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ADDITIONAL RECORDS OF NON-INDIGENOUS, RARE AND LESS KNOWN FISHES IN THE EASTERN ADRIATIC

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ABSTRACT

Authors report additional records of five fish species (Caranx crysos, Fistularia commersonii, Ruvettus pretiosus, Tylosurus acus imperialis, Zu cristatus) that are considered non-indigenous, rare and less known species in the Adriatic Sea. C. crysos and F. commersonii can be considered as established species in the Adriatic Sea.

Key words: *Caranx crysos, Fistularia commersonii, Ruvettus pretiosus, Tylosurus acus imperialis, Zu cristatus, Adriatic Sea*

NUOVE SEGNALAZIONI DI PESCI NON INDIGENI, RARI E MENO CONOSCIUTI NELL'ADRIATICO ORIENTALE

SINTESI

Gli autori riportano nuove segnalazioni di cinque specie ittiche (Caranx crysos, Fistularia commersonii, Ruvettus pretiosus, Tylosurus acus imperialis e Zu cristatus) che vengono considerate specie non indigene, rare e meno conosciute nel mare Adriatico. C. crysos e F. commersonii possono essere considerate come specie stabilizzate nel mare Adriatico.

Parole chiave: *Caranx crysos, Fistularia commersonii, Ruvettus pretiosus, Tylosurus acus imperialis, Zu cristatus, mare Adriatico*

INTRODUCTION

In the Adriatic Sea, at least 24 non-indigenous fish species have been reported in the last two decades of which 13 are Lessepsian migrants (Dulčić & Dragičević, 2011). Pečarević *et al.* (2013) reported on 22 fish non-indigenous fish species that have been recorded in the Eastern Adriatic.

Many of fish species are by no means “rare” in the general sense of the term but are little-known, often because they are small, secretive, and have neither commercial nor sporting or any other value (Dulčić & Lipej, 2002).

Numerous species, previously either rare or completely absent, have recently become more common in the Adriatic Sea. However, although first records of the species are usually documented, tracing of species establishment or subsequent expansion is rarely reported. As a consequence, status of species which are considered rare or very rare is usually left unchanged in spite of species establishment or further expansion. Additionally, subsequent records may indicate that previous occurrences were not just accidental, but may suggest that new region is included in the zoogeographic range of the species (Golani & Levy, 2005).

The aim of the present work is to report additional records of fishes which have hitherto been regarded as

rare or less known and those which have only recently been recorded in the Adriatic Sea for the first time.

MATERIAL AND METHODS

The geographical area concerned in this study is eastern Adriatic (Croatian and Montenegrin waters). Information on the occurrence of studied species mostly originates from the citizens (mostly professional and sport fishermen) which provided either photographs upon which the determination of the species was based or the entire specimen. When possible, basic measurements were taken such as TL (total length) and W (weight). Some of the collected specimens (*Caranx crysos*, *Fistularia commersonii*, *Tylosurus acus imperialis*) were deposited in the Ichthyological collection of the Institute for Marine Biology in Kotor, Montenegro.

Morović (1973) proposed classification of fishes regarding their rarity: a) if the species is recorded fewer than five times, it should be treated as a very rare species, b) if there are up to ten records, then the species is considered to be rare, c) fish species caught in certain areas and only in a specific season should be treated as fairly rare. He also suggested that the number of occurrences should be evaluated based on scientifically documented reports.

RESULTS AND DISCUSSION

In this paper we report records of non-indigenous, rare and less known fishes from the eastern Adriatic (Croatian and Montenegrin waters) (Fig. 1).

Non-indigenous species

CARANGIDAE

Caranx crysos (Mitchill, 1815)

Material examined. Three specimens of blue runner were caught in the eastern Adriatic: first specimen (TL =



Fig. 1: Map indicating locations of records of *Caranx crysos* (square), *Zu cristatus* (dot), *Ruvettus pretiosus* (+), *Fistularia commersonii* (O), *Tylosurus acus imperialis* – 2 specimens (star).

