

FIRST RECORD OF THE MEAGRE, *ARGYRO SOMUS REGIUS* (ASSO, 1801), IN SLOVENIAN COASTAL WATERS WITH ADDITIONAL RECORDS FROM THE CROATIAN PART OF THE ADRIATIC SEA

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ABSTRACT

*One specimen of meagre, *Argyrosomus regius* (Asso, 1801), was caught by trawling in the waters off Slovenia on 24th November 2016 at the depth of cca. 20 m above sandy-muddy bottom. This is the first record of this species for the Slovenian part of the Adriatic Sea. Due to the fact that there are no wild populations in the Middle and North Adriatic and that remaining wild populations in the Southern Adriatic are scarce and small, the specimen is supposed to be an escapee from one of the mariculture facilities. Additional occurrences of this species from the Croatian part of the Adriatic Sea are reported.*

Key words: meagre, *Argyrosomus regius*, Adriatic Sea, farm escapee, aquaculture

PRIMA SEGNALAZIONE DI OMBRINA BOCCADORO, *ARGYRO SOMUS REGIUS* (ASSO, 1801), IN ACQUE COSTIERE SLOVENE CON ULTERIORI RITROVAMENTI NELLA PARTE CROATA DELL'ADRIATICO

SINTESI

*Un esemplare di ombrina boccadoro, *Argyrosomus regius* (Asso, 1801), è stato catturato con la rete a strascico nelle acque al largo della Slovenia, il 24 novembre 2016, ad una profondità di cca. 20 m, sopra il fondale sabbioso-fangoso. Si tratta del primo ritrovamento di questa specie per la parte slovena dell'Adriatico. Poiché non ci sono popolazioni allo stato selvatico nell'Adriatico centrale e settentrionale, e visto che le restanti popolazioni selvatiche nell'Adriatico meridionale sono scarse e limitate, gli autori ipotizzano che l'esemplare sia scappato da uno degli impianti di maricoltura. Vengono inoltre segnalati altri ritrovamenti di questa specie nella parte croata dell'Adriatico.*

Parole chiave: ombrina boccadoro, *Argyrosomus regius*, mare Adriatico, fuggitivo, acquacoltura

INTRODUCTION

The meagre, *Argyrosomus regius* (Asso, 1801), is a demersal, oceanodromus, ray-finned fish of the family Sciaenidae. It is a large top-predator, with a high trophic level (4.3) that consumes large sized and heavy preys. It feeds on a wide range of crustaceans and fish (Valero-Rodriguez *et al.*, 2015). Adults inhabit inshore and shelf waters while juveniles and subadults prefer estuaries and coastal lagoons. It mostly occurs over sandy bottoms, close to rocks, at depths from 1 - 200 m (Louisy, 2002). Original distribution of the meagre is the eastern Atlantic, from Norway to Gibraltar and Congo, including the Mediterranean and the Black Sea (Griffiths & Heemstra, 1995). It also migrated via Suez Canal to the Red Sea as an anti-Lessepian migrant (Chao & Trewavas 1990).



Fig. 1: Map of the Adriatic Sea with localities where meagre specimens were caught (black dots; numbers represent the following localities: 1- Piran, 2 – Brist, 3 – Pelješac, 4 – Zadar, 5 – Rab), with localities (Apulia, Monfalcone, Hvar, Zadar) where the meagre is cultivated (squares) and the area (Bojana river mouth) where the last known natural population still occurs (circle).

Sl. 1: Zemljevid Jadranskega morja z območji, kjer so bili ujeti obravnavani primerki hame (črne pike; številke predstavljajo naslednja območja najdb: 1 – Piran, 2 – Brist, 3 – Pelješac, 4 – Zadar, 5 – Rab), z območji (Apulija, Monfalcone, Hvar, Zadar), kjer hame vzgajajo v marikulturah (kvadrati) in z območjem (ustje reke Bojane), kjer obstaja še zadnja znana naravna populacija te vrste (krog).

