Hodgetts, R.B. University of Alberta, Edmonton, Alberta, Canada. A cytogenetic description of three duplications in which portions of proximal 2L have been inserted into the Y-chromosome.

Three derivatives of Dp(2;Y)G, the aneuploid segregant from T(Y;2)G (Lindsley and Grell 1968) have been constructed. In Dp(2;Y)G, a region of 2L between 36B4-5 and 40F has been inserted into an arm (unknown) of the Y-chromosome. In the derivatives, most of the material in the inserted segment between the dopa decarboxylase locus ($Ddc^+$) and the heterochromatin has been deleted. As a result, the new duplications can be carried in either sex without the serious effects on viability and fertility experienced with Dp(2;Y)G. While the arm of the Y-chromosome into which the 2L fragment is inserted is not known, Y-fertility is unaffected by the translocations.

(a) Dp(2;Y)H1 $rdo^+$ $hk^+$ $Ddc^+$ $pr^-$ $lt^+$. This derivative was obtained following γ-irradiation of a stock carrying Dp(2;Y)G and contains a large deletion of the purple (pr) locus. The breakpoints of the deletion fall between the following limits: distal 37F4 - 38A1; proximal 29C2 - 39D1. Thus, the new order in Dp(2;Y)H1 is: 36B4 - 37F/39C - 40F.

(b) Dp(2;Y)H2 $rdo^+$ $hk^+$ $Ddc^+$ $pr^-$ $lt^+$. This derivative was also obtained from Dp(2;Y)G and like Dp(2;Y)H1, contains a γ-ray induced pr deficiency. The breakpoints of this deficiency fall between the following limits: distal 38B2 - 38C1; proximal 39E2-3. Thus, the new order in Dp(2;Y)H2 is: 36B4 - 38B/39E3 - 40F.

(c) Dp(2;Y)H3 $rdo^+$ $hk^+$ $Ddc^+$ $pr^-$ $lt^-$. This derivative was obtained from Dp(2;Y)H1 and contains a γ-ray induced deficiency for the light (lt) locus. The breakpoints of this deficiency fall between the limits: distal 37E2 - 37F1; proximal 40B2 - 40F. Thus, the new order in Dp(2;Y)H3 is: 36B4 - 37E/40.

We have used one of these duplications, Dp(2;Y)H1, in a recent work (Clark et al. 1978) where it was referred to as Dp(2;Y)$Ddc^+$.

References: Clark, W.C., P.S. Pass, B. Venkataraman and R.B. Hodgetts 1978, Molec. Gen. Genet. 162:287-297; Lindsley, D.L. and E.H. Grell 1968, Carnegie Inst. Wash. Publ. 627.

Ingham, P.W. University of Sussex, U.K. Genetic analysis of trithorax, trx, a new homoeotic mutant of D. melanogaster.

A spontaneous recessive allele, trx, defining a new locus on chromosome 3 has been isolated. The incomplete penetrance of the allele necessitated its being mapped by the selection and test crossing of individual recombinant chromosomes. An approximate localization was achieved by generating several different sets of reciprocal recombinants from 'rucuca'/trx ♀♀. This enabled the identification of cu (50.0 cMs) and Sb (58.2 cMs) as proximal and distal flanking markers respectively. 124 recombinants between these two loci were tested for the presence or absence of trx. The results are consistent with trx mapping to a single locus at 54.2 cMs (±0.4).

Penetrance and expressivity are highly variable. The phenotype consists of the homoeotic transformation of various adult structures. The most extremely affected individuals exhibit the following morphological changes. In the ventral prothoracic segment sternopleural bristles appear between the humerus and the first leg coxa. Transverse rows in the tibia are reduced in number or abolished; large apical and pre-apical bristles are present on the distal tibia (Fig. 1). In the basitarsus, there is a reduction in the number of transverse rows, and in males a concomitant decrease in the number of sex comb teeth. Similar changes in segment specific landmarks also occur in the third leg. The derivatives of the haltere disc are replaced distally by wing blade material and more proximally by notal and scutellar structures (Fig. 2).

The range and variety of the metathoracic transformations are closely analogous to the effects produced by ether phenocopying (Bownes and Seiler 1977; Capdevila and Garcia-Bellido 1978). The ventral prothoracic transformation has not previously been reported. The dorsal prothorax is apparently unaffected. Rotated genitalia and disruption of tergite pigmentation are also common in males.

At 25° the penetrance (P) of the selected homozygous line is 85%. However, there is a substantial maternal influence on penetrance; thus for homozygotes generated by crossing trx/+ ♀♀ with trx/trx ♂♂, P = 9%, while for the reciprocal cross of trx/trx ♀♀ with trx/+ ♂♂, P = 85%.