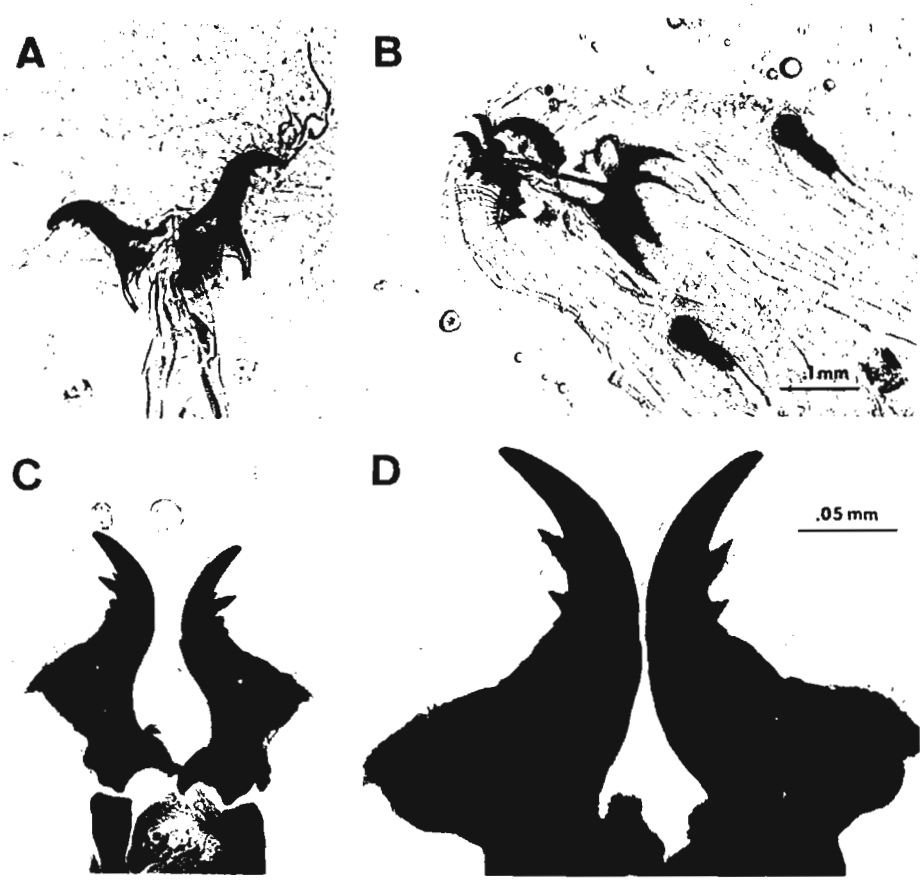

Figure 1. Larvae were squashed between a slide and a coveslip in a drop of water and viewed under a Zeiss microscope. **A,**. First instar larvae. **B,**. Transition from first instar to second instar. **C,**. Second instar larvae. **D**, Third instar larvae. A, C and D at a magnification of 400×, B at 160×.

spiracles showed finger-like papillae. Eight days after hatching, pupariation began, and five days later began eclosion. The shortest life cycle from egg to adult was 14 days at 23°C.

References: Bodenstein, D., 1950, In: *Biology of Drosophila.* Demerec M. (ed.), JohnWiley and Sons, p. 275.

Kosuda, Kazuhiko, and Akira Sekine. Biological Laboratory, Faculty of Science, Josai University, Sakado, Saitama, Japan 350-02. The viability reduction as a correlated response to selection for body weight in *Drosophila melanogaster*.

Artificial selection experiments for light and heavy adult body weight in *Drosophila melanogaster* were carried out for eight generations. The egg to adult viability was also examined as a correlated response to selection for body weight. It was shown that the genetic variations which decrease and increase body weight have deleterious effects on viability.

Flies from a natural population in Katsunuma, Yamanashi, Japan, were used for the present selection experiment. Two replicate selection lines were made in both directions (HA and HB for high lines and LA and LB for low lines). Random samples of 50 virgin female and male flies were taken and maintained in yeast-sugar-molasses medium separately for two days. Then they were weighed at the age of two days old every generation. Five pairs of females and males with the extreme body weight were selected for parents of the next generation in each selection line. These selected flies were transferred to fresh vials with the medium every one or two days in order to avoid a high larval density. These selection procedures were repeated for eight successive generations. The control line was also maintained from five pairs of flies which were randomly taken each generation.

