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Research note

On some land snails (Mollusca: Gastropoda) of Los Molles, central Chile

Sobre algunos moluscos terrestres (Mollusca: Gastropoda) de Los Molles, Chile central

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Abstract

Among the terrestrial invertebrates, the molluscan species of central and northern Chile have been scarcely studied and here, for the first time, a record of the diversity of land snail species of Los Molles (32°14' S, 71°31' W), in the Valparaíso region, central Chile is reported. Four species were found: *Chiliborus rosaceus* (King & Broderip, 1831); *Lilloiconcha lopezi* Araya & Aliaga, 2015; *Plectostylus chilensis* (Lesson, 1830), and *Plectostylus reflexus* (Pfeiffer, 1842); all of them are ground dwelling snails, endemic, occurring in small geographical ranges or in fragmented populations along northern and central Chile; *L. lopezi* is an endemic species to Los Molles. The geographic distribution records of *P. chilensis* and *P. reflexus* are also extended and illustrations of the species and distribution records are presented. The areas around Los Molles harbor a comparatively high diversity of plants and invertebrates, and they should be considered in future conservation efforts.

Keywords: Stylommatophora; Bothriembryontidae; Charopidae; Strophocheilidae

Resumen

Entre los invertebrados terrestres, las especies de moluscos del centro y norte de Chile han sido escasamente estudiadas y en este trabajo, por primera vez, se reporta un registro sobre la diversidad de caracoles terrestres de Los Molles (32°14' S, 71°31' W), región de Valparaíso, Chile central. Se registraron 4 especies: *Chiliborus rosaceus* (King y Broderip, 1831); *Lilloiconcha lopezi* Araya y Aliaga, 2015; *Plectostylus chilensis* (Lesson, 1830), y *Plectostylus reflexus* (Pfeiffer, 1842); todos ellos son caracoles endémicos que viven en el suelo, usualmente bajo hojarasca y que se presentan en rangos geográficos pequeños o en poblaciones fragmentadas a lo largo de Chile central y septentrional; *Lilloiconcha lopezi*, en particular, es una especie endémica de Los Molles. Se extiende la distribución geográfica de *Plectostylus chilensis* y *Plectostylus reflexus*, y además, se presentan ilustraciones de las especies y distribuciones conocidas. Las áreas alrededor de Los Molles albergan una biodiversidad de plantas e invertebrados comparativamente alta y deben ser consideradas en futuros esfuerzos de conservación.

Palabras clave: Stylommatophora; Bothriembryontidae; Charopidae; Strophocheilidae

A great majority of the indigenous terrestrial mollusks found in Chile are distributed from central to southern Chile, and particularly in the Juan Fernández Archipelago (Miquel & Araya, 2015), with sparse records of species distributed in the more arid northern latitudes in the country (Araya & Aliaga, 2015; Araya, Madrid, & Breure, 2016; Miquel & Araya, 2013; Miquel & Ramírez, 2011; Valdovinos & Stuardo, 1989). Most of the species found in the northern areas of Chile (north of 32° S latitude) are known only from their respective original descriptions, chiefly from classical works (d'Orbigny, 1847; Gay, 1854; Hupé, 1854; King & Broderip, 1832; Pfeiffer, 1842; Philippi, 1860; Pilsbry, 1897, 1902) or by a few subsequent studies in the

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matter, reviewing certain genera or groups of species (Araya, 2015b; Gigoux, 1932; Rehder, 1945; Stuardo & Vargas-Almonacid, 2000; Valdovinos & Stuardo, 1988). Excluding bulimulids, whose research is currently under study, 19 indigenous species of terrestrial mollusks are known from central to northern Chile; they belong to 7 families and 10 genera, with a single genus endemic to the Chilean territories (Araya & Catalán, 2014). Non-indigenous mollusks in the area include 8 species, most of which are found in limited urban areas in the country (Araya, 2015a).

The present study describes the diversity and distribution of land snails found around Los Molles, Valparaíso region, central Chile. Due to the rapid urban development, fast action for terrestrial invertebrate conservation of this coastal area is required. This is particularly urgent considering that further undescribed species, particularly micromollusks, may be living along the Chilean coastal areas and that most of the terrestrial snail species in Chile are not protected by law. Abbreviations used in the text are: MPCCL, Museo Paleontológico de Caldera, Caldera, Chile; SBMNH, Santa Barbara Museum of Natural History, Santa Barbara, USA; spm, specimen; sppm, specimens.

