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## ADDITIONAL RECORDS OF TWO LESSEPSIAN FISH, *SIGANUS LURIDUS* AND *CHAMPSODON VORAX* FROM IZMIR BAY (AEGEAN SEA, TURKEY)

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### ABSTRACT

Two Lessepsian fish species, *Siganus luridus* (*Siganidae*) and *Champsodon vorax* (*Champsodontidae*) were reported for the second time from the Bay of Izmir, NE Aegean Sea and some morphometric and meristic characteristics of the specimens were also given.

**Keywords:** Lessepsian fish, new record, measurement, dispersion

## NUOVE SEGNALAZIONI DI DUE PESCI LESSEPSIANI, *SIGANUS LURIDUS* E *CHAMPSODON VORAX*, DALLA BAIA DI SMIRNE (MAR EGEO, TURCHIA)

### SINTESI

La presenza di due specie di pesci lessepsiani, *Siganus luridus* (*Siganidae*) e *Champsodon vorax* (*Champsodontidae*), è stata segnalata per la seconda volta nella baia di Smirne (Izmir), nel Mar Egeo nord-orientale. L'articolo riporta alcune caratteristiche morfometriche e meristiche dei due pesci.

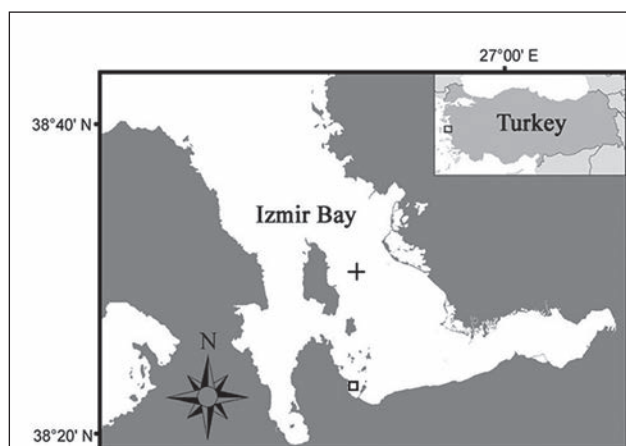
**Parole chiave:** pesci lessepsiani, nuove segnalazioni, misurazioni, dispersione.

## INTRODUCTION

The opening of the Suez Canal in 1869 linked the Mediterranean with the tropical Red Sea and this connection has led to a massive influx of Red Sea biota into the Mediterranean, including fish species (Golani *et al.*, 2006). The invasion of Red Sea organisms through the Suez Canal is known as the “Lessepsian migration” (after Ferdinand de Lesseps, who supervised the canal’s construction).

On the Turkish coasts, Çınar *et al.* (2011) chronologically listed a total of 400 alien species, including 58 fish, with 27 Lessepsian fish species reported from the Aegean Sea. Recently, Ergüden & Özdemir (2015) updated to a total number of 64 the Indo-Pacific fish species in Turkish marine waters, of which 61 species in the Southern coasts of Turkey, 38 in the Aegean Sea, 3 in the Sea of Marmara and one in the Black Sea. It is evident that a rapid range expansion of alien fish occurred along the coasts of the Aegean Sea in recent years.

Izmir Bay is a very important nursery and fishing area in the North-eastern Aegean Sea. About 276 fish species has been recorded from the bay (Geldiay, 1969) and nowadays, increasing the Lessepsian fish diversity in the area must be probably enhanced due to the warming of the sea (Raitsos *et al.*, 2010). Various Lessepsian fish, such as *Saurida undosquamis* (Richardson, 1848), *Lagocephalus sceleratus* (Gmelin, 1788), *Siganus luridus* (Rüppell, 1829), *S. rivulatus* Forsskål, 1775, *Champsodon vorax* Günther, 1867 and *Stephanolepis diaspros* Fraser-Brunner, 1940 were consecutively reported from the bay in the last decade (Akyol & Kara, 2003; Bilecenoğlu *et al.*, 2006; Kara & Akyol, 2011; Gurbet & Kara, 2013; Akyol & Özgül, 2015; Aydın & Akyol, 2015). Recently, *Etrumeus teres* was also found in the bay (O. Akyol, *unpubl. data*).



**Fig. 1:** Sampling locations of the specimens: *Champsodon vorax* (+) and *Siganus luridus* (□).

**Sl. 1:** Vzorčevalni lokaliteti, kjer sta bila ujeta primerka vrst *Champsodon vorax* (+) in *Siganus luridus* (□)

Additional records of alien species in a certain area, accompanied by biological observations, improve knowledge on their establishment success. Thus, this paper documents the occurrence of two Lessepsian fish, *S. luridus* and *C. vorax* caught in the Izmir Bay for the second time while some biological data of collected specimens are presented.

## MATERIAL AND METHODS

During investigations, conducted in 2013 and 2015 in the Turkish Aegean Sea and focusing on the Lessepsian fish distribution one specimen of *Siganus luridus* and one specimen of *Champsodon vorax* were collected from Izmir Bay (Fig. 1). After measurements to the nearest millimeter and counts, both specimens were fixed with 5 % formaldehyde solution and deposited in the fish collection of the Faculty of Fisheries, Ege University (ESFM-PIS).

