Milkman, R., R. Zeitler and L. Layfer. University of Iowa, Iowa City. Multiple paternity in cage populations.

Individual D.m. females were removed from a polymorphic cage population and immediately allowed to lay eggs in vials, then genotyped with respect to α-glycerophosphate dehydrogenase, malate dehydrogenase, and alcohol dehydrogenase. For each double or triple homozygote, 20 F_1 progeny flies were genotyped. All 3 loci are on one chromosome, so the occurrence of more than two genotypes in a progeny sample indicates multiple paternity. Frequencies of the fast allele at each of the loci are 0.30, 0.38, and 0.22, respectively.

Nine of forty-five double homozygotes produced progeny with more than two genotypes; five of thirteen triple homozygotes did also. Additional double inseminations can be inferred: the observed certain cases are those where at least one male parent was heterozygous and the other male parent had a genotype differing from that of the first. The observed frequency, then, is equal to the true frequency of multiple mating multiplied by the frequency

Table 1. Number of progenies in each class.

Number of genotypes	Number of loci at which mother is homozygous: 2	3
1	7	1
2s*	27	6
2A*	2	1
3	7	3
4	2	2
Total	45	13

*2s - more common genotype ≤14; 2A - more common genotype >14 of the sample of 20. The 2A progenies may have resulted from sampling, differential viability of chromosomes, meiotic drive, or the participation of two different homozygous male parents.

of fulfillment of the above conditions. For doubly homozygous females, the value of 0.20 (9/45) is corrected to 0.38, and for triple homozygotes, 0.38 (5/13) is corrected to 0.44, the correction being less when more loci are involved. Smaller previous experiments using two loci and flies from different cages suggested that multiple paternity was rare in the populations studied. For this reason, and because culture conditions are quite diverse, the present estimated frequency, about 0.4, is not intended as a generalization. Also, when one of two male parents makes the larger contribution by far in an egg sample, the multiplicity may go undetected.

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The effect of varying the temperature on flies heterozygous for the shibire^{ts-1} allele are summarized in Table 2. This is one of the most extreme of the shibire^{ts} alleles. It may be seen that the dominant effect is evident at lower temperatures but the time required for crippling is increased at lower temperatures.

References: Grigliatti, T.A., L. Hall R. Rosenbluth and D.T. Suzuki 1973, Molec. Gen. Genet. 120:107; Williamson, R. 1971, DIS 46:148.

This work was supported by a Medical Research Council of Canada Fellowship to L.H. and by NRC grant A1764 and NCI grant 6051 to Dr. David T. Suzuki.

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