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NEW RECORDS OF *OCTOPOTEUTHIS SICULA* RÜPPELL, 1844 (CEPHALOPODA: OCTOPOTEUTHIDAE) IN THE SICILIAN WATERS (CENTRAL MEDITERRANEAN SEA)

NUOVI RITROVAMENTI DI *OCTOPOTEUTHIS SICULA* RÜPPELL, 1844 (CEPHALOPODA: OCTOPOTEUTHIDAE) IN ACQUE SICILIANE (MEDITERRANEO CENTRALE)

Abstract - Four specimens of the rare octopus squid *Octopoteuthis sicula* Rüppell, 1844, were caught in the Sicilian waters (one in the Southern Tyrrhenian Sea and three in the Strait of Sicily). Main morphological characteristics and morphometric measurements of the specimens were reported. An updated map of the species distribution in the Mediterranean was also given.

Key-words: Octopus squid, *Octopoteuthis sicula*, morphology, Sicilian waters, Mediterranean distribution.

Introduction - The squids belonging to Octopoteuthidae family inhabit the meso- and bathypelagic waters of the world's oceans. They play an important ecological role being a part of the diets of pinnipeds, sea birds, large pelagic fishes, and cetaceans. Despite this, the systematics is still poorly understood due to the rarity of the capture and variability in identifying the distinctive features. This note reports 4 specimens of the rare octopus squid *Octopoteuthis sicula* Rüppell, 1844, the only species of the genus *Octopoteuthis* occurring in the Mediterranean Sea, caught in the Sicilian waters (Fig. 1).

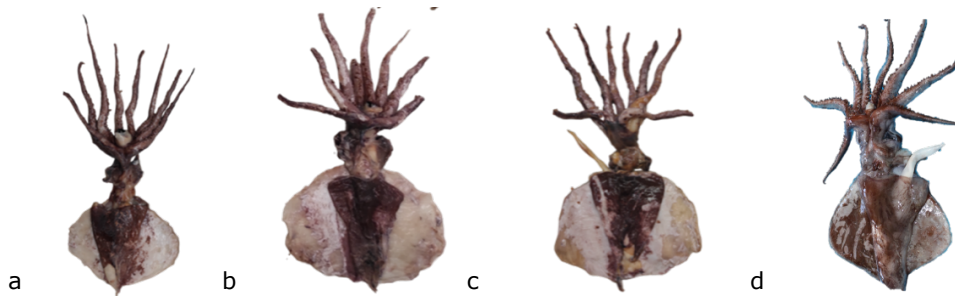


Fig. 1 – Specimens of *Octopoteuthis sicula* caught in the Sicilian waters. Respectively from left to right: two female and one male of the Strait of Sicily (specimens a, b and c of the map) and one male of the Tyrrhenian Sea (specimen d of the map).

Esemplari di *Octopoteuthis sicula* catturati nelle acque siciliane. Rispettivamente da sinistra a destra: due femmine e un maschio dello Stretto di Sicilia (esemplari a, b e c della mappa) ed un maschio del Mar Tirreno (esemplare d della mappa).

Materials and methods - The 4 specimens of *O. sicula* were caught by bottom trawling in the Sicilian waters (Fig. 2). One adult male was captured in 2020 off Rasocolmo Cape (Messina) at a depth of 500 m, being the first finding of the species in the southern Tyrrhenian Sea apart the previously record of one *O. sicula* beak in the stomach contents of swordfish *Xiphias gladius* Linnaeus, 1758 (Romeo *et al.*, 2012). Three adult specimens were captured in the Strait of Sicily: one male in 2013 off South-East Pantelleria Island at 674 m, one female in 2021 and one female in 2022 off North-East Linosa Island at a depth of 661 m and 684 m, respectively. Given the scarcity of taxonomic descriptions of adult *Octopoteuthis* the main morphological features and morphometries are synthesized (Table 1). Furthermore, due to their diagnostic importance, the 3 paired beaks from the specimens of the Strait of Sicily were extracted and examined (Fig. 3). A set of measurements of the beaks was taken (Table 2), to the nearest 0.1 mm, as reported in Jereb *et al.* (2016).