Superfamily Acavoidea Pilsbry, 1895
Family Strophocheilidae Pilsbry, 1902
Genus *Chiliborus* Pilsbry, 1926
Type species: *Strophocheilus chilensis* G. B. Sowerby I, 1833.
Chiliborus rosaceus (King & Broderip, 1831)
(Figs. 1 and 2)

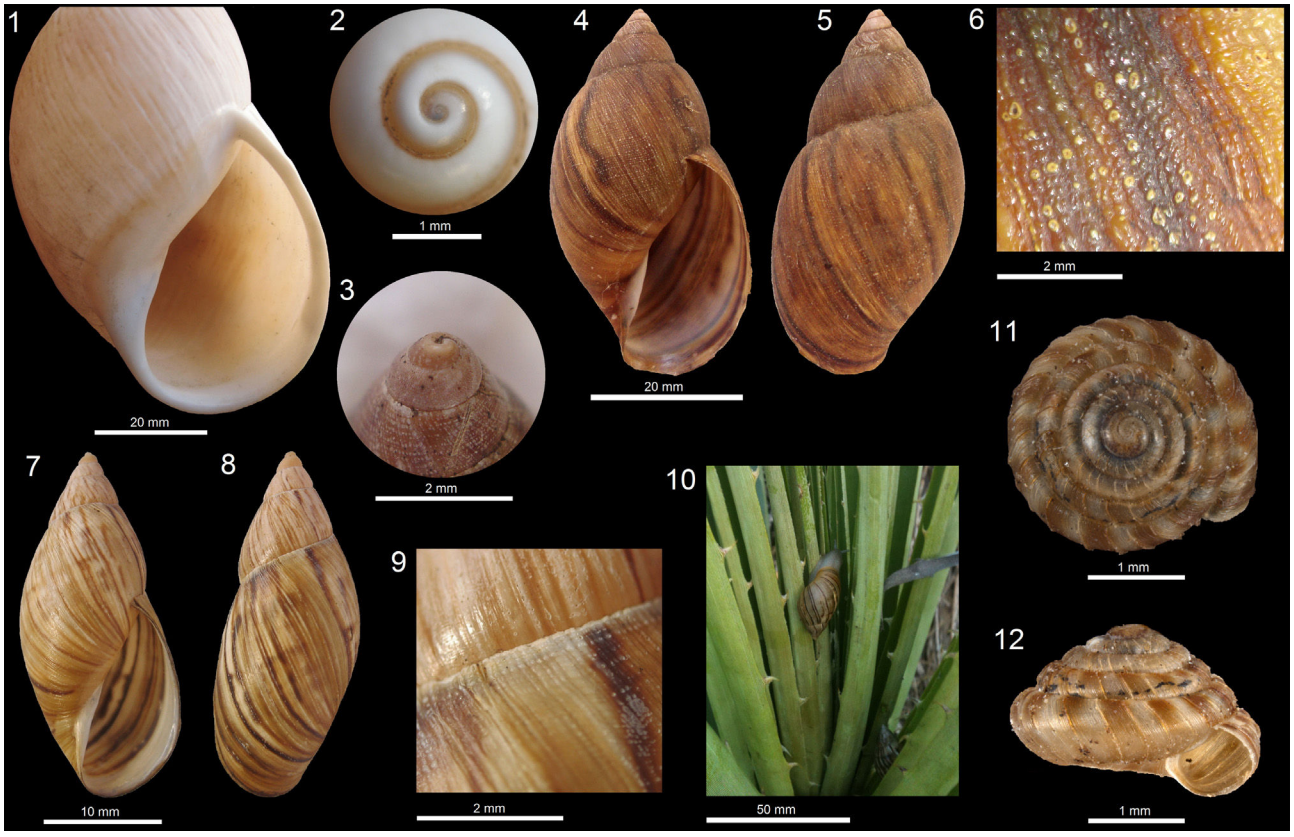
Material examined: estero Los Molles (32°14' S, 71°29' W) (2 sppm) and Pichidangui, Valparaíso region, central Chile (4 sppm); Copiapó, Region of Atacama, northern Chile (1 spm). MPCCL 100216A.

Description: Bequaert (1948: 178)

Distribution: From Copiapó (27°21' S, 70°20' W) to Chiloé Island (42° S, 73° W), living in coastal areas and in the Chilean Coast Range (Araya & Catalán, 2014).

Remarks: Shell fragments (shells without apex and first whorls; Fig. 1) were found under dead leaves and humus, mostly under the ubiquitous, and non-indigenous, *Eucalyptus trees*. Neither live nor complete shell specimens were found during this survey, although the great number of empty shells and fragments may indicate established communities of this species in the area under study. The damage to the shells, mostly in the first whorls, may also hint of predation by birds (Rosin, Olborska, Surmacki, & Tryjanowski, 2011).

Superfamily Orthalicoidea Martens in Albers, 1860
Family Bothriembryontidae Iredale, 1937
Genus *Plectostylus* Beck, 1837
Type species: *Bulimus peruvianus* Bruguière, 1789.



