Researchers find native male praying mantises falling prey to invading females

November 27 2013, by Bob Yirka

Praying mantis, Sphodromantis viridis. Credit: Adamantios/Wikipedia.

(Phys.org) —A trio of researchers from the University of Auckland in New Zealand has found that male praying mantises are being eaten when they attempt to mate with an invasive species of female mantis. In their paper they've had published in the journal *Biology Letters*, the team describes a field study they undertook to find out if the invading species

of praying mantis is causing a decline in the one native species found in the island nation.

Prior to 1970's there was just one kind of praying mantis in New Zealand, *Orthodera novaezealandiae*. Since that time a new species (*Miomantis caffra*) from South Africa has arrived. The two species resemble one another of course, but have two major differences. The first is that the invaders are much bigger than the native species. The second is that the female invaders engage in sexual cannibalism—eating their mates after copulation. Fearing that the invaders might be displacing the native mantises, the researchers set out to study how the two species interact.

The research team first collected both male and female samples of both species. Next, they used a Y-tube with a single spout on one end and double spout on the other to test the drawing power of the invading female. When they placed one of the invading females near one of the double spouts, and a male near the single spout, he chose to proceed towards her, rather than escape out the empty spout. The males did the same even when a female of their own species was placed near the other spout, showing a clear preference for the invading females.

The first experiment was followed up by another to test the survivability of males that attempted to mate with a foreign female—it was low, only 30 percent of the males survived the encounter. To compare the two, the researchers also tested invasive males' survival rates when attempting to mate with invasive females. It was much higher, almost 70 percent of them warded off death.

The researchers suspect that the invasive females give off more enticing pheromones than the native females, and also suggest that invasive males have learned to perform evasive maneuvers when mating with their native female mates to give themselves a better chance of survival.

The researchers note that while they have learned a lot about the invasive mantises, they still have not learned enough to be able to predict whether the invasive species is displacing the native one, thus, more research will have to be conducted.

More information: Fatal attraction: sexually cannibalistic invaders attract naive native mantids, Published 27 November 2013 DOI: 10.1098/rsbl.2013.0746

Abstract

Overlap in the form of sexual signals such as pheromones raises the possibility of reproductive interference by invasive species on similar, yet naive native species. Here, we test the potential for reproductive interference through heterospecific mate attraction and subsequent predation of males by females of a sexually cannibalistic invasive praying mantis. Miomantis caffra is invasive in New Zealand, where it is widely considered to be displacing the only native mantis species, Orthodera novaezealandiae, and yet mechanisms behind this displacement are unknown. We demonstrate that native males are more attracted to the chemical cues of introduced females than those of conspecific females. Heterospecific pairings also resulted in a high degree of mortality for native males. This provides evidence for a mechanism behind displacement that has until now been undetected and highlights the potential for reproductive interference to greatly influence the impact of an invasive species.