

Forgotten sex signals

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Sex signal skillset is not always passed on to offspring. Credit: Kurt Stepnitz

Sending signals to the opposite sex isn't always a trait that's passed on to animals' offspring, according to new research conducted at Michigan State University.

Animal [sex](#) signals, communications between partners indicating health, the capacity to produce healthy offspring and more, were thought to be beneficial and passed down from generation to generation. However, in a new study appearing in *Ecology and Evolution*, these signals can actually adaptively disappear in descendants.

"This means that certain organisms, particularly those that rely on [signaling](#) to do any mating or to tell their species apart from others, may be in more danger of extinction or hybridizing with another species if they lose signals, particularly because signal loss can happen so fast," said Emily Weigel, co-lead author and doctoral candidate with MSU's BEACON Center for the Study of Evolution in Action.

The advantages of signaling to one another should mean that generation after generation the animals retain and keep signaling. That may not be the case, though, she added.

"In nature, it looks like signaling can still disappear, not just a sometimes but often," Weigel said. "And we don't have a good understanding of exactly how and why it is lost in many populations."

Studying this deficit in nature is difficult because scientists are trapped by the practical problem of having to know an animal population is already losing a signal to study its loss. They don't get a good idea of what factors, such as population size, how genes are structured in relation to one-another and how strongly organisms respond to signals, start and influence this loss.

"We also don't know how these factors interact, or how they change based on whether animals must signal to mate, or if it's just an optional strategy," Weigel said.

To conduct the study, Weigel and her team evolved populations in Avida, a software environment developed at MSU in which self-replicating computer programs compete and evolve. Their digital populations varied in different combinations of these characteristics. They found that signaling is indeed quite hard to lose in some scenarios, but not all. How strongly the receiver prefers the signal is a huge component of whether signals are lost or not. In addition, the factor of

optional or required signaling turned out to change the importance of every other factor.

"So, when we're looking at nature, a lot of the loss might have to do with the specific pressures on an organism from its social and physical environment, and whether its biology allows for wiggle-room," Weigel said.

Some of these outside factors can include being able to detect a mating call in a loud environment or being rendered helpless by the extra noise.

Provided by Michigan State University

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