Acta Adriatica 67 (2026):
https://doi.org/10.32582/aa.67.2.2

www.izor.hr

ORIGINAL ARTICLE

Historical occurrence of *Taeniurops grabatus* (Myliobatiformes: Dasyatidae) in the Mediterranean Sea and unpublished up-to-date observations in its Northwestern area (Spain)

Victor Orenes-Salazar[1,4*], Claudio Barría[2,3], Javier Ferrer[4] and Juan A. Pujol[1,5]

[1]*Department of Ecology and Hydrology, University of Murcia, Campus Espinardo, Murcia, Spain*
[2]*Department of Functional Biology, Genetics, University of Oviedo, Oviedo, Spain*
[3]*Catsharks, Association for the study and conservation of elasmobranchs and their ecosystems, Barcelona, Spain*
[4]*Tanit, Association for the observation and exploration of the aquatic environment, Cabo de Palos, Spain*
[5]*Environmental Department, Torrevieja City Hall, Plaza Constitución, Torrevieja, Spain*

Abstract: Chondrichthyans are key components of marine ecosystems, playing an important role in the regulation and stability of coastal and offshore food webs. Despite their ecological relevance, many chondrichthyan species have experienced severe global decline, primarily driven by intense fishing pressure and bycatch. In this context, uncertainties regarding their historical and contemporary distribution limit robust evaluations of population trajectories and the magnitude of human impacts. In this study, we review and update the known distribution of the round stingray *Taeniurops grabatus* (Geoffroy Saint-Hilaire, 1817) in the Mediterranean Sea, reporting the presence of the species in ten Mediterranean countries, mainly along the southern and eastern basins. Furthermore, by combining historical knowledge and citizen science data, we provide the first documented records of *T. grabatus* from Spanish Mediterranean coastal waters and confirm both historical and recent occurrences in the southeastern Iberian Peninsula. By integrating historical with contemporary records obtained through citizen science, our study demonstrates the complementary value of these approaches to offer a more comprehensive understanding of the presence and temporal change of this rare species in the Mediterranean Sea.
Keywords: rare occurrence; round stingray; citizen science; Mediterranean Sea; Spain

Sažetak: POVIJESNI NALAZI VRSTE *TAENIUROPS GRABATUS* (MYLIOBATIFORMES: DASYATIDAE) U SREDOZEMNOM MORU I NOVI, DOSAD NEOBJAVLJENI NALAZI IZ NJEGOVA SJEVEROZAPADNOG DIJELA (ŠPANJOLSKA). Hrskavičnjače su ključne sastavnice morskih ekosustava te imaju važnu ulogu u održavanju strukture i stabilnosti hranidbenih mreža priobalnog i otvorenog mora. Unatoč njihovoj ekološkoj važnosti, brojne vrste hrskavičnjača bilježe značajan pad brojnosti na globalnoj razini, ponajprije zbog intenzivnog ribolova i slučajnog ulova. Istodobno, nedovoljno poznavanje njihove povijesne i današnje rasprostranjenosti otežava pouzdanu procjenu populacijskih trendova i razmjera utjecaja ljudskih aktivnosti. U ovom radu analizirana je i dopunjena poznata rasprostranjenost crne žutuge *Taeniurops grabatus* (Geoffroy Saint-Hilaire, 1817) u Sredozemnom moru, donoseći podatke o prisutstvu vrste u deset sredozemnih država, većinom duž njegovog južnog i istočnog dijela. Nadalje, kombiniranjem povijesnih podataka i opažanja prikupljenih građanskom znanošću, donosimo prve dokumentirane nalaze vrste *T. grabatus*, potvrđujući njenu povijesnu i nedavnu prisutnost u jugoistočnom dijelu Pirinejskog poluotoka. Povezivanjem povijesnih podataka sa suvremenim opažanjima prikupljenima kroz građansku znanost, ovo istraživanje potvrđuje komplementarnu vrijednost ovih izvora podataka te pruža cjelovitiji uvid u rasprostranjenost i vremensku dinamiku pojavljivanja ove rijetke vrste u Sredozemnom moru.
Ključne riječi: rijetka pojava; crna žutuga; građanska znanost; Sredozemno more; Španjolska

INTRODUCTION

Elasmobranchs (sharks, rays, and skates) are key components of marine ecosystems, contributing to the regulation and stability of both coastal and offshore food webs (Ferretti *et al.,* 2010). Despite their ecological importance, many species have experienced severe global declines due to intense fishing pressure (Dulvy *et al.,* 2014). Directed fisheries, together with incidental capture as bycatch, represent the primary threats affecting both demersal and pelagic chondrichthyan populations (Pacoureau *et al.,* 2021). These pressures are particularly pronounced in the Mediterranean Sea, historically recognized as a center of elasmobranch diversity (Serena *et al.,* 2020). Currently, approximately half of the region's shark and ray species are considered at risk, facing extinction, local disappearance, or marked population reductions (IUCN, 2026).

The genus *Taeniurops* Garman, 1913 is currently placed within the subfamily Dasyatinae, together with

*Corresponding author: victor.orenes@um.es
Received: 5 May 2026, accepted: 8 July 2026
ISSN: 0001-5113, eISSN: 1846-0453

Dasyatis Rafinesque, 1810 and *Pteroplatytrygon* Fowler, 1910 (Last *et al.,* 2016a). It comprises two currently recognized species: the Indo-Pacific *Taeniurops meyeni* (Müller & Henle, 1841) and the Atlantic–Mediterranean *T. grabatus* (Geoffroy Saint-Hilaire, 1817) (Froese and Pauly, 2025).

Taeniurops grabatus, commonly known as the round fantail stingray or round stingray, is a demersal and viviparous coastal species inhabiting sandy bottoms and seagrass meadows at depths of up to 450 m, although it is most commonly recorded from coastal and shelf waters down to approximately 100 m depth, showing a marked affinity for shallow nearshore habitats, particularly those shallower than 50 m (Last *et al.,* 2016a; Ben Amor *et al.,* 2019). The species is among the largest dasyatids, reaching a disc width of up to 2.50 m, or up to 2.90 m according to Capapé and Ali (2024), and a total body mass of approximately 300 kg (Capapé *et al.,* 2023a). Its diet mainly consists of benthic fishes and crustaceans (Séret, 2016), and there is no information on this species' age-at-maturity and maximum age.

