Do Allelic Differences Make for Lazy Lovers? Effects on Mating Behavior in *Drosophila melanogaster.*

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Allelic variation on the *foraging* gene in *Drosophila* results in two different strains, rover and sitter, that demonstrate significantly different feeding strategies as larvae and adults.

It has been previously reported that Rover males copulate more quickly and for longer periods of time than Sitter males, and engage in more instances of courtship displays, such as wing vibration and licking behavior (Pereira & Sokolowski, 1991). These differences in mating behavior most likely contribute to the Rovers' mating success.

Photo Credit: Brian Valentine

Does time fly for specific strains of flies?

However, possible influence of the partner's genotype on mating behavior has yet to be examined. This experiment sought to determine whether mating behavior was influenced primarily by the strain of the male or the female in each pairing.

Experimental Design:

Methods:

- •120 virgin flies of both strains were sorted by gender and placed in individual eppendorf tubes.
- •Flies then sorted into rover-rover, sitter-sitter, rover ♂−sitter ♀, and sitter ♂−rover ♀ pairs.
- •Three pairs from each group were observed per one-hour trial.
- •Courtship latency, mating latency, copulation latency, copulation duration, and number of mating attempts made (after initial mating attempt) were recorded.
- •Five trials in total performed.

Hypothesis: Latency to court and mate as well as duration of copulation is determined primarily by the strain of the male. Male Rovers will be more successful than male Sitters.

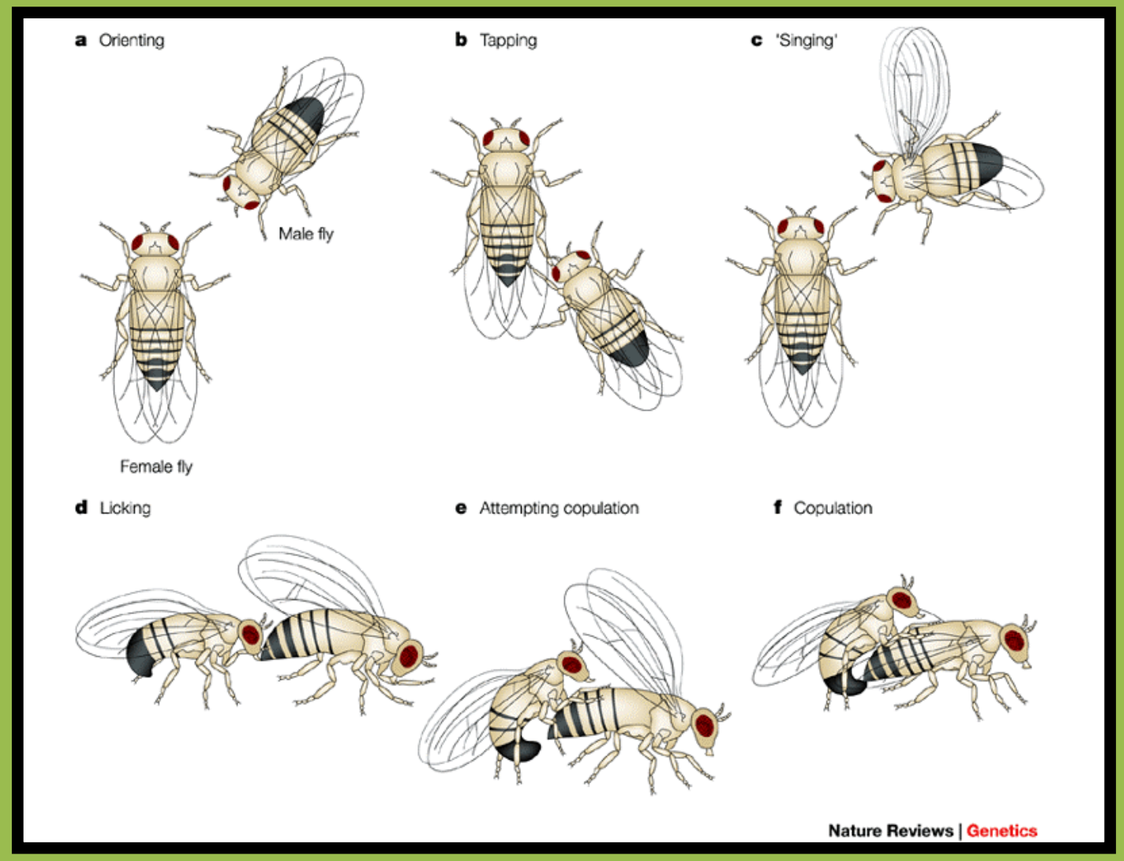

Figure 1: Sequence of mating behaviors shown by *Drosophila melanogaster* males towards females (Sokolowski, 2001). A – D were scored as instances of courtship behaviors.

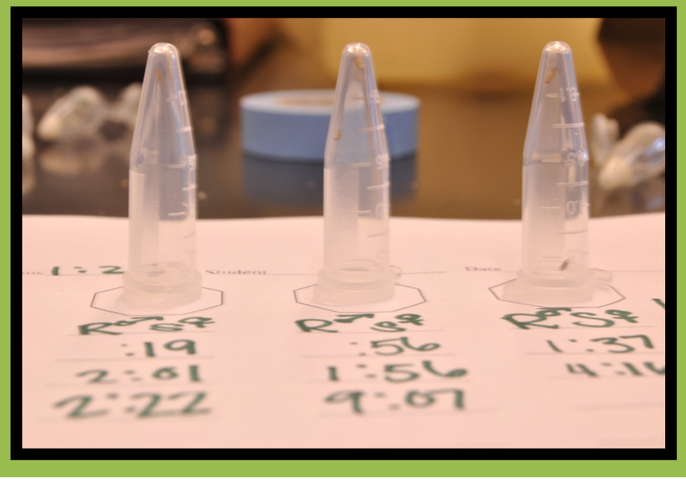

Figure 2: Example of observational setup. Photo Credit: Emily Zhang

Results:

ANOVAs of courtship latency, mating latency, and number of mating attempts revealed no significant differences across strains or genders. Both male and female strain had no effect on these measures.

