



Otolith variability, age composition, and ontogenetic diet shift in *Trachurus trachurus*, Linnaeus, 1758, from the Southern Tyrrhenian Sea

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Overexploitation of marine resources poses a global threat to biodiversity and food security, with the Mediterranean Sea particularly affected due to intense fishing activity and multiple anthropogenic pressures. This study provides new insights into ontogenetic changes in diet and otolith morphology of *Trachurus trachurus*, a commercially important Mediterranean species. A total of 282 specimens were collected from the commercial fishery in the Gulf of Palermo (Southern Tyrrhenian Sea) for analyses of otolith morphometry, age structure, and diet composition. Otoliths were analysed using wavelet transformation methods, and age was determined by counting annual growth zones, each consisting of one translucent and one opaque ring. The diet composition was assessed through stomach content analysis. Wavelet analysis revealed clear differences in rostrum length, notch depth, and posterior dorsal margin, with six distinct morphotypes identified in the sample. Age composition was dominated by juveniles and intermediate-aged fish: 38.7% belonged to age group 1, 46.8% to age 2, 13% to age 3, and only 1.5% to ages 4–6. Dietary analysis revealed a total of 1,418 prey items from 33 taxa, with 254 stomachs containing food remains and 28 being empty. It was also examined the diet variability in relation to specimens age, revealing an ontogenetic dietary shift: juveniles (ages 1-1+) primarily consumed small pelagic crustaceans, individuals aged 2- 2+ included more fish and decapods, and older fish (ages 3-6) specialised in larger crustaceans and fishes. These results demonstrate dietary specialization and trophic flexibility across age classes in response to resources availability. These findings highlight the importance of integrating morphological, age, and dietary data to better understand life history strategies and ecological dynamics in commercially exploited fish species.