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ADDITIONAL DATA ON THE BUMP-HEAD SUNFISH, *MOLA ALEXANDRINI* (RANZANI, 1839) IN THE ADRIATIC SEA

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ABSTRACT

*On 3 June 2017, a group of divers mapping benthic habitats in a locality south of Dubrovnik, Croatia, spotted and photographed a giant specimen of sunfish accompanied by a school of imperial blackfish (*Schedophilus ovalis*) at a depth of 40 m. The specimen was identified as a bump-head sunfish *Mola alexandrini* (Ranzani, 1839). This is one of the few records of this little-known and overlooked species in the Adriatic Sea and one of the few cases in the whole Mediterranean.*

Keywords: *Mola mola, Mola alexandrini, Adriatic Sea, Schedophilus ovalis*

NUOVI DATI SUL PESCE LUNA MERIDIONALE, *MOLA ALEXANDRINI* (RANZANI, 1839) NEL MARE ADRIATICO

SINTESI

*Il 3 giugno 2017, un gruppo di subacquei che ha mappato gli habitat bentonici in una località a sud di Dubrovnik, in Croazia, ha avvistato e fotografato un esemplare gigante di pesce luna accompagnato da un banco di centrolofo viola (*Schedophilus ovalis*) a una profondità di 40 m. L'esemplare è stato identificato come pesce luna meridionale *Mola alexandrini* (Ranzani, 1839). Si tratta di una delle poche segnalazioni di questa specie poco conosciuta e trascurata nel mare Adriatico e uno dei pochi casi nell'intero Mediterraneo.*

Parole chiave: *Mola mola, Mola alexandrini, mare Adriatico, Schedophilus ovalis*

INTRODUCTION

Three species of sunfish (family Molidae) have been reported for the Adriatic Sea so far. While the presence of *Ranzania laevis* (Pennant, 1776) (Jardas & Knežević, 1983; Dulčić et al., 2007) and *Mola mola* (Linnaeus, 1758) (Jardas & Knežević, 1983; Dulčić et al., 2007; Kovačić et al., 2020) has been well known in this region for quite some time, the third molid species was confirmed only recently, when Insacco et al. (2023) identified a large sunfish stranded in 1999 on a beach in the northwestern Adriatic Sea as a *Mola alexandrini* (Ranzani, 1839). This was actually the second recorded instance of this species in the Adriatic Sea – the first specimen, however, discovered in an unspecified location in the Adriatic, was classified by Ranzani (1839) as *Orthragoriscus alexandrini*. The comprehensive overview of the Adriatic fish fauna published by Kovačić et al. (2020), who analysed the Adriatic ichthyological populations with an evidence-based approach, does not mention *M. alexandrini*. However, the

species is included in a subsequent survey of the Mediterranean ichthyofauna by Kovačić et al. (2021), with a note that the holotype is preserved at the Swedish Museum of Natural History in Stockholm.

Historically, there were numerous taxonomic confusions within the *Mola* genus resulting in many misidentifications, but recent studies have begun to address these issues (e.g., Yoshita et al., 2009; Nyegaard et al., 2017). In 2018, Sawai et al. realised that *Mola alexandrini* (Ranzani, 1839) was synonymous with *M. ramsayi* (Giglioli, 1883) and provided a revised description of the species based on the rediscovered holotype and 21 fresh and preserved specimens.

MATERIAL AND METHODS

On 3 June 2017, a group of divers from the NGO "Sunce" performed a mapping of the sea bottom ecosystems south of Dubrovnik near Cavtat, in an area just below Velje brdo ($42^{\circ}31'14.78''N$, $18^{\circ}17'43.04''E$) (Fig.



Fig. 1: Locations in the Adriatic Sea where *Mola alexandrini* was confirmed after the species was discovered by Ranzani (1939) at an unspecified location in the Adriatic. Legend: A – Cervia (Ravenna), 24 March 1999 (Insacco et al., 2023) and B – southern Adriatic (near Cavtat), 3 June 2017 (this paper).

Sl. 1: Lokalitete v Jadranskem morju, kjer je bilo potrjeno pojavljanje vrste *Mola alexandrini*, potem, ko je Ranzani (1939) opisal vrsto na neznani lokaliteti v Jadranu. Legenda: A – Cervia (Ravenna), 24. marec 1999 (Insacco et al., 2023) in B – južni Jadran (blizu Cavtata), 3. junij 2017 (ta prispevek).

