

Mediterranean Marine Science

Vol 17, No 1 (2016)

VOL 17, No 1 (2016)



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doi: [10.12681/mms.1457](https://doi.org/10.12681/mms.1457)

To cite this article:

PATANIA, A., & MUTLU, E. (2015). First occurrence of knight rock shrimp, *Sicyonia lancifer* (Olivier, 1811) (Decapoda: Sicyoniidae) in the Mediterranean Sea. *Mediterranean Marine Science*, 17(1), 144–146. <https://doi.org/10.12681/mms.1457>

First occurrence of knight rock shrimp, *Sicyonia lancifer* (Olivier, 1811) (Decapoda: Sicyoniidae) in the Mediterranean Sea

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Handling Editor: Kostas Kapiris

Received: 9 August 2015; Accepted: 4 December 2015; Published on line: 20 January 2016

Introduction

Rock shrimps of the family Sicyoniidae are benthic penaeid shrimps including only a single genus *Sicyonia* with 52 species known (Perez Farfante & Kensly, 1997; Crosnier, 2003). The rock shrimps are distributed mainly in tropical and subtropical regions from shallow waters to 1000 m depth. Six species of rock shrimps are of minor commercial importance (Carpenter & Niem, 1998). The family Sicyoniidae is represented only by the native species *Sicyonia carinata* in the Mediterranean Sea (Brünnich, 1768). *S. carinata* is commonly known as Mediterranean rock shrimp.

Herein we report the occurrence of *Sicyonia lancifer* (Olivier, 1811) which is the first alien species representative of family Sicyoniidae in the Mediterranean Sea. The new alien shrimp was collected in the Gulf of Antalya, located on the Levantine coast of Turkey, a region particularly susceptible to biological invasions (Bakır *et al.*, 2014).

Materials and Methods

During bottom trawl surveys on macrozoobenthos of the Antalya Gulf (Figure 1), two specimens of *Sicyonia*

lancifer (Olivier, 1811) were collected. The crustaceans were captured by means of a trawl with cod end of 44 mm square and trawl cover of 24 mm net mesh onboard the R/V "Akdeniz Su". The specimens of knight rock shrimp were identified based on the studies of Carpenter & Niem (1998), De Freitas (1984) and George (1966, 1969). The carapace length (CL), carapace width (CW) and total length (TL) of samples were measured with a digital calliper to the nearest 0.1 mm. The specimens, preserved in 70% ethanol, are deposited in the Benthos laboratory of the Faculty of Fisheries, Akdeniz University.

Results

Sicyonia lancifer (Olivier, 1811)

Order: Decapoda Latreille, 1802

Family: Sicyoniidae Ortmann, 1898

Genus: *Sicyonia* H. Milne Edwards, 1830

Synonymy: *Palaemon lancifer* - Olivier, 1811, p. 664; *Eusicyonia lancifer* - Burkenroad, 1934, p. 71.

Material examined: Single male individual (TL 48,3 mm, CL 19,7 mm, CW 11 mm) was caught on October 21st 2014 on sand-muddy bottom (36.698315°N, 31.537889°E), at a depth of 84.2 m and seawater

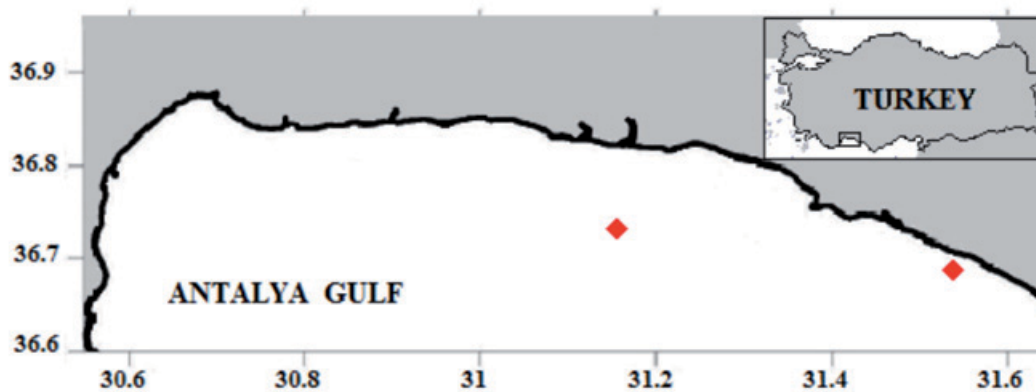


Fig. 1: Map showing the sampling stations (full red diamonds) where the individuals of *Sicyonia lancifer* have been collected in the Antalya Gulf.

temperature 23.56 °C. The second male specimen (TL 53,1 mm, CL 19,3 mm, CW 10,9 mm) was caught on 14th February 2015 on sand bottom (36.774121°N, 31.160361°E) at a depth of 46 m, seawater temperature of 20.13°C.

