Table 1. Experiment 2: matings with R males 2 days old, O males 3 days old.

Female	Male first to court	Total matings male mated R	Total matings male mated O	Excluding trials where one male only courted R	Excluding trials where one male only courted O	χ^2
R	R	23	17	8^a	17^b	13.9
	O	21	10	21^b	4^a	
O	R	25	20	11^a	20^b	13.6
	O	19	8	19^b	3^a	
	Total:	88	55	59	44	

a=Total x first male to court = 26; b=Total x second male to court; c=Chi-square contingency on trials where both males courted.

stored, 10 to 15 per food vial (yeasted). Flies matured for 3 days when testing with no age differential (experiment 1) or for 2 days in the case of R males when testing with an age differential (experiment 2). Testing was done with one R + one O male followed by the female into a 9.5 x 2.5 cm glass vial, and courtship by either male was recorded. All other conditions were the same as those used (Spiess & Kruckeberg 1980). Tables 1 and 2 present the mating data for experiments 1 and 2, respectively; total matings include the trials in which just one male occurred.

In conformity with prevous results, females accepted the second to court male preferentially in both experiments 1 and 2 in the trials where both males courted. Associations are significantly negative between courtship order and mating success. However the amount of mating to the second-to-court male is significantly greater when the O males are a day older than the R males (experiment 2) than when the two types are of equal age (experiment 1). Using confidence limits tables for percentages (e.g., Table W in Rohlf and Sokal's Statistical Tables, Freeman & Co. 1969), we find the total matings (above footnotes)to be significantly different at the 95% confidence level. In addition, it should be noted that O males mated about 10% more in experiment 2 than in experiment 1, and at a level comparable with that achieved in earlier tests with 4-5 day old males (cited above).

References: Long,C.E., T.A.Markow & P.Yaeger 1980, Behav.Genet. 10:163-170; Spiess,E.B. 1982a, Am.Nat. 119:675-693; ----1982b, Behav.Genet. 12:209-221; Spiess,E.B. & J.F.Kruckeberg 1980, Am.Nat. 115:307-327; Spiess,E.B. & W.A.Schwer 1978, Behav.Genet. 8:155-168.

Springer, R. University of Vienna, Austria. "White" D.subobscura prefers darkness for pairing.

In the light-independent strain of D.subobscura (Springer 1973, DIS 50:133) the allele white, sex-linked, recessive, was rediscovered as a spontaneous mutant by Irene Stursa (see new mutants, spp. in this copy). While in the past (Wallace & Dobzhansky 1946) white individuals proved themselves unable to breed because of the dependence of courting and mating on visual stimuli, in the light-independent strain the allele w shows reasonable fertility. Nevertheless some of the mass cultures always failed to breed. The phenomenon vanished when the cultures were kept in complete darkness. In order to establish the peculiar effect 108 culture-bottles were started with about 20 individuals each. The flies, 0-1 day old, from the w-strain that was kept in darkness were distributed in red light, without narkosis, into the bottles. 54 cultures stayed in complete darkness (DD) at 19.5-20.5°C, the other 54 were exposed to constant day-and-night light (LL) at 18°C. All 54 cultures bred normally in the dark, only 39 of the cultures in LL yielded offspring (larvae and/or pupae) within three weeks.

To obtain more detailed quantitative data, single pair cultures in 25 cc tube glasses were used. Besides LL and DD conditions, a simulated circadian rhythm of light, 8 hr a.m. - 8 hr p.m. and darkness "overnight", was tested (LD). The temperatures were:

DD: 19-20.5°C LL: 19-21.5°C LD: 18°C .

Flies from the w-strain kept in darkness were isolated according to sex at the age of 0-1 day. The glasses with 50 or more individuals of same sex were permitted to age in darkness 7-9 days at 18°C. Then single pairs were put into the tube glasses. Each individual of these tests therefore twice underwent light narkosis with ether. 18-20 days later the

investigation of the tubes gave the following result:

DD	N = 101 pairs,	44 with offspring,	57 negative .
LL	N = 105 pairs,	22 with offspring,	83 negative .
LD	N = 85 pairs,	21 with offspring,	64 negative .

Mass cultures and single pairs concordantly show a clearly negative influence of light on successful mating. That result is rather remarkable in a species originally completely light-dependent in courting behaviour and mating. Further investigations concerning circadian rhythmics and the evolutionary importance of the reversion of the ecological valence of light under special conditions are in progress.

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Fertility in a white eye mutant of D.subobscura.

White mutants in D.subobscura have been found repeatedly (Spurway 1945). These mutants all proved to be sterile. This in itself is surprising, since in other Drosophila species white mutants are fertile. The reason that has always been given for this discrepancy is that D.subobscura depends, for mating, largely on the optical sense, so that white mutants are essentially behaviorally sterile, not physiologically.

This interpretation is supported by our finding that a white eye mutation selected from a light-independent selection stock of D.subobscura (Springer 1973) turned out to be fertile. Attempts to see whether carriers of this white allele lose their fertility in a genetic background of a light-dependent wild-type stock are under way.

References: Springer,R. 1973, DIS 50:133; Spurway,H. 1945, J.Genet. 46:268-286.

Taylor, C.E. University of California, Los Angeles, California. Microhabitat selection by mutant strains of D.pseudoobscura.

Waddington, Woolf, and Perry (1954) described an apparatus in which microhabitat preferences of Drosophila could be measured. With this they compared several mutant strains of D.melanogaster (wild type, rough, aristaless, purple, apricot, and forked) and found large differences among their microhabitat preferences. They interpreted this to mean that habitat choice might contribute to the maintenance of stable polymorphisms. We have constructed a similar apparatus and have measured the microhabitat preferences of mutant strains of D.pseudoobscura. Our purpose was to see if Waddington, Woolf, and Perry's results extended to this species as well.

Five strains of D.pseudoobscura were used: 7,8,45,76, and 82. These were supplied to us by W.W.Anderson, and are homozygous for the following markers respectively: w; y sn v co sh; gl; or px; or. Undoubtedly the strains differed at other, unknown, loci as well. They were raised at low density on standard, cornmeal molasses medium at 19°C and were run when 4-6 days old in groups of approximately 200--40 individuals of mixed sex of each strain. At no time prior to running were they anesthesized.

The maze consists of 8 large plexiglass chambers (12" high, 18" long, 18" wide at the outside, 4½" wide at the inside) joined to form a central antechamber (see Figure 1). Microhabitats consisted of the eight possible combinations of light or dark (0 ft candles or ca. 13 ft candles), maltose/agar or lactose/agar medium cups, and dry or moist (ca. 25% RH or ca. 65% RH). The moisture conditions were produced by placing either $CaSO_4$ in a gas chromatograph bag or else H_2O in a flask with a cheesecloth wick into the chamber. (It is possible, in addition, to regulate temperature in the maze by means of heating coils under the bottom of the chambers controlled by thermostats that extend into the centers. These are shown in the figure.) The chamber was charged for 4-5 hours before the flies were introduced at 4:00-5:00 p.m. At 8:00-9:00 the next morning the chambers were flooded with CO_2 and the flies removed. There were 10 replicates.