

First Record of *Abudefduf vaigiensis* (Quoy and Gaimard, 1825) (Teleostei: Pomacentridae) in the Syrian Coasts (Eastern Mediterranean)

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Abstract

The first record of one fish species from the Mediterranean coasts of Syria is reported: the pomacentrid species *Abudefduf vaigiensis*. The specimen was caught on the 1st October 2019, using a fishing spear of sport fisherman at depth of 4 m from the coasts of south east of Arwad Island, south of Tartous City . The captured specimen was an adult individual of 118 mm in standard length (SL) , 159 mm in total length (TL) and 87.9 gr in body weight (BW). Two previously described morphological characters were used to separate the two congener species, *Abudefduf vaigiensis* and *A. saxatilis*. Several factors may explain the presence of this species in the Syrian marine waters.

Keywords: Lessepsian migration, Eastern Mediterranean Sea, Syria, Sergeant fish.

Introduction:

The teleosts fish family Pomacentridae is considered among the highly diversified fish families in the Indo-West Pacific region. This family encompasses 399 valid species in this region (Eschmeyer *et al.*, 2016). Among the genera of the Pomacentridae, the genus *Abudefduf* (sergeants), contains species that are normally broadly dispersed and abundant (Bertrand *et al.*, 2017). This genus comprises of cryptic species such as *Abudefduf saxatilis* and *A. vaigiensis* that the distinguish characters remained unclear for some time (Quenouille *et al.*, 2004; 2011; Bertrand *et al.*, 2017).

Members of the family Pomacentridae have a circumglobal distribution and mainly reside in tropical and temperate near-shore, shallow waters (Litsios *et al.*, 2012; Cowman *et al.*, 2013). *Chromis chromis* is the only native pomacentrid species found in the Mediterranean Sea (Saad, 2005), but there are records of other species present as invasive in the Mediterranean Sea (Golani *et al.*, 2014).

The Indo-Pacific sergeant fish *A. vaigiensis* shows wide geographic dispersal fluctuating from the Central Pacific, to the eastern coast of Africa including the Red Sea including the Hawaiian Islands (Randall, 2007; Coleman *et al.*, 2014), and westerly into the Mediterranean Sea by migration through the Suez Canal to the south of Levantine area (Golani *et al.*, 2014). This species has been reported to extend its distribution further north in the eastern Mediterranean region and reported from the Lebanon (Bariche *et al.*, 2015), and previous work also reported the presence of (although probably non-

established populations) of *A. vaigiensis* in Italy, (Tardent, 1959; Vacchiand Chiantore, 2000). However, no further north extension has been recorded (Bilecenoglu *et al.*, 2014).

This finding constitutes the third record of *Abudefduf vaigiensis* in the Levant region and the first from the Syrian coasts of the Mediterranean Sea.

Materials and Methods:

On 1st October 2019, a catch of one specimen of the Indo-Pacific sergeant fish *Abudefduf vaigiensis* (159 mm TL) (Fig.1) was recorded from the coasts of south east of Arwad Island, south of Tartus City, Syria (E:34° 49.17'; N: 35° 52.37') at the mid-eastern most side of the Mediterranean (Fig. 2).



Fig. 1. The specimen of *A. vaigeinsis* (Quoy and Gaimard, 1825) caught off the Syrian coast

The specimen was caught using a fishing spear of sport fisherman at depth of 4 m. This is clear on the body of the fish, evidenced by the presence of a fishing spear hole just below the anterior end of the dorsal fin. Identification of the specimen, the morphometric and meristic details, according to Randall (2007), Azzurro *et al.* (2013), and Tsadok *et al.* (2014). Eschmeyer (2014) and Fricke (2014) were used for the taxonomic status of the species, spelling of species name, and taxonomic reference respectively.

Systematic position:

Class	Order	Family	Subfamily	Genus	species
Actinopterygii	Perciformes	Pomacentridae	Pomacentrinae	<i>Abudefduf</i>	<i>Abudefduf vaigiensis</i>

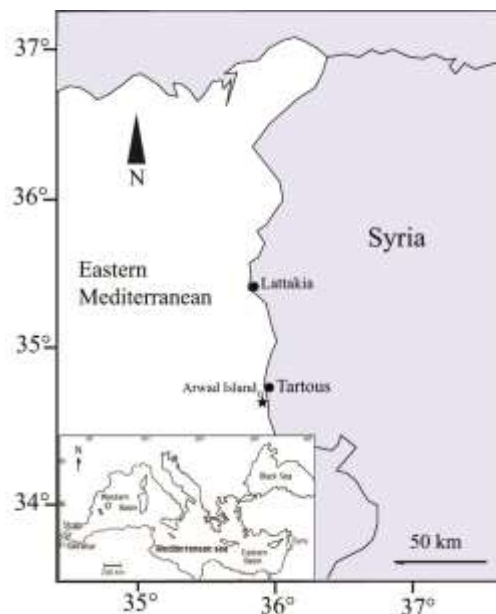


Fig. 2. Specimen catching location of *A. vaigiensis* (Quoy and Gaimard, 1825) on the Syrian coast (black star). (Arwad Island (white circle).

