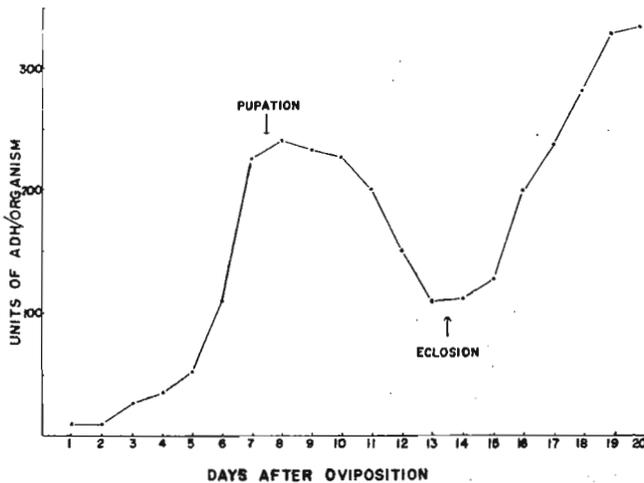


Imberski, R.B. and C. Strommen. University of Maryland, College Park, Maryland. Developmental changes in alcohol dehydrogenase activity in *Drosophila hydei*.

same as reported by Berendes, except that the flies were reared on "Instant *Drosophila* Medium" (Carolina Biological Supply Company). Cultures were started by placing 3-4 week old adults



The activity of alcohol dehydrogenase (ADH) has been determined at specific times of development and adult life in *D. hydei*. A wild-type strain derived from a stock described by Berendes (1965) was studied. The method of synchronizing development and staging was substantially the same as reported by Berendes, except that the flies were reared on "Instant *Drosophila* Medium" (Carolina Biological Supply Company). Cultures were started by placing 3-4 week old adults into fresh food containers for a period of 2 hours. Offspring were then collected at 24 hour intervals following oviposition for a period of 480 hours. A constant temperature of 25°C was maintained throughout this time. Preparation of homogenates and assay for ADH activity was accomplished by the methods of Ursprung, Sofer and Burroughs (1970).

The pattern of change in ADH activity shown on the figure approximates that reported by Ursprung et al. (1970) for *D. melanogaster*. However, in *D. hydei* we observe a slower rate of decrease in ADH activity following pupation. At the mid-point of pupal life the level of activity is approximately 75% of the difference between maximum and minimum values, whereas in *D. melanogaster* the level of ADH activity is

close to the minimum at the corresponding time. Following eclosion ADH activity increases for at least 6 days, reaching values higher than the peak at the time of pupation. Dunn, Wilson and Jacobson (1969) report similar findings in *D. melanogaster*. During this period of increase in the adult, changes in isozymic forms of ADH have been observed in both *D. melanogaster* (Dunn, et al.) and in *D. hydei* (Imberski, 1971).

References: Berendes, H.D. 1965 *Chromosoma* 17:35-77; Dunn, G.R., T.G. Wilson and K.B. Jacobson 1969 *J. Exp. Zool.* 171:185-190; Imberski, R.B. 1971 *Isozyme Bull.* 5:48; Ursprung, H., W.H. Sofer and N. Burroughs 1970 *W. Roux' Arch.* 164:201-208.

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Korochkina, L.S. Institute of Cytology & Genetics, Siberian Branch Academy of Science of USSR, Novosibirsk, USSR. Change of the ring gland in post-natal development of *Drosophila melanogaster* Canton S and in l(2)gl mutant.

On permanent total preparations of the ring gland of *Drosophila melanogaster*, a study was carried out of the changes of cells and nuclei cell number and volume in peritracheal gland and corpora allata for 3 larval ages in the strain Canton S. The characteristics of the age groups are given in Table 1.

In the larvae mutant for the l(2)gl gene, the condition of the ring gland was studied at the end of the 3rd larval age, and in the larvae which had survived 20-24 hours at larval stage (Table 2).

The cell number of the ring gland throughout 3 larval ages is unchanged and maintained at the level of 45-55 cells in the peritracheal gland and 18-25 cells in corpora allata.

The volume of nuclei and cells in both glands at the 1st two ages, as seen in Table 1, increases simultaneously, so that the ratio between the mean volume of nuclei and cells of the peritracheal gland, and the corresponding volume in corpora allata remains constant. However, at the period of the 3rd larval age the volumes of cells of peritracheal gland increase sharply, while the cells of corpora allata almost reach their maximal size by the end of the 2nd larval age and change very little during the 3rd larval age. In this connection, peritracheal cells begin to occupy predominant volume in the total structure of the ring gland.

In larvae heterozygous for  $l(2)gl$  gene, the volume of peritracheal gland and corpora allata cells does not differ from those in normal larvae (Table 2). The larvae homozygous for this gene, phenotypically we divided into 2 groups: the 1st group which formed gigantic larvae, and the 2nd group which did not form gigantic larvae. In both groups of homozygous larvae,

Table 1. Size of ring gland in  $u3$  in *Drosophila melanogaster* (Canton S) during post-embryonic development.

stage	gland	volume nucleus	volume cells	peritr. gland CA ratio (nuclei)	peritr. gland CA (cells)
1st larval stage 1-24 hours	peritr.	150 ± 16	610 ± 90	2, 1:1	2, 6:1
	CA	70 ± 4	234 ± 4		
2nd larval stage 24-72 hours	peritr.	550 ± 60	2100 ± 190	2, 4:1	2, 5:1
	CA	230 ± 40	840 ± 96		
3rd larval stage 72-90 hours	peritr.	2500 ± 186	8800 ± 1416	9, 6:1	9, 7:1
	CA	260 ± 53	900 ± 76		
4th larval stage 90-120 hours	peritr.	3785 ± 272	12710 ± 1096	13, 7:1	10, 4:1
	CA	275 ± 16	1220 ± 86		

Table 2. Size of ring gland in homo- and heterozygous  $l(2)gl$  mutants of *Drosophila melanogaster* at the 3rd larval stage, in  $u3$ .

larva type	gland	nucleus volume	cell volume	peritr. nucl. CA nucl. ratio	peritr. cells CA cells ratio
heterozyg. end of the 3rd larval stage	peritr.	4300 ± 356	14770 ± 1366	14, 8:1	11, 0:1
	CA	290 ± 16	1350 ± 98		
1st group homo- zyg. (gigantic larvae)	peritr.	1600 ± 201	5760 ± 779	4, 4:1	4, 8:1
	CA	360 ± 16	1200 ± 85		
2nd group homozyg.	peritr.	1400 ± 107	4800 ± 380	10, 7:1	8, 6:1
	CA	130 ± 7	560 ± 63		

there occurred a sharp decrease of volume of peritracheal gland cells (Table 2); however, the condition of corpora allata was different. In the 1st group, CA cells were somewhat larger than normal, so that the volumes ratio was maintained at the level close to that of the 1st two stages of normal larval development. In the 2nd group, where we suppose pseudopupae to have developed, the volumes of CA cells diminished simultaneously with the cells of peritracheal gland, so that the ratio remained at the level characteristic of the end of 3rd larval stage. The number of cells both in peritracheal gland and in CA did not differ from the normal.

It is possible that for the transformation of larvae into pupae, the fact of activity of peritracheal gland cells (and in this connection, the quantity of ecdisone) is not as important as the maintenance of a definite ratio between the activity of peritracheal gland and corpora allata cells.

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