Marine Biodiversity Records, page 1 of 3. © Marine Biological Association of the United Kingdom, 2011
doi:10.1017/S1755267210001132; Vol. 4; e14; 2011 Published online

First record of Indo-Pacific Indian scad fish, *Decapterus russelli*, on the north-eastern Mediterranean coast of Turkey

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The lessepsian migrant fish Decapterus russelli *was recorded for the first time on the coast of Turkey, north-eastern Mediterranean. A sampling campaign was carried out from January 2008 to March 2010. A total of sixty-seven specimens was caught with trawl nets at a depth of 15–18 m.* Decapterus russelli *was found in Iskenderun Bay on 17 October 2009, Mersin Bay and Erdemli Bay on 17, 18 and 23 March 2010. Some morphometric and meristic characteristics of this species are presented here.*

Keywords: *Decapterus russelli*, lessepsian migration, first record, the coast of Turkey, north-eastern Mediterranean

Submitted 24 May 2010; accepted 28 October 2010

INTRODUCTION

The Indian scad *Decapterus russelli* (Rüppell, 1830) is classified as a species of the Carangidae family. This species is extensively found to be distributed from the Red Sea to the Indian Ocean and Indo-Pacific (Smith-Vaniz, 1984; FAO-FIGIS, 2001; Jaiswar *et al.*, 2001; Manojkumar, 2005). In the Mediterranean the first occurrence of *D. russelli* was reported by Golani (2006) on the coast of Haifa, Israel. This species has become an important target species in fisheries off the Israeli–Lebanese coast (Golani *et al.*, 2009).

The dispersal of lessepsian fish has been studied by several authors (Spanier & Galil, 1991; Golani, 1998; Shefer *et al.*, 2004; Galil, 2007; Ben Rais Lasram *et al.*, 2008). Lessepsian immigrants to the Mediterranean Sea are generally first reported on the coast of Israel owing to its proximity to the Suez Canal. In the Mediterranean Sea, more than 72 lessepsian fish species have been found to have migrated from the Red Sea since the opening of the Suez Canal in 1869 (Golani *et al.*, 2009). In addition to the reported 42 species on the coast of the Turkish Mediterranean (Mavruk & Avsar, 2008), the current study presents the first record of the lessepsian migrant *Decapterus russelli*.

MATERIALS AND METHODS

Sampling was carried out from January 2008 to March 2010 on the coast of Turkey, north-eastern Mediterranean with the RV 'Lamas' (Figure 1). A total of 203 tows between 5 and 230 m depth were conducted using two different trawl systems from namely, the demersal trawl and a modified demersal trawl with an enlarged opening in order to collect small pelagic fish at speeds ranging between 3.5 and 5 knots.

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Specimens' morphometric measurements and meristic counts were adapted from Smith-Vaniz (1984) and Golani (2006). Some specimens were kept in 4% buffered formaldehyde for the purpose of preserved samples at the Museum of Marine Biology and Fisheries, Institute of Marine Sciences, Middle East Technical University.

Description

Slender, elongated and almost rounded body. Moderate eyes (24.2–32.6% of head length (HL)), wide interorbital space (25.0–29.8% of HL) and the pointed snout (24.3–36% of HL). The transparent eyelid covers larger part of the eye. Two dorsal fins; the first one has eight spines in triangular form, and the second has only one spine with 30–33 rays and a separate finlet. Anal fin consists of two separate spines one of which is followed by 25–28 rays with a separate finlet. Acute pectoral fin (26.4–33.2% of HL) with 18–22 rays. The first upper gill comprises 10 to 15 rakers whilst the lower gill arch has 31 to 36 rakers. There are small teeth on both jaws. Lateral line curves slightly downward under the 9th–12th dorsal rays, anterior part and posterior part of lateral line have 44 to 55 scales and 35 to 41 scutes. There are two small papillae on the edge of the shoulder girdle (cleithrum), the lower one relatively larger than upper.

The specimen has a bluish-green dorsal and silvery-white belly. A small black blotch is located on the margin of the operculum near the upper edge. The colour of the caudal fin is yellowish-brown. Dorsal fin is almost transparent membrane with dark spots on the spines. The remaining fins are transparent.

RESULTS AND DISCUSSION

Species meristic formula for *Decapterus russelli* obtained from the current study (Turkish Mediterranean coast) was as

