ent to the wild X chromosomes, probably insertions.

All the mutant males found in the experiments described above bred true when crossed to attached-X females and the mutant stocks thus established remained stable in the following generations.

An analysis of salivary-gland chromosomes in one of the lines in which ruby-eyed males sometimes appeared showed that the X chromosome of this line contained a large duplication including the locus of ruby.

Besides the 22 females which produced mutant males in their F_1, the progeny was studied of 102 wild females the F_1 of which consisted only of wild-type flies. In the F_2 of three of these females several yellow males were found and such males continued to appear in later generations of these lines.

The same wild population of D. melanogaster was again investigated in 1938 and 1939 and both times the results closely resembled those of 1937.

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Preliminary studies on the effects of a mercurial fungicide Ceresan on fecundity in D. melanogaster.

It is well known that both life span and fecundity in Drosophila are extremely sensitive to a great variety of direct environmental factors (Lints 1971). Indeed, the activity and the number of ovarioles, in turn fecundity of a fly depend on age, genotype and the conditions to which larvae have been submitted (Gruwez et al. 1971). So, investigations were undertaken to evaluate the effects of a residual mercury fungicide Ceresan on fecundity of D. melanogaster.

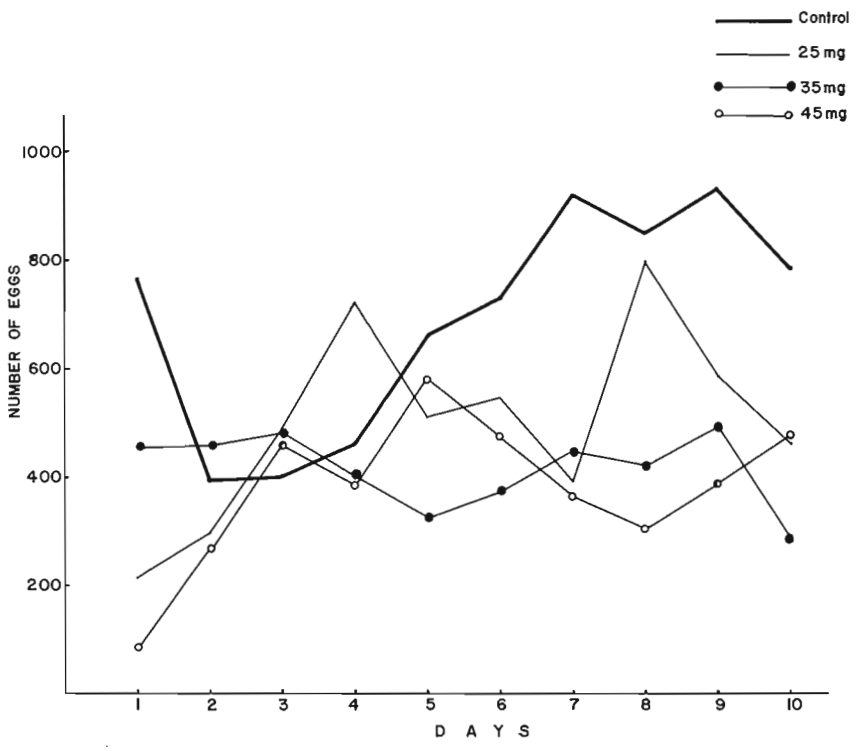

Fig. 1. Egg-laying pattern of Ceresan-treated and control flies.

Ceresan (Universal dry seed dressing; active ingredient: 1% Phenyl mercury acetate, Bayer) in concentrations of 25, 35 and 45 mg was mixed with 100 ml wheat cream agar medium. D. melanogaster flies of Oregon K strain were allowed to lay eggs on this chemical supplemented and normal food media so that the emerging larvae were exposed to Ceresan supplemented and control diets throughout the development. Parents were removed after 3-4 days; virgin flies (males and females) emerging from treated and control food media were isolated, aged for 5-6 days, and pair matings were made. The number of eggs laid by the control and treated flies during the following 10 days were scored. From this data, the pattern of egg laying, total fecundity and mean daily egg production were calculated and presented in Fig. 1 and Table 1.

