

# Biological fitness trumps other traits in mating game

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Diverging color patterns on the wings of *Heliconius* butterflies are an example of fitness-related traits that females have evolved to prefer. Credit: Mathieu Joron

When a new species emerges following adaptive changes to its local environment, the process of choosing a mate can help protect the new species' genetic identity and increase the likelihood of its survival. But of the many observable traits in a potential mate, which particular traits

does a female tend to prefer?

A new study from the National Institute for Mathematical and [Biological Synthesis](#) finds that a female's mating decisions are largely based on traits that reflect fitness or those that help males perform well under the local ecological conditions.

Males' bright colors, flashy ornaments, and elaborate songs are examples of fitness-related traits that females appear to have evolved to prefer, according to the study, which appears in the journal *Ecology Letters*.

An example of these fitness-related traits can be found in the tropical Heliconius butterfly, where diverging color patterns on the butterflies' wings influence mate choice and hence divergence of populations. Another example are Darwin's finches, whose beaks evolved over millions of years with changes in birdsong, an important mating signal, and thus contributed to the rise of new and distinct finch species.

The study settles a long debate in [evolutionary biology](#) about the surprising commonality of traits that play a crucial role in both survival and mate choice. It was previously thought that such traits were uncommon and were thus named "magic traits." However, in unraveling the trick behind the so-called magic traits, the study predicts that these magic traits are far more common in nature than expected, and in fact, predicts that female mating preferences may reflect forces of natural selection that were in place during the origin of the species.

"Even if the link between survival and [mate choice](#) is not there to start with, it will probably evolve," said lead author Xavier Thibert-Plante.

Understanding the biological basis of mating behavior is important because it can shed light on how species boundaries are formed and maintained.

"Mating preference is crucial for the evolution of new species because it reduces, and may in some cases eliminate hybridization, which can produce offspring of mixed ancestry, slowing down or reversing adaptation and differentiation among emerging species," Thibert-Plante explained.

**More information:** Thibert-Plante X, Gavrillets S. 2013. Evolution of mate choice and the so called magic traits in ecological speciation. *Ecology Letters*. [DOI: 10.1111/ele.12131](https://doi.org/10.1111/ele.12131)

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