

MARINE RECORD

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First Record of *Carapus acus* (Osteichthyes: Carapidae) in the Gulf of Gabès (southern Tunisia, central Mediterranean Sea)

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Abstract

Background: One specimen of *Carapus acus* was captured in the Gulf of Gabès (southern Tunisia, central Mediterranean Sea), during an experimental bottom trawl survey in the frame of the monitoring of benthic fish stocks of the Tunisian coast. This represents the first record of the pearl fish in the area and a proof of the occurrence of this species in Tunisian coast.

Results: The pearl fish caught measured 136.1 millimeters and it weighed 2.838 gram. It has been captured at the following coordinate 34°39'629"N; 12°45'795"E by 100 meters depth. Many Echinoderms were landed during this hauls but any Holoturoidea were observed.

Conclusions: *Carapus acus* occurs in Tunisian water but others studies are necessary to confirm its abundance, the commensal or parasitic status usually attributed to the carapidae and to determine the host of this species in the Gulf of Gabès.

Keywords: *Carapus acus*, Tunisian coast, Capture confirmation

Background

The pearl fish, *Carapus acus* occurred throughout the Mediterranean Sea, mainly in the western basin (Italy, Spain, France, Sardinia and the Balearic Island) and the west coast of North Africa (Nielsen et al. 1999). It occur also in the Adriatic and Aegean Seas. The species has a temperate affinity. Adults are typically commensally in the sea cucumbers: *Holothuria stellati*, *Stichopus regalis* and *Holothuria tubulosa*, which it enters tail or head first (Kloss and Pfeiffer 2000; Eeckhaut et al. 2004). The species was recorded for the first time in Tunisia at 13 miles from the shore of "Kélibia" during the "ORVET" fishing campaign by Pruvot (1921). The author mentions the species under a synonymous names "*Fierasfer acus*". Lubet and Azzouz (1969) reported the pearl fish for the second time in the Gulf of Tunis under the name of "*Fierasfer imberbis*".

In this study, we record for the first time the pearl fish *Carapus acus* in the Gulf of Gabès (southern Tunisia) and confirm the occurrence of this species in Tunisian coasts.

Methods

One specimen of "*Carapus acus*" was caught on 9 May 2014 between 8h 40 min and 9h 41 min a.m. in the Gulf of Gabès (34°39'629"N; 12°45'795"E). The capture was occurred by 100 m depth onboard of the scientific vessel of the National Institute of Sciences and Technologies of the Sea during an experimental bottom trawl survey. The surface temperature was 18°C.

The fish was brought to the laboratory where it was identified, photographed, measured and weighted. The fish was identified especially using the description given by Trott and Olney (1986).

Results

The fish was identified as *carapus acus* (Fig. 1). The measures of the pearl fish are summarized in the Table 1, it weighed 2.838g. *Carapus acus* is an Eel-like moderate to shallow body depth. It is typically translucent with

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iridescent spots on head and thoracic region. Anal rays are longer than opposite dorsal rays. Anus is anterior to pectoral fin base. The common size is 200 mm TL.

The species is deposited in the collection of the National Institute of Sea Sciences and Technologies catalogue at Centre of Sfax under the no. CARAP001.

Many Echinoderms were landed with the pearl fish during the hauls as *Echinaster sepositus* many, *Astropecten* sp., *Antedon mediterranea* but no Holothuroidea were caught.

Discussion

The pearl fish was recorded in Tunisian water twice. For the first time in Tunisia by Pruvot (1921) during l'ORVET campaign in the East of kélibia. The specimens was caught by a trawl on a muddy bottom at depth between 107 and 113 m. the second specimens was signaled by Lubet and Azzouz (1969) during an experimental trawling study. It was caught in the circalittoral area of the Gulf of Tunis at a depth ranged between 100 and 200 m on a detritic fine bottom. In the Gulf of Gabès the species was reported at about 100 m of depth during an experimental trawling campaign on muddy sandy bottom (Fig. 2). This capture can be considered as the first one in the area. In fact, since 2000 an yearly experimental survey was carried in the area (Hannibal survey). The same hauls were conducted in the same conditions (date, direction, gear...). The species was never being recorded although the commercial portion and the discard part were carefully examined.

The pearl fish live in association with several species of sea cucumbers. This relation is one of the most

intimate associations between a vertebrate and an invertebrate host. *Carapus acus* spend their quiescent hours within the bodies of echinoderms.

Its occurrence in hosts is largely dependent on host availability and its distribution from potential larval areas. In southeastern Spain coast, *Stichopus regalis* was the only host detected for *Carapus acus* among six sea cucumber species studied: *Holothuria poli*, *Holothuria mammata*, *Holothuria tubulosa*, *Holothuria sanctori*, *Holothuria arguinensis* and *Parastichopus regalis* (González-Wangüemert et al. 2014). While, Trott (1981), reveal that if the pearl fish *Carapus acus* have the choice to pick their host they select only *H. tubulosa*.

It use the sea cucumbers as a protection habitat from predation only or also as a source of food, and to develop into its adult stage of life (Kloss and Pfeiffer 2000).

