



CONFIRMATION RECORD OF THE AREOLATE GROUPER *Epinephelus areolatus* (FORSSKÅL, 1775) (TELEOSTEI: SERRANIDAE) IN SYRIAN MARINE WATERS

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

We confirm the Red Sea (Lessepsian migrant) species the Areolate grouper *Epinephelus areolatus* (Forsskål, 1775), occurrences in the Syrian coast, which constitutes the Fifth record in the entire Mediterranean, 220 mm total length and 144.5 g total weight, was caught by the trap-net on 4 October 2022 at a depth of 50 m over sandy – rocky bottom, off Ras Ibn Hani, Lattakia city. The identification of the present specimen of *E. areolatus* was based on morphological features, colour, and morphometric measurements and meristic counts.

Keywords: *Epinephelus areolatus*; serranidae; Lessepsian migrants; Syrian marine water.

1. INTRODUCTION

The Serranidae family are mostly benthic fish species of tropical and temperate areas, the great majority occur on continental or insular shelves usually in depths less than 200 m, particularly in the Indo-Pacific, Red Sea, and tropical south Atlantic [1,2], includes 3 subfamilies, 75 genera and 538 species [3]. 14 species are found in Syrian waters [4,5]. Several Indo-Pacific species established permanent populations in the Levantine Basin, without extension to the Western Basin regions [2].

The Areolate grouper *Epinephelus areolatus* (Actinopterygii: Serranidae) is a common Serranidae species in the Indo - West Pacific region, including the Red Sea and Arabian Gulf [6], it was described in the Gulf of Aqaba by Khalaf and Disi, [7], it is distinguished from the native species by the

shape and size of the spots on the body and their yellow-brown color. This species was first recorded from the Mediterranean Sea based on a specimen collected by a fisherman at a depth of about 37 m on 30 August 2015 off Haifa, entered through the Suez Canal as a Lessepsian migrant from the Red Sea [8]. Two further specimens were collected in Lebanon: the first was caught off the southern coast of Lebanon on 20 November 2019, and the second was captured on 6 December 2019, with hook and line off Beirut, at about 40 m depth [9]. The last specimen was caught on 29th May 2019 at a depth of 61 m, off the coast of Lattakia, northern Syria [10].

Researchers in Lebanon Bariche et al., [9] and Syria Al Mabruk et al., [10] relied on pictures of this specimen published on a Facebook group, they did not have live or preserved samples.

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In this study, a live specimen of *Epinephelus areolatus* was obtained for the first time in Syrian marine water, and the sample was placed in the Marine Sciences Laboratory, Faculty of Agriculture, Tishreen University, No: MSL 28-2022.

2. MATERIALS AND METHODS

One specimen of *Epinephelus areolatus* was caught on 4th October 2022, mixed with populations of *Epinephelus marginatus*, *Epinephelus aeneus* (180-220 mm total length and 110-150 g total weigh) and

Sillago suezensis, using a commercial trap-net, at a depth of 50 m over sandy – rocky bottom, off Ras Ibn Hani, a locality 10 km north of Lattakia city (35°35'06"N 35°44'46"E) (Fig. 1). Some morphometric measurements were recorded to the nearest millimeter with percentages of standard length (SL), together with meristic counts and total body weight (T.w) in grams. The fish was photographed (Fig. 2), then preserved in 10% formalin, and placed at the Marine Sciences Laboratory of the Faculty of Agriculture (Tishreen University Lattakia, Syria) and received the reference number MSL 28-2022 (Fig. 3).

