

vanced disease, however, which is attended by a degeneration of most nigro-striatal dopaminergic neurons, does not appear to diminish L-dopa's therapeutic efficacy. Lloyd and Hornykiewicz (16) have found that dopa decarboxylase levels in the striatum of parkinsonian patients is low, but enzyme activity is still present (5 to 10 percent of normal). The site of this enzyme activity was not determined and could represent aromatic amino acid decarboxylase in serotonergic neurons. Uptake of dopa into serotonergic or other central neurons containing aromatic amino acid decarboxylase with subsequent conversion to dopamine and release as a "false" transmitter might contribute to clinical changes occurring in patients receiving high doses of this amino acid.

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A Male-Producing Strain of the House Fly

Abstract. *An autosome inherited by male offspring only and a temperature-sensitive lethal factor have been combined in a house fly strain which produces both male and female progeny when reared at 25.6°C but only male progeny when reared at 33.3°C.*

The sterility principle of insect control has received much attention since sterile males were used successfully in screwworm eradication programs in the United States (1). Theoretical models (2) and preliminary tests (3) have indicated the feasibility of using this same principle in control programs against the house fly, *Musca domestica* L. It would be valuable to eliminate the need for sexing adult house flies in any program that involves the field release of sterile males. House flies are currently sexed by hand or through the use of mechanical devices (4) which are not 100 percent efficient. This report discusses the development of a genetic technique for obtaining only male progeny from a house fly

strain that can be maintained routinely in the laboratory.

The male-producing strain (MP) was constructed by means of matings between wild-type house flies from Gainesville, Fla., and house flies that carry a recessive temperature-sensitive lethal factor (*tsl*) on autosome III. The *tsl* factor was recovered in tests at this laboratory by rearing particular autosome III homozygotes at "cold" or "hot" temperatures. House flies homozygous for *tsl* can be reared successfully at 25.6°C but die in the late larval or pupal stage when reared at 33.3°C. The Gainesville strain is unusual because both male and females possess an XX sex chromosome complement and no apparent Y chromosome can

Table 1. Results of rearing house flies of the MP strain at 25.6° and 33.3°C.

Temperature (°C)	Males (No.)	Females (No.)
33.3	1022	0
25.6	512*	472

* The MP males generally produced in slight excess of females.

be observed in cytological preparations (5). More commonly, female house flies are XX whereas males are XY with the Y chromosome determining maleness. However, the important feature of the Gainesville strain in regard to producing MP house flies is that Gainesville males generally show holandric inheritance for one member of the third pair of autosomes; that is, one member is transferred exclusively from a male parent to its male progeny as though it were linked to a male determiner or a Y chromosome. Thus, all MP females are homozygous for the *tsl* factor on autosome III whereas all males are heterozygous for *tsl* against its holandrically inherited *tsl* + (wild-type) allele. Heterozygosity for the *tsl* factor is made permanent in males because crossing over does not occur in the male. When progeny from the MP strain are reared at 25.6°C, both males and females are produced. However, when they are reared at 33.3°C, only males emerge (Table 1).

An additional advantage of the MP strain is that the holandrically inherited third autosome can be extracted from appropriate field populations and combined with the *tsl* factor in two generations. Thus, the debilitating effects of laboratory rearing and inbreeding can be minimized in obtaining MP males for field release. Moreover, increased temperatures tend to decrease house fly rearing time within certain limits (6).

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