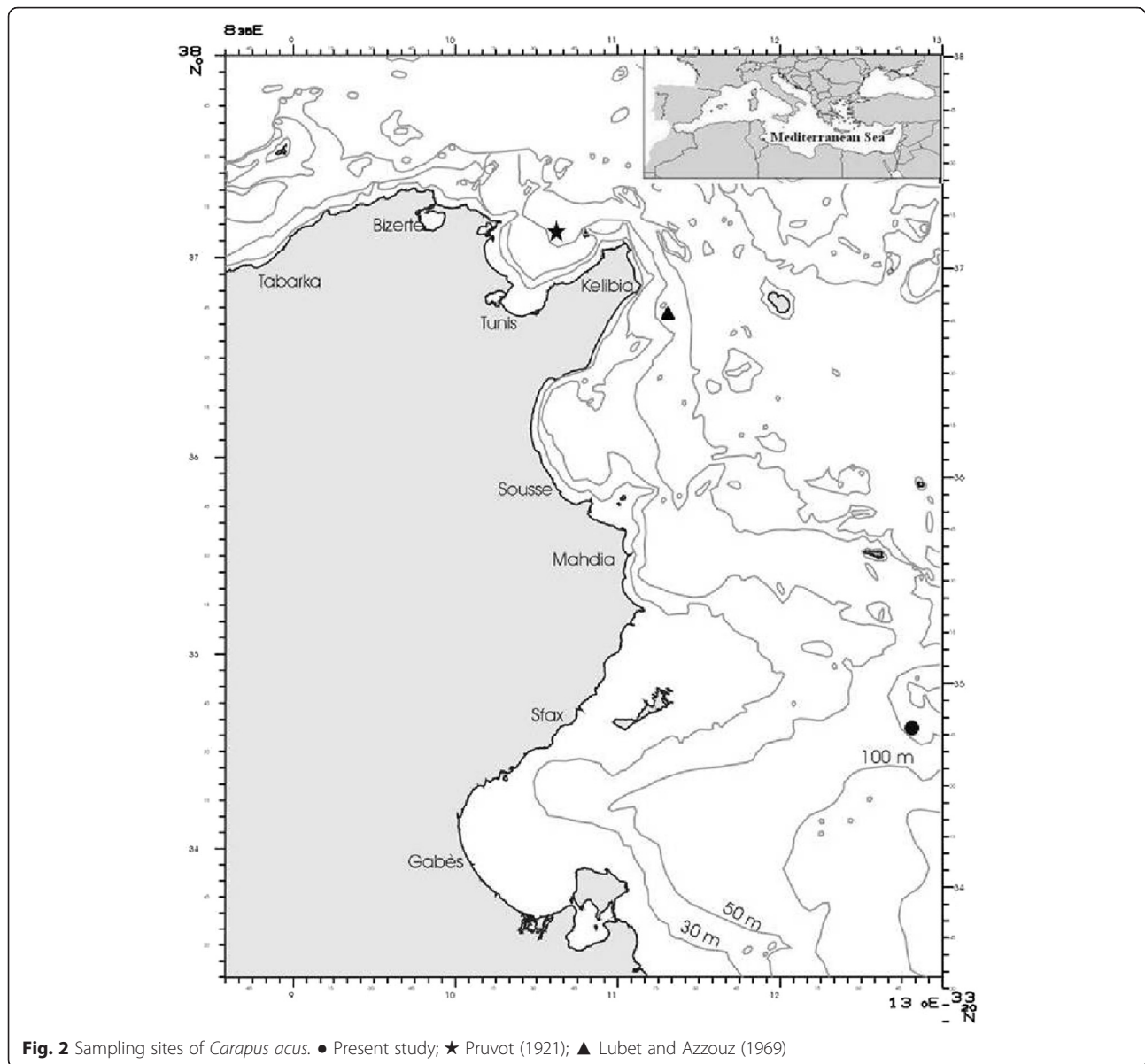
Parmentier and Das (2004), mentioned that the species leave their host holothurians essentially at night, when they presumably feed. The pearl fish of the Gulf of Gabès was captured in the early morning, sea cucumber weren't fished during this experimental trawling hauls. While, 11 Holothuriidae were inventoried in Tunisia water, among them, three species are common in the Gulf of Gabès water: *Holothuria forskali*, *Holothuria tubulosa* and *Stichopus regalis* (Ben Mustapha et al. 1999). After the discovery of the pearl fish, the Holothuroidea observed in discard portion were dissected and examined, no pearl fish were detected.

Conclusion

The pearl fish *Carapus acus* is noted for their unusual behaviors and have attracted the attention of natural historians, ichthyologists and physiologists. These slender fish, usually less than 25 cm TL live in warm Sea. It was captured in Tunisian coast during tree time (northern and southern Tunisian coast) at depth exceed 100 m. The species live in association with several

Table 1 Measurements for the *Carapus acus* specimen caught in the Gulf of Gabès (southern Tunisia)

Measurements	(mm)	% (TL)
Total Length (TL)	136.1	-
Body depth (BD)	5.4	3.96
Head length (HL)	16.1	11.83
Eye diameter (ED)	3.4	2.49
Pre-orbital length (PoL)	3.3	2.42
Pre-pectoral Length (PpL)	17.7	13.00
Pre-dorsal length (PdL)	21.6	15.87
Pre-anal length (PaL)	19.1	14.03



species of sea cucumbers and starfish. The signage of the species in the area makes questions about their abundance, its geographical distribution and the nature of these hosts. Many investigations are necessary in order to answers to these topics.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

ES: Conceive of the study and drafted the manuscript. BMN: Participated in the design, coordination and helped to draft the manuscript. All authors have read and approved the final manuscript.

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