التسجيل الأول لسمكة الأسد الهندية- الهادية الحمراء *Pterois volitans* (Linnaeus, 1758) في المياه البحرية السورية (بانياس).

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الملخص:

تم اصطياد سمكة الأسد الحمراء Pterois volitans (Linnaeus, 1758) (Osteichthyes: Scorpaenidae) قبالة ميناء بانياس ومنطقة عرب الملك في الساحل السوري، هذا هو التسجيل الأول لسمكة الأسد الحمراء P.volitans الهندية- الهادية في المياه البحرية السورية. تم جمع ستة أفراد خلال الفترة الممتدة من شهر أيلول إلى شهر تشرين الثاني 2020 م، على عمق 10 أمتار باستخدام الأقفاص ورمح الصيد. يتوقع أن تستهدف أسماك الأسد مصائد الأسماك ذات الأهمية الاقتصادية، كما يظهر أن النظم البيئية الساحلية تتعرض لتهديد جديد قد يؤثر سلبًا على التنوع البيولوجي المحلي.

الكلمات المفتاحية: سمكة الأسد الحمراء ، Pterois volitans، الأنواع الغازية ، المياه البحرية السورية (بانياس).

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First record of the Indo-Pacific red lionfish *Pterois volitans* (Linnaeus, 1758) in the Syrian marine waters (Banias).

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Abstract:

A red lionfish, *Pterois volitans* (Linnaeus, 1758) (Osteichthyes: Scorpaenidae), was captured off Banias port and Arab almoulk area in the Syrian coast. This is the first record of the Indo-Pacific red lionfish *P. volitans* (Linnaeus, 1758) in Syrian marine waters. Six individuals were collected during September to November, 2020 at 10 m depth by fishing cages and spear fisherman. Lionfish are expected to target economically important fisheries, and coastal ecosystems appear to be under a new threat that may negatively affect local biodiversity.

Key words: Red lionfish, *Pterois volitans*, Invasive species, Syrian marine waters (Banias)

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1-Introduction:

The invasion and establishment of alien species are major threat to marine biodiversity, structure and function that also have economic and human health implications (Charles & Dukes, 2007; Otero *et al*., 2013) the numbers of alien species which have been recorded in the Mediterranean over the past century have relatively increased in recent decades. The movement of lionfish into the Mediterranean Sea is considered to have most likely occurred via the Suez Canal (Zenetos *et al.,* 2012), although their release from aquaria cannot be excluded (Golani *et al*., 2002).

The red lionfish *P. volitans* is distributed in the North, South Pacific and Atlantic Ocean and also found in the Indo-West Pacific Ocean (Schultz, 1986; Whitfield *et al*., 2002; Kimball *et al.,* 2004; Froes & Pauly, 2016). There are 10 valid species of the genus *Pterois* in the world (Froese & Pauly, 2016). Lionfish inhabit in warm marine waters at depths from 1 to 50 m on the hillside, around the coral reefs, rocky bottom layers, hard bottom, mud bottoms, mangroves, sea grasses, coral reef and artificial reefs, they are also an invasive species for the Mediterranean Sea (Schultz, 1986; Albins & Hixon, 2008; Ferreira *et al*., 2015; Froese & Pauly, 2021).

Currently two species of lionfish *Pterois volitans* (Linnaeus, 1758) and *Pterois miles* (Bennett, 1828) are documented from the Mediterranean Sea, both of which are native to the Indo-Pacific region *P. miles* is present in waters extending from the Red Sea to Sumatra, while *P. volitans* is principally found in the western Pacific (Schultz, 1986; Fish Base, 2021). Lion fish cause anxiety as it is an invasive predator (Albins & Hixon, 2008), which can be a major catalyst in reducing or eliminating local populations, and it poses potential threats to human health (Mellina *et al*., 2016).

