

## **First Report of the Non-Native Snail *Rumina decollata* (Linnaeus, 1758) (Subulinidae: Gastropoda) in Córdoba (Argentina): Implications for Biodiversity and Human Health**

Author(s): Paola Reyna and Sandra Gordillo

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## RESEARCH NOTE

### First report of the non-native snail *Rumina decollata* (Linnaeus, 1758) (Subulinidae: Gastropoda) in Córdoba (Argentina): implications for biodiversity and human health

Paola Reyna<sup>1,2</sup> and Sandra Gordillo<sup>1,3</sup>

<sup>1</sup>Universidad Nacional de Córdoba. Facultad de Ciencias Exactas, Físicas y Naturales Av. Vélez Sársfield 299 X5000JJC Córdoba, Argentina, reynasandrip@gmail.com

<sup>2</sup>Instituto de Diversidad y Ecología Animal (IDEA, CONICET-UNC). Av. Vélez Sársfield 299 X5000JJC Córdoba, Argentina.

<sup>3</sup>Consejo Nacional de Investigaciones Científicas y Tecnológicas (CONICET), Centro de investigaciones en Ciencias de la Tierra, (CICTERRA). Av. Vélez Sársfield 1611, Edificio CICTERRA, X5016CGA, Ciudad Universitaria, Córdoba, Argentina.

**Abstract:** *Rumina decollata* (Linnaeus 1758) is native to the Mediterranean region of Europe and north Africa. The first report in Argentina was in 1988 in Buenos Aires. In 2007, it was found in La Pampa and Mendoza. Here, we report its presence in Córdoba, extending its distributional range northwards more than 600 km. This finding is significant given that *Rumina decollata* is a facilitative predator and can deleteriously impact mollusk assembles causing ecological imbalances.

**Key words:** invasive mollusk; gastropod; new record; decollate; distribution

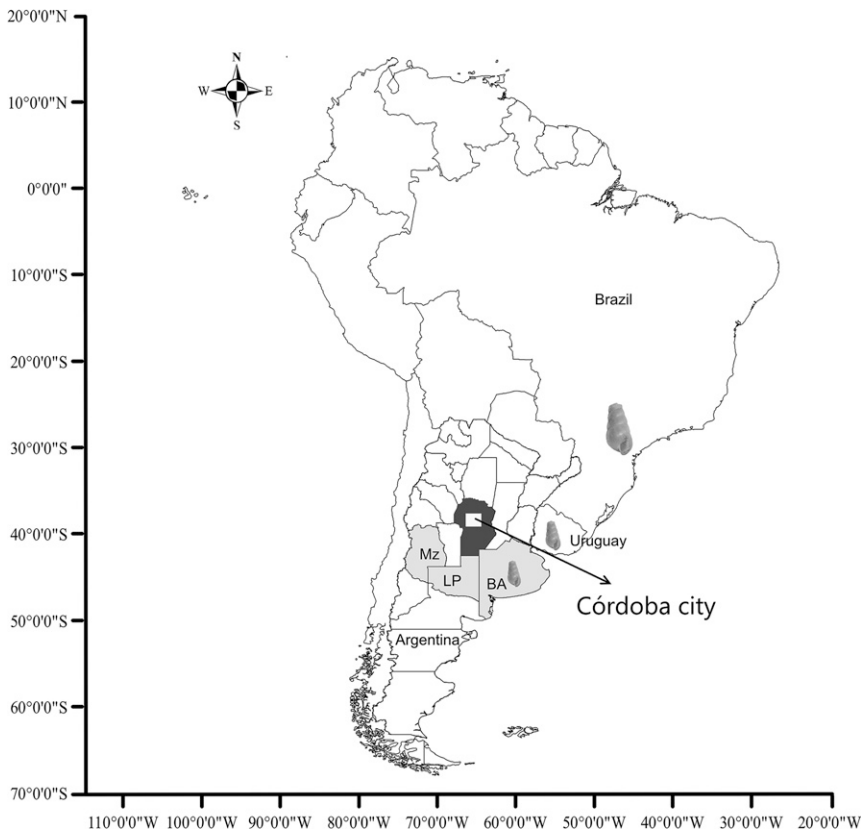
The decollate snail, *Rumina decollata* (Linnaeus 1758) (Subulinidae: Gastropoda) is a native land snail of the Mediterranean region (Batts 1957). It is known as the decollate snail because it breaks off, or decollates, the top whorls of the shell, leaving a truncated apex. The loss of the apical whorls has been correlated with increasing mobility, reduced shell weight and water loss, and as a result, an increase in body and gonad size contributing to increased fitness (Kat 1981). The snail displays omnivorous feeding habit (plants, eggs, worms, snails and slugs) and may be cannibalistic (Fisher 1966, Dundee 1986, Batts 1957). The species is hermaphroditic, with both self-fertilization and cross-fertilization possible (Selander and Kaufman 1973). While adaptable to a wide variety of substrate types, it prefers an alkaline substrate (> 7.7 pH), warm temperatures and available moisture (Batts 1957, Outeiro *et al.* 1993, Moreno-Rueda 2002). Decollate snails are active mainly at night or after rainfall, but remain still and buried during the day when conditions are too cold or dry (Batts 1957).

