Genetics Pre-Quiz

Biology

A biologist mates two fruit flies. The male is wild type (completely normal appearance in every respect). The female has double appendages – she has 12 legs instead of six, and she has four antennae instead of two.

There are about 1600 offspring. Roughly half (about 800) of the offspring have double appendages. The rest are wild type. There are no differences in the rate of mutation between males and females.

The biologist then mates two of the mutant offspring. There are an additional 1600 flies that hatch from the second breeding. Again, there are no differences in the rate of mutation between males and females. The offspring of this breeding show a rate of around 75% (around 1200) mutants and the remaining 25% of the flies are wild type.

Draw the Punnett Squares that illustrate these crosses. Then answer the following questions:

1. Is the mutant trait dominant or recessive?
2. Is the mutant trait sex-linked or autosomal?
3. What were the genotypes of the parents of the initial cross?
4. What were the genotypes of the parents of the second cross?