

Rapid Communication

A further record of the blue swimmer crab *Portunus segnis* Forskal, 1775 (Decapoda: Brachyura: Portunidae) from the Maltese Islands (Central Mediterranean)

Alan Deidun^{1*} and Arnold Sciberras²¹Physical Oceanography Research Group, University of Malta, Msida MSD 2080, Malta²133, 'Arnest', Arcade Street, Paola, Malta

*Corresponding author

E-mail: alan.deidun@um.edu.mt

Received: 22 September 2015 / Accepted: 14 December 2015 / Published online: 19 December 2015

Handling editor: Vadim Panov

Abstract

The occurrence of the blue swimmer crab *Portunus segnis*, a Lessepsian species, within Maltese coastal waters is recorded for the second time. A single male was caught from the shore by means of rod fishing. The individual was caught from a depth of 3 m in close proximity to a busy cargo-handling port. The first record of the species from Maltese waters was made in 1984. *P. segnis* represents yet another Lessepsian species which has established large populations in the Gulf of Gabes, within Tunisian waters to the south of Malta, but only occurs occasionally in Maltese waters.

Key words: Lessepsian, stray, Maltese Islands, Central Mediterranean

Introduction

The combined impact of a number of human activities, such as shipping, aquaculture, and the opening of the Suez Canal has resulted in the introduction of almost 1,000 species of non-indigenous species into the Mediterranean (Katsanevakis et al. 2014). Of this total, almost half have an Indo-Pacific affinity - the so-called 'Lessepsian' migrants. With around 160 confirmed species, Crustacea are the second most represented taxon within the Mediterranean non-indigenous species list (Zenetos et al. 2012). One such species is the blue swimming crab *Portunus segnis* (Forskal, 1775), whose native range extends from the Red Sea up to Tahiti. *P. segnis* belongs to the crab family Portunidae, which dominates commercial crab fisheries worldwide.

The blue swimmer crab was originally described as *Portunus pelagicus* (Linnaeus, 1758), but the occurrence of geographically-separated, distinct, colour morphs prompted Lai et al. (2010) to undertake a comprehensive revision of the systematics

of this species complex, subsequently assigning four distinct *Portunus* species on the basis of morphological, DNA, and biogeographical characters. The *Portunus* individuals inhabiting the western Indian Ocean, from Pakistan to South Africa, including the individuals entering the Mediterranean through the Suez Canal, were ascribed by the same authors to *Portunus segnis*. The species was first recorded from the Mediterranean Sea as *Neptunus pelagicus*, off Egypt (Port Said) in 1898 (Fox 1924), and subsequently followed the classic westward expansion pattern for Lessepsian species once they enter the Mediterranean, currently making it as far west as the northern Tyrrhenian Sea (Crocetta 2006) and the Gulf of Gabes in Tunisia (Crocetta et al. 2015). According to the latter authors, although the species has been known from the Gulf of Gabes ever since October 2014, it 'bloomed' for the first time within such waters over the August-September 2015 period, with local fishermen complaining that such a 'valueless' (since it is not consumed in Tunisia) crab species was dominating their purse



Figure 1. Dorsal view of specimen of *Portunus segnis* captured August 2015 in Marsaxlokk Bay, Malta. Photograph by Alan Deidun.



Figure 2. Abdomen of *Portunus segnis* captured August 2015 in Marsaxlokk Bay, Malta. Photograph by Alan Deidun.

and beach seine catches. The occurrence of *Portunus segnis* in the Western Basin makes it one of the few Lessepsian migrants whose distribution straddles both basins of the Mediterranean, similar to the fish species *Fistularia commersonii* (Ruppell, 1838), *Siganus luridus* (Ruppell, 1839) and *Stephanolepis diaspros* (Fraser-Brunner, 1940).