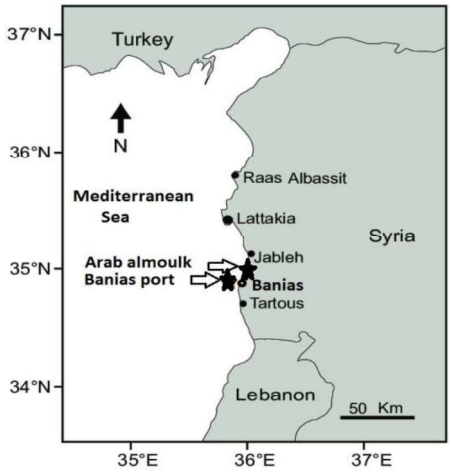
The lion fish (*P. volitans* and *P. miles*) have caused one of the fastest and ecologically most harmful invasions up to now, with their entry into the Western Atlantic (Albins & Hixon, 2013) Lion fish fed with fish and invertebrate animals up to 4% of body weight per day potentially reduce the number of local species and increase competition for the food (Schultz, 1986; Mellina *et al*., 2016). The high feeding rates of lionfish pose a serious threat to its benthic ecosystems (Morris & Akins, 2009; Kulbicki *et al*., 2012; Higgs, 2013). Detrimental impacts on native reef fishes were documented in The Bahamas, where the red lionfish reduced by 65% on average the biomass of small bodied fishes from 42 species in two years (Green *et al*. 2012). The closely related lion fish species, *P. miles* recorded throughout the Mediterranean Sea from Cyprus, Turkey, Greece, Tunisia and Syria (Turan *et al.,* 2014;

Crocetta *et al.*, 2015; Iglésias & Frotté, 2015; Oray *et al.*, 2015; Turan & Öztürk, 2015; Dailianis *et al.*, 2016; Jimenez *et al.*, 2016; Kletou *et al.*, 2016; Mytilineou *et al.*, 2016; Ali *et al.*, 2016; Azzurro *et al.*, 2017), while *P. volitans* has been only recorded in the Turkish waters (Gürlek *et al.*, 2016; Gökoğlu *et al.*, 2017; Ayas *et al.*, 2018).

The first record of the red lion fish was given by Gürlek *et al.* (2016) from Iskenderun Bay in the Mediterranean Sea and this new record of this species from Syrian marine waters which confirms its continued rapid spread and during short period of time.

2-Materials and methods

Six individuals of *P. volitans* were caught at depth 10 m on a rocky bottom during September to November, 2020. Fish specimens were caught from two sites off Banias port (35°11'16.6 N, 35°56'23.8 E) and Arab almoulk area (35°15'39.4 N, 35°55'46.7E) in Syrian coast (Figure,1). The fish was captured by fishing cages and spear fisherman. The samples were fixed in a10% formalin and transferred to the laboratory for identification. Morphometric measurements including many features were recorded (the total weight was taken to the nearest gram, and length to the nearest centimeter). Identification of collected specimens was based on (Schultz, 1986; Paulin, 2012). All collocted material are deposited in the collection of Environmental Prevention Dept. Higher Institute for Environmental Researchs, Tishreen University.



Figure,1 Map of the Syrian coast showing the collection sites of *Pterois volitans* (black stars) (**www.google.com**)

3-Results

In this study, the first appearance of red lionfish, *P. volitans* was recorded in the Syrian marine waters from September to November, 2020. Six individuals of this species were captured off Banias port and Arab almoulk area in the Syrian coast (Figure,2). The body slightly compressed, the head is angular with spiny protrusions along the cheek. There are tentacles above the eyes and around the mouth, scales are circular, head and body are cream colored to red or reddish-brown with alternating vertical stripes, dorsal fin has spines longer than the body length and surrounded by a frilled membrane almost to its base. The dorsal fin has XIII dorsal spines and 12 dorsal soft rays. They have a long pectoral fin and membranes of all fins are spotted, anal fin has III spines and 7 or 8 soft rays, anal and caudal fins are round. Pelvic fins contain I spine and 5 soft rays. Pectoral fins contain 15 soft rays. Dorsal, anal and caudal soft rays have a series of dark spots, which are large in this species compare to other lionfishes (Figure,3), morphometric and meristic data of specimens are shown in table 1.

