

a potent chemical which attracts the males of the same species. *R. verreauxi*, the only species which has been found on trees, has the best-developed (but non-functional) digestive system; this leads us to suggest that the change in adult feeding habits in this species may have occurred more recently than in the others.

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GENETICS

Sex Ratio in Laboratory Populations of *Drosophila*

LABORATORY populations of *Drosophila* have been widely investigated in recent years, and extensive data are available for changes in the frequencies of alternative genes or chromosomal rearrangements. However, little attention has been given to changes in the sex ratio in such populations.

Twelve populations of *Drosophila melanogaster* were examined in this laboratory, using a modification of the cage designed by Thomson¹. Each population was derived from an inbred line maintained by single sib matings for 14–19 generations.

From each cage a random sample of 300 adult flies was taken periodically to follow changes in the frequency of two segregating sex-linked allelic mutants (white and apricot eye, or white and blood eye), and the proportion of males was also determined.

In 80 of the 229 samples the proportion of males was significantly different from 0.5. There were more significant excesses of males than females, 58–22. For individual cages, the results varied from one significant sex ratio in 21 samples to 18 significant sex ratios in 22 samples. The results for two of the populations are illustrated in Fig. 1, where the proportions of males differing significantly from 0.5 are indicated by small circles.

Heterogeneity of the sex ratio was tested for each population using the Brandt and Snedecor χ^2 test. In all cases a significant χ^2 was obtained, the probability of the χ^2 being 1–2 per cent for two populations and $P < 0.001$ for all other populations. There seemed to be no association between significant departures from a 1:1 sex ratio and either gene frequency or population size,

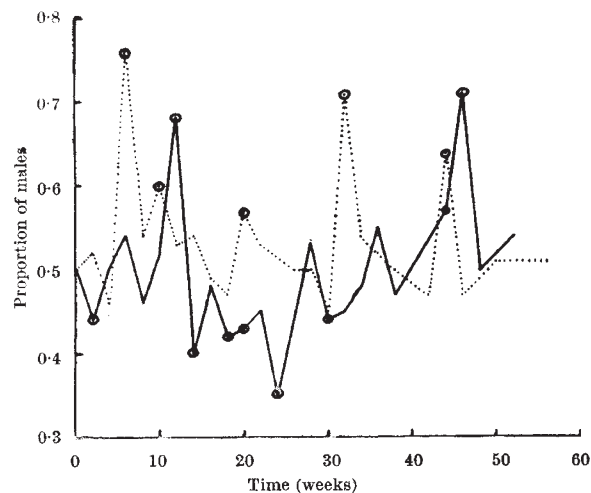


Fig. 1. The proportion of males plotted against time for two of the populations. Readings differing significantly from 0.5 are indicated by small circles

and in consequence it is suggested that this variability in sex ratio should not be limited to populations segregating for these sex-linked mutants.

Most of the published accounts of either large or small laboratory populations record changes in frequency of autosomally inherited characters, and do not present the results separately for the two sexes. Frydenberg² reported the sex ratio in a number of populations of *Drosophila melanogaster* of average size 550. 50 per cent of these showed significant departures from $r = 0.5$, but, as each population was only sampled once, no information is available on variability with time of these sex ratios. A number of investigations of populations with segregating sex-linked genes have reported variable sex ratios, but these have mainly been detected in small populations³ where chance effects might be expected to contribute largely to the extreme sex ratios obtained. Thomson⁴ reported variable sex ratios in large laboratory populations of *Drosophila melanogaster* segregating for sex-linked alleles at the white eye locus. He stated that the excess of one or other sex appeared to be an intrinsic character of each population, but did not indicate whether or not there was heterogeneity of the sex ratio with time.

Thomson's populations were similar to those examined in this laboratory in that each was homogeneous at all loci except perhaps for those closely linked to the white-eyed locus. It is possible that such populations are extremely sensitive to small unavoidable environmental fluctuations, leading to an instability of the sex ratio which would not be observed in a genetically less homogeneous population. This suggestion is now being examined by comparing the variability of the sex ratio in populations of *Drosophila melanogaster* derived directly from laboratory stock bottles with that in populations originating from the same stocks but made homogeneous at all loci. Both wild-type populations and populations homozygous for an autosomal or sex-linked mutant are being considered.

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Difference in the Behaviour of Eu- and Hetero-chromatin: Crossing-over

THE recombination map-length (0.04 per cent) for the heterochromatin of the X chromosome of *Drosophila melanogaster* is far less than would be anticipated from its mitotic bulk (half the chromosome at metaphase) and considerably less than would be estimated from its polytene-length (17 bands of 1,024). An exchange frequency comparable to the euchromatic average for the 66 map units of the X chromosome should result in a heterochromatic map-length of at least 1.6 per cent and possibly as high as 33 per cent, depending on which cytological measurement more closely approximates the actual physical length of X heterochromatin. In order to decide whether this low frequency of crossing-over reflects a basic difference in the exchange behaviour of eu- and hetero-chromatin rather than an over-estimate of the physical length of X heterochromatin, use was made of the ability of autosomal inversions to increase crossing over on the X chromosome, the interchromosomal effect on recombination.

The region between suppressor of forked (*su-f*, 66.0) and non-yellow *Dp(scV1y⁺)* located on the short right arm of the X includes most of the X heterochromatin while the carnation (*car*, 62.5) to *su-f* region includes the euchromatic heterochromatic junction and adjacent euchromatin for comparison. Sisters of the genotype