

Intraguild predation of Atlantic mackerel on early life stages of anchovy and sardine

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Abstract

Intraguild predation between small pelagic fish as regulation mechanism of early life stage survival (e.g. top-down control) may have a significant effect on inter-annual variations in fish abundance and recruitment variability. For instance, although traditionally linked to physical (e.g. transport, retention) processes, survival of anchovy early life stages in the main spawning grounds (i.e. French continental shelf in spring) of the Bay of Biscay is partly regulated by small pelagic fish predation. Visual identification of adult fish stomach contents may underestimate early life stage mortality due to predation; indeed, preliminary genetic based prey identification suggests new potential predators such as mackerel larvae potentially feeding on anchovy and sardine eggs in the shelf break, where they could have been transported by advection. However, the role of different life stages of mackerel as potential predators and the relevance of their co-occurrence in the anchovy and sardine main spawning and nursery areas for early life stages survival and recruitment, remain unclear. This study combines both microscope and genetic based prey identification to provide more accurate estimates of anchovy and sardine early life stage mortality of due to predation by mackerel larvae and adults. In addition, egg and larvae transport is considered as a potential factor that may regulate the effects of the intraguild predation, increasing or decreasing the prey-predator encounter rates. This study provides new insights into the trophic interactions in the Bay of Biscay, which is critical to inform advanced multispecies ecosystem models.