
ISSN: 0001-5113
AADRAY

ACTA ADRIAT.,
53(3): 467 - 471, 2012

First record of the Atlantic crab *Callinectes sapidus* Rathbun, 1896 (Crustacea: Brachyura: Portunidae) in Abruzzi waters, central Adriatic Sea

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*For the first time, one female individual of blue crab *Callinectes sapidus* Rathbun, 1896, a species native to the western Atlantic coasts, is reported from Abruzzi waters (central Adriatic Sea). This species has widely invaded European Atlantic coasts and several areas of the Mediterranean, probably brought by ballast waters; yet, it has not settled in the study area.*

Key words: Abruzzi, Adriatic Sea, ballast waters, *Callinectes sapidus*, first record, immigration, non indigenous species, Portunidae

INTRODUCTION

American blue crab *Callinectes sapidus* Rathbun, 1896 is a coastal and estuarine species, native to the western Atlantic coasts; it ranges from Nova Scotia in Canada down to northern Argentina, including Bermuda and the Antilles (WILLIAMS, 1974). It was reported along the Atlantic European coast in the 1900 year in France (BOUVIER, 1901), and then it spread northward to the Baltic Sea and southward to the Atlantic coast of Spain (see NEHRING, 2011 and literature therein). It has been reported in

Japan since 1975 and in Hawaii since 1985 (ELDRIDGE, 1995). It also entered the Mediterranean but an exact date of its entrance cannot be established because in the past it was often mistaken for Lessepsian crab *Portunus segnis* (Forskål, 1775), which was either referred to as *Neptunus pelagicus* (L., 1758) or *P. pelagicus* (L., 1758) before the revision of the *P. pelagicus* species complex (LAI *et al.*, 2010). Based on a female specimen preserved in the zoological collection of the Natural History Museum of Venice, we can confidently date the first occurrence of a correctly identified American blue

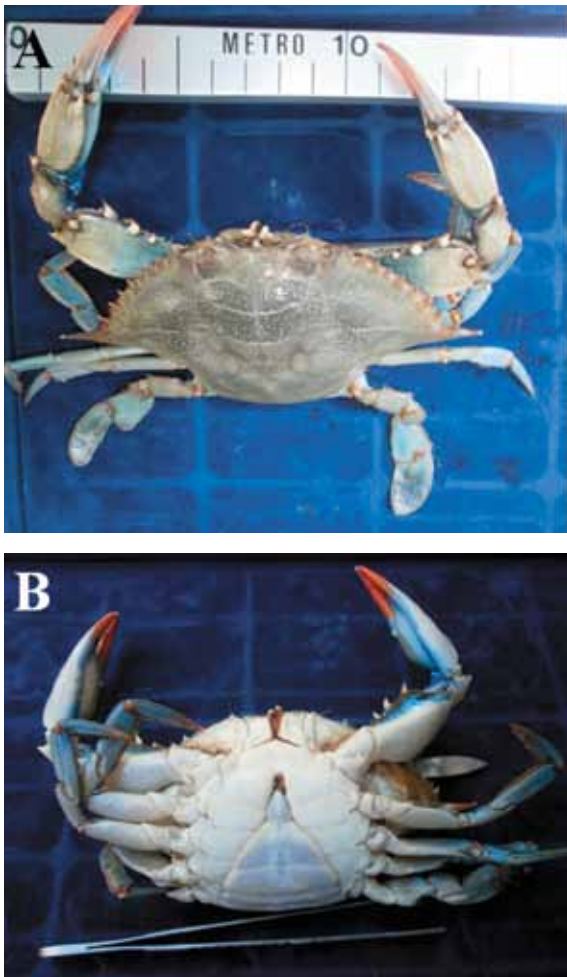


Fig. 1. Female specimen of *Callinectes sapidus* Rathbun, 1896 collected at Silvi Marina, Abruzzi: a) dorsal view, b) ventral view

crab in the Mediterranean to 4 October 1949 (MIZZAN, 1993). This specimen was found near Marina di Grado (Italy), northern Adriatic Sea, and at the time of its finding it was labelled as *N. pelagicus*. *C. sapidus* was then reported in many parts of the Mediterranean and in the Black Sea, somewhere in large colonies (NEHRING, 2011 and literature therein). In the Adriatic Sea, this species has been frequently recorded (see DULČIĆ *et al.*, 2010 for a detailed map), although established populations are only known from southern Croatia (ONOFRI *et al.*, 2008; DULČIĆ *et al.*, 2011), northern Albania (BEQIRAJ & KASHTA, 2010) and southern Italy (FLORIO *et al.*, 2008).

Considering that *C. sapidus* is listed among the “worst invasive” species in the Mediterranean and impacts on both biodiversity and

socioeconomics (STREFTARIS & ZENETOS, 2006), tracing its spreading may be useful to control and prevent potential adverse effects on local ecosystems.

This note refers to the first record of *C. sapidus* in Abruzzi waters, central Adriatic Sea.

MATERIAL AND METHODS

On 12 May 2011, one specimen of *Callinectes sapidus* (Fig. 1) was caught at Silvi Marina (Abruzzi) by gillnet on a sandy, 10 m deep bottom, in correspondence of the Piomba River mouth (42°32'N, 14°11'E, Fig. 2); this area also features rocks at shallower depths and hosts the biocoenosis of fine well-sorted sands. Gillnet was drawn up at 5 a.m. Morphometric data of the specimen were collected with a caliper to the lowest millimetre.

