

A new case of amphibian consumption by Atlantic blue crab (*Callinectes sapidus*) in the Iberian Mediterranean coast

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RESUMEN: Se describe un nuevo caso de consumo de anfibios, esta vez de rana verde (*Pelophylax* sp.) por cangrejo azul (*Callinectes sapidus*), lo que constituye una nueva amenaza a este grupo faunístico. Este caso se suma a los múltiples impactos negativos sobre la biodiversidad autóctona y la economía local, que nos lleva a sugerir la inclusión del cangrejo azul en el catálogo de especies invasoras.

Alien species are proved as one of the main causes of global biodiversity loss (Charles & Dukes, 2008), being involved in the disappearance of 33% of animal extinct species since 1500 (Blackburn *et al.*, 2019). In recent years, a new invasive species has had a remarkable impact on the coastal environments of the Iberian Peninsula: it is the Atlantic blue crab (*Callinectes sapidus* Rathbun, 1896).

The native range of this crab stretches throughout Western Atlantic coast, from Canada to northern Argentina. First record of this species in the Iberian Mediterranean coast dates from 2010, in the Murcian coast. In 2012, the Atlantic blue crab was recorded for the first time in the Ebro Delta (Castejón & Guerao, 2013). Its range expanded progressively to the North following the Catalanian coasts. So, three years later, in 2015, it was observed for the first time in the Foix River Mouth, in the municipality of Cubelles (Barcelona) (Broglio *et al.*, 2020). Currently, this species is well established throughout the Iberian Mediterranean coast from Murcia to Girona (Fuentes *et al.*, 2019) and its Iberian range stretches to the west throughout the Atlantic coast to Guadiana river estuary (Morais *et al.*, 2019).

The Atlantic blue crab is able to survive in a wide range of temperature and salinity conditions (Mancinelli *et al.*, 2017). Furthermore, it is an omnivore that can feed on a big variety of food resources (Olivert, 2018). Its opportunistic diet allows it to take advantage of any food source found in its environment. Its diet includes algae, small fishes and crustaceans (including other blue crabs), and it is also a scavenger, feeding on carrion (Olivert, 2018). Due to this versatile diet and its aggressivity, a great diversity of native species could be seriously threatened by coexistence with this invasive species.

In a study on the diet of the Atlantic blue crab in two locations on the Eastern Iberian Mediterranean coast, it was observed that in the Ebro Delta their diet is made up mostly of plant matter, also including molluscs and other aquatic invertebrates. Stomach contents of individuals from this area were analyzed, and remains of the skin of an amphibian were found. These remains were identified in the study as belonging to a tadpole of western spadefoot toad (*Pelobates cultripes*) (Gil, 2018).



Photo Laia Pérez-Sorribes

Figure 1: Picture showing an Atlantic blue crab (*Callinectes sapidus*) feeding on a water frog (*Pelophylax* sp.) in Foix river mouth (Cubelles).

Figura 1: Fotografía en la que se aprecia un cangrejo azul (*Callinectes sapidus*) consumiendo una rana verde (*Pelophylax* sp.) en la desembocadura del Foix (Cubelles).

Due to the opportunistic behaviour of the Atlantic blue crab, it is very likely that amphibians of several species, whether eggs, tadpoles and adults can be potentially predated if they live in the same habitat.

On August 18, 2020, an adult *Callinectes sapidus* feeding on an adult water frog (*Pelophylax* sp.) was seen in Espai Natural de la Desembocadura del Foix, located in Cubelles (Garraf, Barcelona, Spain) (41°11'59.5" N; 1°40'31.6" E) (Figure 1).

It is unknown if the frog was actively depredated by the crab or if it had recently died due to other causes.

This observation shows that the Atlantic blue crab is able to feed on amphibians, specifically on Western European water frogs (*Pelophylax* sp.), being the second recorded case of amphibian consumption by this crab in the Iberian Mediterranean coast.

The Atlantic blue crab seriously threatens native biodiversity such as amphibians. In addition, it competes with native Mediterranean green crabs (*Carcinus aestuarii*) (Gennaio *et al.*, 2006), and it is also having a negative impact on the local aquaculture and fishing industry (López & Rodon, 2018). For these reasons, the Atlantic blue crab should be included in the Catálogo Español de Especies Exóticas Invasoras. It is necessary to carry out conservation actions in the ecosystems invaded by this crab, allowing their extraction from the environment and looking for the most efficient way to manage this species in order to slow down its expansion. Likewise, more studies should be made to quantificate the impact that this crab has on the native biodiversity.

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