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First record of marbled shrimp *Saron marmoratus* (Olivier, 1811) from Syrian marine waters

Dr. Izdihar Ammar[1], Rabee Raya[2]
[1] Professor, Department of Marine Biology at HIMR, Tishreen University, Lattakia, Syria
[2] Ph.D. Student, Department of Marine Biology at HIMR, Tishreen University, Lattakia, Syria

Abstract
During a marine field trip in September 2018, by hand nets at1 m depth, it was found the shrimp *Saron marmoratus*. The shrimp was found on rocks inside Lattakia port on the Syrian coast. This study is conducted to record this species in the Syrian water for the first time. *S. marmoratus* is an alien Lyspsiani species which entered the Mediterranean through the Suez Canal coming from Indian – Pacific origin.

Keywords: *Saron marmoratus*, Hippolytidae, first record, Syrian coast, alien species, marbled shrimp

Introduction
The number of alien species which entering the eastern Mediterranean is increasing (Zenetos *et al*., 2010; Zenetos *et al*., 2012) [19]. In this side, Crustaceans are the second after the mollusks in a number of alien species. About 159 species of non indigenous or exotic crustaceans have been reported in the Mediterranean (Zenetos *et al*., 2012; UNEP-MAP-RAC/SPA, 2015) [1].

For the Syrian coast, the results of the newest local studies on crustaceans confirm the increase in the number of alien species recorded on the Syrian coast (Ammar & Arabia, 2018; Ammar *et al*., 2018) [3, 3]. To date, it was attained 23 species, which indicate about 23% of the total number of crustacean species. Where crustacean of different orders and families include more than 90 species in the Syrian marine waters from the coastal area to the depth of 160 m, in different regions (Saker and Ammar, 1996; Farah, 1997; Kucheruk *et al*., 1998; Ammar, 2002; Hassan *et al*., 2008; Al Hatoum, 2010) [15, 11, 10, 1].

There are four species of the genus *Saron*, *Saron marmoratus* (Olivier, 1811) [5, 7, 5], *Saron neglectus* (De Man, 1902), *Saron inermis* (Hayashi, 1983) and the species *Saron rectirostris* (Hayashi, 1984). But the species *S. marmoratus* considers the most common species in the Indian and Pacific oceans, lives in caves, between rocks and on coral reefs, near low depth coastal areas and in coastal ponds, between green algae (Sheibani-Tezerjiand Sari, 2007) [16]. A distribution map (WoRMS, 2018) shows its spread in the Indian Ocean and the Arabian Sea. It was notable that the first report to its existence on the Iranian coast was in 2007 (Sheibani-Tezerji and Sari, 2007) [16].

The species *S. marmoratus* entered the Mediterranean Sea through the Lessepsian migration through the Suez Canal. It was referred to its presence in the eastern Mediterranean in recent years. Whereas the first found of it in Nahariya Beach was in 2013 (Rothman *et al*., 2013). Two members of it were also recorded in September and October 2014 on the Lebanese coast (Bitar, 2015) [7]. Very recently, two male members were recorded on the Turkish coast in February 2018 (Erguden *et al*., 2018) [8].

This study attends to registration of this species for the first time in the Syrian coast in Latakia city.

Materials and Methods
Three females of the species *Saron marmoratus* were collected from Lattakia port on the Syrian coast founding on rocks (º35. 3 ′east, º35 4 ′north) (Fig. 1). It was found at a depth of 1-2 meters by hand nets during September 2018. Then the three members were transferred to the laboratory, classified and characterized according to (Barnard, 1950; Miyake and Hayashi, 1966; Baby *et al*., 2016) [6, 12, 15].

Weight and length measurements were taken for the three members. Then saved by alcohol at the laboratory of zoo benthos at the High Institute of Marine Research (HIMR).

