{rokbox title=|Map of the study area (Balearic Islands, western Mediterranean) :: Image: Authors|
thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-conservation-exploitation-status-ferragut-2026-thumb-et-al.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-conservation-exploitation-status-ferragut-2026-et-al.jpg{/rokbox}

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Conservation and exploitation status of skate species (Batoidea: Rajidae) in the Balearic Islands, western Mediterranean
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Abstract: Batoids play key roles in marine ecosystems, yet their slow life history traits make them particularly vulnerable to overexploitation. The Balearic Islands remain a hotspot of batoid diversity, although multiple species could face conservation concerns. We combine genetic analyses based on mitochondrial COI genetic diversity with data-poor stock assessment methodologies to assess the conservation and exploitation status of the most abundant Rajidae species in the area. A total of 181 sequences of five wide distributed species and two Mediterranean endemic species (*Raja radula* and *Raja polystigma*), were analysed and compared against a Mediterranean–Atlantic Rajidae genetic diversity framework. We also assessed the stocks of
Dipturus oxyrinchus
and
Raja clavata,
using the Bayesian state-space implementation of the Schaefer production model, as well as
R. polystigma
, using a length-based Bayesian biomass estimation method. The nucleotide diversity of most species was below the lower confidence interval of the median of the comparative framework. Despite this, the assessed species showed signs of recovery and sustainable exploitation. The biomass of
R. clavata
and
D. oxyrinchus

showed an important increase in recent years following reductions in fishing effort, while *R. polystigma* showed stability and sustainable exploitation. *Raja brachyura*, *R. radula* and *Leucoraja naevus*, with low overlap between their bathymetric distribution and the bottoms most intensively exploited by the bottom trawl fleet, showed the highest genetic diversities. Similarly, the low overlap of this fishery, at least with important fractions of the populations of *R. clavata*, *R. polystigma* and *D. oxyrinchus*, is in coincidence with their resilience to fishing exploitation. These findings highlight the importance of depth distribution in shaping resilience, emphasizing the need for species- and region-specific conservation strategies for these vulnerable species. In this sense, the integration of genetic monitoring with stock assessments is gaining relevance for detecting hidden vulnerabilities on threatened species such as batoids.

Keywords: Population genetics, Islands, Haplotypes, Species diversity, Conservation genetics, Nucleotides, Phylogeography, Skates and rays