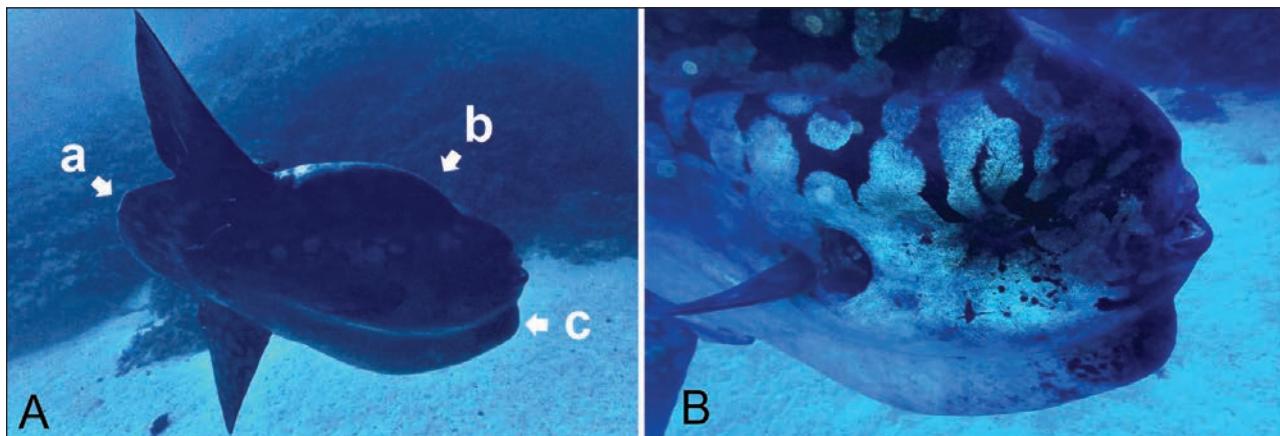


Fig. 2: Bump-head sunfish (*Mola alexandrini*) photographed on 3 June 2017 in the waters off Dubrovnik. Diagnostic features: a – rounded clavus with no indentations, b – bulbous head with bump, c – bump on the chin (A); close-up of the head with clearly visible bumps on the head and chin (B); (Photos: J. Belamarić).

Sl. 2: Grbasti morski mesec (*Mola alexandrini*), fotografiran 3. junija 2017 v vodah blizu Dubrovnika. Diagnostični znaki: a – zaobljen klavus brez zajed, b – zaokrožena glava z grbo, c – grba na bradi (A); bližinski posnetek glave z očitnimi grbami na glavi in bradi (B); (Fotografije: J. Belamarić).

1). They surveyed a sea grass meadow of *Posidonia oceanica* along sampling transects at a depth of 33 m. At a depth of 40 m, they spotted and photographed a giant specimen of sunfish (Fig. 2). It was gliding slowly, moving its perpendicular fins from left to right. The sunfish was accompanied by a group of imperial blackfish (*Schedophilus ovalis*) (Fig. 3).

RESULTS AND DISCUSSION

The specimen was identified based on photographs taken at the time of sighting. The bump-head sunfish (*Mola alexandrini*) can be distinguished from the similar ocean sunfish *Mola mola* by having a distinct bump on the head

and another one on the chin (Sawai et al., 2018) (Figs. 2 and 4). In addition, its body scales are rectangular, the clavus is rounded, without indents (Figs. 2 and 4), and *Mola alexandrini* has 14–24 rays in the clavus (Sawai et al., 2018), while *M. mola* typically exhibits a lower number. Nevertheless, it is worth noting that, according to Wirtz & Biscoito (2019), the bump on the head can also be found in *Mola mola* specimens from the eastern Atlantic populations. The studied specimen was grey on the upper part of the body and paler on the ventral side, with large pale patches present all over the trunk and on the dorsal and anal fins. It was not measured; however, the divers estimated the size of the fish to be approximately 3 metres from the tip of the dorsal fin to the tip of the anal fin.

