

## Article

# A case of spontaneous gynandromorph in *Drosophila melanogaster*

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While constructing stocks for the study of the effect of *unextended* (*uex*) mutation of *Drosophila melanogaster* (Maeda, to be published elsewhere) a spontaneous gynandromorph (sex mosaic) appeared. I report it here as spontaneous gynandromorphs are rare in *D. melanogaster*, and also as this particular case may invite some new studies.

The gynandromorph appeared in a cross to obtain a stock:  $ct^6/CIB$ ; *uex/uex* females  $\times$   $ct^6/Y$ ; *uex/uex* males.  $ct^6$  (*cut*<sup>6</sup>) is a mutation of the *X* chromosome producing the phenotype of incised wing margins, and *CIB* is a balanced lethal *X* chromosome marked with dominant *B* (*Bar*, eye restricted to narrow bar).

Figure 1 shows the gynandromorph. The left side of the head and thorax shows the male phenotype: The compound eye is a bar (*B*/0), the wing is  $ct^6$  ( $ct^6/0$ ), and the first tarsal segment of the foreleg shows a malespecific sex comb. The right side of the head and thorax, on the other hand, is female: The compound eye shows the heterozygous *B* phenotype (*B*/+), the wing is normal ( $ct^6/+$ ), and the first tarsal segment of the foreleg is female (without the sex comb). The left hind leg is missing, most probably due to some abnormal event in development. The abdomen, as far as can be investigated, is normal female.

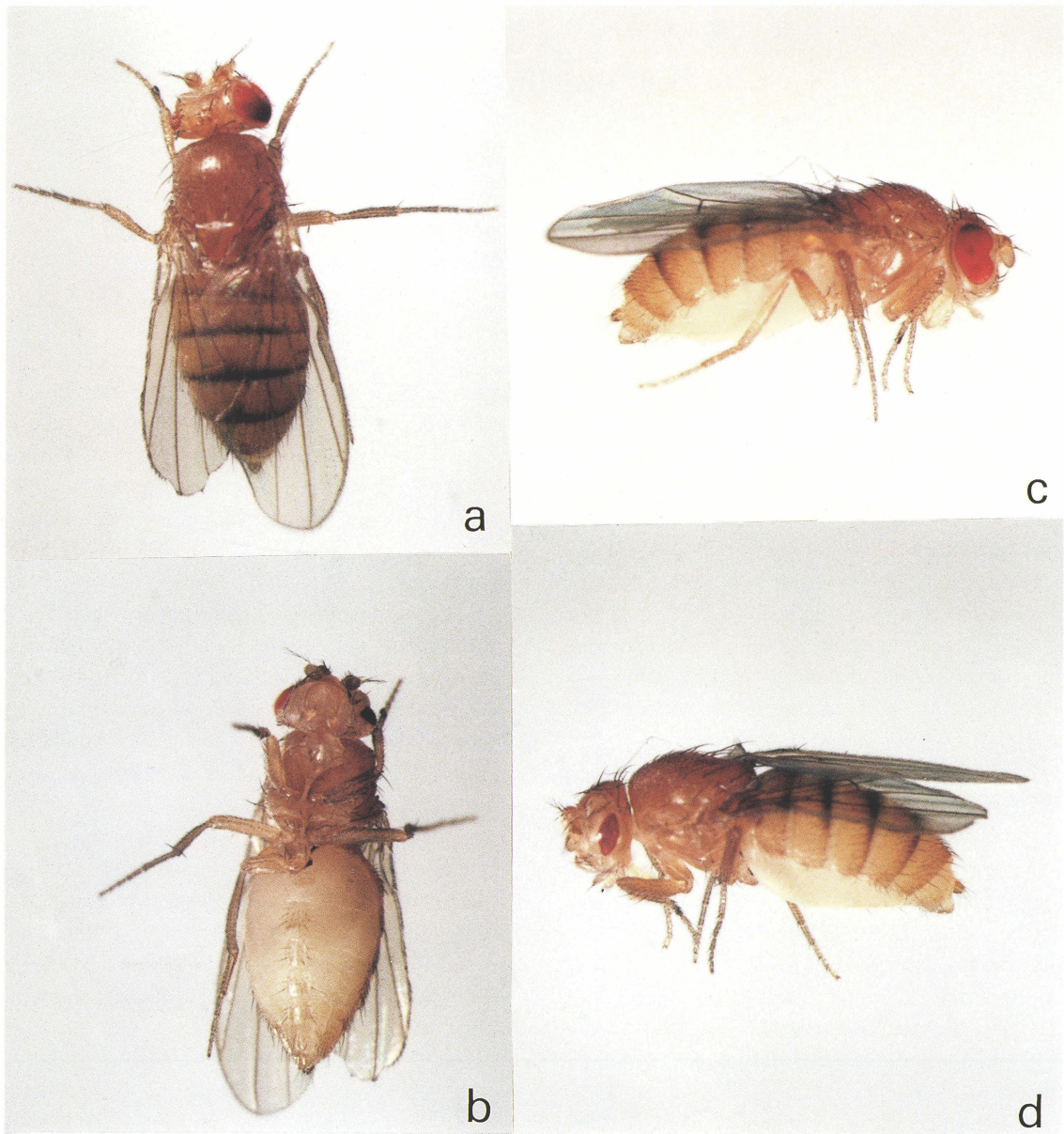
Sex in *Drosophila*, as in most insects, is expressed in a cell autonomous manner: No sex hormones are involved and each cell expresses either male or female characteristics depending on genotype. Without going into the detailed sex determination mechanism in *Drosophila*, it is sufficient to mention here that *X*/*Y* or *X*/*0* cells are male and *X*/*X* cells are female in *Drosophila*.

Gynandromorphs thus appear when the first (or in any case very early) mitotic division in an *X*/*X* zygote fails and produces, instead of two *X*/*X* nuclei, an *X*/*X* nucleus and an *X*/*0* nucleus. In the gynandromorph shown in Fig. 1, the zygote would have been  $X, ct^6/X, CIB$ . The head is  $X, CIB/0$  in the left half and *X*/*X* in the right half. The thorax is  $X, ct^6/0$  in the left half and *X*/*X* in the right half. Accordingly, failure in mitotic division must have occurred twice: once creating  $X, CIB/0$  and once producing  $X, ct^6/0$ . The *CIB* balancer carries a recessive lethal mutation (*l* stands for lethal). Thus *CIB*/*0* males are lethal as individuals. Do *CIB*/*0* cells in an otherwise individual survive?

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**Fig. 1**

A spontaneous gynandromorph of *Drosophila melanogaster*.

- (a) Dorsal view; note the left compound eye is *B*, the left wing is *ct*<sup>6</sup>, and the first tarsal segment of the foreleg shows the presence of sex comb.
- (b) Ventral view; note the left hind leg is missing.
- (c) Right side view; note that the right compound eye shows heterozygous *B*/+ phenotype.
- (d) Left side view; note the hemizygous *B*/0 phenotype.