In view of its relatively large size and edibility, *Portunus segnis* is exploited commercially in certain parts of the Mediterranean, especially in the Levantine where has been sold since the early 1900s in Haifa, Israel; Alexandria in Egypt and in Turkey (Fox 1924; Calman 1927; Perlmutter 1956; Abdel-Razek 1987). It is also fished in harbours along the eastern coast of the island of Sicily, such as Augusta (Galil et al. 2002). In Sicily, there was commercial exploitation in the 1960's to 1980's; followed by a serious decline; however, the population did recover and exploitation has resumed, with the species being regularly on sale in fish markets in Sicily (Crocetta 2006).

Crocetta et al. (2015) have recently revisited the taxonomic identity of a non-indigenous decapod crab recorded in Maltese waters over thirty years ago by Schembri and Lanfranco (1984), identified at the time as *Callinectes sapidus*, and ascribed it to *Portunus segnis*. Since the island of Sicily lies just 90 km north of the Maltese archipelago, it comes as no surprise that the timing (1972) when this first *P. segnis* individual was caught from Maltese waters coincides with the period during which Sicilian populations of the species was high. This systematic revision within Crocetta et al. (2015) supersedes a recent updated review of non-indigenous species recorded from Maltese waters (Evans et al. 2015). The same review listed eight non-indigenous crustacean species from Maltese waters, but did not include *P. segnis*. In view of such a review, our study can be considered as the second confirmed record for the species from Maltese waters, occurring > thirty years after the species was first documented within these waters.

Methods and materials

The *P. segnis* individual was caught at night during the second week of August 2015, from the shore through rod fishing, by an amateur fisherman (Mr. Joseph Bezzina), from a maximum water depth of 3 m at Birzebbuga, within Marsaxlokk Bay (35°49'53.12"N, 14°31'51.02"E). The crab was immediately frozen, was later identified and photographed, and is currently held within the private collections of the authors. Several aspects of the individual are shown in Figures 1–2.

The retrieval of the *P. segnis* individual from Maltese coastal waters was featured in the Maltese printed press. Subsequently, the authors received unconfirmed reports from members of the public that they had observed, on at least two occasions, the same decapod species in shallow water at St. Thomas Bay, which lies about 5 km to the north-east of Birzebbuga on the island of Malta. Since no photos nor specimens were available to substantiate such reports, the same reports could not be confirmed by the authors.

Results and discussion

The captured individual was a large male exhibiting the typical morphometric and meristic characteristics of *P. segnis* (Table 1, Figure 1). The specimen was identified as a male by the triangular abdomen (Galil et al. 2002; Figure 2),

Table 1. Morphometric and meristic characteristics of the *Portunus segnis* captured August 2015 in Marsaxlokk Bay, Malta.

Characteristics	Dimensions (mm)
Carapace length	70
Carapace width	162
Pereiopod 1 (P1) length	277
Pereiopod 1 length/ carapace width	1.71
Chela length (P1)	145
Carpus length (P1)	35.5
Merus length (P1)	96.5
Orbit length	12.0
Carapace front margin length	30
Carapace antero-lateral margin length	69
Carapace posterior-lateral margin length	70
Spines on anterior merus margin of P1 (Right)	3 (+ 1 tooth)
Spines on anterior merus margin of P1 (Left)	3(+ 1 tooth)

as shown in Figure 2 and based on the first pereiopod being considerably longer than the carapace width as reported in Corsini Foka et al. (2004). Its taxonomic identity was further confirmed by the occurrence of the prominent inner spine on the cheliped carpus, a diagnostic feature of the species (Stephenson 1972) that distinguishes it from the superficially-similar *Callinectes sapidus* (Galil et al. 2002).

The *Portunus segnis* individual presented a bidentate front, with nine teeth being present along the antero-lateral margin, of which the last one was the most prominent, and a mottled pattern with yellow-whitish spots and lines on the carapace and legs. Swimming pereiopods were proximally mottled and a vivid blue at the distal end. The fingers on the second, third and fourth pereiopods had a reddish fringe, whilst their surface was blue.

