

# Female Guppies' Preference of Novel Males

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Reproduction is a vital part of life. The sole purpose for many animals is finding a mate and producing offspring; thus, it is necessary to understand as much as possible about not only reproduction itself but the process leading up to it. There is arguably no animal more fascinating to observe in its process of reproduction than the guppy. Researchers Angela Eakley and Anne Houde decided to focus specifically on female guppies' process of sexual selection. Previous research has indicated that females tend to mate multiply (have multiple sexual partners) and tend to prefer new males to those with which they have already copulated when re-mating. From this research, Eakley and Houde determined there were two questions they wanted to answer: do Trinidadian guppies prefer a new male and do female Trinidadian guppies discriminate against mates that look like previous mates? From these questions, they formed two hypotheses; first, there will be behavioral discrimination between novel and original males and secondly, this preference could lead to discrimination against males similar in appearance to the previous mate (Eakley & Houde, 2004). The researchers then predicted that females would prefer a new male over a previous mate, females would prefer a male that did not look like a previous mate, and the previously mentioned action could result in a reproductive disadvantage to males with common color patterns.

To test their hypotheses, they split the study into two experiments. Both experiments were conducted in a 38-liter aquarium that was separated into three sections by opaque dividers. In the first experiment, a virgin female and a male were given 24 hours for initial copulation to occur, after which the original male was placed at one end of the tank and a new male was placed at the other end of the tank and given 10 minutes to acclimate to his surroundings. Both the original male and new male were then separately observed with the female for 20 minutes (Eakley & Houde, 2004). The second experiment was identical to the first, except the original male was replaced with a twin after initial copulation. In both experiments, the researchers recorded whether a second copulation occurred. Furthermore, each male was photographed digitally in the second experiment, exposing the body area and orange spots in order to make sure the guppies were in fact twins (Eakley & Houde, 2004).

In their results, it is first important to note that there was no statistical difference in the number of displays between the original and novel males. There was also no statistical difference between the orange coloration of novel and original males (Eakley & Houde, 2004). This is important because it shows that females were only choosing their mate based on whether they were a new or previous mate. With that in mind, the researchers' results showed that females respond more to novel males than original males and that females respond more to a novel male than the twin of an original male (Eakley & Houde, 2004). This data supports both of their hypotheses.

Overall, Eakley and Houde concluded that "female guppies discriminate in favor of novel males". This study had a significant impact on this area of research as it was the first study to observe this discrimination after initial copulation and was also the first study to show this discrimination extends to males with similar color patterns (Eakley & Houde, 2004). Their results imply the presence of active selection in females and could also indicate that multiple mating could illustrate adaptive behavior in females. As for the next step, Eakley and Houde mention work has already begun to determine whether this preference affects mating success in males (Eakley & Houde, 2004). This experiment produced very meaningful results for this field of study and will most likely be referenced in future studies pertaining to active discrimination in female guppies.

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