paper has attached a 2 cm by 2 cm label of thin white paper. Onto this label is written, in heavy black (e.g. with a Pentel pen), the treatment number. This filter paper was then put against a film plate but separated from it by a thin plastic sheet (0.01 mm) to prevent eggs sticking to it. The film plate, with filter papers held firmly against it by a sheet of clear glass, was then exposed to a 15 watt incandescent light source 120 cm above for 7-9 seconds. This blackens the part of the film plate not covered by a filter paper, making a clear outline around each paper, and permanently marks onto the plate the treatment number of the filter paper. (Light penetrates the white paper label but not the black writing on it, thereby forming an image of clear writing on a grey background.) Resultant exposures according to Tables 1 or 2 indicate eggs laid by D. simulans and by subtraction from the total, the number laid by D. melanogaster was determined. (Work supported by Australian Research Grants Committee.)

References: Barker, J.S.F. and R.N. Podger, 1970 Ecology 51: 170-189; Claringbold, P.J. and J.S.F. Barker, 1961 J. Theoret. Biol. 1: 190-203; Stalker, H.D., 1954 Genetics 39: 4-34.

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The mutant to be described here was found in a dumpy-oblique (dp^o) stock during a comparative analysis of the courtship behaviour of this stock with a wild type strain. This mutant apparently affects the behaviour of the males only (irrespective of whether he courts dp^o or wild type females) since dp^o females show normal courtship behaviour with wild type males.

Observations were made on 4 day old flies in perspex mating chambers of 2 cm. diameter. The behavioural sequence was recorded up to the time of copulation or for the first hour. The pairs of flies which did not mate within this time were classed as non-mating.

A continuous and permanent record of the mating behaviour was made using a kymograph and 5 pointers which were manipulated through a battery by a 5-way switch. Each pointer corresponded to a particular element of mating behaviour viz., orientation, scissoring, vibration, licking and attempted or successful copulation.

The mutant males differ from wild type males in the following features:

1. The mutant males are less successful at stimulating females as indicated by the facts that the duration of courtship is significantly longer for dp^o than wild type males, and that the percentage of unsuccessful matings is also much higher (dp^o 24/41 = 59%; + 6/46 = 13%).

2. Mutant males always initiate courtship upon entry into the mating chamber by wing vibration and not, unlike wild type males, by orientation although orientation after this initial bout does not seem to be affected.

3. Mutant males have fewer rest periods (percentage of time inactive being significantly lower) despite the fact that the total courtship time is longer.

4. The amount of scissoring is significantly reduced but both vibration and attempted copulations are much increased (percentage of time spent and the number of bouts per minute being significantly different for all 3 behavioural elements).

Thus, although the mutant males are more active than wild type males they are in fact less successful. The reduced amount of scissoring, which normally plays an important part in the stimulation of the female, is not compensated by an intensification of other elements of mating behaviour such as vibration and attempted copulation. Or, possibly, the female regards the high activity of the mutant males, in combination with the different pattern, as aggressive rather than courtship behaviour. Outcrossing, reciprocally, the dp^o stock to wild type, showed that the mutant is recessive and not sex linked since both types of heterozygotes behaved as wild type. However, of the 17 progeny of heterozygotes tested 2 showed the same abnormal behaviour.

That the abnormal behaviour does not result from the oblique wing is indicated by the fact that both dp^o males which manifest an oblique wing and those which manifest a normal wing behave abnormally. Furthermore, although the courtship time of dumpy (dp^{o2}) is significantly longer than that of wild type their behaviour pattern is normal.

Behavioural mutants such as described here may prove to be useful in analyzing which elements or pattern thereof of the male's mating behaviour produce the greatest response in the female.