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CONFIRMED OCCURRENCE OF *JAYDIA SMITHI* (APOGONIDAE)
AND *SERIOLA FASCIATA* (CARANGIDAE) ON THE SYRIAN COAST
(EASTERN MEDITERRANEAN SEA)

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ABSTRACT

The present paper reports additional records of two exotic species collected from Syrian marine waters. The first capture concerns a specimen of Smith's cardinalfish Jaydia smithi Kotthaus, 1970, the second a specimen of lesser amberjack Seriola fasciata (Bloch, 1793). The two specimens confirm the presence of both species in the area, suggesting that viable populations have successfully established. S. fasciata displays significant commercial value and a management plan should be implemented within Syrian fisheries to protect the species and prevent its decline in the area.

Key words: Osteichthyes, Teleostei, exotic species, Syrian marine waters

PRESENZA CONFERMATA DI *JAYDIA SMITHI* (APOGONIDAE) E *SERIOLA FASCIATA*
(CARANGIDAE) LUNGO LA COSTA SIRIANA (MEDITERRANEO ORIENTALE)

SINTESI

Il presente lavoro riporta ulteriori ritrovamenti di due specie esotiche nelle acque marine siriane. La prima cattura riguarda un esemplare di Jaydia smithi Kotthaus, 1970, la seconda un esemplare di ricciola fasciata Seriola fasciata (Bloch, 1793). I due esemplari confermano la presenza di entrambe le specie nell'area, suggerendo che le popolazioni vitali si sono stabilite con successo. S. fasciata ha un valore commerciale significativo e dovrebbe venir attuato un piano di gestione nell'ambito della pesca siriana per proteggere la specie e prevenirne il declino nell'area.

Parole chiave: Osteichthyes, teleostei, specie esotiche, acque marine siriane

INTRODUCTION

For several decades, the Syrian coast has been facing a steady and continuous invasion of exotic species, with fishes being the most abundant among them (Saad & Khrema, 2023). Such a phenomenon is the result of the warming of the Mediterranean Sea due to climate change (Ben Raïs Lasram & Mouillot, 2009), which enhances the intrusion of species previously unknown in this sea, either incoming from the Red Sea following the aperture of the Suez Canal or from the eastern tropical Atlantic through the Strait of Gibraltar. The introduction of exotic species is also a consequence of anthropogenic activities such as shipping, mariculture, and aquarium releases (Saad & Khrema, 2023).

The establishment of exotic species in Syrian marine waters (Ali, 2018; Saad & Khrema, 2023) is partly due to the region's geographic location in the eastern



Fig. 2. Specimen of *Jaydia smithi* (ref. 2329 MSL) collected off Jableh on the Syrian coast, scale bar = 20 mm.

Sl. 2: Primerek vrste *Jaydia smithi* (ref. 2329 MSL), ujet v bližini lokalitete Jableh na sirski obali, merilo = 20 mm.