The collection site lies less than 500 m from Freeport - a major cargo-handling facility. This facility is the third largest trans-shipment and maritime logistics centre in the Mediterranean (<http://www.maltafreeport.com.mt> - accessed online on 20th September 2015). The first *P. segnis* individual caught within Maltese waters was retrieved from Marsaxlokk, a fishing port located within the same embayment as Birzebbuga, from where the individual reported in this study was caught. The retrieval of the *P. segnis* individual in close proximity to such an important shipping hub is consistent with the importance ascribed to shipping by various authors (e.g. Zenetos et al. 2012) in the transport of alien decapod and other

marine non-indigenous species. The correspondence between alien-decapod transport and shipping is the prolonged survival in ballast water of the larvae (Occhipinti-Ambrogi 2000). Literature records of the preferred seabed typology of *P. segnis* (e.g., Yokes et al. 2007) also tally with the seabed type from which the Maltese individual was caught, which is dominated by very fine sediment (mud) within a highly sheltered bay environment. Besides shipping-mediated vectors, CABI (2013) also lists aquaculture as a possible pathway for the introduction of the species, but this pathway does not apply to Maltese waters because the species under cultivation. That *P. segnis* occurs in Maltese waters as individuals and has yet to establish a population, in contrast to further south in the Gulf of Gabes in Tunisia where it recently established large populations, is yet another example of a Lessepsian species that occur as strays within Maltese waters. A similar pattern is observed in another Lessepsian species, the scyphozoan *Rhopilema nomadica*, which is recorded as just two individuals within Maltese waters and yet is abundant within the Gulf of Gabes (Daly Yahia et al. 2013).

With the enlargement of the Suez Canal, operational as of August 2015, the influx of Lessepsian species into the Mediterranean is expected to increase and this is a serious within the biological community (e.g. Galil et al. 2015).

Acknowledgements

The authors are indebted to Mr. Joseph Bezzina and Ms. Doreen Sammut for alerting us to the catch of the crab individual in question and to the two anonymous reviewers for greatly improving the manuscript through their valuable comments.

References

- Abdel-Razek FA (1987) Crab fishery of the Egyptian waters with notes on the bionomics of *Portunus pelagicus* (L.). *Acta Adriatica* 28(1–2): 143–154
- CABI (2013) *Portunus segnis* [original text by Ekaterina Shalaeva] In: Invasive Species Compendium. Wallingford, UK: CAB International. <http://www.cabi.org/isc>
- Calman WT (1927) Report on the Phyllocarida, Cumacea and Stomatopoda (Cambridge Exp. Suez 1924). *Transatlantic Zoological Society of London* 22: 399–401, <http://dx.doi.org/10.1111/j.1096-3642.1927.tb00388.x>
- Corsini Foka M, Kondylakos G, Economidis PS (2004) Occurrence of the Lessepsian species *Portunus pelagicus* (Crustacea) and *Apogon pharaonis* (Pisces) in the marine area of Rhodes Island. *Mediterranean Marine Science* 5(1): 83–89, <http://dx.doi.org/10.12681/mms.213>
- Crocetta F (2006) First record of *Portunus pelagicus* (Linnaeus, 1758) (Decapoda: Brachyura: Portunidae) in the northern Tyrrhenian Sea. *Crustaceana* 79(9): 1145–1148, <http://dx.doi.org/10.1163/156854006778859632>