Diagnosis: The specimens agree well with the description and figures given by Carpenter & Niem (1998), De Freitas (1984) and George (1966, 1969) who revised the generic status of the species. Specimens can be distinguished easily from all the other species in the genus by many distinctive features. Rostrum is nearly straight with 8 teeth on dorsal part and 1 tooth on ventral (Fig.2A). The postrostral carina is armed with 5 teeth, 4 of them are behind the strong hepatic spine. On the first segment of abdomen the dorsal carina carry forward a tooth-like process, whereas carina of 6th segment terminates with a long and sharp spine. The first two segments of abdominal pleura are unispinose, whereas 3rd, 4th and 5th carry three spines. The colour of body is brownish with white stripes and black dots. Two distinctive black spots are situated on dorsal surface of first abdominal segment (Fig.2B, 2C).

The decapod assemblage associated with this species was characterized by the following species, listed in order of abundance: *Charybdis longicollis* (Leene, 1938), *Penaeus japonicus* (Spence-Bate, 1888), *Medorippe lanata* (Linnaeus, 1767), and *Pagurus prideaux* (Leach, 1815).

Discussion

Sicyonia lancifer is an Indo-west Pacific species distributed widely in Japan, Vietnam, Indonesia, west and east coasts of India, Malaysia, Sri Lanka, Maldives, and Mozambique coasts (De Freitas, 1984; Muthu, 1968). Its presence in the Red Sea has been documented by Holthuis (1980), but has not been reported in the Suez Canal up to date.

The present species is known to inhabit soft substrates, such as sand and mud bottom, and its depth range distribution is from shallow waters of 25 m to 200 m, usually less than 100 m. It is a species more active in nighttime, and probably burrows in sand during the



Fig. 2: A. Lateral view of carapace, B. and dorsal view, C. whole animal (lateral view).

daytime. When it comes out, often walks on the bottom with the abdomen strongly curved upward. (Carpenter & Niem 1998, De Freitas, 1984). The specimens here reported were collected in analogous habitats and at similar depths to those of the previously reported in literature.

According to Holthuis (1980) and Carpenter & Niem (1998) *Sicyonia lancifer* has no commercial fishery importance or its commercial value is low throughout its distribution range. *Sicyonia lancifer* is reported as bycatch from trawl fishery along north Tamil Nadu coast in India (Pillai *et al.*, 2014.). Kurian & Sebastian (1976) listed the species among the Indian prawns with commercial importance, remarking that only low quantities are reported from Arabian Sea.

The Mediterranean Ecosystem has been affected by significant changes of fauna and flora due to biological invasion of non-native species, by the Suez Canal and from the Strait of Gibraltar. Since the opening of the artificial Suez Canal in 1869, there has been an incessant influx of Indo-Pacific species (the so-called Lessepsian species) into the Mediterranean Sea (Por, 1978). There are 161 alien species of crustacean, and the majority of them occurs in Eastern Mediterranean, inasmuch the native range of four-fifths of them in Mediterranean Sea is introduced from Suez Canal (Zenetos *et al.*, 2012; Zenetos *et al.*, 2010). The detected presence of *Sicyonia lancifer* in this area, reported as the first occurrence in the Mediterranean Sea, reinforces the common invasion pattern of Lessepsian species that are going to be established in the Levantine Sea and further progressively spread westward and northward in the Mediterranean to Ionian and Aegean Sea (Katsanevakis *et al.*, 2013).

Acknowledgements

The study was carried out within a framework of the Project no: 2014.01.0111.001 supported by Scientific Research Project Coordination Unit of Akdeniz University. The authors thank to Cengiz Deval, Cansu Balaban, M. Tunca Olguner, Ahmet Sahin, Ilaria de Meo and Claudia Miglietta for their helps in the field work.

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