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FIRST RECORDS OF SAWBACK ANGELSHARKS *SQUATINA ACULEATA* (SQUATINIDAE) FROM THE ALGERIAN COAST (SOUTHWESTERN MEDITERRANEAN SEA)

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ABSTRACT

*The present paper reports the captures of two specimens of sawback angelshark *Squatina aculeata* Risso, 1810 in the eastern region of the Algerian coast (GSA 04). Both specimens were sub-adult females, with a total length (TL) of 1200 mm and 1300 mm, and an estimated total body weight of 10 kg and 18 kg, respectively. These findings provide the first substantiated records of *S. aculeata* in the Algerian ichthyofauna and address the gap in knowledge for the Maghreb coast. The origin of these specimens remains speculative. However, if the possibility of a viable population in the Mediterranean Sea cannot be completely ruled out, a management plan is needed for *S. aculeata* to prevent the extinction of this squatinid and its two congeneric species.*

Key words: Squatinidae, Angel shark, *Squatina aculeata*, Mediterranean Sea, origin, management

PRIME SEGNALAZIONI DI SQUADROLINO *SQUATINA ACULEATA* (SQUATINIDAE) LUNGO LA COSTA ALGERINA (MARE MEDITERRANEO SUD-OCCIDENTALE)

SINTESI

*Il presente lavoro riporta la cattura di due esemplari di squadrolino *Squatina aculeata* Risso, 1810 nella regione orientale della costa algerina (GSA 04). Entrambi gli esemplari erano femmine subadulte, con una lunghezza totale (TL) di 1200 mm e 1300 mm, e un peso corporeo totale stimato a 10 kg e 18 kg, rispettivamente. Questi risultati forniscono la prima documentazione di *S. aculeata* per l'ittiofauna algerina e colmano la lacuna di conoscenze per la costa del Maghreb. L'origine di questi esemplari rimane speculativa. Tuttavia, sebbene non si possa completamente escludere la possibilità di una popolazione vitale nel Mediterraneo, è necessario un piano di gestione per *S. aculeata* per prevenire l'estinzione di questa specie e delle due specie congeneriche.*

Parole chiave: Squatinidae, squadrolino, *Squatina aculeata*, Mediterraneo, origine, gestione

INTRODUCTION

The sawback angelshark, *Squatina aculeata* Risso, 1810, is distributed from the eastern Atlantic south to the Strait of Gibraltar, off Morocco (Llorid & Rucabado, 1998) and Mauritania (Maurin & Bonnet, 1970). It is caught in relative abundance in the coast of Senegal and landed in craft fishing sites (Capapé et al., 2005). The species is locally used for human consumption, and the oil extracted from its liver protects dried flesh from insects and acarians (Gueye-Ndiaye et al., 1996). Further south, *S. aculeata* has been recorded in Guinea-Bissau (Sanchès, 1991), in the Gulf of Guinea (Blache et al., 1970), and, apparently, along the coast of Angola and Namibia (Compagno, 1984; Roux, 1984).

S. aculeata is found in the Mediterranean Sea with its two other congeneric species: the smoothback angelshark *S. oculata* Bonaparte, 1840 and the common angelshark *S. squatina* (Linnaeus, 1758) following Roux (1984). At present, *S. aculeata* is caught sporadically and is classified as critically endangered (CR) on the IUCN Red List of threatened species, reflecting a drastic decline of captures (Zava et al., 2020, 2022). The species has been progressively disappearing from fishery landings and is presently absent from some northern Mediterranean areas, such as the Languedocian coast (Capapé et al., 2000). Moreno (1995) and Barrull & Mate (2002) considered its presence doubtful off the coast of Spain. Massuti & Moranta (2003) reported no captures of squatinid species from the bottom trawl surveys that were carried out in depths between 46 and 1800 m in the waters surrounding the Balearic Islands.

Tortonese (1956) reported the occurrence of *S. aculeata* in Italian marine waters, based on specimens deposited in ichthyological collections, but Zava et al. (2022) now deem such occurrence doubtful. While Soljan (1975) still reported the presence of *S. aculeata*

in the Adriatic Sea, the species, according to Soldo & Lipej (2023), no longer exists in the area.

Eastwards, *S. aculeata* has been reported throughout the Aegean Sea (Filiz et al., 2005; Zava et al., 2020) and Basusta (2016) stated that the finding of a juvenile specimen in the Bay of Iskenderun suggested the existence of a nursery ground in Turkish marine waters. Additionally, during the second phase of MEDITS surveys from bottom trawling in the Mediterranean Sea (period 2012–2015), *S. aculeata* was only reported from the Aegean Sea (GSA 22), with a 3.3% frequency of occurrence in the total chondrichthyan captures in the depth range of 200–800 m (Follesa et al., 2019).

