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First Record of the Lessepsian Migrant Smith's Cardinalfish *Jaydia smithi* Kotthaus, 1970 (Pisces: Apogonidae) from Syrian Marine Waters

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Abstract: Five individuals of Smith's cardinalfish *Jaydia smithi* were collected from Ibn-Hani area, Lattakia, Syria on the eastern coast of the Mediterranean Sea. Their morphometric and meristic characteristics are reported. There are several factors which assisted this specimen to reach this area of the Mediterranean; some of these factors might be the marine environment changes and the ballast water. This study reports that Smith's cardinalfish *Jaydia smithi*, a member of Lessepsian species was found in Syrian marine waters for the first time.

Keywords: *Jaydia smithi,* lessepsian, Mediterranean Sea, Smith's cardinalfish, Syrian coast.

Introduction

A considerable number of Lessepsian fishes have moved from the Indian and Pacific oceans and the Red Sea to invade the Mediterranean Sea. This migration of Lessepsian fish was happened because of several factors; the most important of which are the climatic changes and the human activities related to them, which have worked to pave the way for these species to invade new areas far from their native habitat. The climatic changes have made the environmental conditions suitable for the species, as long as it became similar to their original habitat in terms of temperature, salinity and food. Indeed, human activities such as the opening of the Suez Canal, and the movement of ships across the world, are important factors for facilitating the movement of Lessepsian fishes and other species to the Mediterranean Sea, which was impossible unless such activities were existed. About 776 Lessepsian species including 105 fish species have been reported in the Eastern Mediterranean Sea (Zenetos *et al.*, 2012). *Jaydia smithi* is a species which belongs to Apogonidae which invaded the Mediterranean Sea from the Indo-Pacific Ocean and Red Sea through the Suez Canal. This fish had been recorded for the first time in the south-east of Mediterranean Sea (Golani *et al.*, 2008; Goren *et al.*, 2009) and for the second time in the north-east of Mediterranean Sea (Gökoğlu

et al., 2010). After six years from the last record, the present study reports the first record of Smith's cardinalfish *Jaydia smithi* in Syrian marine waters.

Material and Methods

Specimens of *Jaydia smithi* Kotthaus, 1970 have been collected from Ibn-Hani area of Lattakia, Syria (35°35'N, 35°43'E) (Fig. 1), on 2nd May 2016. Five specimens were collected using a gillnet with a mesh size of 15 mm at a depth of 35 meters, the bottom of the fishing zone is a soft sand (Al-Shawy *et al.*, 2016).

The morphometric measurements have been taken (length to the nearest millimeter, weight to the nearest gram) and the fishes were stored temporarily at the Fish Biology Laboratory of the Higher Institute of Marine Marine Research of the Tishreen University. The species was identified according to Carpenter and Niem (2001). All meristic measurements were executed in millimeter (mm).

