

On the occurrence of *Zenopsis conchifer* (Lowe, 1852) (Osteichthyes, Zeidae) in the Mediterranean Sea

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Abstract

On the occurrence of Zenopsis conchifer (Lowe, 1852) (Osteichthyes, Zeidae) in the Mediterranean Sea.— The capture of four specimens of Silvery John Dory (*Zenopsis conchifer*), a species recorded in the Mediterranean Sea for the first time in 2006, is reported from the Iberian coast (western Mediterranean). One of the specimens was caught near the Strait of Gibraltar and is probably a vagrant. Despite these catches, there is no evidence of a self-sustaining population, so this species should be considered as alien in the Mediterranean.

Key words: *Zenopsis conchifer*, Fish invasions, Exotic species, Mediterranean

Resumen

Sobre la presencia de Zenopsis conchifer (Lowe, 1852) (Osteichthyes, Zeidae) in el Mar Mediterráneo.— Se informa de la captura de cuatro ejemplares de *Zenopsis conchifer*, especie cuya primera cita en el Mediterráneo data del año 2007, en las costas de la península Ibérica. Uno de los ejemplares fue capturado cerca del estrecho de Gibraltar, por lo que probablemente se trataría de un individuo errante. A pesar de estas capturas, no hay evidencia de la existencia de una población estable, por lo que la especie debe continuar siendo considerada como exótica en el Mediterráneo.

Palabras clave: *Zenopsis conchifer*, Especies invasoras, Mediterráneo

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Introduction

Z. conchifer has a worldwide distribution (Quigley, 2004). In the Eastern Atlantic it occurs from the Bay of Biscay to South Africa and has its greatest abundance off the coast of NW Africa, south of 21° N (Maurin & Quéro, 1982). In the Western Indian Ocean, it is reported from India to South Africa but not in the Red Sea (Froese & Pauly, 2012). It is found near the bottom or in mid-waters and near seamounts (Pakhorukov, 2008) at depths between 100 and 600 m, but mainly between 200 and 300 metres. It reaches a size of up to 75 cm standard length (Quéro, 1986) and 80 cm TL (Quigley, 2004). Reproduction takes place in the summer and its diet is mainly composed of fish (Quéro, 1986).

The John Dory *Zeus faber* Linnaeus, 1758 was the only species of the family Zeidae known in the Mediterranean Sea (Quéro, 1986; Quignard & Tomasini, 2000; Orsi-Rellini, 2001; Froese & Pauly, 2012). Nevertheless, intrusion through the Gibraltar Strait of a new species of the same family, the Silvery John Dory (a. k. a. Buckler dory; Hemstra, 1986) *Zenopsis conchifer* (Lowe, 1852), was reported by Ragonese & Giusto (2007) who recorded the catch of an adult specimen 50 km off Capo Farina (northern coast of Tunisia). We herein aim to report the occurrence of four additional specimens captured by trawling along the Mediterranean coast of the Iberian peninsula

Material examined

One small specimen (deposited in the Institut de Ciències del Mar de Barcelona with the reference IIPB 150/2002) was caught during the Mediterranean International trawl survey (MEDITS) 2002 cruise near the Gibraltar Strait. Given that *Z. conchifer* is regularly caught in the Gulf of Cadiz (western side of the Strait of Gibraltar) during the ARSA bottom trawl surveys (Torres et al., 2012) and by the commercial bottom trawl fleet (Sobrinho, pers. comm.), this individual was probably a vagrant carried by the incoming surface current into the Mediterranean Sea from the Atlantic Ocean and at that time was not recorded in the literature. Three additional specimens were caught by bottom trawl fishing boats approximately 20 nautical miles east of Cabo de Palos (east coast of the Iberian Peninsula) well into the western Mediterranean (fig. 1, table 1), all of them being females with maturing gonads (fig. 2). Other species in the catch, common in the bottom trawl landings, were the demersal fishes blue whiting *Micromesistius poutassou* (Risso, 1827), hake *Merluccius merluccius* (L., 1758), and greater forkbeard *Phycis blennoides* (Brünnich, 1768) and the crustaceans Norway lobster *Nephrops norvegicus* (L., 1758) and pink shrimp *Parapenaeus longirostris* (Lucas, 1846). The stomach of one specimen (IIPB 68/2007) contained two blue whiting and one hake, all between 21 and 22 cm in length.

Results and discussion

The specimens examined were identified as *Zenopsis conchifer* (Lowe, 1852). Morphometric and meristic data of the specimens are shown in table 2. Total length of the specimens ranged between 525 and 605 mm in females, while the specimen with undetermined sex measured 130 mm TL.

