

# ANNALES



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# THE FIRST SUBSTANTIATED RECORD OF AREOLATE GROUper *EPINEPHELUS AREOLATUS* (SERRANIDAE) AND ADDITIONAL RECORDS OF PILOTFISH *NAUCRATES DUCTOR* (CARANGIDAE) FROM THE SYRIAN COAST (EASTERN MEDITERRANEAN SEA)

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## ABSTRACT

A specimen of the non-indigenous species areolate grouper *Epinephelus areolatus* (Forsskål, 1775) and two specimens of pilotfish *Naucrates ductor* (Linnaeus 1758) were fished from the coastal waters off Latakia, Syria. The finding of *E. areolatus* constitutes the first substantiated record of this species for Syrian marine waters and the third for the entire Mediterranean Sea. The areolate grouper is a Lessepsian migrant from the Red Sea which entered the Mediterranean through the Suez Canal. *N. ductor*, on the other hand, has been known to inhabit the Mediterranean Sea together with several other fish species. However, the semi-obligate commensal relationship that it develops with large sharks and rays could explain the species' occurrence in both the Mediterranean and Syrian marine waters. The capture of *N. ductor* reported herein is the second record for the Syrian coast.

**Key words:** Levant Basin, Lessepsian migration, commensalism, large sharks and rays, population

## PRIMO RITROVAMENTO DOCUMENTATO DI *EPINEPHELUS AREOLATUS* (SERRANIDAE) E ULTERIORI SEGNALAZIONI DI *NAUCRATES DUCTOR* (CARANGIDAE) PER LA COSTA SIRIANA (MEDITERRANEO ORIENTALE)

## SINTESI

Un esemplare della specie non indigena *Epinephelus areolatus* (Forsskål, 1775) e due esemplari di pesce pilota *Naucrates ductor* (Linnaeus 1758) sono stati pescati nelle acque costiere al largo di Latakia, in Siria. Il ritrovamento di *E. areolatus* costituisce il primo record documentato di questa specie per le acque marine siriane e il terzo per l'intero Mediterraneo. Si tratta di un migrante lessepsiano proveniente dal Mar Rosso ed entrato nel Mediterraneo attraverso il Canale di Suez. *N. ductor*, invece, è noto per il Mediterraneo, dove convive assieme a diverse altre specie ittiche. Tuttavia, la relazione di commensalità semi-obbligatoria che sviluppa con grandi squali e razze potrebbe spiegare la presenza della specie sia nelle acque marine del Mediterraneo che in quelle siriane. La cattura di *N. ductor* qui riportata è il secondo record per la costa siriana.

**Parole chiave:** Bacino del Levante, migrazione lessepsiana, commensalismi, grandi squali e razze, popolazione

## INTRODUCTION

It has been known from Grivel (1931) as well as more recent literature (Saad, 2005, 2010; Ali, 2018) that fisheries play an important economic role in Syria. Consequently, the local marine waters have been regularly and continuously investigated by researchers assessing the quality and quantities of fish species present in the region (Foulquié & Dupuy de la Grandrive, 2003; Saad et al., 2005; Saad & Alkusairy, 2022). Ali (2018), for example, pointed out the occurrence of non-indigenous species migrating from other areas: from the Red Sea through the Suez Canal or from the eastern tropical Atlantic through the Strait of Gibraltar.

**Tab. 1: Morphometric measurements in mm with percentages of total length (%TL), meristic counts and total body weight recorded in the specimen of *Epinephelus areolatus* (MSL 11/2022) caught off the Syrian coast.**

