Trophic relationships among different fishes in the Santa Giusta lagoon (Western Sardinia, Italy) as traced by $\delta^{13}C$ and $\delta^{15}N$ analysis

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Abstract

Analyses of stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotopes are frequently used to determine the origin and composition of diets of fishes. The main objective of the present study was to identify the trophic relationships among fish species in the Santa Giusta lagoon situated on the Western Sardinia, Italy. We hypothesized that different fish species are specialized on specific diets, allowing niche-separation and co-existence, and this specialization leads to significant isotopic differences even within related fish species. In the present study, we used the stable isotope ratios ($\delta^{13}C$ and $\delta^{15}N$) in tissues of different fish species as a tool to elucidate feeding patterns within the ecosystem of Santa Giusta lagoon. The fish species examined were viz., *Mugil cephalus*, *Liza aurata*, *Liza ramado*, *Aphanius fasciatus*, *Salaria pavo*, *Sarpa sarpa*, *Gambusia affinis* and *Gobius* sp. Cluster analysis of the stable isotope values yielded species clusters that were used to interpret trophic and habitat specialization of each fish species. The study demonstrated large differences in feeding pattern of different (and even related) fish species in Santa Giusta lagoon.