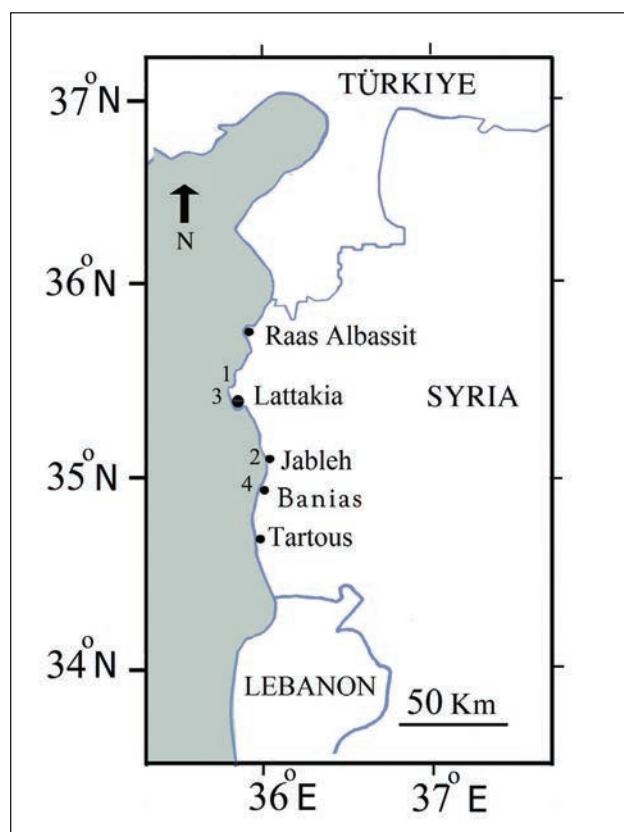


Fig. 1: Map of the Syrian coast indicating the capture sites of *Jaydia smithi*. 1. Off Lattakia (Al-Shawy et al., 2017). 2. Off Jableh (this study). 4. Off Baniyas (Ibrahim et al., 2020); and of *Seriola fasciata* 3. Off Lattakia (Jawad et al., 2015), 4. Off Baniyas (this study).

Sl. 1: Zemljevid sirske obale z označenimi lokalitetami ulova vrste *Jaydia smithi*. 1. Lattakia (Al-Shawy in sod., 2017). 2. Jableh (ta raziskava). 4. (Ibrahim in sod., 2020); in vrste *Seriola fasciata* 3. Lattakia (Jawad in sod., 2015), 4. Baniyas (ta raziskava).



Fig. 3. Specimen of *Seriola fasciata* (ref. 2330 MSL) collected off Baniyas on the Syrian coast, scale bar = 20 mm.

Sl. 3: Primerek vrste *Seriola fasciata* (ref. 2330 MSL), ujet v bližini lokalitete Baniyas na sirski obali, merilo = 20 mm.

Mediterranean Sea and its proximity to the Red Sea, but also, as Gruvel noted (1931), because Syrian marine waters clearly display favorable environmental parameters for the development and production of local fisheries. This opinion has been furtherly confirmed by Foulquié and Dupuy de la Grandrive (2003), and more recently by Ali (2018). Additionally, there are other favourable environmental parameters contributing to the development and production of local fisheries, which play an important role in the country's economy.

Regular investigations conducted along the Syrian coast with the assistance of experienced fishermen, knowledgeable about fishing grounds, have resulted in the collection of additional records of two rare exotic species: Smith's cardinalfish *Jaydia smithi* Kotthaus, 1970 and the lesser amberjack *Seriola fasciata* (Bloch, 1793). This paper describes these two species, along with providing some comments on their distribution in the area and throughout the Mediterranean Sea.

Tab. 1: Morphometric measurements in mm and as percentages of total length (%TL), meristic counts, and total body weight in grams recorded for the specimen of *Jaydia smithi* (ref. 2329 MSL) captured off the Syrian coast.

Tab. 1: Morfometrične meritve, izražene v mm in kot delež celotne dolžine (%TL), meristična štetja in celokupna telesna masa (v gramih) primerka vrste *Jaydia smithi* (ref. 2329 MSL), ujetega v vodah blizu sirske obale.

Reference	2329 MSL	
Morphometric measurements	mm	%TL
Total length	122	100.0
Standard length	100	82.0
Body depth	35	28.7
Head length	23	18.9
Eye diameter	8	6.6
Snout length	5	4.1
Upper jaw length	11	9.0
Lower jaw length	13	10.7
First dorsal fin length	18	14.8
Second dorsal fin length	18	14.8
Pectoral fin length	20	16.4
Pelvic fin length	22	18.0
Anal fin length	26	21.3
Caudal fin length	25	20.5
Pre-dorsal length	40	32.8
Pre-pectoral length	38	31.1
Pre-pelvic length	30	24.6
Pre-anal length	68	55.7
Meristic counts		
Fist Dorsal fin	VII	
Second dorsal fin	I+ 9	
Pectoral fin	14	
Pelvic fin	I + 5	
Anal fin	II+ 8	
Caudal fin	17	
Total body weight (g)	35	

Tab. 2: Morphometric measurements in mm and as percentages of total length (%TL), meristic counts, and total body weight in grams recorded for the specimen of *Seriola fasciata* (ref. 2330 MSL) captured off the Syrian coast.

