

References: Armstrong, E. 1976, *J. Invert. Path.* 27:363; Armstrong, E. 1977, *Z. Parasitenk.* 53:311; Burnett, R.G. & R.C. King 1962, *J. Insect Path.* 4:104; Hazard, E.I., E.A. Ellis & D.J. Joslyn 1981, pp 163-182 in *Microbial Control of Pests and Plant Diseases 1970-1980* (Burgess, Ed.) Academic Press; Kramer, J.P. 1964, *J. Insect Path.* 6:491; Stalker, H.D. & H.L. Carson 1963, *DIS* 38:96; Wolfson, M., H.D. Stalker & H.L. Carson 1977, *DIS* 31:170.

Ruiz, A. & J. Alverola. Univ. Autonoma de Barcelona, Spain. Lack of evidence of embryonic mortality in the progeny of *Drosophila buzzatii* females heterozygous for included inversions.

Natural populations of *Drosophila buzzatii* are polymorphic for several overlapping inversions on the second chromosome and one simple inversion on the fourth chromosome (Fontdevila et al. 1981, 1982). The most widespread second chromosome arrangements are standard (st), j and jz^3 , the first two arrangements being the most fre-

quent in every population. The frequency of the $2 jz^3$ arrangement is in general low (ranges from zero to 0.296 with a mean value of 0.080) and is negatively correlated with that of the standard arrangement ($r = -0.45$; $P < 0.05$). One way to explain this correlation is to postulate a selective force acting against $2 jz^3/st$ heterozygotes due to the deleterious effect of crossing-over associated with included inversions. In fact, inversion $2 z^3$ includes the region occupied by inversion $2 j$ (Wasserman 1962) so in both, the standard and the jz^3 arrangements, the j segment is oriented in the same direction. In $2 jz^3/st$ heterozygotes, crossing-over within the limits of this segment (which constitutes 27% of the total length of the chromosome) must produce aneuploid gametes carrying duplications and deficiencies, thus leading to a reduced fertility (Sturtevant 1938; Wallace 1953).

Table 1. Number of hatched (HT), dead (DD) and unfertilized eggs (UF) in the progeny of the nine different genotypic combinations.

female	male		day				
			1	2	3	4	5
st/st	st/st	HT	288	284	255	292	259
		UF	103	98	136	97	131
		DD	9	18	9	11	19
st/st	jz^3/st	HT	300	311	303	306	279
		UF	93	79	75	85	103
		DD	7	10	22	9	18
jz^3/jz^3	jz^3/jz^3	HT	297	330	297	310	303
		UF	90	57	89	78	81
		DD	13	13	14	12	16
st/st	st/st	HT	371	368	371	362	369
		UF	28	28	23	29	27
		DD	1	4	6	9	4
jz^3/st	jz^3/st	HT	364	385	391	391	388
		UF	24	11	5	5	9
		DD	12	4	4	4	3
jz^3/jz^3	jz^3/jz^3	HT	382	386	385	384	382
		UF	16	6	10	10	14
		DD	2	8	5	6	4
st/st	st/st	HT	342	357	378	377	379
		UF	23	25	18	16	13
		DD	35	18	4	7	8
jz^3/jz^3	jz^3/st	HT	343	349	375	370	377
		UF	29	29	14	16	18
		DD	28	22	11	14	5
jz^3/jz^3	jz^3/jz^3	HT	370	382	382	366	373
		UF	17	7	6	22	20
		DD	13	11	12	12	7

In order to test this hypothesis, mortality among the eggs laid by $2 jz^3/st$ heterozygous females was compared to that of st/st and jz^3/jz^3 homozygous females. Two strains of *Drosophila buzzatii* were used. Strain C-11 is homozygous for the standard sequence in both the second and the fourth chromosomes. Strain PDO is homozygous for the $2 jz^3$ arrangement and polymorphic for inversion 4 s on the fourth chromosome. The two strains were derived from wild females collected in Adeje and Pingado, respectively, both localities situated in the Island of Tenerife (Fontdevila et al. 1981). Individuals of the three second chromosome genotypes (st/st , jz^3/st , $jz^3.jz^3$) were mass crossed in the nine possible combinations. For each combination, 100 one-to-three day virgin females were placed with 100 males of the same age in an egg collecting chamber. A sample of 400 eggs was picked up each day, up to five days, and allowed to hatch on a Petri plate with 1.5% agar. The eggs were examined three days after the collection and scored as hatched, dead or unfertilized. Dead embryos turn brown while unfertilized eggs remain white (Riles 1965; Curtsinger 1981).

