

Developmental analysis of two sex-linked mutation, *Ks10* and *Ks36*, causing malformation of wings in *Drosophila melanogaster* (Insecta: Diptera)

Koshi SATO and Yuzo NIKI

Department of Biology, Faculty of Sciences

Ibaraki University

Mito, Ibaraki, 310 Japan

*Ks10* (1-43.8) is heat-sensitive and shows phenotypic variation in wings at 25°C. Abnormalities in the *Ks10* wings can be classified into incisions at the wing margin and disrupted patterns of the venation of longitudinal vein-3 and -4 (interruption, distal branching and unusual structure).

Although mature *Ks10* wing disc was normal in shape, aldehyde oxidase (AO) activity was seriously affected. Little activities were detectable in the presumptive anterior wing blade and wing margin, and no clear boundary of antero-posterior compartment of the disc could be seen in the AO pattern. On the other hand, pattern of AO activity of wing disc of larvae reared at 18°C was normal.

At 25°C cell death became evident in small area of presumptive anterior wing blade of 24.0% of wing disc in early third instar larva. At mid third instar, area of cell death expanded in whole presumptive wing blade. There were cell death in 69.4% of wing discs at presumptive anterior wing blade, and in 20-40% of wing discs at remainder presumptive wing blade. At late third instar, cell death decreased to about 20% in each area of presumptive wing blade. On the other hand, no cell death was found in any areas of mutant wing disc at 18°C. These results would suggest that malformation of *Ks10* wing is caused by the cell death in the third instar wing disc.

Temperature-sensitive period (TSP) was determined by reciprocal temperature-shifts and cold-pulses experiments. TSP was present from the early stage of the third instar prior to about the time of pupation, and it continued at least 24 hours before pupation. It is interest that TSP corresponded with the stage when the cell death was frequently seen in the wing disc. Thus, a wild-type allele of *Ks10* gene would be one of genes that act during third instar larval stage and are indispensable for normal development of the wing disc.

The *Ks36* (1-59.5) wing lacks anterior crossvein and fuses longitudinal vein-3 and -4, which phenotype mimicks that of *fused* (1-59.5). Morphology and AO staining pattern of *Ks36* wing disc were normal. Furthermore, no cell death could be found in the wing disc during development. It is evident that action of *Ks36* gene is different from that of *Ks10*. Further analysis should be done to elucidate primary lesion of *Ks36* wing.