

Takada, H. Sapporo University, Japan.
Curtonotidae and Drosophilidae from
Ussuriysk, U.S.S.R.

8 species of drosophilids flies are new to fauna of Eastern Siberia.

Family Curtonotidae
Genus Curtonotum Macquart
Curtonotum anus (Meigen), 1830.
female, July 12, 1984 (by Dr. Ozerov).

Family Drosophilidae
Genus Amiota Loew
Subgenus Amiota Loew
Amiota (Amiota) **rufescens** (Oldenberg), 1914
male, August 11, 1984 (by Dr. Ozerov).

Subgenus Phortica Shiner
Amiota (Phortica) **conifera takadai** Okada, 1977
male, July 7 and female, August 21, 1984
(by Dr. Ozerov).

Genus Leucophenga Mik
Subgenus Neoleucophenga Oldenberg
Leucophenga (Neoleucophenga)
quinquemaculipennis Okada, 1956.
male, July 9, 1984 (by Dr. Ozerov).

Faunistic and taxonomic data of Curtonotidae (Diptera) and Drosophilidae from Dr. A.L. Ozerov, the Zoological Museum, Moscow Lomonosov State University's material collected in Ussuriysk, Ussuri, U.S.S.R., from June 30 to August 31, 1984; of the

Genus Drosophila Fallen
Subgenus Scaptodrosophila Duda
Drosophila (Scaptodrosophila) **coracina**
Kikkawa & Peng, 1938.
9 females and 7 males, June 30 to August 31, 1984
(by Dr. Ozerov).

Subgenus Hirtodrosophila Duda
Drosophila (Hirtodrosophila) **confusa** Staeger, 1844
2 females, July 2 and a male, July 7, 1984
(by Dr. Ozerov).

Subgenus Sophophora Sturtevant
Drosophila (Sophophora) **auraria** Peng, 1937.
male, August 10, 1984 (by Dr. Ozerov).

Subgenus Drosophila Fallen
Drosophila (Drosophila) **testacea** von Roser, 1840
5 females and 5 males, July 5 to August 26, 1984
(by Dr. Ozerov).

Drosophila (Drosophila) **transversa** Fallen, 1823.
2 males, August 21 and 31, 1984 (by Dr. Ozerov).

Thompson, S.R. Ithaca College, New York
USNA. The effect of density on death rates
in Drosophila population cages.

death vials could be the territorial behavior of flies within the cage. For example, flies could establish a particular space or "moving territory" around themselves from which they would keep other flies. The less successful flies would be driven away from desirable space and other resources, and could find themselves in the death vials, space which is not fought over. Flies found in the death vial could be of three types: (1) healthy flies who inadvertently find themselves within the vial and who can escape; (2) moribund flies, those who exhibit erratic, uncoordinated behavior and who cannot escape the death vial; and (3) dead flies. If territoriality plays a role in the movement of flies to the specific death vials, then increasing the cage density should cause an increase in the rate of emigration to death vials. This study examines the effect of increase in cage density on death rates.

Seven-day old adult Oregon-R, equal numbers of males and females, were inserted in population cages (lucite boxes 135 x 110 x 160 mm o.d., on 115 mm supports, screen vented at each end, and fitted with six standard 25 x 95 mm culture vials in two rows), at known densities. All but one of the culture vials contained about 10 ml of a standard cornmeal, molasses, Brewer's yeast, agar medium. The empty vial, which occupied a terminal position, served as a "death vial," and contained a 1 x 4 cm heavy paper strip to ease the departure of healthy flies from the vial. On start-up, flies were made to crawl from clean, empty vials into the cage so that no dead or moribund flies entered the cage. The numbers of dead and moribund flies were enumerated every day for a period of seven days, with a new, clean death vial inserted at each count. Before the death vials were removed for classification, the vials were repeatedly disturbed, "rattled," rotated, etc., to cause relatively healthy flies to leave the death vial. Those flies remaining in the death vial were anesthetized with ethyl ether and classified; moribund flies being those which did not leave the death vial, but which recovered from the ether treatment, and dead flies being those which either did not recover from the ether or which were obviously dead prior to treatment.

