Answer on Question # 64130 - Biology - Genetics

Let's suppose that the trait is sex-linked. Then,

X^d – allele for dumpy wings

X^D – allele for normal wings

The female's genotype is $X^d X^d$, while the male's genotype is X^DY

It results in the following cross:

P: $X^d X^d$ X^DY

G: X^d X^D Y

F: $X^D X^d$ $X^d Y$

normal female male with dumpy wings

Thus, in case of sex-linked inheritance, the observed phenotypes are completely different from the expected ones. It means that there is an autosomal inheritance for this trait.

Then, the cross would be:

D- allele for normal wings

d - allele for dumpy wings

The female's genotype is dd, and the male's one is Dd

P: dd Dd

G: d D d

F: Dd dd

normal dumpy wings

As X and Y-chromosomes are inherited independently from autosomes, the flies with normal and dumpy wings can have any sex.

Thus, 3 dumpy- winged females and 2 normal males, produced in the cross, can be explained by the scheme represented above. Thus, the inheritance is autosomal.