

Oshima, C. and T. K. Watanabe. National Institute of Genetics, Japan. Location of recessive lethal genes on the second chromosome of *D. melanogaster*.

A total of one hundred and five recessive lethal chromosomes of various origins (64 chromosomes isolated from Kofu-Katsunuma natural populations, 18 chromosomes isolated from Suyama-Juriki natural populations and 23 chromosomes obtained by Dr. Mukai as spontaneous lethals)

was tested to determine the locus of individual lethal genes on the second chromosome by crossing with the balanced dominant marker Sp B1 L/Cy strain.

Five kinds of inversions (In A, B, K on the left arm; In C on the right arm; a pericentric inversion D) were detected in natural lethal chromosomes.

Seventy natural lethals and all spontaneous lethals were found to be single lethal genes on the second chromosome. The remaining 12 lethal chromosomes seemed to have double, multi-locus and synthetic lethals.

If the lethal genes from natural populations are grouped according to their location on the chromosome by the three regions (left 0-40; middle 40-70; right 70-108), the distribution found was 18 in the left, 36 in the middle and 16 in the right region. This concentration of lethal genes in the central region is similar to that of recessive visible mutant genes on the genetic map of the second chromosome. On the other hand, spontaneous lethal genes seemed to be distributed randomly; 6 in the left, 7 in the middle and 10 in the right region. This distribution of spontaneous lethal genes may be similar to that reported for natural lethals by Paik (1960) and Seto (1963).

Table 1. Comparison of autosomal inversions and their locations, that have been found in natural populations of Japan and other countries, as well as in laboratory stocks.

Chromosome	Natural populations in Japan	Natural populations in U. S., Mexico and Hawaii (Warters)	Laboratory stocks (Bridges)
2 L	In(2L)A: 26A-33E In(2L)B: 22D-34A In(2L)K: 22D-26B	In(2L): 22D-34A	In(2L)t: 22D-34D
2 R	In(2R)C: 52A-56F	In(2R): 51D-56F	In(2R)NS: 52A-56F
2 LR	In(2LR)D: 36F-49B		
3 L	In(3L)E: 63A-74C In(3L)F: 66C-71B	In(3L)A: 63B-72E In(3L)B: 66C-70B	In(3L)P: 63C-72E
3 R	In(3R)G: 89D-96A In(3R)H: 92D-100F In(3R)I: 93D-98F In(3R)J: 96E-98F	In(3R)B: 89E-96A In(3R)A: 94C-98F In(3R)C: 86B-92F	In(3R)P: 89C-96A In(3R)C: 92E-100F In(3R)Mo: 93E-98F

Table 2. Types of inversions and their frequencies in Japanese natural populations.

Population	Suyama	Katsunuma	Kofu
Inversion & standard		Frequency (%)	
2L (standard)	84.5	68.0	67.0
In(2L) A	0.5	0.0	0.5
In(2L) B	15.0	32.0	32.5
2R (standard)	100.0	79.0	73.0
In(2R) C	0.0	21.0	27.0
3L (standard)	97.5	89.5	92.0
In(3L) E	2.5	8.5	6.5
In(3L) F	0.0	2.0	1.5
3R (standard)	82.0	61.0	63.5
In(3R) G	2.5	18.0	11.0
In(3R) H	15.5	10.0	14.0
In(3R) I	0.0	11.0	11.0
In(3R) J	0.0	0.0	0.5