

On the increasing occurrence of the Bluespotted Cornetfish *Fistularia commersonii* (Rüppel, 1838) in the Central Mediterranean (Osteichthyes, Fistulariidae)

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ABSTRACT The increasing occurrence of the blue-spotted cornet fish *Fistularia commersonii*, a highly successful Lessepsian migrant, within coastal waters of Sicily and of the Maltese Islands is hereby recorded. Reports of recent sightings of the species within such a marine area are documented and these suggest the establishment of viable populations for the species within the same marine area.

KEY WORDS *Fistularia commersonii*, Sicily, Maltese Islands, Lessepsian migrant.

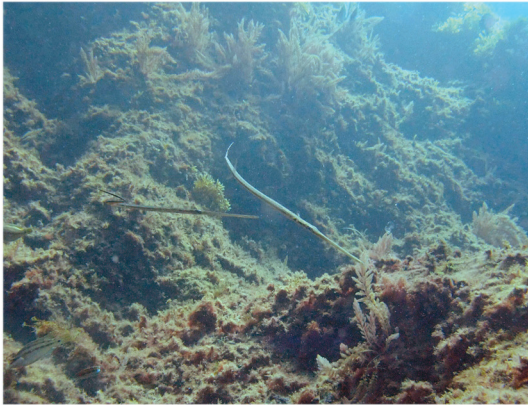
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INTRODUCTION

The ongoing dispersal of exotic species and the general rearrangement of species' geographical distribution are an increasing worldwide phenomenon and currently the most striking biological outcome of global changes (Vitousek et al., 1996). Recent changes in distribution of indigenous fish species as a putative result of climate change have been well documented (Beare et al., 2004; UNEP-MAP-RAC/SPA 2008; CIESM 2008). Ever since the opening of the Suez Canal in 1869, a continuous influx of Lessepsian species, mostly of Erythrean and Indo-Pacific affinity, into the Mediterranean has been observed. CIESM (International Commission for the Scientific Exploration of the Mediterranean Sea) has published regular census results for such species within a series of *ad hoc* atlases (www.ciesm.org/atlas/), with the most recent for Lessepsian fish species being published in 2007 (Golani et al., 2007). According to such a census, of the 108 known allochthonous fish species in the Mediterranean, 65 are thought to be Lessepsian in nature.

In addition to the Lessepsianism phenomenon, meridionalisation, involving the westward and northward shift of indigenous Mediterranean marine species (Andarolo & Rinaldi, 1998; Grau & Riera, 2001), and the influx of Atlantic species through the Straits of Gibraltar, is further disrupting the biotic composition of different biogeographical provinces. An example is given by recent increases in populations of fish species previously almost exclusively restricted to the eastern Mediterranean, such as *Lobotes surinamensis* and *Thalassoma pavo* in central (Deidun et al., 2010) and northern (Dulčić, 2004) areas of the Mediterranean.

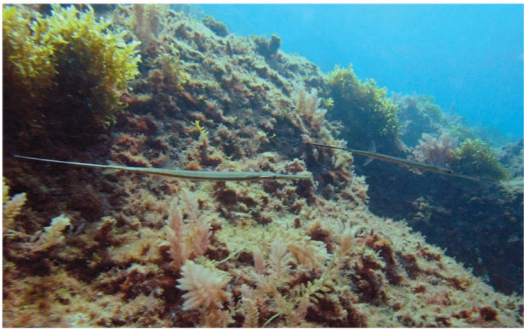
The high dispersal potential, ecological differentiation, general non-resilience, temperature sensitivity, large size and ease of identification make fishes ideal candidates for the study of the effects of climate variability (Wood & Mc Donald, 1997). The cornet fish *Fistularia commersonii* (Figs. 1-5) is a benthopelagic species with a circum-tropical distribution, being associated with reefs or with



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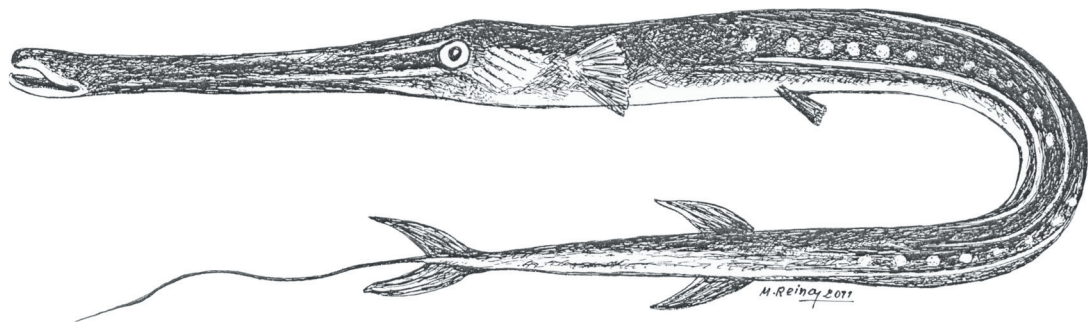
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Figures 1-4. *F. commersonii* individuals photographed in the wild in Maltese coastal waters.
Figure 5. An artistic impression of an adult *F. commersonii* individual.