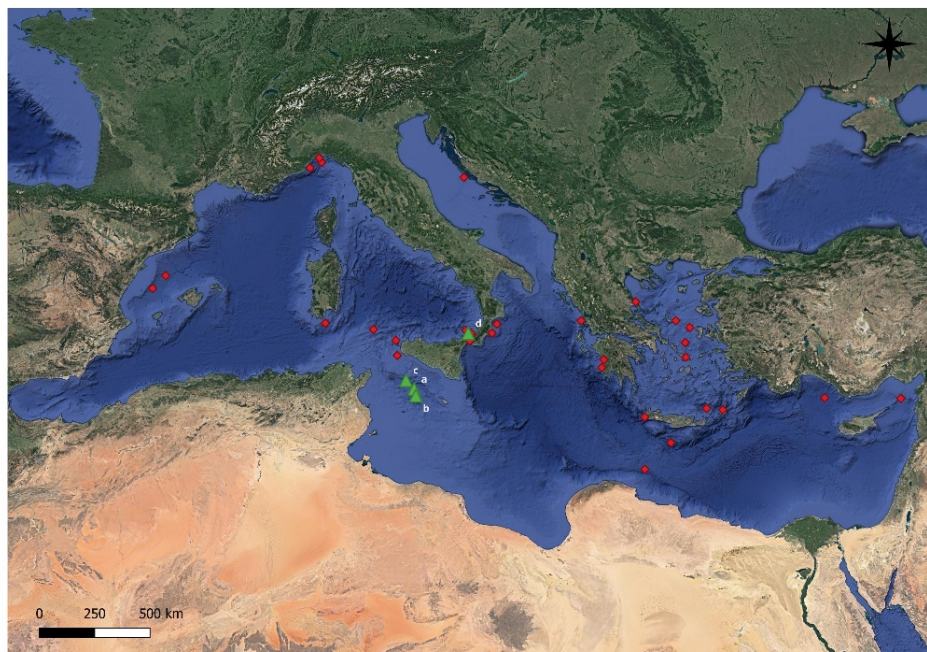


Fig. 2 - Map of *Octopoteuthis sicula* presence in the Mediterranean. In green the samples of this study and in red the others present in literature.

Mappa della presenza di Octopoteuthis sicula nel Mediterraneo. In verde i campioni di questo studio ed in rosso gli altri presenti in letteratura.

Table 1 – Main morphometric measurements of the examined specimens of *Octopoteuthis sicula* caught in the Strait of Sicily.
Principali misure morfometriche degli esemplari esaminati di Octopoteuthis sicula catturati nello Stretto di Sicilia.

	Morphometric measurements (mm)			
	Specimen a N-E Linosa Island 1	Specimen b N-E Linosa Island 2	Specimen c S-E Pantelleria Island	Specimen d Rasocolmo Cape
Mantle length (ML)	175	111	102	190
Head width (HW)	60	42	30	68
Eye diameter (ED)	28	22	19	25
Fins width (FW)	189	132	120	200
Siphon length (SL)	30	26	22	40
Siphon width (SW)	18	15	12	21
Distance between the eyes	26	24	22	31
Distance fins – mantle terminal tip	15	10	8	29
Total weight (TW)	307.5	157.5	80.8	471.5

Table 2 – Measurements of the lower and upper beak of *Octopoteuthis sicula* specimens caught in the Strait of Sicily.
Misure del becco inferiore e superiore degli esemplari di Octopoteuthis sicula catturati nello Stretto di Sicilia.

	Beak measurements (mm)		
	Specimen a N-E Linosa Island 1	Specimen b N-E Linosa Island 2	Specimen c S-E Pantelleria Island
Lower beak			
Rostrum length (LRL)	10.7	7.7	7.1
Hood length (LHL)	7.4	4.8	4.2
Crest length (LCL)	14.5	10.5	9.4
Beak height (LBH)	23.8	17.7	15.9
Upper beak			
Rostrum length (URL)	11.4	8.6	8.5
Hood length (UHL)	27	18.3	10.4
Crest length (UCL)	32.8	24.6	22.6

