

**FIRST RECORD OF THE SENEGALESE SOLE, *SOLEA SENEGALENSIS*  
(ACTINOPTERYGII: PLEURONECTIFORMES: SOLEIDAE)  
FROM THE MEDITERRANEAN COAST OF ISRAEL**

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**Abstract.** The Senegalese sole, *Solea senegalensis* Kaup, 1858, was recorded for the first time from the southeastern Mediterranean near Tel-Aviv, Israel on 17 May 2013. This eastern Atlantic species is rare in the western Mediterranean, but now also documented from the southeastern Mediterranean.

**Keywords:** *Solea senegalensis*, Soleidae, first record, Mediterranean, Israel, distribution, fish biodiversity, zoogeography

In the course of a survey of Mediterranean fishes of Israel in the vicinity of Jaffa, an unusual soleid fish was collected in May 2013, which was determined to be a new record of *Solea senegalensis* from Israel and the southeastern Mediterranean Sea; the specimen is described herein.

On 17 May 2013 a 243 mm SL specimen of *Solea senegalensis* Kaup, 1858 was collected at Jaffa Fish Market (two additional specimens of the same size and species were next to it), and had been trawled the previous night in the vicinity of Tel-Aviv, Israel. The specimen was deposited in the Hebrew University Fish Collection and received the catalog number HUI 20200. Counts and measurements followed Hubbs and Lagler (1947); the classification follows Eschmeyer (2013), references according to Fricke (2013).

SOLEIDAE

*Solea senegalensis* Kaup, 1858

**Material examined.** HUI 20200, 1 specimen, 243 mm SL, Israel, Jaffa Fish Market, 17 May 2013.

**Description.** (Figs. 1–3) Body oval, laterally strongly compressed, eyes on right side of body ('eyed side'), left side of body without eyes ('blind side'). Body depth 2.4 in SL. Head 6.2 in SL. Snout bluntly rounded, its length 5.3 in head length. Eye diameter 4.6 in head length. Interorbital distance 5.3 in head length. Anterior nostril on blind side not enlarged, its diameter about half of eye

diameter. Supratemporal lateral-line branch present, forming arch. Lateral-line scales 124. Caudal peduncle depth 11.0 in SL. Precaudal vertebrae 9, caudal vertebrae 36. Dorsal fin with 92 rays. Anal fin with 73 rays. Last rays of dorsal and anal fins joined by low membrane to caudal-fin base. Caudal fin rounded. Pectoral fin with 10 rays. Pelvic fin with 5 rays. Pectoral-fin length 11.0 in SL. Pelvic-fin length 20.2 in SL.

Colour of fresh specimen (Fig. 1): Head and body dark brown, right side (eye side) of body with scattered pale blotches varying in size; few dusky blotches along dorsal and ventral margins. Pectoral fin rays brown, membranes black, distal margin white (Fig. 2). Left side of body (blind side) white, the distal one-third of dorsal and anal fins and distal half of caudal fin light grey. Dorsal and anal fins brown, with few dusky blotches, tips of fin rays white. Caudal and pelvic fins brown, tips of fin rays white.

**Comments.** This species was first described by Kaup (1858). It was treated as a valid species in a revision of Ben-Tuvia (1990: p. 953), and further defined in a revision of Vachon et al. (2008). In a nucleotide-sequence analysis of the cytochrome b locus, Borsa and Quignard (2001: p. 2300) separated five species of *Solea*, resurrected *Solea aegyptiaca* Chabanaud, 1927 (previously considered as a synonym of *S. solea*), and found that *Solea senegalensis* is most closely related to *S. aegyptiaca*. *Solea melanochira* Moreau, 1874, which was described from

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the Bassin d'Arcachon, France (Moreau 1874: p. 115, pl. 15) is a junior synonym.

The specimen agrees with the generic characters of the genus *Solea* as defined by Vachon et al. (2008: pp. 10–11), including an oval body shape, both pectoral fins well developed, bearing bifid rays, 5 pelvic-fin rays, 9 precaudal vertebrae, the shape of the anterior nostril, a rounded caudal fin which is separate from the dorsal and anal fins, though the last rays of dorsal and anal are connected by a membrane to the caudal peduncle or caudal-fin base; a caudal fin anatomy as illustrated by Vachon et al. (2008: Fig. 3). The characters of the specimen of *Solea*

*senegalensis* from Israel well agree with those defined by Vachon et al. (2008), including the body shape and pectoral-fin colouration (see Vachon et al. 2008: Fig. 5 H), the 92 dorsal-fin rays (slightly higher than the range 78–90 given by Vachon et al. 2008: p. 14), 73 anal-fin rays (again slightly higher than the range 63–72 given by Vachon et al., 2008: p. 14), 124 lateral-line scales (range 108–133 according to Vachon et al. 2008: p. 15), 9 precaudal and 36 caudal vertebrae (Fig. 3) (range 9 + 35–37 according to Vachon et al. 2008: p. 15).

