



USING LOCAL ECOLOGICAL KNOWLEDGE OF FISHERS TO IDENTIFY THE PRESENCE AND HABITATS OF ANGELSHARKS IN ALBANIAN WATERS

Rigers Bakiu^{1,3*}, Artenisa Peculaj², Patrik Krstinic²

¹ Albanian Center for Environmental Protection and Sustainable Development, Tirane, Albania

² WWF Adria, Zagreb, Croatia

³ Agricultural University of Tirana, Faculty of Agriculture and Environment, Department of Aquaculture and Fisheries, Koder-Kamez, Tirane, Albania

*Corresponding Author: rigers.bakiu@ubt.edu.al

ARTICLE INFO

Received: 25 April 2023
Accepted: 12 June 2023

Keywords:

Squatina squatina
Albania
Adriatic Sea
Ionian Sea
Mediterranean Sea

How to Cite

ABSTRACT

The Mediterranean Sea is a hotspot for shark and ray extinctions and is home to the following three angelshark species: sawback angelshark *Squatina aculeata*, smoothback angelshark *Squatina oculata*, and common angelshark *Squatina squatina*. We conducted a questionnaire-based survey in four coastal regions of Albania, Shëngjin (Lezhë), Vlorë, Himarë (Sarandë) and Durrës, with the aim of collecting historical and current data on angelshark catches in the Albanian seas (Adriatic and Ionian Seas). Although the occurrence of common angelshark was reported by Croatian fishermen in the Adriatic Sea, we included the other two species in our study. The number of observations was minimal, although this is the first study of angelshark species sightings in Albania. It will establish a baseline study that will allow further work on the conservation of these regionally extinct and highly endangered species.

Bakiu, R., Peculaj, A., Krstinic, P. (2023): Using local ecological knowledge of fishers to identify the presence and habitats of angelsharks in Albanian waters. Croatian Journal of Fisheries, 81, 139-146. DOI: 10.2478/cjf-2023-0015.

INTRODUCTION

Angelsharks are flat-breasted, bottom-dwelling sharks with broad pectoral fins and dorsally located eyes and spines. Twenty-three species of angelsharks have been identified worldwide (Long et al., 2021). Their range extends from temperate to tropical marine waters, with most species inhabiting areas on the continental shelf and upper slopes up to a depth of 500 m (Soldo, 2021). Their life cycle characteristics (i.e. slow growth and low reproductive rate) and demersal nature make them vulnerable to large mesh nets and trawling (Dulvy et al., 2014). Fisheries intensification and habitat loss have resulted in angelsharks becoming one of the most threatened families of elasmobranchs in the world, with many species in urgent need of protection (Dulvy et al., 2014). Direct fishing as a target species, incidental capture, and illegal fishing have led to a severe population decline for many elasmobranch species (Dulvy et al., 2021). The Mediterranean Sea is a hotspot of extinction risk for sharks and rays (Dulvy et al., 2014; Bakiu and Soldo, 2021), and hosts three angelshark species, sawback angelshark *Squatina aculeata* (Cuvier 1829), smoothback angelshark *Squatina oculata* (Bonaparte 1840), and common angelshark *Squatina squatina* (Linnaeus 1758). Of these, sawback angelshark *Squatina aculeata* is mainly documented in the central basin along the southern Mediterranean coast as far as the eastern basin, including the Aegean Sea (Soldo and Bariche, 2016; Gordon et al., 2019), but not in the Adriatic Sea, while the other two species, smoothback angelshark *Squatina oculata* and common angelshark *Squatina squatina*, are reported as Adriatic species (Lipej et al., 2004; Soldo, 2021).

Angelsharks have been identified as one of the most threatened families of chondrichthyans (sharks, skates, rays, and chimaeras) in the world, with many in need of urgent conservation action (Dulvy et al., 2014). All three Mediterranean species are classified as critically endangered in the Mediterranean due to past population declines and are at extremely high risk of extinction in the wild (Gordon et al., 2019).

The results of the study conducted are presented in this scientific paper. The aim of this study was to collect historical and current data on angelshark catches in Albanian waters (Adriatic and Ionian Seas) by using the local ecological knowledge (LEK) of fishers, and to establish a baseline study that will allow further work on the conservation of these regionally extinct and highly endangered species by understanding the habitats of occurrence as a first step in this approach.