For measuring the egg to adult viability, the following procedure was employed. A glass slide with culture medium on its surface was inserted into a large plastic vial. Female and male flies from each line were put together into the vials and were allowed to lay eggs. After several hours, portions of the medium with 50 eggs were transferred to

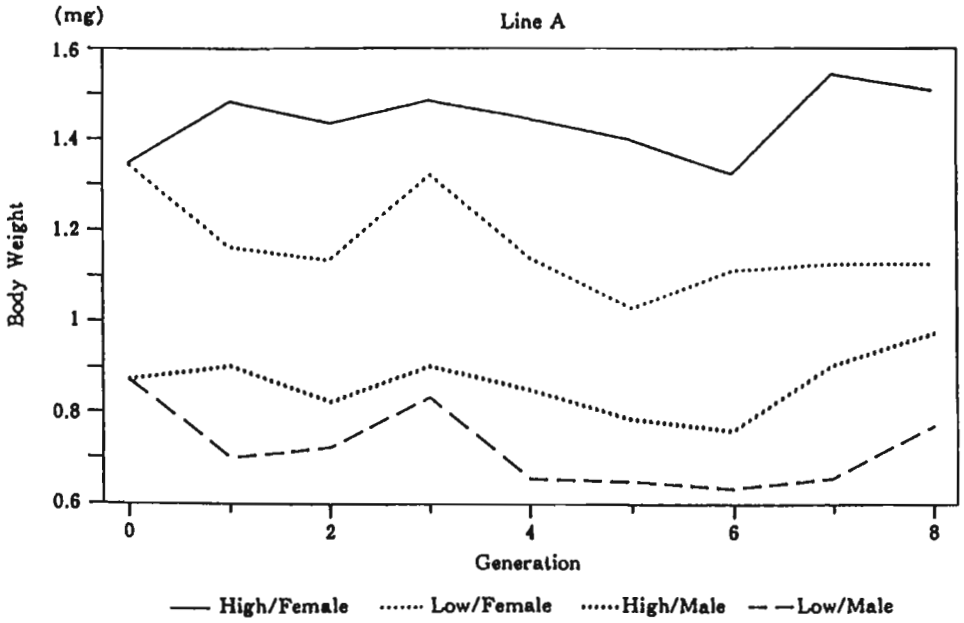

Figure 1. Selection for body weight in the line A.

culture vials. Eclosing flies from these vials were completely counted after 10 to 14 days and the proportion of emerged flies was used as a measure of egg to adult viability. About 20 replicates were made for each measurement.

Experimental results are graphically given in Figures 1 and 2. It should be noted that responses to selection in the line B in both directions was much greater than those in the line A both for female and male, although they are replicate selection lines. The reason for this difference between two replicates is not clear. These figures also show that the selection response in females was remarkably larger that males. The realized heritability was estimated to be 0.17-0.22.

Egg to adult viability was examined as a correlated response to selection for body weight. The viability in the original line was high at 0.899. The linear regression of egg to adult viability on generation did not significantly differ from 0 in the control line ($Y = -0.0063X + 0.914$, $t_3 = 8.63$, $P > 0.05$). On the other hand, it was smaller than 0 in four selection lines without exception. The highly significant regression line of $Y = -0.0346X + 0.920$ was obtained for all selection lines ($t_{26} = 5.37$, $P < 0.001$). Egg to adult viability in the line HB at generation eight was only 0.369. These

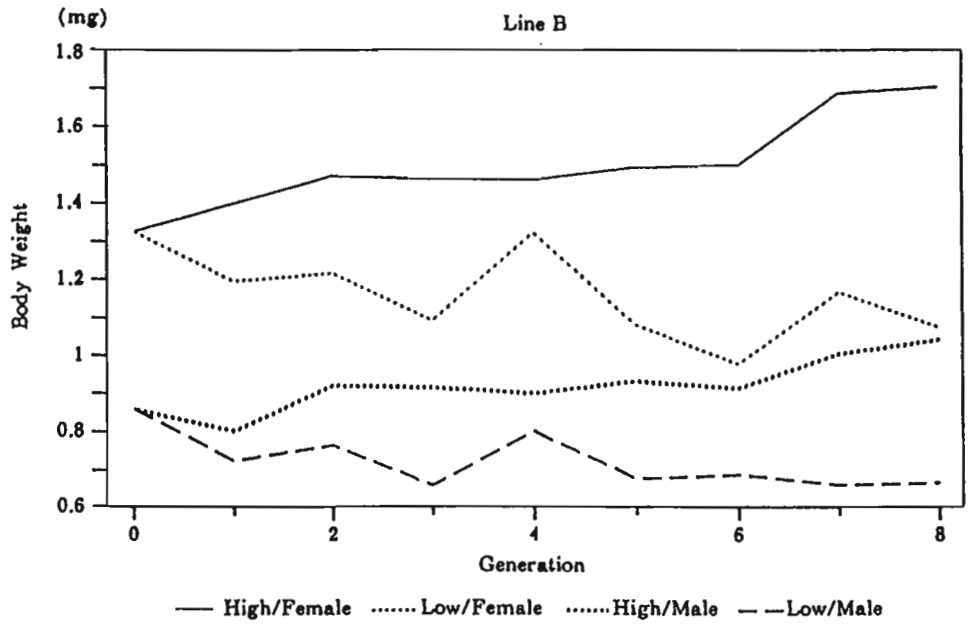

Figure 2. Selection for body weight in the line B.

