superimposition nearly matched the latter in both pattern and intensity. Thus we see a tentative direction taken by some of these proteins (possibly representing certain critical enzymes of metabolism) during evolution to the cultivated state and hence a reflection of gene action and genetic differences.

We would like to continue and amplify some of these observations by comparing and studying in detail specific enzyme systems as a function of their appearance and complexity in natural and artificially induced tetraploids and their ancestral forms. In addition we will study the function and complexity of particular enzyme systems with respect to induced ploity; thus hoping to gain a further insight into genetic mechanisms.

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MOSAIC OR VARIEGATED LEAF MUTANTS

J. E. Endrizzi, Head, Department of Plant Breeding

Several mosaic or yellow-white variegated mutant plants were found in breeding blocks of Acala cotton in 1964. Up to 1966 and 1967 studies were conducted with these mutants primarily in an attempt to produce true-breeding lines and to obtain preliminary information on the possible mode of inheritance of the character. In 1965 the variegated character was found to be quite common in one variety in a particular field.

In 1966, progeny of two of the original 5 variegated plants were selected for a more detailed study. The pedigrees of these progeny (E2A-1966 and E2B-1966) are given below.

Pedigree of E2A and E2B - 1966 (Acala):

AG12 variegated terminals
↓ OP Seed
1 normal green
26 yellow lethal
8 variegated
↓
D14A-2-64 (Selfed)
↓
4 normal green
8 yellow lethal
6 variegated
↓
E1C-1-65 (Selfed)
↓
8 normal green
10 yellow lethal
5 variegated
↓
E2A-66 (AZ145)

Plants No. 4 and 5 variegated

AG13 variegated
↓ OP Seed
16 normal green
1 yellow lethal
6 variegated
↓
D15-19-64 (Selfed)
↓
7 normal green
3 yellow lethal
5 variegated
↓
E1D-1 & 2-65 (Selfed)
↓
14 normal green
4 yellow lethal
6 variegated
↓
E2B-66 (AZ146)

Plants No. 3, 6, and 10 variegated

Some of the variegated segregants of E2A-66 and E2B-66 were intercrossed, outcrossed to TM-1, and selfed for a study of the segregation behavior of the variegated character. Also, some of the normal greens were selfed to determine whether variegated seedlings would appear in their progeny. These data are shown in Table 1. It can be seen in the table that no regular Mendelian behavior suitably fits the segregation ratios observed. About all that should be said at this time is that the variegated character does not segregate in any typical Mendelian pattern characteristic of mutant loci commonly located on chromosomes nor does it appear to be maternally inherited.

Table 1. Chlorophyll Mosaics or Variegations in Cotton (Acala)

Cross or Self	Number of Plants		
	Normal Green	Variegated	Yellow Lethals
Variegated E2A-4-66 X TM-1	13		
" " "	33		
" E2B-10-66 X TM-1	36		
" E2B-3-66 X "	19	9	3
TM-1 X variegated E2A-5-66	29		
" " E2B-10-66	32		
" " E2A-4-66	31		
Variegated E2A-5-66 X " E2B-6-66	3		18
" E2A-4-66 X " E2B-6-66	32		
" E2B-3-66 X " E2A-6-66	5	1	2
" E2A-5-66 Self	11	10	14
" E2B-3-66 Self	37		
" E2B-3-66 Self	14		
" E2B-10-66 Self	6	7	3

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