MATERIALS AND METHODS

We used the LEK approach in our questionnaire-based surveys, comparable to Colloca et al. (2020) and Almojil (2021). An ad hoc questionnaire was created,

translated into Albanian, and then printed in hard copy. The questionnaire included photographs of the sharks and maps of Albania to facilitate the identification of specimens encountered by fishermen in the past, and attempted to obtain other information such as the depth or relative distribution of the species they encountered. From December 2022 to March 2023, all data were collected through personal interviews with fishermen in the four coastal areas of Albania (Shëngjin/Lezhë, Vlorë, Himarë/Sarandë and Durrës). The study, based on questionnaires, was carried out in collaboration with fisheries control officials from each Albanian coastal region. Together with them, meetings with fishermen were organized in the local fishing ports. In the case of Vlorë, even the support of the administrative staff of the Karaburun-Sazani Marine Protected Area (MPA) was beneficial in collecting data from fishermen. Unfortunately, recreational fishermen were not included in the group of participants because they were not willing to be interviewed. This may also be related to the recent events in the enforcement of recreational fishermen in Albania. The group of participants consisted of 92 fishermen from different coastal regions (Figure 1). Most of the fishermen interviewed were from the localities where most Albanian fishermen live. Moreover, the largest fishing ports in Albania are located in these areas.

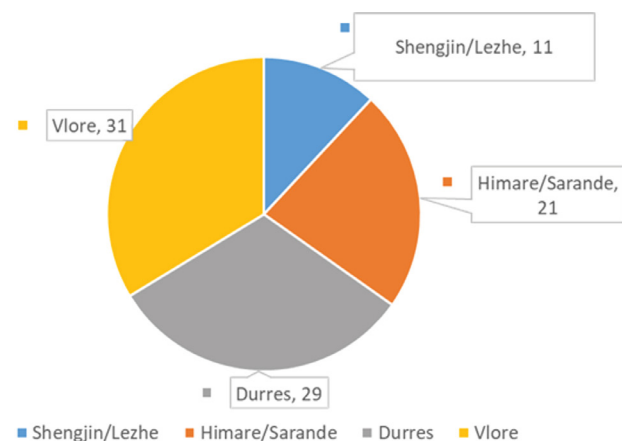


Fig 1. Graphical presentation of the distribution of the interviewed fishers in each coastal region of Albania

The artisanal fishermen interviewed from the Shëngjin/Lezhë and Himarë/Sarandë regions were represented in similar numbers as those working in industrial or large-scale fishing. The situation is different in the coastal regions of Vlorë and Durrës where most of the fishermen interviewed represent artisanal fishermen in Vlorë, while in Durrës, fishermen working in large-scale fishing represent the majority of the fishermen interviewed.

In general, industrial fishermen were found to have more experience than artisanal fishermen in each of the Albanian coastal regions, with industrial fishermen from Durrës achieving the highest value (in years of experience) in large-scale fishing (Figure 2).

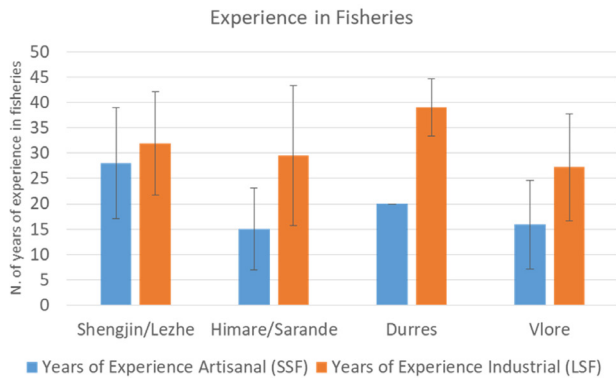


Fig 2. Graphical presentation of the distribution of the interviewed fishers according to the years of experience in each of the corresponding fishing typologies in each coastal region of Albania. Average values and relative standard deviation values are shown.

The fishermen from Shëngjin/Lezhë had an average of 27 years of experience in small-scale or artisanal fishing. In addition, artisanal fishermen used trammel nets, longlines, and gillnets (with minor exceptions for the fyke net in Shëngjin/Lezhë). Compared to the other artisanal fishermen interviewed who used the same gears with the same frequency, the artisanal fishermen from Vlorë and Durrës used trammel nets most frequently. Bottom trawls were used most frequently by commercial fishermen, especially by fishermen in Himarë/Sarandë and Vlorë where they were the only gear used in the commercial fishing sector, which is consistent with the results

published by Bakiu et al. (2022). The interviewed fishers in Shëngjin/Lezhë and Vlorë used midwater trawls (in Shëngjin/Lezhë) or purse seines.

RESULTS

Although in the Adriatic Sea only the presence of common angelshark is reported by Croatian fishermen (Soldo, 2021), in our survey we asked fishermen about sighting and reporting the presence of the three different angelshark species during the questionnaire-based survey in the four Albanian coastal regions.

As seen in Figure 3, only three fishermen from Shëngjin/Lezhë confirmed the presence of common angelshark in the past, while one of them even observed the other two species in the past. The difference between past presence and actual presence is that the meaning of "actual" refers to the last three years, while the meaning of 'past' covers a longer period than the last three years.

In addition, the same fisherman informed us (during the interview) that there are still specimens of common angelshark and smoothback angelshark in Albanian territorial waters.

The interviewed fishermen reported no observations of the three species in the coastal region, which includes Himarë and Sarandë. Similar to the coastal region, which includes Shëngjin and Lezhë, there were also three fishermen in the Durrës region who answered positively to the question "Have you ever fished for shark species (angelshark species shown in the photos)" in the past or present?" (Figure 4).