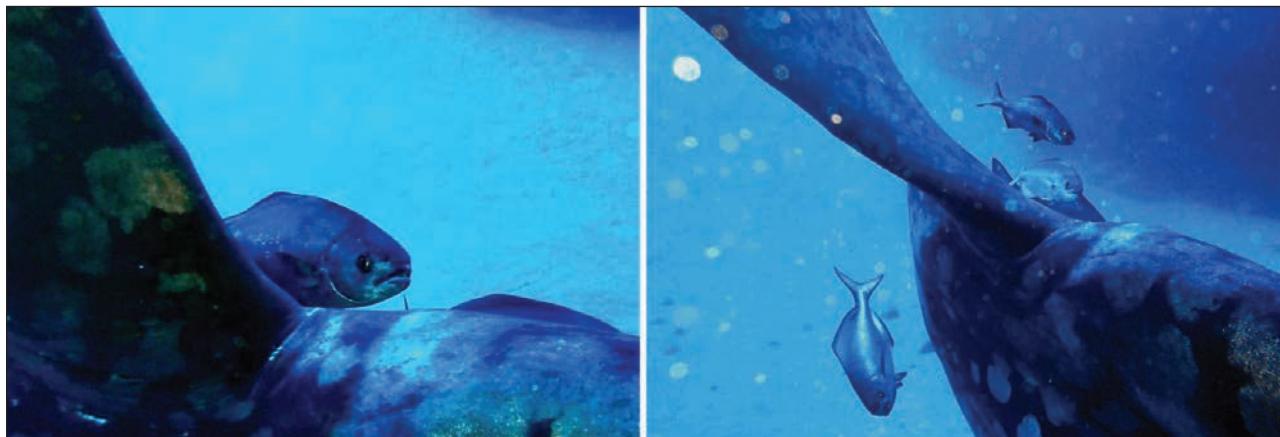


Fig. 3: The imperial blackfish (*Schedophilus ovalis*) swimming together with the specimen of bump-head sunfish (Photo: J. Belamarić).

Sl. 3: Cesarski črnuchi (*Schedophilus ovalis*), ki plavajo poleg primerka grbastega morskega meseca (Foto: J. Belamarić).

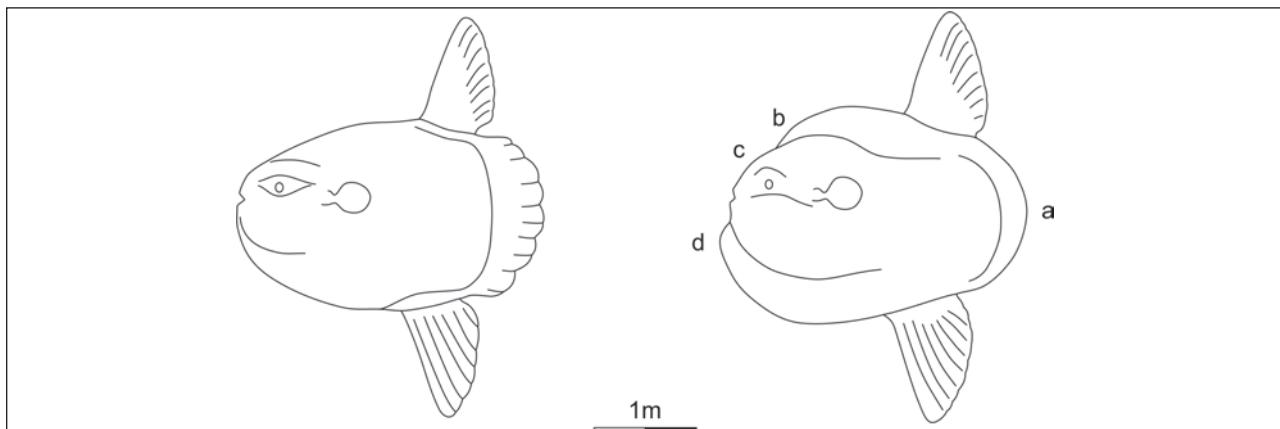


Fig. 4: The differentiation between *M. mola* (left) and *M. alexandrini* (right) based on key morphological characteristics. Legend: a – clavus, b – head bump, c – head profile, and d – chin bump (Drawing: M. Šiško).

Sl. 4: Ločevanje med vrstama *M. mola* (levo) in *M. alexandrini* (desno) na podlagi ključnih morfoloških znakov.
Legenda: a – klavus, b – grba na glavi, c – profil glave, in d – grba na bradi (risba: M. Šiško).

