Check List the journal of biodiversity data

NOTES ON GEOGRAPHIC DISTRIBUTION

Check List 13(2): 2096, 17 April 2017 doi: https://doi.org/10.15560/13.2.2096
ISSN 1809-127X

First record of *Cecilioides acicula* (Müller, 1774) (Mollusca: Ferussaciidae), from Buenos Aires province, Argentina

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Abstract: *Cecilioides acicula* (Müller, 1774), family Ferussaciidae, is native to the Palaearctic region but has been dispersed around the word by human activity. Here, we report the presence of this introduced species in La Plata city, Buenos Aires province, Argentina. This snail is largely subterranean and frequently is found in old graves in association with skeletal remains. Our samples were collected from sediments from the Municipal Cemetery of La Plata, Buenos Aires province, Argentina.

Key words: new record; subterranean habits; cemetery; La Plata

INTRODUCTION

Cecilioides acicula (Müller, 1774) (Mollusca: Gastropoda: Ferussaciidae) is native to central and western Europe, the Mediterranean, Arabia, North Africa, and Central Asia. (Barker 1999). This terrestrial snail is recorded as an introduction from many places worldwide, South Africa (Connolly 1912, 1916; Quick 1952; Herbert 2010), New Zealand (Suter 1913), Mallorca (Gasull 1965), the Azores (Backhuys 1975), the Canary Islands (Barker 1999), and Tasmania (Bonham 2005). In North America, the species was reported from Bermuda (Bland 1861) and Canada (Forsyth et al. 2008), as well as in the USA. There, *C. acicula* is known from Pennsylvania, Florida (Pilsbry 1946), Maryland (Grimm 1959), New Jersey (Dundee 1974), California (Roth 1986), New Mexico (Metcalf & Smartt 1997), Hawaii (Barker 1999) and Virginia (Örstan 2007). Finally, in South America, it was found in the 1990s in Argentina from Rosario, Santa Fe province (Miquel et al. 1995; Miquel & Parent 1996) and In Uruguay (Punta Ballena, Department of Maldonado; Barrio Pocitos and Barrio Parque Batlle, Department of Montevideo; Department of Canelones [Scarabino 2003]). Here, we report the presence of *C. acicula* in the city of La Plata, Buenos Aires province, Argentina.

MATERIALS AND METHODS

Our specimens of *C. acicula* were obtained from sediments associated with human remains and wrappings (from a depth of 40 cm) from legal exhumations at the Municipal Cemetery of La Plata (34°57′21″ S, 057°57′02″ W) (Figure 1). The exhumed remains and wrappings were transferred to the School of Medical Science of the National University of La Plata (UNLP) (Municipal Bylaw 7638/90) for research and teaching and for the creation of the "Prof. Dr. Rómulo Lambre" Osteological Collection. Faunal remains were sampled from five exhumations performed in 1994, 1996 and 1997. These were taken from the wrappings, clothing, the insides of bone cavities, and sediments, and collected with brushes, pins, or fine-tipped tweezers, depending on the size and condition; sediments were also inspected using water flotation. The recovered samples included whole or fragmented specimens lacking soft structures. Adults, pupae and larvae of insects, other arthropods, and molluscan shells were recovered. The cadaverous entomofauna was earlier analyzed to interpret the colonization in burial contexts (Mariani et al. 2014). The shells of 12 *C. acicula* specimens were found. The shells were measured under a stereomicroscope microscope (Leica EZ4). The specimens of *C. acicula* were deposited in the Malacological Collection the Museo de La Plata (MLP-Ma), Buenos Aires province, Argentina (number MLP-Ma14219).

Cecilioides acicula (Müller, 1774)

Figure 2

Buccinum aciculum Müller 1774: 150.
Caecilianella acicula — Melvill & Ponsonby 1898: 184. Nobre 1941: 167, pars, excluding *C. barbozae* and *C. binodosa*.
Caecilianella (Acicula) praeclara Westerlund 1898: 176.
Caecilioides acicula — Adams 1900: 297; Pilsbry 1908: 9, pl. 1; Connolly 1912: 206; 1916: 188.
Cecilioides (Cecilioides) acicula — Pilsbry 1909: 9, pl. 1, figs. 1, 2, 5–8; Barker 1999: 59, figs. 36, 76, 117, 146, 172, 198, 226, C9, M13,