The results of the observations are shown in Table 1. A three-way factorial analysis of variance (Sokal

Table 2. Three-way factorial ANOVA of the arcsine transformed values of the percent mortality data.

Source of variation	df	MS	Fs
A (female)	2	15.5148	14.52*
B (day)	4	0.9135	0.85
C (male)	2	0.3363	0.31
A x B (female x day)	8	2.2086	2.06
A x C (female x male)	4	0.2994	0.28
B x C (day x male)	8	0.4814	0.45
A x B x C	16	1.0682	

* P<0.05

Therefore, a possible confusion between dead embryos and unfertilized eggs does not change the situation at all. There are two alternative explanations for the lack of embryonic lethality in the progeny of 2 jz³/st heterozygous females. (1) In the meiosis of heterozygotes for complex inversions, such as 2 jz³/st, crossing-over in the crucial region of the chromosomes is effectively decreased. (2) Abnormal chromosomes carrying duplications and deficiencies produced by crossing-over are not incorporated into functional egg cells. Whichever the solution to this question is, the low frequency of the 2 jz³ arrangement in most natural populations and its correlation with that of the standard arrangement remain unexplained on cytological grounds.

References: Curtsinger, J.W. 1981, DIS 56:33-34; Fontdevila, A., A. Ruiz, G. Alonso & J. Ocana 1981, Evolution 35:148-157; Fontdevila, A., A. Ruiz, J. Ocana & G. Alonso 1982, Evolution 36:843-851; Riles, L. 1965, Genetics 52:1335-1343; Sokal, R.R. & F.J. Rohlf 1969, Biometry, W.H. Freeman & Co.; Sturtevant, A.H. 1938, Quant.Rev.Biol. 13:333-335; Wallace, B. 1953, Amer.Nat. 87:343-358; Wasserman, M. 1962, Texas Univ.Publ. 6205:85-117.

Schalet, A. University of Leiden, The Netherlands. Vital loci located at the junction of polytene X chromosome sections 2B and 2C in *D. melanogaster*.

$y^{2Y67gl9.1}$ or $T(1\rightarrow3)w^{vco}$, or both of these duplications taken together. Nevertheless, all the lethals were covered by $Dp(1;f)R(1A4-3A)$ and the 3 lethals tested, (5-114, 5-39, 6-62), were covered by $Dp(1;f)Z9(1A1-3E7)$. Lethal bearing chromosomes marked with $y ac sc$ were obtained from linkage mapping experiments and used in combination with $Df(1;f)R$, which carries $y^+ ac^+ sc^+$, to perform allelism tests in the type cross: $Dp(1;f)R/y ac sc 1^X/Y$ males X $y ac sc 1Y/FM7$ females. The 5 lethals fell into 3 complementation groups. The 3 groups and their estimated linkage map positions are: 1. 5-39, 6-62 (0.5); 2. 5-114, 14-28 (0.5); 3. 11-94 (0.7).

According to Lefevre (1981) the proximal limit of the distal region duplicated in $y^{2Y67gl9.1}$ is 2B17±. Lindsley & Grell (1968) gives the distal limit of the w^{vco} duplication as between 2B17 and 2C1, however, in a personal communication to P. Kramers, Lefevre indicates that the duplication does not include 2C1. Accordingly, our results suggest that there is indeed a "gap" between the regions covered by the two duplications, i.e., at the junction of polytene chromosome sections 2B and 2C, and that the 5 lethals described above are located in this interval. In the June 1982 Computerized Stock List 3 these lethals are designated under 1(1)S-2B-C.

References: Lefevre, G. 1981, Genetics 99:461-480; Lindsley, D.L. and E.H. Grell 1968, Carnegie Inst.Wash.Publ. 627.

& Rohlf 1969) was performed with the arcsine transformed values of the percent mortality. Table 2 shows the results of this test. As it can be seen, there is no significant effect of two main factors (male and day), the effect of the third factor (female) being slightly significant ($f_s=14.52$; $P<0.05$). The significant effect of the female is due to the lower percent mortality in the progeny of 2 jz³/st heterozygotes (1.26%) when compared with that of st/st and jz³/jz³ homozygotes (3.18% and 3.45%, respectively). This is just the opposite result of what we expected according to the hypothesis outlined above. If we look at the unfertilized egg data, the same pattern is observed (4.08% versus 23.25% and 4.55%).

Among approximately 150 independent spontaneous X-chromosome lethals, obtained from crossing wild-type males (M56i, Amherst) to $In(1)sc^8 In(1)d1-49, y^{3ld} sc^8 wa v^{of} f$ females, there were 5 lethals that mapped genetically between $ac(1B4)$ and $pn(2E1)$, but none were covered by