neighbourhood, the variability may be a consequence of adaptation to local environment conditions. This suggestion is supported by McKenzie & Parsons (1974) cited above who found that within their vineyard population those strains most closely associated with alcohol in the environment in the cellar were more resistant than strains captured outside the cellar. The considerable difference between the single female lines I1 and I23 derived from the same origin population suggests that there is enough genetic variance within the same population to develop into divergent lines. Single female lines can be viewed as founder populations and a single female being driven to an unoccupied habitat could establish a new population differing in its ethanol preference compared with the origin population. This might be a first step to speciation and so the result of our experiment supports the theory of speciation via founder effect (Mayr 1942; White 1978).

References: Del Solar, E. & H.Palomino 1966, Am.Nat. 100:127-133; Fogleman,J.C. 1979, Behav.Genet. 9:407-412; Krause, J., A.Michutta & W.Köhler 1980, DIS 55:78; Mayr, E. 1942, Systematics and the origin of species, Columbia Univ. Pr, New York; McKenzie, J.A. & P.A. Parsons 1972, Oecologia 10:373-388; McKenzie, J.A. & P.A.Parsons 1974, Genetics 77:385-394; Richmond, R.C. & G.L.Gerking 1979, Behav.Genet. 9:233-241; White, M.J.D. 1978, Modes of speciation, Freeman, San Francisco.

Falk, R. and S.Baker. The Hebrew University, Jersualem, Israel. Production of centric-autosomal-Y translocations.

The availability of stocks with rearranged autosomes, such that one autosomal arm is attached to its homologue (compound arm) and the other arm is free, e.g., C(2L)/F(2R) and F(2L)/C(2R) stocks, makes the screening for translocations between chromosome-Y and the centric heterochromatin of autosomes (centric autosomal-Y translocations: CAYT) a straight forward procedure. Males with a Y-chromosome marked at both ends ($\underline{B}^S Y^{L\circ} Y^S \underline{y}^+$) and a marked chromosome 2 (dp b cn bw) were irradiated and then mated to females with C(1)DX,yf X-chromosomes and a dominantly inverted marked chromosome-2, In(2LR)CyO, $\underline{dp}^{\ell v1}$ Cy pr cn^2. All y^+ B^S Cy cn^2 daughters were mated either to C(2L)RM/F(2R)bw males or to F(2L)dp/C(2R)RM,cn males. No progeny were expected from the great majority of these daughters, which were C(1)DX,y f/B^SY y^+; CyO/dpb cn bw. Only daughters that carried centric-autosomal translocations with the Y-chromosome--i.e., they were C(1)DX y f/O; CyO/$T_{Y;2}$ $\underline{y}^+$ $\underline{B}^S$ -- or with chromosome-4 were fertile (unless gametes of rare autosomal non-disjuntion in both parents happend to complement each other in the zygote). Since newly induced translocations were expected only rarely, it was not necessary to mate the F_1 females individually, and up to 10 females were mated to the appropriate males in some culture bottles. The results of four translocation-induction experiments are given in Table 1.

Table 1.

Expt. No.	X-ray dose to ♂♂	No. F_1 ♀♀	Translocations recovered with tester: F(2L)dp/C(2R)RM,cn No. ♀♀ tested	F(2L)dp/C(2R)RM,cn fertile cultures	F(2L)dp/C(2R)RM,cn CAYT	C(2L)RM/F(2R),bw No. ♀♀ tested	C(2L)RM/F(2R),bw fertile cultures	C(2L)RM/F(2R),bw CAYT
I	3500R	30	14	1	0	16	1	0
II	3500R	48	25	3	0	23	3	1
III	3000R	930	-	-	-	930	8	5
IV	3000R	2410	2410	16	11	-	-	-

In each experiment about 1000 irradiated males were mated to an excess of females for 6 days in 25 culture bottles. Flies were transferred twice to fresh culture bottles. In Expt. I and II F_1 females were mated individually. In Expt. III most females were mated in groups of 4-10 per culture bottle. In Expt. IV all females were mated in groups of 10 per culture bottle.

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).