The strains used were a yw strain of melanogaster and a v strain of simulans, both obtained from J.S.F. Barker. When equal numbers of young adults (1-3 days old) were introduced simultaneously to half pint bottles, 90.4% of the progeny were melanogaster. But if simulans was given a two-day head start, 50.8% of the progeny were melanogaster. As a result an extensive experiment using vials was set up giving simulans a two-day head start at three different parental proportions and two parental densities. The results are summarized in Table 1 and show a strong degree of frequency dependence. When there was a high percentage of melanogaster parents (87.5%), the percentage of melanogaster progeny was reduced to 72.7 and 80.0% at the low and high parental densities, respectively. At a low percentage of melanogaster parents (12.5%), the percentage of melanogaster progeny increased to 26.7 and 26.3%. With equal numbers of parents from both species, there was a decrease in melanogaster (to 42.0%) at the low parental density and an increase (to 60.2% at the high parental density.

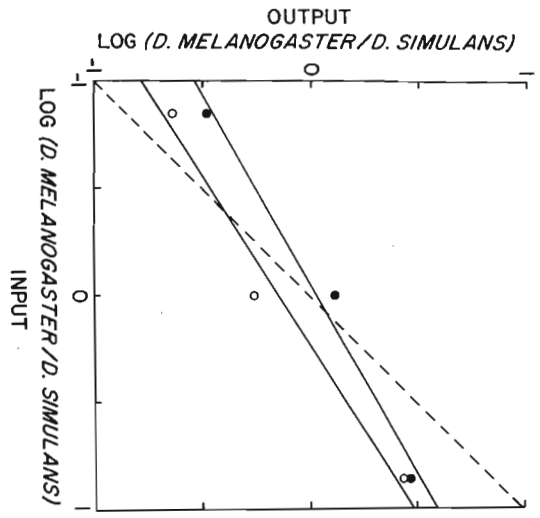

Fig. 1. The linear regression of the log input ratio on the log output ratio for 16 pairs of parents (closed circles) and 32 pairs (open circles). The broken line indicates a regression coefficient of one.

Another interesting aspect of these results was the increase in the number of progeny in pure cultures and the decrease or maintenance of numbers in the mixed cultures from the low to high parental density. As a result, a de Wit diagram analysis indicated facilitation at the low density and interference at the high density between the two species.

The data can also be examined using a ratio diagram (Fig. 1). The linear regressions of both parental densities are significantly less than one (.56 and .64), the condition indicative of a stable equilibrium. The percentage of melanogaster at equilibrium calculated from the ratio diagram is 44.8% at the low density and 60.3% at the high density, indicating that the equilibrium may be density dependent.

Reference: Ayala, F.J. 1971 Science 171:820-824.

Fleming, C. and F. DeMarinis. Cleveland State University, Cleveland, Ohio. A comparative study of electrophoretic protein patterns of the hemolymph of Bar series.

Amides in general, $-CONH_2$, and glutaramide specifically, $NH_2CO(CH_2)_3CONH_2$, when added to the media modify Bar to wild type eye (S. Kaji 1954, DeMarinis and Sheibley 1963). Later it was proposed that this effect could be explained best on the basis of the operon hypothesis, a modified form of Jacob and Monod model (DeMarinis and Sheibley 1965). In this case the amides act as derepressing agents during the sensitive period of Bar, thus permitting the double operon of Bar (wild type having a single operon) to operate as a wild type. This hypothesis gives us much promise in that it explains many facts of Bar that could not be explained before. Therefore, in line with this operon concept of Bar we have initiated a series of investigations in effort to test the validity of this hypothesis.

The present line of investigation describes the protein bands of the larvae hemolymph of Bar (B), double Bar (BB), double infra Bar (BiBi) and reverted Bar (wild type). The larval period investigated was between 60-74 hours. Test samples were taken at two-hour intervals, at 62, 64, 66, 68, 70, 72, 74-hour. This range includes the pre-sensitive and sensitive period of Bar (DeMarinis and Sheibley 1965). The age of the larvae were determined from the initial hatching period. Twelve male larvae were used for each test sample. The larvae were ruptured gently and the hemolymph collected was immediately stored at -60°C until ready for

use. The electrophoretic procedure was carried out with a Bionix Microelectrophoresis apparatus described by Pun and Lombroso, 1964. 80 microgram sample was used in each test. The resulting acrylamide gel patterns were observed and measured against an illuminated yellow gelatin filter (#15 G. Kodak). The pattern of the bands were followed during the developmental period between 60-74 hours. Some 21 different protein bands were identified. Fourteen of these were major bands which we designated as A through N. Bands A, C, J, K, L, M, N developed a complex of subbands at different times of development. Tables 1 and 2 summarize some of the main differences found in bands D and G. Table 3 shows some of the main differences observed in C-band complex. See Figure 1.

These preliminary observations show that a number of proteins change continuously during the larval developmental period. Distinctive protein difference can also be observed between members of the Bar series and wild type. Further differences are observed between control larvae and those treated with glutaramide. The disappearance of bands D and G in the treated larvae and the appearance of new bands in the C-complex of the experimental group during the Bar sensitive period may be related to the multiple effect of turning on the double operon of Bar, as hypothesized by DeMarinis and Sheibley (C.S.AV, Czech. Acad. Sci., 1966, p. 303).

Table 1. Occurrence of protein band D in the hemolymph of the male larvae during the period between 60-74 hours.

Genotypes	Number of larvae used	Control	Experimental
+	12	strong thin band	light thin band
B	12	strong thin band	missing
BB	12	strong thin band	missing
BiBi	12	strong thin band	missing

Table 2. Occurrence of protein band G in the hemolymph of the male larvae during the period between 60-74 hours.