The round stingray is a species with tropical affinities widely distributed across the eastern Atlantic Ocean and the Mediterranean Sea, not present in the Black Sea (Ebert and Dando, 2020). Within the Mediterranean basin, its occurrence is predominantly associated with the southern coastline, particularly along North African shores from Morocco eastwards to Turkey and Syria (Ali *et al.,* 2013; Capapé *et al.,* 2023a, b). A single, geographically isolated record has been reported from the northern Tyrrhenian Sea (Serena *et al.,* 1999). In the Atlantic, the distribution range follows the West African continental margin, from the south of the Strait of Gibraltar to Angola and includes several oceanic archipelagos, namely the Azores, Madeira, the Canary Islands, Cape Verde, and São Tomé and Príncipe (Bañón *et al.,* 2025). Last *et al.* (2016b) also indicate that the species may occur in the Red Sea. Despite this broad range, the species' northernmost Atlantic limit still remains unresolved. While some authors restrict this boundary to southern Moroccan or Mauritanian waters (Ali *et al.,* 2013; Ben Amor *et al.,* 2019; Capapé and Ali, 2024), others suggest a more northerly extension reaching the Bay of Biscay (Báez *et al.,* 2019; Jabado *et al.,* 2021; Bañón *et al.,* 2025). In Spanish waters, although Báez *et al.* (2019) reported the presence of the species along the northern coast of Spain and in the Gulf of Cádiz, confirmed records are restricted to the southern coast. Several individuals have been documented since 2001 in the traditional intertidal fish weirs of Rota, locally known as corrales (Arias Garcia, 2005). To date, there are no verified records from the Mediterranean coast of Spain or from French waters, where the species is considered absent (Béarez *et al.,* 2017).

Accurate knowledge of species distribution is essential for assessing population trends and informing conservation strategies (McClenachan *et al.,* 2012), particularly for elasmobranchs, which are among the most threatened marine vertebrates worldwide (Dulvy *et al.*, 2014). *Taeniurops grabatus* is currently classified as Near Threatened (NT) on the global IUCN Red List, as it nearly meets the criteria for Vulnerable under category A2d, and its population is considered to be declining (Jabado *et al.,* 2021), while in the Mediterranean Sea is considered as Data Deficient (DD) (Jung and Buscher, 2016). Like many coastal rays and sharks, this species is exposed to multiple and intensifying pressures, including fisheries bycatch, habitat degradation, and coastal development, among others (Jabado *et al.,* 2021). In this context, uncertainties regarding its historical and contemporary distribution limit robust evaluations of population trajectories and the magnitude of human impacts. In this study, we compiled (i) historical knowledge and (ii) citizen science records to reconstruct the true distributional limits of *T. grabatus* in Spanish Mediterranean waters. In parallel, we conducted (iii) a comprehensive bibliographic review of the species' distribution throughout the Mediterranean Sea, with the aim of updating and refining current knowledge on its actual occurrence. By integrating these complementary sources of information, this work seeks to provide a more accurate representation of the species' Mediterranean distribution, thereby supporting improved conservation assessments and management strategies for the round stingray *T. grabatus*.

MATERIAL AND METHODS

Photograph-based historical assessment

To document the historical presence of *Taeniurops grabatus* in Spanish Mediterranean waters, a photograph found serendipitously by one of the authors (JAP) was used as the starting point of this study. The image (code "FOT_NEG, RV-003/133"), preserved in the General Archive of the Region of Murcia, was associated with limited metadata, as only its authorship—attributed to the photographer Manuel Rodríguez de Virgui (1923–2003)—and an approximate date (ca. 1945) were known. Consequently, reconstructing the provenance and contextual background of the image became a necessary methodological step to support its use as historical evidence. To this end, a series of semi-structured interviews was conducted between October 2022 and December 2023 with elderly individuals linked to the fishing sector in southeastern Spain, particularly along the coast of Cartagena, as well as with municipal archivists and local historians. The information obtained was cross-referenced with available archival material to refine the contextual interpretation of the photograph.

Citizen science collaboration

To confirm the current presence of *Taeniurops grabatus* in Spanish Mediterranean waters, a recent record identified by the authors was used. The authors are in-

volved in a broader citizen science initiative aimed at compiling photographic records of sharks and rays in the Spanish Mediterranean. Data are collected opportunistically through a network of recreational divers and collaborators, where different researchers distributed across Spain actively request, gather and review sightings and underwater images containing elasmobranch species from marine users, particularly within their local diving communities.

During this process, a photograph depicting a putative individual of *T. grabatus*, initially and erroneously identified as *Dasyatis pastinaca*, was detected. As in the case of the historical photograph, the objective of the present work was restricted to compiling and verifying metadata associated with this record, including its location, date, and authorship.

Species identification of photographic material was based on external morphology by Last *et al.* (2016b), including the characteristic rounded disc, robust tail base, dorsal coloration, and the presence of a well-developed venomous spine.

Bibliographic review on the distribution of *Taeniurops grabatus* in the Mediterranean Sea

A systematic bibliographic review was conducted to compile the available information on the distribution of *Taeniurops grabatus* in the Mediterranean Sea. The primary search was performed in the Web of Science database using the query "*Taeniurops grabatus* AND Mediterranean Sea". To ensure comprehensive coverage, all possible combinations involving the historically synonymised names of the species were also included: *Taeniura grabata*, *Taeniura grabatus*, *Taeniurops grabata*, and *Trygon grabatus* (Froese and Pauly, 2025).

The database search was complemented by examining the reference lists of all retrieved documents to identify additional sources not captured in the initial search. Furthermore, a screening of grey literature—including technical reports, theses, and non-indexed documents—was undertaken using the search engine Google Scholar to provide a more complete overview of the species' distribution within the Mediterranean region. The bibliographic search was completed on 31 December 2025.

