



" A STUDY OF SEX-LINKED POLYMORPHISM IN LABORATORY
POPULATIONS OF DROSOPHILA MELANOGASTER. "

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SUMMARY.

Twelve laboratory populations of Drosophila melanogaster were maintained under constant environmental conditions for over a year, each population containing two of a series of pseudo-allelic sex-linked mutants at the white locus in an inbred background genotype. Regular sampling of adult flies from the cages allowed gene frequency changes to be followed, and tests were made of the hypotheses that random mating and no genetic selection occurred within the populations.

Several of the populations appeared to achieve a stable equilibrium for the sex-linked pseudocalleles, and attempts were made to determine the relative selective values responsible for these equilibria. Two methods of analysis previously developed for data from population cages containing autosomal alleles in competition were modified for application to a sex-linked system. The relative selective values were also calculated directly from the equilibrium gene and genotype frequencies. The analyses yielded conflicting results as to the values of the equilibrium gene frequencies, the magnitude of the relative selective values, and the stability of the established equilibria. Possible reasons for these contradictions are discussed, and criteria suggested for an ideal method of analysis.

Significant heterogeneity was found in all populations

for the sex ratio of different samples from the same cage. The deviations in sex ratio occurred in both directions, and showed no relationship to gene frequency changes in the populations. Further experimental work to elucidate the causes of this phenomenon is suggested.

STATEMENT.

This thesis contains no material submitted for any other degree in any University. To the best of my knowledge, due credit has been given in the text for the authorship of all material published previously by some other person.

3/8/1962.

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