Short Communication

A rare Mediterranean vagrant: *Makaira* cf. *nigricans* (Carangiformes: Istiophoridae) recorded off the Ebro Delta

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Abstract - The Atlantic Blue Marlin *Makaira nigricans* is a large, migratory billfish generally absent from the Mediterranean. On 18th May 2024, video footage of an individual hooked during recreational trolling approximately 5 nautical miles off Sant Carles de la Ràpita (Ebro Delta, Spain) was provided to the authors by a recreational angler through a citizen-science contribution. The fish was visually estimated at ~2.5 m TL and ~100 kg and was cautiously identified as *M.* cf. *nigricans* based on photographs and video footage. Because the individual was released and not examined directly, several diagnostic characters could not be assessed in detail. Nevertheless, the identification was supported by the presence of key diagnostic traits visible in the images, including a robust, round-section rostrum, pectoral fins capable of being folded back against the body, and a first dorsal fin lower than body depth with a long base. This observation potentially represents the third scientifically documented Mediterranean record, the first from the western basin, and the first in several decades. Given location and oceanographic setting, a west-to-east entry via the Strait of Gibraltar is more plausible than Suez ingress and accords with the species' preference for offshore waters and thermal/productivity gradients. There is no evidence of local residency or reproduction, but such vagrant occurrences warrant attention amid climate- and circulation-driven shifts.

Key words: billfishes, citizen science, Istiophoridae, oceanographic gradients, recreational fishery, Strait of Gibraltar, vagrancy.

Riassunto - Un raro accidentale mediterraneo: *Makaira* cf. *nigricans* (Carangiformes: Istiophoridae) osservato al largo del Delta dell'Ebro.

Il marlin azzurro dell'Atlantico *Makaira nigricans* è un grande istioforide migratore generalmente assente dal Mediterraneo. Il 18 maggio 2024, un pescatore ricreativo ha condiviso con gli autori un video che documentava un individuo allamato durante una battuta di traina a circa 5 miglia nautiche al largo di Sant Carles de la Ràpita (Delta dell'Ebro, Spagna), nell'ambito di un contributo di citizen science. Il pesce è stato stimato visivamente in circa 2,5 m di lunghezza totale (TL) e circa 100 kg di peso ed è stato cautamente identificato come *M.* cf. *nigricans* sulla base di fotografie e riprese video. Poiché l'individuo è stato rilasciato e non è stato esaminato direttamente, diversi caratteri diagnostici non hanno potuto essere valutati nel dettaglio. Tuttavia, l'identificazione è stata supportata dalla presenza di alcuni caratteri diagnostici chiave visibili nelle immagini, tra cui un rostro robusto a sezione circolare, pinne pettorali ripiegabili contro il corpo e una prima pinna dorsale più bassa della profondità del corpo e dotata di una base lunga. Questa osservazione rappresenta potenzialmente la terza segnalazione scientificamente documentata nel Mediterraneo, la prima nel bacino occidentale e la prima dopo diversi decenni. Considerando la localizzazione e il contesto oceanografico, un ingresso ovest-est attraverso lo Stretto di Gibilterra risulta più plausibile rispetto al Canale di Suez e concorda con la preferenza della specie per acque pelagiche e per gradienti termici e di produttività. Non vi sono evidenze di residenza locale o riproduzione, ma tali presenze occasionali meritano attenzione alla luce dei cambiamenti indotti da clima e circolazione.

Parole chiave: citizen science, gradienti oceanografici, Istiophoridae, pesca ricreativa, pesci rostrati, Stretto di Gibilterra, vagantismo.

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The Blue Marlin *Makaira nigricans* Lacèpede 1802 is a large, highly migratory billfish species found in tropical and subtropical waters globally, with individuals reaching a maximum weight exceeding 800 kg and over 4.5 meters in total length (Nakamura, 1985; Hill *et al*., 1989). It is characterized by a streamlined, muscular body, a high dorsal fin, and an elongated upper jaw forming a rigid rostrum used to strike or stun prey. It is one of the largest and most iconic pelagic teleosts within the family Istiophoridae. This species spawns in several regions, including Japan, Hawaii, French Polynesia, the Straits of Florida, and the Bahamas (Howard & Ueyanagi, 1965; Richardson *et al*., 2009; Shimose *et al*., 2012; Dale *et al*., 2022). Despite its extensive distribution, the factors driving the movements of blue marlin remain inadequately understood. However, the species exhibits a highly migratory lifestyle, favouring deep offshore waters and showing a preference for areas with strong thermal and productivity gradients (Nakamura, 1985; Andrzejaczek *et al*., 2023). Blue marlin is frequently captured as bycatch in tuna longline fisheries (Serafy *et al*.,

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2004; Molony, 2005) and is also targeted in artisanal and recreational fisheries worldwide (Luckhurst, 2003; Arocha & Ortiz, 2006; Brinson *et al*., 2006). The cumulative catches from these fisheries have led to the blue marlin being listed as vulnerable by the International Union for Conservation of Nature (Collette *et al*., 2022). Although considered a single global species, blue marlin has separate stocks in the Atlantic, Pacific, and Indian Oceans (Graves & McDowell, 2001; Hinton, 2001; Williams *et al*., 2020). Recent genetic evidence, however, suggests that blue marlin populations in the Pacific and eastern Indian Oceans constitute a single stock (Chen *et al*., 2016). The species is typically absent from the Mediterranean Sea, where it is considered a rare occasional visitor rather than a resident component of the regional ichthyofauna (Psomadakis *et al*., 2012; Di Natale, 2021).