Tab. 2: Morfometrične meritve, izražene v mm in kot delež celotne dolžine (%TL), meristična štetja in celokupna telesna masa (v gramih) primerka vrste *Seriola fasciata* (ref. 2330 MSL), ujetega v vodah blizu sirske obale.

Reference	2330 MSL	
Morphometric measurements	mm	%TL
Total length	150	100.0
Standard length	121	80.7
Body depth	63	42.0
Head length	43	28.7
Eye diameter	5	3.3
Snout length	7	4.7
Upper jaw length	23	15.3
Lower jaw length	23	15.3
Dorsal fin length	82	54.7
Pectoral fin length	29	19.3
Pelvic fin length	37	24.7
Anal fin length	44	29.3
Caudal fin length	34	22.7
Pre-dorsal length	48	32.0
Pre-pectoral length	45	30.0
Pre-pelvic length	53	35.3
Pre-anal length	86	57.3
Meristic Counts		
First dorsal fin	VIII	
Second dorsal fin	I+30	
Pectoral fin	15	
Pelvic fin	5	
Anal fin	II +I+30	
Caudal fin	19	
Gillrakers	20 (5+15)	
Scale above/below lateral line	20/30	
Total body weight	60	

MATERIAL AND METHODS

On 8 August 2022, a specimen of *Jaydia smithi* was caught using a demersal fixed gill net, at a depth of 10 m over a rocky bottom, 2 km off Jableh city, at 35°22'02" N, 35°53'45" E (Fig. 1).

On 2 December 2023, a specimen of *Seriola fasciata* was captured using a purse seine net, at a depth of about 20 m on a sandy bottom, 7 km offshore from the city of Baniyas, at 35°10'41.48" N, 35°51'45.30" E (Fig. 1).

Morphometric measurements for the two specimens were recorded to the nearest millimeter and are detailed, including percentages of total length, meristic counts, and total body weight, in Table 1 for *J. smithi* and Table 2 for *S. fasciata*. Subsequently, the two individuals were preserved in 10% buffered formaldehyde and deposited in the Ichthyological Collection of the Marine Sciences Laboratory, Faculty of Agriculture, Tishreen University, under catalogue numbers 2329 MSL for the *J. smithi* and 2330 MSL for the *S. fasciata* specimens.

RESULTS AND DISCUSSION

Smith's cardinal fish *Jaydia smithi* Kotthaus, 1970

The specimen of *Jaydia smithi* (Fig. 2) measured 122 mm in total length (TL), 100 mm in standard length (SL), and weighed 35 g in total body weight. It was identified via the combination of the following main morphological characters and meristic counts (see Tab. 1): body ovate to elongate, slightly compressed, exceeding 100 mm TL; eye large; mouth terminal and oblique; two separated dorsal fins, the third and fourth spines in the first dorsal fin the longest; second dorsal fin much higher; anal fin origin behind origin of second dorsal fin; caudal fin rounded; color of body yellowish-brown; first dorsal fin with dark spot on top; a series of dark dots on the second dorsal fin forming a horizontal line; edges of second dorsal fin and caudal fin black; pectoral and pelvic fins light grey.

The morphology, morphometric measurements, meristic counts, and color are fully consistent with previous descriptions of *J. smithi* (Golani et al., 2008; Goren et al., 2009; Gökoglu et al., 2010; Al-Shawy et al., 2017; Golani et al., 2021). This finding is an additional record of *J. smithi* from Syrian marine waters, where Al-Shawy et al. (2017) and Ibrahim (2020) previously collected five specimens. It also confirms the establishment of the species in the area and the Levant Basin. According to Golani et al. (2021), the distribution of *J. smithi* appears to be restricted to the eastern basin. Despite the fact that the species is a Lessepsian migrant (*sensu* Por, 1971), its morphology indicates that it is not a good swimmer and probably not prone to long migrations. Additionally, *J. smithi* does not have local economic value and is currently discarded at sea after capture. This likely explains why it has escaped the attention of researchers.

