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Mutants from natural populations of D. subobscura in Switzerland.

The following mutants have been extracted from two widely separated populations of D. subobscura in Switzerland. The progenies of 54 inseminated ♀♀ caught in the wild were inbred (6 single-pair cultures on the average). Mutant strains were established from F_2 and further generations. Names and symbols used are derived from earlier work on D. subobscura. Names in quotation marks refer either to similarity with known phenotypes when allelism has not been established or are simply descriptive. The number of independently established strains of one mutant is given in brackets. If not mentioned otherwise, the mutants are recessive and autosomal.

s, scarlet (Burla 1967)(1)
ma, maroon (Gordon et al. 1939)(1)
"light eye color" (3): allelism-tests with different laboratory strains negative.
pp, poppy (Gordon et al. 1939)(3): crosses between this pp strain and with a pp strain from the laboratory gave either 100%, 50% or no pp-phenotypes in single pair cultures. Presence of a suppressor of pp not established.
"rough eyes" (2): similar to rough shaven, but eyes are only partially roughened. Penetrance variable.
"moisty eyes" (1): eyes look as if covered with a thin layer of oil. Eye color slightly lighter than wildtype.
"bladder" (1): lymph-bladder preferentially at inner wing margin.
"roof" (1): folded wings inversely V-shaped. Penetrance incomplete.
"curved wings" (1): wing borders bent upwards, wing surface wavy. Penetrance incomplete.
"outspread" (2): phenotype identical with outspread (Gordon et al. 1939).
"plexus" (4): distally inserted wing veins between Costa and LII. Weak manifestation in F_2, penetrance complete in F_5. Allelism between different "plexus" not tested.
"delta"(1): wing vein inserted parallel or sloping to posterior crossvein. Weak penetrance.
"multiple crossveins"(1): variable number of inserted veins generally parallel to and between anterior and posterior crossvein. Weak penetrance.
"stiff bristles" (1): scutellars not bent, slightly shortened and thin. Fully penetrant in F_4.
"thin dorsocentrals" (1): dorsocentrals shortened and thin. Fully penetrant in F_4.
"thin scutellars" (2): bristles, especially scutellars, thin. Length of bristles not affected. Complete penetrance in F_4.
"translucent bristles" (1): scutellars thin, translucent at the tip. Penetrance incomplete.
"short bristles" (2): phenotype similar to bobbed.
"short scutellars" (1): dorsocentrals and scutellars shortened and stiff. Penetrance variable.
"crossed scutellars" (1): posterior scutellars strongly converging. Penetrance variable.
"singed" (1): phenotype comparable with singed. Penetrance variable, low fertility.
"aristapedia" (1): similar to aristapedia (UCL Report, DIS 20:82-83.)
ho, hoary (1): (Gordon et al. 1939).
"missing bristles" (2): first orbital and anterior ocellar bristle missing. Occasionally second orbital missing. Position of ocelli variable. Sexlinked.

Frequent phenotypes:

"crossveinless", cv1 (11): posterior crossvein absent or incomplete, often asymmetrically expressed. Phenotype found in offspring of 36 ♀♀. 11 strains with variable penetrance and expressivity established. Crosses between different strains gave results similar to those obtained by Gordon et al. (1939).
"short vein", sv (10): different strains with incomplete longitudinal wing veins: sv_2, sv_4, sv_5, sv_{2-5}. Phenotypes found in offspring of 32 ♀♀. 10 strains established. For descriptions and frequencies see also Gordon 1936, Gordon et al. 1939, Prevosti 1951.
"three dorsocentrals", tdc (13): three or more dorsocentrals present on one or both sides, the additional bristle preferentially inserted anterior to the normally present dorsocentrals. Found in offspring of 36 ♀♀. 13 strains with variable penetrance.
"short scutellar", shsc (12): (Burla 1968) 1-4 scutellars shortened, giving 16 phenotypic combinations when positions are considered. Other bristles may be affected. Found in offspring of 40 ♀♀, 12 strains established. Penetrance incomplete.
"extra scutellars" (6): (Burla 1967) additional scutellars near normal bristle positions.

Number of supernumerary bristles variable. Found in offspring of 24 ♀♀, 6 strains with variable degrees of penetrance.

High frequencies of cvl and sv phenotypes have been found in all populations investigated. tdc and shsc phenotypes have not been described from natural populations of D. subobscura. Phenotypes similar to esc were found in Greek populations (Pentzos da Ponte et al. 1967).