All articles retrieved through the bibliographic search were systematically screened to extract information on the presence of the target species. For each record, data on the year of observation, location, and geographic coordinates were collected whenever available. Only studies providing explicit georeferenced information were used to reconstruct the distribution map of *T. grabatus* in the Mediterranean Sea.

Ethical statement

The present study did not involve the capture, handling, experimentation, or disturbance of live animals. All data were obtained from historical archival photographs and previously existing visual records. The photographic material was collected opportunistically and non-invasively, without any manipulation, attraction, or harm to the animals. Therefore, no ethical approval or permits from animal welfare authorities were required for this study.

RESULTS

Historical knowledge

Based on archival analysis and interviews with local stakeholders, the following results were obtained. Bartolomé Navarro Llorca (1943), former president of the Cartagena Fishermen's Guild, and the fisherman Ramón Ausó (1969), son of one of the fishermen depicted in Fig. 1, confirmed that the photograph found in the General Archive of the Region of Murcia dates from approximately 1945. They also identified the precise location where it was taken as Marín Street, in the fishing village of Cabo de Palos (Cartagena, Region of Murcia, SE Spain). In addition, they recognized the four fishermen shown in the photograph, who were engaged in longline fishing activities.

The photograph clearly displays the presence of two pterygopodia (claspers) adjacent to the pelvic fins, allowing the specimen to be identified as a male with an estimated disc width of approximately 55–60 cm. Despite the absence of the tail and the specimen being displayed in ventral view, it was unambiguously identified as *T. grabatus* based on key diagnostic characters visible on its undersurface that perfectly match the criteria by Last *et al.* (2016b). The specimen exhibits a characteristically robust body with a subcircular disc (slightly wider than long) and a moderately elongate, broadly angular snout with a pointed tip. This rounded silhouette clearly distinguishes it from other regional dasyatids with more rhombic or angular discs, such as *Dasyatis* spp. or *Pteroplatytrygon violacea*. Furthermore, the ventral surface shows a characteristically pale coloration with sharply defined, dark brownish margins along the edges of the disc and pelvic fins, as well as a robust tail base that is uniformly dark underneath, which are diagnostic traits for this species. The rest of the tail is absent, likely having been deliberately removed by the fishermen as a precautionary measure to prevent accidents once the animal was brought on board.

Citizen science collaboration

Based on the review of citizen science information obtained, only one of the records provided corresponded to the target species. This observation dates to the summer of 2018 and was recorded in the Bay of Portmán (Fig. 2), along the Cartagena coastline (37°34′47.2″ N, 0°50′40.4″ W). The specimen was observed over a coarse sandy bottom at a depth of 8 m. It was identified as an adult individual with an estimated total length

Fig. 1. Archival photograph currently housed in the General Archive of the Region of Murcia, dating from approximately 1945, showing a male specimen of *Taeniurops grabatus* with an estimated disc width of approximately 55–60 cm. The photograph was taken in the fishing village of Cabo de Palos (Cartagena, Region of Murcia). Photo credit: Manuel Rodríguez de Viguri.

of approximately 150 cm. Taxonomic identification was unambiguously confirmed as *T. grabatus* based on the diagnostic characters visible in the underwater image (Fig. 2), matching the description by Last *et al.* (2016b). The specimen exhibits a robust trunk with a distinctly subcircular disc that is slightly wider than long, a skin coverage with sparse, low denticles, and a moderately elongate, broadly angular snout with a pointed tip. Crucially, the tail is short and robust at its base, featuring a prominent ventral skin fold that tapers toward the tip, with the tail section behind the spine being uniformly dark. The dorsal surface is plain dark brown with weak speckling, which clearly separates it from the rhombic disc and longer, whip-like tails of other common regional batoids like *Dasyatis* spp. or *Pteroplatytrygon violacea*. The observation was made during a SCUBA dive at dusk.

Bibliographic review

A literature search conducted in the Web of Science (WoS) database retrieved nine articles referring to *Taeniurops grabatus* (including its synonyms). An expanded search, incorporating additional databases and grey literature, identified 17 additional scientific contributions providing some form of information on the species in the Mediterranean Sea. Most of these works were published in regional, non-indexed journals.

Based on published records and present contributions, *T. grabatus* has been reported in 10 Mediterranean countries, comprising a minimum of 26 individuals with quantified records (Table 1; Fig. 3). These observations are geographically distributed from east to west as follows: Israel (n = 2), Egypt (abundance unspecified), Cyprus (n = 7), Syria (n = 5), Türkiye (n = 2), Libya (n = 1, plus one record with unspecified abundance), Tunisia (n = 1, plus one record with unspecified abundance), Algeria (n = 4), Italy (n = 2), and Spain (n = 2). Along the southern and eastern Mediterranean coast, the easternmost records correspond to Israel, where the species was reported from unspecified localities (Golani, 2005) and later from Gdor during the period 2016–2018 (Chaikin *et al.,* 2020). In Egypt, the species has been reported from unspecified locations (Akel and Karachle, 2017). Further north along the Levantine basin, several records originate from Syria, including Lattakia, Lattakia–Jableh, Banias and areas close to the Lebanese border, reported in 2012 (Ali *et al.,* 2013) and 2013 (Capapé

Fig. 2. The specimen of *Taeniurops grabatus* observed in 2018 over a coarse sandy bottom at a depth of 8 m in the Bay of Portman, along the Cartagena coastline (SE Iberian Peninsula, SW Mediterranean). Photo credit: Javier Ferrer.

