Assessment of the presence of *Gracilipurpura rostrata* (Gastropoda: Fasciolariidae) along the northern coasts of Brittany (France)

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Abstract

One specimen of *Gracilipurpura rostrata* (Olivi, 1792) was found in 2017 in Penvénan (Northern Brittany), an intermediate site between two bays where this mediterranean introduced species had been already recorded. We precise here the ecology of the species, and discuss the primary and secondary vectors of the spread of the species along the coasts of northern Brittany.

Keywords: Fasciolariidae; introduced species; northern Brittany

État des lieux de la présence de *Gracilipurpura rostrata* (Gastropoda : Fasciolariidae) sur les côtes de Bretagne nord (France)

Résumé

La découverte d'un spécimen de *Gracilipurpura rostrata* (Olivi, 1792) dans un secteur où cette espèce méditerranéenne introduite n'était jusqu'alors pas répertoriée, permet de dresser un état des lieux de sa présence sur les côtes nord de la Bretagne et de préciser son écologie. Les vecteurs de propagation de cette espèce dans la région sont également discutés.

Mots-clés : Bretagne nord ; espèce introduite ; Fasciolariidae

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On the 18th November 2017, we have found a living specimen of the Fasciolariidae gastropod *Gracilipurpura rostrata* (Olivi, 1792) (= *Fusinus rostratus* (Olivi, 1792)) in Penvénan (Côtes-d'Armor). The specimen was collected at the bottom of a jetty (48°50′35.3″N 3°16′29.4″W) in the vicinity of the village of Buguélès (near Penvénan) among a pile of *Pecten maximus* (Linnaeus, 1758) shells freshly cleaned out by fishermen.

The specimen was quickly identified by its red-orange flesh color and its opened and relatively long siphonal canal (0.8 cm) typical of *Gracilipurpura rostrata*. The shell is 32 mm length with 7 whorls (protoconch broken) and 13 mm maximum width (Figure 1). It is encrusted by bryozoans (genus *Turbicellepora* Ryland, 1963), the polychaete *Spirobranchus triqueter* (Linnaeus, 1758) and the cirriped *Balanus balanus* (Linnaeus, 1758).

Figure 1: *Gracilipurpura rostrata* (Olivi, 1792): living specimen collected on the 18th November 2017 near Buguélès (Penvénan, Côtes-d'Armor, France). Scale bar: 10 mm.

G. rostrata is a Mediterranean endemic species, present all over the basin although it is more frequent in the Northern and Central Adriatic, in the Tyrrhenian Sea as well as in the Sicily Canal (Russo, 2014; Scaperrotta *et al.,* 2016). However it is also present on the Atlantic coasts from Morocco southward to Cantabria northward and including the Canary Islands (Poppe & Goto, 1991; Serrano *et al.,* 2006; Goulletquer, 2016). The presence of *G. rostrata* was also reported from Mauritania althouh those records might be doubtful (Serrano *et al.,* 2006; Buzzurro & Russo, 2007).

The species lives on various muddy substrates including muddy-sandy and muddy-detritic bottoms (Poppe & Goto, 1991; Buzzurro & Russo, 2007; Scaperrotta *et al.,* 2016). Generally, it is reported from depths around 20 meters but it ranges from a few meters (lagoon of Venice) to more than 800 m (12 km southwest Isle of Marettimo, Italy) (D'Amico, 1912; Poppe & Goto, 1991; Buzzurro & Russo, 2007; Le Duff *et al.,* 2009; Russo, 2012). The species is carnivorous, feeding on polychaetes, gastropods

and bivalves although lacking the ability to drill shells (Goulletquer, 2016).

On the south Channel coast, it has been reported from two areas. Firstly in October 2007, from the bay of Morlaix (Finistère nord), within a heterogeneous-mud habitat (mud mixed with dead *Crepidula fornicata* (Linnaeus, 1758) and dead maerl fragments) at 9 m to 10 m depth (Le Duff *et al.,* 2009; Nolf, 2009). Secondly in September 2009, a specimen was collected by D. Halleux on a muddy-sand beach, on the east of the pointe du Roselier, in the bay of Saint-Brieuc (Côtes-d'Armor) (Le Quément, 2010). Since 2010, it has been recorded in several localities in this bay: from a beach in the north of Plouha, around the pointe du Roselier (Plérin), in the anse de Morieux, from sandy and muddy-sand bottom (Gully & Cochu, 2020) (Figure 2).

Consequently, our specimen is the first record of this introduced species reported outside from these two bays.

