Armstrong, C.E. Howard University, Washington, D.C. A thermostability study of octanol dehydrogenase isozymes in D. metzii and D. pellewae.

Following the study of octanol dehydrogenase (ODH) of D. melanogaster by Ursprung and Leone (1965) and Courtright, Imberski, and Ursprung (1966), this enzyme has been the object of extensive developmental and genetical analysis in the sibling species D. metzii, D. pellewae (Pipkin 1968, 1969 in press), and D. albirostris (Ogonji, this issue of DIS). To this date little work has been done on the characterization of ODH isozymes. This report describes the first in a series of experiments to characterize the ODH isozymes of D. metzii and D. pellewae.

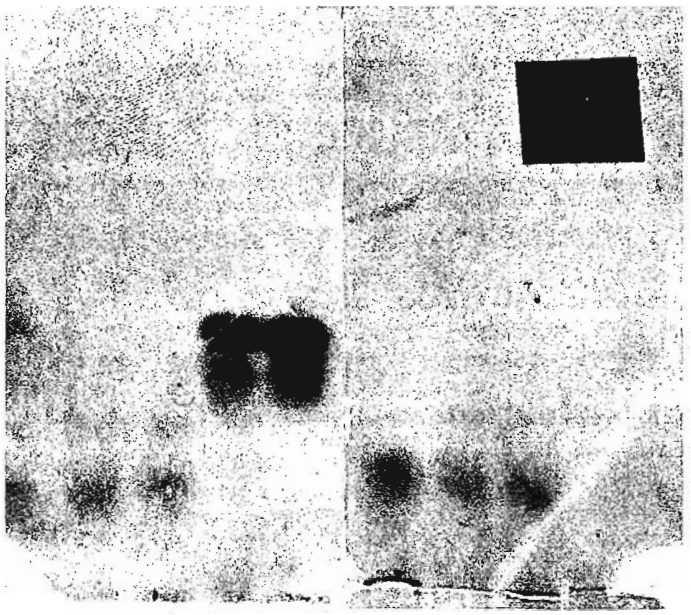

Fig. 1. Left, control ODH isozymes of homogenates of six day old adult females of true breeding D. metzii and D. pellewae strains; right, gel treated with 55°C for 35 minutes shows only the #1 isozyme still enzymatically active.

Differences in the thermostability of certain ODH isozymes separated by agar gel electrophoresis have been found in the crude homogenate obtained from four virgin females aged for six days, derived from eight different strains of D. metzii and D. pellewae. Known isozymic patterns of these experimental strains have been altered by timed exposure to high temperature ranges.

Experimental results have shown that the maximum thermal range of all the ODH isozymes was 55°C with a forty minute exposure time. At the same temperature, however, with a 35 minute exposure time, isozymes located at positions 1 and 2 were found to be heat stable and isozymes located at positions 3,5,6, and 7 were found to be heat labile (Fig. 1). No detectable difference in thermostability of isozymes at positions 3,5,6, and 7 has been observed. It is also noted that the thermal studies on third stage larval isozyme patterns agree with the results found in the adults.

The absence of a difference in the heat stability of isozymes at positions 3,5,6, and 7, and the finding of such a difference between the number 1 and 2 isozymes and all the other isozymes is in agreement with the duplicate gene hypothesis as outlined by Pipkin (1969 and her Fig. 1, this issue DIS).

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References: Courtright et al, 1966, Genetics 54: 1251-1260; Ogonji, G. 1969, DIS (this issue); Pipkin, S.B., 1968, Genetics 60: 81-82; Pipkin, S.B., 1969, Genetics (in press); Ursprung et al, 1965, J. Exptl. Zool. 160: 147-154.

Lim, J.K. Wisconsin State University, Eau Claire, Wisconsin. A selective system for testing reversibility of the sex-linked recessive lethals carried in males.

A genetic selection system for quick detection of apparent reverse mutations of the sex-linked recessive lethals utilizing the special Y-chromosomes and the attached X-chromosome has been tested. The results from a preliminary test indicate that the system works well in practice. Each of the sex-linked recessive lethals located at the proximal end and at the center of the X-chromosome, near the v locus, was made self-maintaining in males as follows:

lethals at the proximal end of the X-chromosome

y f:=/y^+·Y·ma-l^+ and l/y^+·Y·ma-l^+