Milkman (1975) demonstrated that flies in **Drosophila melanogaster** population cages will preferentially die in empty vials (food cups), if they are provided; such sites were termed "death vials." According to Milkman, one of the causes of emigration of flies to

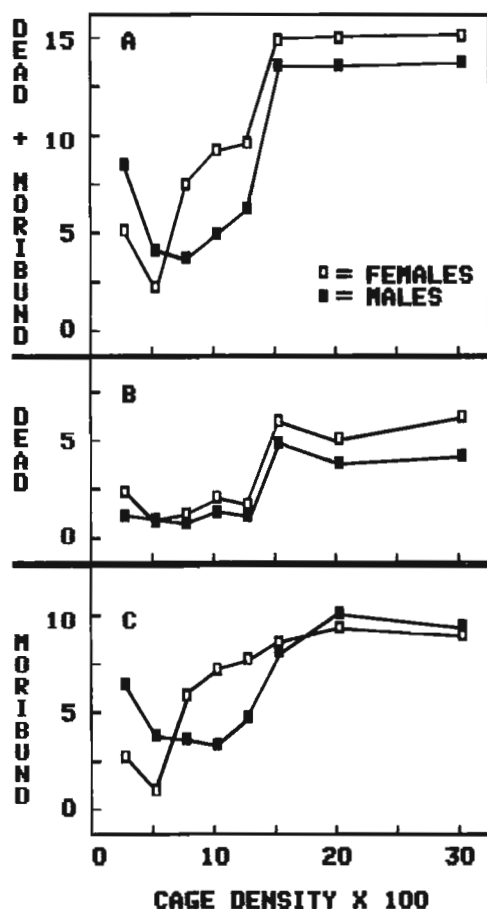


Figure 1. Components of death rate (average %).

The effect of varying cage density on the overall death rate (% dead + moribund) is shown in Figure 1A, where the individual points represent the average of three trials at each density. With the exception of the lowest cage density, 250 flies/cage, increasing density causes an increase in overall death rate up to 1500 flies/cage. At that density, and above, the overall death rate is constant. Females and males differ significantly in overall death rates from 750 through 1250 flies/cage, and at the lowest density, 250 flies/cage, where a very small numerical difference results in a large rate difference. Separation of the two components of death rate into the average % dead and the average % moribund revealed two things. (1) There are two percentage rates of dead flies, one below 1500 flies/cage where there is no significant difference between males (1.33% dead) and females (1.71% dead); and a second rate at cage densities of 1500 flies/cage and above where the average rate for males (4.17%) is significantly different from that of females (5.78%) (see Figure 1B). (2) The sex differences in the overall rate are due to differences in the average % moribund flies below cage densities of 1500 flies/cage (see Figure 1C).

With increasing cage density, two things appear to occur. First, an overall increase in the number of flies emigrating to the death vials at densities up to 1500 flies/cage occurs. Secondly, at high densities, 1500 flies/cage or higher, the rate of emigration to the death vial remains constant, but a much higher percentage of dead flies is found in the death vial. This second event may in part be due to the marked increase in absolute numbers of flies in the death vial, a large increase in numbers could cause physical trampling of weaker individuals resulting in their death. The absolute number of flies in the death vials almost doubles between the densities of 1250 (112 flies in the death vial) and 1500 (212 flies in the death vial) and it is at this point that the % dead increases markedly.

From other studies, we know of several other things which will affect the rate at which flies emigrate to death vials. (1) Different mutants have different rates, mutants which confer poor optimotor behavior usually lead to a marked increase in rate, e.g., the mutant *ebony* (e) has a very high rate. (2) Locomotor activity of flies. Flies with high rates of activity are less likely to be found in the death vial than those with lower rates of activity. In part this accounts for the difference in the male-female emigration rate to the death vial at cage densities between 750 and 1500, as males are more active than females at seven days and apparently escape the death vial more readily. Activity rate may also explain why at low densities (500 or below) more males are found in the death vial; being more active, a male may find himself in such a space, while exploring the cage, and once there may not escape.

Reference: Milkman, Roger 1975, *Biol. Bull.* 148:274-285.

Thompson, V. and L.D. Brooks*. Roosevelt University, Chicago, Illinois USNA; *Harvard University, Cambridge, Massachusetts USNA. A semibalancer system for detecting third chromosome two-arm synthetic lethals in *D.melanogaster*.

To facilitate the detection of two-arm synthetic lethal third chromosomes (synthetic lethals with components in each arm of the metacentric third chromosome), we have developed a "semibalancer" system. It utilizes the old-fashioned third chromosome balancer *Me Sb [In(3L)P In(3R)C, Me Sb e l(3)e]* in combination with structural heterozygosity for the first chromosome balancer *Inscy*. The left and

right arm inversions suppress third chromosome intra-arm recombination while the first chromosome structural heterozygosity increases crossing over in the centromeric region that is free to recombine.