Results:

The characteristic features of the specimen of *A. vaigiensis* obtained in the present study are in agreement with those given by Tsadok *et al.*, (2014), and Vella *et al.*, (2016). The morphometric and meristic characters are given in Table (1).

Table 1. Measurements and meristic for *Abudefduf vaigiensis* specimen caught in Syrian coastal waters

Parameter	Values	Abreviation
Body weight (gr)	87.9	Bw
Total length (mm)	159	Tl
Standard length (mm)	118	Sl
Maximum body depth (mm)	70	Mbb
Pre-pectoral (mm)	32.5	Pp
Pre-anal length (mm)	75	Pa
Pre-pelvic length (mm)	39	Pv
Head length (mm)	33	Hl
Eye diameter (mm)	83	Yd
Length of dorsal fin base	69	Ldb
Length of anal fin base	28	Lab
Counts		
Dorsal fin spines	XIII	
Dorsal fin soft rays	12	
Ventral fin spines	I	
Ventral fin soft rays	4	
Pectoral fin soft rays	16	
Anal fin spines	II	
Anal fin soft rays	11	

A species *Abudefduf*, with following set of characteris: body circular to orbital in shape; body deep; head small and eye large; imaginary line passes through the mouth is also passes at the ventral edge of the eye (present specimen) or through the lower third of the orbit; head profile slightly curved over the orbit; absence of scale on lacrimal; presence of five black bars on lateral side of body; absence of black spot from the caudal fin base. Body with greenish olive colour and a longitudinal orange band runs under dorsal fin, fifth dark vertical bar is separated from the extension on the dorsal fin; both the posterior end of dorsal and anal fins were at the posterior border of the 4th dark band at the beginning of the caudal peduncle area; anterior edge of the pectoral fin at the anterior border of the 1st dark band (Fig. 3)

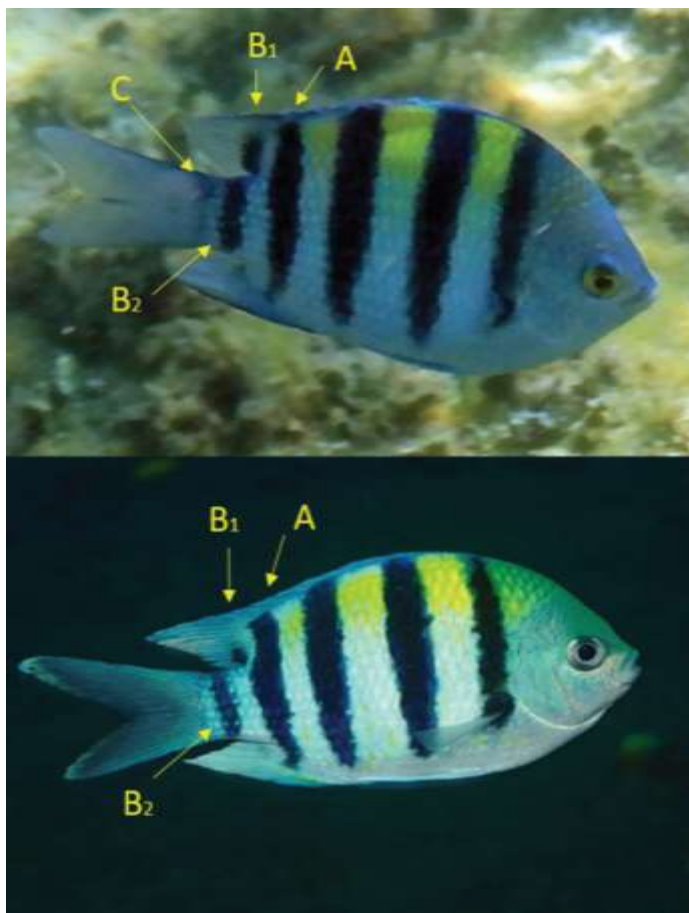


Fig. 3. Comparison of two similar species of *Abudefduf*, both already recorded in the Mediterranean Sea as alien species. Below is the specimen representing the studied species *A. vaigiensis* and Above a specimen of *A. saxatilis* from Malta Island (Deidun and Castriota, 2014). The arrow A shows that in *A. saxatilis* the origin of the 4th vertical bar is located under the last dorsal spine, while in *A. vaigiensis* it is placed behind the spine in the soft part of the dorsal fin. The arrow B1 shows the extension of the 5th black vertical bar from the origin of the dorsal fin to the anal fin in *A. saxatilis*, which is shorter and discontinued in *A. vaigiensis* and is located on the caudal peduncle (arrow B2). The arrow C shows the presence of two dark dots on the caudal

Discussion:

The standard length of our specimen (118 mm) is larger than those specimens obtained by Tsadok *et al.*, (2014) (45 mm), (85 mm) both from Palestine, Francis, *et al.* (1999) (50-60 mm) from New Zealand and Wibowo *et al.*, (2018) (39.2-67.2 mm) from various world areas. The specimens of Vella Saad *et al.*, – *Syrian Journal of Agricultural Research – SJAR* 7(4): 478-485 August 2020

et al., (2016) collected from the coasts of Malta have higher standard length range (89-169 mm). The standard length of the specimen collected in the present study makes it the largest specimen collected from the eastern Mediterranean Sea. Both the morphometric and meristic characters fall within the range given for these features by Vella *et al.*, (2016) from Malta.

