References: Gerasimova, T.I. 1981, Mol.Gen.Genet. 184:544; Golubovsky, D.M. 1979, Genetika (Rus.) XV:1599; Gerasimova, T.I. DIS in press; Chow j. et al. 1979, Proc.Natl.Acad. Sci. USA 76:4020.

Gilbert, D.G., W.T. Starmer & M-A. Lachance.* Syracuse University, Syracuse, New York and *University of Western Ontario, London, Ontario, Canada. Drosophila collected in Southwestern Ontario.

Drosophila were collected July 17-18, 1982, from banana baits in an oak-pine forest in Pinery Provincial Park of Ontario, on the east coast of Lake Huron. These flies were plated to enumerate their yeast content, to be reported elsewhere. Collections were made at 0700 to 0900 hr in a 3000 sq. m area. The table lists species and numbers collected.

Species	Number	Species	Number
Sap feeders:		Fungus feeders:	
D. affinis	93	D. quinaria	3
D. athabasca	23	D. falleni	31
D. algonquin	13	D. recens	1
affinis group females	56	D. putrida	9
D. robusta	17	D. testacea	1
D. melanica	7		
melanogaster group females	5	Chymomyza amoena	12
D. busckii	1		
D. hydei	1		

Goetz, K.G. & R. Biesinger. Max-Planck-Institut f. biologische Kybernetik, Tuebingen, FRG. Wind-controlled selection of motion detectors in the eyes of D. melanogaster.

Visually induced responses such as the optomotor control of course and altitude in flies require spatial integration of motion within the retinal images. Overlooking flexibility in the optomotor system seemed to be justified as long as the flies were held in a steady-state of visual stimulation. Symptoms of flexibility in the optomotor system of Drosophila (Heisenberg & Wolf 1979; Wolf & Heisenberg 1980) and Syritta (Collett 1980a & 1980b) only appeared when the flies were allowed to control the direction and speed of the stimulus. The occasional suppression, restriction and shift of motion-attention in these flies demonstrate that they are capable of restricting spatial integration to selected areas of their motion detector networks.

Recent observations extend the notion of flexibility to properties of the optomotor control system which have been attributed, so far, to the neural hardware of these networks (Buchner, Goetz & Straub 1978; Goetz & Buchner 1978). The 'preferred directions' in the Table are the averages of the direction of maximum sensitivity of the motion detecting system associated with the altitude control response of Drosophila. The angular representation of these directions refers to the frontal (0°), and dorsal (90°), coordinates of the retinae on either side. The data were obtained under condition of steady-state stimulation. They show the influence of head wind on the preferred direction, and the absence of this influence after immobilisation of the antennae. The shift of the preferred direction is specific to the altitude control system. No such effect has been found in the course control system of Drosophila. The shift appears sufficient to compensate the expected decrease of body angle upon transition from hovering to cruising flight. This may help to maintain a vertical preferred direction for altitude control, regardless of the flying speed.

	Preferred direction of motion (deg.)		
Antennae	tail wind	no wind	head wind
free	66	62	98
fixed	72	74	77

The preferred direction of a typical local motion detector in Drosophila seems to be invariably determined by the relative position of two contiguous elements in the hexagonal array of visual units. Control of the preferred direction is more likely to occur at higher levels of motion processing, e.g., at the level of spatial integration of the detector signals. However that may be, wind-induced shift is not compatible with a conservative wiring scheme of the optomotor control system.

References: Heisenberg & Wolf 1979, J.Comp.Physiol. 130:113-130; Wolf & Heisenberg 1980, J.Comp.Physiol. 140:69-80; Collett 1980a, J.Comp.Physiol. 138:271-282; Collett 1980b, J.Comp.Physiol. 140:145-158; Buchner, Goetz, & Straub 1978, Biol.Cybernetics 31:235-242; Goetz & Buchner 1978, Biol.Cybernetics 31:243-248.

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The increase of X-linked lethal and non-disjunction rates in genotypes with unstable singed alleles in D. melanogaster.

As it was suggested in 1977 the instability of different sn alleles isolated from wild populations was due to insertion of movable or transposable elements (TE) and action of MR natural factors (Golubovsky et al. 1977; Green 1977). It is well known that one of the main features of TE is the induction of the site specific mutations and chromosome breakage. The appearance of lethal mutations is the most typical consequence of TE integration in a vital locus. It is possible to expect that the breakage of chromosomes may be connected with the disturbance of their disjunction. So it is interesting to estimate the same components of the mutation process in lines having insertional unstable mutations. For this purpose we made an attempt to estimate: (1) the frequency of sex-linked lethals in X-chromosome containing unstable sn; (2) to what extent the allelic transition in the unstable sn is directly connected with the appearance of lethal mutation in other loci of the X-chromosome; (3) the rate of non-disjunction of X-chromosomes with unstable sn. All these parameters have been obtained by using the slightly modified Muller-5 technique:

F_0 1♂ $\frac{sn^*}{\rightharpoondown}$ x $\frac{w^a\ B\ (Basc)}{w^a\ B\ (Basc)}$ ♀♀

(sn^* - the unstable)

F_1 1♀ $\frac{sn^*}{w^a\ B}$ x $\frac{w\ sn^3}{\rightharpoondown}$ ♂♂

F_2 regular phenotypes:

♀♀ w^aB; sn. ♂♂ w^aB;

sn^* (are absent if the lethal occurred in a gamete of the F_0 male)

Table 1. The increased lethal mutation frequency in the X-chromosomes containing unstable singed alleles. The absence of direct association between the sn mutations and the appearance of lethals in other loci of the same X-chromosome.

Allele in X-chrom. of F_0 males	number chrom. tested	Mutational events in X chromosome of $\frac{sn^*}{\rightharpoondown}$ ♂♂ I only sn mutations	II sn mutat. and lethals in same chrom.	III only lethals and strong semilethals
sn^{11}	406^a	4(27)	1(3)	2
	106^b	8	1	4
sn^{+10}	222^b	2	0	2
sn^{B8}	168	5(12)	0	2
sn^{B14}	117	4(11)	0	2
Total	1019	23(50)	2	11

Experiment: 1019 chrom. - 13 lethals or 1.28%±0.35%

Control[c] : 4605 chrom. - 17 lethals or 0.37±0.09%

a = numbers in parenthesis represent the mutations appearing in clusters;

b = in these cases there were mass crosses in F_0 but individual in F_1 (see above the scheme);

c = X-chromosomes from wild populations tested in laboratory by Yu.N. Ivanov.