In the Adriatic Sea, the meagre was historically widespread along the eastern coast, especially in sandy and muddy shallows with turbid and fresh water influence although it was considered rare or very rare (Šoljan, 1975; Jardas 1985). Grubišić (1967) considered areas of Ulcinj (Bojana rivermouth), Omiš (Cetina rivermouth) and Neretva rivermouth as the only areas with locally abundant populations. However, at the end of 20th century the fisheries reports about the species became very scarce, with the Bojana rivermouth (Montenegro) being one of the last locations in the Adriatic Sea hosting natural/wild populations (Joksimović, 2007). Jardas *et al.* (2008) have declared it as a regionally extinct species in the Red Book of Sea Fishes of Croatia. For the Slovenian sea there are no records for this species in the available literature, such as Matjašič & Štirn (1975) and Kryštufek & Janžekovič (1999). The meagre has suffered alarming declines in other parts of the Mediterranean as well (Quéro & Vayne, 1987; Quéro, 1989; Wolff, 2000), mostly due to overexploitation and habitat degradation. On the other hand, it is considered as an emerging species in the Mediterranean aquaculture (Monfort, 2010), with the main production reported in Egypt (brackish ponds) and in Spain, France, Italy and Turkey (off-shore mariculture).

MATERIAL AND METHODS

The meagre specimen was caught by trawling in the waters off Slovenian coast on 24th November 2016 at the depth of cca. 20 m above sandy-muddy bottoms (Fig. 1). The specimen was sold at the local market, but was photographed by the fisherman previously since it was not identified (Fig. 2a). The researchers from Marine Biology Station of the National Institute of Biology were informed about the catch and were given the photographs to identify the specimen. Using the photographs, the total length of the specimen was estimated. Additionally, we managed to locate 3 records of this species caught in the wild from Croatia whose identification was also based solely on photographs of the specimens (Fig. 1).

On 26th July 2011, a specimen was caught near village of Brist (middle Adriatic, Croatia) (Fig. 2b). In summer of 2012 another specimen of meagre was collected by sportive fisherman from area of Pelješac peninsula (southern Adriatic; Croatia) (Fig. 2c) and in December 2017 one specimen was caught in waters off Zadar (middle Adriatic, Croatia). Photos of all the mentioned specimens were sent to the Institute of Oceanography and Fisheries in Split (Croatia). Beside photos, data on weight were provided directly by the fishermen for individuals from Brist and Pelješac while we estimated length of the specimen from Zadar in relation to the size of the fish container. Since we did not get the permission for publication of the photo of the Zadar specimen, this one is not shown in the paper, but is available on request.

