Colot, Hildur[1], W. J. Perreault[2] and H. Gay. Carnegie Institution of Washington and University of Michigan, Ann Arbor, Michigan. The nucleotide composition of the DNA-associated RNA of Drosophila melanogaster larvae.

A type of RNA that is complexed with DNA in a ratio of 1:2 has been isolated from Drosophila melanogaster (Mead, 1964; Perreault, 1966; see also Perreault, Kaufmann and Gay, this issue of D.I.S.). The rapid uptake of $P^{32}$ by this DNA-associated RNA suggests that at least some of it may be messenger (mRNA). Our previously reported data for the nucleotide composition of adult DNA-associated RNA indicated that it is somewhat different from DNA. The present series of experiments, using Swedish-b flies, was carried out to determine whether the larval DNA-associated RNA is similar to that of adults. The results presented in the accompanying table show that it is not, and reveal moreover that its nucleotide composition is quite different from the base composition of larval and adult DNA.

Table 1. Composition of larval and adult DNA-associated RNA.

| | N | A(AMP) | T(UMP) | G(GMP) | C(CMP) | $\frac{A + T(U)}{G + C}$ |
|---|---|---|---|---|---|---|
| DNA-associated RNA | | | | | | |
| Larvae | 9 | 26.7±0.5 | 27.4±0.4 | 25.1±0.5 | 20.6±0.4 | 1.18 |
| Adults | 2 | 28.9±0.2 | 29.9±0.4 | 22.6±0.0 | 18.7±0.2 | 1.42 |
| Adults* | 10 | 28.3±0.1 | 28.6±0.2 | 24.5±0.3 | 18.6±0.3 | 1.32 |
| DNA | | | | | | |
| Larvae | 4 | 28.8±0.7 | 32.7±0.3 | 19.1±0.1 | 19.4±0.8 | 1.60 |
| Adults* | 88 | 29.3±0.4 | 31.2±0.4 | 19.5±0.3 | 20.0±0.3 | 1.53 |

*Data from experiments of W. J. Perreault (1966).

These results support the point of view that part of the DNA-associated RNA may represent messenger RNA; the difference between larval and adult forms might be a manifestation of developmental differences in the types of messengers being synthesized. Since it is still not known what proportion of the total DNA-associated RNA has the characteristics of messenger RNA, or whether some of it may be preformed structural or regulatory RNA, further work is in progress to determine the probable molecular heterogeneity of this class of RNA and the nature of its binding to DNA.

References: Mead, C.G., J. Biol. Chem., 239:550 (1964)
Perreault, W. J. (Reported by H. Gay in Carnegie Institution of Washington Yearbook, 65:585 (1966))

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Doane, W. W. Yale University, New Haven, Connecticut. Observations relating to duplications in the Amylase region of D. melanogaster.

I have data relevant to Bahn's contention (DIS 42: 84) that major isoamylase bands in homozygous Amy strains are indicative of gene duplications. A bennett population cage was set up in 1964 with 50 pairs of flies of the genotype $Amy^1$ $adp^{60}/Amy^{2,6}$ +adp. At $F_{45}$, the sample taken from the cage (N = 769) contained 5 exceptional phenotypes indicative of crossing-over within the Amy region. They were: $Amy^{1,6}$ +adp (2 females; 2 males) and $Amy^6$ $+^{adp}$ (1 female).

Bahn indicated the importance of distinguishing between stocks of independent origin which possess identical electrophoretic patterns. This becomes more evident from findings (Doane, in press) that amylases with the same mobility, but from different strains, may differ in their degree of sensitivity to heat and to various $\alpha$-amylase inhibitors. Thus, homozygotes producing multiple bands may reflect duplications of the Amy region, but amylases with the same mobility from different strains need not represent the same duplication. (Supported by N.S.F. grant GB 1718.)