Since the mid-1960s, a progressive expansion towards the north has been observed for some species of tropical Atlantic origin and such migration has been associated with the warming of the upper slope current waters that flow in a south-north direction along the coasts of northern Spain and southern France (Quéro et al., 1998). In particular, *Z. conchifer* has reached the NW coast of Ireland (Quigley, 2004; Quéro et al., 1998; Swaby & Potts, 1999). Expansion of the distribution area of numerous species of Atlantic origin has also been confirmed towards the Mediterranean. Golani et

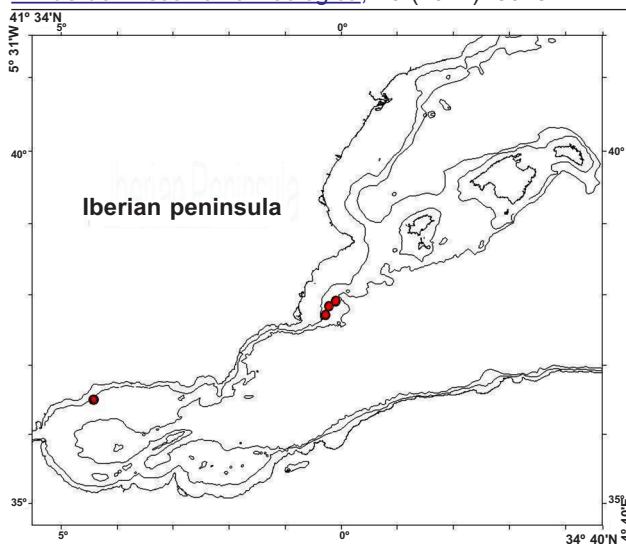


Fig. 1. Map showing the occurrences (red circles) of *Zenopsis conchifer* in Spanish Mediterranean waters (200 m and 1,000 m isobaths are shown).

Fig. 1. Presencia (círculos rojos) de *Zenopsis conchifer* en aguas del Mediterráneo español (se muestran las isóbatas de 200 m y 1.000 m)

al. (2002) recorded six species of Atlantic origin (principally tropical and subtropical) from 1980 to 1990 and up to fifteen of these species from 1980 to 2004. Quignard & Tomasini (2000) attributed the increase in the entry of species of Atlantic tropical origin across the Strait of Gibraltar to hydro-climatic changes in the Mediterranean (Béthoux et al., 1998). Because this species is a poor swimmer (Ragonese & Giusto, 2007), the presence of adult specimens in areas so far from the Strait of Gibraltar cannot be interpreted as accidental and most probably are related to these changes. Despite these new records and the fact that the advanced maturity state of the three females suggests that *Z. conchifer* could find environmentally favorable conditions for reproduction in the Western Mediterranean, according to CIESM criteria (Golani et al., 2002) there is no evidence of a self-sustaining population, so this species should remain considered as alien in the Mediterranean. Because of the differences in the bathymetric distribution of

Table 1. General data of the specimens of *Zenopsis conchifer* caught in Spanish Mediterranean waters (MEDITS macroscopic scale for maturity).

Tabla 1. Datos de carácter general de los especímenes de *Zenopsis conchifer* capturados en aguas del Mediterráneo español (escala de madurez macroscópica MEDITS).

Specimen	Date	Position	Depth (m)	Sex	Maturing stage
IIPB 150/2002	05/2002	36° 37' N – 04° 25' W	69	Undet.	–
IIPB 68/2007	01/2007	37° 39' N – 00° 19' W	200	♀	Maturing
#3	11/2008	37° 43' N – 00° 13' W	390	♀	Maturing
#4	12/2009	37° 41' N – 00° 17' W	270	♀	Maturing



Fig. 2. *Zenopsis conchifer* IIPB 68/2007 (605 mm TL) and the specimen gonads.
 Fig. 2. *Zenopsis conchifer* IIPB 68/2007 (605 mm TL) y sus gónadas.

the two species, any possible competition with *Z. faber*, the native species of the family Zeidae, is likely scarce. Given the low resilience and a moderate to high vulnerability (Froese & Pauly, 2012), its capacity to support high fishing exploitation rates, especially from trawling, could be a determinant factor in the possible expansion of this species through the Western Mediterranean.

Table 2. Morphometric and meristic data of the specimens of *Zenopsis conchifer* caught in Spanish Mediterranean waters.

Tabla 2. Datos morfológicos y merísticos de los especímenes de *Zenopsis conchifer* capturados en aguas del Mediterráneo español.

Measure / Variable	IIPB 150/2002	IIPB 68/2007	#3	#4
Total weight (grs)	28	3,500	1,913	2,137
Total length (mm)	130.0	605.0	525.0	545.0
Head length (mm)	43.3	169.0	153.9	153.8
Snout length (mm)	17.6	92.0	71.7	68.9
Eye diameter (mm)	8.8	30.1	28.1	24.3
Interorbital distance (mm)	7.5	29.5	27.7	27.3
Pectoral length (mm)	16.1	60.2	63.8	60.1
Pelvic length (mm)	34.5	106.8	97.5	90.7
Dorsal fin rays	IX + 24	IX + 26	IX + 26	IX + 26
Pelvic fin rays	I + 5	I + 6	I + 8	I + 7
Anal fin rays	III + 25	III + 25	III + 25	III + 25
Belly scutes	12	7	8	7
Dorsal / anal bucklers	7 / 6	9 / 6	7 / 5	6 / 5
Gonad weight (g)	–	531.6	154.9	270.9

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