Mukai, T. North Carolina State University, Raleigh, North Carolina. Spontaneous mutation rates of isozyme genes in D. melanogaster.

Using three second chromosomes collected from a Madison, Wisconsin population, an experiment is being conducted to accumulate mutant genes, after they have been replicated to 150. The mating scheme is Cy/Pm (5 females) x $Pm/+_i$ (1 male) where i indicates line number. All chromosomes carried F alleles at the alcohol dehydrogenase (ADH) locus. A second experiment was initiated using two lethal carrying second chromosomes that originated from an Erie, Pa. population. One of them carried the F allele and the other the S allele at the ADH locus. These chromosomes were each replicated to 500 chromosomes (Total=1000) and 1000 lines were established in the mating scheme: Cy/F 1 x Cy/F 1 and Cy/S 1 x Cy/S 1 [Cy-chromosomes (SM1 chromosomes) carry F gene at the ADH locus]. These lines were maintained by single pair brother-sister matings. In generation 85 for the first group and from generation 37 to generation 39 for the second group, these lines were examined for the ADH alleles and, in addition for the malic dehydrogenase-1 (MDH-1) - Madison only - and α-glycerophosphate dehydrogenase-1 (αGPDH-1) alleles, the loci of which are also located in the second chromosome. The results are described in the following table. Several somatic mutations, which show mutant characters that are not transmissible, were discovered but they were not counted as mutants.

| Material | Erie, Pa. | | | Madison, Wis. | |
|---|---|---|---|---|---|
| Enzyme | ADH | α-GPDH-1 | MDH-1 | ADH | α-GPDH-1 |
| Number of mutants | 0 | 0 | 0 | 1* | 0 |
| Total number of chromosome generations | $\sim 7.4 \times 10^4$ | $\sim 7.8 \times 10^4$ | $\sim 7.4 \times 10^4$ | $\sim 1.2 \times 10^4$ | $\sim 1.2 \times 10^4$ |

*mutations from F to S

So far, a pooled estimate for isozyme mutation rate is $0.4 \times 10^{-5}$/locus/generation, so it would appear that isozyme mutation rates are not higher than recessive lethal mutation rates on a per locus basis. Accumulation of enzyme mutations at these loci is being continued.

Bahn, E. University of Copenhagen, Denmark. Restoration of fertility of the female sterile mutant rudimentary on pyrimidine enriched culture medium.

Nørby discovered (Hereditas: in press) that rudimentary mutants show a pyrimidine requirement for development on a special minimal culture medium. It was, therefore, investigated whether homozygous r♀♀ mated to r♂♂ would respond to enrichment of the culture medium with pyrimidines by showing higher fecundity. Striking results were obtained when pure preparations of cytidine were added to the medium. On a routine basis homozygous rudimentary stocks are now kept without difficulty on a sugar yeast medium with 1% RNA added (Sigma, Ribonucleic acid from Torula yeast, Grade VI). In Table 1 the results are compiled in absolute numbers from the cross $r^{39k}/r^{39k}$ x $r^{39k}$ made on the standard sugar yeast medium with different additaments. In sets of 12 vials, 3 pairs per vial were allowed to lay eggs for 7 days.

Table 1

| Additament | Number of offspring produced males | females |
|---|---|---|
| Control (sugar yeast) | 38 | 61 |
| ½% Orotic acid | 39 | 40 |
| 1% DNA | 30 | 38 |
| 1% RNA | 287 | 461 |
| ½% Cytidine | 1279 | 1072 |

Despite the vast surplus of RNA no effect on the wing phenotype has been observed. These results show, as Counce (DIS 44: 101) concluded from her studies on deep orange, the necessity of clearly defining and carefully controlling the conditions under which studies of female sterility mutants are carried out.