and Ali, 2024). Although Bariche and Fricke (2020) cite the first record from Lebanon based on Lteif (2015), the original document does not report any evidence of the presence of the species in Lebanese waters. Additional occurrences were documented along the southern Türkiye coast, including Iskenderun Bay in 1997 (Başusta *et al.,* 1998) and Finike Bay in 2012 (Santin *et al.,* 2021). In Cyprus, records span from Akamas in 1977 (Giovos *et al.,* 2021), Pervolia-Mazotos-Tochni in 2013 (Giovos *et al.,* 2021), and Northern Cyprus during 2018–2022 (O'Keefe *et al.,* 2023). Moving westwards, the species was reported from the Gulf of Gabès, Tunisia, between 2016 and 2017 (Carpentieri *et al.,* 2021; Saidi *et al.,* 2023), and from Bizerte in 2019 (Ben Amor *et al.,* 2019). In Libya, occurrences have been reported from Susah (Buzaid, 2022) and the Gulf of Sirte (Shakman *et al.,* 2023), although without precise dating. Finally, in the western Mediterranean, available records from Skikda–Annaba, Algeria, spanning 1999–2020, indicate the persistent presence of the species in this sector (Capapé *et al.,* 2023a, b), while an earlier northern Mediterranean record was reported from Livorno, Italy, in 1997 (Serena *et al.,* 1999). The two records reported here constitute the first confirmed occurrences of *T. grabatus* on the Mediterranean coast of Spain and the Iberian Peninsula, as well as the westernmost records of the species in the Mediterranean Sea (Fig. 3).

DISCUSSION

This study updates the known distribution of the round stingray *Taeniurops grabatus* in the Mediterranean Sea, where the species has been reported from ten Mediterranean countries, predominantly in the southern and eastern sectors. In addition, we provide the first documented records of *T. grabatus* from Spanish Mediterranean coastal waters, integrating historical information with data derived from citizen science initiatives.

Several authors have suggested that *T. grabatus*, a species with clear tropical affinities, is currently extending its occurrence towards more northern sectors of the Mediterranean Sea and the adjacent Atlantic, potentially in response to increasing sea temperatures (Bañón *et al.,* 2025). Such shifts are consistent with broader expectations under climate change, as elasmobranchs are predicted to undergo latitudinal and bathymetric redistributions driven by thermal constraints, facilitated by their high mobility and metabolic demands (Osgood *et al.,* 2021). Batoids, in particular, are known to perform extensive horizontal and vertical movements, which may make them especially sensitive to ongoing ocean warming (Perry *et al*., 2005; Ajemian and Powers, 2014). However, our data confirm both historical (1940s) and recent (2018) records of the round stingray in the southeastern Iberian Peninsula, indicating that its current occurrence in this region cannot be solely attributed to a recent northward expansion linked to climate change, as the species was already present several decades ago. The fact that the species has remained largely overlooked in this area may be related to a combination of factors, including its cryptic benthic habits, potential misidentification with morphologically similar stingray local species, and the scarcity of targeted surveys in soft coastal bottoms. Previous surveys have also characterized the round stingray as a generally uncommon species in the Mediterranean Sea, with most records con-

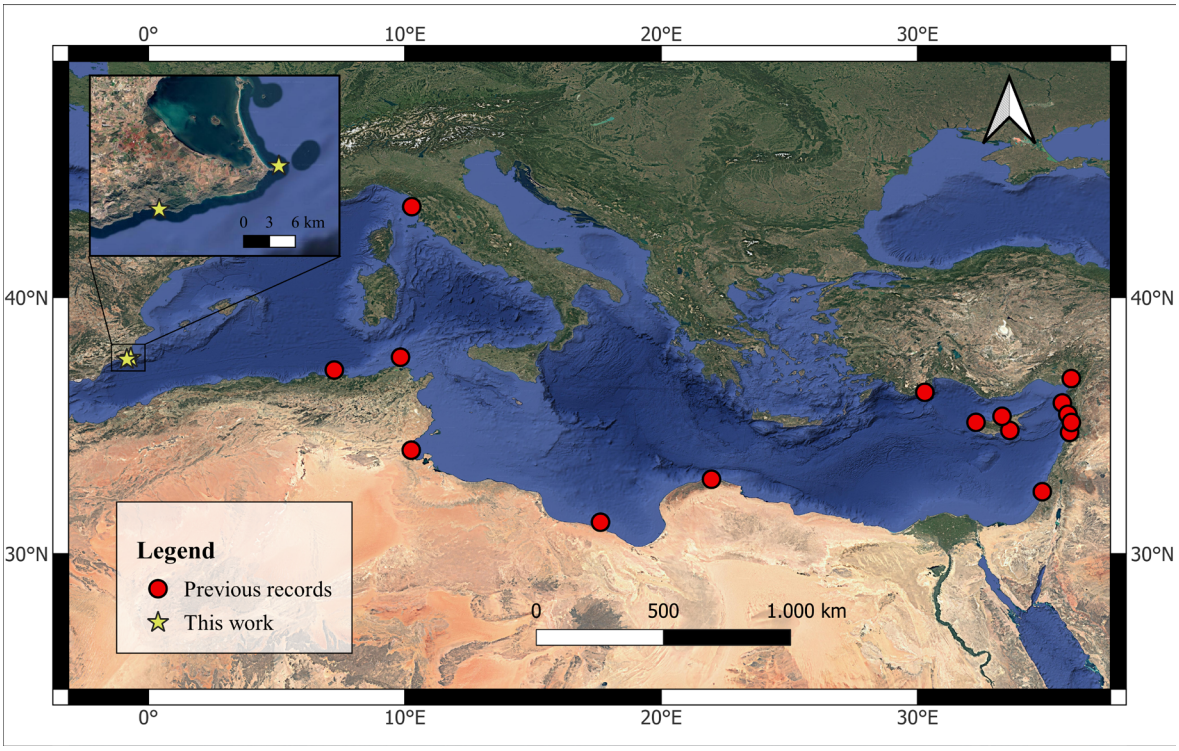

Fig. 3. Historical distribution map of *Taeniurops grabatus* in the Mediterranean Sea. Only explicit georeferenced records obtained from the bibliographic review were used to depict the species' distribution. Red circles represent occurrences reported in the literature; yellow stars indicate records provided by the present study.

centrated along the North African coastline. In fact, just a single documented occurrence has been previously reported in the northwestern Mediterranean, in which two individuals were captured in a trammel net off the coast of Livorno (Italy) in 1997 (Serena *et al.,* 1999).

