Baird, M.B., H.V. Samis and H.R. Massie. Masonic Medical Research Laboratory, Utica, New York. Changes in Drosophila catalase activity associated with preadult development.

Catalase (EC 1.11.1.6) activity was determined in preadult D. melanogaster at various time intervals after oviposition at 25°C. Ore-R females were permitted to lay eggs on enriched yeast plates for four-hour intervals, following which the eggs were transferred to standard corn meal-agar-molasses medium (1). This technique results in cultures of developing flies which are temporally synchronous within ± 2 hours.

Samples of eggs were collected directly from the yeast plates at the indicated times after oviposition and washed thoroughly with insect saline to remove yeast and media contaminants. Samples of larvae were collected by flotation in 1M NaCl, followed by thorough rinsing with insect saline. Samples of pupae were manually collected from the sides of the culture bottles.

All samples were homogenized in water, and dechitinized by a filtration technique described elsewhere (2). Catalase assays were performed at 22.5°C by modification of the spectrophotometric technique of Price et al. (3), utilizing a Perkin-Elmer 139 spectrophotometer equipped with an externally thermostated constant temperature cuvette chamber. 0.050ml of sample was added to a cuvette containing 3.0ml of 0.02M phosphate buffer, pH 6.8. The cuvette was blanked to zero absorbance, and 0.030ml of 0.98M hydrogen peroxide was added to the cuvette. Helium gas was immediately bubbled through the contents of the cuvette for five seconds, and the disappearance of hydrogen peroxide was recorded at 230 mμ for an additional 30 seconds with a chart recorder. Units of catalase were calculated as described by Lück (4), and protein was determined by the method of Lowry et al. (5).

No appreciable catalase activity was found in Drosophila embryos [Fig. 1]. However,

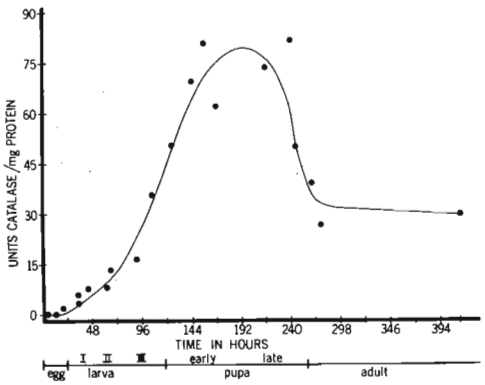


Figure 1. Catalase activity in preadult D. melanogaster at various times after oviposition at 25°C. Data expressed as units/mg. protein, where one unit is that amount of enzyme necessary to liberate half the peroxide oxygen from a hydrogen peroxide solution of given concentration in 100 seconds at 22.5°C.

appreciable enzyme activity appeared during the early larval stages of development, increasing 70-fold to maximal activity during mid-pupal development. This increase was followed by a sharp decline in enzyme activity prior to eclosion.

These preliminary results indicate a stage specific activation (e.g. differential gene action) of those genes in D. melanogaster which code for the normally ubiquitous catalase.

References: 1. Ursprung, H. 1967. In Methods in Developmental Biology (F.H. Wilt and N.K. Wessells, eds), Thomas Y. Crowell, Co., New York, p486; 2. Samis, H.V., Jr., and F.C. Erk. 1969. DIS 44:132; 3. Price, V.E., Sterling, W.R., Tarantola, V.A., Hartley, R.W., Jr., and Rechcigl, M., Jr. 1962. J. Biol. Chem. 237:3468; 4. Lück, H. 1965. In Methods of Enzymatic Analysis (H. Bergemeyer, ed), Academic Press, New York, p885; 5. Lowry, O.H., Rosebrough, N.J., Farr, A.L., and Randal, R.J. 1951. J. Biol. Chem. 193: 265.

Minamori, S. and K. Ito. Hiroshima University, Hiroshima, Japan. Effects of delta on fertility in D. melanogaster.

The ID^b-45 chromosome line usually carries an appreciable amount of delta b, but it is not susceptible to the killing action of this delta (Minamori et. al. 1970). The productivity of this line was examined when it carried various amounts of delta b. More than one-third of Cy/ID^b-45

males and females tested became sterile when they carried cytoplasm of Cy/Pm stock which is considered to carry no delta b. The number of progeny was smaller when flies of this line were raised at 25° C than raised at 28° C at which temperature the multiplication of delta is accelerated. The progeny number was appreciably reduced when the flies were raised at 18° C at which temperature the multiplication of delta is suppressed. This line could not be maintained at that temperature, since both males and females became sterile (Table 1).

Table 1. The number of progeny (average) recovered from Cy/ID^b-45 flies which were raised for successive generations at 18° C

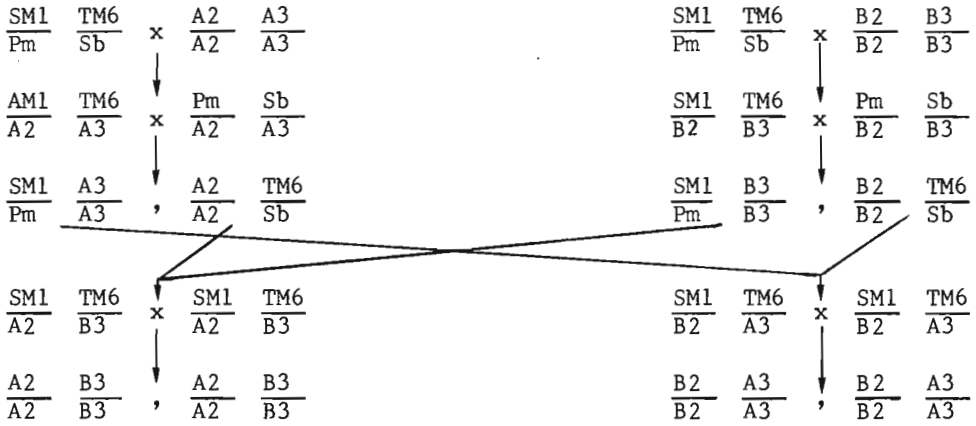
Subline	Raising temperature for progeny (C)	Generations raised at 18° C			
		1	2	3	4
0-9	18°	0	-	-	-
	25°	0	-	-	-
y-9	18°	5.9	15.0	3.4	0
	25°	33.5	0	-	-

Thus, the conclusion drawn may be that the presence of an appreciable amount of delta b is necessary for the gametogenesis of the Cy/ID^b-45 flies.

Reference: Minamori, S., Fujioka, N., Ito, K., and Ikebuchi, M. 1970. Evolution 24: 735-744.

Moree, Ray. Washington State University, Pullman, Washington. A method for the construction chromosomal interchange lines.

The following scheme has been found useful for the construction of chromosomal interchange lines used in heterozygosity studies, where only the 2nd and 3rd chromosomes are interchanged.



A and B designate different wild type stocks; 2 and 3 designate chromosomes 2 and 3. All other chromosomes are those described in Lindsley and Grell (Carnegie Institution of Washington Publication No. 677, 1968) except that TM6, obtained from E.B. Lewis, has a new marker, Ubx^{P15}. Males used in the fourth cross can of course carry Pm instead of SM1 and Sb instead of SM1 and Sb instead of TM6, which sometimes makes this cross easier to set up. The X chromosomes consist of material from the double balancer line, from line A, and from line B in the approximate ratio of 4:1:1, respectively. If lines A and B are made isogenic prior to making the interchanges, then maximum heterozygosity contrasts are possible. (Aided by funds from the State of Washington Initiative Measure No. 171 for the Support of Biological and Medical Research.)