



# International Journal of Fisheries and Aquatic Studies

E-ISSN: 2347-5129

P-ISSN: 2394-0506

(ICV-Poland) Impact Value: 5.62

(GIF) Impact Factor: 0.549

IJFAS 2019; 7(2): 213-215

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www.fisheriesjournal.com

Received: 19-01-2019

Accepted: 22-02-2019

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## A new occurrence of *Sillago suezensis* (Forsskål, 1775) from the Aegean Sea coastal waters of Turkey

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### Abstract

The present paper includes report of the alien species *Sillago suezensis* (Forsskål, 1775) collected from angling performed on Gökova Bay, Turkey, southern Aegean Sea. On 9 July 2018 in the inner side of Gökova Bay (37°02'N, 28°19'E), a single specimen was captured by the angling technique from shore, with chicken meat used as a bait, from an area characterized by a sandy bottom at a depth of 1-2 m. The finding shows that a potential economically important species' distribution is expanding northwards, along the Anatolian coasts of the Aegean Sea.

**Keywords:** smelt-whitings, lessepsian, migration, gökova bay

### 1. Introduction

The Sillaginidae family comprises 30 species<sup>[1]</sup>, known commonly as smelt-whitings, and is distributed natively in the marine and brackish waters of the Indo-West Pacific Ocean, with some species being recently introduced to the Mediterranean Sea. The smelt-whitings are medium-size species with an elongate body, a long snout and long soft dorsal and anal fins, and, due to the low variability in morphometric and meristic differences among species, there is no consensus about the exact number of species within this family<sup>[2]</sup>.

*Sillago suezensis* Golani, Fricke & Tikochinski, 2013 was identified recently as a distinct species within the Sillaginidae family<sup>[2]</sup>. It is considered as a non-indigenous species for the Mediterranean Sea, probably introduced through the Suez Canal (i.e. it is a Lessepsian migrant), and was recorded for the first time within the Basin in 1977<sup>[3]</sup>. Originally, within the Mediterranean, it was identified mistakenly as *Sillago sihama* (Forsskål, 1775) with several subsequent records of the species following the same classification<sup>[2]</sup>. More recently, the species has been recorded with its current valid name from Cyprus<sup>[4]</sup>, and from Iskenderun Bay<sup>[5]</sup>. and Antalya Bay<sup>[6, 7]</sup> in Turkey. Possibly all previous records of *S. sihama* in the Mediterranean should be ascribed to *S. suezensis*<sup>[2]</sup>. The species is normally found in large numbers<sup>[6]</sup> and can potentially have commercial importance for the Basin.

Our work presents the first record of *S. suezensis* from Gokova Bay, south-eastern Aegean Sea, Turkey, which constitutes the westernmost and northernmost record of the species in the Mediterranean Sea. Given the relatively rapid increase of the species along the Turkish coast and the anomalies between records of *S. suezensis* and of *S. sihama*, our works aims to (i) contribute to the updated distribution of and (ii) to disentangle the ambiguity of occurrences of *S. suezensis* within the Mediterranean Sea.

### 2. Material and Methods

A male specimen of *S. suezensis* (Fig-1) was captured on 9 July 2018 in the inner side of Gökova Bay (37°02'N, 28°19'E) (Fig-2) by the angling technique from shore, with chicken meat used as a bait, from an area characterized by a sandy bottom at a depth of 1-2 m. The sampling location is in close proximity to the mouth of the Azmak River. The individual caught was immediately transported to the laboratory at the Department of Fisheries and Seafood Processing Technology, Muğla Sitki Koçman University (Muğla-Turkey) and was frozen. Subsequently, the same individual was measured for total length, fork length and standard length (TL, in mm) to the nearest mm and weighed (W, total wet weight in g) to the nearest 0.01 g.