Table 1. Fecundity of Ceresan treated and control D. melanogaster flies.

Concentrations	Total fecundity	Mean daily egg production/female
Control	6910	34.55 ± 0.23
25 mg	5016	25.08 ± 0.23*
35 mg	3934	19.67 ± 0.22*
45 mg	3736	18.68 ± 0.23*

* $P < 0.05$, by Analysis of Variance.

It is clear from Fig. 1 that, in controls, fecundity suddenly declines after the first day and gradually increases, whereas in different concentrations of Ceresan, egg laying pattern is abnormal and the fecundity is altered day to day, with many fluctuations. An abnormal egg laying behavior was also shown by hens fed with 0.5 ppm mercury, which laid a greater percentage of eggs outside nest boxes compared to controls (Heinz 1976).

Perusal of Table 1 indicates that Ceresan has a significant effect upon fecundity of D. melanogaster. Analysis of variance computed to compare the fecundity of treated flies with that of controls has shown that fecundity is significantly reduced even by the lowest concentration of 25 mg of Ceresan tested ($P < 0.05$). A dose-related reduction in fecundity is also evident from Table 1. Such an effect of mercury on fecundity is also known in other animals (Heinz 1974; Spann et al. 1972).

Ramel and Magnusson (1969), analyzing the genetic effects of mercurial compounds on D. melanogaster, state that "Mercurials given in the food to Drosophila larvae or adult flies obviously reach the gonads, where they cause chromosome disturbances presumably of the similar nature as the ones observed cytologically in plant cells". A chromosome breaking action of mercury has also been shown by Levan (1945). Further, Ramel (1969) also points out that Phenyl mercury causes more chromosome breakage than methyl mercury compounds. Phenyl mercury is also shown to cause somatic mutations, pollen sterility and chromosome fragmentation in plants (Mac Farlane 1950). The authors are of the opinion that chromosome disturbances caused by Phenyl mercury in the gonads and the germinal cells may be one of the major causes for the effects on reproduction in Drosophila.

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Golubovsky, M.D. and I.K. Zakharov. Institute of Cytology and Genetics, Novosibirsk 90, USSR. Simultaneous reversions of two sex-linked unstable mutations.

Since 1973 an outbreak of mutability of singed bristle locus was observed in natural populations of D. melanogaster. Most of the new alleles were unstable and putatively interpreted as insertions (Berg 1974, Ivanov 1974, Golubovsky et al. 1977, Golubovsky 1978). In 1975 in the progeny of one male from a wild Far East population we found a remarkable case of simultaneous appearance of two mutations in the same X chromosome: singed and club wing (clw). In all male progeny the original sn49 allele had strong mutant expression, but club wing phenotype varied in penetrance and clearly was expressed in only 10-11% of males carrying the clw allele (at 25°C). In special tests 225 males with phenotypically normal wings crossed with $\overline{XX}$/Y females produced 1408 club-wing F_1 males out of 13829 tested, or 10.2%. At the same time, males with mutant club-like wings produced 11.7% of club-like sons among 4839 tested. It is evident that the rate of expression of clw phenotype in the progeny does not depend on parental phenotype. Instability of the two mutations was tested in successive generations. We isolated some allelic derivatives of the original sn49 alleles, as stable and unstable (Table 1). The revertants from $sn49^s$ (strong mutant expression) to sn^+ occurred with a frequency of 3×10^{-3}. They had absolutely normal bristles and wings, but some were stable (as $sn49^+$ 1-1), others unstable (1-4 and 7-3) (see Table 1). The last ones in turn were also capable of producing two types of "contra-revertants": (1) with original bi-mutant condition and (2) with mutant singed bristle phenotype and normal wing (clw^+) (as $sn49^s$ 18-1). The moderate sn^m derivaties were discovered to be quite unstable. The total scheme of allelic transitions is given in Fig. 1.