Mukherjee, A. S. Max Planck Institut für Biologie, Germany. Cytological localization of the white locus in D. hydei.

Analysis of the salivary gland chromosomes of white-mottled-1 (w^{m-1}), white-mottled-2 (w^{m-2}) and white-mottled-3 (w^{m-3}) shows that although the three mutants differ phenotypically from each other in their extent of mottling, the distal break is, in every case, between 17A3 and 17A4 (numbering of bands and segments is according to Berendes, Chromosoma, 14, 1963). This breakpoint is close to a heavy doublet, the 17A(1-2).

While the w^{m-1} and w^{m-3} are cases of transposition of the heterochromatic arm of the X chromosome and nucleolar organizer into the region of the distal break (17A3-17A4), the w^{m-2} involves a compound double inversion. Other breakpoints are given below:

w^{m-1} and w^{m-3}: Proximal break is in the heterochromatin most likely at the end of the euchromatic arm between the centromere and the band segment 1A (In hydei one arm of the X is wholly heterochromatic: Figure 1). The difference between the two mutants may be the consequence of differential transposition of the heterochromatin.

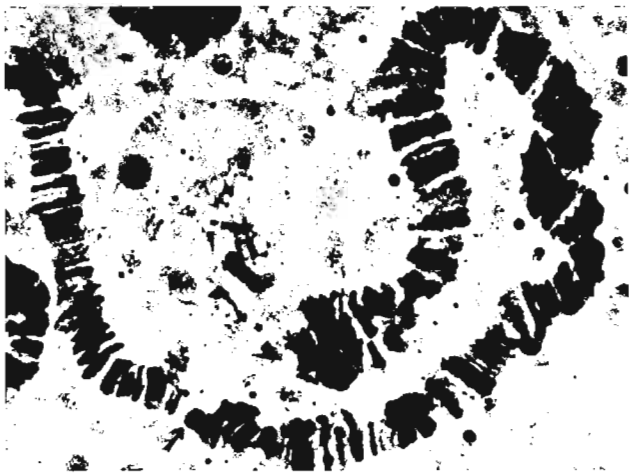

Figure 1: X-chromosomes of w/w^{m-1}. Arrow indicates the suggested white locus.

w^{m-2}: Set I: Distal break same as above; proximal break is between 1A and the centromere; Set II: Break 1= between 9A4 and 9B1; Break 2= in the heterochromatic arm; this last break shifts the centromere to the region 9A4-9B1 and perhaps splits the nucleolar organizer (Figure 2).

Frequent heterochromatinization is observed extending from the break to about 16D4 on the one hand, and 17A6 on the other. Whenever heterochromatinization is found the 17A (1-2) is always involved.

These results, together with the finding that white-deficiency (w^{df-686}) shows a deletion for the bands from 16D3 to 17A(1-2), strongly suggest that 17A(1-2) is the white locus. The doublet nature of the white locus and the Notch phenotype of the deficiency (w^{df-686}, male lethal), suggests a homology between this region in this species and that in D. melanogaster.

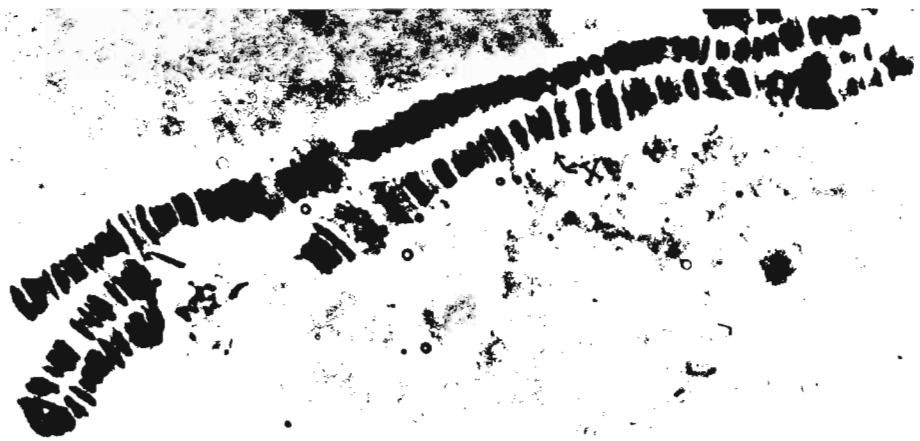

Figure 2: X-chromosomes of w^{m-2}/w^{m-2}.