
Implications of Hybridization between Introduced and Resident *Orconectes* Crayfishes

WILLIAM L. PERRY,* JEFFREY L. FEDER,[†] AND DAVID M. LODGE[†]

*Behavior, Ecology, Evolution, and Systematics Section, Department of Biological Sciences, Illinois State University, Normal, IL 61790-4120, U.S.A., email wlperry@ilstu.edu

[†]Department of Biological Sciences, University of Notre Dame, Notre Dame, IN 46556-0369, U.S.A.

Abstract: *One of the most imperiled taxonomic groups in North American freshwaters is that of crayfish (Decapoda: Astacoidea): over 30% of the 390 species are threatened or endangered. This situation is globally significant because 80% of the world's crayfish species are North American. Few studies have examined the environmental changes that most threaten crayfish biodiversity, but competition and hybridization with non-native crayfishes appear to be among the most important threats to native crayfishes. The rusty crayfish, *Orconectes rusticus*, native to southwestern Ohio has been introduced widely throughout the United States and is displacing two resident taxa, *O. propinquus* and *O. virilis*, in northern Wisconsin. Using morphological and allozyme comparisons of crayfish from allopatric and sympatric populations, we tested whether *O. rusticus* is hybridizing with the resident crayfishes in northern Wisconsin. We found no evidence of hybridization between *O. virilis* and either *O. rusticus* or *O. propinquus*. In contrast, numerous morphologically intermediate crayfish between *O. rusticus* and *O. propinquus* occurred at sympatric sites, and many of these individuals possessed allozymes diagnostic for both species in allopatry. Over 6% of the crayfish at one sympatric site were putative F_1 hybrids, 4% were putative F_2 individuals (hybrid \times hybrid origin), and 13% were putative backcrosses (product of hybrid \times parental matings). This is the first genetic documentation of hybridization between a resident and invading crayfish. Our results suggest that genetic mechanisms play a role in the extirpation of *O. propinquus* by *O. rusticus* and are consistent with observations of other researchers suggesting that hybridization with non-native species is common among crayfishes at many other locations. High rates of endemism and widespread introductions of non-native crayfish suggest that invasions and hybridization are a major threat to crayfish biodiversity.*