16. The effect of Dt on the mutability of an A_1 allele.

The positive effect of Dt_1 on the mutability of one A_1 allele was reported in the 1955 Newsletter. However the allele used (A:D2) was one which had originated as a mutant from a_1 through the action of Dt_1 and therefore might have retained a susceptibility to Dt action. Four natural occurring A_1 alleles which have had no history of Dt association have been tested for mutability of female gametes in presence of Dt. Two failed to give any recessive mutants in large populations while the other two gave an occasional case. It was thought that perhaps increasing dosage of Dt would increase the frequency of these cases. To test this a male stock carrying one of the two more promising alleles, A:Provo, and also carrying two Dt genes, so as to increase the basic rate, was crossed on two female stocks which differed only in their Dt constitution. The first was a^s sh_2 dt, and the other a^s sh_2 Dt_1 Dt_2. Seeds from the dt ear stock have two doses of Dt contributed by the male parentp while those from the Dt ear stock have six doses of Dt (four from the female and two from the male). The seeds produced were examined for 1/8 + a Sh_2 aleurone sectors which represent A → a mutation occurring after fertilization takes place. As can be seen in table 1, the Dt female parent yielded significantly more mutant sectors than did the dt parent. Thus by increasing Dt dosage it is demonstrated that Dt can cause a naturally occurring A_1 allele to mutate at an increased frequency.

Table 1. Mutation of A:Provo expressed in aleurone sectors.

		1/8 seed or more		
Parents	Population	a sh	a Sh	A sh
a^s sh, Dt x A Sh, Dt	3521	8	9	0
a^s sh, dt x A Sh, Dt	4362	14	1	0

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