx kernels or a severe deficiency of them (about 4% of wx). These figures permit calculation of a crossover rate of about 8.7% for the distance between Wx and the Ga factor detected by the senior Author.

A similar procedure for the repulsion phase Ga wx / ga Wx (independently found by Schwartz and Salamini) leads to an estimate of 13% as a c.o. distance between Wx and ga (566 ears with a large excess of wx, 161 with 25% wx kernels, 105 ears with no wx, and 5 ears with a great deficiency of wx). As reported in the 1966 MNL, this Ga factor has been located between Wx and Bz, at about 2/3 of the Wx-Bz distance from Wx.

Selfed ears of plants Ga sh C/ga Sh c exhibit an excess of sh (about 37.2%), and a deficiency of c (15.6%). If ga gametes are assumed not to function at all (as indicated by other results), these data confirm the median position of ga, at a distance of about 25 c.o. units from sh, and 31 from c. A distance of the same order of magnitude from sh is indicated for ears of selfed plants of the genotype Ga Sh/ga sh that show 12% of sh kernels.

An additional chromosome 9 marker, exhibiting close linkage with ga, is an albino seedling factor (w). Selfed ears of plants Ga Wx/ga wx gave the following results (only 1/3 of the wx kernels were planted):