



First record of the Asian clam *Corbicula fluminea* (Müller, 1774) (Bivalvia: Cyrenidae) at Poxim-Açu River, northeastern Brazil

Primeiro registro de ocorrência de *Corbicula fluminea* (Müller, 1774) (Bivalvia: Cyrenidae) no rio Poxim-Açu, região nordeste do Brasil

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Abstract: Aim: The objective of this work is to provide a new occurrence record of the Asian clam *Corbicula fluminea* in the Poxim-Açu River, northeastern Brazil. **Methods:** Samplings were carried out on October 20th of 2016 at five sites along Poxim-Açu River. At each site five samples were taken with a PVC core of 0.25 m of diameter and all individuals found inside core were sorted by hand. **Results:** The species was recorded at all sites with densities ranging from 412±169 to 1692±1474 individuals/m². **Conclusion:** This record extends the distribution of *C. fluminea* at northeastern Brazil.

Keywords: non-native species; first record; Asian clam; Sergipe River basin.

Resumo: Objetivo: Esse trabalho tem como objetivo registrar pela primeira vez a presença do berbigão asiático *Corbicula fluminea* no Rio Poxim-Açu, região nordeste do Brasil. **Métodos:** As amostragens foram realizadas em 20 de outubro de 2016 em cinco pontos ao longo do Rio Poxim-Açu. Em cada ponto foram coletadas cinco amostras com o auxílio de um tubo de PVC (diâmetro de 0,25 m). Todos os indivíduos presentes dentro do tubo foram coletados manualmente. **Resultados:** A espécie esteve presente em todos os pontos amostrais com densidades variando entre 412±169 e 1692±1474 indivíduos/m². **Conclusão:** Esse registro amplia a distribuição de *C. fluminea* na região nordeste do Brasil.

Palavras-chave: espécies exóticas; primeiro registro; berbigão asiático; bacia hidrográfica do Rio Sergipe.



The introduction of non-native species is considered to be the second most important reason for biodiversity loss worldwide (Bellard et al., 2016). Among freshwater invertebrates, *Corbicula fluminea* (Müller, 1774) (Bivalvia: Cyrenidae) is one of the most important non-native invasive species in aquatic systems mainly due to its widespread distribution and ecological and economic impacts (Sousa et al., 2008; Crespo et al., 2015). This species is native from Southeast Asian but currently have spread to majority of freshwater systems worldwide (Mansur et al., 2004; Crespo et al., 2015). In South America, this species was first recognized around the 1970s in the Rio de la Plata estuary (Ituarte, 1981). Veitenheimer-Mendes (1981) recorded *C. fluminea* for the first time in Brazil, and since then several works showed its dispersion in the south (Mansur & Garces, 1988), southeast (Avelar, 1999; Suriani et al., 2007; Vianna & Avelar, 2010; Lima, 2017), central-west (Callil & Mansur, 2002; Poleze & Callil, 2015) and north (Beasley et al., 2003; Pimpão & Martins, 2008) regions of the country. The species was also recorded in the northeastern region along São Francisco River (Santana et al., 2013).

In this work, the presence of *C. fluminea* is recorded for the second time in the Northeastern

Brazil and by first time in the Poxim-Açu River. The Poxim-Açu River is part of the Poxim River sub-basin, which belongs to the Sergipe River basin (Figure 1). The sub-basin has an area of 128 km², 10% winding index, 4th order river hierarchy and compactness coefficient of 1.76, with elongated and practically straight form and low tendency to flood peaks (Rocha et al., 2014). The Poxim River basin contributes to about 30% of the water supply of Aracaju city, state capital. Despite its social and economic importance, this sub-basin is in a high level of environmental degradation, especially with regard to the suppression of its riparian vegetation (Ferreira et al., 2011).

Samplings were carried out on October 20th of 2016 at five sites along Poxim-Açu River (Figure 1). Five samples were taken at each site using a PVC core of 0.25 m of diameter which was pushed 10 cm into the sediment. All individuals found inside were taken by hand and stored in plastic bags properly identified. At lab, individuals were identified and counted. Individuals of *C. fluminea* (Figure 2) were caught at all sampling sites with densities ranging from 412±169 (Site 5) to 1692±1474 individuals/m² (Site 3) (Figure 3).

