sperm. Manipulation of the shape of the productivity curve through manipulation of culturing conditions should make it possible to test some predictions of the nature of sperm competition, as detailed elsewhere (Gromko in prep.).

References: Gilbert, D.G., R.C. Richmond & K.B. Sheehan 1981, Evolution 35:21-37; Gromko, M.H. in prep., A new model of sperm competition in Drosophila melanogaster; Pyle, D.W. & M.H. Gromko 1978, Experientia 34:449-450.

Guest, W.C. University of Arkansas, Fayetteville. Chlorpromazine delays D. melanogaster larval development.

Chlorpromazine (CPZ) is a widely used tranquilizer that is thought to block dopamine neuroreceptor sites in the brain of vertebrates (Gale 1980) and may act in other ways as well. Dopamine is an intermediate in the synthesis of the tanning pigment sclerotin involved in the molting of insects (Karlson & Sekeris 1966). When D. melanogaster first instar larvae were fed 0.2 mg/ml CPZ in laboratory food pupation was delayed approximately three days. At a concentration of 0.3 mg/ml there was a delay in pupation of five and one-half days although at this concentration only three percent of the larvae survived to pupate.

When second instar larvae were treated with CPZ the delay in pupation increased with the concentration of CPZ. The delay varied from four days at 0.2 mg/ml to seven days at 0.1 mg/ml. There was no reduction in survival at 0.2 mg/ml but at 0.6 mg/ml only 47 percent of the larvae survived and at 1.0 mg/ml there was only a six percent survival rate. When third instar larvae were treated there was a delay in pupation of approximately three days at all concentrations up to 2.0 mg/ml and the percent survival varied directly with the concentration from 80 percent survivaly at 0.2 to 16 percent at 2.0 mg/ml.

There are no reports in the literature on the effects of CPZ on insect larvae. Studies with vertebrates indicates that the drug may interfere with steroid hormone function (Wakabayashi et al. 1980), block dopamine receptors (Gale 1980), as well as decrease membrane permeability (Maoi 1979). Most investigators have indicated that a block in dopamine utilization occurs and this appears to be a reasonable explanation of the action of CPZ in insect development. The availability of dopamine to form sclerotin would have an adverse effect on pupation.

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Gupta, A.P. Instituta Biologica da UFRJ, Rio de Janeiro, Brasil. Molecular evidence for developmental stability in species crosses and backcross progeny of D. pseudoobscura and D. persimilis.

Prakash & Merritt (1972) reported that at the adult acid phosphatase-6 (AP-6) locus, two alleles determining the presence (+) or the absence (-) of the enzyme are found in D. pseudoobscura, but this locus is monomorphic for the absence in the adults of D. persimilis (Prakash 1977). AP-6 is sex linked and the + allele is dominant over the - allele. In D. pseudoobscura, the frequency of the + allele is 30-40% in standard arrangement, whereas this allele is absent in the sex ratio arrangement.

Even though these two species are similar in morphology, they show significant genetic differences. The F_1 males of the species cross are sterile and backcross progeny have very low viability. The sterility in F_1 males is caused by abnormal spermatogenesis. A breakdown of developmental stability in species crosses and backcrosses occurs due to unfavorable interactions of chromosomes from the two species.

The present experiment was designed to examine the level of enzyme activity at the adult acid phosphatase-6 locus in interspecific crosses and backcrosses. Two strains of D. pseudoobscura homozygous for + allele and two strains of D. persimilis homozygous for the - allele were used. Virgin females and males were collected to make F_1's and various backcrosses. The species identity of strains was confirmed by demonstrating the sterility of both classes of F_1 hybrid males. Ten replicates each of parental, F_1's (in both directions) and four backcross classes (only F_1 females could be used for making backcrosses) were reared concurrently at 17.5°C. Fifty individual females from each of the parental, F_1's and various backcross

classes were examined by routine gel electrophoresis. Parental strains of D. pseudoobscura were homozygous for the + allele while the individuals from D. persimilis strains were homozygous for the - allele. On examination of progeny of F_1 females backcrossed to males of D. persimilis, fifty percent of the female progeny were homozygous for the - allele while the remaining fifty percent were +/-. Conversely, all the progeny of F_1 females backcrossed to D. pseudoobscura males were of the + phenotype. This result suggests that the enzyme activity at the acid phosphatase-6 locus is not disrupted in the backcross individuals. This work was carried out at the Museum of Comparative Zoology, Harvard University, and was supported by NIH Grant GM-21179 to Professor R.C. Lewontin.

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Gene dosage compensation in the X chromosome of D. melanogaster: transcription levels in metafemales and metamales and the amount of 6-phosphogluconate dehydrogenase in metafemales.

Studies of transcription activity and protein amounts encoded by X-chromosome genes in D. melanogaster suggest that the X chromosome of males is twice as active as the X chromosome of females (Khesin & Leibovitch 1976; Lucchesi 1977; Stewart & Merriam 1980). All authors agree that the activity of the X chromosome crucially depends on the ratio of the number of X chromosomes to the number of autosome sets (X:A ratio), i.e., the sex index. Yet various groups have come out with different assessments of the relationship between X-chromosome activity and the sex index. Lucchesi et al. have shown the activity of the X chromosome, measured by the incorporation of ^{3}H-uridine in polytene chromosome RNA and by the activity of the enzymes encoded by X-chromosome genes, to be higher in metamales (1X3A) than in diploid males (1X2A) (Lucchesi et al. 1974) and lower in metafemales (3X2A) than in diploid females (2X2A) (Lucchesi et al. 1977). This amounts to a gradual dependence of X-chromosome activity on the value of sex index. By contrast, we have shown (Faizullin & Gvozdev 1973; Ananiev et al. 1974) by similar methods that the transcription activity of the X chromosome is the same in metamales and males and is half that level in the X chromosomes of females and metafemales, as assessed by transcription intensity and the activity of 6-phosphogluconate dehydrogenase

Table 1. Transcription activity of X chromosomes in metafemales, intersexes and metamales.

Sex	Method of analysis: incorporation	Number of grains over X	Number of grains over autosomes	X/A[a)]	1X/1A[b)]	Number of nuclei
Metafemales	of ^{3}H-uridine	5487	17245	0.35±0.04	0.22±0.01	8
(3X2A)	of ^{3}H-NTP	5000	14176	0.35±0.02	0.23±0.01	24
Metamales	of ^{3}H-NTP	6241	34490	0.18±0.01	0.55±0.03	28
(1X3A)						
Intersexes	of ^{3}H-NTP	4164	16821	0.25±0.01	0.38±0.02	20
(2X3Z)						
Females	of ^{3}H-uridine[c)]	-	-	0.24	0.25	-
(2X2A)	of ^{3}H-NTP[d)]	-	-	0.24	0.24	-
Males	of ^{3}H-uridine[c)]	-	-	0.24	0.48	-
(1X2A)	of ^{3}H-NTP[d)]	-	-	0.26	0.52	-

a) = ratio of the number of grains over all X chromosomes to the number of grains over all autosomes; b) = ratio of the number of grains over one X chromosome to the number of grains over one autosome set; c) = data from (7); d) = data from (8). The Table lists mean values ± standard error.