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Figures 6-11. Various aspects of the *F. commersonii* caught at Marzamemi (SR), Sicily.

sandy bottoms at depths extending down to 132 m (Froese & Pauly, 2010), whose ease of identification makes it seamless to track. The species is ventrally flattened and has a long, whip-like tail filament, being green dorsally and grading to silvery white ventrally, with two blue stripes or rows of blue spots on the back. It reaches a maximum length of 160 cm and maximum weight of 4 kg, with the most frequent length being that of 100 cm. The body is extremely elongated, the head (consisting of a long, tubular snout) constitutes more than one-third of the total body length, ending in small mouth. Dorsal and anal fins are posterior in position, opposite to each other. The caudal fin is forked, with two very elongated and filamented middle rays. The skin is smooth, without bony plates along the midline of the back.

MATERIALS AND METHODS

In December 2010, a specimen of *F. commersonii* (Figs. 6-11) was caught in Marzamemi (36°44'17"N, 15°07'02"E) in the south-eastern extremity of the island of Sicily, in a trammel net deployed over a depth of 20-30 m. The specimen was frozen and successively identified, whilst anecdotal counts of sightings or captures of the species from the coastal waters of the whole of Sicily and the Maltese Islands were collated. These reports were submitted to the authors by fishermen and SCUBA divers and were also gleaned from the grey literature (primarily, newspaper reports).

RESULTS AND CONCLUSIONS

Fistularia commersonii has been recently sighted or caught on numerous occasions within Sicilian and Maltese coastal waters. In Sicily, the species has been sighted or caught in 2010 specifically at Pozzallo (36°43'31"N, 14°50'47"E - Castaldo, 2010), at Avola (36°54'24"N, 15°09'00"E - Tiralongo, 2010), within the Ragusa province, at Messina (38°11'32"N,

15°33'44"E - Ventimiglia, 2010), Mazara del Vallo (37°38'59"N, 12°35'21"E), Selinunte (37°34'51"N, 12°48'21"E) and along coastal areas within close proximity of Palermo, such as Addaura (38°11'28"N, 13°20'53"E), Aspra (38°06'28"N, 13°30'07"E), Cefalù (38°02'20"N, 14°01'19"E), and Isola delle Femmine (38°12'30"N, 13°14'16"E).

Table 1 gives the details for the various (21) sightings and collections of *F. commersonii* individuals made in Maltese coastal waters and arranged in chronological order.

The cornet fish individual captured at Marzamemi in December 2010 had a length of 102 cm and a weight of 450 g. The dorsal and anal fins had a combined total of 14 rays. The colouration of the body, which lacked dorsal bony scales, ranged from grey mottled with grey along dorsal areas to a silver sheen along the sides.

An analysis of the data reported in this study suggests that the abundance of *F. commersonii* in the Malta-Sicily shelf area has increased greatly recently, with numerous reports of sightings being made in just a few months. The *F. commersonii* individuals sighted within the same marine area range from 30 cm to 110 cm in length, dimensions which are consistent with a wide spectrum of age classes for the species, including juveniles. This further confirms that the species has established viable populations within the region and this is consistent with the view expressed by Golani et al. (2007) that *F. commersonii* is well established in the Mediterranean with the presence of both juvenile and adult individuals. In addition, most of the sightings for the species reported in this study refer to small shoals rather than to single individuals, with most sightings being made in shallow water (<5 m) characterized by a seagrass-dominated rocky seabed, although the species was recorded from other infralittoral bioceonoses as well. The species was mostly recorded at popular diving sites (e.g. Zurrieq in Malta) or at important fishing (e.g. Mazara del Vallo in Sicily) or touristic (e.g. Cefalù in Sicily) locations.

