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NOTES ON THE OCCURRENCE OF *OCTOPOTEUTHIS SICULA* RÜPPELL, 1844 (CEPHALOPODA: OCTOPOTEUTHIDE) IN THE WESTERN MEDITERRANEAN

NOTE SUL RITROVAMENTO DI *OCTOPOTEUTHIS SICULA* RÜPPELL, 1844 (CEPHALOPODA: OCTOPOTEUTHIDE) NEL MEDITERRANEO OCCIDENTALE

Abstract - Two specimens of the meso-bathypelagic Cephalopod *Octopoteuthis sicula* Rüppell, 1844 were found in 2012 and 2024 in the by-catch of trawl fishery targeting red shrimps, in the waters off Sardinia and Liguria, at depths of 568 and 470 m, respectively. The knowledge on this species is limited, due to the scarce catches. The two specimens, measuring 17.7 and 15.3 cm Dorsal Mantle Length were fully mature males. Morphometric and meristic data were collected for both individuals, and a description of the reproductive apparatus was provided. The peculiarity is the long terminal organ (65 and 72 mm in the two samples), that extends beyond the mantle cavity; it is used to transfer the spermatangia (discharged spermatophores) in the mantle tissue of the females. Such characteristic, common to other Cephalopods, seems to be a strategy to guarantee the reproductive success in deep-water environments.

Keywords: Cephalopods, reproduction, trawl fishery, western Mediterranean

Introduction - *Octopoteuthis sicula* Rüppell, 1844 (Oegopisida, Octopoteuthidae) is a meso-bathypelagic Cephalopod; the characteristic that gives name to this Genus is the lack of tentacles, which are present only in the *paralarvae*. Several photophores are located on different parts of the body, according to the species. The male doesn't have a *hectocotylus*, but a well-developed terminal organ (*penis*). *Octopoteuthis* plays an important role in food webs, being preyed by various species of toothed cetaceans. *O. sicula* has been recorded several times in the Mediterranean, although in small numbers, testifying its regular presence in this Sea (D'Onghia *et al.*, 1996; Giordano *et al.*, 2024; Villari & Ammendolia, 2009; Jereb *et al.*, 2016; Battaglia *et al.*, 2013; Cuccu *et al.*, 2013). This note provides information on two males found in the Italian waters of the western Mediterranean, data still little known to the scientific literature.

Materials and Methods - Two specimens of *O. sicula* were found during a monitoring of commercial fisheries, by means of observations on board, in Sardinian and Ligurian Seas. They belonged to the discards of the bathyal trawl fishery, targeted to red shrimps and Norway lobsters (Tab. 1). Both specimens were found in good status (Figs 1 and 2); after catch, they were frozen at -20°C and transferred to the laboratories, where they were analysed for the species determination. After that, the main morphometric, meristic and biological data were taken.

Tab. 1 – Catch data of the two specimens of *Octopoteuthis sicula*.
 Dati di cattura dei due esemplari di *Octopoteuthis sicula*.

	Specimen n. 1	Specimen n. 2
Date	03/08/2012	07/11/2024
Place	Sardinian Sea	Ligurian Sea
Source	By catch trawl fishery	By catch trawl fishery
Haul position (start)	38° 59.79'; 09° 15.68'	44° 13.38'; 09° 15.15'
Haul position (end)	38° 01.08'; 09° 17.88'	44° 15.08'; 09° 08.68'
Haul mean depth (m)	568	470

