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ADDITIONAL RECORDS OF STRIPED EEL CATFISH *PLOTOSUS LINEATUS* (OSTEICHTHYES: PLOTOSIDAE) FROM THE SYRIAN COAST (EASTERN MEDITERRANEAN)

SUMMARY

The authors describe in the present paper four additional records of striped eel catfish *Plotosus lineatus* (Thunberg, 1787), including morphometric measurements and meristic counts. All captured specimens were mature females carrying developed ovaries with yellow yolked oocytes. Additionally the use of the local ecological knowledge allows to assess the status of *P. lineatus* which is successfully established in the area where it is able to live and reproduce.

INTRODUCTION

Striped eel catfish *Plotosus lineatus* (Thunberg, 1787) is widely distributed in the Indo-Pacific, generally found in shallow coastal areas, entering in estuaries, both brackish and freshwater areas from Japan, Samoa and east Africa (Golani *et al.*, 2013). The species was previously known from the Red Sea (Goren and Dor, 1994), then recorded in the Great Bitter Lake (Chabanaud, 1932), and finally entered through Suez Canal into the Mediterranean Sea, where it was firstly recorded by Golani (2002). The second well-documented record occurred off El-Arish from the Egyptian coast (Temraz and Ben Souissi, 2013) and furtherly some specimens were captured from the coast of Syria (Ali *et al.*, 2015). The species migrated towards northern areas was captured in Iskenderun Bay located in the eastern Turkey (Dogdu *et al.*, 2016), and western areas and the Tunisian coast constitutes to date its westernmost extension range in the Mediteranean Sea (Ounifi-Ben Amor *et al.*, 2016).

Routine monitoring in the Syrian waters since a decade, we were in-

formed that four specimens were captured during May 2017 from the Syrian coast. The present paper shows a short description of these specimens, including morphometric measurements and meristic counts, with some comments about the real status of the species in the area.

MATERIAL AND METHODS

Information on captures of these specimens was provided in the wake of a collaboration with experienced fishermen aware of fishing grounds. The help of local communities was considered by researchers to enlarge and improve attention in fisheries research. It was referred as local ecological research following Anadòn *et al.*, (2009), used to track geographical distribution of alien species in their new living area (Azzurro *et al.*, 2011), especially species playing a negative role in ecosystems, the best instance being the common lionfish, *Ptrerois miles* (Bennett, 1828), following Azzurro and Bariche (2017). On 14 May 2015, 4 specimens of *Plotosus lineatus* were captured in Syrian sea off Latakia City, two specimens at 35°37´ N and 35°45´ E, on rocky bottom, depth of 20 m, using a bottom cage net in metal wire, two specimens at 35°28´ N and 35°47´ E, on sandy bottom, using beach seine (Fig. 1).

All measurements were made to the nearest 0.1 mm by using digital caliper, and weighed to the nearest 0.1 g for total body and gonads (Table 1). The specimens were preserved in 10% buffered formalin and deposited in the Ichthyological Collection of the Marine Science Laboratory, Agriculture Faculty in Tishreen University; receiving the catalogue numbers 2286 M.S.L., 2287 M.S.L., 2288 M.S.L., 2289 M.S.L, respectively (Fig. 2 A).

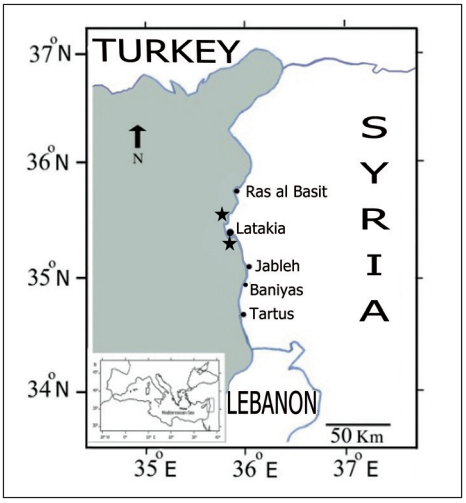

Fig. 1. Map of the Mediterranean showing Syria and map of the coast of Syria indicating the capture sites of *Plotosus lineatus* (black stars).

