Muhs, H.-J. Forstbotanisches Institut, Freiburg, Germany. Increased frequency of the silent gene (LAP D^0) in laboratory stocks of Drosophila melanogaster during humid-hot summer season.

Homozygous lines were produced for the allele LAP-D^F and LAP-D^S for population genetic experiments. These lines can be distinguished by electrophoresis by the isozyme bands DF and DS of the leucineaminopeptidase (LAP). (See also the technical note on the resolution of a modified micromethod in this issue.) During the humid, hot summertime (from June to the end of August) phenotypes with decreased activity of the enzymes of the D-bands suddenly appeared. The frequency of such phenotypes was able to increase up to 0.3. Therefore it was necessary to stop the already started experiments and to repeat them in the cooler season. Together with the decreased activity of the D-bands one could observe an increased activity, especially of the C1-band and sometimes of the E- and F-bands.

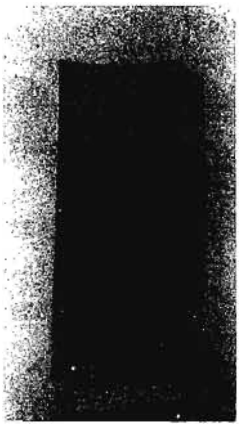

fig.1

fig.2

Figure 1 shows 4 samples of late pupae. The start is at the bottom, the direction of migration leads upwards. The third sample which can be seen on the left side represents a homozygote D^SD^S, the other three samples D^SD^0.

Figure 2 shows as well 4 samples of late pupae. The third sample seen from the left side is a heterozygote D^FD^0, all the others are homozygotes D^FD^F.

The reason for these phenomena is unknown. All during the year the populations were held at a constant temperature of 25°C. It is possible to regulate the temperature exactly but not the humidity. So it happens that warm and humid weather creates condensation water on the inner walls of the incubator. Any mistake in the electrophoretic method can be excluded because parallel samples with full and with decreased activity occur. Phenotypically the samples with the decreased activity of the D-bands look just like the heterozygotes D^FD^0 and D^SD^0 respectively (Muhs, 1973) so that we can take it for granted that they are identical. If all these samples represent such heterozygotes, it remains still inexplicable how the rapid increase of frequency from 0.0 to 0.3 within a few generations is possible. Homozygotes D^0D^0 have a small survival and have only been found twice. As a second interpretation we cannot exclude that in this case a regulator gene is controlling the activity of the D-bands but this had not been proved.

Reference: Muhs, H.-J. (in prep.) Frequency of phenotypes (LAP, Aph and Est) seldom observed in laboratory strains of Drosophila melanogaster.