

## Research article

## First record of the lessepsian migrant mackerel, *Scomber indicus*, (Scombridae) off the Syrian coasts, Eastern Mediterranean

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**Abstract:** Mediterranean Sea has been connected to Red via the Suez Canal. Since its opening, the Canal has been regarded as a hotbed for invading alien species. A single specimen of the Lessepsian migrant mackerel fish was obtained by purse seine in Ras Albasit region in the Syrian marine waters - Eastern Mediterranean Sea. The fish sample was transported to the laboratory and subjected to morphometric, meristic and anatomical measurements (Otolith, First haemal spine, Hypoid arch) measurements to facilitate its identification. The scientific identification has verified that the caught fish is *Scomber indicus* belonging to family Scombridae. This is the first record of *S. indicus* in the eastern Mediterranean Sea off the Syrian marine waters.

**Keywords:** *Scomber indicus*, Syrian marine waters, new species, Mediterranean.

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### Introduction

The greatest change in the Levantine marine environment took place after the opening of the Suez Canal. The creation of a direct link between the Mediterranean and Indo-Pacific basins resulted in the introduction of unintentional and intentional species into Levantine aquatic systems (Goren and Galil, 2005). To date, over 106 fish species of Indo-Pacific origin (Lessepsian immigrants) have entered the Levantine Basin through the Suez Canal and established flourishing populations (Golani et al., 2023, Çiçek and Bielecenoğlu, 2009, Çiçek and Avşar, 2011).

The following characteristics define the family Scombridae: body elongated and fusiform, moderately compressed in some genera; snout pointed; two dorsal fins, depressible into groove; finlets present behind dorsal and anal fins; caudal fin forked to lunate (Collette, 1986; Golani et al., 2006). Species belonging to the family are epipelagic; some species are found in coastal waters,

others occur far offshore, and many species have a large population. Some species feed on plankton; others are predators and prey upon fish, squid, and crustaceans.

*Scomber* includes four recognized species: Atlantic mackerel *Scomber scombrus* Linnaeus, 1758, Chub mackerel *Scomber japonicus* Houttuyn, 1782, Pacific mackerel *Scomber australasicus* Cuvier, 1832, and Atlantic chub mackerel *Scomber colias* Gmelin, 1789 (Collette & Nauen, 1983; Collette, 1999; Collette, 2003; Catanese et al., 2010; Eschmeyer & Fong, 2015; Abdussamad et al., 2016). The species belonging to this genus that have been recorded in the Mediterranean Sea and in Syrian marine waters are: *S. scombrus* and *S. japonicus* by Sbahi (1994); *S. scombrus* by Ghanem (2006); *S. japonicus*, by Mtawej (2012); *S. colias* and *S. scombrus* (Ali, 2018). However, the species *S. indicus* had not been recorded yet. Thus, the primary goal of this study is to report the first sighting of *Scomber indicus*

Abdussamad, Sukumaran & Ratheesh, 2016 both in the Mediterranean Sea and in Syrian marine waters.

### Material and Methods

During collecting samples of *Scombridae* in the marine waters of Lattakia (Figure 1) for studying the qualitative composition of the species of this family that had been caught in the Syrian marine waters, a single specimen of

mackerel fish was detected in a purse seine catch in Ras Albasit (35°51'46"N, 35°48'12"E) in October 2022 and was brought to the laboratory for further identification. The species was identified using the taxonomical keys of Abdussamad et al. (2016). Subsequently, the specimen was measured, weighted, and dissected at the Laboratory of Hydrobiology, Faculty of Sciences, Tishreen University, Lattakia, Syria.