According to Nakamura (1985), the species can be identified by the following diagnostic features: body not strongly compressed; bill long, very stout and round in cross section; nape conspicuously elevated; two dorsal fins, the first lower than the maximum body depth throughout its length, with a pointed anterior lobe and a long base, originating above the posterior margin of the preopercle and ending near the origin of the second dorsal fin; second dorsal fin positioned slightly posterior to the second anal fin; two anal fins, the second very similar in size and shape to the second dorsal fin; pectoral fins long and narrow, adpressible against the sides of the body; pelvic fins shorter than the pectorals; two strong keels on each side of the caudal peduncle; body blue-black dorsally and silvery white ventrally, with about 15 rows of pale cobalt-coloured stripes, each consisting of round dots and/or narrow bars; first dorsal-fin membrane blackish or dark blue, without dots or marks; other fins usually brownish black, sometimes tinged with dark blue; bases of the first and second anal fins tinged with silvery white. Nakamura (1985) also reported additional diagnostic characters, including fin-ray counts, the configuration of the lateral line, and scale morphology. However, these characters could not be assessed in the present case, as they generally require direct examination of a captured specimen and were not reliably appreciable from the available photographic/video material.

Within the Mediterranean, the presence of *M. nigricans* has only been documented through a limited number of historical reports, with no evidence of local reproduction or sustained occurrence. The first documented record date back to Bini (1968), who described the capture of a large istiophorid (approximately 3.85 m and 310 kg) in a tuna trap off Gallipoli (Ionian Sea, southern Italy). The specimen was morphologically assigned to the genus *Makaira*, most likely *M. nigricans*. A second observation was reported by Costa (1991), who documented the capture of another large individual in the Strait of Messina, again identified as a blue marlin based on its distinctive morphological traits and exceptional size. Both records refer to isolated individuals, unrelated to regular migrations or any known regional populations. In the comprehensive review by Psomadakis *et al*. (2012), these occurrences are confirmed as exceptional events, and the authors stress the species' general absence from the Mediterranean, as well as the difficulty in differentiating *Makaira* from other billfishes when no genetic or voucher specimens are available. In this context, we report a new record of *Makaira* cf. *nigricans* from the western Mediterranean.

On 18 May 2024, a recreational angler reported the capture of a billfish hooked approximately 5 nautical miles offshore from Sant Carles de la Ràpita, close to the Ebro River Delta (Catalonia, Spain; Fig. 1). The observation, supported by video footage and photographs,

