

{rokbox title=|Clearance rates (CR, L g DW⁻¹ h⁻¹) in high (HF, in blue) and low (LF, in red) feeding oysters from the Mar Menor measured under three particle concentrations, I (total particulate matter (TPM) = 1.27 ± 0.09 mg L⁻¹, particulate organic matter (POM) = 0.82 ± 0.08 mg L⁻¹), II (TPM = 3.03 ± 0.18 mg L⁻¹, POM = 2.50 ± 0.21 mg L⁻¹) and III (TPM = 5.55 ± 0.61 mg L⁻¹, POM = 4.83 ± 0.46 mg L⁻¹) :: Image:

Authors|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-recovery-eutrophized-marine-luis-2023-thumb-et-al.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-recovery-eutrophized-marine-luis-2023-et-al.jpg{rokbox}

M. Albentosa, M. I. Akinyemi, M. Vera, I. Ibarrola, R. Filgueira, E. Galimany, F. da Costa, B. G. Pardo, **M. Vázquez-Luis**, A. Hernández, S. Hernandis, P. Martínez, 2023. [Recovery of eutrophized marine ecosystems using the European flat oyster, *Ostrea edulis*.](#)

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Abstract: 1. The development of tourism and intensification of agriculture has released large amounts of nitrogen and phosphorus into the Mar Menor coastal lagoon in South-east Spain, resulting in a phytoplankton bloom in 2016. This bloom turned the clear and transparent waters turbid and greenish, and killed approximately 85% of benthic macrophytes. 2. Nutrient bioextraction by flat oysters, *Ostrea edulis*, has been proposed for remediation of these eutrophication events and water quality recovery. 3. This research aims to quantify the clearance rate and investigate the genetic origin of Mar Menor oysters under eutrophized conditions for potential applications to bioremediation projects. Oligotrophic and eutrophic conditions were replicated in the laboratory, and oyster feeding behaviour (i.e. clearance rates, ingestion rates, absorption efficiency and absorption rates) were studied using a flow-through system. 4. The genetic characterization of oysters showed no significant difference between individuals from the Mar Menor and individuals collected from a nearby Mediterranean bed (Tabarca Island). 5. Based on the physiological results observed, oysters were grouped into high-feeder (HF) and low-feeder (LF) categories according to their clearance rate, that was 3-fold higher in the HF group. Different responses in feeding behaviour were observed under eutrophic conditions in both oyster groups. Constraints in the absorption capacity of LF oysters seemed to be related to their reduced filtering activity. Lower body condition of LF oysters was evidenced by their negative scope for growth value. 6. From this work, several conclusions can be drawn for future restoration/bioextraction actions: (i) the recovery of half of the oyster population that existed in the past would act as an effective top-down control on the phytoplankton community; (ii) using clearance rate measurements is recommended to select oysters as broodstock; and (iii) Mediterranean oysters could be used as broodstock in the event that Mar Menor oysters fail to reproduce.

Keywords:clearance rates,eutrophication,flat oysters,genetics,nutrient bioextraction,restoration.