

received: 2021-05-03

DOI 10.19233/ASHN.2021.02

## FIRST RECORD OF THE FLAT NEEDLEFISH, *ABLENNES HIANS* (BELONIDAE) IN CENTRAL MEDITERRANEAN WATERS (WESTERN IONIAN SEA)

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### ABSTRACT

*Two specimens of Ablennes hians (Valenciennes, 1846) were collected between 2018 and 2020 in nearshore waters off the island of Malta. The first occurrence of the flat needlefish in the central Mediterranean, almost contemporary to its first record in the eastern Levantine Sea, is briefly discussed.*

**Key words:** Malta, *Ablennes hians*, non-indigenous fish, Mediterranean Sea

## PRIMO RITROVAMENTO DI *ABLENNES HIANS* (BELONIDAE) IN MEDITERRANEO CENTRALE (MAR IONIO OCCIDENTALE)

### SINTESI

*Due esemplari di Ablennes hians (Valenciennes, 1846) sono stati catturati tra il 2018 e il 2020 nelle acque costiere dell'isola di Malta. La prima segnalazione della specie nel Mediterraneo centrale, quasi contemporanea a quella documentata per il Mar di Levante orientale, è brevemente discussa.*

**Parole chiave:** Malta, pesci non-indigeni, Mediterraneo

## INTRODUCTION

The flat needlefish *Ablennes hians* (Valenciennes, 1846) is one of the 47 species comprised in the ten genera of the family Belonidae (Froese & Pauly, 2021). It has a widespread distribution, being known from tropical and subtropical waters of the eastern and western Atlantic Ocean, as well as from eastern and western Pacific and Indian Oceans, as far as the Red Sea and the Gulf of Aqaba (Collette, 1999, 2016; Golani & Fricke, 2018; Golani, 2019; Collette & Bemis, 2019; Alshawy *et al.*, 2019). While the species is not listed among the ichthyofauna of the Gulf of Suez (Golani & Fricke, 2018), it is found among the belonids of the Suez Canal (Sabrah *et al.*, 2018). The flat needlefish is reported in by-catch communities of the pelagic ecosystem in the tropical tuna purse seine fishery of the Eastern Atlantic and Western Indian Oceans (Lezama-Ochoa *et al.*, 2015, 2018). This pelagic fish reaches over 120 cm in standard length, inhabits offshore surface waters, but also coastal waters, is often found near islands, and in estuaries; it occurs both as a solitary and schooling fish; its diet consists mainly of small fishes, such as Atherinidae; the deposited eggs may be found attached to objects in the water using filaments on their surface (Fishelson, 1975; Collette, 1986, 2016; Froese & Pauly, 2021; Golani, 2019).

In the Mediterranean, the first specimen of *A. hians* was collected in September 2018 off the coasts of Israel by trammel net at a depth of 20–30 m (Golani, 2019). A few months later, in February 2019, two specimens were caught off the coasts of Syria in a gill net (Alshawy *et al.*, 2019), and another one, in March 2019, along the coasts of Israel, by purse seine (Tadmor-Levi *et al.*, 2020). These recently documented records of *A. hians* in the Levantine Sea increase to six the number of belonid species known in the Mediterranean. The five previously known species include the native *Belone belone* (Linnaeus, 1761), *Belone svetovidovi* Collette & Parin, 1970, *Tylosurus acus acus* (Lacépède, 1803), and *Tylosurus acus imperialis* (Rafinesque, 1810), as well as the rare non-indigenous species of Indo-Pacific origin *Tylosurus choram* (Rüppell, 1837) (Froese & Pauly, 2021; Galil *et al.*, 2021). Although listed in Zenetos *et al.* (2010, 2018), the non-indigenous *Tylosurus crocodilus* (Péron & Le Sueur, 1821) is not included because the single specimen from Hellenic Aegean waters (Sinis, 2005) was probably a misidentified co-generic Mediterranean species.

This study documents the first record of *A. hians* in the coastal waters off the island of Malta and in the central Mediterranean, offering some considerations about the possible introduction pathways for this species.