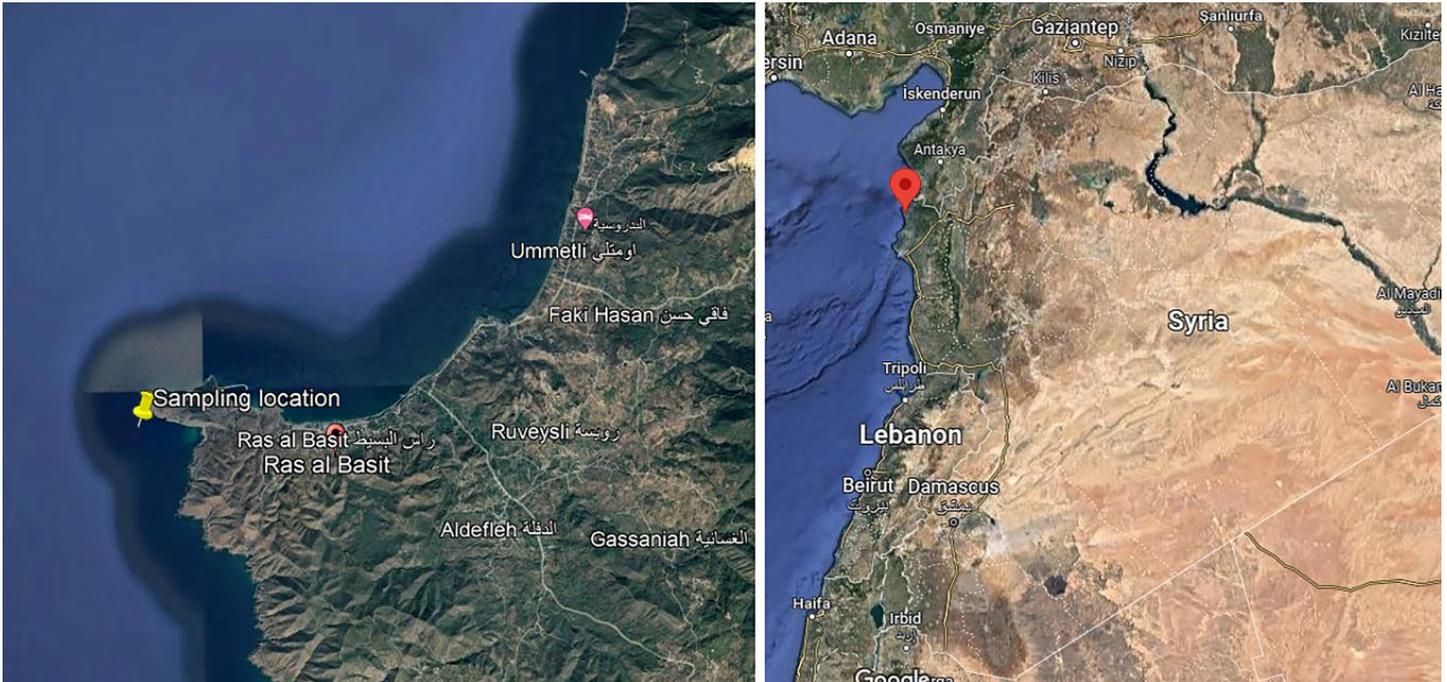


Figure 1. Sampling location (by Google Earth 2022)

### Results and Discussion

For the first time, the investigated Scomberid fish, *Scomber indicus* Abdussamad, Sukumaran & Ratheesh, 2016, has been described as a new record from the Syrian coast in the Mediterranean Sea. The captured specimens (Figure 2a) had a total length of 23.6 cm and a standard length of 20.2 cm, with a total weight of 120 g. General characteristics include a fusiform body that is elongated and rounded, a pointed snout, and a well-developed adipose eyelid. Color: dark bluish on the dorsal side with greenish wavy bands, pectorals black, small back spots on pectorals below the lateral line, and it has 7 (left side) and 6 (right side) small blue dashed lines above the pectoral fin, below the lateral line (Figure 2b, c).