Photos of the individual were taken via Canon 600D photograph machine and transferred to the ImageJ 1.51H software for further analyses. The following thirteen morphometric characters were measured through the software program: total length, standard length, fork length, body depth at dorsal fin, predorsal length (first dorsal fin), predorsal length (second dorsal fin), postdorsal length (first dorsal fin), post dorsal length (second dorsal fin), prepectoral length, prepelvic length, preanal length, caudal fin depth, caudal fin length, head (6 characteristics; head length, head height, eye diameter, interorbital distance, preorbital length, postorbital length). For the meristic characters, first dorsal fin rays, second dorsal fin rays, pectoral fin rays, pelvic fin rays

and anal fin rays were counted for the specimen under a magnifying glass<sup>[1]</sup>.

### 3. Results

The total length, fork length, standard length and weight of the *S. suzezensis* individual were recorded as 174 mm, 164 mm, 146 mm and 36, 58 gm respectively (Table-1). The values for the corresponding meristic and morphometric characters are given in Table-1. The body was elongated, with the snout and head being pointed. The mouth was small and terminal, with the upper jaw being slightly longer than the lower one.

**Table 1:** Metric and Morphometric characters for the *Sillago suzezensis* individual

Morphometric characters	Length/ mm
Total length (TL)	174
Total weight (g)	36.58
Fork length (% of TL)	91.38
Standard length (% of TL)	79.89
Body depth at dorsal fin (% of TL)	14.96
Predorsal-1 (% of TL)	30.78
Postdorsal-1 (% of TL)	46.21
Predorsal-2 (% of TL)	48.52
Postdorsal-2 (% of TL)	76.30
Prepelvic (% of TL)	26.11
Prepectoral(% of TL)	25.87
Preanal (% of TL)	48.33
Postanal (% of TL)	74.21
Caudal peduncle depth (% of TL)	6.96
Head length (% of TL)	24.37
Head height	52.33
Eye diameter	24.37
Preorbital	41.25
Interorbital	22.62
Postorbital	35,87
Meristic characters	
Dorsal rays	XII
Dorsal rays	I+21
Anal spines	II
Anal soft rays	18
Caudal fin rays	21
Pelvic fin spines	I
Pelvic fin soft rays	6