	Yes		No	
	In the Past	Actually	In the Past	Actually
Common angelshark (<i>Squatina squatina</i>)	3	1	8	10
Smoothback angelshark (<i>Squatina oculata</i>)	1	1	10	10
Sawback angelshark (<i>Squatina aculeata</i>)	1	0	10	11

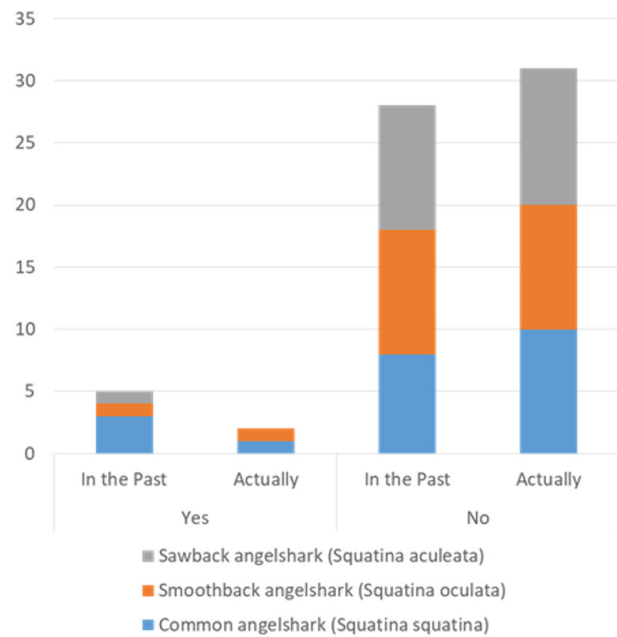
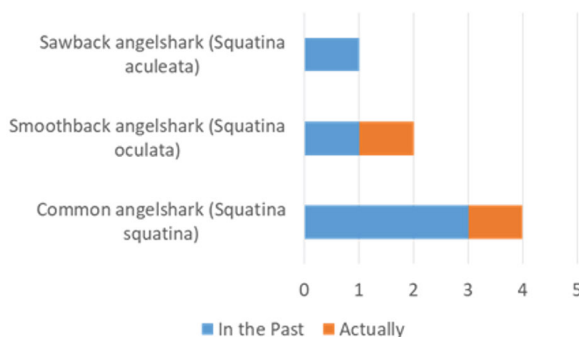


Fig 3. Graphical presentation of the number of observations of the three angelshark species, in the past and actually, by interviewed fishers in the coastal region of Shëngjin/Lezhë

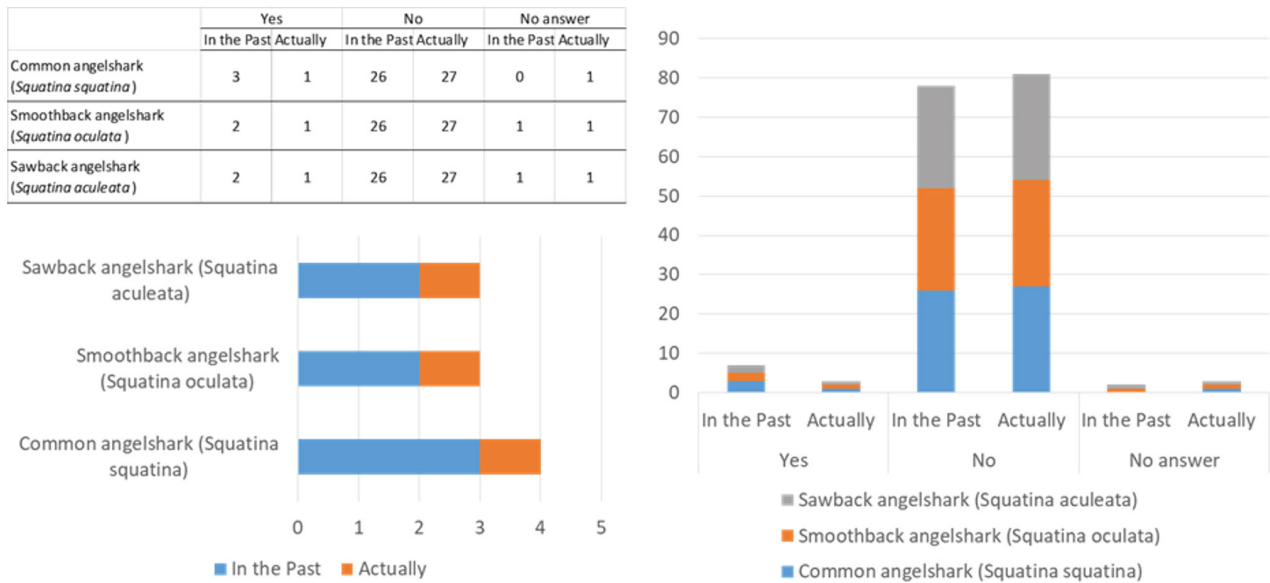


Fig 4. Graphical presentation of the number of observations of the three angelshark species, in the past and actually, by interviewed fishers in the coastal region of Durrës