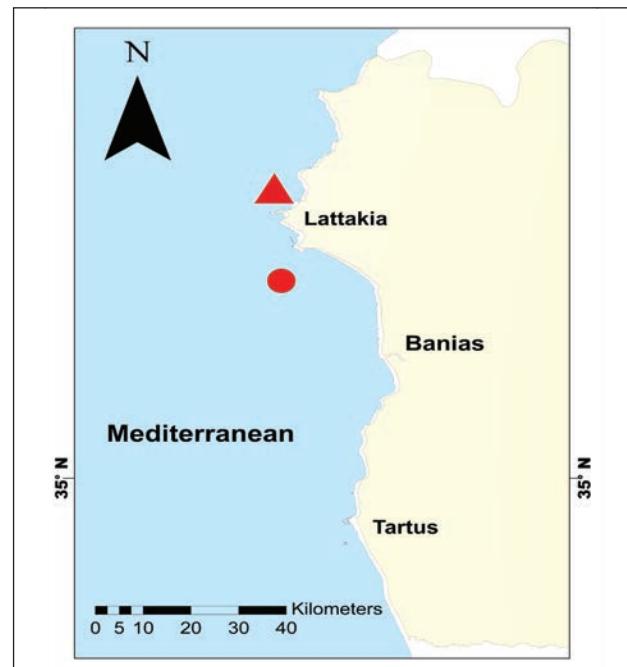
**Tab. 1: Morfometrične meritve v mm in izražene kot delež celotne dolžine (%TL), meristična štetja in totalna telesna masa primerka vrste *Epinephelus areolatus* (MSL 11/2022), ujetega ob sirski obali.**

References	MSL 11/2022	
Morphometric measurements	mm	%TL
Total length	297	100
Standard length	242	81.4
Body depth	73	24.5
Head length	86	28.9
Eye diameter	14	4.7
Snout length	25	8.4
Length of dorsal fin base	133	44.7
Length of anal fin base	39	13.1
Pre-dorsal length	80	26.9
Pre-pectoral length	82	27.6
Pre-pelvic length	84	28.2
Pre-anal length	155	52.1
Meristic counts		
Dorsal fin spines	XI	
Dorsal fin soft rays	17	
Pectoral fin spines	-	
Pectoral fin soft rays	16	
Ventral fin spines	I	
Ventral fin soft rays	5	
Anal fin spines	III	
Anal fin soft rays	9	
Total body weight (gram)	285	

Surveys recently conducted in the area with assistance of local fishermen have allowed the collection of a specimen of areolate grouper *Epinephelus areolatus* Forsskål, 1775, and two specimens of pilotfish *Naucrates ductor* (Linnaeus, 1758). The aim of the present study is to report these captures and comment the distribution of both species in the region and the Mediterranean Sea.

## MATERIAL AND METHODS

On 30 July 2022, a specimen of *Epinephelus areolatus* was caught by fish trap at a depth of 30 m, off the Ibn Hani region (Fig. 1), close to the city of Latakia ( $35^{\circ}35'37.3''N$ ,  $35^{\circ}45'05.6''E$ ). On 3 October 2022, two specimens of *Naucrates ductor* were caught using a trawling net at a depth of 30 m, south of the city of Latakia ( $35^{\circ}27'05.9''N$ ,  $35^{\circ}43'11.3''E$ ). Some morphometric measurements were recorded to the nearest millimetre and expressed as percentages of total length (TL), together with meristic counts and total body weight (TBW) in gram (Tables 1 and 2). The three specimens were preserved in 10% buffered formalin and deposited in the collection of the Marine Sciences Laboratory, Tishreen University, and assigned reference numbers MSL 11/2022 for *E. areolatus*, and MSL 15/2022 and MSL 16/2022 for *N. ductor*.



**Fig. 1: Map of the Syrian coast indicating the captures sites of *Epinephelus areolatus* (red triangle) and *Naucrates ductor* (red circle).**

**Sl. 1: Zemljevid sirske obale z označenimi lokaliteta mi ulova vrst *Epinephelus areolatus* (rdeči trikotnik) in *Naucrates ductor* (rdeči krogec).**

## RESULTS AND DISCUSSION

*Epinephelus areolatus* (Forsskål, 1775)

The specimen of *E. areolatus* (MSL 11/2022) measured 297 mm total length (TL) and weighed 285 g (Fig. 2). It was identified based on the following: body depth less than head length and 3.3 times in standard length (SL), head length 2.8 times in SL; gill rakers of first gill arch 9 on the upper limb and 16 on lower limb; preopercle with 5 enlarged serrations at the angle; caudal fin truncate or slightly emarginated; head, body, and fins pale, all covered with numerous brownish yellow spots, posterior edge of caudal fin with a distinct white margin. *E. areolatus* can be confused with another alien serranid species recently occurring in the Mediterranean Sea, namely, the spotted grouper *E. geoffroyi* Klunziger, 1870. This latter species does not exhibit a whitish margin on the posterior edge of caudal fin, conversely, it displays more numerous and smaller dark brown spots covering the entire body.

