Public Abstract

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Title:Postcopulatory sexual selection in the soldier fly *Merosargus cingulatus*

My dissertation research focuses on the largely understudied field of postcopulatory (or cryptic) mate choice. For the past few decades, it has become increasingly clear that both males and females can perform mate choice during and after copulation, but the implications of this for sexual selection and evolution have been little explored. As part of my research, I have developed a novel model system for the study of postcopulatory mate choice, the soldier fly *Merosargus cingulatus*. I have demonstrated that cryptic female choice occurs in this species through a novel mechanism: female control of oviposition timing. In another study, I tested different hypotheses that can explain variation in copulation duration. Different factors can affect copulation duration, and one of them is the social environment: males are expected to prolong copulation duration in situations where the risk of sperm competition is high. I showed that this occurs in *M. cingulatus*. In addition, I demonstrated that cryptic male choice occurs in this species as well: males selectively allocate resources, investing more in copulations with larger females. Finally, I tested if longer copulations result in higher reproductive success for males. I found that males that mated for longer fertilized a higher percentage of the clutch than those with shorter copulations. My dissertation work is an unusually complete study of postcopulatory sexual selection, since I have examined cryptic female choice mechanisms, selected traits, and their interactions with cryptic male choice in a single species.