| Stock | Reported Autosomal Breakpoint | Observed Autosomal Breakpoint |
|---|---|---|
| A87 | 40 | 38A-B |
| L138 | 39C | 39A |
| B190 | 40 | 39C |
| A107 | 40 | 39D-E |
| B209 | 40 | 39D-E |
| B251 | 40 | 39D-E |
| H54 | 40 | 39D-E |
| B199 | 40 | 40 |
| H118* | 40 | 40 |
| H131 | 40 | 40 |
| R116 | 40 | 40 |

*May have free $B^{s}y^{+}$ element segregating in stock.

were examined to verify the reported breakpoints. Several discrepancies between the reported and observed breakpoints were found.

Table 1 lists the various T(Y;2) stocks examined, the autosomal breakpoints as reported in Lindsley and Sandler et al. (1972), and the observed breakpoints. All stocks with breakpoints reported to be distal to M(2)H carry euchromatic breaks, whereas those reported broken proximal to M(2)H bear heterochromatic breaks. It is of interest that several of the stocks examined are broken between 39D and 39E, the chromosomal region known to include the histone gene sequence (Pardue et al. 1977). Segmental aneuploids deficient for the region between the breakpoint of L138 and the breakpoints of H54, B251, and B209 do not show a Minute phenotype. However, deficiencies carrying more proximal euchromatic breaks are Minute (Wright et al. 1976). It is possible, therefore, that M(2)H may map to the proximal region of the histone gene cluster. My recent studies on irradiation-induced lethal mutants mapping to the histone gene locus also suggest that the M(2)H locus may coincide with a part of the histone gene locus.

References: Lindsley, D.L., B. Baker, A.T.C. Carpenter, R.E. Denell, J.C. Hall, P.A. Jacobs, G.L.G. Miklos, B.K. Davis, R.C. Gethmann, R.W. Hardy, A. Hessler, S.M. Miller, H. Nozawa, D.M. Parry and M. Gould-Somero 1972, Genetics 71:157; Pardue, M.L., L.H. Kedes, E.S. Weinberg and M.L. Birnsteil 1977, Chromosoma (Berl.) 63:135; Wright, T.R.F., R.B. Hodgetts and A.F. Sherald 1976, Genetics 81:267.

Simms, R.W., N.D. Bearss and J. Tonzetich. Bucknell University, Lewisburg, Pennsylvania. Transfer RNA resolution in a Minute mutant of D. melanogaster.

Mutations producing the Minute phenotype in D. melanogaster occur in a number of genes on all four chromosomes. It has been proposed by Atwood (Ritossa et al. 1966) that alterations in DNA cistrons which code for transfer RNA are responsible for the characteristic mutations of the Minute class. Atwood argued that the slow rate of development in Minute bearing individuals was consistent with the reduced rate of protein synthesis expected from the decreased availability of a particular tRNA. Several investigators have tested this hypothesis using radioactively labeled tRNA and the method of in situ RNA-DNA hybridization to correlate sites of tRNA binding with genetically established positions of Minute loci (Steffensen and Wimber 1971; Grigliatti et al. 1974). The results, however, have been inconclusive. The present study involves a new preliminary test of the Atwood hypothesis, which utilizes a qualitative comparison of tRNA chromatographic elution profiles from both normal and Minute flies, thus

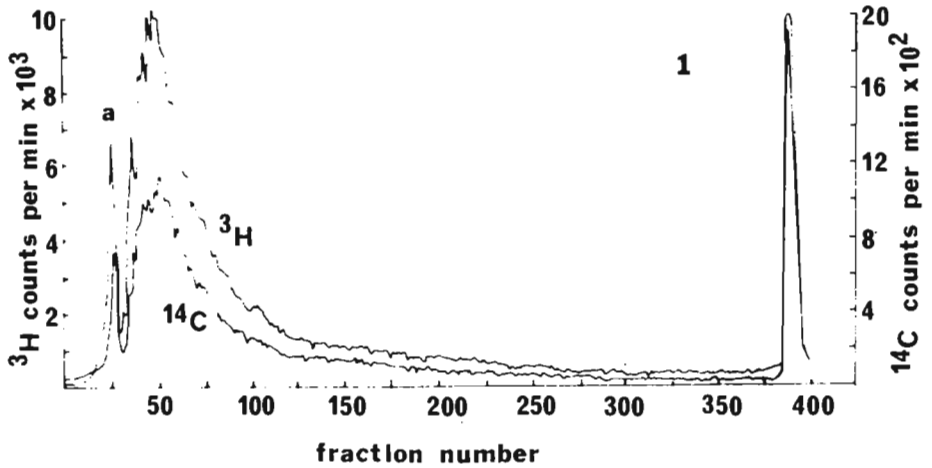


Fig. 1. Elution profiles of M(2)S7-($^3$H)-tRNA and Oregon R-($^{14}$C)-tRNA from a BD-cellulose column.