The morphology, morphometric measurements, meristic counts and colour recorded in the present specimen of *E. areolatus* are in agreement with previous descriptions of this species by Heemstra & Randall (1993), Rothman et al. (2016) and Bariche & Edde (2020). Al Mabruk et al. (2021) reported the first occurrence of *E. areolatus* in Syrian marine waters based on a photograph of a specimen that was discovered on social media but was unavailable for confirmation in an ichthyological collection. The present specimen, on the other hand, was thoroughly described following Bello et al. (2014) and deposited in the Ichthyological Collection of the Marine Sciences Laboratory, Tishreen University, with reference number MSL 11/2022. It therefore constitutes the first substantiated record of *E. areolatus* from the Syrian coast.

*E. areolatus* is widely distributed in the Pacific Ocean region bounded by Fiji in the east, Japan in the north, and the Arafura Sea and northern Australia in the south. It is also widespread in the Indian Ocean, from southern Africa and KwaZulu-Natal to the Arabo-Persian Gulf

**Tab. 2. Morphometric measurements in mm with percentages of total length (% TL), meristic counts and total body weight recorded in the two specimens of Naucrates ductor (MSL 15/2022 and MSL 16/2022) caught off the Syrian coast.**

**Tab. 2: Morfometrične meritve v mm in izražene kot delež celotne dolžine (%TL), meristična štetja in totalna telesna masa primerkov vrste Naucrates ductor (MSL 15/2022 in MSL 16/2022), ujetih ob sirski obali.**

References	MSL 15/2022		MSL 16/2022	
	mm	% TL	mm	% TL
Total length (TL)	357	100	351	100
Standard length (SL)	290	81.23	290	82.6
Fork length (FL)	315	88.23	310	88.3
Body depth (BD)	63.2	17.7	77.7	22.13
Head length (HL)	73	20.4	75	21.3
Eye diameter	11	3.11	11	3.25
Pre-orbital length	23	6.4	22	6.26
Post-orbital length	37	10.3	37	10.5
Pre-dorsal length	103	28.8	107	30.4
Dorsal fin base	151	42.2	155	44.15
Pre-pelvic length	83	23.2	84	23.9
Pre-pectoral length	70	19.6	70	19.9
Pectoral fin base	14	3.92	14	3.9
Pre-pelvic length	83	23.2	84	23.9
Pre-anal length	184	51.5	180	51.2
Anal fin base	72	20.1	76	21.6
Peduncle depth	18	5.0	17	4.87
Caudal peduncle length	40	11.2	40	11.3
<b>Meristic counts</b>				
Dorsal fin	III+I+27		IV+I+27	
Anal fin	II+I+16		II+I+16	
Pelvic fin	I+5		I+5	
Total weight (gram)	580 g		540 g	



**Fig. 2: Specimen of *Epinephelus areolatus* (MSL 11/2022) caught off the Syrian coast, scale bar = 50 mm.**  
**Sl. 2: Primerek vrste *Epinephelus areolatus* (MSL 11/2022), ujet ob sirski obali, merilo = 50 mm.**

and the Red Sea *E. areolatus* could be considered a Lessepsian migrant (*sensu* Por, 1978) coming into the Mediterranean Sea through the Suez Canal. The present record and other previous findings in the Levant Basin suggest that a viable population is probably being established in this area.

#### ***Naucrates ductor* (Linnaeus, 1758)**

The two specimens of *N. ductor* herein presented measured 357 mm and 351 mm TL, and weighed 580 g and 540 g, respectively. They were identified based on the following: body elongate, shallow, and barely compressed with nearly equal upper and lower profiles; head profile tapering sharply above anterior half of upper jaw producing a nearly blunt snout; upper jaw very narrow posteriorly and extending to about the anterior margin of eye; teeth in upper and lower jaws minute, arranged in a band; gill rakers on first arch 6 upper, 14 lower for a first specimen, and 8 upper, 15 lower for the second; dorsal fin with 4 spines (last spine in first specimen possibly reduced and skin-covered due to fork length over 20 cm), followed by 1 spine and 25 to 29 soft rays, anal fin with 2 spines separated from the rest of fin followed by 1 spine and 16 soft rays, second dorsal fin lobe short, 2.4 times the fork length; anal fin base short, 1.7 and 1.8 times the second dorsal fin base length, respectively; caudal peduncle with a well-developed lateral, fleshy keel on each side and dorsal and ventral peduncle grooves; body displaying 5 or 6 broad black bands, caudal fin banded with prominent white tips. This description is in total accordance with Smith-Vaniz (1986), Bauchot (1987) and Carpenter & De Angelis (2016). The present specimen (Fig. 3) thus constitutes the third occurrence of the species in Syrian marine waters, where a viable population appears to be fully established (Ali-Basha et al., 2021).

