Meyer, Helen U. University of Wisconsin, Madison, Wisconsin. An iso-allele of the dumpy lethal.

Two similar cases of an unconventional mutation were found, located on second chromosomes of D. melanogaster from nature (Madison, Wisconsin, 1966); they were probably of common origin. These chromosomes from nature ($+_n$) were lethal in combination with $dp^{lv\ I}$ Cy, Ins CyO pr cn^2 sp ($dp^{lv\ I}$ = dumpy-Thoraxate of Ives). This suggested that we were dealing with an allele of some lethal present in this Curly chromosome, most likely with a lethal allele in the dumpy region. But contrary to expectation it was then found that homozygotes $+_n/+_n$ were viable and of wild type appearance. A homozygous stock could be established which, however, showed higher egg mortality than a typical wild type stock.

The tests with $dp^{lv\ I}$ were repeated with the same result, and crosses made to other mutant alleles of the dumpy region. The following results were obtained:

Lethal combinations:		Viable combinations and wild type heterozygotes	
$+_n/dp^{lv\ I}$	(dumpy-Thoraxate)	$+_n/dp^{lv}$	(dumpy-thoraxate)
$+_n/dp^{olv}$	(dumpy-Truncate)	$+_n/dp^{cm2}$	(dumpy-comma)
$+_n/dp^{lM}$	(dumpy-lethal)	$+_n/dp^{ov}$	(dumpy)

Non-lethality (complementation) with thoraxate was unexpected. Localization of the factor responsible for lethality in combination with dp^{lM} was carried out by crossing females $+_n/S$ Sp Bl L^{rm} bw^D to males dp^{lM}/S^2 Cy, Ins(CyL+R)... Classification of the non-curly offspring for the dominant markers S, Sp Bl, L^{rm}, bw^D placed the factor between S and Sp and indeed showed that it was located in the dumpy region.

This mutation can be interpreted as an iso-allele at the dumpy-lethal sublocus, or at one of them, if there should be more than one such sublocus. It must be considered a hypomorph, since it produces some, but less than the normal amount of a gene-initiated product necessary for survival. Two doses of it, as in homozygotes, are sufficient; one dose is not sufficient in combination with other (amorphic) dumpy-lethals. An exception is the case of dp^{lv}, which likewise must be a hypomorph and apparently is a less drastic mutation than $dp^{lv\ I}$.

This dumpy-lethal isoallele might be useful in attempts to discriminate between the potentialities of various dumpy-lethal mutations, in a similar way as dp^{cm2} is useful. It also might be a tool in some biochemical investigations of that region. On the basis of this tentative interpretation the symbol dp^{lMi} (dumpy-lethal iso-allele) is suggested for this mutation.

Williamson, J.H. University of California Riverside, California. Simultaneous recovery of two detachment-X chromosomes from an irradiated female.

The model of directed disjunction predicts that subsequent to an induced interchange in immature oocytes the affected centromeres will segregate during anaphase I (Parker, 1969). Consistent with this prediction is the observation that induced detachments of a compound X chromosome are recovered singly. An exception to this rule was recently recovered from a C(1)RM, y v bb/0;$y^+ \cdot spa^{pol}$/ci ey^R female treated with 2000 r of X rays, mated to y w^a $Y^L \cdot Y^S$/Y;spa^{pol} males and brooded daily. The exceptional female was v and at first assumed to be triplo-4 or (more likely) to carry a recombinant $y^+ \cdot$ci ey^R fourth chromosome. All exceptional progeny were being tested to determine their chromosomal complements and this female was found to carry two detachment-X chromosomes. One was y v bb$\cdot y^+$, the other was y v bb$\cdot$ci ey^R. In addition she carried a paternal fourth marked with spa^{pol} and a Y chromosome. The recovery of these two detachments required at least three induced breaks and cyclical interchange. At anaphase I the centromeres from the compound-X and the y^+-marked fourth segregated from the other fourth centromere. At anaphase II non-randomness would prefer the detachment capped with ci ey^R but not the captured detachment marked with y^+. However, both were incorporated into the oocyte, with no free maternal fourth chromosome. This exception, along with those described in DIS 43: 178, adequately demonstrate that multiple break rearrangements can be recovered and recognized only if one thoroughly analyzes all exceptional progeny.

Reference: Parker, D.R., 1969, Mutation Res. 7: 393-407.