All of them confirmed the presence of common angelshark in the past, while only two of them confirmed having observed the other two species in the past. Moreover, only one of them told us during the interview that there were still individuals of the three species in Albanian territorial waters, although he did not have photos to show. In the Vlorë region (Figure 5), of all the fishermen interviewed (most of them answered the question negatively, although some did not want to answer the question; two of them preferred not to answer the

question about the occurrence of common angelshark in the past, while one of them preferred not to answer the questions about the actual occurrence of common angelshark and the other species), only one fisherman told us that he had encountered common angelshark in the past. Together with other interviewed fishermen, they also told us that there were still individuals of *S. squatina* in Albanian territorial waters, although they had no photos to show.

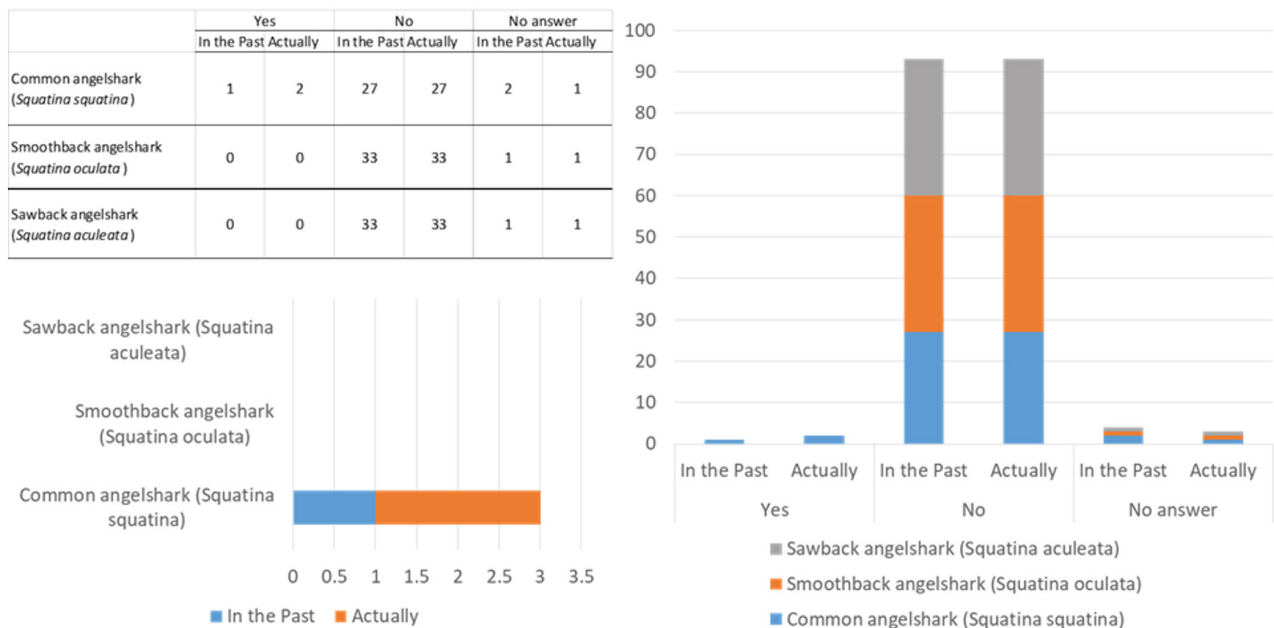


Fig 5. Graphical presentation of the number of observations of the three angelshark species, in the past and actually, by interviewed fishers in the coastal region of Vlorë

Finally, it should be noted that all fishermen who confirmed having observed individuals of *Squatina* species could not provide photos during the interview because they did not take any. Due to these facts, the statements of the fishermen who confirmed the presence of these species in Albanian territorial waters are very uncertain.

Only some of the fishermen answered positively to the question about the possible area where they encountered or fished at least one of the angelshark species (Figure 6). In Figure 7, different symbols indicate the sites where different shark species were encountered during fishing.