The records presented in this assessment have direct implications for Spanish batoids. Until now, *Taeniurops grabatus* has been absent from published inventories of Mediterranean elasmobranchs in Spanish waters, where the species has generally been considered restricted to Atlantic areas (Báez *et al.,* 2019). Despite ongoing efforts to compile a comprehensive checklist of regional elasmobranchs, confirmed records of *T. grabatus* remain absent from the Spanish Mediterranean inventory (Barría, pers. comm.). The confirmation of its presence along the Spanish Mediterranean coast, therefore, represents an addition to the national batoid fauna and increases the known diversity of Myliobatiformes in this region.

From a regional perspective, the presence of *Taeniurops grabatus* in the northwestern Mediterranean Sea reinforces the role of the southeastern Iberian coast as a key biogeographic transition zone. This area functions as an ecotone between Atlantic-influenced and Mediterranean assemblages and supports a high diversity of coastal habitats suitable for demersal batoids. The presence of the species in the region, as indicated by both historical and recent records, suggests the existence of low-density but long-standing populations, highlighting the conservation importance of southeastern Iberian coastal ecosystems. Although coastal dasyatids often display local residency, electronic and satellite tagging studies on closely related species, such as *Dasyatis pastinaca*, have demonstrated their capability to undergo distinct, long-distance seasonal migratory movements (Nadia, 2024). Therefore, while the potential for occasional vagrant individuals moving into the northwestern Mediterranean cannot be entirely discounted, the extensive temporal persistence spanning over seven decades between the 1945 and 2018 records within the same localized coastal sector (Cartagena coastline) suggests the existence of a stable, low-density resident population rather than temporary vagrancy, although this interpretation requires confirmation through further research. From the ecological perspective, *T. grabatus* likely plays an important ecological role similar to other mesopredator rays (Barría *et al.,* 2015), including predation on benthic fishes and crustaceans and disturbance of sediments during foraging. Such activities have been shown to influence benthic community structure and energy flow in coastal ecosystems (Flowers *et al.,* 2021).

A relevant aspect emerging from both the new data and the bibliographic review is that several records of *Taeniurops grabatus* originate from incidental captures in fisheries (e.g., Saidi *et al.,* 2023; O'Keefe *et al.,* 2023). This highlights both the importance of bycatch as a primary source of occurrence data for certain species and underscores a significant conservation concern. Bycatch remains one of the main threats to elasmobranchs

Table 1. Historical presence of *Taeniurops grabatus* in the Mediterranean Sea by country and year. Geographic coordinates are provided only when explicitly reported in the original reference.

Year	Location	Country	Number	Latitude	Longitude	Reference
1945	Cape of Palos	Spain	1	37°38'11.90" N	0°41'15.00" W	This work
1977	Akamas	Cyprus	1	35°07'30.00" N	32°16'53.40" E	Giovos *et al*., 2021
1997	Livorno	Italy	2	43°32'33.70" N	10°16'24.30" E	Serena *et al.,* 1999
1997	Iskenderun Bay	Türkiye	1	36°50'00.00" N	36°00'00.00" E	Başusta *et al.,* 1998
2012	Lattakia	Syria	1	37°10'00.00" N	7°15'00.00" E	Ali *et al.,* 2013
2012	Lattakia-Jableh	Syria	1	35°53'00.00" N	35°39'00.00" E	Ali *et al.,* 2013
2012	Finike Bay	Türkiye	1	35°26'00.00" N	35°52'00.00" E	Santin *et al.,* 2021
2012	Lebanese border	Syria	1	36°17'53.16" N	30°17'08.16" E	Ali *et al.,* 2013
2013	Lattakia	Syria	1	35°26'02.0" N	35°51'59.0" E	Capapé and Ali, 2024
2013	Banias	Syria	1	35°07'15.0" N	36°00'17.0" E	Capapé and Ali, 2024
2013	Pervolia-Mazotos-Tochni	Cyprus	1	34°48'29.70" N	33°36'07.10" E	Giovos *et al.,* 2021
2016-2018	Gdor	Israel	2	34°44'00.00" N	35°56'00.00" E	Chaikin *et al.,* 2020
2018	Portman Bay	Spain	1	32°25'01.78" N	34°52'10.25" E	This work
2019	Bizerte	Tunisia	1	33°32'24.10" N	11°38'57.60" E	Ben Amor *et al*., 2019
1999-2020	Skikda-Annaba	Algeria	4	37°34'47.20" N	0°50'40.40" W	Capapé *et al.,* 2023b
2016-2017	Gabès	Tunisia	Unspecified	35°21'37.10" N	33°17'52.80" E	Carpentieri *et al*., 2021
2018-2022	Northern Cyprus	Cyprus	5	37°40'00.00" N	9°50'00.00" E	O'Keefe *et al.,* 2023
Unspecified	Susah	Libya	1	32°54'10.10" N	21°57'51.40" E	Buzaid, 2022
Unspecified	Sirt Gulf	Libya	Unspecified	31°13'38.80" N	17°38'04.40" E	Shakman *et al.,* 2023
Unspecified	Unspecified	Egypt	Unspecified	Unspecified	Unspecified	Akel and Karachle, 2017
Unspecified	Unspecified	Israel	Unspecified	Unspecified	Unspecified	Golani, 2005

in the Mediterranean Sea, where many species exhibit high vulnerability due to slow life histories and limited population resilience (Carpentieri *et al.,* 2021). In this context, records of *T. grabatus* derived from fisheries should be interpreted cautiously, as they may reflect fishing effort rather than true distribution patterns (Ruiz-García *et al.,* 2023). At the same time, the recurrent capture of these elasmobranch species suggests ongoing interactions with demersal fisheries, reinforcing the need to better assess bycatch rates and implement mitigation measures for this poorly known species. In the northwestern Mediterranean, southeastern Iberian Peninsula, the coastal waters are subjected to intense fishing pressure from both commercial bottom trawling and small-scale artisanal fleets using trammel nets and longlines (Barría *et al.,* 2015; Barría and Colmenero, 2019). These fishing gears operate extensively over the shallow sandy bottoms and seagrass meadows that constitute the primary habitat for *T. grabatus*, thereby creating a high potential for continuous, undetected interactions and incidental mortality.