Sl. 1: Zemljevid z označenimi lokalitetami, kjer so bili ujeti primerki vrst *Caranx crysos* (kvadrat), *Zu cristatus* (pika), *Ruvettus pretiosus* (+), *Fistularia commersonii* (O), *Tylosurus acus imperialis* – 2 primerka (zvezdica).

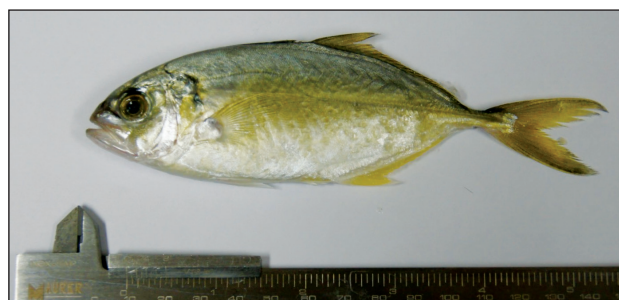


Fig. 2: A specimen of *C. crysos* caught on 9 December, 2103 near settlement Orahovac near Kotor (Boka Kotorska Bay, Montenegrin waters). (Photo: Z. Ikica)

Sl. 2: Primerek vrste *C. crysos*, ujet 9. decembra 2013 pri naselju Orahovac blizu Kotorja (Boka Kotorska, črnogorske vode). (Foto: Z. Ikica)

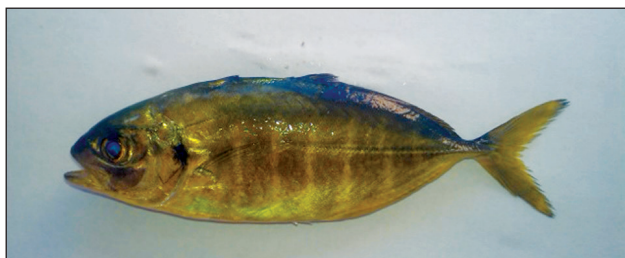


Fig. 3: A specimen of *C. crysos* caught in Pelješac channel in October 2013 (southern Adriatic, Croatian waters) 2013. (Photo: N. Alač)

Sl. 3: Primerek vrste *C. crysos*, ujet v pelješkem kanalu v oktobru 2013 (južni Jadran, hrvaške vode). (Foto: N. Alač)

15.6 cm, W = 38.1 g, CC1) (Fig. 2) was caught by beach seine "srdelara" on 9 December, 2103 near settlement Orahovac near Kotor (Boka Kotorska Bay, Montenegrin waters); second specimen was caught near Rogoznica (near Šibenik, Croatian waters) by spear-gun on 14 August, 2013 (unfortunately without any other data on specimen, except photograph; third specimen (Fig. 3) was caught in Pelješac channel, Southern Adriatic in October 2013 (approx. 12 cm TL).

Remarks. Blue runner, *Caranx crysos*, is distributed in the eastern Atlantic from Senegal to Angola, including the western Mediterranean, St. Paul's Rock, and Ascension Island. It has also been reported from Mauritania and the western Atlantic from Nova Scotia in Canada to Brazil, including the Gulf of Mexico and the Caribbean (Froese & Pauly, 2014). First record of this species, for the Adriatic, was in the Northern Adriatic (western coast of Istria peninsula, Croatia) (TL = 368 mm, W = 634 g) on 27 August, 2008 (Dulčić et al., 2009), while second record was in the south-eastern Adriatic on 1 March, 2013 near Ulcinj (Montenegrin waters) (Dulčić et al., 2014). Considering available information, it seems that *C. crysos* established its population in the Adriatic. This statement is supported by the fact that juveniles and adults of the species have been recorded in the area of the whole eastern Adriatic, and the frequency of the records is increasing. Furthermore, due to certain similarity between this species and some autochthonous congeneric species, especially in juvenile phase, it is possible that its abundance is underestimated.