The species has also been reported from the Levant Basin, where rare specimens were generally observed and/or captured off the Israeli coast (Golani, 2005), the Syrian coast (Ali, 2018), and the Lebanese coast (Bariche & Fricke, 2020). *S. aculeata* is also sporadically caught in Libyan (Shakman et al., 2023) and Egyptian marine waters (El Sayed et al., 2017).

With special regard to the Algerian coast, only two squatinid species have been recorded to date: *S. squatina*, reported by Dieuzeide et al. (1953) and, more recently, *S. oculata*, by Capapé et al. (2023). *S. aculeata* was previously unknown in the area (Dieuzeide et al., 1953), but scientific investigations regularly carried out in the same area have allowed us to collect two specimens of *S. aculeata*, which are herein described and provided with comments on the distribution of the species.

MATERIAL AND METHODS

The specimens of *S. aculeata* were observed at the main fish market in Algiers, where fish caught from various areas along the Algerian coast, between the Moroccan and Tunisian borders, are landed. During the sampling period, which extended from 2010 to

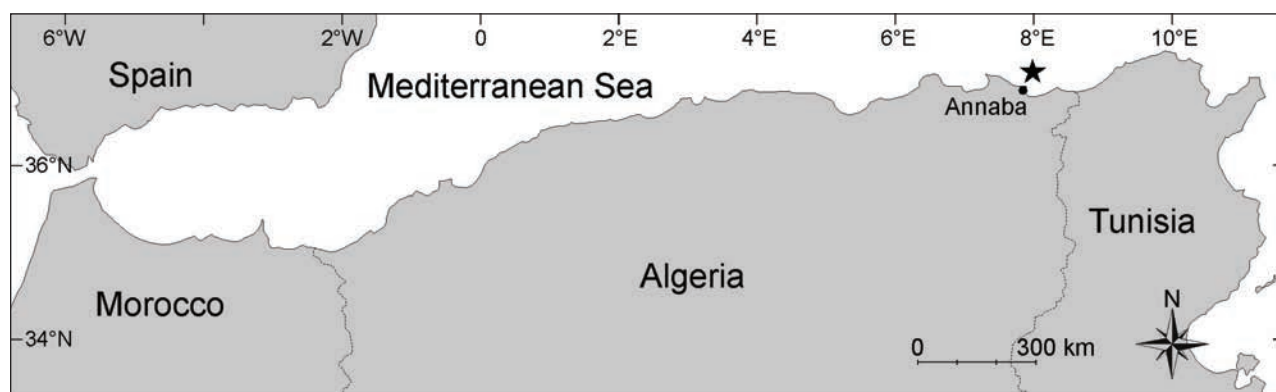


Fig. 1: Map of the Algerian coast with the black star indicating the capture site of the specimens of *Squatina aculeata* (redrawn from Capapé et al., 2023).

Sl. 1: Zemljevid alžirske obale z označeno zvezdico, ki ponazarja lokaliteto ulova primerkov vrste *Squatina aculeata* (prirejeno po Capapé in sod., 2023).