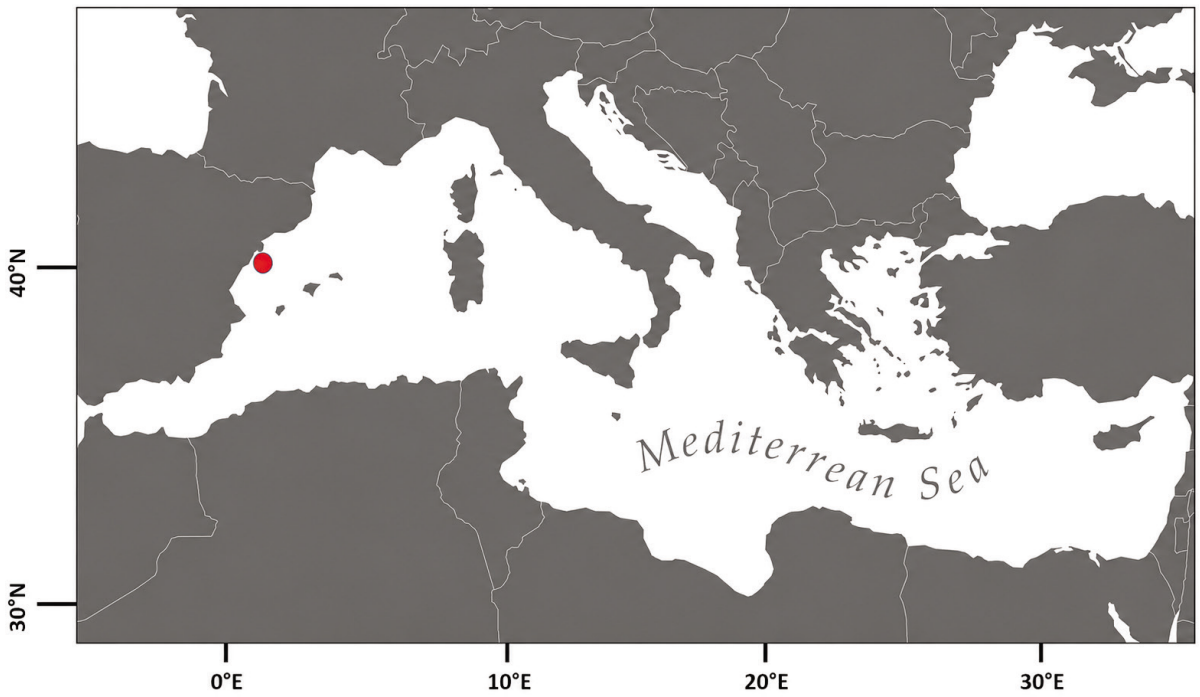


Fig. 1 - Map of the Mediterranean Sea, the study area in which the specimen of *Makaira* cf. *nigricans* was caught is indicated by a red dot. / Mappa del Mar Mediterraneo; l'area di studio in cui è stato catturato l'esemplare di *Makaira* cf. *nigricans* è indicata da un punto rosso.

was shared with the authors and subsequently validated. The encounter occurred during a recreational big-game fishing trip using a trolling technique, with a "kona head" artificial lure, 130 lb tackle, and a trolling speed between 6 and 7 knots. The strike occurred around 12:40 p.m., and the fish was released alive after a fight lasting about 15 minutes, at approximately 12:55 p.m. The individual was visually estimated at about 2.5 metres in length and around 100 kg in weight (Fig. 2). Species-level identification was therefore based exclusively on the available visual material. The individual showed several characters consistent with *M. nigricans*, including the morphology of the rostrum, body shape, and dorsal fin structure. However, the identification could not be verified through direct examination of fine morphological and meristic characters or genetic analysis.

The present record is best interpreted as a probable occurrence of *Makaira nigricans* in the western Mediterranean. The available photographs and video footage show several diagnostic features consistent with this species. Nevertheless, in agreement with the caution recommended for Mediterranean billfish records lacking voucher specimens, morphometric data, or genetic confirmation, we conservatively refer to the individual as *Makaira* cf. *nigricans*. This approach acknowledges the limitations inherent to visual documentation obtained through citizen-science contributions while still providing a useful and verifiable record of an exceptional istiophorid occurrence in the basin. Despite these limitations, the observation potentially represents the first verifiable record attributable to *Makaira nigricans* in the western Mediterranean in several decades and contributes to our understanding of the occasional occurrence of large tropical pelagic fishes in this region. Given the absence of stable blue marlin populations in the Mediterranean and the rarity of previous records, this case deserves attention, particularly in the context of potential changes in species movements, oceanographic conditions, and climate-driven shifts affecting the distribution of highly migratory pelagic fishes.



Fig. 2 - Individual of *Makaira* cf. *nigricans* caught on 18th May 2024 in Spain (Carles de la Ràpita, close to the Ebro River Delta). / Esemplare di *Makaira* cf. *nigricans* ~~catturato~~ il 18 maggio 2024 in Spagna (Carles de la Ràpita, nei pressi del delta del fiume Ebro). Video available at the follow link: / Video disponibile al seguente link: <https://archive.org/details/whats-app-video-2024-05-20-at-15.14.51>.

The Mediterranean Sea hosts a single native and regularly occurring billfish species: the Mediterranean Spearfish *Tetrapturus belone* Rafinesque 1810, which is endemic to the basin. This species can be distinguished from other billfishes by its moderately compressed body, slightly elevated nape, a bill typically less than 18% of the total body length, and a first dorsal fin whose anterior lobe is slightly higher than both the body depth and the posterior portion of the fin (Nakamura, 1985). Other billfishes of the family Istiophoridae, including *M. nigricans*, the White Marlin *Kajikia albida* (Poey 1860), the Black Marlin *Istiompax indica* (Cuvier 1832) and the Atlantic Sailfish *Istiophorus albicans* (Latreille 1804), are not part of the native fauna and are only occasionally reported in the region. These species are therefore considered vagrants in the Mediterranean Sea (Bini, 1968; Costa, 1991; Psomadakis *et al*., 2012; Tiralongo *et al*., 2019; Di Natale, 2021; Tsagarakis *et al*., 2021). To date, only a few documented records of *M. nigricans* have been documented in the Mediterranean, all involving isolated individuals. The new observation reported here potentially represents, to our knowledge, the third scientifically documented record of the Atlantic blue marlin in the basin. The presence of such a large pelagic predator in the western Mediterranean, near the Ebro Delta (Spain), raises biogeographical questions regarding its possible route of entry. While both the Strait of Gibraltar and the Suez Canal are theoretically viable corridors for occasional ingress of oceanic species, the location and oceanographic context of this sighting strongly suggest a west-to-east dispersal from the Atlantic Ocean through the Strait of Gibraltar. Continued documentation, combining citizen science and traditional scientific surveys, will test whether occurrences remain rare or are increasing.

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