Genotypes	Number of larvae used	Control	Experimental
+	12	heavy band	light band
B	12	light band	missing
BB	12	light band	missing
BiBi	12	heavy band fades out by the 68th hour	missing

(Table 3 on next page)

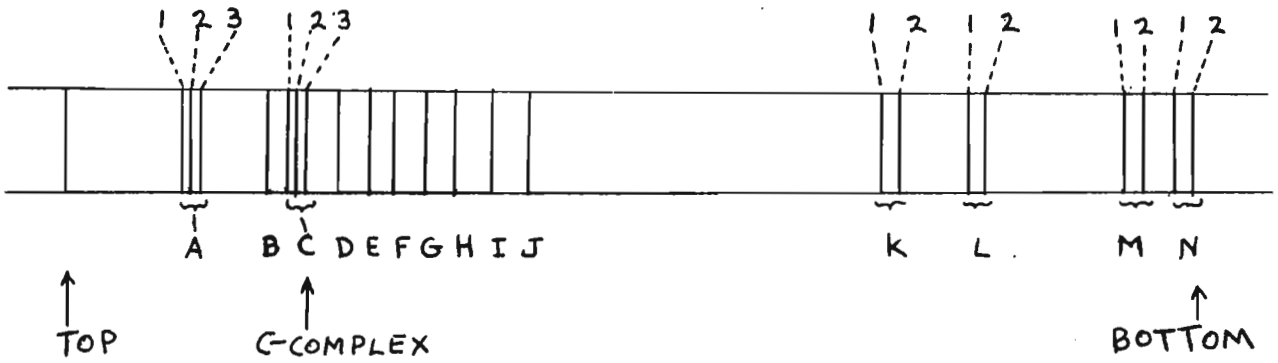

Figure 1. Protein bands identified in hemolymph of male larvae of the Bar series and wild type between ages 60-74 hours.

Table 3. Protein band changes in the hemolymph of male larvae between 60-74 hour period in band C-complex. Exp. = treated with 2.5% glutaramide for one hour.

Ages	Genotypes: +						B						BB						BiBi					
	Contr.			Exp.			Contr.			Exp.			Contr.			Exp.			Contr.			Exp.		
	C_1	C_2	C_3	C_1	C_2	C_3	C_1	C_2	C_3	C_1	C_2	C_3	C_1	C_2	C_3	C_1	C_2	C_3	C_1	C_2	C_3	C_1	C_2	C_3
60	-	-	-	-	-	-	-	-	-	-	+	+	-	-	+	±	+	+	-	-	d	-	-	d
62	single diffuse band			-	-	-	+	-	+	-	+	+	-	-	-	±	+	+	-	-	d	-	-	+
64	single diffuse band			-	-	-	-	-	+	-	+	+	+	+	+	±	+	+	-	-	+	-	+	+
66	single diffuse band			+	+	+	+	+	+	-	-	+	+	+	+	+	+	+	-	-	+	-	-	d
68	single diffuse band			+	+	+	-	-	-	-	-	+	+	+	+	+	+	+	-	-	+	-	-	-
70	single diffuse band			-	-	-	-	-	+	-	+	+	-	-	-	-	+	+	-	-	+	-	-	-
72	single diffuse band			-	-	-	-	-	+	-	+	+	-	-	±	-	+	+	-	-	+	-	-	-
74	single diffuse band			+	+	+	-	-	+	-	+	+	-	-	±	-	+	+	-	-	+	-	-	d

+ Denotes distinct band
± Denotes less distinct band
- Denotes absence of band
d Denotes diffuse band

Minamori, S. and K. Sugimoto. Hiroshima University, Hiroshima, Japan. Production of delta-retaining sensitive chromosomes by EMS in D. melanogaster.

The extrachromosomal element denoted by delta has a virus-like nature in killing host and damaging host chromosomes, and is retained steadily by a specific second chromosome line symbolized by S^b, S^r or ID^b (S^b, sensitive to killing action of delta b, but not to delta r; S^r, sensitive to delta b and r; ID^b, insensitive to delta b and r). The association between the chromosomes and delta is inseparable. In earlier reports (Minamori 1969, 1971), it was assumed that delta may be a copy of a chromosomal gene or of a certain agent integrating inseparably into the chromosome. These alternative hypotheses were examined by the following experiment.

Cy-heterozygous males for an insensitive second chromosome, I-521, which retains no delta were fed with 0.025M solution of ethyl methane sulfonate (EMS, alkylating mutagen; cf. Lewis and Bacher 1968) for 24 hours, and then crossed with Cy/Pm females for two days. Single Cy/I-521 sons of this mating were crossed with Cy/bw^D females (bw^D-chromosome is S^b, retains delta b), and the mortality of the I-521/bw^D progeny was checked. Five out of 1970 chromosomes (I-521) tested were sensitive, although no sensitive chromosome was obtained in the control (0/1733). Among the five, four chromosomes were S^b and one was S^r. These lines were maintained in the heterozygous condition for Cy-chromosome at 25°C. At the tenth generation after establishment, each line was tested for delta - retention by mating females with Cy/S^r-20 males. All the four S^b lines carried delta b, and the S^r line carried delta r. These findings indicate that delta-retaining sensitive chromosomes are inducible by mutation, and lead to the interpretation that delta may be a product of a chromosomal gene, but not a copy of integrating agent.

References: Lewis, E.B. and F. Bacher 1968 DIS 43:193; Minamori, S. 1969 Japan. J. Genet. 44:347-354; _____1971 Japan. J. Genet. 46:169-180.