Thompson, J. N., Jr. University of Oklahoma, Norman, Oklahoma. Recessive mutants in a wild D. melanogaster population.

In a recent series of tests (summer, 1966) an attempt was made to analyze the frequency with which mutants causing morphological changes are carried in the wild populations of Drosophila melanogaster in and near Marshall County, Oklahoma. Special attention was paid to mutants affecting the wings, bristles, and body and eye color.

Two types of tests for mutations were employed. The first, denoted as "Section 1", utilized wild females which laid eggs in single vials. The offspring of these vials were then mated in ten single-pair matings. The second filial generation was counted and classified. Through this procedure, a recessive mutant would have a high probability of becoming homozygous and identifiable in the second generation. The second type of test, denoted as "Section 2", was similar to the first, except that wild males were trapped and mated to virgin females collected as larvae.

From successful tests of 82 original wild parents, 38 distinguishable mutants were recovered. Offspring in 11 other vials were killed by mold growth. Each successful pair of original parents carried at least one recoverable, visible mutant, and some carried as many as eight. Tables 1 and 2 indicate the number of individuals (F_2 offspring) carrying the mutant as well as the number of different tests (parents) it occurred in. A certain variably-expressed bristle mutant was found to affect approximately 97% of the sample flies. Counting each different occurrence of a mutant separately, 249% of the tested females in Section 1 and 206% of the original parent-pairs in Section 2 carried a recessive mutant. It should be noted that this only includes morphological mutations, with the exception of two affecting fertility and viability. It is also important to remember that they were concentrated in only three morphological areas. Although these are very representative and important characters, other mutations could have occurred which, because of their nature, were not recognized. Thus, the number of mutants reported here, though rather large, is almost undoubtedly only a small number of the actual existing mutants carried by the original parents and by the population at large.

A brief comparison of these data with those of earlier workers and several possible explanations of this phenomenon are included in the full paper to be published in the Proceedings of the Oklahoma Academy of Science, 47(1966): in press.

Table 1

Occurrence of Mutants: Section 1

Mutant	No. of sets involved	No. of indiv. involved
A. Wild-type (normal)	77	20,353
B. Bristles		
1. Irregularly stubbled	65	4,956
2. "Stubble"-like	2	327
3. "Singed"-like (?)	1	1
C. Color		
1. Orange eye color	5	55
2. Brown-streaked thorax	5	52
3. Yellow body	3	143
4. Brown body	3	61
5. Light red eye color	2	20
6. Red-brown eye color	1	46
7. "Plum"-like eye color	1	35
D. Wings		
1. Bent wing base	19	138
2. Fragments of extra veins present	12	106
3. "Dichete"-like wings	8	88
4. Notched wings	5	22
5. Vein V not touching wing margin	4	15
6. U-shaped wing notch	3	8
7. Wavy wings	3	indet.

Table 1 continued:

Mutant	No. of sets involved	No. of indiv. involved
8. Small, almost opaque, wrinkled wings	2	35
9. Vein LII broken	1	10
10. Folded	1	7
11. Thickened veins	1	14
12. Eave-like wings	1	6
13. Held out with rough veins	1	14
14. Vein LII forked	1	13
15. "Miniature"-like wings	1	20
16. Posterior crossvein half present	1	32
17. Added crossvein	1	4
18. Ballooned wings	1	5
E. Miscellaneous		
1. Abnormal abdominal segmentation	9	87
2. Sterility mutant	2	--*
3. Low viability factor	1	--*
4. Rough eye	1	4
F. Others (unsuccessful)	10	--

*These mutants are functions of the set, not of individuals.

Table 2

Occurrence of Mutants: Section 2

Mutant	No. of sets involved	No. of indiv. involved
A. Wild-type (normal)	16	2,678
B. Bristles		
1. Irregularly stubbled	14	927
C. Color		
1. Brown eye color*	1	21
2. Orange eye color	1	12
D. Wings		
1. Bent wing base	4	12
2. Fragments of extra veins present	3	20
3. Vein LII broken	1	15
4. Ballooned wings	1	8
5. "Rudimentary"-like wings*	1	6
6. Nicked wing tips*	1	5
7. Vein V not touching wing margin	1	4
E. Miscellaneous		
1. Abnormal abdominal segmentation	3	10
F. Others (unsuccessful)	1	--

*These mutants did not occur in Section 1.

Staub, M. Zoologisches Institut der Universität Zürich, Switzerland.

Larval stages dispensible for the development of giant chromosomes.

Anterior halves of 6 h old embryos (25°C) were transplanted into the abdomen of adult females (method E. Hadorn). After culturing time of 10-14 days, development of salivary gland cells was observed. Chromosomes can attain maximal size or even supergiant dimensions. Thus "larval life" is not required for the process of differentiation and polytaenisation.