### 4. Discussion

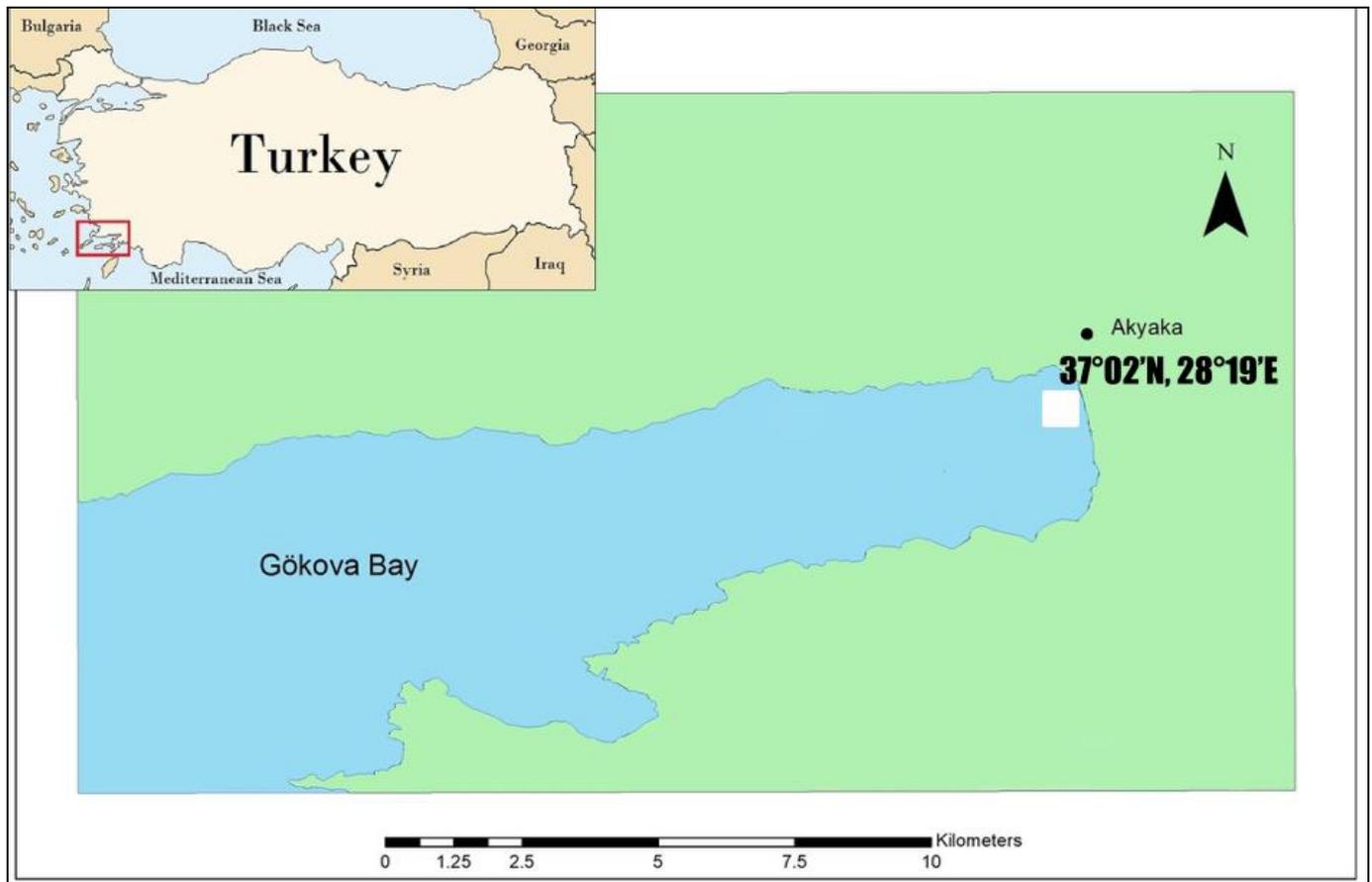
The values for the characters recorded for the *S. suzezensis* individual reported in this study (Table 1) tally and are consistent with minimum and maximum character values reported by<sup>[6]</sup>. For the *S. suzezensis* population sampled within Antalya Bay, Turkey, with one exception – head length (reported as % of TL) - which was marginally (0.13cm) longer in our individual than the maximum value reported in<sup>[6]</sup>. As a result of this high degree of consistency between the two sets of results, we are confident of the outcome of our taxonomic identification exercise. Further analysis of the results obtained indicates that the *S. suzezensis* individual caught at Gökova Bay was an adult, given that values exhibited by this individual for its morphometric attributes approached the maximum ones reported by<sup>[6]</sup>.

The nearest location within the Mediterranean Basin from which the species was previously recorded is Antalya Bay<sup>[6]</sup>, 200km to the east of Gökova Bay, suggesting a gradual westward spread of the species within the Basin. The present study, therefore extends considerably the known geographical

distribution of *S. suzezensis* within the Basin<sup>[6]</sup>. report the collection of a total of 119 *S. suzezensis* individuals from Antalya Bay, further underscoring the invasive nature of the species and its establishment in the Levantine Basin of the Mediterranean. A rapid unstructured survey conducted within Gokova Bay revealed that commercial fishermen have not yet caught the species by commercial fishing methods. Since the species has potential commercial importance, *S. suzezensis* might represent in future a novel exploitable halieutic resource, as is the case for a number of other Lessepsian fish species already exploited by fishermen in the area, including *N. randalli* and *S. lessepsianus*<sup>[8]</sup>. The ecological ramifications of the establishment of *S. suzezensis* within eastern swathes of the Mediterranean are as yet unknown since they have not been studied to date. Further research into the economic potential of the new eastern Mediterranean coastal fishery represented by *S. suzezensis* as well as into the potential ecological ramifications of the establishment of the species in this part of the Mediterranean should be conducted.



**Fig 1:** Lateral view of *Sillago suezensis*



**Fig 2:** Map showing sampling locality of *Sillago suezensis*

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