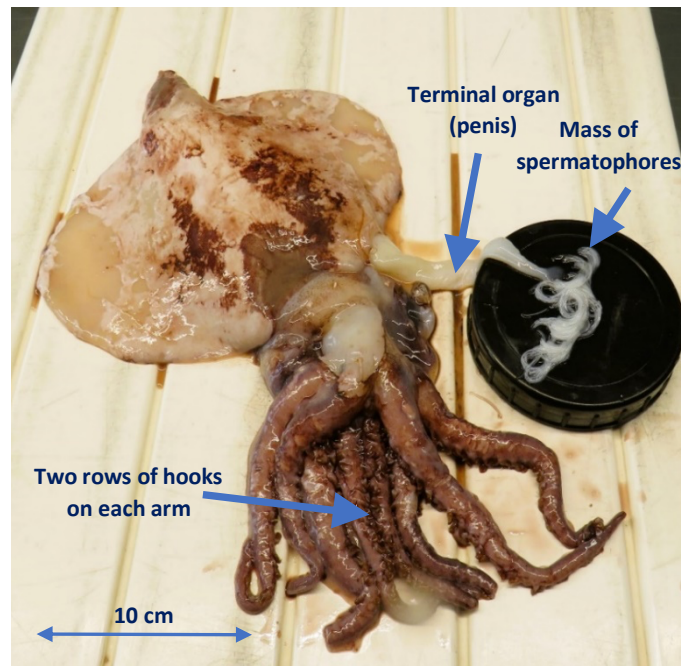


Fig. 1 – *Octopoteuthis sicula*: dorsal side of the specimen n. 2.
Octopoteuthis sicula: visione dorsale dell'esemplare n. 2.

Results - Both specimens exhibited the morphological characteristics typical of *O. sicula* (Figs. 1 and 2): absence of tentacles, eight arms bearing two rows of small suckers covered by a muscular cap and absence of hectocotylus; the mantle ends with a conical-shape, with the tip extending beyond the large rhomboidal fins. The head was round-shaped with the two sides almost entirely occupied by large eyes. The mouth was wide and surrounded by a membrane. Presence of photophores, in particular a pair in the ventral side of the caudal end (Fig. 2). Table 2 shows the morphometric and meristic data collected on the two specimens. The specimens measured 17.7 and 15.3 cm in dorsal mantle length, with total weights of 680 g and 273 g, respectively. They were equipped with well-developed terminal organs (72 and 65 mm in length, respectively), which extended well beyond the mantle opening (Figs. 1, 2). These structures contained a large number of fully formed spermatophores (Fig. 3): 1,158 and 975 respectively in the two specimens, with an average length of 14.7 and 14.1 mm. Minimal pressure was sufficient to release them, indicating that both specimens were in spawning phase.

Tab. 2 – Morphometric and meristic data (in mm) of the two specimens of *Octopoteuthis sicula*.
Dati morfometrici e meristici (in mm) dei due esemplari di Octopoteuthis sicula.

Morphometric and meristic data	Specimen n. 1	Specimen n. 2
	Sardinian Sea	Ligurian Sea
Dorsal and ventral mantle length	159, 177	141, 153
Mantle width	90	90
Fins width and length	212, 159	148, 135
Head width and length	70, 60	52, 36
Terminal organ (penis) length	72	65
Testicle length	79	66
Needham' sac length	172	131
Total weight (g)	680	273
Sex, maturity stage	Male, mature	Male, mature
Number of spermatophores	1158	975
Length of spermatophores (range)	12.2-16.2	13.0-15.0
Length of sprmatophores (mean ± SD)	14.7±0.27	14.1±0.24