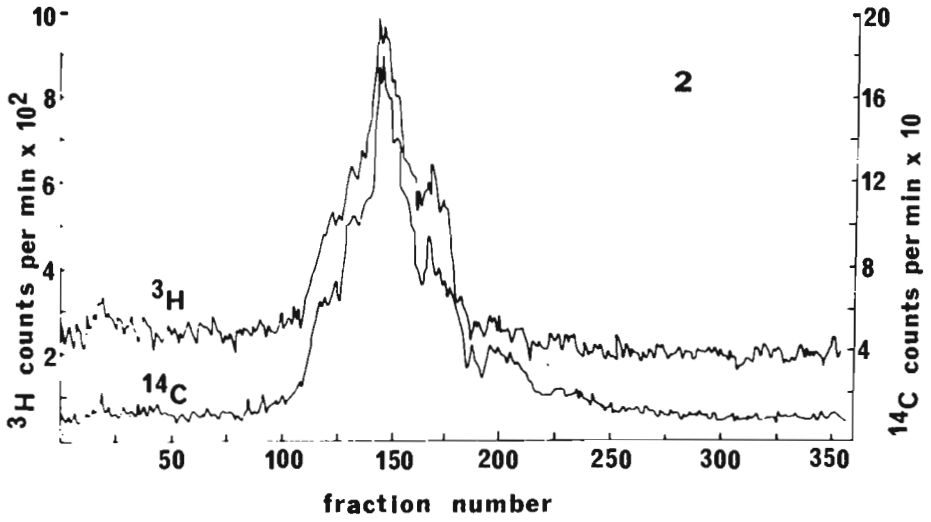


Fig. 2. Elution profiles of M(2)S7-($^3$H)-tRNA and Oregon R-($^{14}$C)-tRNA contained in fractions 20-120 of Fig. 1 from a BD-cellulose column.

avoiding the difficulties associated with in situ hybridization.

Labeling of RNA in Oregon R flies was accomplished by growing first instar Oregon R larvae on a low agar medium (0.3%) injected daily with a yeast-water suspension containing a total of 1 mCi (5-$^{14}$C)-uridine (New England Nuclear Corp., 51.0 mCi/mole). M(2)S7 Minute RNA was labeled by permitting the first instar Minute larvae to feed on the low agar medium injected daily with a yeast-water suspension containing a total of 1 mCi (5-$^3$H)-uridine (New England Nuclear Corp., 28.3 Ci/mole). Transfer RNA from Drosophila was prepared by the method of White et al. (1973). Whole labeled third instar M(2)S7 Minute and Oregon R larvae were homogenized together and the final tRNA preparation was applied to a DEAE-cellulose column for further purification. The chromatography of the labeled tRNA sample follows the general method of Gillam et al. (1967), utilizing BD-cellulose. The sample was applied to a 1 x 90 cm BD-cellulose column previously equilibrated with the starting buffer. The column was then prewashed with buffer and the labeled tRNA was subsequently eluted in 5 ml fractions using a linear NaCl gradient ranging from 0.3 M NaCl to 1.0 M NaCl. Once the gradient was completed, 7 M urea was added to the final NaCl solution. Two ml aliquots of each fraction were added to 15 ml of Biofluor and then assayed for radioactivity in a Packard Tri-Carb liquid scintillation spectrophotometer. Fractions 10-120 from the BD-cellulose column were taken to be the major tRNA fractions as they contained the peaks with the highest number of counts. To further resolve the profile these fractions were pooled, precipitated, and applied to a BD-cellulose column as before with a similar linear NaCl gradient. 2 ml aliquots of each fraction were added to 15 ml of Biofluor and again counted in the scintillation spectrophotometer.

Fig. 1 shows the elution profiles of both M(2)S7 Minute ($^3$H)-tRNA and the wild type Oregon R ($^{14}$C)-tRNA chromatographed simultaneously on a BD-cellulose column. The two curves indicate that the tRNA from both Minutes and wild type are qualitatively very similar. The differences in height are due to the lower specific activity of the $^{14}$C isotope. The major peaks in Fig. 1 occur simultaneously at fractions 30 and 55 and drop off at the same rate through fraction 120. tRNA's in fractions 120-138 are also similar with no major discrepancies and occur in much lesser quantities until the final peak representing the extraction by urea. If the relative peak heights of each profile are compared by dividing the counts per minute of each fraction by the height of peak A for each profile, no significant differences are found.

