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It has been previously reported (DIS 46:81) that the differences in positive phototactism found among flies of the strains "wild" (Canton S), "ebony" (e¹¹), and "white" seem to be much more marked for "old" (30 days) than for "young" (5

days) flies. But it was doubted if such differences were founded on characteristics only phototactic. The process of aging can, e.g., affect diversely the locomotor capacity of flies of the various strains and the weaker phototactism of the "ebony" and "white" in old age could be attributed purely to a lower aptitude to move towards the light.

Therefore "young" and "old" individuals of the strains "wild", "white", and "ebony" were submitted to various tests concerning: 1) positive and negative phototactic reactions of flies in groups (by the "countercurrent distribution method", as previously reported, but with 5 possibilities of choice in place of 15); 2) locomotor activity of flies in a group (in a series of six glass tubes connected by glass funnels); 3) locomotor activity of isolated flies (in a square "arena").

For isolated flies, the locomotor activity is significantly reduced in old age for the three strains, the "wild" flies remaining the most active and the "ebony" flies the least. For the flies in a group, the diminution of locomotor activity with age is evident for the "wild" ones; in the strains "ebony" and "white" the differences between old and young are less marked: the locomotor activity of young "white" and "ebony" flies in a group is already a very low one.

From these observations, it could be concluded that the differences previously reported in positive phototactism are a consequence of a lower locomotor activity of the "ebony" and "white" flies: the "wild" flies are more "phototactic" only because they move faster towards the light. But the present tests concerning the negative phototactic reactions show that the greater differences between strains in old age could perhaps be attributed to a greater repulsion from light in some cases (especially for the old males "white") or to a lowered one in some other cases (e.g. the old "ebony" females).

The relatively uncomplicated behavior reported in the previous experiences concerning the positive phototactic reactions seems to result from complex interactions of various factors, not at the same level for the three strains.

Elens, A. Facultés Universitaires N.D. de la Paix, Namur, Belgium. Temperature, light intensity, and sexual isolation in function of frequency ratio of both genotypes for various strains of *D. melanogaster*

The object of this work was to study the effect of temperature and light intensity on mating activity and sexual isolation at various relative frequencies of both genotypes in presence ("white" and wild, or "ebony" and wild).

20 temperature-light intensity combinations were used (4 levels of temperature and 5 levels of light intensity), the relative humidity of the air being kept roughly constant. For each combination the sexual activity was measured according to our previously described method (DIS 39:118, 1964) by direct observation for a period of two and one half hours. Three chambers were in observation at the same time; the total number of flies was the same in the three cases, but the frequency ratio of both genotypes differed. 5 repetitions were done.

The major characteristics in sexual activity can be drawn from the Fig. 1 and 2 which give, for each genotype and sex, the ratio of flies having mated. In Fig. 1, the data concerning the 5 levels of light intensity at the same temperature have been grouped; in Fig. 2 the grouping concerns the data obtained for the same light intensity at 4 different temperatures.

The greater activity of the wild males is evident; it seems even that some can copulate more than once in two and one half hours (this is particularly manifest in the case where rare "wild" flies are in competition with many "white" ones). The activity of the "ebony" females can also be relatively high.

It seems that 20°C is the optimal temperature (25°C for the "ebony" males). The influence of light intensity is not a striking one. But the sexual activity is much more affected by the frequency ratio of both genotypes in presence; the wild males are much more active when rare; a same trend is evident for the "ebony" females (much less for the "white" ones). On the contrary, the "white" and "ebony" males are more active when numerous. Such general behavioural characteristics seem relatively independent from the physical environmental factors (30°C is not far from the critical limit).