The two morphological characters that can separate the two congener species, *A. vaigiensis* and *A. saxatilis* from each other are the absence of two black spots from the caudal peduncle (presence of these spots in *A. saxatilis*) (Randall, 1996); and the presence of the fourth dark bar originates well behind the last spine, more towards the centre of the soft portion of the dorsal fin in *A. vaigiensis*, while it is located directly behind the last dorsal spine and usually just makes contact with it in *A. saxatilis* (Allen, 1991).

From the images provided by Tsadok *et al.*, (2014, Fig. 2) the two species *A. vaigiensis* and *A. saxatilis*, can be distinguished using additional morphological characters, which are also found in the specimen of *A. vaigiensis* obtained in the present study. The imaginary line that passes through the mouth is also passes at the ventral edge of the eye (present specimen) or through the lower third of the orbit in *A. vaigiensis*, passes well below the orbit in *A. saxatilis* and the head profile slightly curved over the orbit in *A. vaigiensis*, while it is steep in *A. saxatilis*. This finding in disagreement with suggestion of Gerald R. Allen (Western Australian Museum, Perth, Australia; stated by Deidun and Castriota, 2014) in that there are no consistent morphometric differences between the two congeners, as emerging from the examination of different specimens of both species, from the Atlantic and the Pacific Oceans (Deidun and Castriota, 2014).

An existence of *A. vaigiensis* in the Syrian waters of the Mediterranean Sea is not totally unexpected, since the species has been reported from localities in the western and eastern Mediterranean and its significance sits in knowing the zoogeographical form in the area and filling the gap found between the north and south of the eastern Levant coasts of the Mediterranean Sea. Since only single specimen was collected and since this species could be used for aquarium industry, it will be interesting to monitor its development in the Syrian waters of the Mediterranean Sea, where it could become an established species that can be used commercially as a species of ornamental fish.

We can mention the main reasons behind the emergence of *A. vaigiensis* in the waters of the Syrian coast are: pomacentrid species are known for their ability to inhabit the ballast of large ships as shelter and travel into new localities through the ballast water of these vessels (Occhipinti-Ambrogi *et al.*, 2011). Moreover, aquaria on vacation liners and the aquarium industry of ornamental species around the Mediterranean are also likely means of enabling alien species introductions (Calado, 2006).

Some aspects can explain the non-record of *A. vaigiensis* from the marine waters of Syria before. It may be owing to the deficiency of ichthyological investigation in the area due to the political instability in the region. On the other hand, the event of the biological conquest and the constant upsurge of invaders in the Mediterranean Sea has fascinated scientists globally (Streftaris *et al.*, 2005).

Conclusion:

The present case, which involves colonizing fishes in the eastern Mediterranean Sea, may also suggest that the gradual warming of the area, occurring over the last period (Kevrikidis and Galil, 2003; Bradai, 2010), also enables the immigration of Indian Ocean exotic species through the Suez Canal, which contribute to recent colonization events in the entire Mediterranean and mainly in the area looked at in this study.

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التسجيل الأول لنوع سمك الرقيب الهندي - الهادي *Abudefduf vaigiensis* من فصيلة بوماسانتريدي Pomacentridae في المياه البحرية السورية

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الملخص

تتضمن هذه الدراسة أول تسجيل موثق لسمك الرقيب الهندي - الهادي (*Abudefduf vaigiensis*) (Gaimard Quoy and 1825) في المياه الساحلية السورية (الحوض الشرقي للبحر الأبيض المتوسط). تم صيد الفرد السمكي موضوع الدراسة بواسطة بارودة الصيد جنوب غرب جزيرة أرواد (GPS: 34 49 °. 17 ' N ؛ 52 35 درجة 37'. وعلى عمق نحو 4 متر. بلغ طول الجسم الكلي (TI) للعينة 159 ملم الطول القياسي (SI) 118 مم، وبلغ وزنه 87.9 غرامًا. تم إجراء القياسات المورفومترية والمورفولوجية على العينة بهدف تحديد الموقع التصنيفي لها، وتمييز هذا النوع عن نوع آخر قريب منه ويتبع لنفس الجنس هو *A. saxatilis*، وذلك وفق المفاتيح التصنيفية العالمية المعتمدة في هذا المجال.

الكلمات المفتاحية: هجرة ليسبسيانية، شرق المتوسط، سورية، أسماك الرقيب (*A. vaigiensis*)، بوماسانتريدي Pomacentridae.