## RESULTS AND DISCUSSION

***Siganus luridus* (Rüppell, 1829)**

The specimen of *Siganus luridus* (197 mm of total length, ESFM-PIS/2013-004) (Fig. 2) was captured on 2 October 2013 at Urla coast of Izmir Bay (38° 30' 14" N, 26° 47' 00" E), with trammel net (72 mm stretched mesh size) at a depth of 8 m on sandy bottom with *Posidonia* meadows.

Morphometric characteristics, meristic counts, selected body proportions (Tab. 1) and color pattern were in accordance with the description of Ben-Tuvia (1986), Golani *et al.* (2006) and Kara & Akyol (2011).

***Champsodon vorax* Günther, 1867**

The specimen of *Champsodon vorax* (125 mm of total length, ESFM-PIS/2015-002) (Fig. 3), was caught on 10 March 2015 with bottom trawl net (44 mm mesh size), east of Uzunada Island, Izmir Bay (38° 22' 21" N, 26° 45' 54" E), on muddy bottom at a depth of 50 m.



**Fig. 2:** *Siganus luridus* (ref. ESFM-PIS/2013-004), captured in Izmir Bay (scale bar = 50 mm). (Photo: O. Akyol)  
**Sl. 2:** Primerek vrste *Siganus luridus* (ref. ESFM-PIS/2013-004), ujet v Izmirskemu zalivu (merilo = 50 mm). (Foto: O. Akyol)



**Fig. 3:** *Champsodon vorax* (ref. ESFM-PIS/2015-002), captured in Izmir Bay: (A) lateral view, (B) ventral view (scale bar = 50 mm). (Photo: O. Akyol)

**Sl. 3:** *Primerek vrste Champsodon vorax* (ref. ESFM-PIS/2015-002), ujet v Izmirskemu zalivu: (A) pogled s strani, (B) pogled od spodaj (merilo = 50 mm). (Foto: O. Akyol)

All measurements, counts, selected body proportions (Tab. 1) and color patterns were in accordance with previous descriptions of Aydın & Akyol (2015 and references therein).

*S. luridus* has been a well-known colonizer of the southern Aegean Sea waters for a long time. In recent years, it has reached the northernmost latitude both in southern Chios Island (Katsanevakis & Tsiamis, 2009) and Sigri Bay, Lesvos Island, Greece (Evangelopoulos *et al.*, 2015) and Edremit Bay, coast of Assos, Turkey (Işmen *et al.*, 2015). After the first record of the species in Izmir Bay (17 individuals) given by Kara & Akyol (2011), the second one reported here may indicate that the species is establishing in the area.

The second record of *C. vorax* in Izmir Bay, firstly reported in the area by Aydın & Akyol (2015), documents a tendency to rapid expand towards the northern latitudes of the Aegean, since Gökova Bay record in 2014, SE Aegean Sea (Yapıcı *et al.*, 2015).

The findings reported in this ichthyological note further highlight that Izmir Bay, located in northern latitudes of the Mediterranean, is becoming step by step an area suitable to Lessepsian fish introduction and establishment, linked to the effects of global warming.

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**Tab. 1:** Morphometric measurements, ratios and counts of *Siganus luridus* and *Champsodon vorax*, captured from Urla coast, Izmir Bay.

**Tab. 1:** Morfometrične meritve in meristični podatki za primerka vrst *Siganus luridus* in *Champsodon vorax*, ujetih na obrežju Urla v Izmirskem zalivu

Species	<i>Siganus luridus</i>		<i>Champsodon vorax</i>	
	Size (mm)	Proportion	Size (mm)	Proportion
Total length (TL)	197		125	
Standard length (SL)	166	84.3 %TL	108	86.4 %TL
Maximum body depth	70	35.5 %TL	18	14.4 %TL
Predorsal fin length	42	21.3 %TL	36	28.8 %TL
Prepectoral fin length	34	17.3 %TL	30	24.0 %TL
Pre-anal fin length	87	44.2 %TL	54	43.2 %TL
Head length (HL)	38	19.3 %TL	29	23.2 %TL
Eye diameter	10	26.3 %HL	5.6	19.3 %HL
Preorbital length	14	36.8 %HL	8.5	29.3 %HL
<b>Counts</b>				
1st Dorsal fin rays	XIV+10		V	
2nd Dorsal fin rays	-		20	
Anal fin rays	VII+9		18	
Pectoral fin rays	16		12	
<b>Weight (g)</b>	147		16	

DODATNI ZAPISI O POJAVLJANJU DVEH VRST LESEPSKIH RIBJIH SELIVK, *SIGANUS LURIDUS* IN *CHAMPSODON VORAX*, IZ IZMIRSKEGA ZALIVA (EGEJSKO MORJE, TURČIJA)

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## POVZETEK

Dve vrsti leseskih ribjih selivk, *Siganus luridus* (družina *Siganidae*) in *Champsodon vorax* (družina *Champsodontidae*), sta bili drugič potrjeni v Izmirskem zalivu v severovzhodnem delu Egejskega morja. Avtorja podajata morfolometrične in meristične podatke primerkov obeh vrst.

**Ključne besede:** leseske ribe, novi zapis, meritve, razširjanje

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