The results of the meristic study showed first dorsal fin IX, dorsal finlets 5, and anal finlets 5 (Figure 3). Gill rakers on the first gill arch 43 and the space between the

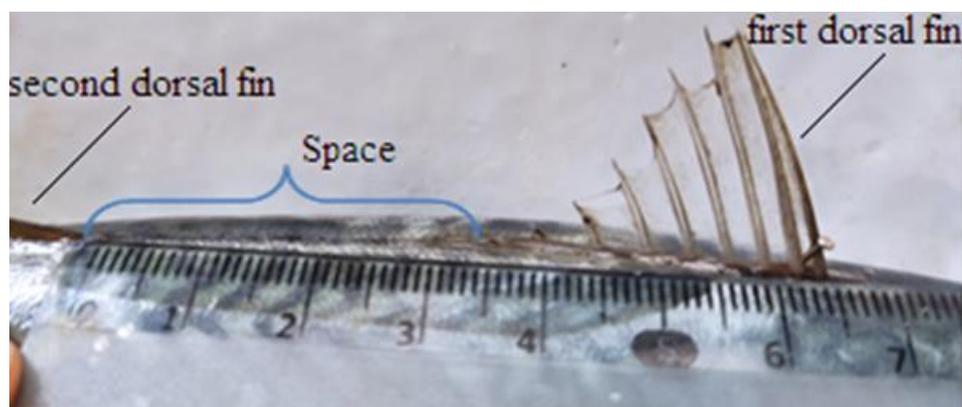
first dorsal fin groove and the second dorsal fin (3.5 cm) are slightly greater than the length of the groove (2.9 cm) (Table).

Table. Morphometric and meristic measurements for *Scomber indicus* caught from Syrian coast

Morphometric, Meristic measurements	Value
Total weight (g)	120
Total length (cm)	23.6
Standard length (cm)	20.2
Fork length (cm)	21.8
Dorsal fin spines	IX
Dorsal finlet	5
Anal finlets	5
Gill rakers on first gill arch	43
Space between first dorsal fin groove and second dorsal fin (cm)	3.5



**Figure 2.** a) General view of *Scomber indicus* (23.6 cm TL), b) 7 small blue dashed lines above and c) 6 small blue dashed lines above the pectoral fin, below the lateral line (left side) the pectoral fin, below the lateral line (right side) from Syrian coast



