

Short communication

On the Establishment of the Yellow Boxfish *Ostracion Cubicus* Linnaeus, 1758 in the Lebanese Waters, Eastern Mediterranean Sea

Ali Badreddine¹, Ghazi Bitar²

Faculty of Sciences, Lebanese University, Hadath, Beirut, Lebanon.

Received Date: 01 August 2021
 Revised Date: 04 September 2021
 Accepted Date: 15 September 2021

Abstract - The yellow boxfish *Ostracion cubicus* Linnaeus, 1758 was reported for the first time, in the Mediterranean Sea from the Lebanese waters, on January 25th 2011. However, it is widely distributed from the north to the south of the Lebanese waters to date. Therefore, this note aims to trigger an alert on the spread of the non-indigenous lessepsian *O. cubitus* in the Lebanese waters.

Keywords — *Ostracion cubicus*, non-indigenous species, Lebanese waters, eastern Mediterranean Sea

I. INTRODUCTION

The yellow boxfish *Ostracion cubicus* Linnaeus, 1758 naturally occurs in the Indo Pacific Ocean, in the Red Sea and East Africa, the Persian Gulf, to the Hawaiian and Tuamotu islands ([1]). In the Mediterranean Sea, it has been reported from the northern Lebanese waters ([2]). Later, In March and November 2015, two other records of *O. cubicus* were also confirmed from two localities (Beirut, and Tyre) of the Lebanese waters ([3]). Subsequently, in 2017, the yellow boxfish has been observed and confirmed from the Turkish and south Levantine coasts ([4], [5]). Therefore, we report two other records of this species from the Lebanese waters, constituting the seventh occurrence of *O. cubicus* in the Mediterranean Sea, and confirming the establishment status of this species in the Lebanese waters.

II. MATERIALS ANDMETHODS

On the 22th December 2020, a single individual of *O. cubicus* was caught by a Lebanese spearfishing fisher, at a depth of around 8 m, in Khalde, Mount-Lebanon (33°47'6.71"N, 35°28'25.64"E). Subsequently, photos and videos of this specimen were shared with one of us (AB) by the fisher for more detailed information.

Recently, a photo of one other individual of *O. cubicus* was published, on the 20th August 2021, on different Lebanese ©Facebook pages. After investigation, it has been confirmed that the collected specimen was caught by spearfishing, at a depth of 5 m, by a professional diver in Saida, south Lebanon (34.031633N, 35.625361E).

The complete list of *O. cubicus* sightings along the entire Lebanese coast is presented in Table 1 (see Figure 2). Additional supporting information regarding the sightings, including the location, date, proofs based on photos/ videos, references, and details (when available) of the collected specimen are provided in Table 1.

TABLE I
Records of *Ostracion cubicus* along the Lebanese coasts from 2011 until 2021

Location	Date	Photo	References/ or proofs/ or comments	Comments related to the number of individual/ Length (cm) / Weight (g)- When available
Ramkine Island- Tripoli	25- 01- 2011	Yes	[2]	1 Specimen Length 40 cm
Tyre	03- 03- 2015	Yes	[3]	1 Specimen
Beirut	02- 11- 2015	Yes	[3]	1 Specimen Length 34.6 cm
Khalde	22- 12- 2020	Yes	Photo and video shared by a Lebanese fishermen (Amin Mezher)	1 Specimen Length 42 cm Weigh 2500 g
Ziri Island- Saida	20- 08- 2021	Yes	Photo shared by a Lebanese fishermen (Ali Jdeidi)	1 Specimen Length 40 cm Weight 2000 g



III. RESULTS AND DISCUSSION

From a morphological point of view, *O. cubicus* can be easily distinguished by its characteristic shape, taking the form of a cube box, its yellowish and bluish body-color with black-edged blue spots. In addition, it presented one single dorsal fin located on the posterior side of the body with no pelvic fins ([1], [2]) (Figure 1).



Fig. 1: Ostracion cubicus caught in Saida, south Lebanon.
Photo credit: ©Ali Jdeidi

It is worth noting that the way of introduction of *O. cubicus* in the Lebanese waters, as the majority of the non-indigenous fish species originated from the Red Sea, is the Suez Canal ([2], [6]).

Concerning the current status of the *O. cubicus*, the results of observations indicate a significant increase in the abundance along the Lebanese coast since its first record in 2011 until today, when the species spread along the entire Lebanese coast from the north to the south (Table 1, Figure 2). Additionally, the total length of the recorded specimen varied from 34 ± 42 cm. In this context, and based on all these records, it can be confirmed the established status of the yellow boxfish *O. cubicus* in the Lebanese waters.

