Ga^m refers to the allele which combines the characters of the allele ga (when the F_1 hybrid containing this allele is used as the maternal plant) and the characters of the allele Ga (when the same plant is used as the source of pollen) (Genetika 6:14, 1970). Ga^m is widely distributed in popcorn maize populations (Genetika 8:2, 1972). The initial popcorn maize may be either homozygous or heterozygous for the gametophyte locus; if it is heterozygous, the F_1 hybrids are distributed into two phenotypical classes and if it is homozygous, the F_1 hybrids all belong to a single phenotypical class.

The results obtained in two F_1 hybrids after 4 and 5 repeated sowings of seed from one corn-cob are given in Table 1. Similar or very similar results have been additionally obtained in 23 F_1 hybrids. It should be noted that a part of the repeatedly sown hybrids were always assigned to the same phenotypical class.

Thus, the capacity of pollen tubes having Ga and Ga^m alleles to compete for the allele ga varies considerably depending on the pollination conditions. The environmental factors influencing the manifestation of the gametophyte locus were not analyzed.

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2. Analysis of the gametophyte allele Ga^m in F_2 hybrids.

The gametophyte allele Ga^m, as compared with the allele Ga, has the interesting feature of being active only in the male gametophyte. However, all the alleles of the gametophyte locus are highly variable, which makes difficult their identification and even makes their existence very questionable. An allelic test between the alleles Ga and Ga^m has been carried out earlier (Genetica 6:14, 1970). This is a report of the analysis of F_2 plants from the hybrid Golden Bantam x Globe White Shelled (see communication 1) and the analysis of the F_2 plants from hybrids of Ga Su/ga su genotype. This hybrid was used as tester in the preceding work. In addition to the analysis of genotypes obtained as a result of self-pollination of these F_2 hybrids, a similar analysis of hybrids produced by reciprocal crosses between two of the F_1 hybrids was carried out. The genotypes were identified by the method described in the preceding paper.

On theoretical grounds, nine different genotypes heterozygous for $\underline{su}_1$ are possible in the offspring of the four hybrids. As shown in the diagram, the genotypical classes correspond to 6 phenotypical classes.

	⊗	♀	♂	class
Ga Su/ga su	14	14	14	I
Ga^mSu/ga su	25	25	14	II
Ga^mSu/Ga^msu	25	25	25	III
ga Su/ga su	25	25	25	III
Ga Su/Ga su	25	14	25	IV
Ga Su/Ga^msu	25	14	25	IV
Ga^mSu/Ga su	25	14	25	IV
ga Su/Ga su	36	14	36	V
ga Su/Ga^msu	25	25	36	VI

Table 1 presents the relative occurrence percentage of phenotypical classes predicted in the offspring of four hybrids.

Table 2 gives the actual figures obtained in the experiment. The sample is not large, but the actual figures are in good agreement with those expected on theoretical grounds, in spite of the influence of environmental conditions on the results (in particular, the expression of the phenotypical class 1 in the $\underline{Ga}$ $\underline{Su/ga}$ $\underline{su}$ x $\underline{Ga^m Su/ga}$ $\underline{su}$ hybrid). In this experiment the inheritance of the allele $\underline{Ga^m}$ is just as clear-cut as that of the allele $\underline{Ga}$.

Table 1. Theoretical phenotypical ratio expected in the F_2 of four hybrids (%)

Genotype of F_1	Phenotypical class					
	1	2	3	4	5	6
1. Ga Su/ga su ⊗	52	-	-	40	8	-
2. Ga^mSu/ga su ⊗	-	52	40	-	-	8
3. Ga Su/ga su x Ga^mSu/ga su	-	52	-	40	-	8
4. Ga^mSu/ga su x Ga Su/ga su	26	26	20	20	4	4

Table 2. Phenotypical ratios obtained in the F_2 of four hybrids

Genotypes of F_1	Number of analyzed plants	Distribution according to classes					
		1	2	3	4	5	6
1. Ga Su/ga su	26	19	-	-	7	-	-
2. Ga^{m}Su/ga su	50	-	21	25	-	-	4
3. Ga Su/ga su x Ga^{m}Su/ga su	28	3	15	-	10	-	-
4. Ga^{m}Su/ga su x Ga Su/ga su	36	10	9	7	4	3	4

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3. Identification of multiple molecular catalase forms in different maize tissues.

Scandalios (Ann. N.Y. Acad. Sci. 151:274, 1968) has described the locus Ct in maize endosperm. The locus has 5 alleles corresponding to 5 electrophoretic catalase variants. The line homozygous for 1 of the 5 alleles shows one zone of enzyme activity. An isozyme pattern in the hybrid consisting of two parental and three hybrid variants of catalase has been established. In studies of a collection of self-fertilized maize lines we have detected 6 electrophoretic variants of catalase (Bull. Isoz. 4:40, 1971).

In 1971 lines were sorted out containing two electrophoretic variants of catalase in their endosperm. Occasionally the two variants are represented by two zones of similar enzyme activity, but usually one catalase zone stains more intensely in comparison with the other weaker staining zone. This additional zone is displayed best at fixation during the early stages of endosperm development, on day 13 after pollination. The main zone of catalase activity appears by day 16 and becomes more intense in the process of endosperm maturation, while the first fraction either remains weakly stained or disappears altogether.

We have also found lines in which seeds of one corn-cob contain one or the other electrophoretic variant of the enzyme. No seeds had