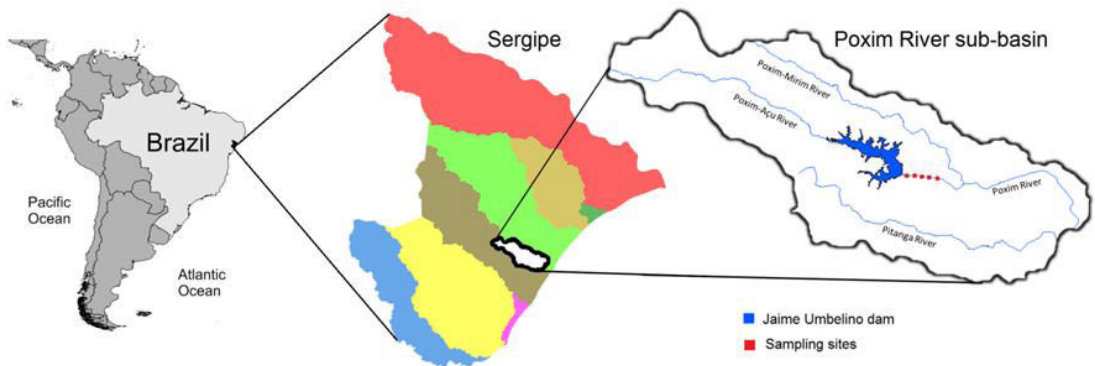


Figure 1. Map of Poxim River sub-basin indicating the sampling sites.



Figure 2. Internal and external views of valves of the *Corbicula fluminea* caught at Poxim-Açu River. Scale=1 cm.

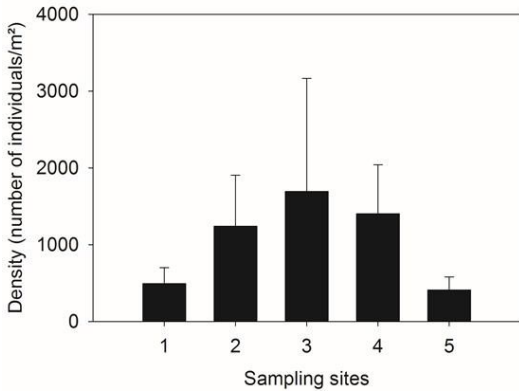


Figure 3. Mean densities (+ 1 standard deviation) of *Corbicula fluminea* in each sampling site at Poxim-Açu River.

The transport vector of *C. fluminea* into the Poxim-Açu River is unknown but the high densities recorded suggest that the species is already established. Similar values (from 379 to 2609 individuals/m²) were recorded by Cataldo & Boltovskoy (1998) in the Paraná River delta, Argentina.

In general, the introduction and subsequent dispersion of *C. fluminea* in aquatic ecosystems is a result of various human activities such as ballast water transport or the juvenile byssal attachment to boat hulls (Sousa et al., 2008; Crespo et al., 2015). Additionally, this species has extensive capacities for natural dispersion since the pediveliger and juveniles are also passively transported adhered with a byssal attachment to mobile animals such as aquatic birds (Sousa et al., 2008; Crespo et al., 2015). This species was previously recorded at São Francisco River, approx. 200km away from Poxim-Açu River. However, since there are no boat navigations at Poxim-Açu River, is probable that dispersion to this new place occurred by natural ways though passive transport of individual adhered to aquatic birds.

The establishment of non-native species is often favored by human disturbances such as the construction of reservoirs for either hydropower generation or water supply for human consumption, which changes environmental conditions and makes vulnerable aquatic ecosystems more susceptible to invasion (Poleze & Callil, 2015). Coincidentally, this record of *C. fluminea* occurs just after the building of a dam situated a few kilometers upstream the sampling sites. The dam was built by Sanitation Company of State to provide water supply for human consumption and started to operate in 2013.

Besides negative ecological impacts, the presence of the *C. fluminea* has also resulted in negative economic impacts as the species cause obstruction of pipelines, channels, cooling systems of industries and hydroelectric power plants. Shutdown of hydroelectric power plants and water supply systems by *C. fluminea* has already been registered in Southeast Brazil (Santos et al., 2012).

In this way, the present new record of the *Corbicula fluminea* in the Poxim-Açu River is a contribution to a better knowledge about the species distribution, especially at Northeastern Brazil. Also, this finding reinforces the need for a monitoring program to evaluate the possible ecological and economic impacts on this ecosystem.

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