Many non-indigenous venomous fish species, such as *Lagocephalus guentheri* Miranda Ribeiro, 1915, *Lagocephalus sceleratus* (Gmelin, 1789), *Lagocephalus suezensis* Clark & Gohar, 1953, *Plotosus lineatus* (Thunberg, 1787), *Pterois miles* (Bennett 1828), *Ruvettus pretiosus* Cocco, 1833, *Siganus luridus* (Rüpell, 1829), *Siganus rivulatus* Forsskål & Niebuhr, 1775 *Sphoeroides pachygaster* (Müller & Troschel, 1848), *Torquigener flavimaculosus* Hardy & Randall, 1983) are already invaded the Lebanese waters ([7], [8], Lebanese Fishers.pers.comm.). Consequently, they have a significant impact since they are considered competitors for local commercial species stocks. Therefore, the importance of this note is to trigger an alert on the possibility invasion of *O. cubicus*.

O. cubicus feeds on a range of benthic organisms such as molluscs, crustaceans, fishes, polychaete worms and algae ([1]). Additionally, *O. cubicus* produces a poisonous toxin as a protection from other species. However, *O. cubicus* does not harm humans ([7]). To date, no data on its impact has been recorded in Lebanon. Therefore, it is essential to follow up on the current status of this new invader in the Lebanese

waters, to reduce the risk of its impacts, from the economic and ecological point of view, on the environmental state.

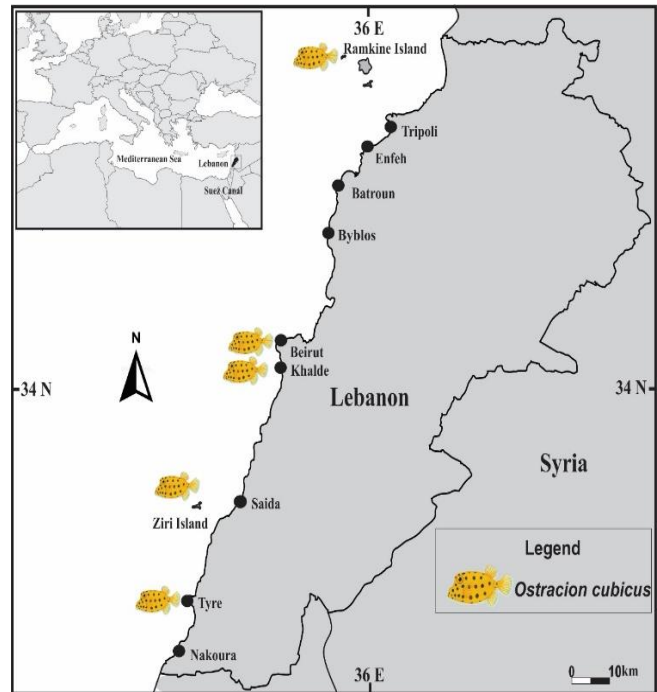


Fig. 2: Map of the Lebanese coast showing all Ostracion cubicus records locations

REFERENCES

- [1] R. Froese and D. Pauly Editors. FishBase. World Wide Web electronic publication. www.fishbase.org. (Accessed 06/2021). (2021).
- [2] M. Bariche, First record of the cube boxfish *Ostracion cubicus* (Ostraciidae) and additional records of *Champsodon vorax* (Champsodontidae) from the Mediterranean, *Aqua, International Journal of Ichthyology*, 17 (4) (2011) 181–184.
- [3] D. Dailianis, O. Akyol, N. Babali, M. Bariche, F. Crocetta, et al. New Mediterranean Biodiversity Records (July 2016). *Mediterranean Marine Science*, 17 (2) (2016) 608–626.
- [4] V. Gerovasileiou, E.H.K. Akel, O. Akyol, G. Alongi, F. Azevedo, et al. New Mediterranean Biodiversity Records (July 2017). *Mediterranean Marine Science*, 18 (2017) 355–384.
- [5] S. Katsanevakis, D. Poursanidis, R. Hoffman, J. Rizgalla, S.B.S. Rothman et al. Unpublished Mediterranean records of marine alien and cryptogenic species, *BioInvasions Records*, 9 (2) (2020) 165–182.
- [6] M. Bariche and R. Fricke, The marine ichthyofauna of Lebanon: an annotated checklist, history, biogeography, and conservation status. *Zootaxa*, 4775 (1), 1–157. 2020.
- [7] I. Uysal, and C. Turan, Impacts and risk of venomous and sting marine alien species in Turkish marine waters. *Biharian Biologist*, 14 (1) (2020) 41–8.
- [8] Bitar, G. and A. Badreddine, An updated checklist of the marine fishes in Lebanon. An answer to Bariche and Fricke (2020): The marine ichthyofauna of Lebanon: an annotated checklist, history, biogeography, and conservation status. *Zootaxa*, 5010 (1) (2021) 001–128.