The bump-head sunfish was previously believed to inhabit only the southern hemisphere (Parkinson, 2021). However, recent Mediterranean records (Kovačić et al., 2021; Insacco et al., 2023; this paper) and findings in Atlantic (Wirtz & Biscoito, 2019) suggest its presence in the northern hemisphere as well. Due to the revision of species within the genus *Mola* and the related misidentification with *Mola mola*, it is highly probable that new cases of overlooked *M. alexandrini* will emerge in the future (*sensu* Parkinson, 2019). This prediction is further supported by the fact that photographic identification is now considered a valid source of data on species presence (Colombo & Langeneck, 2013; Bello et al., 2014).

Although no specific studies have been conducted on the diets of *Mola mola* and *M. alexandrini*, the bump-head sunfish can mainly be considered a predator of gelatinous planktonic animals, such as salps and siphonophores (Pope et al., 2010; Parkinson, 2021). The specimens accompanying the sunfish were identified as imperial blackfish (*Schedophilus ovalis*). This species is also poorly known in the Adriatic Sea and was considered very rare by Jardas (1996). Previously, it was mostly observed in the southern part of the Adriatic Sea (Dulčić et al., 2003), while during the recent decades, it has been reported to be spreading to its northern areas as well (Dulčić et al., 2012). Some authors emphasised that the occurrence of both species of the genus *Schedophilus* (*S. ovalis* and *S. medusophagus*) is influenced by environmental factors, including higher temperatures (Dulčić, 1998; Corsini-Foka & Frantzis, 2009), and suggested that the northward expansion of *S. ovalis* was related to sea warming. The imperial blackfish is known as an obligate gelativore, so it seeks gelatinous organisms together with the bump-head sunfish. The sighting of species from the genus *Schedophilus* alongside the bump-head sunfish has previously been noted by Parkinson (2021).

In the past, the *Mola mola* species and molids in general received only sporadic scientific attention, and even scarcer are the data regarding *M. alexandrini*. To ascertain the actual presence of the bump-head sunfish in the Adriatic Sea and to elucidate its status within the region, a thorough review of the photographic material depicting specimens previously identified as *Mola mola* is necessary (Insacco et al., 2023). In fact, during the preparation of this article we uncovered at least one other possibly overlooked case of the bump-head sunfish's presence in the Adriatic Sea through various web sources. On 10 April 1933, a specimen of what appears to be a bump-head sunfish was caught off the coast of Rimini (Colonia Bolognese) and exhibited for public viewing in several Italian locations. Still, this report requires further detailed investigation to be fully confirmed.

Counting the record presented in this paper, the total number of confirmed specimens of *M. alexandrini* in the Adriatic Sea presently stands at three. This work highlights the importance of photo documentation and thorough analysis of various photo archives and other historical data that can be valuable in shedding light on the presence of certain species over time and in different locations, especially those that are rare and not well known. Nyegaard et al. (2023) have shown that photographs can also be used to identify individuals and even observe their behaviour and growth when a comprehensive photo collection is available. This further underscores the importance of thoroughly analysing the already extensive amount of photographic material that is expanding rapidly due to the availability of high-quality and affordable photo cameras and the growing community of underwater researchers, divers, and enthusiasts. However, it is essential to exercise caution when assessing the reliability of sources and the accompanying data, especially regarding the location and time of the photographed events.

DODATNI PODATKI O POJAVLJANJU GRBASTEGA MORSKEGA MESECA, *MOLA ALEXANDRINI* (RANZANI, 1839) V JADRANSKEM MORJU

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POVZETEK

*Skupina potapljačev je 3. junija 2017 pri popisovanju pridnenih habitatov na lokaciji blizu Dubrovnika (na Hrvaškem) opazila in fotografirala orjaški primerek morskega meseca, ki ga je spremljala jata cesarskih črnuhov (*Schedophilus ovalis*) na globini 40 m. Primerek so določili za grbastega morskega meseca, *Mola alexandrini* (Ranzani, 1839). To je eden izmed redkih zapisov o pojavljanju te slabo poznane in spregledane vrste v Jadranskem morju in eden od redkih primerov v Sredozemskem morju nasploh.*

Ključne besede: *Mola mola, Mola alexandrini, Jadransko morje, Schedophilus ovalis*

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