Historical records of rare benthic elasmobranch species that exhibit cryptic behavior are often scarce or absent from the scientific literature, particularly at local scales (Jorgensen *et al.,* 2022). In this study, information provided by local fishers with more than five decades of experience in the study area allowed us to document the historical occurrence of a rare stingray species that

would otherwise remain unrecorded. This highlights the value of local ecological knowledge (LEK) as a complementary source of information for reconstructing past species distributions and temporal persistence (Silvano and Valbo-Jørgensen, 2008). Incorporating LEK is especially relevant in the context of shifting baseline syndrome, as the absence of long-term scientific monitoring can lead to underestimation of historical biodiversity and misinterpretation of present-day rarity (e.g., Jones *et al.,* 2020). Our findings illustrate how fishers' knowledge can improve our understanding of marine biodiversity patterns and long-term species presence, while highlighting the importance of intergenerational communication for the transmission and preservation of local nature.

Our work also benefits from data contributed through citizen science, which has become increasingly recognized as valuable for marine biodiversity research and conservation (Kelly *et al.,* 2020). Citizen science can greatly expand species occurrence records across broad spatial and temporal scales, augmenting traditional scientific datasets and enhancing understanding of distributional patterns that would otherwise be difficult to document through conventional sampling alone (Cigliano *et al.,* 2015; McKinley *et al.,* 2017), particularly in underrepresented or poorly sampled habitats. Such approaches have been identified as important tools for informing marine conservation and monitoring programs, particularly when traditional data sources are limited or costly to obtain (Jarvis *et al.,* 2015). Considering that the species addressed in the present study may have gone unnoticed along the Spanish Mediterranean coast due to identification difficulties, targeted educational and citizen science initiatives could play a key role in enhancing public awareness, improving species recognition, and increasing the accuracy and frequency of species reporting (e.g., Castejón-Silvo *et al.,* 2023). By combining historical information derived from fishers' experience with recent observations collected through citizen science efforts, our study demonstrates the complementary value of both approaches: historical LEK helps reconstruct past presence and baseline conditions, while citizen science contributes contemporary occurrence data, together providing a more comprehensive picture of species presence and change over time.

In conclusion, this work updates the current knowledge on the distribution of the rare round stingray *Taeniurops grabatus* in the Mediterranean Sea and confirms both historical and recent records from the southeastern Iberian Peninsula. These results highlight the existence of persistent gaps in our understanding of elasmobranch occurrence and ecology, even in comparatively well-studied areas. The present study suggests that integrating local ecological knowledge with information obtained through citizen science initiatives may contribute to partially filling these gaps.

REFERENCES

Ajemian, M.J., Powers, S.P. 2014. Towed-float satellite telemetry tracks large-scale movement and habitat connectivity of myliobatid stingrays. Environmental Biology of Fishes, 97, 1067-1081. https://doi.org/10.1007/s10641-014-0296-x

Akel, E.S.H.K., Karachle, P.K. 2017. The marine ichthyofauna of Egypt. Egyptian Journal of Aquatic Biology and Fisheries, 21(3), 81-116. https://doi.org/10.21608/ejabf.2017.4130

Ali, M., Saad, A., Reynaud, C., Capapé, C. 2013. First records of the round fantail stingray, *Taeniura grabata* (Chondrichthyes: Dasyatidae), off the Syrian coast (eastern Mediterranean). Zoology in the Middle East, 59(2), 176-178. https://doi.org/10.1080/09397140.2013.810883

Arias García, A.M. 2005. El monumento natural de Andalucía: Corrales de Rota (Natural monument of Andalusia: Corrales de Rota). Fundación Alcalde Zoilo Ruiz-Mateos, 349 pp.

Báez, J.C., Rodríguez-Cabello, C., Bañón, R., Brito, A., Falcón, J.M., Maño, T., Baro, J., *et al*. 2019. Updating the national checklist of marine fishes in Spanish waters: An approach to priority hotspots and lessons for conservation. Mediterranean Marine Science, 20(2), 260-270. https://doi.org/10.12681/mms.18626

Bañón, R., Baldó, F., González-Carrión, F., de Carlos, A. 2025. Northern range extension of the round stingray *Taeniurops grabatus* (Geoffroy Saint-Hilaire, 1817) (Myliobatiformes: Dasyatidae). Environmental Biology of Fishes, 108(2), 171-178. https://doi.org/10.1007/s10641-024-01642-y

Bariche, M., Fricke, R. 2020. The marine ichthyofauna of Lebanon: An annotated checklist, history, biogeography, and conservation status. Zootaxa, 4775(1), 1-157. https://doi.org/10.11646/zootaxa.4775.1

Barría, C., Coll, M., Navarro, J. 2015. Unravelling the ecological role and trophic relationships of uncommon and threatened elasmobranchs in the western Mediterranean Sea. Marine Ecology Progress Series, 539, 225-240. https://doi.org/10.3354/meps11494

Barría, C., Colmenero, A.I. 2019. La pesca de tiburones y rayas en el noroeste del Mediterráneo, una situación compleja (Shark and ray fishing in the northwestern Mediterranean, a complex situation). Derecho Animal. Forum of Animal Law Studies, 10(4), 105-111. https://doi.org/10.5565/rev/da.468

Başusta, N., Erdem, U., Kumlu, M. 1998. Two new fish records for the Turkish seas: Round stingray *Taeniura grabata* and skate stingray *Himantura uarnak* (Dasyatidae). Israel Journal of Zoology, 44(1), 65-66.

