About 0.7% of the F_1 paternal gametes irradiated with a dose of 3000R carried the expected centric autosomal translocations, all with the Y-chromosome. It appears that with the slightly higher dose of 3500R as many as 10% of the irradiated sperm carried CAYT, and that the increase in radiation dose caused also a steep increase in the frequency of many other chromosomal aberrations, that resulted in dominant lethality, thus allowing the recovery of only a few F_1 daughters.

Farmer, J.L. Brigham Young University, Provo, Utah USNA. Expression of ey in Drosophila pseudoobscura.

The eyeless mutation (ey) was found in a wild population by Bryant (1980). When I obtained the stock from the center at Austin, Texas, the penetrance of ey was extremely low compared to the value reported by Bryant (1980). Since no other laboratory had the stock, I tried to increase the penetrance by selective breeding. Single-pair matings and close inbreeding of progeny did produce a few flies which were unilaterally eyeless, but when these progeny were interbred, they had a very low fertility and a stock could not be established. Backcrosses of the unilaterally eyeless flies with their wild-type sibs produced a few progeny with the same phenotype, but they also were infertile in crosses with each other.

In an attempt to overcome the infertility, I outcrossed the unilaterally eyeless flies with a vigorous wild-type stock which carried the TL inversion (obtained from W.W.Anderson). As expected, the F1 was all wild-type and had a high fertility. (The fertility remained high through all succeeding generations.) Unexpectedly, the F2 was also all wild-type. The F3 produced a few eyeless flies (approx. 5%) from both single-pair matings and from mass matings.

After four generations of intensive selection and closeinbreeding of only completely eyeless flies (no facets and no detectable pigment below the integument in the normal position of the eyes) penetrance was higher. At 25°C about 5 to 10% are completely eyeless, about 5 to 10% are nearly completely eyeless (ranging from a single facet to a small number of facets on one or both sides or patches of pigment beneath the integument without facets), with the remainder about equally divided between unilaterally eyeless flies (with the same range of expressivity noted above) and wild-type flies. The unilaterally eyeless flies have one eye that is morphologically completely normal except that in many flies the color is duller than wild-type, as though the drosopterins were reduced.

The eyeless phenotype seems to be due to a major gene with modifiers, although further crosses would have to be done to verify that hypothesis.

If eyeless flies are allowed to lay eggs for a short time in a bottle, their progeny eclose in the order: completely eyeless first, wild-type last, other phenotypes in between but strongly overlapping each of the first two phenotypes.

The penetrance of ey is greatly enhanced at 18°C, approaching 100% completely or nearly completely eyeless flies.

The ey stock called SHB-5 which is currently maintained at the Mid-America Drosophila Stock Center (Bowling Green) is the stock which I derived from the crosses described above.

Reference: Bryant, S.H. 1980, DIS 55:212.

Fogleman, J. University of Denver, Colorado USNA. The ability of cactophilic Drosophila to utilize soaked soil as larval substrates.

Both rearing records and aspiration records indicate a very high degree of host plant specificity among the cactophilic Drosophila of the Sonoran Desert (Fellows & Heed 1972) with little species overlap (Heed 1978). Recently, investigations into the ecology of D.mettleri have shown that it utilizes a greater variety of substrates than had been previously thought. In addition to its normal substrates of soil which has been soaked by saguaro or cardon rot exudate, D.mettleri can tolerate the alkaloids in senita cactus that have been shown to be toxic to all other species tested except the resident species, D.pachea (Kircher et al. 1967; Fogleman et al. 1982). Field experiments have demonstrated that D.mettleri will use soil which has been soaked with senita rot juice as a breeding substrate when available. D.mettleri has also been reared from organpipe soaked soil (Fogleman at al. 1981).