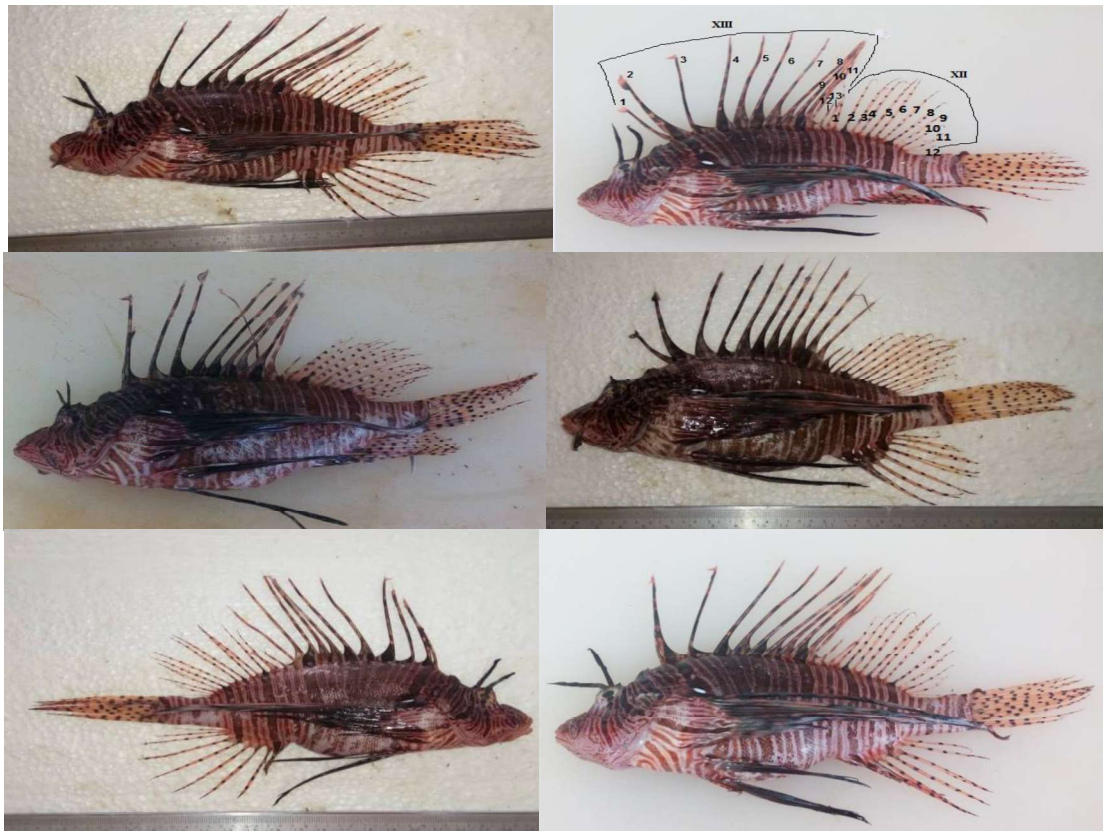


Figure 2. Six individuals of *Pterois volitans* captured off the Syrian coast (Banias at 2020).