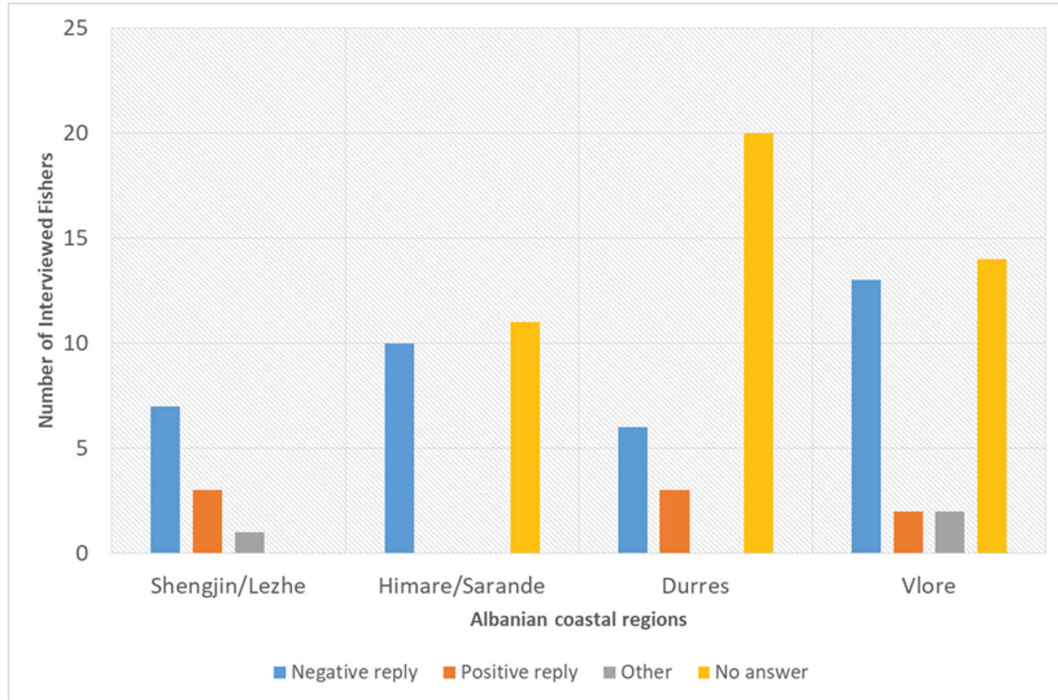


Fig 6. Graphical presentation of answers to the question “In which areas have you fished them in the past?” (point in the map) provided by the interviewed fishermen



In which areas have you fished them in the past?

Coastal Region	Species	Location
Shengjin/Lezhe	Common angel shark	Fished in the area 36B; in Buna/Bojana Delta
	All the 3 species	In the Ionian Sea, while in the past I have fished these species rarely in the Adriatic Sea
Durres	All the 3 species	In the Bay of Durres/Seman
	Common angel shark	In the fishing area close to the Seman delta; in high depths (420 m)
Vlore	Common angel shark	Something similar with the species according to the pictures, I've caught in 2020 at the depth of 160 - 180 at the western part of Porto Palermo
	Common angel shark	in 2020 close to Sazani island
	Common angel shark	

- Common angelshark
- ◆ Smoothback angelshark
- ✕ Sawback angelshark

Fig 7. Graphical presentation of sites indicated by the interviewed fishermen who answered positively to the questions about observing individuals of angelsharks in the past. In the sites where all the symbols are indicated together, it means that all three species were encountered in those sites according to the fishermen.

The fishermen who answered positively to the question about the depth at which they encountered the animals were the fishermen from the three coastal regions mentioned earlier who also observed at least one of the angelshark species during their fishing activities. In general, the fishermen from the coastal regions, which includes Shëngjin and Lezhë, stated that they encountered different species in sandy areas with marine vegetation at a depth of 15-180 m, while the fishermen from the Durrës region stated that the depth was up to 100 m and it was mostly common angelshark. The fishermen from Vlorë seemed to be more accurate in their relative answers, stating that the depth was 100-200 m.

In addition, fishermen from Shëngjin and Lezhë stated that those encountered during capture were still alive and generally released because fishermen had no information about the species. Although many of the interviewed fishermen from Durrës and Vlorë did not want to answer the question, the fishermen from Durrës who answered the question positively answered that the animals were still alive and were later kept by the fishermen. All the answers of the fishermen from Vlorë indicated that the animals ended up dead in the nets.

When asked next about the fishing areas of angelshark species and the possible changes compared to the previous fishing areas, the fisherman from Shëngjin/Lezhë region answered that he did not observe individuals of these species anymore because these species have disappeared or are rarely observed, while his other colleagues answered that these species are currently

found at greater depths of about 500-600 m, while a few years ago these species were fished at depths of 100-200 m, although rarely. Interesting answers were also given during the interviews with fishermen from Durrës who generally stated that there is almost no by-catch of these species, although they are mostly encountered near the Seman Delta. The main reason they gave was overfishing and the fact that new species are entering the territorial waters due to climate change. Only one of the fishermen from the Vlorë region specifically addressed the question, as most of the fishermen from Vlorë tended to give answers that were not specific to the question. The fisherman from Vlorë said that they are more common in the area from Porto Palermo to Kepi i Gjuhëzës (Ionian Sea).

In addition, some of the fishermen interviewed responded to the question "In which year did you observe or fish individuals of at least one of the species?" and the corresponding responses are shown in Figure 8. Of the two fishers from Shëngjin/Lezhë who responded positively to this question, one indicated that he had observed the species in 2003-2004, while the other indicated that he had observed *Squatina oculata* in the 80-90s. It is interesting to note the similarity of the answers coming from the fishers from Shengjin/Lezhe and the ones from Durres who declared that most of the observations were during the 80-90s and after the year 2000, while the fishers from Vlore encountered them later (in 2019 and 2020).