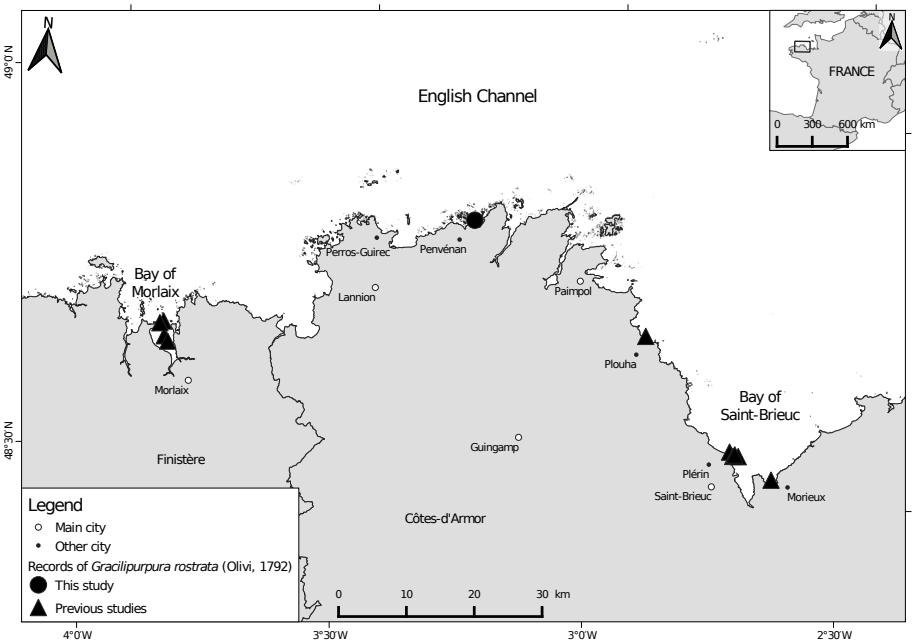

Figure 2: Map showing the records of *Gracilipurpura rostrata* (Olivi, 1792) reported from northern Brittany (this study and the literature): Le Duff *et al.* (2009) and Nolf (2009) for the bay of Morlaix, Le Quément (2010) and Gully & Cochu (2020) for the bay of Saint-Brieuc.

Two non exclusive hypotheses can be put forward to explain the presence of this species in a place where it was previously unknown. The first assumes that *G. rostrata* might have been introduced by the way of oyster culture and more precisely through oyster translocations between several aquaculture areas. Indeed, the Bay of Morlaix, where 7 specimens were found by Le Duff *et al.* (2009), as well as the bay of Saint-

Brieuc (including Paimpol area) are major areas of oyster aquaculture in Brittany, with 704 ha and 836 ha of oyster farms, respectively.

The second hypothesises that the propagation of the species was caused indirectly by professional fishing activities.Indeed, the western maritime area of the Côtes-d'Armor department is one of the major king scallop french fishery. The bay of Saint-Brieuc holds today the largest stock of this area with a total yearly catch of 5 600 t spread over more than 150 000 ha. Closer to the site where we found our specimen of *G. rostrata*, in the secondary fishery of Perros-Guirec, 165 t were catched during the 2017 fall season. *P. maximus* is catched by dredging over a very short period of time (45 min by day in Bay of Saint-Brieuc) and the fished stock is often sorted out from the dredge non passed fraction and cleaned out at the harbour (this task is forbidden at sea).

In our case, *G. rostrata* have been found on pebbles at the bottom of a jetty, among *P. maximus* shells freshly cleaned out by fishermen (some pieces of fresh flesh were present on some shells). This localisation on the upper shore at low water is not coherent with the environmental preferences of this subtidal species living on muddy habitats. Therefore, we believe that the specimen we found was probably accidentaly catched together with *P. maximus* in front of Penvénan and discarded there with *Pecten* valves on the shore where we found it. The question of its ability to come down the shore and settle on the coasts of Penvénan stands.

Gracilipurpura rostrata seems to be well established along the french Channel coasts, between the bay of Morlaix and the bay of Saint-Brieuc. We hypothesize *G. rostrata* populations could be now present almost continuously between these two bays. Considering that constant oysters transportation between oyster farms from the french Channel-Atlantic seabord (Le Bihan *et al.,* 2017), the presence of *Gracilipurpura rostrata* should be carefully researched within other oyster farms basins, such as the gulf of Morbihan (southern Brittany), the Marennes-Oléron basin (Charente-Maritime) or the Bassin d'Arcachon (Gironde). These ecosystems already show substantial numbers of introduced species, brought there predominantly by aquaculture activities.

The gastropods species *Crepidula fornicata*, *Gibbula albida* (Gmelin, 1791), *Ocenebra erinaceus* (Linnaeus, 1758), *Rapana venosa* (Valenciennes, 1846) and hence *Gracilipurpura rostrata* are but a few examples of the species introduced through aquaculture activities along the french coasts of the Channel. This is an ongoing process. Therefore one may wonder on the identity of the forthcoming species that will be introduced to theses ecosystems. But overall the issue regards their potential impacts on biodiversity as well as on ecosytems functionning of there areas. How many other introductions will happen along our coasts? And which will be the consequences for the ecosystems?

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