The extremely low occurrence of the newly described phenotypes (tdc, shsc, esc) in F_2 cultures and the difficulty of detecting them presuppose the idea that these types might not be specific for the populations in Switzerland; perhaps their presence or absence reflects different intensity of observation.

References: Burla, H. 1967 DIS 42:66; _____ 1968 DIS 43:76-78; Gordon, C. 1936 J. of Genetics 33:25-60; Gordon, C., H. Spurway and P.A.R. Street 1939 J. of Genetics 38:37-90; Pentzos-Daponte, A., E. Boesiger and A. Kanellis 1967 Thessaloniki physikomathematikes scholes 10:133-159; Prevosti, A. 1951 Genetica Iberica 3, 1/2:37-46.

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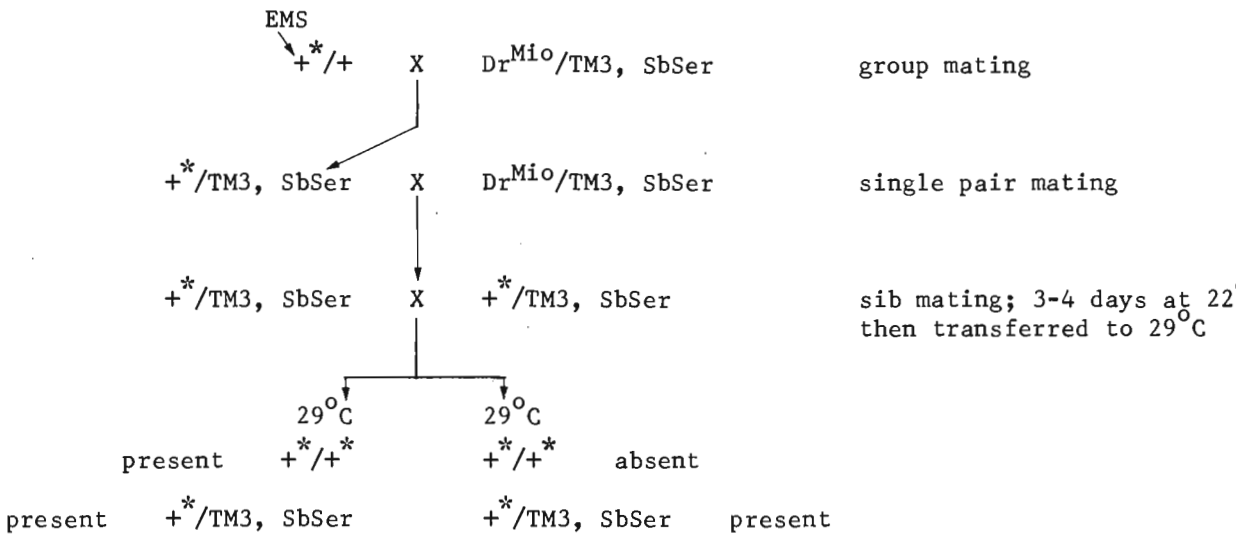
Isolation of temperature sensitive mutants of the third chromosome of D. melanogaster.

A screening procedure for the detection of recessive temperature sensitive lethal mutations on the third chromosome of Drosophila melanogaster has been devised and tested. Oregon-R (Oak Ridge) males were treated with ethylmethane sulfonate (EMS) according to the method of Lewis and Bacher (DIS 43:193, 1968), and mated according to the following diagram.



Recessive temperature sensitive lethality was indicated in those crosses in which both homozygous and Stubble Serrate progeny were present at 22°, but only Stubble Serrate progeny were present at 29°.

All stocks in which these results were observed were retested to confirm their temperature sensitive lethality. Crosses between the heterozygous Stubble Serrate progeny and between the homozygous progeny were incubated at 22° and 29° and subsequently scored for the production of homozygous progeny. Some of the mutant stocks obtained from the original isolations were sterile when homozygous. In these cases crosses between the heterozygous Stubble Serrate progeny incubated at 22° and 29° were scored for the production of homozygotes. Those retests in which homozygotes were produced at 22° but were completely absent at 29° resulted in the classification of the mutant stocks as confirmed recessive temperature sensitive lethals.

Two separate isolations series were done using different concentrations of EMS. In the first isolation series (0.025 M EMS) 4.7 per cent of all chromosomes tested (235) were confirmed temperature sensitive lethals, and in the second isolation series (0.005 M EMS) the recovery frequency was 4.0 per cent of all chromosomes tested (251).