Datta, Rajat Kumar. University of Calcutta India. Influence of y^+ and sc alleles in suppression of yellow color in the sexcomb of Drosophila melanogaster.

The sexlinked mutant 'yellow' (y) causes the production of yellow body, hairs and bristles in D. melanogaster, and results in a brownish-yellow hue in the sexcomb teeth which are black in normal strains. The y^+ allele in y^+/y females or $y^+ \cdot Y/y$ males, and many sc alleles in y/y (sc/sc) females or y/sc·Y males suppress the yellow color of body and bristles. However, these alleles behave differently in the sexcombs. The behavior is variable and the variability in the color of the sexcomb teeth, seen in various combinations, can be classified in to three classes, (a) black, (b) intermediate color of brownish yellow and (c) yellow. The $y/Y^S{:}y^+$ bb^+-7 males as expected, had normal body color and black bristles. But pigmentation of the teeth in their sexcombs show three shades of color, most of which being of an intermediate (brownsih yellow) hue (Table 1). The $sc^{V1} \cdot Y^S/y$ and $sc^{S1} \cdot Y^L\#2/y$ males on the other hand, show still different expression. Sc^{V1} does not suppress the yellow (y) and, therefore, the body color of $y/sc^{V1} \cdot Y^S$ males are yellow. However, among the sexcomb teeth examined, 22% are dark brown, 78% yellow and none are black (Table 1). In addition, some of the yellow teeth also show occasional black pigments at the basal part, while the upper portion remains yellow. Finally, in the y/sc^{S1} males the yellow body color is completely suppressed but the sexcomb shows all the three classes of pigment distribution in considerable proportions.

Genotype	% of colored teeth			No. of teeth
	Black	Intermediate	Yellow	examined *
1. $y/Y^S{:}y^+$ bb^+-7	11	83	6	276
2. $y/sc^{V1} \cdot Y^S$	0	22	78	274
3. $y/sc^{S1} \cdot Y^L\#2$	31	23	46	276

* Total number of teeth in 30 males.

Van Delden, W. University of Groningen, Netherlands. Adaptation in D. melanogaster populations started from an inbred line.

Cage populations were started with flies derived from an inbred line kept by single-pair brother-sister mating for hundreds of generations. The original inbred line had a very low fitness using such measures as productivity, egg hatchability, longevity, competitive ability, etc. Five cages were held at a constant temperature of 25°C and three cages were held at the same mean temperature but undergoing a regular oscillation of 10°C during each 24-hour period. Populations 1-5 were kept at 25°C and populations 6-8 under the fluctuating temperature. A control population (C) which originated from the same inbred line, but was started two years earlier, was also kept at 25°C. Productivity of the populations was measured by withdrawing at regular intervals foodcups with eggs from the cages and counting the numbers of emerging adults.

Only mutation, followed by recombination, can bring about improvement of fitness in the populations started with homozygous material. There were great differences in increase of productivity between the populations (Table 1).

Table 1. Regression of productivity on time (months) during the first 14 months.

Cages:	1. + 15.2	4. + 34.5	7. + 51.7
	2. - 5.3	5. + 36.4	8. + 45.3
	3. + 21.4	6. - 11.4	C. - 1.6

After an initial increase, all populations except the control suffered a temporary decline in productivity. This began at the 6th-8th month and continued for 2-3 months. Populations 2 and 6 nearly became extinct. However, after 14 months half of the populations equaled the control population in productivity. The heritability of sternopleural bristles in these populations equaled or surpassed the control value (0.30). There was good correlation between productivity and other fitness measures as population size, egg hatchability, larval survival to adulthood, adult longevity, and productivity in different new environments.