## MATERIAL AND METHODS

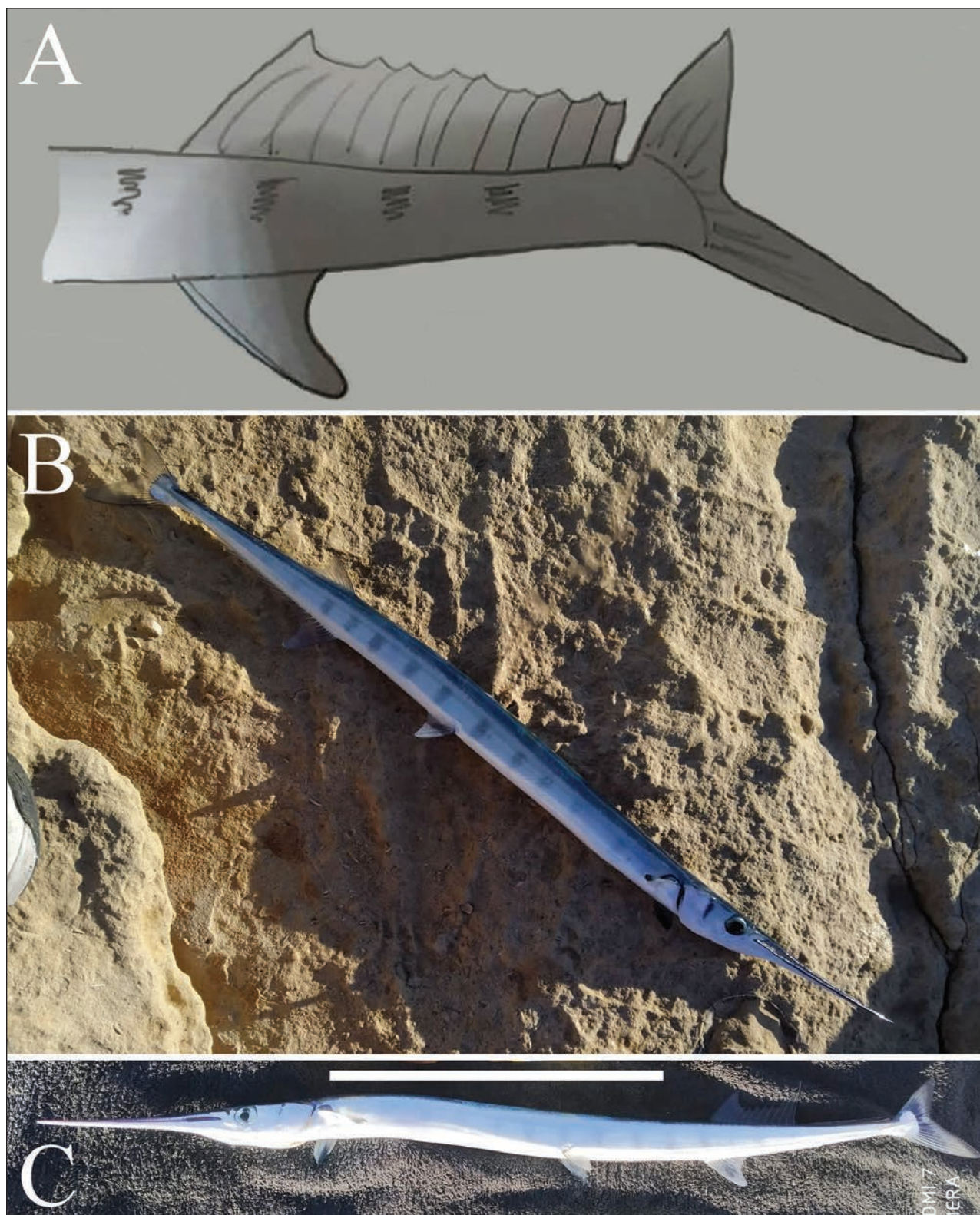
On 1 December 2020, one specimen of *A. hians* (specimen *a*) was caught off the southern coast of the island of Malta (35.808434°N, 14.537536°E), by means of a kayak fishing rod, at a depth of 10 m, over a rocky seabed. The bait was sliced fragments of *Arenicola* sp. (Polychaeta). The fisher reported the capture through social media (*Spot the Alien Fish* campaign Facebook page, <https://www.facebook.com/aliensmalta>). The *Spot the Alien Fish* citizen science campaign was launched by the University of Malta in 2017 to collate a national database of all records made by different sea users in relation to non-indigenous species (NIS) of fish within Maltese waters. Reports to the campaign can be submitted through a dedicated web portal (<https://www.um.edu.mt/newspoint/news/2020/06/spot-alien-website-launched>), as well as through the corresponding campaign social media page and email address.

