Loverre, A. and R. Cicchetti. Istituto di Genetica, Università di Roma, Italy. A male-specific lethal gene in D. melanogaster.

In a natural population of D. melanogaster from Corato (Apulia, Italy), a second SD (Segregation Distorter) chromosome was found which in the homozygous condition is present only in females.

The results of the crosses in Table 1 show that in the Cy progeny males and females are present in equal number, but in the Cy^+ progeny there are no males, independent of the maternal genotype, and the females are present but are fewer than expected. These results suggest that the absence of homozygous males is due to the action of a lethal recessive factor(s) acting in males alone. In order to localize this factor on the 2nd chromosome, the progeny of SD/Bl L females crossed with SD/SM5, Cy males was studied (see Table 2A). An examination of the class Cy^+ for the presence or absence of males led to some preliminary conclusions: the lethal factor, which will be termed malelethal (mll), is located between Bl (54.8) and L (72.0), closer to Bl than to L, and not coinciding with the SD factor which is to the left of Bl. Moreover, a series of parental chromosomes and crossovers from the cross in Table 2A recovered in Cy males and females were examined for the presence of mll. These, crossed with mll/SM5,Cy males and females, supplied the data in Table 2B. Pooling the data, we have three recombinant chromosomes between Bl and mll (2 mll^+ L and 1 Bl mll) and 136 between mll and L (42 mll L and 50 + 44 Bl mll^+), which places mll at 3/139 of 17.2 m.u. to the right of Bl, that is, at 55.2 ± 0.2 in the centromeric region.

In order to individuate the effective lethal phase of mll the development of progeny from crosses between mll/mll females and mll/SM5,Cy males (experiment) was observed, ORE males and females being used as the control (see Table 3). A significant difference in viability in the progeny of the two crosses was observed in the development from egg to first instar larva and a still more marked difference in the development from second and third instar larva to pupa. It is still to be ascertained whether the greater mortality of the eggs in the experiment is related to mll/mll zygotes or is due to a maternal effect. The major effect of mll is to be found, however, in second or third instar larva.

The phenotype, mapping and E.L.P. of mll are very similar to those of the maleless gene found by Fukunaga et al. in a Japanese population (Genetics 81:135-141, 1975).

Table 1.

Cross	F_1 Progeny (expected ratio) Cy^+ ♂	Cy^+ ♀	Cy ♂	Cy ♀
$\frac{SD}{SD}$ ♀ X $\frac{SD}{SM5,Cy}$ ♂	0 (1 :	180 1 :	272 1 :	276 1)
$\frac{SD}{SM5,Cy}$ ♀ X $\frac{SD}{SM5,Cy}$ ♂	0 (1 :	149 1 :	564 2 :	500 2)

Table 2.

A. F_1 progeny of the cross between SD/Bl L females and SD/SM5,Cy males.

Phenotype	Cy^+ ♂	Cy^+ ♀	Cy ♂	Cy ♀
+	0	280	328	371
Bl L	361	331	335	330
Bl	50	53	66	56
L	2	50	63	53

B. Presence of the mll factor in chromosomes from the above cross.

Chromosome examined	mll	mll^+
+	55	0
Bl L	0	59
Bl	1	44
L	42	0

Table 3. Viability of various developmental stages in experiment and control. Percent values in relation to individuals of the preceding developmental stage are given in parentheses.

Egg	I instar larva	II or III instar larva	Pupa	Adult
413	314 (76%)	286 (91%)	220 (76%)	190 (90%)
145	130 (90%)	124 (95%)	119 (98%)	112 (94%)