Lesser amberjack *Seriola fasciata* (Bloch, 1793)

The specimen of *Seriola fasciata* (Fig. 3) measured 155 mm in total length (TL), 121 mm in standard length (SL), and weighed 60 g in total body weight. It was identified via the combination of the following main morphological characters and meristic counts (see Tab. 2): body elongated, oblong, and compressed; head slightly convex; posterior end of upper jaw relatively slender; soft anal fin base distinctly shorter than dorsal fin base; caudal peduncle grooves present and moderately developed, lateral line without scutes; color of body yellowish with eight dark body bars, and a single smaller one at the end of caudal peduncle.

The morphology, morphometric measurements, meristic counts, and color are in total agreement with previous descriptions of *S. fasciata* (Smith-Vaniz, 1986; Massutí & Stefanescu, 1993; Deidun et al., 2011; Jawad et al., 2015; Golani et al., 2021). *S. fasciata* is known in the western Atlantic from Bermuda and Massachusetts to Brazil, and in the eastern Atlantic from the waters surrounding the Azores, Madeira, Canary, Cabo Verde, and St. Helena islands (Golani et al., 2021).

In the Mediterranean, the species was first recorded in the Balearic Islands (Massutí & Stefanescu, 1993), gradually expanding its distribution throughout the western basin, especially the Italian seas and the Strait of Sicily (Andaloro et al., 2005), including the Maltese Islands (Deidun et al., 2011). *S. fasciata* migrated eastwards and has been recorded from Libya (Elbaraasi et al., 2019), Egypt (El Sayed et al., 2017), the Greek island of Rhodes (Corsini et al., 2006), and the coast of Turkey (Bilecenoglu et al., 2014). Finally, it reached the Levant Basin (Bariche & Fricke, 2020; Golani et al., 2021) and a first record occurred off the coast of Syria (Jawad et al., 2015).

The present specimen is the second record of *S. fasciata* for Syrian marine waters and the fourth for the Levant Basin, where a viable population is successfully established. *S. fasciata* is one of the rare species of Atlantic origin that has been able to expand its distribution so rapidly throughout the Mediterranean. The first record of *S. fasciata* occurred in 1989 (Massutí & Stefanescu, 1993) and within a few years, the species gained commercial value in the Strait of Sicily (Andaloro et al., 2005) and rapidly spread to the eastern basin, reaching the easternmost sectors. Contrary to *J. smithi*, *S. fasciata* possesses the morphology of a good swimmer capable of long migrations and could be considered a Herculean sprinter, analogous to the blue-spotted cornetfish *Fistularia commersonii* (Rüppel, 1835), described as a Lessepsian sprinter by Karachle et al. (2004). It is evident that *S. fasciata* is finding adequate resources to thrive and reproduce in its new environment, where it is also locally used for human consumption. Therefore, in full agreement with Jawad et al. (2015), a management plan should be implemented in Syrian fisheries to protect *S. fasciata* and prevent the decline of this recently established species in the area.

POTRJENO POJAVLJANJE SMITHOVEGA MORSKEGA KRALJIČKA *JAYDIA SMITHI*
(APOGONIDAE) IN MALEGA GOFA *SERIOLO FASCIATA* (CARANGIDAE)
NA SIRSKI OBALI (VZHODNO SREDOZEMSKO MORJE)

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POVZETEK

*Avtorji poročajo o dodatnih zapisih o pojavljanju dveh eksotičnih vrst, ujetih v sirskih morskih vodah. Prvi ulov se nanaša na primerek Smithovega morskega kraljička, *Jaydia smithi* Kotthaus, 1970, drugi pa na primerek malega gofa, *Seriola fasciata* (Bloch, 1793). Primerka potrjujeta pojavljanje obeh vrst na obravnavanem območju, kar odpira možnost, da sta se vzpostavili viabilni populaciji obeh vrst. *S. fasciata* je pomembna lovna vrsta, ki ima veliko komercialno vrednost, zato je potrebno v sirskem ribištvu izvajati načrt upravljanja, da se vrsto zaščiti in prepreči njeno upadanje na obravnavanem območju.*

Ključne besede: Osteichthyes, Teleostei, eksotične vrste, sirske morske vode

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