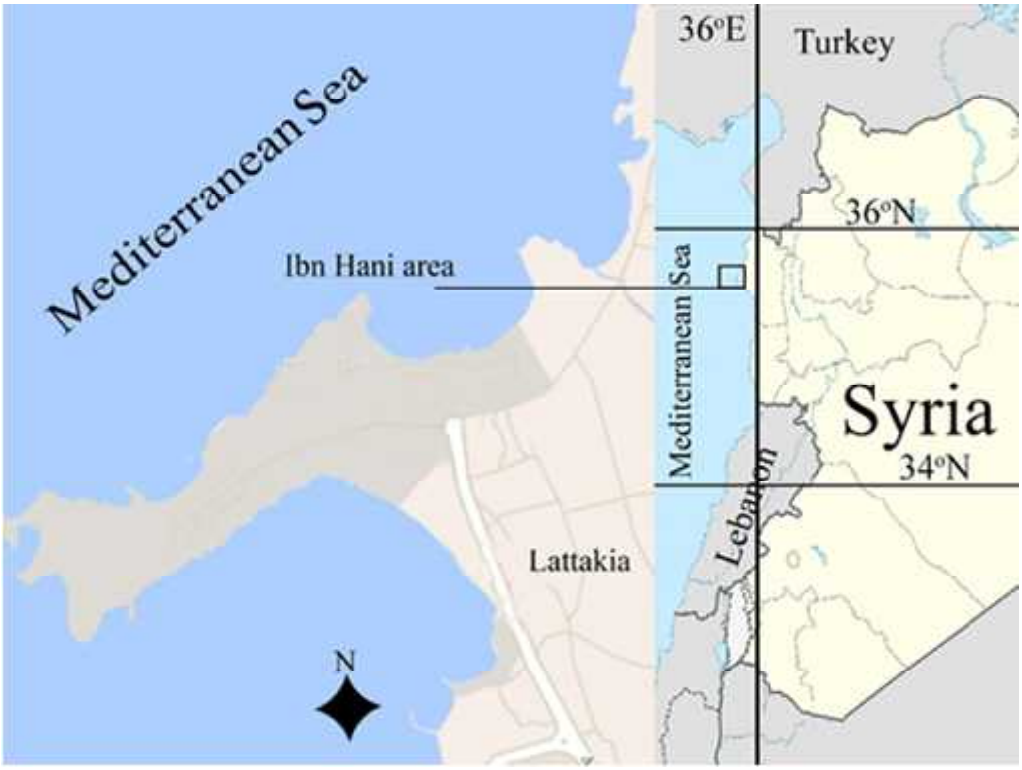

Fig. (1): A map showing the collection site of the specimens from the Syrian marine waters.

Results

The morphological characteristics of *Jaydia smithi* are shown in Fig. (2). The body of the fish is ovate to elongate with two separated dorsal fins and the first one has a dark spot on the top. The dorsal fin has small black spots; the caudal fin is black-coloured at the outer edge while the body is coloured yellowish brown.

The morphometric measurements are shown in Table (1); the meristic data were: the first dorsal fin with seven spines, the second dorsal fin with one spine and nine rays; the pectoral fin with 15 rays; pelvic fin with 1 spine and 5 rays; anal fin with 2 spines and 8 rays. The number of scales on the lateral line is 25. The sexual status of *Jaydia smithi* is as following: three individuals are males in reproduction stage (immature and developing stages) and two individuals are females in reproduction stage (developing and spawning stages).

Fig. (2): *Jaydia smithi* Kotthaus, 1970: 120 mm T.L. specimen was caught on May 2016 from Ibn-Hani area (Lattakia, Syria).

Table (1): Morphometric and biometric (expressed as percentage of S.L. = standard length) characteristics of five individuals of *Jaydia smithi* captured from Ibn-Hani, Lattakia (min= minimum, max= maximum, SE= standard error).

Characters	Min-Max (Mean ±SE)	Proportional measurements as expressed as percentage of SL
Total length	98-135 (112□6.84)	-
Standard length	80-113 (92.2□6.67)	-
Body depth	40.48-57.17 (46.65±27)	50.60-64.60 (57.29±3.1)
Head length	27.02-40 (33.06□2.6)	21.60-45.20 (33.4±4.02)
Snout length	0.44-0.91 (0.64□0.08)	0.55-0.80 (0.69±0.18)
Eye diameter	6.8-9 (7.52□0.4)	7.96-8.80 (8.1±0.37)
Upper jaw length	9.3-20 (16.6□1.78)	12.50-21.69 (18.06±2.5)
Lower jaw length	10-21.1 (15.74□1.9)	11.62-18.67 (17.07±2.2)
Mouth width	8.2-13.3 (10.6□0.87)	10.25-11.76 (11.49±1.01)
Caudal peduncle length	14.3-19.2 (16.34□0.89)	16.99-17.88 (17.72±0.79)
Pre-dorsal length	26.2-40 (32.86□2.7)	28.41-43.38 (35.63±1.36)
Pre-anal length	48.6-69.4 (57.12□3.9)	52.71-75.27 (61.95±0.68)
Pre-pectoral length	15.1-23.1 (19.64□1.4)	16.37-25.04 (21.30±1.05)
Pre-pelvic length	25-42.7 (31.58□3.3)	31.25-37.78 (34.25±2.1)

