

## Mutation Notes



**A recessive lethal gene, *l-Cy*, found in a natural population of *Drosophila melanogaster*.**

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The second chromosome balancers, SM1, SM5, and SM6, have been used as a most useful tool to study the genetic variations in natural populations of *Drosophila melanogaster* (Ives, 1945; Wallace, 1946; Mukai, 1964; Kosuda and Moriwaki, 1971). These balancers suppress recombination in almost the whole region of the second chromosome, since they have complicated inversions both in the right and left arms. They are lethal in the homozygous condition, and they also have a dominant mutant, *Cy*, and several recessive mutations (Lindsley and Zimm, 1990). Homozygous lethality has been explained by the presence of *In(2LR)* or *Cy* itself. However, the cause of lethality is not necessarily clear. Recently, the author has found a recessive lethal gene in a natural population, which is allelic to these balancer chromosomes. In this short communication the author reports that the lethality of these balancers in the homozygous condition is due to a recessive lethal gene.

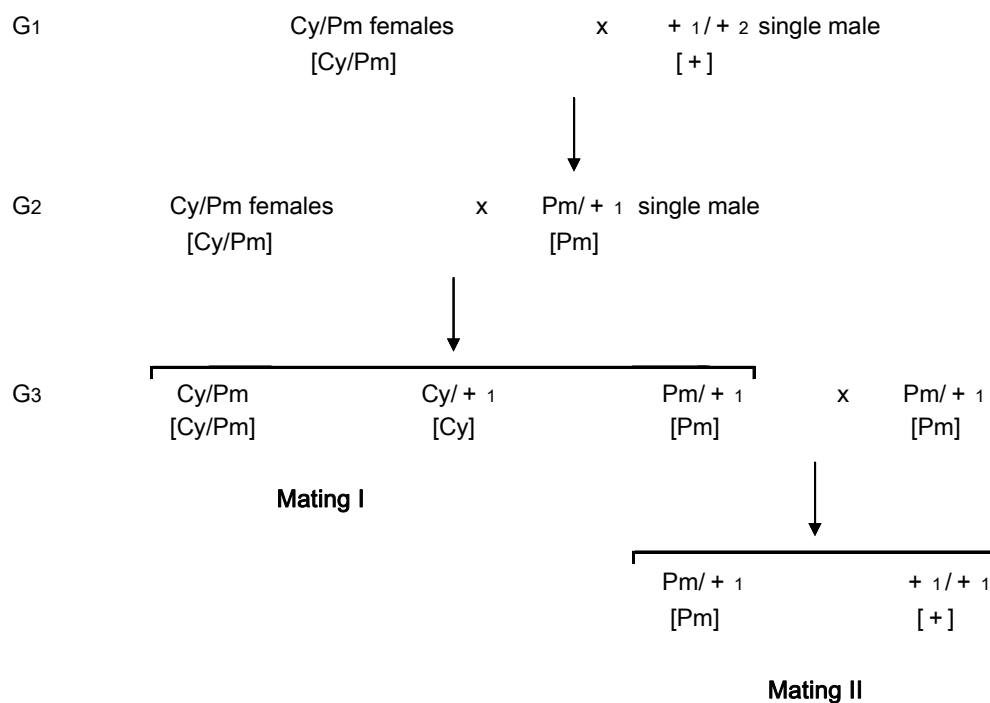


Figure 1. Mating scheme. If + 1 chromosome is bearing a recessive lethal, *l-Cy*, all the progenies in the G3 of Mating I are only *Cy/Pm*, and the progenies in G4 of Mating II are only *Pm*, since *Cy/+ 1* is dead.

Table 1. Progeny from Mating-I, Cy/Pm x Pm/C-1367

Cy/Pm	Pm	Cy
86	106	0
40	41	0
22	40	1
113	129	1
82	84	0
112	112	0
125	126	0
104	109	0
67	87	1
153	143	2
142	150	0
116	125	0
132	136	0
71	83	2
101	115	1
Total	1466	1586

Table 2. Progeny from Mating II, Pm/C-1367 x Pm/C-1367.

Pm	+
59	2
60	0
52	1
70	0
71	0
72	1
134	0
141	1
111	3
100	3
155	0
138	1
146	0
163	2
Total	1472

Mating-I in Figure 1 was repeated and the number of progenies in generation 3 is given in Table 1. As clearly shown in Table 1, one of second chromosomes sampled from a natural population in Szentendre, Hungary, was found to be lethal in combination with the second chromosome balancers. This lethal chromosome and lethal gene were tentatively named C-1367 and *l-Cy*, respectively. It should be noted that it was impossible to detect *l-Cy*, if *Cy* males were singly mated with *Cy/Pm* females in generation 2. The result clearly shows that C-1367 is carrying a recessive lethal gene, although it is not complete. *Pm* males in generation 3 of Mating-I were also mated with *Pm* females repeatedly. The result shown in Table 2 indicates the same conclusion, that *Cy/l-Cy* is substantially lethal and the viability of *Cy/l-Cy* is less than 0.005 of *Pm /l-Cy* heterozygote. Several wild type phenotypes appeared in the progenies in this

mating, because *Pm* chromosome is not complete as a balancer. These results indicate that C-1367 has a lethal allele, *l-Cy*, and this lethal allele is concealed in the second chromosome balancers in the heterozygous condition, and that *l-Cy* is completely linked with *Cy*.

References: Ives, P.T., 1945, Genetics 30: 167; Kosuda, K., and D. Moriwaki 1971, Genetics 67: 287; Lindsley, D.L., and G.G. Zimm 1990, *The Genome of Drosophila melanogaster*; Mukai, T., 1964, Genetics 50: 1; Wallace, B., 1956, J. Genetics 54: 280.



### Ovary phenotype and expression of *bab1* and *bab2* paralogs in the larval ovary of two mutants of the *bab* locus in *Drosophila melanogaster*.

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France; \*these authors contributed equally to this work.

## Introduction

The *bric-à-brac* locus (*bab*, Godt and Laski, 1995) is composed of two evolutionarily related genes, *bab1* and *bab2* (Couderc *et al.*, 2002), that play important roles in various developmental processes and sex-specific differentiation (Sahut-Barnola, *et al.*, 1995; Godt, *et al.*, 1993; Barmina and Kopp, 2007; Randsholt and Santamaria, 2008; Kopp *et al.*, 2000; Williams, *et al.*, 2008). In