Aubele, Audrey M. and H. L. Plaine. Ohio State University, Columbus. Occurrence of the erupt effect in the al b c sp^2 strain of D. melanogaster.

Previous experiments (Plaine, H. L. DIS 40: 56) with eggs and larvae of the Su-er tu bw;er^+ Su-tu^+ strain gave the phenotype characteristic of extreme erupt after X-irradiation in air. Since, theoretically, this strain possesses the wild type allele of erupt (er^+), further studies as to the nature of this response have been conducted.

This laboratory strain (Su-er tu bw;er^+ Su-tu^+) had been derived originally by substitution of the second chromosome of the Suppressor-erupt or bw st strain which had the highest frequency of the erupt phenotype after X-irradiation, and the third chromosome of the al b c sp^2 strain which did not express the erupt phenotype after X-irradiation in air. Series of eggs and larvae from both of these parent strains were exposed to X-irradiation according to the methods described in the previous report. Since an atmosphere of O_2 had been shown to increase the frequency of the erupt phenotype when used in conjunction with X-irradiation, the Su-er;er^+ and the al b c sp^2 strains were also exposed to X-irradiation in an atmosphere of 100% O_2.

The phenotype characteristic of extreme erupt was found in all irradiated series (Table 1). All series subjected to X-irradiation differed significantly from the non-irradiated controls of the same strain. The frequencies of extreme and total erupt after X-irradiation also differed significantly among the strains tested.

These results indicate that the suppressor-erupt system is present in the al b c sp^2 strain. Failure to detect the suppressor-erupt system in this strain is highly probable if a small number of flies is examined or if special techniques for enhancement of the erupt response, such as an atmosphere of O_2, are not used. Studies of the relationship of the suppressor of erupt and erupt alleles present in the al b c sp^2 with respect to those present in the Suppressor-erupt or bw st strain are now in progress.

While the results obtained in this present study confirm the presence of the suppressor-erupt system in the al b c sp^2 strain, there is no indication that this expression is due to the direct enhancement of the mutant gene rather than to inhibition of the suppressor. If this were the case, we would expect the response in both the Su-er; er^+ and the al b c sp^2 strains to be equivalent, since both have the same erupt allele. It seems more probable that both loci are involved to some extent in the response. Further studies to clarify the relationship of the erupt locus and its specific suppressor locus in the response of the suppressor-erupt system to X-irradiation are now in progress.

Table 1: Frequency of erupt eye in irradiated and non-irradiated series of the Su-er;er^+, al b c sp^2, and Suppressor-erupt or bw st strains.

Treatment	Total counted			Phenotype of eyes (%) Normal			Extreme erupt			Total erupt		
Treatment	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
X-ray; Air	1268	1027	729	81.2	74.6	7.7	1.8	5.4	65.0	18.8	25.4	92.3
		594	325		74.1	26.2		5.2			25.9	
		1087			75.8			6.2			24.2	
X-ray; 100% O_2	1509	1129	---	67.8	42.0	----	5.3	28.7	----	32.2	58.0	----
Non-irradiated Controls	1250	1511	1010	99.4	99.7	93.9	0.0	0.0	0.09	0.6	0.3	6.13

(1) al b c sp^2 (2) Su-er tu bw;er^+ Su-tu^+ (3) Suppressor-erupt or bw st