Food Habits and Dietary Overlap Between Juvenile Cunner, Tautog, and Black Sea Bass in the Narragansett Bay Estuary (RI, USA)

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The Narragansett Bay Estuary serves as a nursery habitat for cunner (*Tautogolabrus adspersus*), tautog (*Tautoga onitis*), and black sea bass (*Centropristis striata*). Due to their co-occurrence in the estuary and similar life history characteristics, there is the potential for dietary overlap and resource competition among the three species. In July-August 2018 and June 2019, juvenile cunner, tautog, and sea bass were collected using beach seines and traps at 24 sites in the Narragansett Bay. Fish were preserved in 70% ethanol (n = 51, 115, and 33 for cunner, tautog, and sea bass, respectively) and measured for total length (mm; TL) in the laboratory. Stomach content analysis was performed on each fish, and prey were identified to the lowest possible taxon. The overall contribution of prey to fish diet was determined by numeric percent, volumetric percent, and frequency of occurrence, from which an index of relative importance (%IRI) was calculated. The Schoener's index was also used to quantify dietary overlap among target species with respect to fish size: small (20-72 mm TL), medium (80-104 mm TL), and large (105-173 mm TL). Small cunner and tautog demonstrated significant dietary overlap ($\alpha = 0.84$), which was caused by their mutual reliance on copepods, amphipods, and crustaceans (cumulative %IRI = 93 and 90%, respectively). Medium cunner and tautog both consumed increasing amounts of algae (%IRI = 47 and 31%, respectively), although no significant dietary overlap was observed at this class size ($\alpha = 0.45$): medium cunner fed on copepods and crustaceans (cumulative %IRI = 37%), whereas equal-sized tautog continued to rely on amphipods (%IRI = 60%). Large cunner and tautog also demonstrated a significant overlap in diet ($\alpha = 0.74$) due to the high contributions of algae in stomach contents (%IRI = 91 and 65%, respectively). Finally, there were no differences in the diet between small sea bass and both cunner and tautog of the same size ($\alpha = 0.47$ and 0.33, respectively), though the sea bass similarly preyed on crustaceans and amphipods (cumulative %IRI = 87%). Overall, the results support dietary overlap between small cunner and tautog, after which dietary preferences diverged in medium-sized fish and re-converged in larger individuals. With respect to sea bass, there was no evidence of dietary overlap between this species and cunner or tautog.

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