Ramamoorthy, C., N.R. Padaki, S. Nirmala Sajjan and E. Krishnamachari. K.L.E. Society's S. Nijalingappa College, Bangalore, India. Mutagenic activity of quinine in D. melanogaster.

Quinine is one of the commonly used antimalarial drugs in India. It has been shown that it forms an intercalated complex with DNA in vitro (cf. Schupbach 1979). But its mutagenicity in higher organisms remains obscure. The mutagenic activity of injectable quinine (each ml contains 0.3 gm of quinine dihydrochloride I.P and 0.01 gm of sucrose I.P, manufactured by Bengal Immunity Co., Ltd., India) is tested in D. melanogaster at different germ cell stages employing "Basc" test for sex-linked recessive lethals.

Two-day-old male Drosophila flies of Oregon-R stock are fed with quinine solution on glass filters for 48 hours following the method described by Vogel and Luers (1974). The brooding pattern (3-2-2) of Wurgler et al. (1977) is followed. The results have been tabulated in Table 1. The data given indicate mutagenic effect of quinine in Drosophila at different germ cell stages. The incidence of sex-linked recessive lethals is significantly very high in Brood 2, which represents the spermatid stage. Detailed work in this direction is in progress.

Table 1. Induction of sex-linked recessive lethals by quinine in D. melanogaster.

	Total no. of chromosomes tested	No. of normal chromosomes	No. of lethals	% of lethals
Brood 1	640	639	1	0.15
Brood 2	640	614	26	4.23*
Brood 3	620	619	1	0.17

Index: Brood 1 = mature sperm stage
Brood 2 = early spermatid stage
Brood 3 = spermatogonial stage

*X^2 = 47.6
P < 0.001

Acknowledgments: The authors are deeply indebted to the Principal, S. Nijalingappa College, Bangalore for his constant encouragement. This work is financially supported by U.G.C., India.

References: Schupbach, M.E. 1979, Mut. Res. 68:41-49; Vogel, E. and H. Luers 1974, DIS 51:113-114; Wurgler, F.E., F.H. Sobels and E. Vogel 1977, Handbook of Mutagenicity Test Procedures, ed. Kilbey et al., pp. 335-373.

Rapport, E. and M.K. Yang. University of Toronto, Ontario, and Simon Fraser University, Burnaby, B.C. Effects of food deprivation on larval amino acid pools.

Experimental manipulations often require that fruit fly larvae be removed from the normal complement of food. We wished to determine the effect of an 8-hour period of food deprivation on the free amino acid pool. Oregon-R larvae 36, 56 or 85 hours after hatching were removed from a yeast seeded cream of wheat-molasses medium. Approximately half the larvae in each age group were placed on paper pulp moistened with water and the remainder were frozen prior to amino acid analysis. After 8 hours, larvae on the paper pulp were also frozen. Amino acids were obtained from supernatants of 80% ethanol homogenates of larvae which had been boiled for 1/2 hour and centrifuged (Rapport and Sing 1971; Rapport and Yang 1974). A Beckman 119 amino acid analyzer was used for quantitative amino acid determinations. Table 1 shows the relative abundance of amino acids in molar percents.

The most striking result is that the relative abundance of alanine diminishes after food deprivation in each age group. It is likely that alanine is deaminated to pyruvic acid for energy metabolism and the amino group is either found primarily as ammonia in the 44-hour larvae or as glutamine in the 64-hour larvae. Other changes less readily interpreted involve a reduction in threonine with "starvation" and an elevation of arginine and a peak identified tentatively as ethanolamine in the two younger age groups. Analysis of the oldest group is complicated by the fact that even under normal conditions feeding is slowing down in this age group as rapid physiological changes occur in preparation for metamorphosis. For example, relative tyrosine levels almost double between 85 and 93 hours and glucosamine was found in the 93 but not 85-hour larvae. The results tend to support the view that certain amino acids like alanine fluctuate in response to physiological stress, perhaps buffering the relative abundance of other amino acids.

Table 1. Percentage (in moles) of free amino acids in Oregon-R larvae at different ages before and after 8 hours of food deprivation.

	36 hr*	36-44 hr H_2O	56 hr*	56-64 hr H_2O	85 hr*	85-93 hr H_2O
Aspartic acid	3.6	1.6	3.4	2.1	2.0	2.4
Threonine	3.3	0.9	3.9	1.7	4.8	2.4
Serine	3.5	2.9	3.1	2.7	2.3	2.2
Asparagine & glutamine	32.9	32.2	30.1	37.1	25.6	27.5
Proline	2.5	3.1	7.6	5.4	12.2	14.2
Glutamic acid	11.5	12.6	8.9	7.8	7.2	9.8
Glysine	4.1	5.1	3.5	3.8	3.5	3.2
Alanine	16.6	5.9	13.3	6.2	10.9	5.6
Valine	1.3	0.8	1.0	0.8	1.0	1.2
Methionine	--	--	--	--	--	0.1
Isoleucine	0.5	0.3	0.3	0.4	0.7	0.7
Leucine	0.7	0.5	0.5	0.6	1.1	1.2
Tyrosine	0.9	0.9	3.4	4.6	7.7	13.3
Phenylalanine	--	0.2	--	0.4	0.6	0.9
β-alanine	3.1	2.3	4.7	3.4	4.6	2.4
Ethanolamine	2.1	5.0	2.3	5.0	0.6	0.3
Ammonia	2.9	11.0	2.2	1.2	2.6	1.6
Lysine	3.1	3.4	4.4	4.0	3.0	2.4
Histidine	4.2	5.3	3.6	6.7	4.6	4.0
Typtophane	0.1	--	0.2	--	0.4	0.3
Arginine	3.2	6.0	3.6	6.2	4.7	4.2

*removed from growth media and immediately prepared for analysis

References: Rapport and Sing 1971, Can. J. Genet. and Cytol. 13:822-833; Rapport and Yang 1974, Comp. Biochem. Physiol. 493:165-169.

Richmond, R.C. and M.E. Claerbout. Indiana University, Bloomington. Ratios in crosses segregating for Esterase 6^o (Null) and Esterase 6^s alleles.

The presence of a null allele at the esterase 6 locus in D. melanogaster was first described in these pages (Johnson et al. 1966). These investigators examined segregation ratios in crosses of Est 6^s/Est 6^o x Est 6^o/Est 6^o and Est 6^s/Est 6^o x Est 6^s/Est 6^o. In both cases a significant deficiency of the Est 6^o/Est 6^o genotype was found. This result suggests that the Est 6 locus has an important function which is expressed during the development of flies. These data are suspect, however, since the stock homozygous for the Est 6^o allele apparently also carried car. We repeated this analysis using esterase 6 stocks which do not carry morphological markers. Our data show no significant deviation from mendelian expectations.

Stocks homozygous for the Est 6^s and Est 6^o alleles were obtained by crossing a sc ec cv ct^6 v g^2 f/FM3 y^{31d} sc^8 dm B l strain which is also homozygous for a null allele of Esterase C to a car strain which is homozygous for Est 6^o. F_1 females from this cross were mated to TM3(Sb)/Pr males to begin the series of crosses necessary to extract recombinant third chromosomes. This procedure is summarized on the following page and allowed us to produce four different types of strains each homozygous for the following combinations of alleles at the esterase 6 and esterase C loci: 6^oC^+, 6^+C^o, 6^oC^o, 6^+C^+ (+ = active allele). These stocks contain no morphological markers.

Approximately 200 #3 crosses were made and strains that proved to have identical Est 6 and C genotypes were combined. Crosses made to determine segregation ratios utilized the 6^oC^+ and 6^+C^+ combined stocks.