73-14 Winning the Invasion Roulette: Escapes from Fish Farms Increase Admixture and Facilitate Establishment of Nonnative Rainbow Trout

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Aquaculture is a major source of invasive aquatic species, despite the fact that cultured organisms often have low genetic diversity and tend to be maladapted to survive in the wild. Yet, to what extent aquaculture escapees become established by means of high propagule pressure and multiple origins is not clear. We analysed the genetic diversity of 15 established populations and 4 farmed stocks of non-native rainbow trout in Chile, a species first introduced for recreational fishing around 1900, but which has in recent decades escaped in large numbers from fish farms and become widespread. Aquaculture propagule pressure was a good predictor of the incidence of farm escapees, which represented 18% of all free-ranging rainbow trout and were present in 80% of the study rivers. Hybrids between farm escapes and established trout were present in all rivers at frequencies ranging between 6 and 85%, and population admixture was positively correlated with genetic diversity. We suggest that non-native salmonids introduced into the Southern Hemisphere could benefit from admixture because local adaptations have not yet developed and there is no fitness loss associated with outbreeding depression.

73-15 Phylogenetic Patterns of Fish Community Assembly in the American Southwest: The Influence of Non-Native Species and the Environmental Template

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The spatial hierarchy of systems greatly influences biogeographical patterns and the composition of communities. Further, environment conditions can act as a filter, determining the presence of species in a location. Fish are constrained by barriers to dispersal, and their distribution should therefore reflect the geomorphological features of the landscape, e.g., fish generally cannot disperse across drainage boundaries. However, the introduction of non-native species and alteration to the prevailing environmental drivers erodes dispersal barriers and alters the hierarchical influence of the landscape. Using a large database on fish occurrence from the Lower Colorado River Basin, we examined phylogenetic patterns and beta diversity in native and non-native fish communities, measures of differences in species composition across space. Historically, fish communities in the arid American Southwest were shaped by harsh environmental conditions, including droughts and floods, leading to the evolution of a highly endemic and specialized fauna. However, dam construction and flow regulation have significantly altered the environmental conditions in the region, enabling non-native species that are not adapted to harsh conditions to survive and thrive, displacing native species. Therefore, we hypothesize that fish assemblages dominated by native species are phylogenetically clustered (consisting of closely related members), but that assemblages dominated by non-native species are overdispersed (consisting of distantly related members), reflecting competitive influences generated by altered flow conditions favouring non-natives. We constructed a phylogeny for native and non-native fish species in the Lower Colorado River Basin, and calculated measures