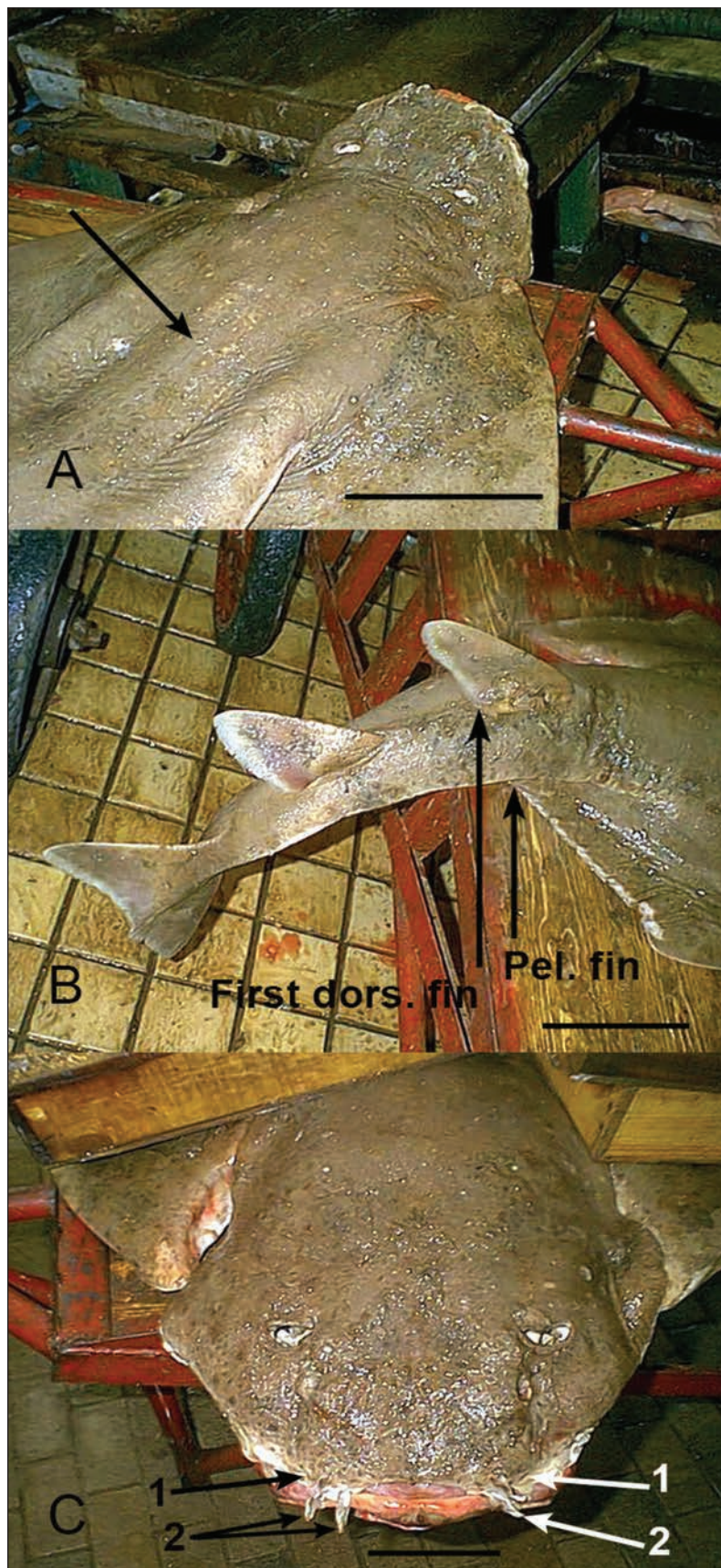


Fig. 2: Specimen of *Squatina aculeata* caught on 26 December 2016. A. Dorsal surface with arrow indicating median line of spines. B. Lateral and posterior view showing hind tips of pelvic fins (Pel Fin) reaching level of first dorsal fin origin (First Dors Fin). C. Anterior view of head with arrows indicating dermal folds on sides, slightly undulate (1), external nasal flap heavily fringed with prominent fringes (2). Photos by F. Hemida, scale bar = 200 mm. Sl. 2: Primererek vrste *Squatina aculeata* ujet 26. decembra 2016. A. Hrbtina površina s puščico, ki označuje sredinski niz trnov. B. Pogled na bočni in zadnji del telesa kaže zadnji konici trebušnih plavuti (Pel Fin), ki dosega koren prve hrbtne plavuti (First Dors Fin). C. Sprednji pogled glave s puščicami, ki kažejo: kožni gubi na straneh, rahlo valoviti (1), in zunanji nosne krpe, izrazito resaste (2). Fotografije: F. Hemida, merilo = 200 mm.

2020, only these two specimens were recorded. Both specimens were captured by a commercial trawl at a depth of 100 m over sandy-muddy bottoms, off Annaba, in the east, at 35°42'35" N and 1°22'17" W (Fig. 1). The geographical region where the presented specimens of *S. aculeata* were captured coincided with the borders of the GFCM geographical subarea (GSA) 04 (GFCM, 2018). The specimens were carefully examined and identified using field guides in ichthyological fauna. One specimen was photographed, and both were measured for total length (TL) to the nearest millimetre. Their total body weights (TBW) to the nearest kilogram was provided by fishermen and/or sellers. It should be noted that it is generally difficult to get morphometric measurements at the market, as the fish here, intended for local consumption, are sold rapidly and mainly in bulk.

