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wingless - a new mutant in D. melanogaster.

Among the Ethyl methanesulphonate induced sex linked recessive lethals, maintained for the analysis of temperature sensitive mutants, wingless flies were recovered in one stock. These flies were freed from lethal bearing X-chromosome and were subjected to genetic analysis. The results obtained showed that the wingless condition (see Figure) was governed by a single recessive gene, designated wingless (wgl), and mapped on the left arm of the second chromosome at approximately 30 map units distance. Further, the wingless phenotype was not completely stable. The progeny of wingless parents were comprised of flies with no wings, one wing and two wings in approximately 2:2:1 ratio. The segregation pattern was consistant. Progeny raised by crossing one-winged x one-winged and two-winged x two-winged (isolated from the progeny of wingless flies) also segregated into the three phenotypes. The ratio of the three classes, too, was similar to that obtained in the cross of wingless flies. This segregation pattern suggests that individuals with the three phenotypes are genotypically similar and that changed phenotypic expression is the result of incomplete penetrance.

Besides affecting the wing, the wgl mutation has an associated effect on haltere development. In the wingless stock, flies with none, one or both of the halteres occurred. The suppression of wing and haltere development was, however, independent since flies with all combination of wing and haltere number were produced in the progeny of wingless parents. This points to the fact that there is complete autonomy in wing and haltere development but suggests that the critical stages during wing and haltere differentiation are controlled by similar steps.

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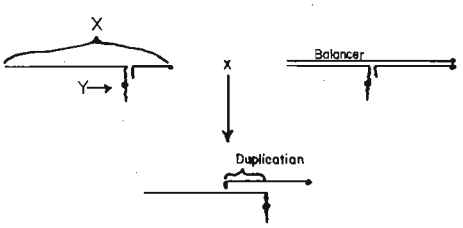
A duplication that causes leg shaking.

We have found that male and female flies which carry Dp(1;4)f^+ exhibit abnormally rapid and vigorous leg shaking under ether anaesthesia. According to Dr. George Lefevre, Jr. (personal communication) these flies are duplicated for at least 14A1 - 16A1. It was not clear whether the shaking is caused by a duplication of normal material or by a dominant mutation associated with the duplication.

Accordingly we crossed to each other X;Y translocations (obtained from Bowling Green) with different breakpoints to produce duplications in the 14A1 - 16A1 region as shown at left. Using this method, shaking flies were produced from parents which did not shake. Because of a genetic discrepancy in one of the translocation stocks, we decided to examine the progeny of translocations whose cytology had been more recently determined. These stocks were kindly given to us by Drs. Barbara Stewart and John Merriam. A summary of the cytology of the duplications and their associated behaviour is shown at left.



Duplication Cytology	Behaviour
13F - 15DE	Shakes
15B - 17BC	Normal
13EF - 14F	Shakes
13A - 13F	Normal

Thus far the shortest duplication to cause shaking is 13F - 14F. We are attempting to localise the operative duplication and to discover its spacial and functional relation to known behavioural mutations in this region.