possible that higher activities could be found between 21 and 26 days, the activities found at 26 days after pollination were used as a reference (100%) for the rate of decay.

The rate of the average daily decay was relatively very low (Table 2). The average decrease in activity units was similar in the three lines. But, since the levels of activity were different, the relative loss of activity was somewhat different too.

Table 2

Mean daily loss of ADH activity in the endosperm of AD-1, AD-7 and AD-19.

Days after pollination	Mean daily loss of ADH activity					
	Activity units			Percent of activity		
	AD-7	AD-1	AD-19	AD-7	AD-1	AD-19
26-30	.98	1.71	1.45	3.25	3.88	2.70
30-35	1.12	.98	.78	4.28	2.64	1.62
35-40	.96	1.24	1.64	4.68	3.96	3.72
26-40	1.02	1.28	1.28	3.40	2.90	2.40

Thus, it might be concluded that ADH is a stable enzyme unless it is actively inhibited (Efron and Schwartz, 1968), and that the differences in ADH activities of the three lines are not due to differences in enzyme stability.

Y. Efron

2. Extent of variation in ADH activity and Adh_1 genotypes among inbred lines of maize.

The subject of variation in enzyme activity and its genetic control is under investigation in our laboratory for the last few years. We have shown variation in acid phosphatase activity in maize (Efron, Biochem. Genet. 5: 33-44, 1971) and alcohol dehydrogenase activities in maize

Table 1

Distribution of ADH activity and $\underline{Adh_1}$ genotypes among 213 different lines of maize.

ADH activity unit/min/mg dry seeds	No. of inbred lines	Adh_1 genotype			Both Adh_1^S and Adh_1^F are present
		Adh_1^S/Adh_1^S	Adh_1^F/Adh_1^F	$Adh_1^{F/C(m)}/Adh_1^{F/C(m)}$	
3.1 - 6.0	4	-	2	2	-
6.1 - 9.0	2	-	2	-	-
9.1 - 12.0	20	1	19	-	-
12.1 - 15.0	58	8	48	1	1
15.1 - 18.0	64	1	62	-	1
18.1 - 21.0	36	4	30	-	2
21.1 - 24.0	19	3	14	-	2
24.1 - 27.0	7	3	4	-	-
27.1 - 30.0	3	1	2	-	-

Table 2

Relative frequencies of $\underline{Adh_1}$ genotypes in three ADH activity levels.

Range of activity	No. of inbred lines	Adh_1 genotype			Both Adh_1^S and Adh_1^F are present
		Adh_1^S/Adh_1^S	Adh_1^F/Adh_1^F	$Adh_1^{F/C(m)}/Adh_1^{F/C(m)}$	
3.1 - 12.0	26 (100%)	1 (3.8%)	23 (88.5%)	2 (7.7%)	-
12.1 - 21.0	158 (100%)	13 (8.2%)	140 (88.6%)	1 (0.6%)	4 (2.5%)
21.1 - 30.0	29 (100%)	7 (24.1%)	20 (69.0%)	-	2 (6.9%)

(Efron MNL 45: 25-27, 1971) and in the genus Carthamus (Efron, Ashri and Peleg, Biochem. Genet., in press). We have concluded that such variation may be common and could be an important factor in evolution.

In the present study we have initiated a large scale investigation on the extent of variation in ADH activity and $\underline{Adh}_1$ genotypes among different inbred lines of maize. $\underline{Adh}_1$ genotype was tested by starch gel electrophoresis and ADH activity by following the rate of NAD reduction at 340 mμ. The activity was calculated in activity units/min/mg ground dry kernels.

Two hundred and thirteen different inbred lines have been tested so far. The results are summarized in Table 1.

Three $\underline{Adh}_1$ alleles, $\underline{Adh}_1^S$, $\underline{Adh}_1^F$, and $\underline{Adh}_1^{C(m)}$, have been described by Schwartz and Endo (Genetics 53:709-715, 1966) in maize. Two other alleles ($\underline{Adh}_1^u$ and $\underline{Adh}_1^w$) were induced artificially by EMS (Schwartz, personal communication). All three naturally occurring alleles have been found among the inbred lines tested. However, their frequencies were completely different (Table 1). About 90 percent of the inbreds were homozygous $\underline{Adh}_1^F/\underline{Adh}_1^F$ and only 10 percent $\underline{Adh}_1^S/\underline{Adh}_1^S$. The $\underline{Adh}_1^{C(m)}$, whose products do not show ADH activity, was found in only three lines and only as a duplication together with the $\underline{Adh}_1^F$ allele.

About tenfold differences in ADH activity have been found between the highest and lowest lines. Only the four lines with the lowest activity could be classified as a distinct group with very low activity. The other lines showed a continuous variation (Table 1). A study of this type is subjected to experimental variation despite all efforts to unify the experimental technique. Therefore, it is also possible that there were a number of distinct activity groups masked by the experimental variation. Most of the lines (about 75 percent) showed intermediate levels of activity (12-21 units), which may suggest that lower or higher activity levels are not desirable.

The comparison between the relative frequencies of the $\underline{Adh}_1^F/\underline{Adh}_1^F$ and $\underline{Adh}_1^S/\underline{Adh}_1^S$ homozygous lines among the activity groups is of most interest (Table 2). The relative proportion of the $\underline{Adh}_1^S/\underline{Adh}_1^S$ lines among the lines with the highest activity was significantly greater than among the lines with lower activity levels. This suggests again that electrophoretic mobility is not the only difference between allelic isozymes.

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