Discussion

The features of this species are in agreement with Gon and Randall (2003) and Goren *et al.* (2009). *Jaydia smithi* which belongs to Lessepsian, has never been recorded in the Syrian coastal waters before, despite the fact that two species from other genera: *Apogon imberbis* (Linnaeus, 1758) and *Apogonichthyoides nigripinnis* (Cuvier, 1828) were reported from this area (Saad, 2005; Ulman *et al.*, 2015). This fish had been recorded in the south and north of the Levantine basin in the Mediterranean Sea, but was not recorded in the area between the north and south of Levantine basin (Syrian marine waters) (Fig. 3). We assume that there are several reasons which allowed the recording of such fish in the Syrian coastal waters such as the small size of the fish, which allowed it to transport through the ships ballast water from its native habitat to this area of the Mediterranean Sea. One additional factor is the environmental changes in the Syrian marine waters, which made it possible for the spread of many Lessepsian fishes. Furthermore, the presence of Lessepsians fishes in the Mediterranean Sea confirms the ability of exotic species to adapt to the conditions of life in this part of the Mediterranean Sea which is characterized by a high salinity and the highest temperatures (Masters and Norgrove, 2010). This fish might not be recorded in the Syrian waters during the period from 2010 to 2016, due to the lack of any scientific research on fishes in the study area, which is the most important factor among the other factors, as long as recording new species is done by researchers and research centers. Consequently, the presence of *Jaydia smithi* in the Syrian marine waters confirms, from the spread of this species, that the eastern Mediterranean Sea and the Syrian coastal area became a convenient location for Lessepsian species (Dial and Roughgarden,1998).

Conclusions

After the recording of *Jaydia smithi* from Syrian coast in present study, the total migrant species reach 53 species (51 species).

Fig. (3): Eastern Mediterranean map showing the distribution of *Jaydia smithi*: ● for Golani *et al.* (2008); ■ for Gökoğlu *et al.* (2010); ▲ the present record in Syrian marine waters.

reported by Saad (2005), one species by Al-Shawy *et al*. (2016) and one in the present study).

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References

Al-Shawy, F.; Lahlah, M. & Hussein, C. (2016). First record of the Berber ponyfish *Leiognathus berbis* (Valenciennes, 1835) (Osteichthyes: Leiognathidae) from Syrian marine waters (Eastern Mediterranean Sea). Marine Biodiversity Records, 9(1): 93-98.

Carpenter, K.E. & Niem, V.H. (2001). FAO species identification guide for fishery purposes. The living marine resources of the Western Central Pacific. Vol. 4: Bony fishes, part 2 (Mugilidae to Carangidae), Rome: 445 pp.

Dial, R. & Roughgarden, J. (1998). Theory of marine communities: The intermediate disturbance hypothesis. Ecology, 79(4): 1412-1424.

Golani, D.; Appelbaum-Golani, B. & Gon, O. (2008). *Apogon smithi* Kotthaus, 1970 (Teleostei: Apogonidae), a Red Sea cardinalfish colonizing the Mediterranean Sea. J. Fish Biol., 72(6): 1534-1538.

Gon, O. & Randall, J.E. (2003). A review of the cardinalfishes (Perciformes: Apogonidae) of the Rea Sea. South African Institute for Aquatic Biodiversity: 60 pp.

Goren, M.; Yokes, M.; Galil, B. & Diamant, A. (2009). Indo-Pacific cardinal fish in the Mediterranean Sea- New records of *Apogon smithi* from Turkey and *A. queketti* from Israel. Marine Biodiversity Records, 2: 1-5.

Gökoğlu, M.; Özbek, E.Ö.; Kebapçioğlu, T; Balci, B. A. & Kaya, Y. (2010). The second location records of *Apogon smithi* and *Vanderhorstia mertensi* (Pisces) from the Turkish coast of the Mediterranean Sea. Marine Biodiversity Records, 3(2): 83-91.

Masters, G. & Norgrove, L. (2010). Climate change and invasive alien species. CABI Working Paper 1: 30 pp.

Saad, A. (2005). Check-list of bony fish collected from the coast of Syria. Turkish Journal of Fisheries and Aquatic Sciences, 5(2): 99-106.

Ulman, A.; Saad, A.; Zylich, K.; Pauly, D. & Zeller, D. (2015). Reconstruction of Syria's fisheries catches from 1950-2010: Signs of overexploitation. Acta Ichthyol. Piscat., 45(3): 259-271.

Zenetos, A.; Ballesteros, E. & Verlaque, M. (2012). Alien species in the Mediterranean Sea by 2012. A contribution to the application of European Union's marine strategy framework directive (MSFD). Part 2. Introduction trends and pathways. Mediterranean Sea Marine Science, 13(2): 328-352.