

Jones, D. L., M. R. Lara, Z. Chen. Submitted. Taxonomic and spatial variation of otolith microchemistry among three species of juvenile snapper from southern Florida. Estuarine, Coastal and Shelf Science.

ABSTRACT:

Snapper (*Lutjanus* spp.) are abundant in the estuarine nursery habitats of south Florida where they reside as juveniles before migrating to offshore reefs when they mature. Natural tags based on otolith microchemistry provide a tool to gauge the relative contribution of specific nursery habitats in replenishment of adjacent adult populations. Our goal was to determine if otolith elemental tags of gray snapper (*Lutjanus griseus*), schoolmaster (*L. apodus*), and yellowtail snapper (*L. chrysurus*) inhabiting the same nursery sites were similar enough to allow one species to serve as a proxy for another in subsequent studies employing natural tags to track ontogenetic migrations. We also examined whether otolith microchemistry indicated similar use of the nursery habitat among these species. Twenty-seven elements incorporated into the otoliths of these fishes were screened for their ability to discriminate among nursery habitats (within species) and among pairs of co-occurring species. Subsets of this elemental suite were found to substantially contribute to the separation of both *L. apodus* and *L. chrysurus* from *L. griseus*; significant spatial variation was also detected. Our results indicate that variation in elemental chemistry may be used to discriminate among closely related species of lutjanids and identify specific nursery sites on very small spatial scales. This study is the first to compare the otolith elemental chemistry among co-occurring species in the same genus and the first to successfully employ lanthanides in otoliths to discriminate closely related fish taxa. The existence of specific otolith elemental signatures among species inhabiting the same southern Florida nursery grounds emphasizes their differential use of microhabitats within this environmentally heterogeneous region.