

**SHORT COMMUNICATION**

**First record of the diamondback puffer,  
*Lagocephalus guentheri* Miranda Ribeiro, 1915, from  
Libyan waters**

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**Abstract**

Two specimens of the diamondback puffer, *Lagocephalus guentheri*, were caught at the "Ras Alteen" coast East of Libya. This is the first record of the species from the Libyan waters, increasing the number of Lessepsian migrants that belong to the Tetraodontidae family within the Libya up to four species.

**Keywords:** Diamondback, *Lagocephalus guentheri*, Lessepsian migrants, Libyan water, Mediterranean

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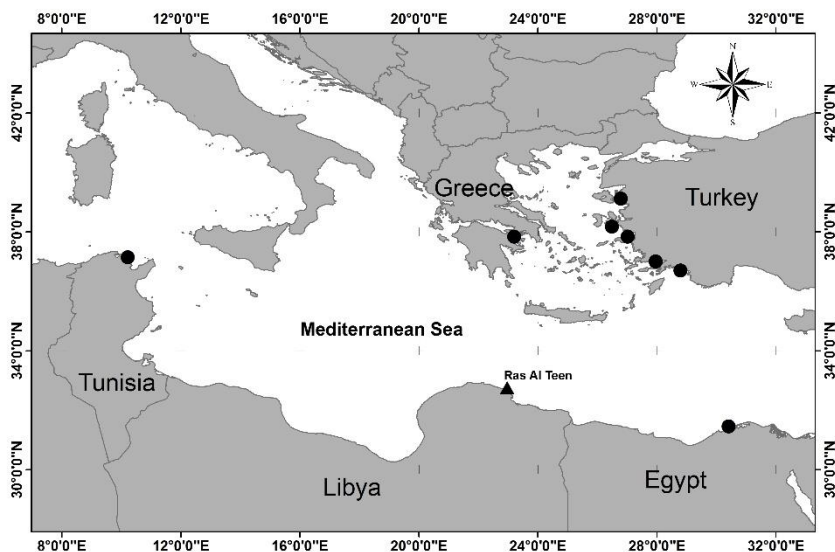
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The diamondback puffer, *Lagocephalus guentheri* Miranda Ribeiro, 1915 (Tetraodontiformes: Tetraodontidae), is a pufferfish, that is native to the Indian Ocean and the West Pacific up to the Red Sea. The species usually occurs in shallow waters, feeding on a variety of organisms (Froese and Pauly 2017). The species was observed for the first time in the Mediterranean Sea, where it is considered alien, by Kosswig (1950) and Ben-Tuviaa (1953), and it was not until five decades later when it was described off the coast of Tunisia (Charfi-Cheikhrouha 2004) and in the Marmara Sea (Tuncer *et al.* 2008) as *Lagocephalus spadiceus*, and then reported from the Egyptian coast of the

Mediterranean as *Lagocephalus guentheri* (Farrag *et al.* 2016), the Aegean Sea (Akyol and Aydin 2016), the northeastern Mediterranean coasts of Turkey (Iskenderun Bay) (Erguden *et al.* 2017), off the coast of Israel (Karahan *et al.* 2017) and last by Kleitou *et al.* (2019) from the Argosaronicos Gulf of Greece.

The difficulty in identifying *Lagocephalus* to a species level led in several cases to misidentification in the past. The most known misidentification case of *L. guentheri* Miranda Ribeiro, 1915 and *L. spadiceus* (Richardson, 1845), was cleared by Matsuura *et al.* (2011). Thus, currently it is suspected that all individuals from the Mediterranean Sea previously identified as *L. spadiceus* records might be wrongly identified and should be reexamined based on the new findings by Matsuura *et al.* (2011). Hereby, we present the first record of *L. guentheri* from Libyan waters.

A fisherman was contacted by scientists from Omar Al-Mukhtar University to provide pufferfish specimens for the scientific exhibition at the Faculty. On 19 April 2019, the fisherman caught three pufferfish specimens in Ras Al Teen ( $32^{\circ}36'33.92''\text{N}$   $23^{\circ}7'28.40''\text{E}$ ; Figure 1). Of these, one specimen was identified as *Torquigener flavimaculosus* Hardy & Randall, 1983 and the other two as *L. guentheri* based on their morphological characteristics (Figure 2).