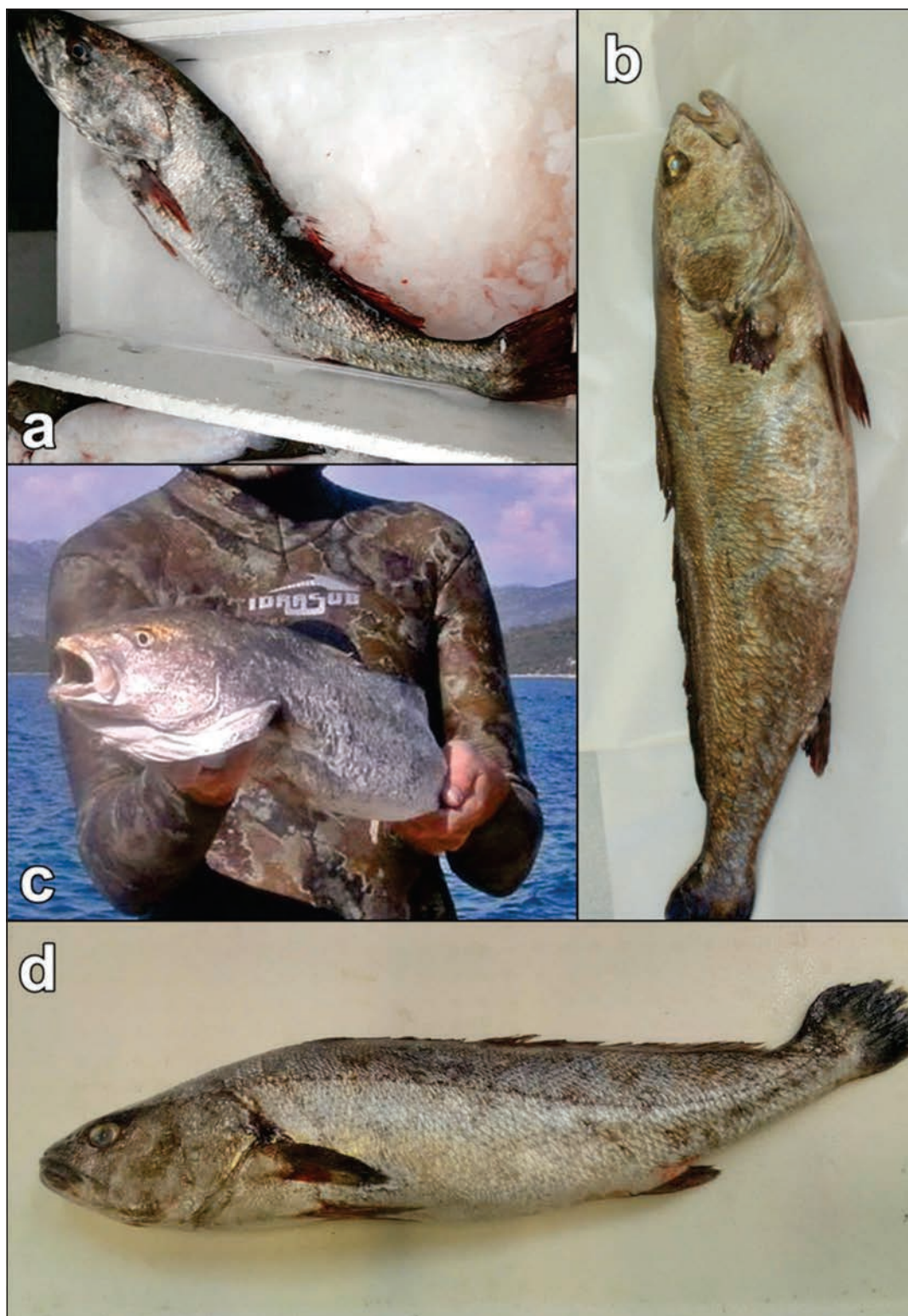


Fig. 2: Photographs of the caught meagre specimens from: a – Piran (photo: M. Buh), b – Brist (photo: Željko and Ernesto Trampa), c – Pelješac (photo: Pero Ugarković), d – Rab (photo: Šime Sušič).

Sl. 2: Fotografije ujetih primerkov hame iz: a – Pirana (foto: M. Buh), b – Brista (foto: Željko in Ernesto Trampa), c – Pelješca (foto: Pero Ugarković), d – Raba (foto: Šime Sušič).

RESULTS AND DISCUSSION

All specimens were identified as *Argyrosomus regius* based on distinctive features that could be clearly seen from the photographs provided (Fig. 2). All specimens had elongated body pearly-silver in colour with bronze hints on the dorsal part and fins of reddish colour; the second dorsal fin much longer than the first; ventral fins positioned directly below relatively short pectoral fins. Head is rather large in respect to the body with a large terminally positioned mouth of yellowish colour. The estimated total length (TL) of the specimen from Slovenia was 650 mm (Fig. 2a) while the Croatian specimen from Brist measured 740 mm TL and weighed 4.5 kg (Fig. 2b) and the specimen from Pelješac weighed 2.2 kg (Fig. 2c, no data on TL). For the specimen from Zadar area, we estimated the TL ranging between 750–800 mm. According to the previously documented length-at first maturity (Gonzalez-Quiros *et al.*, 2011; Abou Shabana *et al.*, 2012) all specimens were either mature or close to its matureness.

Prior to these records, the last documented record of a wild specimen in the Adriatic Sea dates from August 2008, from the area near Neretva river mouth in Croatia (Dulčić *et al.*, 2009). This specimen was considered as an escapee from the mariculture. In Croatian waters the meagre was declared as regionally extinct species (Jardas *et al.*, 2008), although there is a small possibility that some specimens can find their way into Croatian waters from the area of Bojana river mouth (Montenegro), hosting one of the last wild populations of this species (Joksimović, 2007) in the Adriatic Sea. Since there are no wild populations in the Middle and North Adriatic and due to the fact that the only remaining wild populations in the southern Adriatic are scarce (Joksimović, 2007; Jardas *et al.*, 2008; Dulčić *et al.*, 2009), we presume that the specimen collected near Brist (Croatia) probably originated from the mariculture facilities from Mljet island which was active during 2011 when the specimen was collected. The same is probably true for the specimen from Pelješac where, beside one specimen reported herein, several other specimens were caught in summer 2012 by various fishermen (P. Ugar-ković, *pers. comm.*).