Béarez, P., Pruvost, P., Feunteun, E., Iglésias, S.P., Francour, P., Causse, R., De Mazieres, J., *et al.* 2017. Checklist of the marine fishes from metropolitan France. Cybium, 41(4), 351-371. https://doi.org/10.26028/cybium/2017-414-006

Ben Amor, M.M., Bdioui, M., Ounifi-Ben-Amor, K., Reynaud, C., Capapé, C. 2019. Unusual record of round fantail stingray *Taeniurops grabata* (Chondrichthyes: Dasyatidae) from the Tunisian coast (central Mediterranean Sea). Annales, Series Historia Naturalis, 29, 223-228. https://doi.org/10.19233/ASHN.2019.23

Buzaid, E.M.K. 2022. X-ray radiological study for skeleton of rounded fantail stingray *Taeniura grabata* from Susah,

Libya. Journal of Marine Sciences and Environmental Technologies, 8(1), E 1-15. https://doi.org/10.59743/jmset.v8i1.2

Capapé, C., Reynaud, C., Hemida, F. 2023a. Capture of a giant round fantail stingray *Taeniurops grabatus* (Dasyatidae) from the Algerian coast (southwestern Mediterranean Sea). Annales, Series Historia Naturalis, 33(2), 199-204. https://doi.org/10.19233/ASHN.2023.23

Capapé, C., Reynaud, C., Hemida, F. 2023b. Occurrence of round fantail stingray *Taeniurops grabatus* (Chondrichthyes: Dasyatidae) from the Algerian coast (southwestern Mediterranean Sea). Cahiers de Biologie Marine, 64, 183-186. https://doi.org/10.21411/CBM.A.1C44B285

Capapé, C., Ali, M. 2024. Captures of large and abnormal round fantail stingrays *Taeniurops grabatus* (Chondrichthyes: Dasyatidae) from the Syrian coast (eastern Mediterranean Sea). Cahiers de Biologie Marine, 65, 109-114. https://doi.org/10.21411/CBM.A.BF53A61

Carpentieri, P., Nastasi, A., Sessa, M., Srour, A. 2021. Incidental catch of vulnerable species in Mediterranean and Black Sea fisheries – A review (Studies and Reviews No. 101). FAO, 338 pp. https://doi.org/10.4060/cb5405en

Castejón-Silvo, I., Terrados, J., Morales-Nin, B. 2023. Citizen science in the study of marine biodiversity: The case of iconic and cryptic syngnathids. Thalassas, 39(2), 679-686. https://doi.org/10.1007/s41208-023-00590-1

Chaikin, S., Belmaker, J., Barash, A. 2020. Coastal breeding aggregations of threatened stingrays and guitarfish in the Levant. Aquatic Conservation: Marine and Freshwater Ecosystems, 30(6), 1160-1171. https://doi.org/10.1002/aqc.3305

Cigliano, J.A., Meyer, R., Ballard, H.L., Freitag, A., Phillips, T.B., Wasser, A. 2015. Making marine and coastal citizen science matter. Ocean & Coastal Management, 115, 77-87. https://doi.org/10.1016/j.ocecoaman.2015.06.012

Dulvy, N.K., Fowler, S.L., Musick, J.A., Cavanagh, R.D., Kyne, P.M., Harrison, L.R., Carlson, J.K., *et al.* 2014. Extinction risk and conservation of the world's sharks and rays. eLife, 3, e00590. https://doi.org/10.7554/eLife.00590

Ebert, D.A., Dando, M. 2020. Field guide to sharks, rays & chimaeras of Europe and the Mediterranean. Princeton University Press, 384 pp. https://doi.org/10.2307/j.ctv12sdwkk

Ferretti, F., Worm, B., Britten, G.L., Heithaus, M.R., Lotze, H.K. 2010. Patterns and ecosystem consequences of shark declines in the ocean. Ecology Letters, 13(8), 1055-1071. https://doi.org/10.1111/j.1461-0248.2010.01489.x

Flowers, K.I., Heithaus, M.R., Papastamatiou, Y.P. 2021. Buried in the sand: Uncovering the ecological roles and importance of rays. Fish and Fisheries, 22(1), 105-127. https://doi.org/10.1111/faf.12508

Froese, R., Pauly, D. 2025. FishBase. *Taeniura* Müller & Henle, 1837. https://www.marinespecies.org/aphia.php?p=taxdetails&id=105753 (accessed 23 December 2025).

Giovos, I., Serena, F., Katsada, D., Anastasiadis, A., Barash, A., Charilaou, C., Hall-Spencer, J.M., *et al.* 2021. Integrating literature, biodiversity databases, and citizen science to reconstruct the checklist of chondrichthyans in Cyprus (eastern Mediterranean Sea). Fishes, 6(3), 24. https://doi.org/10.3390/fishes6030024

Golani, D. 2005. Checklist of the Mediterranean fishes of Israel. Zootaxa, 947(1), 1-90. https://doi.org/10.11646/zootaxa.947.1.1

IUCN. 2026. The IUCN Red List of Threatened Species. Version 2025-2. https://www.iucnredlist.org (accessed 14 March 2026).

Jabado, R.W., Chartrain, E., De Bruyne, G., Derrick, D., Dia, M., Diop, M., Doherty, P., *et al.* 2021. *Taeniurops grabatus*. The IUCN Red List of Threatened Species 2021, e.T161513A124497651 https://doi.org/10.2305/IUCN.UK.2021-2.RLTS.T161513A124497651.en (accessed 20 December 2025).

Jarvis, R.M., Bollard Breen, B., Krägeloh, C.U., Billington, D.R. 2015. Citizen science and the power of public participation in marine spatial planning. Marine Policy, 57, 21-26. https://doi.org/10.1016/j.marpol.2015.03.011

Jones, L.P., Turvey, S.T., Massimino, D., Papworth, S.K. 2020. Investigating the implications of shifting baseline syndrome on conservation. People and Nature, 2(4), 1131-1144. https://doi.org/10.1002/pan3.10140

Jorgensen, S.J., Micheli, F., White, T.D., Van Houtan, K.S., Alfaro-Shigueto, J., Andrzejaczek, S., Arnoldi, N.S., *et al.* 2022. Emergent research and priorities for shark and ray conservation. Endangered Species Research, 47, 171-203. https://doi.org/10.3354/esr01169

Jung, A., Buscher, E. 2016. *Taeniurops grabatus* (Mediterranean assessment). The IUCN Red List of Threatened Species 2016: e.T161513A90728912 https://www.iucnredlist.org/species/161513/90728912 (accessed 14 March 2026).