**Figure 1.** Libyan coastline indicating the location (triangle) where the *Lagocephalus guentheri* were landed, with the locations of previous records in the Mediterranean as *L. guentheri* or *L. spadiceus* (circles)

Following the description of Matsuura *et al.* (2011) the two individuals of *L.guentheri* were identified based on (i) the pale pectoral fins, (ii) the slightly lunar caudal fin with the apparent posterior extension medially that made it appear doubly emarginated and (iii) the coloration of the caudal fin, which is entirely dark-brown except for the dorsal and ventral white tips (Figure 2). The morphometric measurements of the collected specimens are given in Table 1.



**Figure 2.** Two specimens of *Lagocephalus guentheri* reported in this study

**Table 1.** The morphological measurements for the two specimens of *Lagocephalus guentheri* in this study

<b>Morphometric characteristic (cm)</b>	<b>Sample 1</b>	<b>Sample 2</b>
TL(Total length)	36.6	29.2
SL(Standard length)	31.9	24.7
FL(Fork length)	35.2	27.5
BD(Body depth)	10.7	7.6
HL(Head length)	9.4	8.0

The Mediterranean Sea is faced with severe invasions of marine organisms that are introduced through a variety of pathways. The Suez Canal is considered as the most prevalent pathway (Katsanevakis *et al.* 2013) for the majority of the Lessepsian migrants spreading throughout the Eastern basin (Katsanevakis *et al.* 2013) and a few expanding their distribution towards the central Mediterranean. Alien species reach the Libyan waters with a variety of pathways, primarily via secondary dispersion from neighboring countries, e.g. Tunisia or Malta (Rizgalla *et al.* 2018) or via shipping traffic (Rizgalla *et al.* 2019b). In this case, we suspect that the species might have reached Libyan waters via range expansion from Egypt (Farrag *et al.* 2016).

The recent reports of several Lessepsian species from Libya (central Mediterranean) (Shakman *et al.* 2017; Al Mabruk *et al.* 2018; Rizgalla *et al.*

2018; 2019a; 2019b; Al-Mabruk and Rizgalla 2019; Osca *et al.* 2020), might suggest that thermophilic species find suitable conditions for their establishment and further dispersal in Libya's warm waters (Shakman *et al.* 2017).

Together with the present record, the inventory of the alien species of Tetraodontidae found in Libya increased to five species; *Sphoeroides pachygaster* (Müller & Troschel, 1848) reported in 1993 (Shakman *et al.* 2017), *Lagocephalus sceleratus* (Gmelin, 1789) reported in 2006 (Kacem-Snoussi *et al.* 2009), *Lagocephalus suezensis* Clark & Gohar, 1953 reported by Ben Abdallah *et al.* (2011), *T. flavimaculosus* Hardy & Randall, 1983 reported in 2018 (Al Mabruk *et al.* 2018).

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### References

- Akyol, O., Aydın, I. (2016) A new record of *Lagocephalus guentheri* (Tetraodontiformes: Tetraodontidae) from the north-eastern Aegean Sea. *Zoology in the Middle East* 62(3): 271-273.
- Al-Mabruk, S., Stoilas, V., Kleitou, P., Giovos, L. (2018) The first record of *Torquigener flavimaculosus* (Tetraodontiformes: Tetraodontidae) from Libya. *International Journal of Fisheries and Aquatic Studies* 6(4): 449-450.
- Al Mabruk, S. A., Rizgalla, J. (2019) First record of lionfish (Scorpaenidae: Pterois) from Libyan waters. *J Black Sea/Medit Environ* 25(1): 108-114.
- Ben-Abdallah, A., Al-Turky, A., Nafti, A., Shakman, E. (2011) A new record of a Lessepsian fish, *Lagocephalus suezensis* (Actinopterygii: Tetraodontiformes: Tetraodontidae), in the South Mediterranean (Libyan coast). *Acta Ichthyologica et Piscatoria* 41(1): 71.
- Ben-Tuvia, A. (1953) Mediterranean fishes of Israel. *Bulletin of the Sea Fisheries Research Station* 8: 1-40.
- Charfi-Cheikhrouha, F. (2004) Premières observations de quatre espèces de poissons allochtones à Rafrat (Nord-Est de la Tunisie). *Bulletin de l'Institut National des Sciences et Technologies de la Mer de Salammbô* 31: 115-117.

