Title: Individual Recognition in the crayfish *Orconectes obscurus*

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Abstract

Social interactions are essential for most animals. Different species exhibit varying degrees of sociality, ranging from highly solitary individuals that only get together to mate to social animals that congregate in groups, establish hierarchies and stable social networks. Within these social networks individuals must be able to distinguish members of their own group from non-members, and remember the interactions through which dominance is established and maintained. Furthermore, for highly territorial and aggressive species, being able to recognize neighbors and previous opponents, and distinguish them from strangers could be essential for conserving energy and minimizing aggression intensity.

In this study I examined the presence of individual recognition in the Pennsylvania native crayfish *Orconectes obscurus.* All animals were socially isolated for 1 week. Following the isolation period two individuals were placed in a tank for a familiarization trial, during which the winner of the interaction was considered dominant and loser a subordinate. Following the familiarization trial, each individual was paired with 3 opponents: 1) known opponent from the familiarization trial, 2) an unknown opponent of the same status as known opponent, and 3) a naïve individual. Aggression intensity, duration, and overall frequency of defensive and offensive behaviors were analyzed to determine if individuals act less aggressively towards previously fought opponents. I predicted that if *O. obscurus* exhibit individual recognition, then overall aggression and fight duration towards previously fought opponents would be less than aggression towards same status unknown opponents. Furthermore, I compared my findings in *Orconectes obscurus* to the invasive crayfish *Orconectes rusticus* While *O. rusticus* is larger and more aggressive than *O. obscurus*, both species occupy the same habitats and compete for similar resources. I hypothesized that *O. obscurus* and *O. rusticus* would exhibit similar levels of individual recognition. Results addressing these hypotheses will be discussed.