RESULTS AND DISCUSSION

The first specimen, captured on 27 March 2010, was a female measuring 1200 mm TL and with an estimated total body weight of 10 kg (Fig. 2). The second specimen, also a female, was caught on 26 December 2016. It measured 1300 mm TL and weighed about 18 kg. Based on Capapé et al. (2005), who noted that the size at first sexual maturity for female *S. aculeata* is typically about 1370 mm TL, the studied specimens were determined to be sub-adults, nearing adulthood.

Both specimens were identified as *S. aculeata* through a combination of main morphological characters: dorsal surface rough with a median line of spines (Fig. 2-A), pectoral fins very high and broad with rounded rear tips; hind tips of pelvic fins reaching level of first dorsal fin origin (Fig. 2-B), dermal folds on sides of head slightly undulate (Fig. 2-C1); external nasal flap heavily fringed with prominent fringes (Fig. 2-C2); teeth pointed, slightly curved at the distal end and with triangular base; colour greyish-brown with some white spots, belly beige. The morphology and colour of both specimens were consistent with previous descriptions of the species (Roux, 1984; Capapé & Roux, 1980; Compagno, 1984; Ebert & Stehman, 2013; Zava et al., 2020, 2022; Barone et al., 2022). Therefore, *S. aculeata* can be considered as present in Algerian marine waters and included in the local ichthyofauna.

The main morphological difference between *S. aculeata* and *S. oculata* is that in *S. oculata*, the hind tips of pelvic fins do not reach the level of first dorsal fin origin. While in both *S. aculeata* and *S. squatina* the hind tips of pelvic fins reach the level of first dorsal fin origin, *S. aculeata* can be distinguished from *S. squatina* by the spinules on the dorsal surface and by the heavily fringed external nasal flap.

Zava et al. (2022) reported the capture of one specimen of *S. aculeata* off the Sardinian coast, and one in the central Mediterranean Sea in the marine waters surrounding the Islands of Malta, Lampedusa, and Linosa. Capapé et al. (2005) reported that 27 specimens, 15 males and 12 females, of different sizes, including small specimens, were caught throughout the Tunisian coast, also located in the central Mediterranean Sea, which could constitute a nursery ground for *S. aculeata*.

The finding of the two specimens herein presented fills the gap in the knowledge of the species concerning the area between the Tunisian coast (Capapé et al., 2005) and the Moroccan coast (Lloris & Ruca-bado, 1998). The origin of both specimens remains speculative. A potential nursery ground in the central Mediterranean Sea could indicate an easterly origin of these specimens. On the other hand, *S. aculeata* is caught in relative abundance along the eastern tropical Atlantic coast (Capapé, 2005), and therefore a westerly migration of the species through the Strait of Gibraltar into the Mediterranean Sea cannot be totally ruled out. At the moment, both hypotheses regarding the origin remain equally plausible.

Between 2005 and 2022, a total of 18 specimens of *S. aculeata* were detected in the Mediterranean Sea according to Zava et al. (2022); the present report brings the count to 20. The species appears to be very rare and could potentially be considered as critically endangered due to fishing pressure and its *k*-selected characteristics (Zava et al., 2020). However, according to Zava et al. (2020), the species' rarity could also be attributed to the prohibition of captures and trades since 2012, as recommended by GFCM/36/2012/3. Nevertheless, local fishermen have observed a substantial decline in captures of squatid species throughout the Algerian coast.

PRVI ZAPISI O POJAVLJANJU TRNASTEGA SKLATA *SQUATINA ACULEATA*
(SQUATINIDAE) IZ ALŽIRSKIH VODA (JUGOZAHODNO SREDOZEMSKO MORJE)

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POVZETEK

Avtorji poročajo o ulovu dveh primerkov trnastega sklata *Squatina aculeata* Risso, 1810 v vzhodni regiji alžirske obale (GSA 04). Bili sta skoraj odrasli samici, ki sta merili 1200 mm in 1300 mm telesne dolžine in tehtali 10 kg oziroma 18 kg. Ti najdbi predstavljata prva utemeljena zapisa o pojavljanju vrste *S. aculeata* v alžirski ihtiofavni in odpravljata vrzel v poznavanju te vrste na obali Magreba. Izvor teh primerkov ostaja nejasen. Ni možno povsem izključiti možnost pojavljanja viabilne populacije v Sredozemskem morju, zato je smiselna priprava načrta upravljanja, da bi s tem preprečili izumrtje vrste *S. aculeata* in njegovih najbližjih sorodnikov iz istega rodu.

Ključne besede: Squatinidae, sklat, *Squatina aculeata*, Sredozemsko morje, izvor, načrt upravljanja

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