Upon capture, the fisher noted unusual evident black bars/markings in the posterior part of the fish, which led him to promptly sketch and submit a drawing of the same markings (Fig. 1A) to the citizen science campaign's social media platform. Specimen *a* was not preserved by the fisher, who did, however, take photographs (Fig. 1B, C). Its length was measured using a plastic bottle; the bottle having a known length of 20.5 cm, it was placed alongside the fish and included in the original photograph. In Fig. 1C, the bar corresponds to the length of the bottle.

Two months after the submission of the above *A. hians* photo to social media, the fishery community of the island was alerted about it by one of the authors (AD) and the photo of another specimen (specimen *b*) emerged on the mentioned platform (Fig. 2). Specimen *b* had been caught two years earlier, on 22 September 2018, in a location off the south-eastern coast of the island of Malta (35.819001°N, 14.559989°E), using a rod fishing technique known as 'spinning' from land. This sample was not preserved by the recreational fisher, so the only morphometric attribute that could be inferred from the corresponding photo was the total length.

## RESULTS

Both specimens of *A. hians* (specimen *a*: 61.5 cm total length, 57.5 cm standard length, 330 g approximate weight; specimen *b*: 75.0 cm estimated total length) were identified based on the submitted photographs and drawing/sketch, following the descriptions by Collette & Parin (1970), Collette (1999, 2016), Collette & Bemis (2019), Golani (2019), and Alshawy *et al.* (2019). Body elongate and laterally compressed. Upper and lower jaws greatly elon-



**Fig. 1:** *Ablennes hians* (specimen a) caught in December 2020 off Malta (A, drawing made on board; B, immediately upon landing; C, a few minutes after landing, white bar 20.5 cm, details in Material and Methods (Drawing and photographs by L. Saliba).

**Sl. 1:** *Ablennes hians* (primerek a), ujet decembra 2020 pri Malti (A, risba na tablici; B, ravnokar ujet; C, nekaj minut po ulovu, bela črta 20,5 cm, detajli v poglavju Materiali in metode (Slika in fotografije: L. Saliba).

gate, with small sharp teeth. Apparently, there were no lateral keels on the caudal peduncle. Dorsal and anal fins opposite, their anterior parts presenting moderately falcate lobes; caudal fin deeply forked, lower lobe longer than upper. Colour: bluish-green back, light blue flanks, white ventral surface; pelvic fins whitish, other fins appearing darker, posterior lobe of dorsal fin black (Fig. 2); a series of at least 13 dark vertical bars on the body along the sides (Figs. 1B-C, 2). In Fig. 1C, the vertical bars appear slightly faded compared to Fig. 1B, probably due to different light exposure values of the two photographs. Jaws pinkish.

## DISCUSSION

The presumed arrival in 2020 of *A. hians* in Maltese waters led us initially to hypothesise a rapid spread of this newly introduced fish from the Levantine basin (Golani, 2019; Alshawy *et al.*, 2019) to the central Mediterranean, as it was reminiscent of the exceptional spread rate of *Fistularia commersonii* Rüppell, 1838 within the Mediterranean observed two decades ago. In fact, in only two years since its first record in the basin in 2000, off the Mediterranean coasts of Israel (Golani, 2000), that Lessepsian migrant extended its distribution range by over 2500 km, as far as the Italian island of Lampedusa in the central parts of the basin (Azzurro *et al.*, 2004), earning the species the title of ‘Lessepsian sprinter’ (Karachle *et al.*, 2004). Golani (2019) underlined the uncertainty of the origin of the first *A. hians* specimen found in Israel, but since the Suez Canal was included in the distribution range of the flat needlefish (Sabrah *et al.*, 2018), a tentative introduction into the Mediterranean via the Suez Canal (Lessepsian migration) was initially hypothesised, and this main route of introduction was also ascribed to the *A. hians* specimens from Syrian waters (Alshawy *et al.*, 2019). However, recent molecular analysis of *A. hians* samples collected from a broad geographical range revealed that within *A. hians*, previously considered a single circumtropical species, there may be several cryptic taxa (Tadmor-Levi *et al.*, 2020). Given the genetic differences between Red Sea specimens and the specimen sampled from Israel (Mediterranean Sea), the Lessepsian migration theory for the introduction of *A. hians* into the Mediterranean appears less probable, albeit not impossible; further studies are required to verify the introduction pathway for the species into the basin (Tadmor-Levi *et al.*, 2020).

