POSTCOPULATORY SEXUAL SELECTION IN THE SOLDIER FLY MEROSARGUS CINGULATUS

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My dissertation research focuses on the largely understudied field of postcopulatory (or “cryptic”) mate choice. As part of my dissertation 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 M. cingulatus through a novel mechanism: female control of oviposition timing. In this study, I showed that failure to oviposit before remating by the female decreases the previous male’s reproductive success. This study was the first demonstration of cryptic female choice in the field in any species. In another study, I showed that males prolong copulation duration in situations where the risk of sperm competition is high. 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. I also tested the hypothesis that longer copulations result in higher reproductive success for males. I found no effect of copulation duration on the number of eggs laid by females. However, I found that fertilization success is influenced by copulation duration: 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.