Complex relationships between studied traits are telling us how much could be restricted adaptive biological variation, and which are developmental strategies to reduce enormous potentials of such a variation to efficient ontogenetic programs realized in eclosed adult individuals.

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Koryakov, Dmitry E.[1], Elena S. Belyaeva[2], and Igor F. Zhimulev[1,2]. [1]Department of Cytology and Genetics, Novosibirsk State University, Novosibirsk 630090, Russia [2]Institute of Cytology and Genetics, Novosibirsk 630090, Russia. The new *Drosophila melanogaster* nonlethal inversion, arisen from the *In(2R)bw^{VDe2}*.

In the stock *In(2R)bw^{VDe2}/CyO*, received from the Umea *Drosophila* stock center, part of the flies spontaneously lost lethality in homozygous condition. The new stock, called *In(2R)bw^{VK} - brown Variegated of Koryakov*, was constructed. Cytological analysis has shown that the new stock has the same inversion - 41A-B - 59D6-E1, as the *bw^{VDe2}*.

The viability was studied of heterozygotes of *bw^{VDe2}* and *bw^{VK}* with other rearrangements, displaying *bw-Variegation* phenotype (*In(2R)bw^{VDe1}*, *In(2R)bw^{V1}*, *T(2,3)bw^{VDe4}*, and *T(2,3)bw^{V4}*), and with two lethals *uex^{4}* and *rl^{9}*, located according to Dimitri (1991) in heterochromatin distally and proximally to the break point of the inversion *bw^{VDe2}*, respectively (Table 1). In the case of *bw^{VK}* the expected ratio of the *Cy/Cy^{+}* offspring is 1:1, in the case of *bw^{VDe2}* the ratio is 2:1, and the percentage of surviving flies was calculated from these ratios. It should be noted that the surviving flies *bw^{VK}/bw^{VDe2}* slightly differ in reciprocal crosses. In comparison with *bw^{VDe2}*, viability of heterozygotes of *bw^{VK}* with *bw^{VDe1}*, *bw^{V1}*, and *bw^{VDe4}* is noticeable higher, but with *bw^{V4}* it is lower. Viability of *bw^{VK}/uex^{4}* flies is greatly higher than expected.

Table 1. The viability of heterozygotes of *bw^{VDe2}* and *bw^{VK}* with other rearrangements, displaying *bw-Variegation* phenotype and with two lethals (at 25°C).

		bw^{VK}		*bw^{VDe2}*	
		number of flies	Survived (in %%)	number of flies	Survived (in %%)
bw^{VK}	Cy			124	
	Cy^{+}			116	96.7
bw^{VDe2}	Cy	133			
	Cy^{+}	107	89.2		
bw^{V1}	Cy	121		160	
	Cy^{+}	94	87.4	38	57.6
bw^{VDe1}	Cy	135		164	
	Cy^{+}	19	24.7	0	0
bw^{V4}	Cy	102		110	
	Cy^{+}	41	57.3	33	68.8
bw^{VDe4}	Cy	82		134	
	Cy^{+}	22	42.3	8	17.0
uex^{4}	Cy	82		157	
	Cy^{+}	168	134.4	63	86.3
rl^{9}	Cy	122		153	
	Cy^{+}	126	101.6	80	102.6

In some crosses the flies with wing defects were found in small amounts (Table 2), which is supposedly due to position effect variegation of the *uex* locus, because a very similar phenotype was described for the *uex* homozygotes (Maeda, 1984).

So, losing the lethality for *bw^{VK}* is accompanied by increasing viability with other *bw-Variegated* rearrangements.

Comparison of genetic inactivation as a result of position effect variegation of the *bw*-locus was performed with the inversions *bw^{VDe1}*, *bw^{VDe2}*, and *bw^{VK}*.

Cis-effect of *bw^{+}*-variegation in rearranged chromosomes can be observed in *R(bw^{+})/R^{+}(bw)* heterozygotes where *R* is eu-heterochromatin rearrangement. Precise calculation of pigmented facets is possible if their number is not higher that 30 per eye. Therefore, we established five classes of variegation: 0, 1-10, 11-20, 21-30 and more than 30 pigmented facets per an eye. As a rule, both eyes of the fly

Table 2. A number of flies with wing defects from some crosses.

	number of flies	
	completely unexpanded wings	turbid, crumpled wings
bw^{VK}/ bw^{V4}	7*	23**
*bw^{VK}/ bw^{VDe4}***	4*	5
bw^{VDe2}/ bw^{V1}	0	3
bw^{VDe2}/ bw^{V4}	14	18
bw^{VDe2}/ bw^{VDe4}	3	2