- Crocetta F, Agius D, Balisteri P, Bariche M, Bayhan YK, Cakir M, Ciriaco S, Corsini-Foka M, Deidun A, El Zrelli R, Erguden D, Evans J, Ghelia M, Giavasi M, Kleitou P, Kondylatos G, Lipej L, Mifsud C, Ozvarol Y, Pagano A, Portelli P, Poursanidis D, Rabaoui L, Schembri PJ, Taskin E, Tiralongo F, Zenetos A (2015) New Mediterranean Biodiversity Records (October 2015). *Mediterranean Marine Science* 16(3): 682–702
- Daly Yahia MN, Daly Yahia-Kefi O, Maïte Gueroun SK, Aissi M, Deidun A, Fuentes V, Piraino S (2013) The invasive tropical scyphozoan *Rhopilema nomadica* Galil, 1990 reaches the Tunisian coast of the Mediterranean Sea. *BioInvasions Records* 2: 319–323, <http://dx.doi.org/10.3391/bir.2013.2.4.10>
- Evans J, Barbara J, Schembri PJ (2015) Updated review of marine alien species and other ‘newcomers’ recorded from the Maltese Islands (Central Mediterranean). *Mediterranean Marine Science* 16(1): 225–244
- Fox MH (1924) The migration of a Red Sea crab through the Suez Canal. *Nature* 113: 714–715, <http://dx.doi.org/10.1038/113714b0>
- Galil B, Froglija C, Noel P (2002) CIESM Atlas of Exotic Species in the Mediterranean. Volume 2. Crustaceans: decapods and stomatops. CIESM Publishers, Monaco, 192 pp
- Galil BS, Boero F, Campbell ML, Carlton JT, Cook E, Fraschetti S, Gollasch S, Hewitt CL, Jelmert A, Macpherson E, Marchini A, McKenzie C, Minchin D, Occhipinti-Ambrogi A, Ojaveer H, Olenin S, Piraino S, Ruiz GM (2015) “Double trouble”: the expansion of the Suez Canal and marine bioinvasions in the Mediterranean Sea. *Biological Invasions* 17: 973–976, <http://dx.doi.org/10.1007/s10530-014-0778-y>
- Katsanevakis S, Coll M, Piroddi C, Steenbeek J, Ben Rais Lasram F, Zenetos A, Cardoso AC (2014) Invading the Mediterranean Sea: biodiversity patterns shaped by human activities. *Marine Ecosystem Ecology* 1: 32, <http://dx.doi.org/10.3389/fmars.2014.00032>
- Lai JCV, Ng PKL, Davie PJF (2010) A revision of the *Portunus pelagicus* (Linnaeus, 1758) species complex (Crustacea: Brachyura: Portunidae), with the recognition of four species. *The Raffles Bulletin of Zoology* 58(2): 199–237
- Occhipinti-Ambrogi A (2000) Biotic Invasions in a Mediterranean Lagoon. *Biological Invasions* 2: 165–176, <http://dx.doi.org/10.1023/A:1010004926405>
- Perlmutter A (1956) Sea fisheries - Report to the government of Israel. Technical Assistance program USOM Agricultural Report 13, 58 pp
- Schembri PJ, Lanfranco E (1984) Marine Brachyura (Crustacea: Decapoda: Brachyura) from the Maltese Islands and surrounding waters (Central Mediterranean). *Centro [Malta]* 1 (1): 21–39
- Stephenson W (1972) An annotated check list and key to the Indo-West-Pacific swimming crabs (Crustacea: Decapoda: Portunidae). *Bulletin of the Royal Society of New Zealand* 10: 1–64
- Yokes MB, Karhan SÜ, Okus E, Yüsek A, Aslan-Yılmaz A, Yılmaz İN, Demirel N, Demir V, Galil BS (2007) Alien crustacean decapods from the Aegean coast of Turkey. *Aquatic Invasions* 2: 162–168, <http://dx.doi.org/10.3391/ai.2007.2.3.2>
- Zenetos A, Gofas S, Verlaque M, Çinar ME, García Raso JE, Bianchi CN, Morri C, Azzurro E, Bilecenoglu M, C. Froglija C, Siokou I, Violanti D, Sfriso A, San Martín G, Giangrande A, Katagan T, Ballesteros E, Ramos-Esplá A, Mastrototaro F, Ocaña O, Zingone A, Gambi MC, Streftaris N (2012) Alien species in the Mediterranean Sea by 2012. A contribution to the application of European Union’s Marine Strategy Framework Directive (MSFD). Part 2. Introduction trends and pathways. *Mediterranean Marine Science* 13(2): 328–352, <http://dx.doi.org/10.12681/mms.327>