

When food is scarce, hungry female spiders alter mating preferences

April 1 2011, By M.B. Reilly



Female wolf spider

(PhysOrg.com) -- Weather and environmental change can bring alterations – and scarcity – in food resources. In looking at how such changes might affect mating choices and subsequent reproduction, University of Cincinnati researchers studied how hunger affects the mating preferences of common female spiders.

The research examined how short-term and long-term hunger affected mate selection and aggression in female wolf spiders (*Schizocosa ocreata*) commonly found in the eastern United States and Canada. These female spiders are potentially aggressive and cannibalistic when approached by a courting male.

The research is published in the April 2011 print issue of the journal, *Animal Behavior*. It was carried out by George Uetz, UC professor of biology, and former UC doctoral student Brian Moskalik, now a postdoctoral teaching fellow at College of the Holy Cross, Worcester, Mass.

According to Uetz, this research helps indicate what might result if environmental changes affect food resources for animal populations, shedding light on the possible effects of scarce resources on short- and long-term mating preferences and potential long-term population dynamics.

He added, “For instance, we had a drought this past summer, and we saw smaller spiders in the fall. This spring, we’re getting a lot of rain, which will likely mean more insects and an abundant food supply for spiders. That should mean well-fed spiders this year – and, according to our research, that will affect spider mating choices.”

Hunger does affect female spiders’ receptivity to mating, with well-fed [females](#) showing the most overall receptivity to mate and the least aggression. These satiated females were, however, quite choosy, and were most receptive to large-bodied males with large leg tufts (an indication of success in foraging for food). As they aged, they showed lower levels of aggression, and that aggression was directed toward small-bodied males with small leg tufts.

Overall, female spiders that experienced short-term starvation showed relatively little receptivity to mating and higher levels of aggression. The aggression was strongest toward small-bodied males with shorter leg tufts. This aggression was seen in these females both shortly after maturation and as they aged.

However, as these females aged, they increased their receptivity to mate

with large-bodied males.

Early in adulthood, female spiders that experience long-term starvation were most receptive to mating with large-bodied males regardless of the size of leg tufts of hair. At the stage of early maturation, however, they were extremely aggressive toward small-bodied males.

As these females aged, they continued to show preference for large-bodied males, especially those with large leg tufts. While [aggression](#) toward small-bodied males continued, it decreased in intensity.

In general, large-bodied males with large leg tufts were the most preferred by both satiated and hungry females. They were also less likely to be cannibalized, thus – in all probability – increasing the population of “attractive,” high-quality males.

“These results suggest that hungry females are making a trade-off, mating with preferred males and eating the less-desirable ones,” said Uetz.

Said Moskalik, “Still, a general trend apparent in the results suggests that as unmated female [spiders](#) age, they become less aggressive. So, [males](#) that are typically unattractive to females when those female are early in the maturation period may be given [mating](#) opportunities as the female population ages.”

Provided by University of Cincinnati

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