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

a hybrid enzyme pattern. That each seed possesses its own enzyme variant suggests that different loci, controlling catalase synthesis, function in each seed.

The comparison of endosperm catalase with that of the leaves and seedlings within a single line has shown that the enzyme is tissue specific. The catalase of these tissues differs in the electrophoretic mobility of the enzyme and in the number of zones of enzyme activity.

From the studies on the catalase of maize endosperm, leaves and seedlings it may be inferred that an oligogenic system functions to control the synthesis of multiple molecular forms of the enzyme. The presence of the catalase variant is determined by the type of tissue and its stage of development.

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1. Attempted maize x sorghum hybridization.*

Materials used in our 1971 maize x sorghum crossing nursery are listed in Tables 1 and 2. Three dates of planting (delayed approximately 10 days) were used. To reduce contamination from stray pollen, maize stocks used as females were planted in isolation from their male counterparts and were detasseled. Also, male-sterile sorghums were isolated from male-fertile sorghums. A total of 1,293 reciprocal, controlled pollinations (727 using maize ♀ and 566 using male-sterile sorghum ♀) were made by conventional methods and by a "vial method." The latter technique involved attaching plastic vials (filled with water) to the maize or male-sterile sorghum plants at the bases of the ears or heads. Tassels or male-fertile sorghum heads were inserted into the vials and all components were placed under pollinating bags. Bags were tapped periodically to release pollen onto the stigmatic surfaces. Observations indicated that the "vial method" supplied viable pollen for 3-7 days.

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