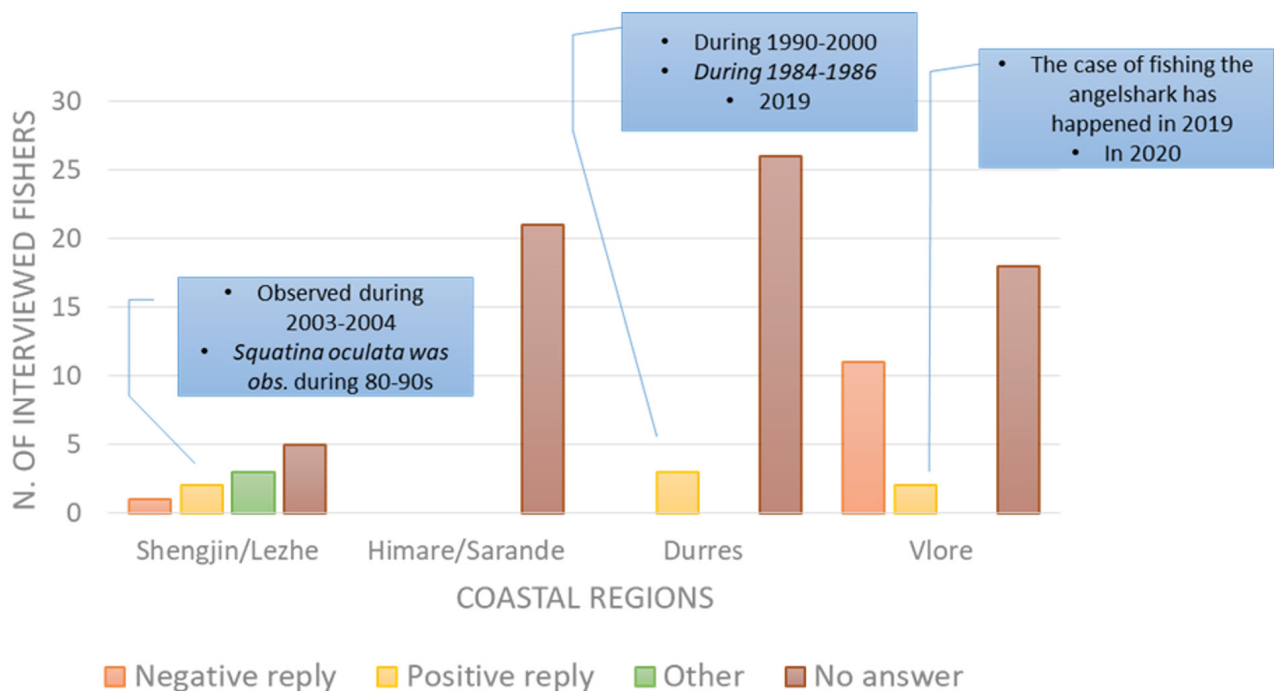


Fig 8. Graphical presentation of answers provided by the interviewed fishers to the question "In which year did you observe or fish individuals of at least one of the species?"

DISCUSSION

In the Adriatic Sea, according to Brusina (1888), *S. oculata* was rarer than *S. squatina* in the Gulf of Trieste and Dalmatia. Jardas (1996) defined *S. oculata* as rare throughout the Adriatic, while Soldo (2021) assumed that this species was locally extinct after several decades without new records of *S. oculata* in the Adriatic. Moreover, Soldo (2021) reported in his scientific paper that a live specimen was caught on 23 April 2021 with a trammel net at a depth of 23 m off Debeljak Bay near Point Kamenjak (the southernmost tip of the Istrian Peninsula). Previous data indicate that *S. squatina* was often a by-catch of bottom trawls (Soldo, 2021). Angelshark was reported as a caught species in 1948 during the Hvar expedition, but the Medits expedition that took place 50 years later, in 1998, could not confirm the presence of this species (Jukić-Peladić et al., 2001). Soldo (2006) classified the Adriatic angelshark species as very rare and critically endangered in its range. Based on this assessment, Croatia has assigned the highest level of protection (strictly protected status) in its waters to both angelshark species (common angelshark and smoothback angelshark) in the Adriatic Sea. In Croatia, angelsharks were targeted for capture in the past. One of the gillnets with a large mesh size was named after the Croatian term for angelshark (sklat – sklatara). A similar name also exists in Montenegro (Matic-Skoko et al., 2017). Something similar was suggested by Fortibuoni et al. (2016) who reported that according to the accounts of naturalists and historical documents, the species was so abundant in the northern Adriatic in the 19th and early 20th centuries that directed fisheries could be sustained, and large quantities of *S. squatina* were sold in the main fish markets, but in the 1960s the species collapsed and became economically extinct. However, Fortibuoni et al. (2016) also concluded that even though *S. squatina* was never detected in scientific surveys conducted in the area between 1948 and 2014, interviews with fishermen indicated that the species was not extinct in the Adriatic. This conclusion was also supported by occasional detections from the Adriatic, for example, Holcer and Lazar (2017) reported 4 detections from 2008-2016 (two from the Murter area and two from Kvarner).