Date	Location	Geographical coordinates	Estimated abundance	Estimated range of individual fish lengths	Evidence in hand	Other details
15.01.08	Munxar Point	35°50'58"N 14°34'18"E	4-6		None – anecdotal (skin diver account)	3-15 m depth, rocky seabed
10.03.08	Marsascala	35°51'41"N 14°34'33"E	5	110 cm	Photos	3 m depth; <i>Posidonia</i> on bedrock
15.12.09	Xrobb l-Ghagin	35°50'03"N 14°33'50"E	3 shoals of 3 individuals each		None – anecdotal (skin diver account)	10-20 m depth; rocky seabed with <i>P. oceanica</i>
August 2010	Munxar Point	35°50'58"N 14°34'18"E	3-4		None – anecdotal (skin diver account)	10-15 m
21.09.10	Santa Marija Bay, Comino	36°01'05"N 14°20'14"E	1		None – anecdotal (skin diver account)	15 m; sandy seabed
05.12.10	Rās il-Hobz, Gozo	36°00'59"N 14°16'46"E	4-6		Photos	12-14 m depth; rocky seabed
20.12.10	St. Thomas Bay	35°51'14"N 14°33'49"E	3		None – anecdotal (diver account)	5 m; <i>Posidonia oceanica</i> meadow
05.02.11	Zurrieq	35°49'17"N 14°27'28"E	5-8	50-80 cm	None – anecdotal (diver account)	12-14 m depth; rocky seabed
07.02.11	Birzebbuga	35°49'13"N 14°31'51"E	3		None – anecdotal (diver account)	4-10 m; sandy seabed
10.02.11	Zurrieq	35°49'17"N 14°27'28"E	5		Photos	14-18 m depth, rocky bottom
12.02.11	Qawra	35°57'54"N 14°25'28"E	4		None – anecdotal (diver account)	10 m, <i>Posidonia oceanica</i> meadow
14.02.11	Xwejni Bay	36°04'43"N 14°14'54"E	2	30-40 cm	video	2 m depth; bare sand with coarse sediment
14.02.11	Cirkewwa	35°59'11"N 14°19'41"E	2	40-50 cm	None – anecdotal (SCUBA diver account)	
19.02.11	Qawra	35°57'54"N 14°25'28"E	1		None – anecdotal (diver account)	6 m, <i>Posidonia oceanica</i> meadow
21.02.11	Zurrieq	35°49'17"N 14°27'28"E	3	40-50 cm	video	5-10 m depth; rocky bottom with photophilic assemblages
21.02.11	Qajjenza	35°49'56"N 14°32'38"E	3	30 cm	Photos	2-3 m, <i>Posidonia</i>
23.02.11	Manoel Island	35°54'17"N 14°29'53"E	1		None – anecdotal (diver account)	6 m, muddy seabed with anthropogenic debris and within yacht marina
27.02.11	Zurrieq	35°49'17"N 14°27'28"E	3-4	50 cm	Photo	15 m, rocky seabed
08.03.11	Zurrieq	35°49'17"N 14°27'28"E	4-5	50-70 cm	Photos	6-8 m depth, rocky seabed

Table 1. Recent reports of *Fistularia commersonii* from Malta.

The recent westward range expansion of Lessepsian species within the Mediterranean Sea is a well documented phenomenon. For instance, since the first published record of *F. commersonii* from the Mediterranean in 2000 (Golani, 2000), the species has been subsequently recorded from the south of Italy in 2004 (Azzurro et al., 2004), from Tunisia (Souissi et al., 2004) and from the Adriatic Sea and Ligurian Sea in 2008 (Dulčić et al., 2008; Garibaldi & Orsi Relini, 2008), making it one of the most successful Lessepsian migrants in the Mediterranean. In fact, no other Lessepsian species has spread so far in the Mediterranean (Golani et al., 2007). The number of published reports for the species within the Mediterranean has surged greatly in recent years and covers a vast geographical area, being recorded from Turkey (Bilecenoglu et al., 2002), Rhodes (Corsini et al., 2002), north Aegean (Karachle et al., 2004), Montenegro (Joksimovic et al., 2008), Malta (Cini, 2006), Sardinia (Pais et al., 2007), central Tyrrhenian (Psomadakis et al., 2009) and from Libya (Elbaraasi & Elsalini, 2009). Golani et al. (2007) report a reduced level of genetic differentiation within *F. commersonii* populations in the Mediterranean, with only two mitochondrial haplotypes being recorded for the species. According to the same authors, this has not hampered in any way the successful proliferation of the species within the Basin.

Several other instances of Lessepsian fish expansion have been documented. For instance, For the Tetraodontidae constitute a striking example of the tropicalization of the Mediterranean fish fauna, with the number of pufferfish species recorded for the Mediterranean waters rising from three (*Ephippion guttiferum*, *Lagocephalus lagocephalus* and *Lagocephalus spadiceus*) to 10 species, with seven novel tetraodontids of Lessepsian or tropical-Atlantic origin (Vacchi et al., 2007).

Fistularia commersonii is listed, along with nine other species, as an alien fish species for Italian waters (Occhipinti-Ambrogi et al., 2010). The species is also listed as one of the six alien species recorded from Maltese waters reputed to have an invasive nature (Sciberras & Schembri, 2007), with the latter authors also listing two additional records of the species, observed on both occasions in shoals of about 20 individuals, from Maltese waters in 2007. On the 27th February 2011, the species was sold commercially within the Marsaxlokk fish market (Reno Tonna, personal communication), a novelty for the Maltese Islands.

Some authors, including Psomadakis et al. (2009) have already speculated that the proliferation of the species within the Mediterranean could be indicative of an imminent colonization of the Basin by the same species. The arrival of Red Sea macroherbivores in the eastern Mediterranean, such as the rabbitfishes *Siganus luridus* and *S. rivulatus*, has been shown to disrupt native ecosystems (Lejeune et al., 2010). Despite its success in spreading throughout the Mediterranean, the occurrence of *Fistularia commersonii*, a Red Sea predator, has not been attributed, to date, such consequences.

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