The unexpected emergence of an even earlier record of *A. hians* (dating back to September 2018) from Maltese waters and the subsequent finding of the same species in 2020 within the same waters may further substantiate the hypothesised improb-

ability of the arrival of the species in the Mediterranean through Lessepsian migration, in agreement with Tadmor-Levi *et al.* (2020). The outcomes of our study, in fact, suggest that a different route of introduction of the species into the Mediterranean should be considered. The Strait of Sicily, east of which the Malta archipelago is located, is an ecological corridor for the east-west and west-east dispersion of exotic species within the Mediterranean basin,



**Fig. 2:** *Ablennes hians* (specimen b) caught off Malta in September 2018 (Photograph by M. Caruana, submitted to social media in February 2021).

**Sl. 2:** *Ablennes hians* (primerek b) ujet pri Malti septembra 2018 (Fotografija: M. Caruana, objavljen v socialnih medijih februarja 2021).

i.e., a biogeographical crossroads between the two parts of the basin (Guidetti *et al.*, 2010; Azzurro *et al.*, 2014; Insacco & Zava, 2017; Deidun *et al.*, 2021). As a result, an Atlantic origin of *A. hians* inhabiting the Mediterranean cannot be completely discounted. Although Moroccan Atlantic waters are not included in the Atlantic distribution range of the flat needlefish by Collette & Bemis (2019), the latter is listed as an unexploited species of Morocco that could acquire economic and commercial value (Menioui, 2009). Given the pelagic character of *A. hians*, a passive (not mediated by human agency) range expansion from the tropical east Atlantic into the Mediterranean via the Strait of Gibraltar could be speculated, analogously to an increasing number of non-native species within the basin (Essl *et al.*, 2019). This hypothesis, however, is not supported by any records of the species from the western basin of the Mediterranean, which is anomalous for a putative range-expanding species of Atlantic origin.

Given that the Sicily Channel is a busy shipping lane, alternative vectors linked with maritime transport, including vessel ballast water and oil

platforms, could also be responsible for introducing the species into the central Mediterranean, as has been documented in previous studies (e.g., Pajuelo *et al.*, 2016; Insacco & Zava, 2017). Based on the records of *A. hians* from a wide geographical range within the basin, multiple instances of introduction of the species into the same basin are plausible; however, as suggested by Tadmor-Levi *et al.* (2020); a larger sample size is necessary in any future genetic investigation in order to ascertain the origin of the flat needlefish in the Mediterranean.

#### ACKNOWLEDGEMENTS

The authors warmly thank the fishers Laurence Saliba and Miguel Caruana for providing information on the capture of the fishes studied in the present work and photographic material. The authors are also indebted to the International Ocean Institute (IOI) for financially supporting the University of Malta in conducting the Spot the Alien Fish citizen science campaign.

PRVI ZAPIS O POJAVLJANJU PLOŠČATE MORSKE IGLE, *ABLENNES HIANIS* (BELONIDAE)  
V VODAH OSREDNJEGA SREDOZEMSKEGA MORJA (ZAHODNO JONSKO MORJE)

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POVZETEK

*Dva primerka ploščate morske igle, Ablennes hians (Valenciennes, 1846), sta bila ujeta med 2018 in 2020 v obalnih vodah Malte. Avtorji razpravljajo o prvem pojavljanju ploščate morske igle v osrednjem Sredozemskem morju, ki časovno sovпада s prvim zapisom o pojavljanju te vrste v vzhodnem Levantskem morju.*

**Ključne besede:** Malta, *Ablennes hians*, tujerodna vrsta, Sredozemsko morje

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