

ASSESSING THE TROPHIC ECOLOGY OF THE INVASIVE ATLANTIC BLUE CRAB *Callinectes sapidus* IN THE COASTAL WATERS OF THE GULF OF CADIZ

Elena Ortega-Jiménez ^{*1,5}, Cesar Vilas^{2,5}, Francisco Baldó³, Jose A. Cuesta^{1,5},
Irene Laiz⁴, Enrique González-Ortegón, ^{1,5}

¹ Institute of Marine Science of Andalusia (CSIC-ICMAN), Cádiz, Spain;
elena.ortega@csic.es; jose.cuesta@csic.es; e.gonzalez.ortegon@csic.es

² Andalusia Research and Training Institute for Fisheries and Agriculture (IFAPA), Puerto Santa
María, Cádiz, Spain; cesar.vilas@juntadeandalucia.es

³ Spanish Institute of Oceanography (IEO-Cádiz), Cadiz, Spain; francisco.baldo@ieo.es

⁴ Facultad de Ciencias del Mar y Ambientales (CASEM), Puerto Real, 11510 Cadiz, Spain. ⁵
Unidad Asociada IFAPA-CSIC “Crecimiento azul”, Spain

Abstract: *Callinectes sapidus*, the invasive blue crab from the west of the Atlantic Ocean, has extended its distribution along the Atlantic coast around the Gulf of Cadiz and increased massively since 2016. Food web studies are useful for understanding changes in ecosystems caused by exotic species. Stable isotope analysis ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) were used to assess the potential carbon sources and its trophic relationships among different ecosystems (estuaries and saltmarshes), sexes (male and females) and seasons (summer vs. autumn). Significant differences were found in the $\delta^{13}\text{C}$ of blue crabs from the estuaries and salt-marshes (-21.2 ± 2.6 vs -14.2 ± 0.9 , respectively). These differences may be explained by an increase in the ^{13}C of the blue crabs from the salt-marshes, probably due to the enrichment of this isotope in the primary producers such as the salt marsh plants (Menéndez and Sanmartí, 2007) and its preys inhabiting this ecosystem. Meanwhile,

the more depleted ^{13}C values in the estuary crabs seem to reflect a carbon source from mollusks and fish derived from decomposing detritus. Among the ecosystems analyzed, $\delta^{15}\text{N}$ was only significantly enriched in the crabs of the Guadalquivir estuary and was higher in males than females. Also, seasonal differences were found in this estuary in both sexes, by a decrease in the ^{15}N values between summer and autumn. Those differences, can be explained by the fact that the Guadalquivir estuary suffers nitrogen hyper-nitrification due to intensive agriculture and is more noticeable in the upper part of the estuary, to which the males are more associated due to their life cycle. Previous studies reported, the diet of *C. sapidus* seems to be opportunistic, dependent on the food availability in different habitats (Prado et al., 2022), with a divergence in sexes induced by different spatial distributions. Future studies analyzing the stomach content and trophic behavior should be conducted to clarify our results.

Key words: *Callinectes sapidus*, stable isotopes, trophic ecology, invasive species.

References

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