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Brown trout life history and habitat use in the Kerguelen Islands as revealed by otolith microchemistry

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Résumé

Characterization of the life history traits of introduced brown trout (*Salmo trutta* L.) in the Kerguelen Islands is fundamental to understand the success of the islands invasion by this fish species. The capacity to use marine habitats (Anadromy) by brown trout is one of the most critical traits in the invasion process and its study is essential to understand how marine habitats contribute to dispersal in trout populations. Otoliths are calcified structure (aragonite) located in the inner ear of fishes; they record seasonal growth as scales but are also inert and able to trap trace element present in the fish environment (Campana and Thorrold, 2001). Strontium, particularly the Sr:Ca ratio, is a common indicator used to trace brackish/salt water migrations of salmonids (Limburg et al., 2001; Milton et al., 2008). We studied Sr:Ca ratios on otoliths of brown trout captured in specific habitats (lake, upstream and downstream zones of rivers, marine coastal waters) to characterize life history traits linked to freshwater or salt water migration (resident/migrant status, age at migration, homing, maternal origin). Results showed that the method is relevant because water and otolith present correlated chemical signatures across each selected Kerguelen habitat. A strong diversity of life histories appeared, ranging from pure residency in freshwater to permanent use of saltwater. Intermediate phenotypes were observed in downstream populations taking benefit of the highly productive estuarine habitats whereas specific migratory phenotypes could contribute to colonize new pristine aquatic systems.

Références

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