FISTULARIDAE

Fistularia commersonii Rüppell, 1838

Material examined. Two specimens of Lessepsian migrant *Fistularia commersonii* were caught in Montenegrin waters: first specimen (TL = 119.1 cm, W = 558.4 g, FC3) (Fig. 4) was caught by gill-net called "polandara" on 1 December, 2013 near Tivat (Blue horizons, 42° 23' N, 18° 40' E), second specimen (Fig. 5) was caught near Budva on 16 November, 2013 with a spear gun (unfortunately we did not get any other data on specimen).



Fig. 4: A specimen of *F. commersonii* caught by gill-net called "polandara" on 1 December 2013, near Tivat (Montenegro). (Photo: Z. Ikica)

Sl. 4: Primerek vrste *F. commersonii*, ujet v mrežo polandaro 1. decembra 2013 blizu Tivata. (Foto: Z. Ikica)



Fig. 5: A specimen of *F. commersonii* caught near Budva on 16 November, 2013. (Photo: Z. Ikica)

Sl. 5: Primerek vrste *F. commersonii*, ujet 16. novembra 2013 blizu Budve. (Foto: Z. Ikica)

Remarks. The bluespotted cornetfish, *F. commersonii*, originally distributed in the Indian and Pacific Oceans (Froese & Pauly, 2014), is today one of the most successful invaders of the Mediterranean Sea and European waters (Azzurro et al., 2012). First Adriatic records of this species consider two specimens caught on 7 November, and 15 December, 2006 in trammel nets off the coastal waters of Tricase Porto (southwestern Adriatic, Italy) and Sveti Andrija (southeastern Adriatic, Croatia), respectively (Dulčić et al., 2008). Juveniles of this species were caught in Molunat Bay (Croatian waters) (Dulčić et al., 2013). Additional records of *F. commersonii* could support previously proposed hypothesis about self-sustaining population in the southern Adriatic (Croatian and Montenegrin waters).

Rare and less known species

GEMPYLIDAE

Ruvettus pretiosus Cocco, 1829

Material examined. Two specimens of oilfish (Fig. 6) were caught near peninsula Prevlaka (southern Adriatic) in summer 2012. Only approximate weight of the fishes were provided by the fishermen (W1 = approx. 15 kg, W2 = approx. 10 kg).

Remarks. Oilfish is an oceanic, benthopelagic species found on the continental slope and underwater at about 100-700 m (Jardas, 1996). It is rare in the Adriatic, occurring mostly in the southern part. One speci-



Fig. 6: Two specimens of oilfish *R. pretiosus* were caught near peninsula Prevlaka (southern Adriatic, Croatian coast) in summer 2012. (Photo: N. Cvitković)

Sl. 6: Primerka vrste *R. pretiosus*, ujeta blizu polotoka Prevlaka (južni Jadran, hrvaške vode) poleti 2012. (Foto: N. Cvitković)

men recorded in the northern Adriatic represents the northernmost extension in the range of this species in the Adriatic (Bettoso & Dulčić, 1999). It was reported for the first time in the Adriatic by Kolombatović (1882) near the island Šolta (eastern Adriatic, Croatian waters) in 1875. After that in 1960 one specimen (TL = 175 cm, W = 22.5 kg) was caught near settlement Igrane near Makarska. Overall, only 5 documented records, including two from this study, are reported from the Adriatic. It seems that *R. pretiosus* is a very rare species occurring only sporadically in the Adriatic waters.

BELONIDAE

Tylosurus acus imperialis (Rafinesque, 1810)

Material examined. Two specimens of the agujon needlefish *Tylosurus acus imperialis* (Rafinesque, 1810) were caught in Montenegrin waters: on 17 June, 2007 a



Fig. 7: A specimen of *T. acus imperialis* was caught in front of St. Nikola Island, Budva (Montenegro). (Photo: Z. Ikica)

Sl. 7: Primerak vrste *T. acus imperialis* je bil ujet pred otokom Sv. Nikole blizu Budve (Črna gora). (Foto: Z. Ikica)

1070 mm (TL) specimen was caught by gillnet at 5–7 m depth near Budva (W = 1820 g, fully mature female with visible large, whitish eggs; TAI1); on 9 June, 2011 in early morning a specimen (Fig. 7) was caught in front of St. Nikola Island, Budva (Montenegro) (42° 16' N, 18° 50' E), in shallow waters (6.5 m depth) (specimen was found still alive, entangled in a gillnet "polandara").

