Atlan, H., J. Miquel, and B. Jennings. Ames Research Center, NASA, Moffett Field, Calif., 94035. Life-shortening effects of ultraviolet radiation on Drosophila melanogaster imagoes.

Preliminary experiments on UV irradiation of Drosophila melanogaster have shown that doses of 3,000 joules/m^2 (30,000 ergs/mm^2) have a definite life-shortening effect. The flies used in this experiment were Oregon R males fed standard food. The radiation source was a General Electric BH-6 high-pressure, air-cooled, mercury, capillary arc lamp. An Engis Equipment Co. grating-type instrument was used as the monochromator. With the grating used the range was 2000 Å to 7500 Å and the dispersion, 33 Å/mm. A black-body thermopile detector was used to measure total irradiance.

Flies, 48 ±6 hours old, were etherized, placed in suitable holders, and irradiated.

Mortality data for control and irradiated Drosophila are shown in Table 1 and Figure 1. It appears that UV radiation at both 2600 ±100 Å and 2800 ±100 Å resulted in similar life shortening. Whereas exposure to ionizing radiation shortens life and reduces the variability of longevity of the various flies of a group, UV irradiation shortened life with a marked increase in variability, i.e., the plateau phase of the control mortality curve was sharply shortened in the irradiated groups while the maximum life span was much less reduced. Because of the similarity of the effects of the two different wavelengths used and because of the strong absorptive properties of the pigmented superficial layers of the flies, we can speculate that sensitive superficial structures, particularly the eyes are responsible for the life shortening.

Table 1

UV Radiation (Å)	No. of flies	Mean longevity (days)	2X Standard error	Standard Deviation
None	133	95.95	2.12	12.27
2600	95	48.16	4.20	20.45
2800	92	52.21	4.28	20.60

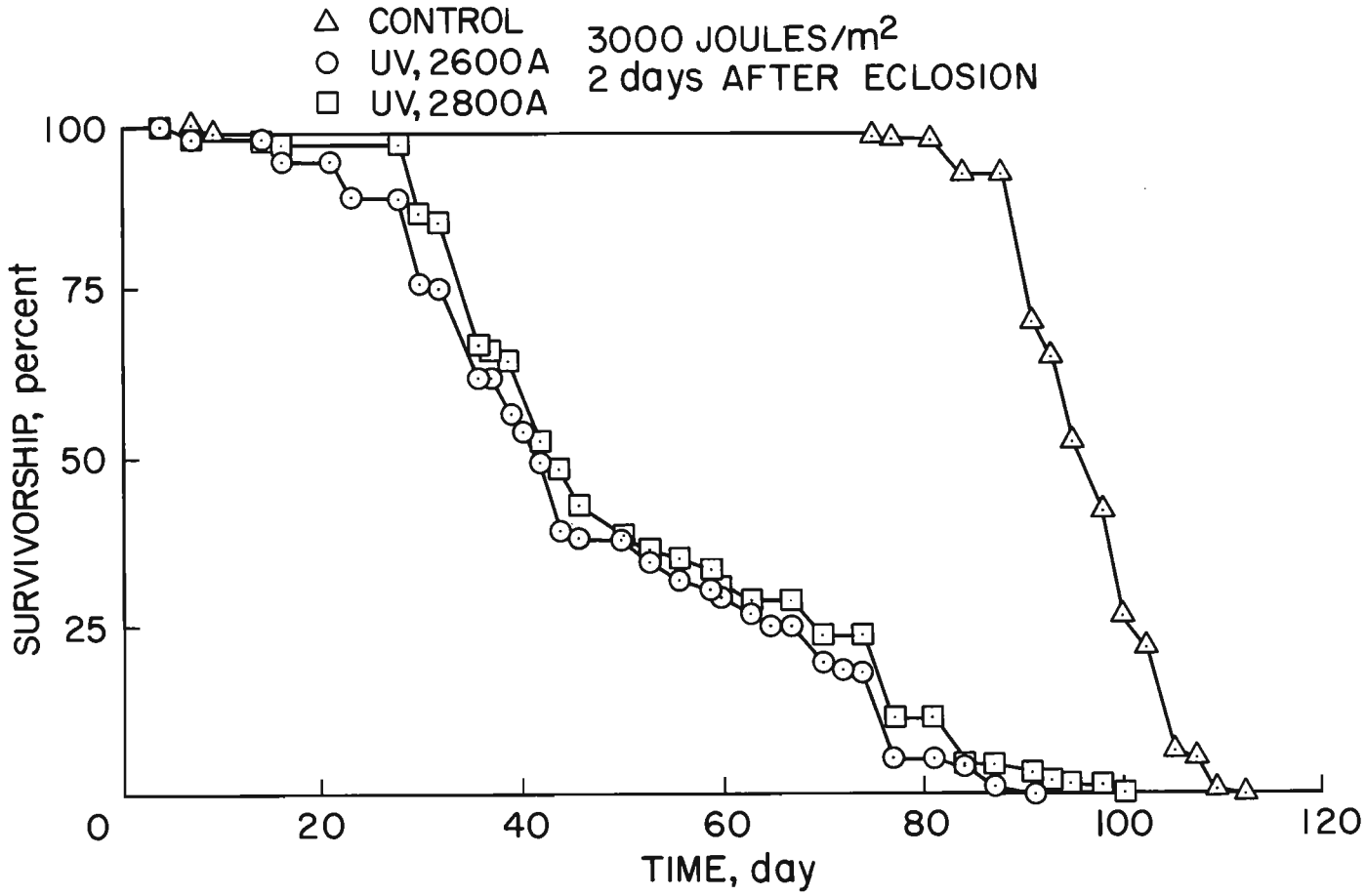

Fig. 1. Effects of ultraviolet radiation on longevity of Drosophila melanogaster.