Erguden, D., Kabaklı, F., Uyan, A., Doğdu, S. A., Karan, S., Gurlek, M., Turan, C. (2017) New record of diamondback puffer *Lagocephalus guentheri* Miranda Ribeiro, 1915 from the North-eastern Mediterranean, Turkey. *Natural and Engineering Sciences* 2(3): 67-73.

Farrag, M., El-Haweet, A.A., Moustafa, M.A. (2016) Occurrence of puffer fishes (Tetraodontidae) in the eastern Mediterranean, Egyptian coast-filling in the gap. *BioInvasions Record* 5(1): 47-54.

Froese, R., Pauly, D. (Eds.) (2017) FishBase. World Wide Web electronic publication. www.fishbase.org, version (Accessed 02/2017).

Kacem-Snoussi, A., Ben Abdallah, R. A., El Turkey, A. A., Ben Moussa, N. M. (2009) Guide to Bony Fishes in Libyan Waters. Marine Research Center, Tripoli, Libya (in Arabic).

Katsanevakis, S., Zenetos, A., Belchior, C., Cardoso, A. C. (2013) Invading European seas: assessing pathways of introduction of marine aliens. *Ocean & Coastal Management* 76: 64-74.

Karahan, A., Douek, J., Paz, G., Stern, N., Kideys, A. E., Shaish, L., Rinkevich, B. (2017) Employing DNA barcoding as taxonomy and conservation tools for fish species censuses at the southeastern Mediterranean, a hot-spot area for biological invasion. *Journal for Nature Conservation* 36: 1-9.

Kleitou, P., Giovos, I., Tiralongo, F., Doumpas, N., Bernardi, G. (2019) Westernmost record of the diamondback puffer, *Lagocephalus guentheri* (Tetraodontiformes: Tetraodontidae) in the Mediterranean Sea: First record from Greek waters. *Journal of Applied Ichthyology* 35(2): 576-579.

Kosswig, C. (1950) Erythraische Fische im Mittelmeer und an der Grenze der agais. *Syllegomena Biologica*. Festschrift Kleinschmidt Akademik Verlag, Leipzig, Germany, pp. 203-212

Matsuura, K., Golani, D., Bogorodsky, S.V. (2011) The first record of *Lagocephalus guentheri* Miranda Ribeiro, 1915 from the Red Sea with notes on previous records of *L. lunaris* (Actinopterygii, Tetraodontiformes, Tetraodontidae). *Bulletin of the National Museum of Nature and Science, Series A* 37(3): 163-169.

Osca, D., Tanduo, V., Tiralongo, F., Giovos, I., Almabruk, S. A., Crocetta, F., Rizgalla, J. (2020) The Indo-Pacific Sergeant *Abudefduf vaiagensis* (Quoy & Gaimard, 1825) (Perciformes: Pomacentridae) in Libya, South-Central Mediterranean Sea. *Journal of Marine Science and Engineering* 8(1): 14.

Rizgalla, J., Bron, J.E., Crocetta, F., Shinn, A.P., Almabruk, S.A. (2019a) First record of *Aplysia dactylomela* Rang, 1828 (Mollusca: Gastropoda) in Libyan coastal waters. *Bio Invasions Records* 8(1): 80-86.

Rizgalla, J., Fridman, S., Ben Abdallah, A., Bron, J.E., Shinn, A.P. (2018) First record of the non-native sea snail *Haminoea cyanomarginata* Heller & Thompson, 1983 (Gastropoda: Haminoeidae) in the Southern Mediterranean Sea. *Bio Invasions Records* 7(4): 411-414.

Rizgalla, J., Shinn, A.P., Crocetta, F. (2019b) First documented record of the invasive cockle *Fulvia fragilis* (Forsskål in Niebuhr, 1775) (Mollusca: Bivalvia: Cardiidae) in Libya. *Bio Invasions Records* 8(2): 314-319.

Shakman, E.A., Abdalha, A.B., Thala, F., Al-Faturi, A., Bariche, M. (2017) First records of seven marine organisms of different origins from Libya (Mediterranean Sea). *Bio Invasions Records* 6(4): 377-382.

Tuncer, S., Aslan Cihangir, H., Billeceoglu, M. (2008) First record of the Lessepsian migrant *Lagocephalus spadiceus* (Tetraodontidae) in the Sea of Marmara. *Cybium* 32(4): 347-348.