Table 1 (contin.)

N	n*	K	V_1	V_2
		18	0.39002 ± 0.03610	0.42584 ± 0.02954
		24	0.47445 ± 0.03206	0.59281 ± 0.03643
		29	0.61254 ± 0.03290	0.59318 ± 0.04483
40	19	8	0.10161 ± 0.01282	0.12610 ± 0.01833
		16	0.26831 ± 0.02801	0.28024 ± 0.02342
		24	0.40296 ± 0.02798	0.33257 ± 0.03474
		32	0.47619 ± 0.03331	0.49050 ± 0.03612
		39	0.59710 ± 0.02394	0.64023 ± 0.02412
50	16	10	0.14573 ± 0.01596	0.11992 ± 0.01388
		20	0.22489 ± 0.02269	0.23789 ± 0.01761
		30	0.38186 ± 0.02159	0.34837 ± 0.03453
		40	0.47197 ± 0.03047	0.51342 ± 0.02742
		49	0.62752 ± 0.02343	0.57838 ± 0.03744
60	19	12	0.13127 ± 0.01544	0.14540 ± 0.01876
		24	0.24562 ± 0.02005	0.25008 ± 0.01861
		36	0.35685 ± 0.03174	0.38115 ± 0.01816
		48	0.50787 ± 0.01634	0.53117 ± 0.03397
		59	0.59681 ± 0.01882	0.59052 ± 0.01538
70	17	14	0.12178 ± 0.01341	0.10846 ± 0.01586
		28	0.25899 ± 0.01385	0.21884 ± 0.02080
		42	0.35761 ± 0.02267	0.40287 ± 0.02263
		56	0.48298 ± 0.03544	0.52257 ± 0.02168
		69	0.66098 ± 0.02802	0.62936 ± 0.02067

* = number of genetic compositions for each pair of N, K.

References: Wallace, B. 1981, Basic Population Genetics, Columbia University Press, New York.

Nahmias, J. and G.C.Bewley. North Carolina State University, Raleigh, North Carolina USNA. Catalase-specific CRM in flies euploid and aneuploid for the cytogenetic region 75D-78A.

Generation of segmental aneuploids spanning the entire genome of Drosophila melanogaster has demonstrated that polytene chromosome region 75D-78A is the only segment in the genome exhibiting a dosage sensitive response to catalase activity with a hyperploid to euploid ratio of 1.54 (1). This result has suggested that this region is the site for the catalase structural gene, Cat^+. Analysis of catalase turnover rates using the irreversible inhibitor 3-amino-1,2,4-triazole has attributed this dosage effect to a 1.4 fold increase in the rate of enzyme synthesis while the rate of enzyme degradation remains constant (1). In the present study, we report that this dosage effect is also reflected by an analogous increase in the number of enzyme molecules as evidenced by quantitating levels of catalase-specific cross reacting material (CRM) using antiserum from rabbits injected with purified catalase antigen (2).

Segmental aneuploids were generated by crosses between stocks L131 and R153 which carry (Y;3) translocations with autosomal breakpoints at 75D and 78A respectively (1). Male progeny euploid and hyperploid for region75D-78A were homogenized at a concentration of one fly per 10 µl of 10 mM sodium phosphate buffer (pH 7.0) containing 0.1% Triton X-100 and 5 µl were applied to each well of a 1% agarose gel containing monospecific antibodies against catalase (2). Gels were stained for catalase activity and the area underneath each rocket was estimated. The ratio of 3-dose to 2-dose flies obtained was 1.52 (Fig. 1). This result demonstrates that the 50% increase in activity observed in 3-dose vs. 2-dose flies is not attributed to structural modifications of the enzyme molecules but rather to differential rates of enzyme accumulation to the steady state.

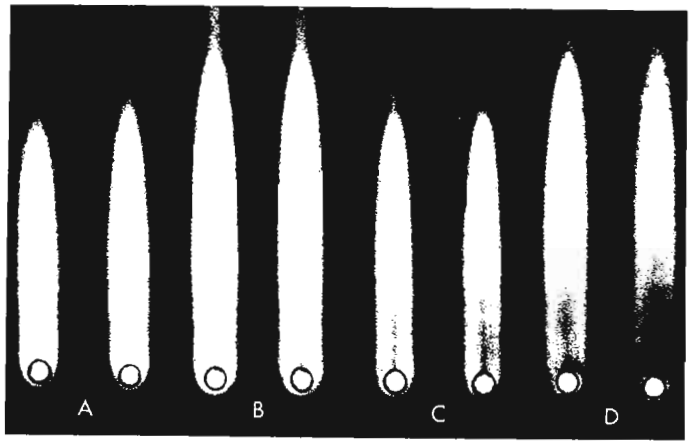

Figure 1. Rocket immunoelectrophoresis of male whole fly extracts bearing 2-doses (A and C) and 3-doses (B and D) of the cytogenetic region 75D-78A. Mean rocket areas ± 1 standard deviation are 258.8 ± 13.9 mm^2 for euploid and 392.9 ± 17.2 mm^2 for hyperploid flies giving a ratio of 1.52.

The data on enzyme levels, CRM levels, and enzyme turnover rate constants all corroborate the notion that the cytogenetic region 75D-78A contains the structural gene for catalase.

Nomenclature Note: There has been some confusion in the literature concerning the gene symbol for catalase and choline acetyltransferase. We have conferred with Jeff Hall on this matter and have mutually agreed that the gene symbol for catalase will remain Cat^+ and that for choline acetyltransferase will be changed to Cha.

References: (1) Lubinsky & Bewley 1979, Genetics 91:723; (2) Nahmias & Bewley 198 , Comp.Biochem. and Physiol. 77B:355.

Najera, C. Universidad de Valencia, Espana.
The maintenance of variability in artificial populations. I. Heterozygotes frequency.

The problem of variability and its maintenance is basic in population genetics.

Considering variability from a selective point of view, one of the several explanatory mechanisms for its maintenance is heterosis (Dobzhansky 1952,1970).

In a previous work the behavior of four eye colour mutants from a cellar was tested against their wild allele from the same cellar, in artificial populations, comparing two culture mediums, one supplemented with alcohol at 10% and the other without alcohol (Najera & Mensua 1983).

Table 1. X^2: Level of significance.

			Without Alcohol		With Alcohol	
2/58A (sepia)	first replica	1° count	1.252	ns	7.429	0.01
		2° count	4.301	0.05	4.657	0.05
		3° count	1.672	ns	8.813	0.005
	second replica	1° count	1.584	ns	18.780	0.001
		2° count	0.111	ns	1.304	ns
		3° count	0.000009	ns	0.092	ns
1/51.3 (Safranin)	first replica	1° count	10.395	0.001	8.562	0.005
		2° count	7.736	0.005	4.149	0.050
		3° count	6.215	0.010	25.169	0.001
	second replica	1° count	10.674	0.001	4.518	0.050
		2° count	3.618	0.050	6.603	0.010
		3° count	5.492	0.025	9.087	0.001
2/54A (cardinal)	first replica	1° count	20.823	0.001	53.760	0.001
		2° count	28.192	0.001	55.370	0.001
		3° count	47.453	0.001	80.606	0.001