Fig. 2 shows the elution profile obtained from a rechromatographing of fractions 20-120 on a BD-cellulose column. Both curves exhibit a large peak at fractions 145 and 169 and two small shoulders at fractions 124 and 131. The tRNA constituting the sharp peak at fraction 30 in Fig. 1 is spread over the broad profile ranging from fractions 0-100 in Fig. 2. Thus only one broad peak is observed as opposed to the two sharp peaks seen in Fig. 1. Fig. 2 also shows a significant reduction in the number of radioactive counts detected as compared to the number of counts observed in Fig. 1. A small portion of the tRNA (500 ml) in Fig. 1 was spread over a volumn of 2 liters in the latter graph. Thus a substantial loss of quantity is expected. A comparison of relative peak heights of the two profiles in Fig. 2 again shows no significant differences. Further resolution may be achieved by chromatographing the peak material on reverse phase columns as described by Pearson, Weiss and Kilmers (1971).

References: Gillam, I., S. Millward, D. Blew, M. van Tigerstrom, E. Wimmer and G.M. Tener 1967, Biochemistry 6:3043-3056; Gillam, E. and G.M. Tener 1971, in: Methods in Enzymology, Vol. XX, K. Moldane and L. Grossman, eds., Academic Press, New York; Grigliatti, T.A., B.N. White, G.M. Tener, T.C. Kaufman and D.T. Suzuki 1974, Proc. Nat. Acad. Sci. USA 71:3527-3531; Pearson, R.L., J.F. Weiss and A.D. Kilmers 1971, Biochem. Biophys. Acta 228:770-774; Ritossa, F.M., K.C. Atwood and S. Spiegelman 1966, Genetics 54:663-676; Steffensen, D.M. and D.E. Wimber 1971, Genetics 69:163-178; White, B.N., G.M. Tener, J. Holden and D.T. Suzuki 1973, J. Mol. Biol. 74:635-651.

Singh, B.K. and Y.N. Dwivedi. Banaras Hindu University, Varanasi, India. Report on spontaneous occurrence of mosaics in D. rajasekari Reddy & Krishnamurthy.

It was Morgan (1914) who reported for the first time the spontaneously arising gynandromorph in D. melanogaster. Subsequently, there have been a few reports on gynandromorphs in other species of Drosophila also, such as in D. simulans (Sturtevant 1921), D. virilis (Weinstein 1922) and D. funebris (Spencer 1927; Timofeeff-Ressovsky 1928). According to Sturtevant and Beadle in the insects hormonal control of sex and secondary sex characters apparently does not occur, but instead these are controlled by intracellular factors. This is shown in a very simple way in individuals in which part of the body is XX in constitution and the remainder XY or XO. Such individuals, known as gynandromorphs, are mosaic for sex characters. They result in two ways: (1) by elimination from one daughter cell at an early cleavage of one of the two X chromosomes (Morgan and Bridges), or (2) from double nucleus eggs (Doncaster). In the former, all descendents of the cell with a single X chromosome are genetically male while those from the sister XX cell are female. A double-nucleus egg may or may not give rise to a gynandromorph, depending on whether the two nuclei are fertilized by like (X and X or Y and Y) or different (X and Y) sperms. Regardless of origin, gynandromorphs in Drosophila usually show autonomy of development with regard to sex characters, i.e., each part develops (with few exceptions) according to its own genetic constitution and without regard to the genetic constitution of adjacent or associated tissues.

Fig. 1

Recently extensive collections were carried out for Drosophilid fauna in the vicinity of Punjim (Goa) which yielded a large number of flies representing several species of the genus Drosophila. They are D. bipectinata, D. malerkotliana, D. jambulina, D. rajasekari, D. nasuta, D. orissaensis, D. eugracilis and D. meijerei.

D. rajasekari is an indigenous species which seems to be quite common in certain parts of the Indian subcontinent. The male individual of the species can be easily distinguished from the female in having completely black terminal tergites, apical black patch on wings, metatarsal sex-comb of prothoracic legs. Altogether 50 flies represented this species during the collection. Of these flies, one was found to show the characteristics of a gynandromorph, with half of the body showing male and the other half female characters, especially with respect to wing patch and sex comb. However, this fly was found to be a female with respect to its external genitalia and the abdominal banding pattern (Fig. 1).

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