

Morgan's white-eyed fly

Historically, Morgan discovered the white-eyed fly in 1910. He found one white-eyed fly male in the fly pool. However, Frank Eugene Lutz said he had given the white-eyed fly to Morgan in 1910.

Morgan rebutted this claim in 1942:

“It is not obvious from this statement that the flies Lutz gave me were the descendants of the ‘white-eye sport’ since it was dead when found, unless the bottle had contained a virgin female and the white-eyed male. Moreover, if it had mated before death to a female, many white-eyed males would have appeared in the next generation, which was not the case.”

The white-eye allele is X-linked recessive (white, X^w) to the X-linked dominant red allele (X^+) in the fruit fly.

- a. If the dead white-eyed male had mated with a homozygous red female, what ratios of white-eyed and red-eyed flies would Morgan have observed in the F_1 generation, by sex?
- b. If the dead white-eyed male had mated with a red heterozygous female, what ratios of white-eyed and red-eyed flies would Morgan have observed in the F_1 generation, by sex?
- c. If the F_1 descendants mated with one another described in a, what ratios of white-eyed and red-eyed flies would Morgan have observed in the F_2 generation, by sex? Assume the random mating.
- d. If the F_1 descendants mated with one another described in b, what ratios of white-eyed and red-eyed flies would Morgan have observed in the F_2 generation, by sex? Assume the random mating.
- e. Is what Morgan said convincing? How do you think?