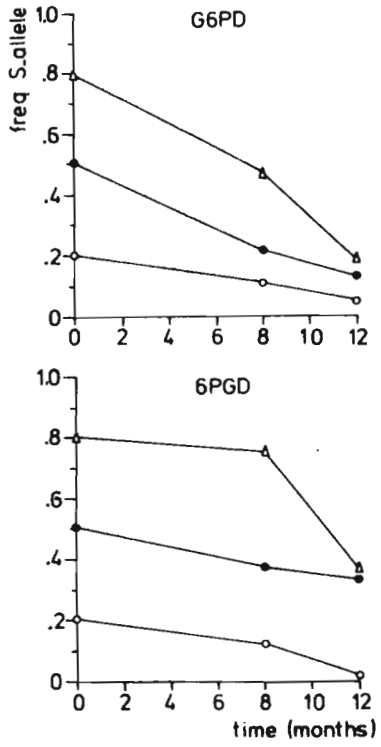

Figure 2. Change in S-frequency in the cages established with isolated lines (see text).

that the strains probably have different genetic backgrounds which probably influence the results. Ten new lines of each homozygous genotype were then isolated from the .50 S cage. This was done 6 months after this cage was established. With these lines new cages were established with initial frequencies 0.20 S, 0.50 S and 0.80 S for both loci (Figure 2).

Figures 1 and 2 show the same trend for both loci in most cages. The initial high frequencies of the S-alleles decrease rapidly. The first and second set of cages do not differ much after twelve months, most allelic frequencies are between 0.10 - 0.20 S. The rapid allelic frequency changes found for both loci strongly suggest the action of selection. Other experiments, now in progress, support this statement. The decrease of the S-frequency of the 6PGD locus is consistent with what is found for the eleven natural populations, in which the S-allele is absent or only present in a low frequency (the Evanston population being the one exception).

Whether the S-frequencies in the artificial populations will stay at the present low level, or the F-alleles will become fixed, as occurred already in one cage, can not be predicted at the moment. Further experiments, including natural populations, are started now to investigate the nature of the selective forces discovered.

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Springer, R. Institut für allgemeine Biologie, Vienna, Austria. Light-independent mating, probably a dominant character of behaviour in D. subobscura.

Selection of a Viennese wild strain (caught in mass in 1966) by means of gradual reduction of invariable day-and-night-illumination to zero within 14 generations gave rise to several strains that have been cultivated in complete darkness for over five years since. Sub-lines brought back into light and cultivated normally for eight generations or more kept their ability to mate in darkness with only a slight decrease of the percentage of successful matings. The F_1 of nearly all crossings of the selected strains with wild type or marked strains of different origin yielded small percentages of individuals able to mate successfully in darkness. The F_1 and F_2 of a crossing between strain Küsnacht and Vienna 30, both structurally homozygous, with the gene-arrangement J_1 as the only deviation from Standard type in the Vienna 30 strain, showed a significantly lower threshold of required brightness for mating, compared to the parental strains. To eliminate the possibility of a non-genetic mechanism of "inheritance" as, for instance, virus infection, Viennese wild strain and "Light-independent" flies respectively were squashed and added to the food medium. Wild strain was tested on "Lin"-infected medium, vice versa, in darkness. Even after three generations of repeated cultivation of the tested strains on infected medium, no influence of the treated food on the mating was observed.

For the present the genetic diagnosis of the "character" Light-independent can be summarized as caused by a dominant major gene heavily influenced in its penetrance by modifiers and environment. Dominant inheritance possibly happens only as an effect of heterosis when outcrossing the heavily inbred Lin strain with other lines. Due to the variable penetrance of the character no attribution to a linkage group has been secured yet.