Ranganath, H.A. and N.B. Krishnamurthy.
University of Mysore, Manasagangotri, India. Rate of development and fecundity in Drosophila nasuta.

Natural selection is the result of at least three component processes - differential survival, differential mating success and differential fecundity (Ayala 1970). Differential survival at different densities during preadult stages has been shown in D. nasuta (Ranganath and Krishnamurthy 1972). The experiment was conducted at 4 different densities - 200, 100, 50 and 25 eggs per vial (A, B, C and D groups respectively). To estimate the fecundity, the flies that emerged on the first day (Fast) and those that emerged on the last day (Slow) were selected. Virgins were isolated, aged for 5 days and then pair matings were made. The number of eggs laid were noted for the following 10 days. The fecundity test (Table 1) has shown

Table 1. Summary of the $\chi^2$ homogenity test for the fecundity of Fast and Slow developing flies.

| Group | No. of Pairs | | Observed | Expected | $\chi^2$ | P value |
|---|---|---|---|---|---|---|
| A | Fast | 4 | 390 | 318.28 | 36.9 | 0.0001 |
| | Slow | 3 | 167 | 238.72 | | |
| B | Fast | 6 | 697 | 480.60 | 243.5 | 0.0001 |
| | Slow | 4 | 104 | 320.40 | | |
| C | Fast | 4 | 441 | 336.50 | 65.4 | 0.0001 |
| | Slow | 4 | 232 | 336.50 | | |
| D | Fast | 6 | 798 | 478.80 | 432.0 | 0.0001 |
| | Slow | 4 | - | 219.20 | | |

that the fast emerging flies are more fecund than the slow ones. The average number of eggs laid by fast individuals in the A, B, C and D groups are 97, 116, 110 and 133 respectively, while the corresponding slow emerging flies have 55, 26, 58 and none respectively.

The characters of organisms are an outcome of the combined effects of its genetic constitution and the process of development. The egg laying capacity varies significantly between the fast flies of the 4 groups and also those of slow flies. This is indicative of the effect of different crowdings during development on the fecundity of adult flies.

Fast developing individuals having shorter generation time with a greater average reproductive output are the positive contributors to the process of adaptation at the population level.

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References: Ayala, F.J. 1970, Essays in Evolution and Genetics in Honor of Th. Dobzhansky. Ed. M.K. Hecht & W.C. Steere, 121-158; Ranganath, H.A. and N.B. Krishnamurthy 1972, DIS 48:132.

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genesis (Fig. 2, S). If these spermatids do not mature and participate in fertilization the number of $F_1$ females would be less than the number of $F_1$ males. Such a deficiency of progeny from XY-bearing sperm relative to nullo-XY sperm is commonly observed in crosses of XY/O males. Males from the attached XY stocks studied with the electron microscope also yield this altered sex ratio. In a cross of the $Y^SX.Y^L$, In(1)EN, y B/O males to Canton-S females the fraction of Bar $F_1$ females was .409 (790/1929). The relation between abnormal nuclei and sperm function is being investigated.

The phenomena have also been seen in flies of the following genotypes: (1) C(2L)RM, dp; C(2R)RM, px (2) C(3L)RM, se h $rs^2$;C(3R)RM, sbd gl $e^s$ (3) $y^2/B^SY$;C(2L)RM, dp;C(2R)RM, px, C(3L)RM, $h^2$;C(3R)RM, + (4) mei-S332.

The nuclear profiles observed in these stocks have more variation than the attached XY stock. This is explicable if the kinds of aneuploidy that can occur in each stock are taken into consideration. For instance in stock (1) there are four kinds of nuclei that could occur: 1/4 no 2, 1/2 either 2L or 2R and 1/4 both 2L and 2R.

These preliminary results suggest that head size during spermiogenesis depends on chromatin content and that there are constraints on the physical amount of genetic material that a spermatid nucleus can contain and undergo normal cytodifferentiation. An analysis of nuclei in various stages of spermiogenesis is now in progress.