However, an Chi squared test examining whether or not both genders of each strain engaged in mating attempts at all revealed a significant effect of male strain, with more Rover males attempting to mate than Sitter males (see Figure 4.). Females demonstrated no such effect.

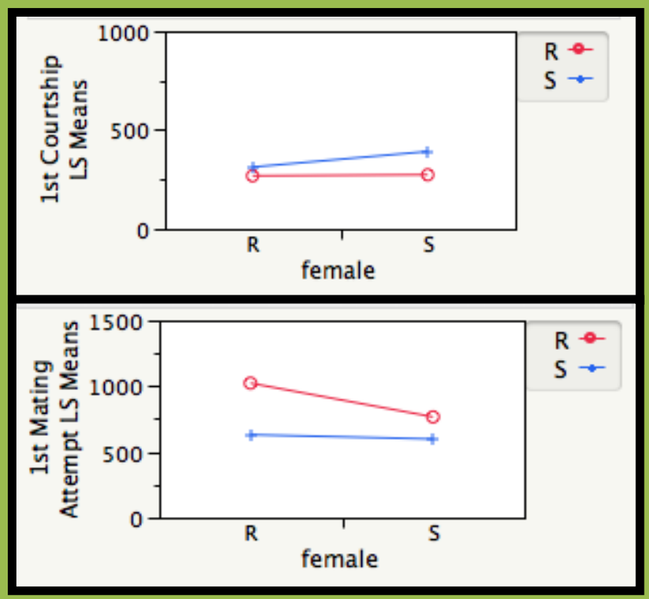

Figure 3. ANOVA tests across strains and genders reveal a null effect for courtship latency (p = 0.085) and mating latency (p = 0.47).

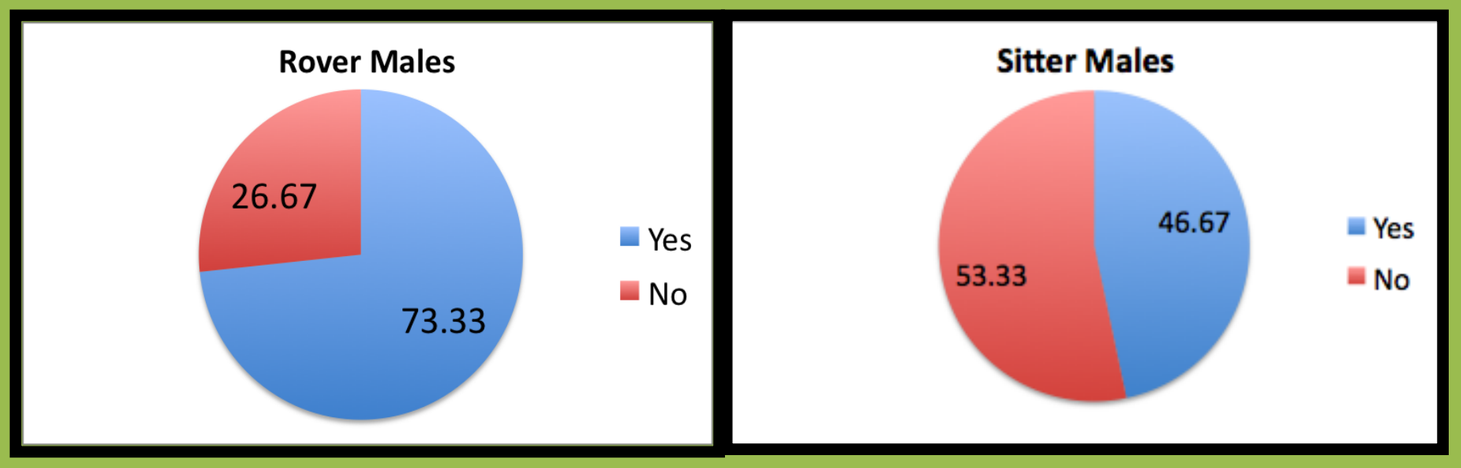

Figure 4. Chi-squared test results indicate that more Rover males attempted to mate than Sitter males, regardless of partner strain (p = 0.0337).

We Conclude that:

Male strain matters.

Future Directions:

We propose a replication of this study using larger sample sizes and more trials in order to more successfully evaluate our courtship and mating measures. In light of the fact that only one pair successfully achieved copulation, ascertaining the ideal time in both the flies' lifecycles and time of day of peak sexual receptivity.

References:

(1) Sokolowski, MB (2001) *Drosophila*: Genetics meets behaviour Nature Rev Genet 2:879-890.

(2) Pereira and Sokolowski (1991) Rover and Sitter strains of *Drosophila melanogaster* differ in 2 adult behavior patterns - foraging and courtship. J. neurogen. 7:138.

(3) Photos copyright of Brian Valentine: http://www.flickr.com/photos/lordv/1845209747/

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