Kelly, R., Fleming, A., Pecl, G.T., von Gönner, J., Bonn, A. 2020. Citizen science and marine conservation: A global review. Philosophical Transactions of the Royal Society B: Biological Sciences, 375(1814), 20190461. https://doi.org/10.1098/rstb.2019.0461

Last, P.R., Naylor, G.J.P., Manjaji-Matsumoto, B.M. 2016a. A revised classification of the family Dasyatidae (Chondrichthyes: Myliobatiformes) based on new morphological and molecular insights. Zootaxa, 4139(3), 345-368. https://doi.org/10.11646/zootaxa.4139.3.2

Last, P.R., White, W.T., de Carvalho, M.R., Séret, B., Stehmann, M.F.W., Naylor, G.J.P. 2016b. Rays of the world. CSIRO Publishing, 832 pp.

Lteif, M. 2015. Biology, distribution and diversity of cartilaginous fish species along the Lebanese coast, eastern Mediterranean. PhD thesis, University of Perpignan Via Domitia, 262 pp. https://doi.org/10.70675/98246ce7z0a13z4f65z9403z5883afa47919

McClenachan, L., Ferretti, F., Baum, J.K. 2012. From archives to conservation: Why historical data are needed to set baselines for marine animals and ecosystems. Conservation Letters, 5(5), 349-359. https://doi.org/10.1111/j.1755-263X.2012.00253.x

McKinley, D.C., Miller-Rushing, A.J., Ballard, H.L., Bonney, R., Brown, H., Cook-Patton, S.C., Evans, D.M., *et al.* 2017. Citizen science can improve conservation science, natural resource management, and environmental protection. Biological Conservation, 208, 15-28. https://doi.org/10.1016/j.biocon.2016.05.015

Nadia, M. 2024. Geolocation and spatial susceptibility assessment of rays (family Rajidae and Dasyatidae) in the English Channel and North Sea. MSc thesis, Wageningen University, 37 pp.

O'Keefe, M., Bengil, E.G.T., Palmer, J.L., Beton, D., Çağlar, Ç., Godley, B.J., Özkan, M., *et al.* 2023. Diversity and distribution of elasmobranchs in the coastal waters of Cyprus:

Using bycatch data to inform management and conservation. Frontiers in Marine Science, 10, 1181437. https://doi.org/10.3389/fmars.2023.1181437

Osgood, G.J., White, E.R., Baum, J.K. 2021. Effects of climate change–driven gradual and acute temperature changes on shark and ray species. Journal of Animal Ecology, 90(11), 2547-2559. https://doi.org/10.1111/1365-2656.13560

Pacoureau, N., Rigby, C.L., Kyne, P.M., Sherley, R.B., Winker, H., Carlson, J.K., Fordham, S.V., *et al.* 2021. Half a century of global decline in oceanic sharks and rays. Nature, 589(7843), 567-571. https://doi.org/10.1038/s41586-020-03173-9

Perry, A.L., Low, P.J., Ellis, J.R., Reynolds, J.D. 2005. Climate change and distribution shifts in marine fishes. Science, 308(5730), 1912-1915. https://doi.org/10.1126/science.1111322

Ruiz-García, D., Raga, J.A., March, D., Colmenero, A.I., Quattrocchi, F., Company, J.B., Recasens, L., *et al.* 2023. Spatial distribution of the demersal chondrichthyan community from the western Mediterranean trawl bycatch. Frontiers in Marine Science, 10, 1145176. https://doi.org/10.3389/fmars.2023.1145176

Saidi, B., Enajjar, S., Bradai, M.N. 2023. Vulnerability of elasmobranchs caught as bycatch in the grouper longline fishery in the Gulf of Gabès, Tunisia. Mediterranean Marine Science, 24(1), 142-155. https://doi.org/10.12681/mms.27483

Santin, A., Aguilar, R., Akyol, O., Begburs, C.R., Benoit, L., Chimienti, G., Crocetta, F., *et al.* 2021. New records of rare species in the Mediterranean Sea. Mediterranean Marine Science, 22(1), 199-217. https://doi.org/10.12681/mms.25295

Serena, F., Silvestri, R., Voliani, A. 1999. Su una cattura accidentale di *Taeniura grabata* (E. Geoffroy Saint-Hilaire, 1817) (Chondrichthyes, Dasyatidae) (On an accidental catch of *Taeniura grabata* (E. Geoffroy Saint-Hilaire, 1817) (Chondrichthyes, Dasyatidae)). Biologia Marina Mediterranea, 6(1), 617-618.

Serena, F., Abella, A.J., Bargnesi, F., Barone, M., Colloca, F., Ferretti, F., Fiorentino, F., *et al.* 2020. Species diversity, taxonomy and distribution of Chondrichthyes in the Mediterranean and Black Sea. European Zoological Journal, 87(1), 497-536. https://doi.org/10.1080/24750263.2020.1805518

Séret, B. 2016. Dasyatidae. *In* The living marine resources of the Eastern Central Atlantic. Bivalves, gastropods, hagfishes, sharks, batoid fishes and chimaeras (eds. K.E. Carpenter, N. De Angelis). FAO. pp. 1404-1419.

Shakman, E., Siafenasar, A., Etayeb, K., Shefern, A., Elmgwashi, A., Hajaji, M.A., bek Benghazi, N., *et al.* 2023. National inventory and status of Chondrichthyes in the South Mediterranean Sea (Libyan coast). Biodiversity Journal, 14(3), 459-480. https://doi.org/10.31396/Biodiv.Jour.2023.14.3.459.480

Silvano, R.A.M., Valbo-Jørgensen, J. 2008. Beyond fishermen's tales: Contributions of fishers' local ecological knowledge to fish ecology and fisheries management. Environment, Development and Sustainability, 10(5), 657-675. https://doi.org/10.1007/s10668-008-9149-0