We are also aware of a specimen caught near Ulcinj (Montenegro) in May 2016 which appeared on social network (Facebook group »More i Ribolov«) as a curiosity. Presence of farmed meagre escapees have been reported from many areas in the Mediterranean, even in areas far from meagres natural distribution, or in areas where it is considered locally absent or extinct (Mayol *et al.*, 2000; Dulčić *et al.*, 2009; Sanchez-Jerez *et al.*, 2011; Arechavala-Lopez *et al.*, 2015). There are several places in the Adriatic where the meagre is still farmed, although the production is relatively small in comparison to overall marine fish production (Kružić *et al.*, 2016; Cataudella & Spagnolo, 2011). In Croatia there are two areas where meagre is still cultured in the floating cages, the first on island Hvar and the second

on islands off Zadar (Pašman, Ugljan, Dugi otok) (Kružić *et al.*, 2016). Farms from Zadar area were probably the source of meagre escapees encountered in the area. Indeed, in 2012 there were media reports of significant quantities of smaller specimens (300–700 g) of meagre being caught near Lošinj Island by the local fishermen which probably originated from fish farms in vicinity (Šuljić, 2012). In Italian part of the Adriatic Sea two areas host the meagre production, Adriatic part of Apulia and the Gulf of Trieste (Cataudella & Spagnolo, 2011).

According to geographic position, the Cà Zuliani mariculture at Monfalcone in the Gulf of Trieste seems to be the appropriate site where the Slovenian specimen originated from. In that farm, placed in the East-West canal of Monfalcone, two small cages were, at the time, devoted to the production of the meagre. The sea water in this canal is heated by the discharge water of electric plant helping to a better production of the species, known not to be prone to the temperatures below 11°C, which are common for the area during winter periods. Without the heated water discharges the production of the meagre would not be possible, as was observed in the beginning of 2017 when all specimens from the cages died due to water temperature drop, which was a direct consequence of the disrupted water discharge from the power plant (biologist and mariculture operator Walter de Walderstein, *pers. comm.*). The water temperature drops during winter time, from the site of production through the canals to the waters of the Gulf of Trieste, which would most probably prevent any possible escapees to reach the open sea. According to the interview held with Walter de Walderstein there were also no damages observed to the cages in the canal and therefore no fish are presumed to have escaped from there. According to these statements it cannot be excluded that the Slovenian specimen could originate from the distant maricultures from the Middle Adriatic, which are several hundred kilometres away from the place of capture. Meagre have a low degree of site fidelity (Toledo-Guedes *et al.*, 2009; Arechavala-Lopez *et al.*, 2016) and regularly perform seasonal migrations. Moreover, they are capable of swimming over long distances (Gonzalez-Quiros *et al.*, 2011; Morales-Nin *et al.*, 2012). Distance from Middle Adriatic mariculture facilities to the Gulf of Trieste could still be within its range and possible to overcome. According to Grubišić (1967), this species has been occurring in the northern Adriatic until the middle of the 20th century, although it was very rare. Despite this fact the meagre has so far never been recorded for the area of the Slovenian Sea according to available literature (Matjašič & Štirn, 1975; Kryštufek & Janžekovič, 1999), making the specimen reported here-in the first record for the Slovenian Sea.

Finally, although rare, occurrences of meagre in the Adriatic Sea seem to be occasional in the recent years. During the final preparation of this manuscript, we got informed about the catch of meagre from in waters off

Lopar on Rab island (10th April 2018; Croatian coast; W=1.75 kg) (Fig. 1) accompanied with a photo of the specimen (Fig. 2d) (Šime Sušić, *pers. comm.*).

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PRVI PRIMER POJAVLJANJA HAME, *ARGYRO SOMUS REGIUS* (ASSO, 1801),
V SLOVENSKEM OBALNEM MORJU Z DODATNIMI ZAPISI POJAVLJANJA
IZ HRVAŠKEGA DELA JADRANA

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POVZETEK

Primerek hame, Argyrosomus regius (Asso, 1801) so 24. novembra 2016 ujeli v pridveno vlečno mrežo na peščeno muljastem delu slovenskega morja, na globini okoli 20 m. To je prvi zapis za to vrsto v slovenskem morju. Ker v srednjem in severnem delu Jadrana ni divjih populacij hame, gre verjetno za primerek, ki je ušel iz marikulture. Avtorja v članku podajata tudi dodatna pojavljanja iz hrvaškega dela Jadrana.

Ključne besede: hama, *Argyrosomus regius*, Jadransko morje, ubežnik, akvakultura

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