The introduction of decollate snail as biological control of brown garden snail *Cornu aspersum* (O. F. Müller), together with its high adaptability has allowed this species to establish a worldwide distribution which includes the United States of America, China, Japan, South Africa and South America (Batts 1957, Miquel 1988, Minato and Uozumi 1992, Matsukuma and Takeda 2009, Herbert 2010). In South America, it has been recorded in Argentina, Uruguay and Brazil (Miquel *et al.* 1995, De Francesco and Lagiglia 2007). In Argentina, it has been previously recorded in urban areas

of Buenos Aires (1988), La Pampa (2003) and Mendoza (2005) provinces (Miquel 1988, De Francesco and Lagiglia 2007). In their native range, two morphs of *Rumina decollata* were recorded, the light and dark morph. Prévot *et al.* (2014) recorded the black morph as introduced in Argentina (black body with dull olive-gray foot) likely originating from the Atlantic coasts of the Iberian Peninsula.

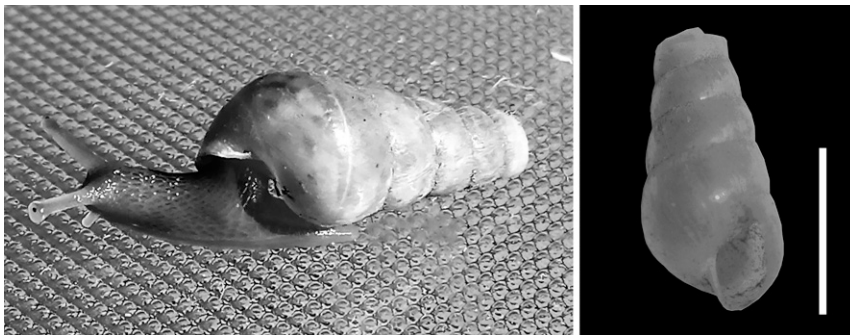
Because early detection, rapid response and possible eradication are important steps for management of invasive species in the early stages of invasion (Simberloff *et al.* 2013), we report the first record of *Rumina decollata* in the Province of Córdoba, Argentina. *Rumina decollata* was found in Córdoba City (Argentina) during summer of 2017 (Figs. 1, 2). The species has been observed mainly after rainfall and feeding on the leaves of different garden plants such as *Portulacaria afra* (L.) Jacq., *Plectranthus verticillatus* (L. f.) Druce and decomposing organic matter.

A total of 54 individuals (20 empty shells and 34 living specimens) were collected and transported to the laboratory where width and height were measured with a vernier caliper to the nearest 0.1 mm, and the number of whorls were counted to aid in accurate identification. Identification of the species was made following Batts (1957). Mean shell height was 13.72 mm ranging from 6.15 to 25.02 mm, while mean shell width was 6.02 mm ranging from 2.37 to 10.09 mm. Fifty-five percent of the individuals have decollate shells, with 4-6 whorls corresponding to adult individuals, while forty-five percent are without decollation and have the between 5-7 whorls corresponding to a juvenile individual.



**Figure 1.** Map of the distribution of *Rumina decollata* in South America: Brazil, Uruguay and Argentina. Light gray represents areas in Argentina where presence of the species is known: Buenos Aires (BA), La Pampa (LP) and Mendoza (Mz). The dark gray area is Córdoba province.

The presence of *Rumina decollata* in the province of Córdoba means the species is rapidly expanding its range northwards, extending its distribution more than 600 km. The semiarid and subtropical condition of Córdoba is likely suitable for long-term establishment of *R. decollata*, which has



**Figure 2.** *Rumina decollata* found in Córdoba city. Live specimen (left), valve (right) scale bars indicate 10 mm.

a wide adaptability to different climates (Selander and Kaufman 1973). The extent to which this species may be impacting natural systems is unknown. Our findings are limited to urban garden and no records exist of the species out of the urban zone. The way of introduction in Argentina is unknown, but we suspect that introduction into the Córdoba province was accidental and associated with the exchange of garden plants.

Decollate snails prey upon other mollusks and their eggs threatening native species. In Argentina, there are 240 recorded species of terrestrial mollusk, 62 species are present in Córdoba province (Gordillo *et al.* 2013). High terrestrial mollusk diversity highlights that early prevention is warranted. In addition, this species is considered pest of crops and a problem for horticultural (Miquel 1988, De Francesco and Lagiglia 2007). Therefore, *R. decollata* could deleteriously impact in fauna, flora, and agriculture commerce.

It is suspected that *R. decollata* could be a potential parasitic host of *Toxocara cati*, which infects domestic cats (Cardillo *et al.* 2016). *Toxocara* spp. is the common roundworms of dogs and cats. This parasite is capable of infesting animals with their larva or eggs, and once inside can migrate through their different tissues. The infection could be asymptomatic or produce significant tissue damage (e.g. in liver). Humans are also susceptible. If children ingest larval or eggs through contaminated food or contact the disease with an infested animal, toxocariasis can result (Rubinsky-Elefant *et al.* 2010, Ahn *et al.* 2014). The fact that *R. decollata* is a host of this parasite, highlights that prevention efforts may also mitigate additional environmental and human health risks. Considering *R. decollata*'s ability to rapidly spread and deleteriously impact native biota, commerce, and health of pets and humans, monitoring its distribution and implementing early control efforts is warranted.

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