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Pre-juvenile Naked Goby (Gobiosoma bosc) age and growth

Annamaria Deitz
Coastal Carolina University, amdeitz@coastal.edu

Juliana Harding
Coastal Carolina University, jharding@coastal.edu

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Honors student: Annamaria Deitz

Thesis mentor: Dr. Juliana Harding

Department: Marine Science, Coastal Carolina University, Conway, South Carolina

ABSTRACT

Due to the abundance of larval naked gobies, *Gobiosoma bosc*, within the estuarine ichthyoplankton, it is important to understand their age and growth. Naked gobies are a largely distributed, both geographically and within an estuary, small, benthic fish species. There are 3 pairs of otoliths, calcium carbonate structures within the ear canal, that detect vibrations and record the age of the fish, both daily and annually. Using laboratory-reared gobies of a known age (Tremont et al. 2015), daily signatures on the sagittal otoliths were first validated to be daily, then a growth curve for the wild caught larvae was calculated as well as estimated spawning dates. Wild fish were collected from Clambank Creek in North Inlet estuary during the spawning seasons in 2018 and 2019. Sub-daily signatures were evident between daily signatures in, in most otoliths, for the cultured and wild fish, but no regular pattern was determined. After daily deposition was confirmed within the cultured fish, wild caught gobies from 2018 and 2019 were then aged and a two parameter exponential regression growth curve was calculated to estimate growth for both year classes individually and together. Cultured larvae showed no relationship between the known days post hatch and the total otolith growth signatures observed, but daily deposition was validated by the relationship between known age and observed daily signatures. Predicted hatch lengths for wild larvae were 2.49 ± 0.26 mm with an instantaneous daily growth rate of 0.043 ± 0.004 mm d^{-1}. Hatch sizes in wild fish larvae were significantly smaller than those observed in the cultured larvae (3.1 ± 0.2 mm). Nest hatching dates were predicted from wild larval fish ages to establish a baseline for spawning times for these important ichthyoplankton.