Remarks. *Tylosurus acus imperialis* is distributed in the Eastern Atlantic (Cape Verde and Morocco) and the Mediterranean Sea (Froese & Pauly, 2014). Two records from this study were the first records of this species for the eastern Adriatic (Montenegrin waters). Prior to these records, two male and one female specimens of the agujon needlefish were collected off the southwestern Adriatic coast representing the first record for the Adriatic Sea (Bello, 1995). This species could still be considered very rare in the eastern Adriatic although there are some indications that its abundance in Montenegrin waters is underestimated (Đurović, pers. comm.).

TRACHIPTERIDAE

Zu cristatus (Bonelli, 1819)

Material examined. Two specimens of scalloped ribbonfish were recently recorded in the eastern Adriatic. First specimen (TL = approx. 20 cm) (Fig.8) was found stranded ashore near Zadar in December 2009. Second specimen (TL= approximately 50 cm) (Fig.9) was caught in summer of 2013, near cape Pelegrin (northern coast of Island Hvar) with a beach seine "girarica". Additionally, in November 2004 a juvenile specimen of *Zu cristatus* was caught in the harbour of Vis on Vis Island (identification based on photograph, but with no additional data).

Remarks. The scalloped ribbon fish (Pisces: Trachipteridae) is a cosmopolitan meso-bathypelagic species of circumglobal distribution occurring in the tropical through temperate Mediterranean Sea, Atlantic, Indian and



Fig. 9: A specimen of *Z. cristatus* caught by gill-net in July 2013 near Cape Pelegrin, Hvar channel (northern coast of Island Hvar, Croatian waters). (Photo: V. Žuanić)

Sl. 9: Primerak vrste *Z. cristatus*, ujet v ribiško mrežo v juliju 2013 blizu rta Pelegrin (severna obala otoka Hvara, hrvaške vode). (Foto: Vinko Žuanić)



Fig. 8: A specimen of *Z. cristatus* was found thrown ashore near Zadar (Croatian waters) on 3 December, 2009. (Photo: P. Bavdek)

Sl. 8: Primerek vrste *Z. cristatus*, naplavljen na obalo blizu Zadra (hrvaške vode) 3. decembra 2009. (Foto: P. Bavdek)

Pacific oceans (Froese & Pauly, 2014). It is rare in the Adriatic Sea, occurring only sporadically (Jardas, 1996).

It was reported that 16 individuals (mostly juveniles) were recorded in the northern and central Adriatic between 1846 and 1973 (Jardas, 1980). The last documented record of adult specimen was on 31 December, 1973 in Hvar channel (eastern central Adriatic) near the town of Bol (southern coast of Island Brač). There were no documented records of adults and juveniles in the eastern Adriatic in the period from 1973 until 1987. Pallaoro & Jardas (1996) reported a finding of scalloped ribbon fish (TL = 59.5 cm) caught in 1987 in the middle eastern Adriatic. Meanwhile, early stages (eggs) of scalloped ribbon fish were reported for the first time in the Adriatic waters in 1998 (Dulčić, 2002). Scalloped ribbonfish is considered as less known species for the Adriatic and reasons for its occasional presence are unknown.

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NOVI ZAPISI O TUJERODNIH, REDKIH IN MANJ ZNANIH VRSTAH RIB
V VZHODNEM JADRANU

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POVZETEK

Avtorji poročajo o novih zapisih petih vrst rib (*Caranx crysos*, *Fistularia commersonii*, *Ruvettus pretiosus*, *Tylosurus acus imperialis*, *Zu cristatus*), ki so tujerodne, redke ali manj znane vrste v Jadranskem morju. Za vrsti *C. crysos* in *F. commersonii* menijo, da jih lahko uvrstimo med ustaljene vrste v Jadranskem morju.

Ključne besede: *Caranx crysos*, *Fistularia commersonii*, *Ruvettus pretiosus*, *Tylosurus acus imperialis*, *Zu cristatus*, Jadransko morje

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