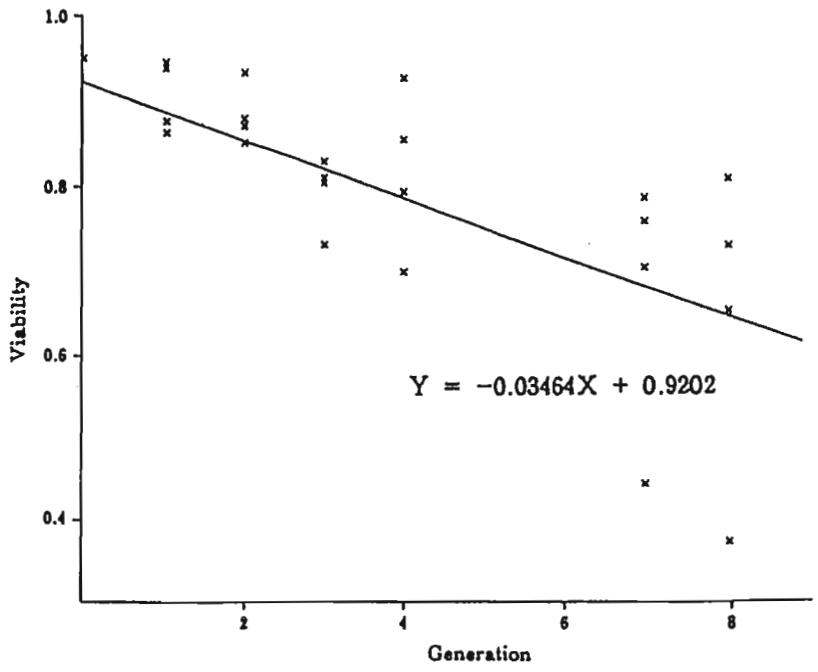

Figure 3. Regression line of viability on generations in selection lines.

facts imply that the artificial selection for light and heavy body weight has deleterious effects on egg to adult viability and suggest the existence of the stabilizing selection for body weight in *D. melanogaster*.

Regner, L.P.,[1] A. Zaha,[2] E. Abdelhay,[3] and V.L.S. Valente[1]. [1]Departamento de Genética, Instituto de Biociências, Universidade Federal do Rio Grande do Sul (UFRGS). Caixa Postal 15053, CEP 91501 - 970. Porto Alegre, RS, Brazil; [2]Departamento de Biotecnologia, 1. Biociências, UFRGS, CEP 91501 - 900 Porto Alegre, RS, Brazil; [3]Laboratório de Biologia Molecular, Instituto de Biofísica, Universidade Federal do Rio de Janeiro (UFRJ). CEP 21949 - 900. Rio de Janeiro, RJ, Brazil. *P* elements in natural populations of *Drosophila willistoni* from different geographical origins.

The present study involved a screening of several strains of *Drosophila willistoni* from different places of its geographical distribution, analyzed by Southern blot for the presence of *P* elements.

Drosophila willistoni is among the most abundant drosophilid species inhabiting the hot, humid South American forests, with a wide Neotropical distribution extending from Mexico and Florida to North Argentina and from the Atlantic to the Pacific Oceans (Ehrman and Powell, 1982).

P elements have been shown to be widely distributed in this species, as well as in several others of the subgenus *Sophophora* (Lansman *et al.*, 1985; Daniels and Strausbaugh, 1986; Daniels *et al.*, 1990; Kidwell, 1994). It has been noticed that virtually all strains of *D. willistoni* studied show the presence of *P* elements, in contrast to *D. melanogaster*, where strains may (P strains) or may not (M strains) have the complete *P* sequences.

Molecular analysis of *D. melanogaster P* elements has permitted the identification of two structurally distinct types: complete elements and defective ones (O'Hare and Rubin, 1983). The complete *P* elements are 2.9 kb in length and encode two known polypeptides. Depending on the pattern of pre-mRNA splicing, a complete element may produce a transposase or a transposition-repressor protein (for a review, see Rio, 1990). Defective elements are deletion-derivatives of complete ones, and have lost their capability to encode transposase themselves but can be mobilized if a source of transposase is provided to them. It has been suggested that some truncated forms of transposase produced by internally deleted elements can act as negative regulators of transposition in *D. melanogaster* (Black *et al.*, 1987; Robertson and Engels, 1989).