In this study, we presented the results of the first questionnaire-based survey on the occurrence of angelsharks in Albanian territorial waters. Even though the number of reported observations seems to be much lower compared to the 23 reported in the questionnaire-based survey conducted by Gaji (2022) in Croatia in 2021, these are the first published results using the LEK approach, trying to collect as much information as possible from experienced fishermen in Albania. The documented occurrence of each of the three endangered angelsharks living in the Mediterranean is urgently needed, as the widespread grouping of sharks

and rays in landing statistics, as well as misidentification of species or confusion between species, continues to impede a clear picture of their status and distribution in the Mediterranean (Cashion et al. 2019; Gordon et al., 2019; Lawson et al., 2020). It would be even more urgent, given the confirmed presence of common angelsharks in the Adriatic Sea (Croatia, Soldo, 2021), where the other countries (Albania, Bosnia and Herzegovina, Montenegro) have not reported any confirmed observation in the last five years (scientific communication, report with photos, etc.).

ACKNOWLEDGMENT

The authors would like to thank the fishery inspectorate, the representative of the MPA Administrative Vlorë and all the fishers from the Albanian coastal regions for their valuable help during the questionnaire-based survey. In addition, the authors would like to thank Adjona Bejko for her valuable help in proofreading the final version of the manuscript.

KORIŠTENJE LOKALNOG EKOLOŠKOG ZNANJA RIBARA ZA UTVRĐIVANJE PRISUTNOSTI I STANIŠTA SKLATOVA U ALBANSKIM VODAMA

SAŽETAK

Sredozemno more žarište je izumiranja morskih pasa i raža, a u njemu žive tri vrste morskih pasa sklatova: sklat vrste (*Squatina aculeata*), sklat žutan (*Squatina oculata*) i sklat sivac (*Squatina squatina*). Proveli smo istraživanje temeljeno na upitniku u četiri obalne regije Albanije: Shëngjin (Lezhë), Vlorë, Himarë (Sarandë) i Durrës, s ciljem prikupljanja povijesnih i trenutnih dokaza o ulovu morskih pasa u albanskim morima (Jadransko i Jonsko more). Iako su hrvatski ribari u Jadranskom moru prijavili prisutnost sklata sivca, u naše istraživanje uključili smo i druge dvije vrste. Broj opažanja bio je minimalan, unatoč činjenici da je ovo početna studija o viđenjima morskih pasa sklatova u Albaniji. Ova studija poslužit će kao temelj koji će omogućiti daljnji rad na zaštiti tih regionalno izumrljivih i kritično ugroženih vrsta.

Ključne riječi: *Squatina squatina*, Albanija, Jadransko more, Jonsko more, Sredozemno more

REFERENCES

- Almojil, A. (2021): Local ecological knowledge of fisheries charts decline of sharks in data-poor regions, *Marine Policy*, 132, 104638.
- Bakiu, R., Moutopoulos, D. K., Gurma, M., Çakalli, M. (2022): Typology of the Albanian small-scale fisheries. *Croatian Journal of Fisheries*, 80, 26-37.1.