Reference of specimens	2286		2287		2288		2289	
Morphometric measurements	mm	%TL	mm	%TL	mm	%TL	mm	%TL
Total length	186.2	100.0	170.2	100.0	178.5	100.0	156.8	100.0
Standard length	179.3	96.3	166.4	97.8	173.2	97.0	150.8	96.2
Head length	36.9	19.8	34.3	20.2	35.5	19.9	39.4	25.1
Interorbital space	10.5	5.6	9.6	5.6	10.3	5.8	8.7	5.5
Eye diameter	5.6	3.0	4.8	2.8	5.4	3.0	4.5	2.9
Snout length	14.3	7.7	13.0	7.6	13.8	7.7	11.8	7.5
Upper jaw length	11.4	6.1	10.3	6.1	10.8	6.1	9.8	6.3
Lower jaw length	10.0	5.4	8.8	5.2	8.9	5.0	7.8	5.0
Pectoral fin length	20.3	10.9	18.2	10.7	19.6	11.0	16.5	10.5
Pre-dorsal length	44.4	23.8	42.8	25.1	43.5	24.4	37.0	23.6
Pre-anal length	78.0	41.9	78.1	45.9	76.3	42.7	68.8	43.9
Counts								
First dorsal fin rays	I + 4		I + 4		I + 4		I + 4	
Second dorsal fin rays	72		86		81		78	
Pelvic fin soft rays	10		11		10		10	
Anal fin soft rays	65		69		72		67	
Pectoral fin spinous rays	I + 10		I + 10		I + 10		I + 10	
Total weight (g)	42.1		36.0		39.9		28.9	
Sexual glands weight (g)	3.1		2.2		4.7		4.2	

Table 1. Morphometric measurements in mm and as a percentage of total length (%TL) recorded in specimens of *Plotosus lineatus* (Thunberg, 1787), captured off the Syrian coast.

RESULTS AND DISCUSSION

The identification of the present specimens of *Plotosus lineatus* was based on morphological features, colour, morphometric measurements and meristic counts which agree with those previously provided by Goren and Dor (1994), Golani (2002), Temraz and Ben Souissi (2013), Ali *et al.,* (2015) and

Fig. 2. A. Specimen female of *Plotosus lineatus* (ref. 2289 M.S.L.) captured off the Syrian coast. scale bar = 20 mm. B. Mature female (ref. 2289 M.S.L.) exhibiting the liver (1), the stomach (2), and the mature ovaries (3). scale bar = 20 mm. C. Mature ovaries removed from the same specimen containing yellow yolked oocytes (1). scale bar = 20mm.

Dogdu *et al.,* (2016). Such captures suggest that the species is at present successfully established in the Syrian marine waters, and consistent with fishermen and divers who locally sighted schools of the species. Additionally, these four captured specimen were mature females which exhibited large ovaries containing fully yolked oocytes. Some of them were removed from the ovaries and their consistence suggests that they were probably ready to be ovulated (Fig. 2 B, C). Recently, in the wake of local ecological knowledge, Syrian fishermen reported a new capture of 20 specimens of *Plotosus lineatus*, at least, caught on 07 July 2017 in a single bottom cage, north the city of Latakia by 35°36′ N and 35°45′ E). Such pattern confirms that the species found favourable environmental conditions to reproduce in Syrian marine waters, and concomitantly, the occurrence of a viable population remains a suitable hypothesis.

Following Golani (2002), *Plotosus lineatus* is a relative recent Lessepsian migrant (*sensu* Por, 1978) which has rapidly invaded the eastern Mediterranean and became a dominant component of the Levant Basin (Dogdu *et al.*, 2016). Unfortunately, the species is not locally appreciated for human

consumption and has a low commercial value, specimens are generally discarded at sea by fishermen when caught. Additionally, *P. lineatus* displays venomous spines, cause of injuries which could be fatal although no deaths were recorded to date (Dogdu *et al.,* (2016). The species is voracious, probably a top predator which feeds on crustaceans, molluscs and fishes, it lives in the wild from different ecological habitats (Dogdu *et al.,* 2016). Therefore, a competition pressure for food with native species having similar life styles and ontogenetic shifts cannot be totally ruled out, and following Ali *et al*. (2015), *P. lineatus* could be a threat for local biodiversity. Such negative patterns explain why the species was included among the 100 worst invasive species which entered into the Mediterranean Sea (Streftaris and Zenetos, 2006)

Plotosus lineatus should be rapidly monitored in order to avoid negative impacts on local environment and economy, following for instance suggestions of Ruttenberg *et al*. (2012) and Azzurro and Bariche (2017), used to avoid drastic invasion of a common lionfish *Pterois volitans* (Bennett, 1828) in the eastern Mediterranean;

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