* - Black mouthparts. **- One wing may be smaller than another one, sometimes with bubbles. ***- In this cross a fly with notched wings planted apart (looking like Notch and Dichaete) was found

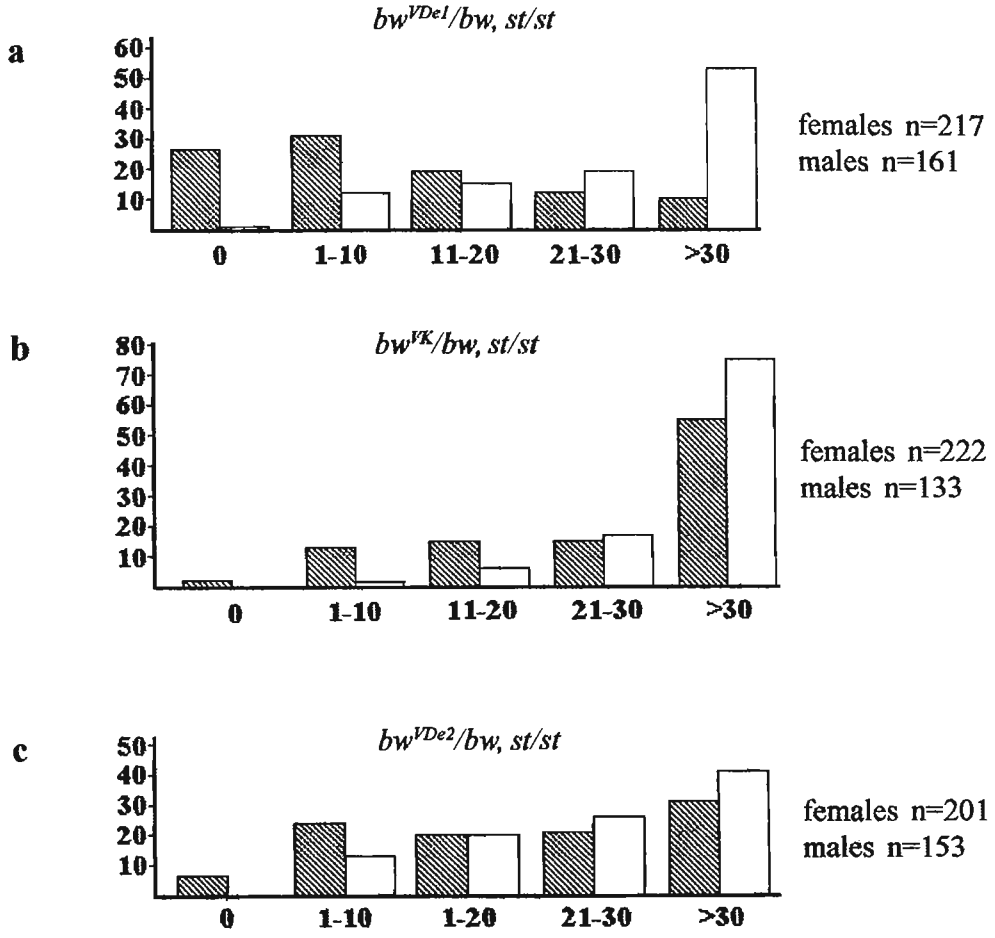

Figure 1. Comparison of the cis-inactivation of bw^+ in different strains at temperature 18°C. Abscissa, classes with different number of pigmented facets; ordinate, number of eyes of every class (in%%). Open columns are males, dashed are females.

belong to the same or to two neighboring classes.

Comparison of bw^+ cis-effect in chromosomes with different inversions gives the following row: $bw^{VDe1}>bw^{VDe2}>bw^{VK}$. Cis-inactivation is stronger in females than in males in all these cases (Figure 1).

Cytological analysis shows that in $X0;bw^{VK}/+$ males at 16°C (maximum enhancement of position effect variegation) only 11% of nuclei shows heterochromatization of the 59E region in rearranged homologue. In these cases the light chromosome region near 59D1-4 disappears and the bands 59D1-4 join to the chromocenter; they have diffuse morphology or are not seen at all. At the same conditions in bw^{VDe2} heterochromatization was found in 66% of nuclei (Belyaeva *et al.*, 1997).

So, the data show that bw^{VK} has noticeably decreased heterochromatization and frequent inactivation of the bw^+ gene in comparison with bw^{VDe2}.

Acknowledgments: The work was supported by grants from "Frontier genetic program of Russian Federation" and RFBR (96-04-50142, 96-15-97749).

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