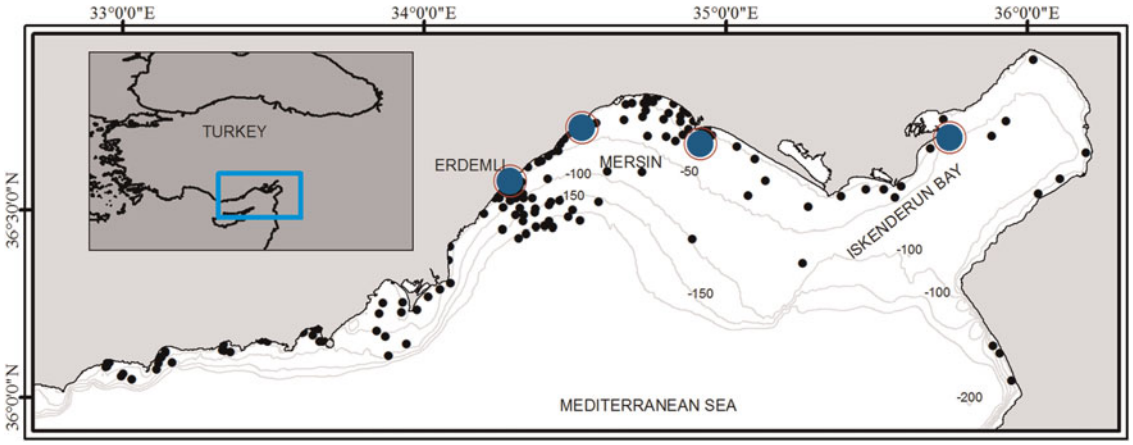

Fig. 1. Location of trawl stations between January 2008 and March 2010 along the Turkish Mediterranean coast (black lines). Blue dots represent the location where *Decapterus russelli* was found.

Table 1. Sampling details and average total length (TL, cm), weight (W, g) of collected individuals.

Date	Location	Coordinates	Depth (m)	No. of ind.	Mean TL	± SE	Ratio to total carangids
17/10/2009	Iskenderun Bay	35°44′E 36°42′N	18	11	16.82	0.74	88%
17/03/2010	Mersin Bay	34°55′E 36°41′N	18	2	9.15	0.15	5%
18/03/2010	Mersin Bay	34°31′E 36°43′N	15	14	7.9	0.23	5%
23/03/2010	Erdemli Bay	34°17′E 36°35′N	17	40	8.2	0.15	27%

follows: D1, VIII; D2, I + 30–33; A, II + I + 25–27; P, 18–22; V, I + 5; LL, 8 –96 which is in agreement with the previous publications (FAO-FIGIS, 2001; Golani, 2006).

A total of 67 specimens of the lessepsian migrant *D. russelli* were caught with modified trawl nets in October 2009, and in March 2010 (Figure 1; Table 1). During the study period, the first occurrence of the aforementioned species was 11 individuals recorded in Iskenderun Bay on 17 October 2009. On 17 and 18 March 2010, 16 specimens were obtained from Mersin Bay, and a total of 40 individuals were observed in Erdemli Bay on 23 March 2010 (Table 1). In addition, carangid fish such as *Caranx rhoncus* Geoffroy Saint-Hilaire, 1817, *Trachurus mediterraneus* (Steindachner, 1868), and lessepsian fish *Alepes djeddaba* (Swainson, 1839) were recorded during trawling studies. It is worth mentioning that *D. russelli* constituted 88% of the total amount of the carangid abundance obtained from Iskenderun Bay (Table 1).

Decapterus russelli can easily be distinguished from *T. mediterraneus* and other carangids by applying three main individual characteristics: (a) the lack of scutes on the anterior part of the lateral line; (b) the presence of widely detached finlets at terminal dorsal and anal rays; and (c) the existence of two small papillae on the shoulder girdle (cleithrum) margin where the lower papilla is larger (Figure 2).

The first maturity of *D. russelli* females has been reported at 155 mm total length in the south-western Indian Ocean (Manojkumar, 2005). The average total length of the specimen was found to range from 7.9 to 16.82 cm in the study area (Table 1). Larger individuals, all of which were females, were obtained from Iskenderun Bay; whereas almost all specimens observed in Mersin Bay and Erdemli Bay (Figure 1) were collected as juveniles.

Smith-Vaniz (1984) reported that *D. russelli* most commonly inhabited inshore waters shallower than 100 m in the Indian Ocean. However, current trawling results suggest that all individuals are likely to habituate water depths less than 20 m.

In contrast to the open waters, the coastal part of the north-eastern Mediterranean Sea has been characterized by relatively warm seawater temperatures, broad coastal shelf and high productivity due to riverine inputs (Dogan-Saglamtimur & Tugrul, 2004; Ozsoy, 2008). Success of this small pelagic lessepsian species might be attributed to prevailing conditions on the coast of the north-eastern Mediterranean. Furthermore, occurrence of *D. russelli* in different areas dictates that this species has already become a resident in the north-eastern

Fig. 2. Specimens of *Decapterus russelli* found on the Turkish Mediterranean coast: (A) 14.7 cm SL, Iskenderun Bay; (B) 8.6 cm SL, Mersin Bay. (Photograph: S. Sakınan.)

Mediterranean. Considering the favourable conditions in the eastern Mediterranean and rapid expansive pattern of this small pelagic (Golani *et al.*, 2009) it is possible that *D. russelli* may play an important role in the pelagic realm of the region in the near future.

ACKNOWLEDGEMENTS

We would like to thank Dr Ali Cemal Gücü, Dr Bettina A. Fach Salihoglu and Dr Mustafa Kocak for valuable comments on the draft of the manuscript. Special thanks also to academic and technical staff of the Institute of Marine Sciences of METU. This study has been conducted as part of the TOVAG-108O566 project supported by the Turkish Scientific and Technical Research Council of Turkey (TÜBITAK).

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