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The arrangement of genes in the proximal region of the X chromosome of Drosophila melanogaster.

We have determined the relative positions of a number of genes in the proximal region of the X chromosome. Most of these have been supplied by other workers who had localized them to the right of carnation by conventional crossover tests. We have utilized duplications of the proximal X carried on the Y to test mutants of independent origin for allelism. Other major tools, deficiencies of the maroon-like locus on the X chromosome and deficiencies of ma-l induced in a Y chromosome carrying a duplication for ma-$l^+$, were used to position the various mutants. The extent of some of these chromosome aberrations are indicated in the new mutants section of this issue. The relevant breakage point in the Y with the duplication of the proximal X, $Y^S$ ma-$l^+$.$Y^L$ $y^+$ (reported as $y^+$Yma-$l^+$#2 in DIS-38), as well as the pertinent breakage points in the most useful rearrangements are shown in the accompanying figure.

Additional points of interest and amplification:

1) Dp(1;f)3 has been reported by Cooper to have a proximal break in the distal portion of heterochromatic segment hD. On this basis all of the loci to the right of A7 may be considered to be located in the proximal heterochromatin.

1) The relative positions of:
A7 and N30
gluful-2, DCA3-19 and DCB2-19
t2-14a and DCB2-35a, 151
have not been determined.

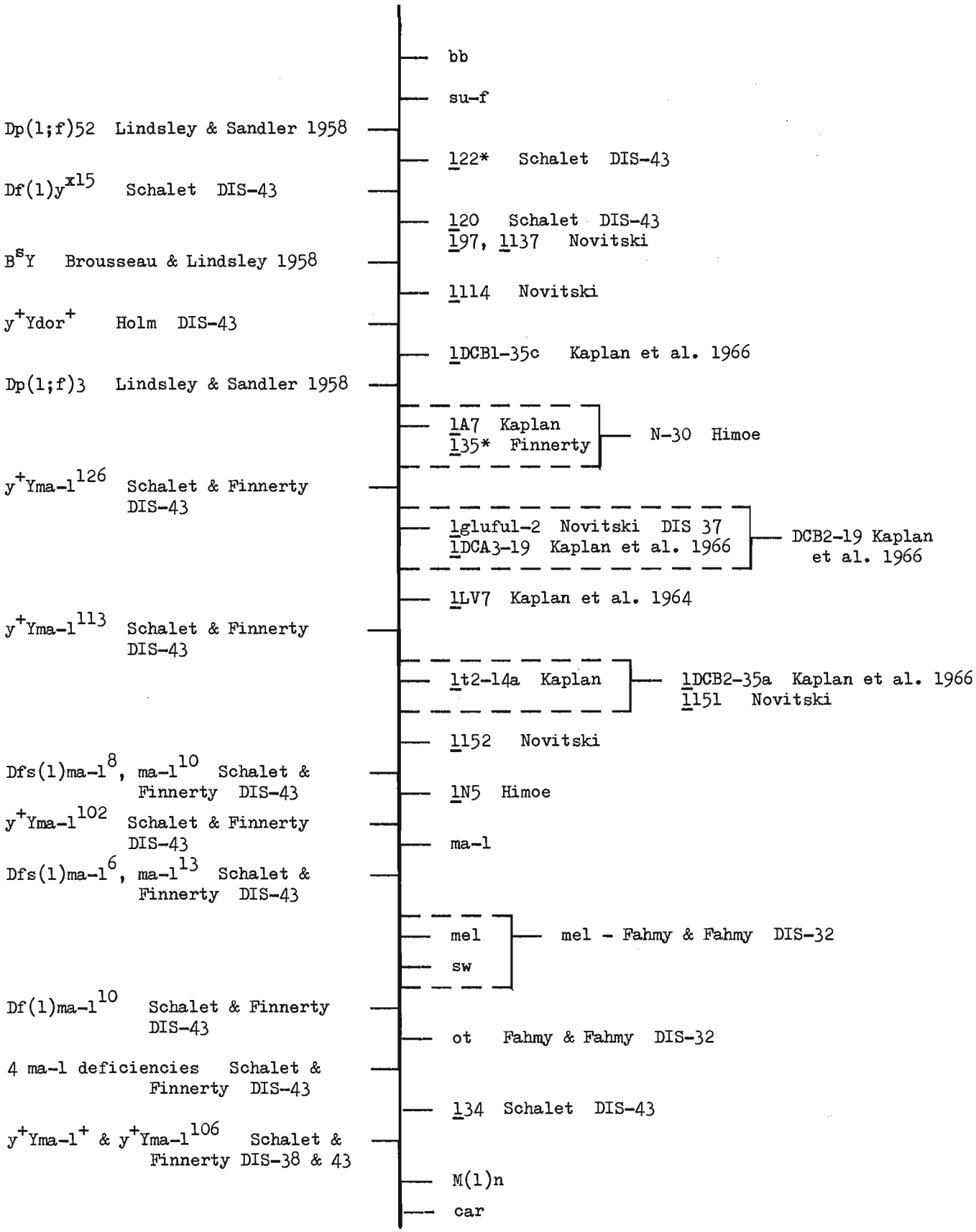
2) Placement of 152 to the left of t2-14a and DCB2-35a, 151 is uncertain and based on the following considerations. A lethal now lost, 133 was found to be lethal with 152 and viable with t2-14a. But 33 was lethal with $y^+$Yma-$l^{102}$ while 152 was covered by $y^+$Yma-$l^{102}$. If 33 was a deficiency that included 152, rather than two close but separable lethals, then 152 should be to the left of t2-14a.

3) Placement of mel to the right of sw is uncertain. However, the viable ma-$l^{14}$, when heterozygous with either of two ma-l deficiencies, ma-$l^6$ and ma-$l^{13}$, with breaks just to the left of ma-l, shows a phenotype that mimics the body color and turned up wing effect of mel. But ma-$l^6$, ma-$l^{13}$ and ma-$l^{14}$ are all wild type with mel.

4) We have at least 3 additional aberrations, not involving ma-l, that are within the region between 134 and bb.
   a. 1DCB1-35b, Kaplan et al. 1966, is a deficiency with a distal break to the right of LV7, a proximal break to the left of bb and lethal with all the extant lethals in between.
   b. 1D43L1 Himoe is a deficiency with a distal break to the right of t2-14a and 151 and a proximal break between su-f and bb.
   c. 1t2-4a Kaplan is lethal with sw and mutant with mel.

5) Crossing over between some of the loci in the region has been measured under standard conditions.
   a. 120 and su-f - 1/3,507(0.03%) in experiments which gave 2/3,507(0.06%) between su-f and Dp(1)$sc^{V1}y^+$ and 188/3,507(5.4%) between car and su-f.
   b. sw and ma-l - 4/747(0.5%) in an experiment which gave 63/747(8.5%) between f and sw.
   c. ma-l and su-f - 19/865(2.2%) and 15 and su-f - 13/370(3.5%) in the same experiment.
   d. 15 and 120 - 95/2637(3.6%)
   e. 134 and 120 - 63/2632(2.4%)

6) Mutants localized to the right of car but not covered by $y^+$Yma-$l^+$.
Lethals - A11, A12, B4, DCB2-35b of Kaplan
Lethals - 1, 77, 106, 412, glufulproless of Novitski
Lethal - 5 of Schalet
Lethal - D43L3 of Himoe
Visible - $wa^2$ of Fahmy and Fahmy

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