*N. ductor* is a circumtropical marine fish. In the eastern Atlantic, the species is known from the Strait



**Fig. 3: Specimen of *Naucrates ductor* (MSL 16/2022) caught off the Syrian coast, scale bar = 100 mm.**  
**Sl. 3: Primerek vrste *Naucrates ductor* (MSL 16/2022), ujet ob sirski obali, merilo = 100 mm.**

of Gibraltar to southern Angola, including the Azores, Madeira, the Canaries, and the Cape Verde, Ascension and St Helena Islands (Bauchot, 1987). Conversely, it is considered a rare vagrant off the British Isles (Smith-Vaniz, 1986). The species is also found in the Mediterranean Sea and has been reported from the Adriatic Sea (Kovačić et al., 2020), Egypt (El Sayed et al., 2017), Libya (Elbaraa et al., 2019), Turkey (Akyol, 2019) and the Levant Basin (Ben Tuvia, 1971, Ali-Basha et al., 2021). Quignard & Tomasini (2000) count *N. ductor* among the inhabitants of the Mediterranean Sea together with several other fish species. However, Smith-Vaniz (1986) note that *N. ductor* displays a semi-obligate commensal relationship with large sharks and rays, which could explain its occurrence in the Mediterranean and in Syrian marine waters, where these elasmobranch species are captured in relative abundance (Saad & Alkusairy, 2022). Similar patterns could also explain the occurrence of sea lamprey, *Petromyzon marinus* (Linnaeus, 1758) in the same area (Saad et al., 2021).

*N. ductor* is unknown in the Red Sea, and the Suez Canal does not offer sufficient space for migration of large fishes. Hence, entering through the Strait of Gibraltar would seem to be a more likely hypothesis, however, *N. ductor* cannot be considered a Herculean migrant (*sensu* Quignard & Tomasini, 2000). The successful establishment of *E. areolatus* and *N. ductor* in Syrian marine waters speaks to the fact that Syrian marine waters is an environment suitable for the development and production of local fisheries. Such favourable conditions have been confirmed by several papers published over the past decades which show that the number of species comprised in the Syrian ichthyofauna has been regularly increasing (Saad, 2005; Ali, 2018). The number of records of both *E. areolatus* and *N. ductor* to date is sufficient to regard these fish as resident species in Syrian marine waters.

PRVI POTRJEN ZAPIS O POJAVLJANJU RDEČEPIKASTE KIRNJE, *EPINEPHELUS AREOLATUS* (SERRANIDAE), IN DODATNI ZAPIS O POJAVLJANJU PILOTA, *NAUCRATES DUCTOR* (CARANGIDAE), IZ SIRSKE OBALJE  
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*POVZETEK*

V obalnih vodah Latakije (Sirija) so bili ujeti primerek rdečepikaste kirnje *Epinephelus areolatus* (Forsskål, 1775) in dva primerka pilota *Naucrates ductor* (Linnaeus 1758). Najdba vrste E. areolatus predstavlja prvi potrjen zapis o pojavljanju te vrste v sirskih morskih vodah in tretji za celotno Sredozemsko morje. Rdečepikasta kirnja je lesepska selivka, ki je prišla skozi sueški prekop iz Rdečega morja. N. ductor pa je domorodna vrsta, ki prebiva v Sredozemskem morju skupaj z drugimi vrstami. Kljub vsemu pa povezujemo pojavljanje te vrste v Sredozemskem morju in sirskih vodah s semiobligativnim odnosom z velikimi morskimi psi in skati. Ulov pilota N. ductor, o katerem avtorji poročajo, je drugi primer pojavljanja te vrste v sirskih vodah.

**Ključne besede:** levantski bazen, lesepska selitev, komenzalizem, veliki morski psi in skati, populacija

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