The specimen was identified to species level on the base of the presence of two large and obtuse teeth on the frontal margin which differentiate *C. sapidus* from either *C. danae* Smith, 1869 or *P. segnis*, two other exotic crabs reported in the Mediterranean (WILLIAMS, 1974; MIZZAN, 1993; LAI *et al.*, 2010). *P. segnis* also bears a prominent spine on the internal margin of the cheliped carpus (LAI *et al.*, 2010), which lacks in the two species of the *Callinectes* genus.

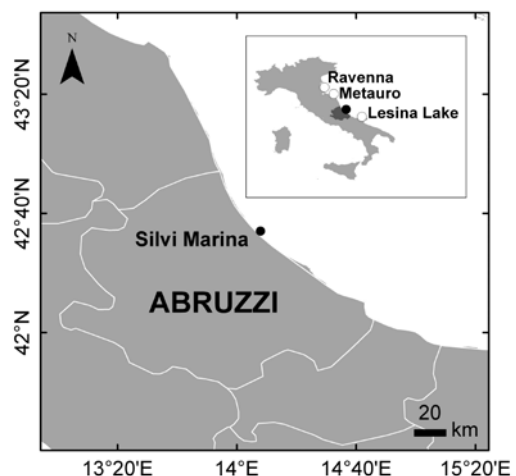


Fig. 2. Map of Abruzzi (central Adriatic) showing the site (full circle) where *Callinectes sapidus* Rathbun, 1896 has been collected, with indication of the nearest localities where the species has been previously recorded

RESULTS

The specimen of *Callinectes sapidus*, currently preserved by one of the authors (R. Costantini), is a female of 59 mm carapace length and 133 mm carapace width (including the 9th lateral spines) (i.e. width is 2.25 times its length).

At the time of its catch, the dorsal carapace surface was brownish-green, with white spots scattered mostly in its anterior portion; the ventral surface was whitish; it had blue walking legs and bright orange cheliped fingers, which are typical for mature female individuals (WILLIAMS, 1965, 1974).

DISCUSSION

Callinectes sapidus is one of the most important targets of commercial and recreational fishery in its native area (JORDAN, 1998). The way *C. sapidus* entered the Mediterranean is still unknown. It has often been reported close to harbours and shipping routes, or in spots far off one from the other. This leads to hypothesize that most probably it was brought in with ballast waters (WILLIAMS, 1974), possibly at different intervals followed by rapid colonization and dispersal (NEHRING, 2011). On the other hand, adult specimens are excellent swimmers and migrate from seawater to rivers, and vice versa, at different stages of their life cycle. Therefore, it might well be that they naturally spread, moving away from the site of introduction toward other locations, covering long distances of several hundred kilometres. More in particular, after mating in estuarine brackish waters females migrate to higher salinity coastal waters to lay eggs (VAN

ENGEL, 1958) and then tend to remain there, or rather move to close-by seawaters while males prefer to remain in low salinity areas (WILLIAMS, 1965).

Our specimen was found at 130 km approx. (calculated along a coastal route) north of the nearest southern record site - i.e. Lesina Lake (FLORIO *et al.*, 2008), where the species seems to have settled (see Fig. 2) - and 180 km south of the nearest northern record site, where the species has been occasionally reported - i.e. 1 mile off the Metauro River mouth (FROGLIA, 1972). One male individual of blue crab was recently reported in the northern Adriatic Sea offshore the Ravenna coasts (SCARAVELLI & MORDENTI, 2007), at approximately 280 km from our record site. *C. sapidus* might have arrived in the Abruzzi coastal waters via shipping transport as a larva, although the hypothesis of natural migration cannot be excluded.

CONCLUSIONS

The “vigorous and pugnacious nature” of this species, its high fecundity, tolerance of extreme environments (it is euryhaline and eurythermal) and swimming ability (WILLIAMS, 1965, 1974), all of these characteristics make it a successful invader. Yet we cannot assert that blue crab has settled in our study area because of the rare occurrence reports as well as time and space dispersion of individuals.

ACKNOWLEDGEMENTS

The Authors are grateful to Mr. Fabrizio D'ALBERTO who caught and preserved the specimen.

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Received: 21 July 2011

Accepted: 16 July 2012

Prvi nalaz plavog raka *Callinectes sapidus* Rathbun, 1896 (Crustacea: Brachyura: Portunidae) u vodama pokrajine Abruzzi, srednji Jadran

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SAŽETAK

Po prvi put, jedinka ženke plavog raka *Callinectes sapidus* Rathbun, 1896 vrste koja potječe sa zapadne obale Atlantika, zabilježena je u vodama pokrajine Abruzzi (srednji Jadran). Ova vrsta je uvelike najezdila europske obale Atlantika i nekoliko područja u Mediteranu, donešena vjerojatno balastnim vodama; ipak, još se nije u potpunosti nastanila u istraživanom području.

Ključne riječi: Abruzzi, Jadransko more, balastne vode, *Callinectes sapidus*, prvi nalaz, imigracija, alohtone vrste, Portunidae