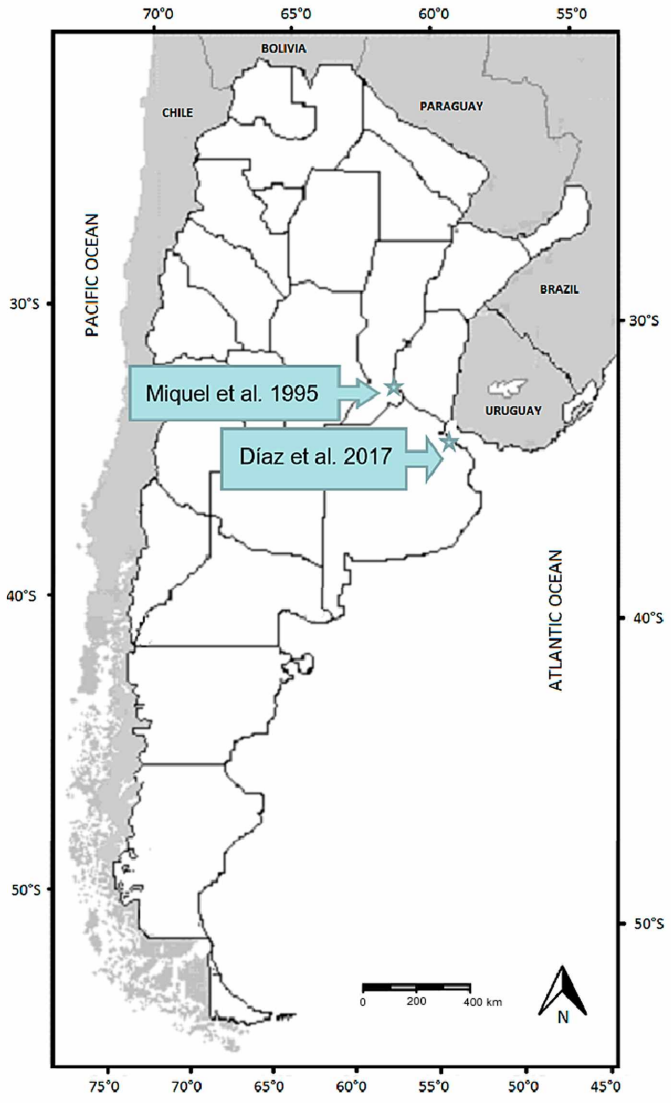

Figure 1. Map showing previous and new records of *Cecilioides acicula* in Argentina.

M14, M56, M57, map 9; Schileyko 1999: 553–554; Bank et al. 2002: 107; Albuquerque de Matos 2004: 48, 2014: 146.

Cecilioides acicula — Connolly 1930: 297; 1939: 368, pl. 8, fig. 12; Pilsbry 1946: 185, fig. 89a; Quick 1952: 188; Van Bruggen 1964: 163; Miquel et al. 1995: 26; Miquel & Parent 1997: 110, fig. 2; Van Bruggen & Van Goethem 2001: 156, figs. 10, 11.

For extended synonym lists see Barker (1999), Herbert (2010), and Holyoak & Holyoak (2015).

Cecilioides acicula has a transparent, thin and glossy shell, with elongated shape. Apex blunt, protoconch rounded. The aperture is oval and narrow at the base, 40% of the total length. The columella is short and obliquely truncated. Our specimens are between 1.22–5.25 mm long and 0.49–1.46 mm wide. The spire is composed of 2–5½ whorls, the last whorl occupies more than 50% of the total length.

Cecilioides consobrina (d'Orbigny, 1837), the only native *Cecilioides* species in Argentina and Uruguay, presents an elongate-oval shell, shallow sutures and the suture between the last whorl and preceding one is more straight compared with *C. acicula*.

Figure 2. *Cecilioides acicula* collected in sediments from a grave at the Municipal Cemetery of La Plata, Buenos Aires province, Argentina (MLP-Ma 14219). Photos by ACD.

DISCUSSION

Cecilioides acicula is largely subterranean, burrowing in soil down to 70 cm (Bonham 2005) and in some cases to 2 m (Kerney 1999), which may explain the paucity of records of this species and why its presence seems to have passed unnoticed. Many authors emphasize the species' preference for calcareous substrates (Germain 1930; Kerney & Cameron 1979; Giusti et al. 1995; Barker 1999). It is frequently observed among skeletal remains of old graves, and in Egypt, Georges and Charlier (2010) found as many as 364 specimens in a single grave. From Latvia, close to the natural range, Štefek et al. (2008) first recorded the presence *C. acicula* from the oldest cemeteries in Riga; these authors described cemeteries as suitable refuges for the snail fauna within an urban area due to favorable soil conditions. Moreover, Örstan & Kösemen (2009) reported that cemeteries in Istanbul (Turkey) serve as refuges and conserve habitat not only for terrestrial gastropods but also for many native plant species.

The presence of *C. acicula* in graves in the Municipal Cemetery of La Plata could be a consequence of optimum conditions for this species' development and survival. The high calcium content of the soil would be beneficial for this calcifilic species. There are no data available on how long this species has existed in the cemetery. It may have been there since the formation of the cemetery in 1886. Given its cryptic underground habits, it could be more widespread in surrounding areas.

In addition to graves, this species has been found in association with vegetables, ornamental plants (including bulbs and cacti), wet soil among dead leaves, stones, and roots, but it is rarely found at the surface (DUNDEE 1974; MIQUEL et al. 1995). Therefore, as with many other terrestrial gastropods, movement of plants and soil from one place to another likely accounts for the dispersal of this species.

Our new record of *C. acicula* adds to the geographical distribution of the species in Argentina, reporting this species from the province of Buenos Aires for the first time.

ACKNOWLEDGEMENTS

We wish to thank Cecilia Moreno, who helped with the English version this manuscript. This study was financially supported by CONICET (PIP0 796-2014) and Proyectos de Investigación y Desarrollo UNLP- FCNyM - N727, N 783.

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Authors' contributions: RM and GLV collected the data, ACD and SMM identified the specimens, ACD wrote the text, SMM corrected paper.

Received: 28 September 2016
Accepted: 24 March 2017
Academic Editor: Robert G. Forsyth