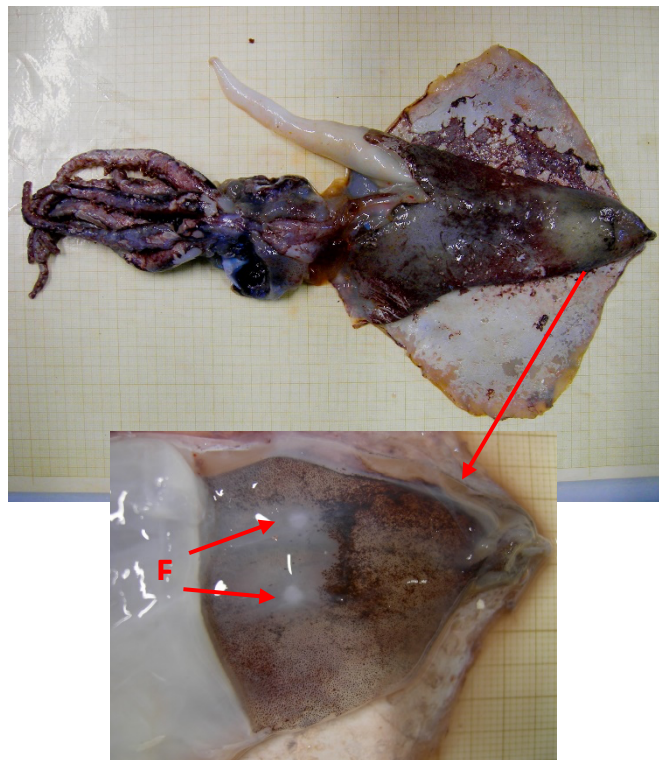


Fig. 2 - *Octopoteuthis sicula*: ventral side of the specimen n. 1. Frame: tail photophores (F), after removal of the superficial dermal layer.

Octopoteuthis sicula: visione ventrale dell'esemplare n. 1. Riquadro: fotofori caudali (F), visibili dopo rimozione degli strati dermici superficiali.

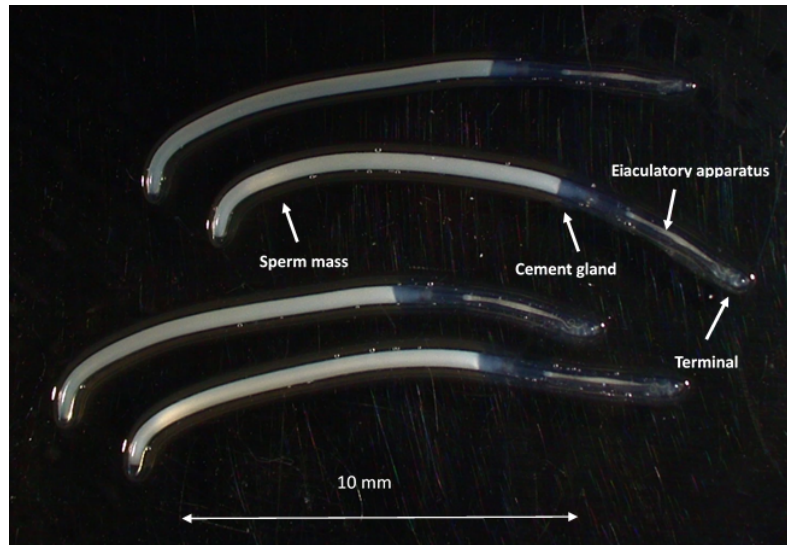


Fig. 3 - Details of some spermatophores of *Octopoteuthis sicula*.
Dettagli di alcune spermatofore di Octopoteuthis sicula.

The rostral lengths (URL and LRL) in the upper and lower beaks of the specimen n. 2 measured 8 mm and 5,1 mm, respectively (Fig. 4).



Fig. 4 - Upper (left) and Lower (right) beaks of the specimen n. 2. URL: upper rostral length; LRL: lower rostral length.

Becco superiore e (sinistra) e inferiore (destra) dell'esemplare n. 2. URL: lunghezza del rostro superiore; LRL: lunghezza del rostro inferiore.

Conclusions - This note contributes to increase the knowledge on *O. sicula*, currently based on sporadic and occasional findings from strandings, accidental captures in fishing nets or occurrences in stomach contents of predators. Often, these organisms are poorly preserved, making difficult to extract useful information.

In the present case, the two well-preserved specimens of *O. sicula* provide useful data on the sexual products and reproductive strategy of males. As in other species of the Octopoteuthidae Family, the male, lacking a hectocotylus, uses the terminal organ to transfer the evaginated spermatophores (*spermatangia*) into the female's body, implanting them externally in different zones of the mantle tissue (Hoving *et al.*, 2008). This peculiarity is common to other bathyal Cephalopods, whose females lack seminal receptacles and seems useful to guarantee reproductive success, since in deep waters the encounters of males and females are rather difficult and sporadic.

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