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Effect of X-rays of the eye of heterozygous Antennapedia flies.

In some Antennapedia ($Antp^R$) individuals irradiated with 1000r of X-rays, irregularities were found in the eye and head region, whereas no such abnormalities were found in unirradiated $Antp^R$ animals. These irregularities consisted of lumps of extra cuticle, bearing bristles which appeared in the region of the verticle or orbital bristles. The morphology of the supernummary bristles and the ground pattern was characteristic of this region of the head. The bristles often encroached upon ommatidia, causing the eye to be smaller. Frequently, a sector in the dorsal anterior part of the eye also contained bristles.

The frequency at which defects occurred in $Antp^R$ flies varied with the time of irradiation (Fig. 1), and

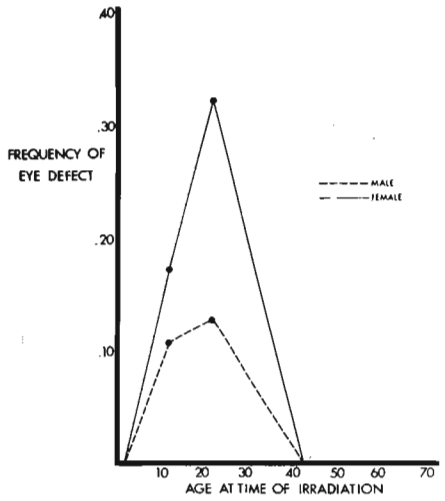

Fig. 1. Frequency of X-ray induced defects in the eye of $Antp^R$ flies vs. time of irradiation.

there was a peak at 24 hours after egg deposition. The penetrance of the eye defect was greater in females than males. In irradiated progeny of the cross y;mwh $Antp^R$/ mwh Sb Ubx X Df(1)sc^8, w^a/Dp(1;3)sc^{J4} and the cross $Antp^R$/Sb Ubx X y sn^3 f^{36a}, 72 of 383 $Antp^R$ individuals irradiated prior to 45 hours had defective eyes, while only 1 of 944 of their Sb Ubx siblings irradiated at this time had a defective eye. This indicates that the factor responsible for the eye defect is on the $Antp^R$ chromosome. Unirradiated $Antp^R$ flies did not show such irregularities in our experiments, nor did progeny of the cross y;mwh X Df(1)sc^8, w^a/Dp(1;3)sc^{J4} and y sn^3 f^{36a} X Oregon R irradiated with 1000r. Haskins and Enzmann[1], however, did obtain eye defects similar to the ones reported here after irradiation of an eosin stock.

Malformations of the head capsul without X-rays occur in D. melanogaster heterozygous for $Antp^{LC}$ [2], D. funebris bearing aristapedia[3], and D. hydei bearing ss^{Anp} [4]. The eye effect in D. funebris is more pronounced in females than males[3], as it was in our experiments. The gene erupt (er), also on the third chromosome, leads to a bristled structure protruding from the eye after irradiation of certain stocks at ten hours after egg laying. It is not known whether the eye defects reported here are due to the $Antp^R$ gene itself, or to some other locus, such as er, on the $Antp^R$ third chromosome.

References: 1. Haskins, D.P. and E.V. Enzmann, 1937 Amer. Nat. 71: 87-90; 2. Le Calvez, J., 1948 Bull. Biol. Fr. Belg. 82: 97-113; 3. Tiniakoff, G., 1939 DIS 11:52; 4. Gloor, H. and H. Kobel, 1966 Rev. Suisse Zool. 73: 229-252; 5. Glass, B., 1944 Genetics 29: 436-446.

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The alteration of X-ray induced genetic damage by aflotoxin in D. melanogaster.

The treatment of Drosophila flies with certain chemicals, and antibiotics prior to irradiation has altered the genetic damage (Sobels 1961, 1963, 1964, 1965; Burdette 1961, Clark 1963 and M.S. Rao 1965) and one of the methods offered for explanation was the inhibition of protein synthesis.

Aflotoxin is a collective name given to a group of highly toxic substances produced by certain strains of the mould Aspergillus flavus. The biological effects of this substance include: (i) inhibition of protein synthesis and also (ii) inhibition of m-RNA synthesis possibly through RNA polymerase.

With a view to find out whether aflotoxin would be able to alter the genetic damage akin to antibiotics experiments were undertaken to assess the alteration if any.

Oregon-K males of D. melanogaster were injected with 0.2 micro cc of saline solution containing 1 mg of aflotoxin dissolved in 1 cc of saline. The treated flies were exposed to