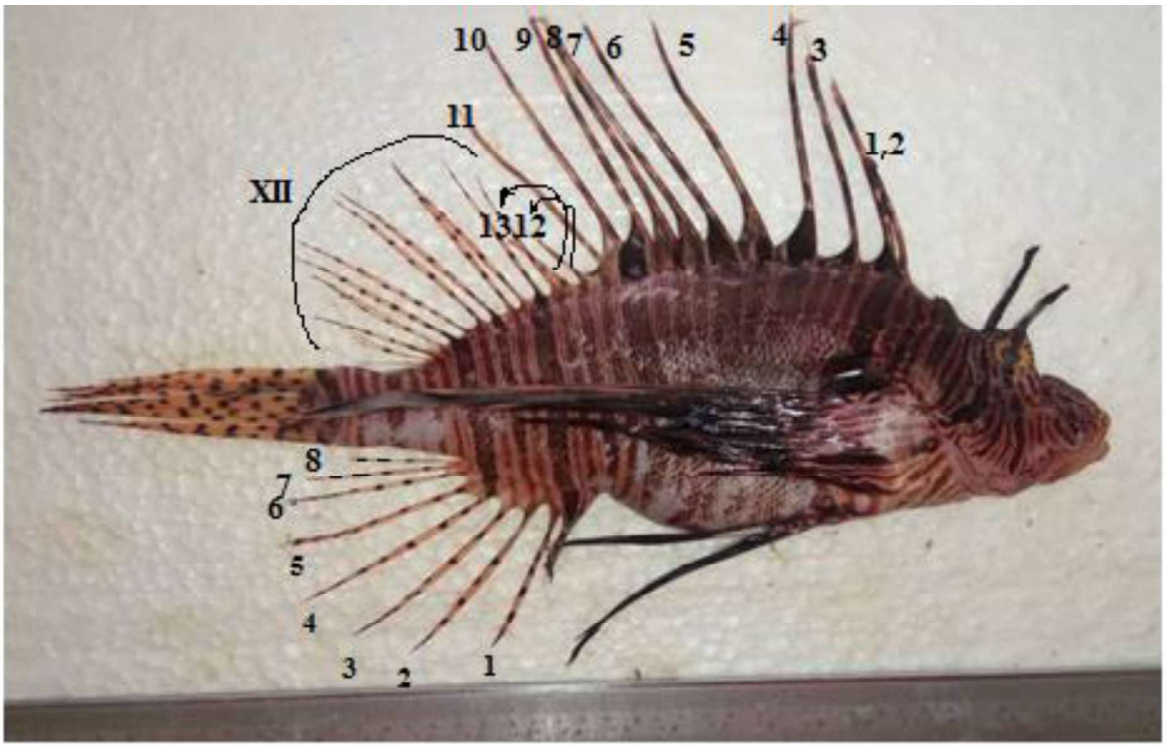


Figure 3. *Pterois volitans* captured off the Syrian coast (Banias at /11/10/2020).

Table 1: Morphometric measurements and meristic counts of *P. volitans* from the Syrian coast.

Fishing sites	Off Banias port	Off Banias port	Off Arab almoulk area	Off Arab almoulk area	Off Banias port	Off Banias port
Date and number samples	**5/9/2020**			**11/10/2020**		**9/11/2020**
	1	**2**	**3**	**4**	**5**	**6**
Total length (cm)	25.6	23.5	21.1	22.5	23	22
Standard length (cm)	19.7	17.1	15.7	17	16.8	16
Head length (cm)	6	5.8	5.4	4.6	5.1	5.1
Body depth (cm)	6.9	6.1	5.3	6	5.5	5.6
Inter–orbital space (cm)	0.9	0.6	0.8	0.6	0.7	0.6
Eye diameter (cm)	0.4	0.4	0.4	0.4	0.4	0.4
Mouth diameter (cm)	3.4	2.8	5.1	2.5	2.4	2
Dorsal fin spines	**XIII**	**XIII**	**XIII**	**XIII**	**XIII**	**XIII**
Dorsal fin rays	12	12	12	12	12	12
Pelvic fin spines	**I**	**I**	**I**	**I**	**I**	**I**
Pelvic fin rays	5	5	5	5	5	5
Anal fin spines	**III**	**III**	**III**	**III**	**III**	**III**
Anal fin rays	**7**	**7**	**8**	**7**	**8**	**7**
Pectoral fin rays	15	15	15	15	15	15
Total weight (g)	246.44	185.49	122.93	188.95	157.35	144.89
Sex and degree of sexual maturity	♂ **II**	♀ **III**	♂ **II**	♀ **III**	♂ **I**	♂ **I**

4-Discussion

Red lionfish are most notably recognized by their ornate, feathery pectoral fins and their distinct coloration. Red stripes appear vertically along the head and throughout the body. They are similar to other scorpion fish species and share characters such as spiny protrusions and tentacles around the eyes and mouth thirteen spines are present on the dorsal fin.

Pterois volitans can be distinguished from other *Pterois* species with few morphologic features and meristic counts. Although the two species (*P. volitans, P. miles*) are very similar, the *Pterois miles* have less dorsal and anal fin rays. *P. volitans* has a longer pectoral fin than *P. miles*, also generally has XIII dorsal spine, 11 dorsal fin rays and 7 anal fin rays, while *P. miles* has XIII dorsal spine, 10 dorsal fin rays and 6 anal fin rays, as well *P. volitans* has often large tentacles above eyes (Schultz, 1986; Kuiter & Tonozuka, 2001). Spots present on the dorsal, anal and caudal fins are generally larger in *P. volitans* compared to other lionfish (Schultz,1986), morphological difference between *P. volitans* and *P. miles* shown in table 2 according to Schultz (1986) and Allen & Erdman (2008).

Table 2: Morphological difference between *P. volitans* and *P. miles*

Species	*P. volitans*	*P. miles*
Dorsal fin counts	10-12	9-11
Anal fins counts	6-8	6
Horizontal scale rows counts (above lateral line)	8-14	11-13
Horizontal scale rows counts (below lateral line)	18-25	17-21
Pectoral fin	Extending over the caudal fin	Extending before the caudal fin
Tiny brown spots surrounding the eye	Do not exist	Exist

5-Conclusions

Continuing invasion of alien species into our marine environment, and some of these species are harmful and pose a threat to the local marine diversity and cause huge economic losses to the fisheries sector and pose a threat to human health in general and the fisherman in special.

6-Recommendations

There is still needed to research on the negative effects of lionfish on new habitats and environments, and monitoring of the introduction of invasive species should be continued in order to control them and reduce their harmful effects on the local environment and biodiversity.

Still researches are also needed on the negative impacts of lionfish on the habitats and new environments.

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