Abstract

Tuna Larvae (Scombridae) off Eastern Australia: When and Where Are They Spawned?

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Abstract: Tunas, mackerels, and bonitos (Scombridae) are commercially valuable fishes and contribute to the functioning of pelagic marine ecosystems worldwide, either as large predatory fishes or forage fishes. Despite this, the seasonality of larvae for most scombrids off eastern Australia is unknown. Using monthly plankton samples collected from 2014 to 2020 off Brisbane (27°S) and Sydney (34°S) and scombrid larvae in samples from several historical voyages at various times between 1983 and 2003 that were sampled between Brisbane and Sydney, we describe the spatial and temporal distribution of scombrid larvae occurring off eastern Australia. Based on morphology and mitochondrial DNA cytochrome c oxidase subunit I (COI) barcoding, we identified Acanthocybium solandri (wahoo), Allothunnus fallai (slender tuna), Auxis rochei (bullet tuna), Auxis thazard (frigate mackerel), Euthynnus affinis (mackerel tuna), Katsuwonus pelamis (skipjack tuna), Sarda australis (Australian bonito), Thunnus albacares (yellowfin tuna) and Thunnus tonggol (longtail tuna). Auxis rochei was the most abundant species, with predominately preflexion larvae present from October (mid spring) to February (late summer) off the coast of North Stradbroke Island (27°S). The water temperature significantly influenced the larval distributions of A. rochei (20–24 °C) and E. affinis (24–26 °C), while E. affinis larval abundances were positively associated with eddy kinetic energy. This highlights the importance of western boundary currents and their eddies in facilitating the spawning of scombrids.

Keywords: Scombridae; larvae; eastern Australia; cytochrome c oxidase subunit I (COI) barcoding

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