

Scientists report new take on sexual signaling

May 9 2007



Male Fiddler Crab, *Uca terpsichores*, with hood. Credit: John Christy, STRI

In dangerous environments, females looking for a mate run great risks. Scientists from Seoul National University, in Korea, and the Smithsonian Tropical Research Institute in Panama present a new take on sexual signaling in the May issue of the *Public Library of Science*. The researchers report that females prefer a male sexual signal that helps them avoid their predators as they sequentially visit and assess potential mates.

The traditional explanation for the evolution of outrageous sexual signals like the male peacock's plumage is that showy males attract females and give them better offspring. Showy males escape from predators despite their highly conspicuous ornaments and behaviors—proof of their superiority.

"In our study of fiddler crabs, the strength of female preference for a male signal that increases her own survival increases with her perceived risk of predation. That a female's choice of a mate is based on sexual signals that benefit her directly is a fundamentally new and perhaps widely applicable idea," said Tae Won Kim, who did this work as a student at Seoul National University and is now a post-doctoral fellow at Ewha Women's University in Korea.

As the tide recedes, revealing great expanses of Pacific beach, fiddler crabs (*Uca terpsichores*) segue in and out of their burrows, dodging predatory shorebirds. Male crabs build hood-like sand castles next to the entrance of their burrows, attracting the attention of females by waving their one, super-sized claw.

Females prefer males that have built hoods to males that have not. When they run across the beach to check out or mate with a male, they orient visually to both the waving male and to his hood. In this way they reach the male's burrow quickly and directly and avoid their predators.

"When we bait predatory birds into the area—artificially increasing the risk of predation, females show an even greater preference for males who have built hoods," said STRI staff scientist John Christy, who has studied sexual selection in this group for nearly 35 years. This study illustrates how the ecology of choosing a mate can shape sexual communication. "Conspicuous male sexual signals need not advertise the quality of the signaler as a mate," Christy suggests. "Some may simply allow choosy females to stay safe."

Citation: Ref. Tae Won Kim, John H. Christy, Jae C. Choe. 2007. A preference for sexual signal keeps females safe. *Public Library of Science ONE*. DOI 10.1371/journal.pone.0000422

Source: Smithsonian Tropical Research Institute

Citation: Scientists report new take on sexual signaling (2007, May 9) retrieved 23 April 2024 from <https://phys.org/news/2007-05-scientists-sexual.html>

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