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"Masculinizer" is an allele of "double-sex".

The mutation "Masculinizer" (Mas:3-) was discovered in 1959 and described by Mischaikow in a short note (ref. 1). Its effects are sex-limited: males are unaffected whereas females become "masculinized". The affected flies are sterile and exhibit a mixture of abnormal male and female characteristics, very similar to dsx (ref. 2) and dsx^D (ref. 3; originally described as Hr, ref. 4).

Short description of the mutant - Body size and segmentation of XX;Mas/+ are female; there are 7 sternites with bristles, and 8 tergites; tergites 5 to 8 show dark (male) pigmentation. The sex combs are rotated, but not completely, and their bristles are heavy, but not quite typical of males. The derivatives of the genital disc contain an almost complete set of male internal and external genitalia which are, however, abnormal; the female genitalia are very reduced with only the spermathecae being regularly present; the anal plates occupy a lateral position typical of males and have a sexually intermediate bristle pattern. The gonads vary widely; they range from almost normal ovaries with mature eggs (very rare) to rudimentary ovaries, and sometimes no gonads are found; testis-like vesicles with yellow pigment, attached to yellow-colored vasa deferentia are frequent. The main difference between Mas and dsx or dsx^D concerns the vaginal plates: these are reduced in dsx and dsx^D bearing a few bristles whereas they are completely absent in Mas; however, an amorphous chitinous mass is always found in the position of the vaginal plates. In summary, Mas appears to be a slightly stronger masculinizer than dsx^D.

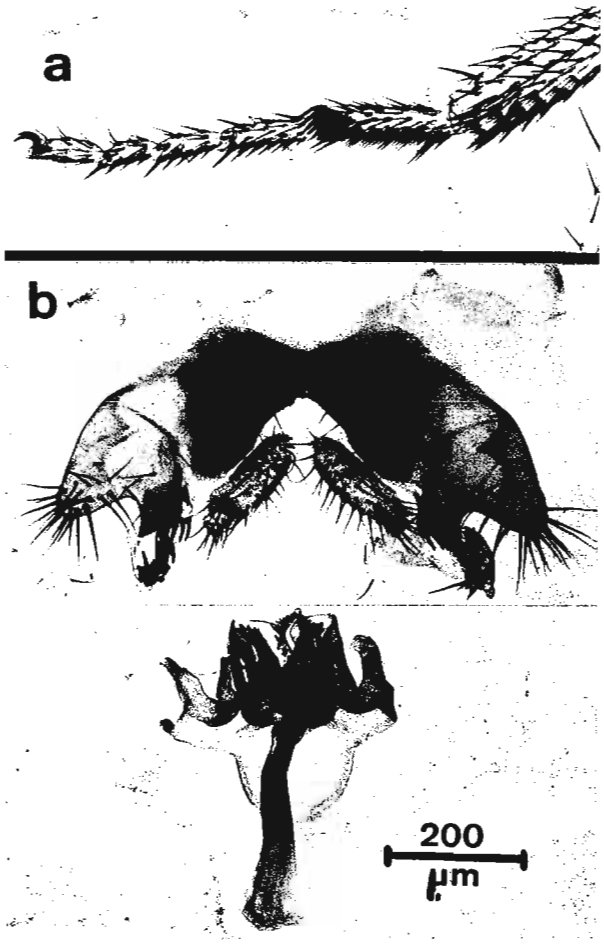

Fig. 1. Tarsus of foreleg with sex comb (a), and external derivatives of the genital disc (b) of XX;Mas/dsx. All structures are perfectly male.

Genetic tests - The mutant Hr has recently been identified as an allele of dsx and is now called dsx^D (ref. 3). We have produced three genotypes which provide evidence that Mas is another dominant allele of dsx:

i) $\widehat{XX}$;Mas/dsx is a phenotypically normal, but sterile male (Fig. 1). The combination Mas/dsx acts like dsx^D/dsx (ref. 3) or tra/tra (ref. 5).

ii) XX/Y·dsx^+;Mas/+ is a phenotypically normal, but sterile female, as is $\widehat{XX}$/Y·dsx^+;dsx^D/+. This result and the fact that a deficiency for dsx is completely recessive define Mas and dsx^D as antimorphs. (The Y·dsx^+ was kindly provided by E.B. Lewis, Pasadena, and is described as T(3;Y)P92 in ref. 3).

iii) XX; Mas/dsx^D Sb e is a phenotypically normal, but sterile male. This combination was constructed by transplanting pole cells of XX; dsx^D Sb e/Ki pp embryos into XX, fs(1)K10 female embryos (see ref. 6 for description of fs(1)K10). The adult hosts were then crossed to XY;Mas/TM1 males. The mutation dsx^D has apparently no effect on the germ line so that normal X; dsx^D Sb e eggs are produced which may then be fertilized with X;Mas sperm.

The phenotypes produced in combinations with dsx, dsx^D and Y·dsx^+ reveal that Mas is another dominant allele of dsx and should therefore be renamed dsx^{Mas}.

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