Figures 1–12. Shells of terrestrial molluscs of Los Molles, central Chile. 1–2 *Chiliborus rosaceus*, detail of last whorl and aperture (1) and detail of protoconch (specimen from Pichidangui) (2); 3–6 *Plectostylus chilensis*, detail of protoconch (3), apertural view (4), abapertural view (5) and detail of sculpture (6); 7–10 *Plectostylus reflexus*, apertural view (7), abapertural view (8), detail of sculpture and suture (9) and the species in situ (10), living among the bromeliad *Puya chilensis*; 11–12 *Lilloiconcha lopezi* apical view (11) and apertural view (12).

Plectostylus chilensis (Lesson, 1830)
(Figs. 3–6)

Material examined: estero Los Molles (32°14' S, 71°29' W) (4 sppm) and Pichidangui, Valparaíso region, central Chile (16 sppm). MPCCL 100216B

Description: Valdovinos & Stuardo (1988: 123)

Distribution: The previous distribution of this species ranges from Valparaíso (33°02' S, 71°38' W) to Concepción (36°50' S, 73°03' W) according to Valdovinos and Stuardo (1988). The specimens examined in this study constitute the northernmost record of this species.

Remarks: Empty shells of this species were found under dry leaves and under rock slabs, often buried.

Plectostylus reflexus (Pfeiffer, 1842)
(Figs. 7–10)

Material examined: estero Los Molles (32°14' S, 71°29' W) (6 sppm) and Parque Los Molles (32°14' S, 71°31' W), Región de Valparaíso, central Chile (4 sppm). MPCCL 100216C.

Description: Valdovinos and Stuardo (1988: 137).

Distribution: according to Valdovinos and Stuardo (1988) this species has been found from Coquimbo (29°58' S, 71°21' W) to Pichidangui (32°08' S, 71°30' W). The specimens studied here constitute the southernmost record of this species.

Remarks: all the specimens found in this study were collected exclusively on leaves of the large, spiny and endemic bromeliad *Puya chilensis* (Molina, 1782) (Fig. 10), which in turn is not a common plant; having a restricted distribution along the Chilean coastal territories (Zizka, Schneider, Schulte, & Novoa, 2013). *Plectostylus reflexus* is a very uncommon snail, and it should be considered an endangered species, taking into account the loss of natural areas and its close relationship with *P. chilensis*.

Superfamily Punctoidea Morse, 1864
Family Charopidae Hutton, 1884
Genus *Lilloiconcha* Weyrauch, 1965
Type species: *Austrodiscus tucumanus* Hylton Scott, 1963.
Lilloiconcha lopezi Araya & Aliaga, 2015
(Figs. 11 and 12)

Material examined: Parque Los Molles (32°14' S, 71°31' W), Commune of La Ligua, Valparaíso region, central Chile (4 sppm). SBMNH 456358, 452239, MPCCL 01572015.

Description: Araya and Aliaga (2015: 12)

Distribution: Los Molles (32°14' S, 71°31' W, 31 m), Commune of La Ligua, Valparaíso region, central Chile.

Remarks: this recently described species is the smallest gastropod found in the area, and 1 of the only 4 charopid species living in central or northern Chile (the others are *Austrodiscus solemi* Valdovinos & Stuardo, 1989; *Radiodiscus quillajicola* Vargas-Almonacid, 2000 and *Stephacharopa calderaensis* Miquel & Araya, 2013).

Among the native species found in the area under study, the genera *Chiliborus* and *Plectostylus* have the largest geographical distributions in the country, with species found in a great variety of habitats, from the rain forests of the Región de Aysén to the arid Desert of Atacama in the northern part of the country. *Chiliborus* is a genus endemic to Chile, with 4 ground-dwelling species living in low altitude coastal areas, mostly in the northern and central areas of the country; while *Plectostylus* have arboreal and ground-dwelling species, found from coastal desert localities (*P. broderipii*) to the deep forests of southern Chile (*P. araucanus*); with a single species also present in Argentina (Miquel, 1998). The genus *Lilloiconcha* is the genus with the most widespread distribution, occurring from coastal to Andean areas in Argentina, Brazil, Colombia, Chile, Paraguay and Perú (Cunha, Salvador, & Simone, 2015; Hausdorf, 2005; Miquel & Barker, 2009). Surprisingly, non-indigenous molluscan species were absent in the area of Los Molles, even when several species have been recorded from central Chile, most of them limacoid slugs (Araya, 2015a).

Scientific records are the basis for future legal protection; knowledge on the biodiversity on specific areas or regarding the geographical distributions of indigenous species establishes the basis for conservation studies. This is particularly important considering the heavy urban development on the coastal areas of central Chile, and in this particular case around Los Molles. Urbanization is, among the many human activities that cause habitat loss, the one which produces the greatest local extinction rates; frequently eliminating a large majority of native species (McKinney, 2002) and in particular terrestrial mollusks, which are the group of organisms most prone to extinction (Régnier, Fontaine, & Bouchet, 2009). The records reported in this work are especially important taking into account the scarceness of scientific research on terrestrial invertebrates in the country.

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