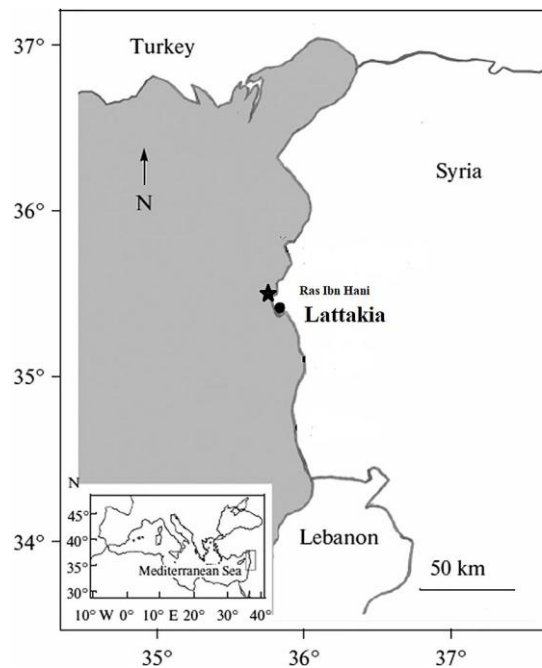


Fig. 1. Map of the Mediterranean and Levantine coast of Mediterranean pointing out the specimen collecting locality of *Epinephelus areolatus* (black star)



Fig. 2. *Epinephelus areolatus*. Specimen caught from the coast of Syria



Fig. 3. *Epinephelus areolatus*. Reference number MSL 28-2022

3. RESULTS AND DISCUSSION

The taxonomic position of the specimen was determined by the following external characteristics: Total weight (Tw) was 144.5 g, total length (TL) was 220 mm with a standard length (SL) of 180 mm. The dorsal fin had 11 spines and 16 soft rays. The anal fin had 3 spiny rays and 8 soft rays (Fig. 2). The Pelvic fin had 1 spine and 5 soft rays. Pectoral fins are formed with 17 soft rays. All measurements and meristic for this specimen were reported in Table (1). Color: Densely covered with rounded or polygonal yellow-brown spots on the body, head, and all fins; whitish posterior margin of the caudal fin.

The general morphology of the studied species agrees with those from previous descriptions of the species

[7,11], and with the pictures that researchers included in the previous recordings [9,10].

This species is most similar to *E. chlorostigma*, but the former is distinguished from the latter by having larger brown spots and a white posterior margin on the caudal fin [12].

After the addition of *Epinephelus areolatus*, the number of species belonging to the Genus *Epinephelus* recorded in the Syrian coast became nine: four of them are of native origin: *Epinephelus aeneus*; *E. costae*; *E. haifensis*; *E. marginatus*; four immigrant species from the Red Sea: *E. areolatus*; *E. fasciatus*, *E. coioides* and *E. malabaricus*; and the species *E. caninus* immigrant from the Eastern Atlantic Ocean [4,5,13].

Table 1. Measurements and meristic for *Epinephelus areolatus* specimen caught in Syrian coastal waters

Morphometric measurements (mm)	Specimen	%SL
Total length (TL)	220	122.22
standard length (SL)	180	
Head length (HL)	71	39.44
Body depth (BD)	60	33.33
Eye diameter(ED)	12.5	6.94
Postorbital length (PL)	11	6.11
Predorsal length (Pdl)	61	33.89
length of base of Dorsal fin (dbl)	105	58.33
Prepectoral length (Ppl)	62	34.44
Preanal length (Pal)	119	66.11
length of base of anal fin	29	16.11
pectoral fin length	43	23.89
Counts		
Scales on lateral line	52	
Dorsal fin rays	XI+16	
Anal fin rays	III+8	
Pelvic fin rays	I + 5	
Pectoral fin rays	17	
Total weight (g)	144.5	

The Areolate grouper is a common species in the Red Sea and it could have entered the Mediterranean Sea through the Suez Canal, thus, the increasing number of alien fish - at least - another 111 teleosts recorded to date in this basin, highlights a dramatic ecosystem change due to the alteration of its biodiversity [14-19].

The importance of data collected over social media platforms is deficient, as opposed to the collection of the organism and its handling in a laboratory, particularly in inconspicuous species that may require meristic, morphometric, and also genetic characteristics to identify species [9]. Therefore, it was necessary to document this type with a live sample preserved within the laboratory.

4. CONCLUSION

The result of the present study showed that the invasion of fish species to the Mediterranean Sea from the Red Sea and through the Suez Canal is a continuous process. This record is considered the first documentation of a live fish specimen of the species *Epinephelus areolatus* in the Syrian marine waters, placed at the Marine Sciences Laboratory with number MSL 28-2022, and the fifth individual recorded in the Mediterranean Sea.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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