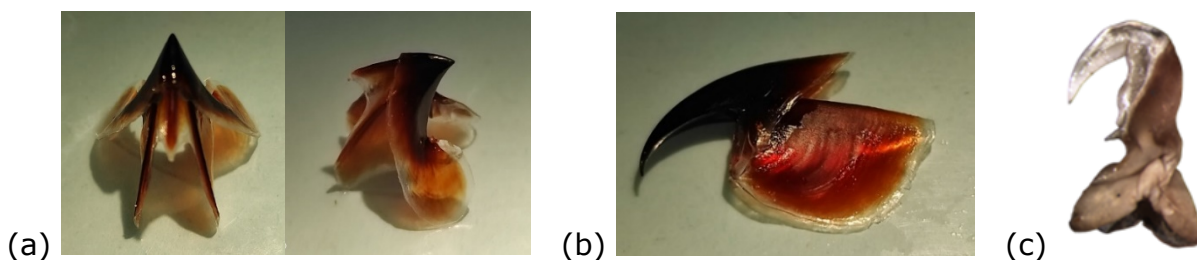


Fig. 3 – Lower (a) and upper (b) beak of one individual of *Octopoteuthis sicula* caught in the Strait of Sicily and detail (c) of accessory cusp at the base of the arm hooks.
Becco inferiore (a) e superiore (b) di un esemplare di Octopoteuthis sicula catturato nello Stretto di Sicilia e particolare (c) della cuspidi accessoria alla base degli uncini del tentacolo.

Results and conclusions - The finding of these specimens confirms the presence of the species in the area. Morphological characteristics of the body agreed with the description of the species reported in the literature. Tentacles absent, eight arms with two rows of small hooks, covered by a muscular hood and with light organs at the tips and absence of hectocotylised arms. Mantle conical endings with a point extending beyond the fins. Fins wide and rhomboidal. Head round, with sides almost completely occupied by large oculars bulbs. Buccal opening large and surrounded by a membrane. Siphon conical and projecting from the mantle. It is noteworthy to observe the presence of accessory cusps at the base of the arm hooks and of only a hint of protrusion on the rostrum of the lower beak. Furthermore, *spermatangia* were observed on the mantle of one adult female. An updated occurrence of *O. sicula* in the Mediterranean Sea is provided, constituting a baseline for studying expected variation in distribution of the species affected by the current phase of climate change (Orsi Relini and Garibaldi, 2005; Kovacic *et al.*, 2010; Sanchez *et al.*, 2013; Salman, 2016; Foskolos *et al.*, 2020; Luna *et al.*, 2022).

References

- FOSKOLOS I., KOUTOUZI N., POLYCHRONIDIS L., ALEXIADOU P., FRANTZIS A. (2020) – A taste for squid: the diet of sperm whales stranded in Greece, Eastern Mediterranean. *Deep-Sea Res. I*, **155**: 103164.
- JEREB P., CANNAS R., MAIORANO P., BELLO G., GARIBALDI F., MEREU M., ANCONA F.G., AMMENDOLIA G., BATTAGLIA P., DUYSAK O., HOVING H.J.T., LEFKADITOU E., LIPINSKI M.R., MELIS R., PERISTERAKY P.N., RAGONESE S., ROMEO T., SALMAN A., SANTOS B.M., VILLARI A., CUCCU D. (2016) – The deep-water squid *Octopoteuthis sicula* Ruppell, 1844 (Cephalopoda: Octopoteuthidae) as the single species of the genus occurring in the Mediterranean Sea. *Mar. Biol.*, **163**: 192.
- KOVAČIĆ I., GOMERČIĆ M.Đ., GOMERČIĆ H., LUCIĆ H., GOMERČIĆ T. (2010) - Stomach contents of two Cuvier's beaked whales (*Ziphius cavirostris*) stranded in the Adriatic Sea. *Mar. Biodivers. Rec.*, **3**: e19.
- LUNA A., SANCHEZ P., CHICOTE C., GAZO M. (2022) – Cephalopods in the diet of Risso's dolphin (*Grampus griseus*) from the Mediterranean Sea: a review. *Mar. Mam. Sci.*, **38**: 725-741.
- ORSI RELINI L., GARIBALDI F. (2005) - Diversità dei cefalopodi mesopelagici del santuario dei cetacei in base a campionamenti diretti e osservazioni sull'alimentazione dello zifio (*Ziphius cavirostris*). *Biol. Mar. Mediterr.*, **12** (1): 106-115.
- ROMEO T., BATTAGLIA P., PEDA' C., PERZIA P., CONSOLI P., ESPOSITO V., ANDALORO F. (2012) – Pelagic cephalopods of the central Mediterranean Sea determined by the analysis of the stomach content of large fish predators. *Helgol. Mar. Res.*, **66**: 295-306.
- SALMAN A. (2016) – Cephalopods of the Turkish Mediterranean coast. In: Turan C., Salihoglu B., Ozbek E.O., Ozturk B. (eds), *The Turkish part of the Mediterranean Sea*. Turkish Marine Research Foundation, Istanbul (Turkey): 198-204.
- SANCHEZ P., BELCARI P., SARTOR P. (2013) – Composition and spatial distribution of cephalopods in two north-western Mediterranean areas. *S. Afr. J. Mar. Sci.*, **20** (1): 17-24.