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PANDEMIC AND CONSERVATION OF FRESHWATER MOLLUSCS IN ARGENTINA

By Diego E. Gutiérrez Gregoric, Micaela de Lucía, Santiago Torres & Gustavo Darrigran

To date, the impact of the Coronavirus COVID-19 pandemic in Argentina has been quite significant in terms of social activity, but more specifically in terms of scientific field research (because of the absence of collection permits, the restrictions on circulation, the closure of laboratories, border controls and social distancing, among other issues). Completion of research by the present authors on issues related to the conservation and distribution of gastropods and freshwater bivalves from Argentina, for example by Torres & Darrigran (2019) and de Lucía & Gutiérrez Gregoric (2020), has been delayed because of laboratories being closed or field work not being possible. Even though the quality of the thesis work of these doctoral students (de Lucía, Torres), and of other students and researchers, has not diminished, its completion has been held back.

Regarding conservation of the freshwater mollusc fauna of Argentina, there is a relatively high species richness of around 168 species (Rumi *et al.*, 2006, 2008; Núñez *et al.*, 2010) but there are also considerable information and resources gaps when it comes to the study of freshwater molluscs, both native and non-native, the latter also being a threat to native biodiversity (Darrigran *et al.*, 2020). For conservation management, it is necessary to generate an update of the current diversity of freshwater molluscs in Argentina in particular and in South America in general. For this purpose,

we have taken up the challenge of generating an update of the distributions of the freshwater mollusc taxa of Argentina, as well as their conservation status according to criterion B of regional distribution according to the IUCN (2012).

The latest overall study of freshwater gastropods of Argentina (Núñez *et al.*, 2010) counted 103 available species, of which 40 were considered vulnerable. However, in this study, the IUCN criteria were not used to determine their status. The IUCN, for Argentina, published evaluations in 2010/2011 (in which G. D. participated) using the official IUCN categories: Critically Endangered-CR, Endangered-EN, Vulnerable-VU, Near Threatened-NT and Least Concern-LC.

Due to the closure of laboratories and the necessity of working from a home office, as a result of the COVID-19 pandemic, the databases of freshwater molluscs have been updated, based on records in malacological collections, that is, analysis of new pre-pandemic collections, as well as publications since 2008 and 2010, when the latest updates had been made for bivalves and gastropods, by Rumi *et al.* (2008) and Núñez *et al.* (2010), respectively.

To date, we have finished updating both the list of species, as well as the records for bivalves. For gastropods, the list of species has been fully updated, but the list of records has only been partially updated. For the completed databases, the GEOCat software applied by IUCN has been used to estimate the Extent of Occurrence (EOO) and Area of Occupation (AOO) of each of the species, and thus to determine the level of vulnerability (Bachman *et al.*, 2011).

As a result of this update, we estimate that in Argentina there are 68 species of bivalves (63 natives, three non-natives, two possible synonyms of other species) and 117 gastropods (106 natives, six non-natives, three possible synonyms of other species). Thus the numbers of recorded freshwater mollusc species in Argentina appears to have increased in recent years, rising from 168 to 185.

For bivalves, the database used by Rumi *et al.* (2008), included 2,100 geo-referenced records, and as a result of the present update, 3,200 geo-referenced records have been obtained (Fig. 1). Of the 63 native species, 56 of them have been evaluated (species with just one or two records have been omitted). Considering the AOO, all species in Argentina are, at least, Endangered (EN), whereas some are Critically Endangered (CR). Regarding the EOO, some species are considered threatened, for now, potentially CR (8 species), EN (7), VU (4) species; others are assessed as NT (5) and LC (32).

Regarding gastropods, the database used by Núñez *et al.* (2010) included ~ 4,000 geo-referenced records, and so far we have been able to increase this to 5,000 records. Within this group, the database of the Chiliniidae (Fig. 2) is fully updated, with 670 records and 24 species (seven species with one or two records). As for bivalves, all Chiliniidae species may be EN, according to the AOO. Regarding the EOO, some species are considered threatened, for now, potentially CR (2 species), EN (1), VU (3); others are assessed as NT (2) and LC (9).

Once all the databases have been updated, our next step is to analyse the threats to each species to evaluate their final

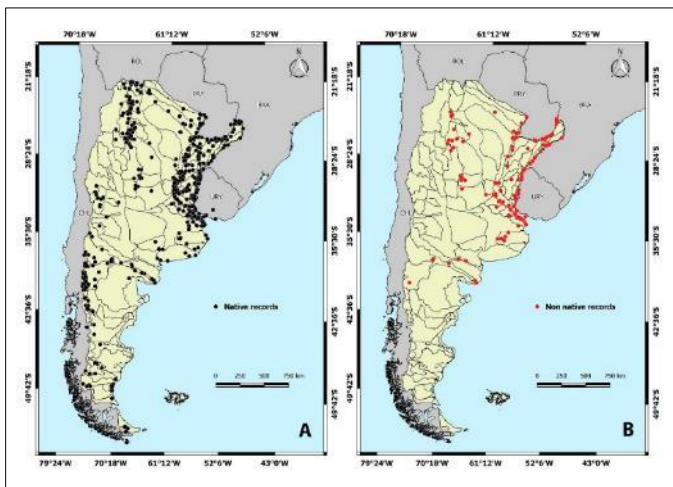


Fig. 1. Geo-referenced bivalve records for Argentina. A, native species; B, non-native species.



Fig. 2. *Chilina fluminea* (Gastropoda, Chiliniidae, length ~ 1.5 cm) in the Río de la Plata (Buenos Aires province), on a branch with settled *Limnoperna fortunei* (Bivalvia), an invasive species and one of the main threats to the epifauna in this river basin.

conservation status. In addition, we aim to analyse how the distribution of freshwater molluscs is related to protected areas. In this sense, the work of Torres *et al.* (2018), which showed that fewer than 14% of the Argentinean protected areas have records of Unionida and only 9% have records of four or more species, may serve as a useful precedent.

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NOT SILVER, NOT GOLD BUT A PRECIOUS MUSSEL FAUNA: PAST AND FUTURE OF UNIONIDA OF RÍO DE LA PLATA

By Cristhian Clavijo & Igor Christo Miyahira

The Río de la Plata basin covers an area of 3.25 million km² making it the 6th largest river basin in the world. It includes territory of five South American countries (Argentina, Bolivia, Brasil, Paraguay and Uruguay) and large rivers as tributaries, notably the Paraná, Paraguay and Uruguay Rivers. The name 'Plata' (which means 'silver' in Spanish) was given by the conquerors because of their belief that they would find this precious metal by following the river. The silver was not found in great quantities, but another precious thing was found later, a rich mussel fauna (Fig. 1). Freshwater mussels (Unionida) are represented in the Río de la Plata basin by two families: Mycetopodidae and Hyriidae. There has been more than 200 years of research on this basin but this effort did not take place continuously or homogeneously through time, and thus knowledge of these molluscs is still poor. These gaps in knowledge hinder the evaluation of conservation status and