- Bakiu, R., Soldo, A. (2021): Shark capture by commercial fisheries in Albania. *Journal of Applied Ichthyology*, 37, 607–610.
- Bonaparte, C. L. (1840): *Iconografia della fauna italica per le quattro classi degli animali vertebrati*. Tomo III. Pesci. Roma: Fasc. 27–29, 136–154, 10.
- Brusina, S. (1888): *Morski psi Sredozemnoga i Crljenog mora (Sharks of the Adriatic and the Black Sea)*. Glasnik hrvatskoga naravoslovnoga društva, Zagreb, III, 167–230. (In Croatian)
- Carpenter, K. E., De Angelis, N. (2016): The living marine resources of the Eastern Central Atlantic. Volume 2: Bivalves, gastropods, hagfishes, sharks, batoid fishes, and chimaeras. *FAO Species Identification Guide for Fishery Purposes*. FAO, Rome, 665–1509.
- Cashion, M. S., Bailly, N., Pauly, D. (2019): Official catch data underrepresent shark and ray taxa caught in Mediterranean and Black Sea fisheries. *Marine Policy*, 105, 1–9.
- Colloca, F., Carrozzini, V., Simonetti, A., Di Lorenzo, M. (2020): Using Local Ecological Knowledge of Fishers to Reconstruct Abundance Trends of Elasmobranch Populations in the Strait of Sicily. *Frontiers in Marine Science*, 7, 508.
- Cuvier, G. L. C. F. D. (1829): *Le règne animal, distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée*. Edition 2. Paris, Déterville, de l'Impr. de A. Belin,
- Dulvy, N. K., Fowler, S. L., Musick, J. A., Cavanagh, R. D., Kyne, P. M., Harrison, L. R., Carlson, J. K., Davidson, L. N., Fordham, S. V., Francis, M. P. (2014): Extinction risk and conservation of the world's sharks and rays. *eLife*, 3, e00590
- Dulvy, N. K., Pacoureau, N., Rigby, C. L., Pollom, R. A.; Jabado, R. W. Ebert, D. A., Finucci, B., Pollock, C. M., Cheok, J., Derrick, D. H. (2021): Overfishing drives over one-third of all sharks and rays toward a global extinction crisis. *Current Biology*, 31, 4773–4787.
- Fortibuoni, T., Borme, D., Franceschini, G., Giovanardi, O., Raicevich, S. (2016): Common, rare or extirpated? Shifting baselines for common angelshark, *Squatina squatina* (Elasmobranchii: Squatinidae), in the Northern Adriatic Sea (Mediterranean Sea). *Hydrobiologia*, 772, 1, 247–59.
- Gajić, A. A. (2022): New hope for the critically endangered common angel shark *Squatina squatina* in the Adriatic Sea. *Croatian Journal of Fisheries*, 80, 1–6. 1.
- Gordon, C.A., Hood, A.R., Al Mabruk, S.A.A., Barker, J., Bartolí, A., Ben Abdelhamid, S., Bradai, M.N., Dulvy, N.K., Fortibuoni, T., Giovos, I., Jimenez Alvarado, D., Meyers, E.K.M., Morey, G., Niedermuller, S., Pauly, A., Serena, F., Vacchi, M. (2019): *Mediterranean Angel Sharks: Regional Action Plan*. The Shark Trust, United Kingdom. 36 pp.
- Holcer, D., Lazar, B. (2017): New data on the occurrence of the critically endangered common angelshark, *Squatina squatina*, in the Croatian Adriatic Sea. *Natura Croatica*, 26, 2, 313–320.
- Jardas, I., Pallaoro, A., Kovačić, M. (1998): Recent ichthyofauna of the Rijeka Bay. In: Arko-Pijevec, Kovačić, M., D. Crnković (eds.) *Natural History researches of the Rijeka region*. Ed. Natural History Library, Rijeka, pp. 671–684.
- Jukić-Peladić, S., Vrgoč, N., Krstulović-Šifner, S., Piccinetti, C., Piccinetti-Manfrin, G., Marano, G., Ungaro, N (2001): Long-term changes in demersal resources of the Adriatic Sea: comparison between trawl surveys carried out in 1948 and 1998. *Fisheries research*, 53, 95–104.
- Lawson, J. M., Pollom, R. A., Gordon, C. A., Barker, J., Meyers, E. K. M., Zidowitz, H., Ellis, J. R., Bartolí, Á., Morey, G., Fowler, S. L., Jiménez Alvarado, D., Fordham, S. V., Sharp, R., Hood, A. R., Dulvy, N. K. (2020): Extinction risk and conservation of critically endangered angel sharks in the eastern Atlantic and Mediterranean Sea. *ICES Journal of Marine Science*, 77(1), 12–29.
- Linnaeus, C. (1758): *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio decima, reformata [10th revised edition], vol. 1: 824 pp. Laurentius salvius: Holmiae, available online at <https://biodiversitylibrary.org/page/726886> page(s): 233.
- Lipej, L., De Maddalena, A., Soldo, A. (2004): *Sharks of the Adriatic Sea*. Knjižnica Annales Majora, Koper, 254 pp
- Long, D. J., Ebert, D. A., Tavera, J., Acero, P. A., Robertson, D. R. (2021): *Squatina mapama* n. sp., a new cryptic species of angel shark (Elasmobranchii: Squatinidae) from the southwestern Caribbean Sea. *Journal of the Ocean Science Foundation*, 38, 113–130.
- Matic-Skoko, S., Ikica, S., Vrdoljak, D., Melita Peharda, M., Tutman, P., Dragicevic, B., Joksimovic, A., Dulcic, J., Đurovic, M., Mandic, M., Markovic, O., Stagicic, N., Pesic, A. (2017): A comparative approach to the Croatian and Montenegrin small-scale fisheries (SSF) in the coastal eastern Adriatic Sea: fishing gears and target species. *Acta Adriatica*, 58(3), 459 – 480.
- Soldo, A. (2006): Current status of the sharks in the eastern Adriatic. *Cetaceans, sea turtles and sharks of the Adriatic Sea – Cattolica (RN), Italy – 27-28 Oct. 2006*. Conference Proceedings, 8 pp.
- Soldo, A. (2021): The occurrence of the common angel shark *Squatina squatina* in the Adriatic Sea, 37–44. *ANNALES Ser. hist. nat.* 31 2021 1
- Soldo, A., Bariche, M (2016): *Squatina aculeata*. The IUCN Red List of Threatened Species 2016: e.T61417A16569265. Downloaded on 06 May 2021.