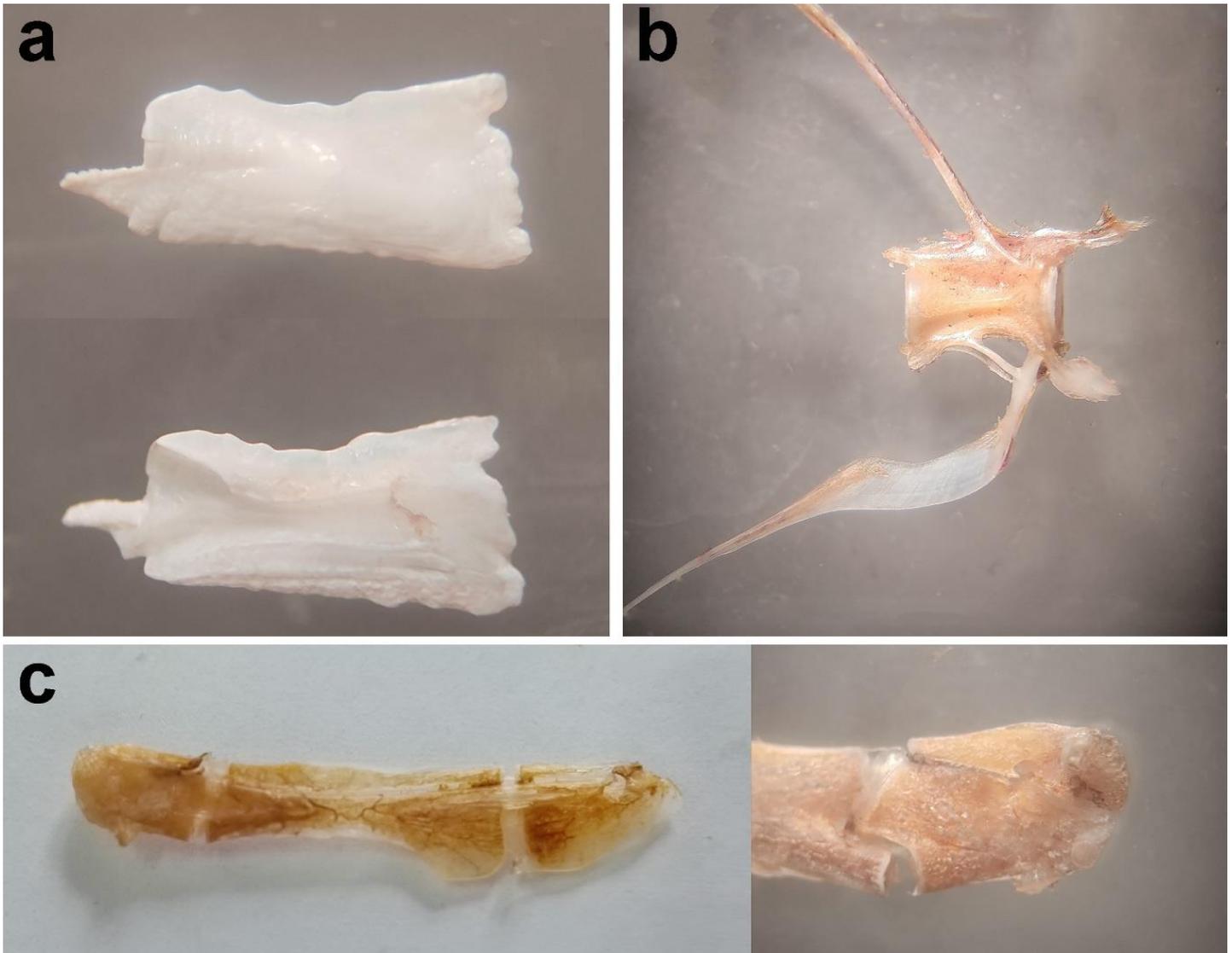
**Figure 3.** Space between first dorsal fin groove and second dorsal fin of *Scomber indicus* caught from Syrian coast

Sagittal otolith is rectangular with pointed rostrum positioned medially without a prominent anti rostrum and oblique posterior (Figure 4a); Anterior portion of the first haemal spine following hemoptysis broader with a sharp curve with the posterior spinous process projecting almost horizontally (Figure 4b) and Hyoid arch is characterized by lateral posterior most part of hypohyal blunt with a small pit between the hypohyal and the ceratohyal (Figure 4c).

The result of the morphological, merismal, and anatomical study agreed with Abdussamad et al. (2016). *Scomber indicus* was recorded in the Arabian Sea (Kochi region) by Abdussamad et al. (2016), and it may have crossed the Red Sea towards the Mediterranean Sea through the Suez Canal, where it was recorded for the first time in the Eastern Mediterranean and Syrian coasts. It falls within the framework of the Lessepsian migration of marine biota that began decades ago from the Red Sea to

the Mediterranean Sea (Galiya, 2003; Golani et al., 2006; Othman & Galiya, 2019; Othman et al., 2020; Othman et al., 2022). With the discovery of *S. indicus* in this study, a

total of 107 and 67 Lessepsian fish species have been found off the coasts of the Mediterranean and Syria, respectively.



**Figure 4.** a) Sagittal otolith, b) first haemal spine and c) hyoid arch of *Scomber indicus* caught from Syrian coast

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#### Ethical Approval

No need to ethical approval for this study.

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The authors don't declare any fund.

#### Conflict of Interest

The authors declare that they have no conflict of interest.

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