Duttagupta, A.K., D. Mutsuddi and M. Mutsuddi (Das). University of Calcutta, India. Replication in X chromosomal segmental aneuploids in Drosophila.

In all the Drosophila species, while the male-X chromosome in polytene nuclei shows puffy appearance and early completion of replication, the female-X chromosome exhibits a similar state of chromatin condensation and synchronous pattern of replication like that of their autosomal counterparts. From our earlier works (Duttagupta et al. 1984) the idea was deduced that in **D.melanogaster** the male-X chromosome can recognize with up to 62% segment as its "duplication". As in these experiments duplicated segments were added to 1X individuals from the proximal side towards the tip linearly, study of distal and intercalary duplications of comparable length became essential to know whether the "tolerance of male duplication" would always remain within the same range. We started experiments with intercalary duplications of variable length to verify the above notion.

In the present investigation, with the help of T(1;3)$w^{vco}v$ f/C1B stock, three aneuploid conditions, viz. (i) individuals with 1.05 X-chromosomal segments, (ii) individuals with 1.95 X-chromosomal segments,

Figure 1. Morphology of the salivary gland chromosomes of **D.melanogaster** showing the female X chromosomes (a) deficient for the region $2C_1$ to $3C_4$ and (b) duplicated for the same segment which remains as translocated segment to the 3rd chromosome. Note in each case, each part of X chromosomes represents similar diameter and staining intensity in comparison to that of autosomal segments. **x** = X chromosome. **A** = autosome. Arrow indicates the aneuploid region.

Figure 2. Autoradiograms showing synchronous pattern of ^{3}H-TdR labelling on the X chromosomes and autosomes in individuals with (a) 1.95 X chromosomal segment and (b) 2.05 X chromosomal segment. **x** = X chromosome. **A** = autosome. Arrow indicates the aneuploid region.

and (iii) individuals with 2.05 X-chromosomal segments were constructed. In the first and third case, the segment $2C_1$ to $3C_4$ was added (as translocated segment to 3rd chromosome) to 1X and 2X individuals, respectively, and in the second case 2X individuals were deficient for the similar segments. Replication pattern of the salivary gland chromosomes were studied after pulse labelling with ^{3}H-thymidine (sp. activity: 17,400 uCi/mM, BARC, Trombay, India; Cons. 500 uCi/ml, exposure time - 20 days).

Our results reveal that in individuals with 1.05 X-chromosomal segments, both the entire X and the X chromosomal fragment involved in duplication, displays both puffy appearance and asynchronous replication pattern in comparison to that of autosomal segments. On the other hand, in individuals with 1.95 and 2.05 X-chromosomal segments, each part of X chromosomes, so far morphology and replicationi is concerned, represents a typical female X chromosome (Figures 1a-b; 2a-b). Such results indicate that 1X individuals could recognize small fragments as its duplication, regardless of the position of the duplicated segments. However, further works with large intercalary duplications would provide a more clear picture and such works are in progress.

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Reference: Duttagupta, A.K., M. Mutsuddi and D. Mutsuddi1984, DIS 60:97-98.

Engels, W.R. University of Wisconsin, Madison, USNA. A set of P cytotype balancer stocks.

Multiply rearranged balancer chromosomes in P-cytotype stocks are often useful for maintaining dysgenesis-induced mutations while avoiding further changes in P element numbers and positions. I constructed two such stocks for the X chromosome and one for each major autosome. The resulting balancer stocks are:

M-5(P), w^a B; π_2 , C(1)DX,y f /FM7(P) y sn^{x2} B; π_2 ,
CyO(P), S^2 cn^P bw/π; π_2 , TM6B(P), e Tb ca/π-lethal; π_2 .

The strain π_2 is a strong P strain described previously (Engels & Preston 1979) and the symbol π refers to individual chromosomes from this stock. Tb is described by Craymer (1980),and cn^P is a strong cinnabar allele that was EMS-induced by C.R. Preston (pers. comm.) in 1977. The TM6B chromosome, constructed by L. Craymer (pers. comm.), is thought to be the most effective crossover suppressor available for the third chromosome. The other balancers and the markers they carry are all described in DIS or Lindsley & Grell.

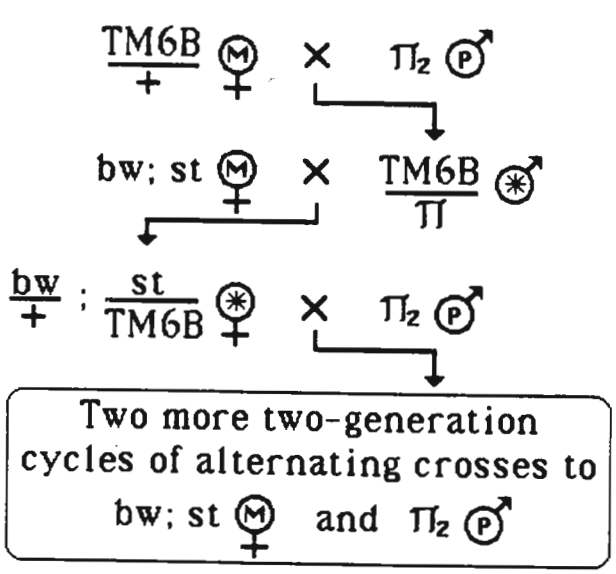

Figure 1. Crossing scheme to generate an M-5 chromosome with P elements. Each fly is designated as **P** or **M** according to its classification in the **P-M** system, or else as * to indicate it is dysgenic. All crosses were performed at 21°.

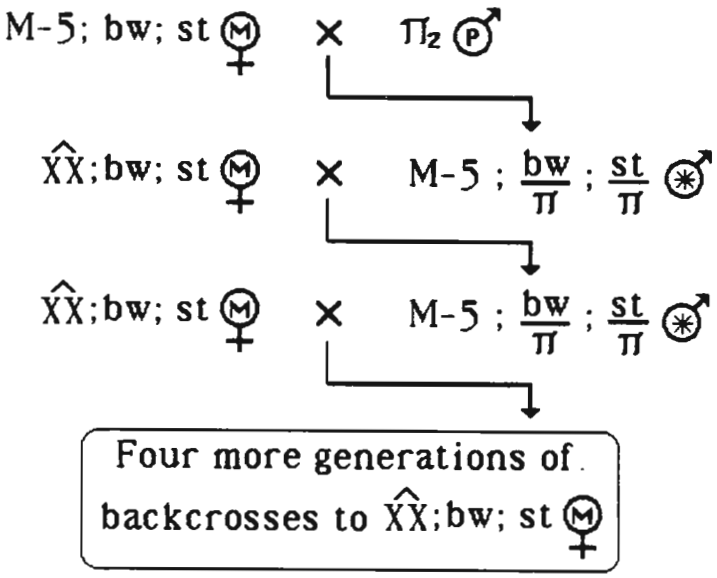

Figure 2. Crossing scheme to generate a TM6B chromosome with P elements. The designations **P**, **M** and * are the same as in Figure 1.