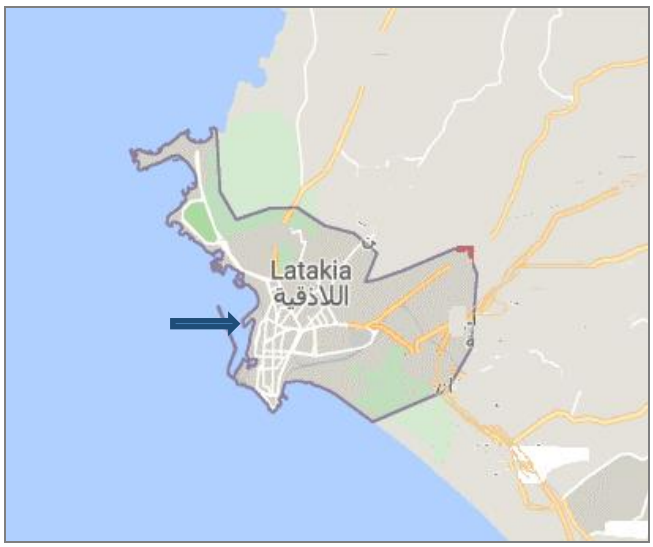

Fig 1: Sampling site, Lattakia port (Syria).

Results
The taxonomic status of the species

Kingdom:	Animalia
Phylum:	Euarthropoda
Subphylum:	Crustacea
Class:	Malacostraca
Order:	Decapoda
Family:	Hippolytidae
Genus:	*Saron*
Species:	*S. marmoratus* (Olivier, 1811) [5, 7, 5].

A short description

The members collected from the Syrian coast were characterized by the presence of spines rostrum, where there are three spines on the upper edge of the rostrum, followed by three other spines on the dorsal edge of the carapace (Fig. 2). The under edge was characterized by the presence of 7 spines. The eyes are large, prominent and there is two spines under the eye. The pereopods are thin with hair. The first pereopod is different between males and females. Where it is shorter in the female, forms about 26.66-38.53% of the total length of the member. The second pereopod is characterized with a large number of articles(between 11-13). Where the third, fourth and fifth ones were characterized by the presence of two spines on each of them. The end of the telson is branched, the body is pale brown with redish brown and yellow spots. It turns into dark spots after it is out of water.

Based on the classification setting by Poupin & Juncker (2010) [13] which concern in the specific characteristics of females and males of this species, especially in terms of the length of the first claw pereopod and the presence of dense thick hair on the dorsum, the members in this study are females. Figure (3) shows living member in the aquarium in the laboratory after collection, where tufts of setae can be observed on the dorsum clearly.

As for the color, it is known that this species varies from the point of color from one location to another. Its members are characterized by its ability to change their color and redistribution of color pigments (Sheibani-Tezerji and Sari, 2007) [16]. The members in this study were browned with brown-redish spots and yellowish on the edges, and the pereopod were colored with yellow lines or rings alternating with gray and reddish brown.

Fig 2: Female of the species *Saron marmoratus* from the Syrian coast

Fig 3: Female of *Saron marmoratus* living inside the aquarium in the laboratory

Discussion

Results showed the morphometric and weight measurements of the three specimens, which are similar in size. The total length TL of the member is about 58 mm and the length of the carapace CL is ranged between 15.37 - 16.56 mm. Also the weight was converging and ranged between (3.23 - 3.60 g) (Table 1).

Table 1: Measurement of total length, length of carapace and the weight in the species *Saron marmoratus*

The weight (g)	Carapace length (mm)	Total length (mm)
3.60	16.56	58.20
3.32	15.37	58.1
3.34	15.38	58.1

By comparing the lengths of the specimens in this study with the specimens found in other regions, we found that for the male measurements recorded in Turkey (total length 59.1 mm, carapace length 22.2 mm and weight 3.0 g) (Erguden *et al.*, 2018) [8], We noted the approximation of height and weight with our study, while female measurements recorded in Iran had a total length and carapace length is greater than the length recorded in the current study (Total length 62.23 mm and carapace length 30.74 mm) (Sheibani-Tezerji and Sari, 2007) [16]. Members in this study are similar in size to samples in the Turkish coast, while they appear smaller than Iranian samples.

By registering the presence of this species in the Syrian marine waters, a knowledge gap related to its existence on the entire eastern shores of the Mediterranean has been filled after having documented its existence north in Turkey (Erguden *et al*., 2018) [8], and south Lebanon (Bitar, 2015) [7]. It is also proved that this species is Lessepsian and entered the region through the Suez Canal.

It is useful to note the need to study the environmental and biological characteristics of species and their relation to local species of Palaemonidae, especially with the local species *Palaemonlon girustrus*, which lives in its own environment. It is necessary to study and monitor its spread and potential of appearance more numbers of it in other areas of the Syrian coast for fear of turning it into ainvasive species. Also it was necessary to aquaculture it in aquarium for subsequent breeding.

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