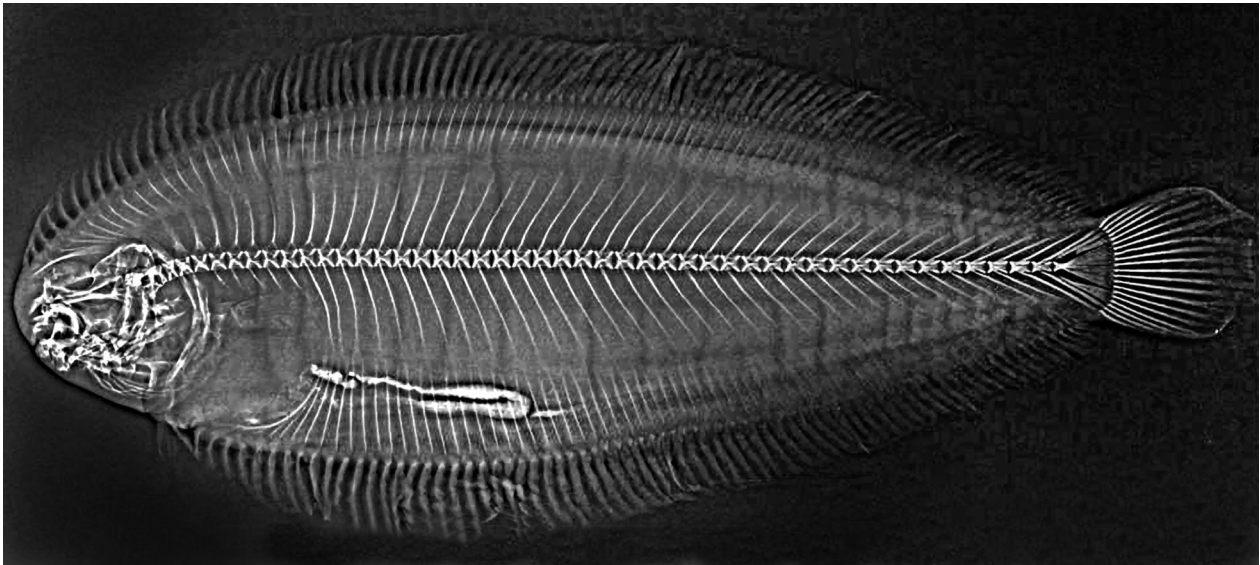
*Solea senegalensis* differs from the other species of the genus that occurs in the Mediterranean, *Solea solea*,



**Fig. 1.** Senegalese sole, *Solea senegalensis*, Lateral view; HUI 20200; 243 mm (SL); 17 May 2013; Tel-Aviv, Israel; Photograph by D. Golani



**Fig. 2.** Senegalese sole, *Solea senegalensis*; Pectoral fin; HUI 20200; 243 mm (SL); 17 May 2013; Tel-Aviv, Israel; Photograph by D. Golani



**Fig. 3.** Senegalese sole, *Solea senegalensis*; HUI 20200; 243 mm (SL); X-ray photograph

in its 9 precaudal vertebrae (usually 10 precaudal vertebrae in *S. solea*), its 35–37 caudal vertebrae (36–41 in *S. solea*; mean 39), the pectoral-fin colouration with all membranes black, but fin rays pale (with a black blotch in the upper distal part in *S. solea*), and the pectoral-fin length 11–13 in SL (13–15 in SL in *S. solea*). It is distinguished from *Solea aegyptiaca* by its 78–92 dorsal-fin rays (65–76 in *S. aegyptiaca*), 63–73 anal-fin rays (53–62 in *S. aegyptiaca*), 35–37 caudal vertebrae (32–34 in *S. aegyptiaca*), the pectoral-fin colouration with all membranes black, but fin rays pale (with a black blotch in the upper distal part in *S. aegyptiaca*), and the pectoral-fin length 11–13 in SL (13–14 in SL in *S. aegyptiaca*).

*Solea senegalensis* is distributed in the eastern and northeastern Atlantic from France south to Angola, and in the western Mediterranean. The species was first recorded from the Mediterranean by de Borja y Goyeneche (1920), misidentified as *Solea melanochira* (see Golani et al. 2002). In subsequent years it spread east to Tunisia and Turkey (Fricke et al. 2007: p. 116). This species lives on sand or mud bottoms, mainly in shallow water including brackish lakes, but occurs down to 100 m depth. It feeds mainly on benthic invertebrates.

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