

New records of exotic land snails and slugs in Argentina

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Abstract: We announce the presence of two species of exotic terrestrial mollusks new for Argentina: *Oxychilus draparnaudi* (Oxychilidae) in Buenos Aires province and *Opeas* (*O.*) *pumilum* (Subulinidae) in Tucumán province. New records expand further the distributions of seven other species in Argentina: *Paralaoma servilis* (Punctidae) and *Deroceras* (*Agriolimax*) *reticulatum* (Limacidae) throughout the country; in northern tropical climates, *O.* (*O.*) *pumilum* and *Bradybaena* (*B.*) *similaris* (Helicidae); in the warm central area, *Theba p. pisana* (Helicidae) and *O. draparnaudi*; in Patagonia, *Limax* (*L.*) *maximus* (Limacidae); and *Vertigo ovata* (Vertiginidae) and *Hawaiiia minuscula* (Pristilomatidae) in northern and central Argentina. The presence of *Deroceras laeve* and *D. agrestis* (Limacidae) could not be confirmed. It is not clear if *Pupisoma* (*Ptychopatala*) *dioscoricola* (Valloniidae) is a native or exotic species in Argentina.

Key words: South America, Land snails, slugs, Stylommatophora, *Oxychilus draparnaudi*, *Opeas* (*O.*) *pumilum*.

Resumen: Nuevos registros de gasterópodos y babosas terrestres exóticos para la Argentina. Se da a conocer la presencia de dos especies de moluscos terrestres estilomatóforos exóticos, nuevos para la República Argentina: *Oxychilus draparnaudi* (Oxychilidae) en la provincia de Buenos Aires y *Opeas* (*O.*) *pumilum*. (Subulinidae) en la provincia de Tucumán. Nuevos registros amplían las distribuciones en la Argentina de otras siete especies: *Paralaoma servilis* (Punctidae) y *Deroceras* (*Agriolimax*) *reticulatum* (Limacidae), se registran en todo el país; en climas tropicales del norte aparece *Bradybaena* (*B.*) *similaris* (Helicidae), en el área central templada *Theba p. pisana* (Helicidae), en Patagonia, *Limax* (*L.*) *maximus* (Limacidae), en tanto que *Vertigo ovata* (Vertiginidae) y *Hawaiiia minuscula* (Pristilomatidae) se encuentran en el norte y centro de la Argentina. No se ha podido confirmar la presencia de *Deroceras laeve* y *D. agrestis* (Limacidae) o el carácter de especie nativa o exótica de *Pupisoma* (*Ptychopatala*) *dioscoricola* (Valloniidae).

Palabras clave: América del Sur, Gasterópodos terrestres, Babosas, Stylommatophora, *Oxychilus draparnaudi*, *Opeas* (*O.*) *pumilum*.

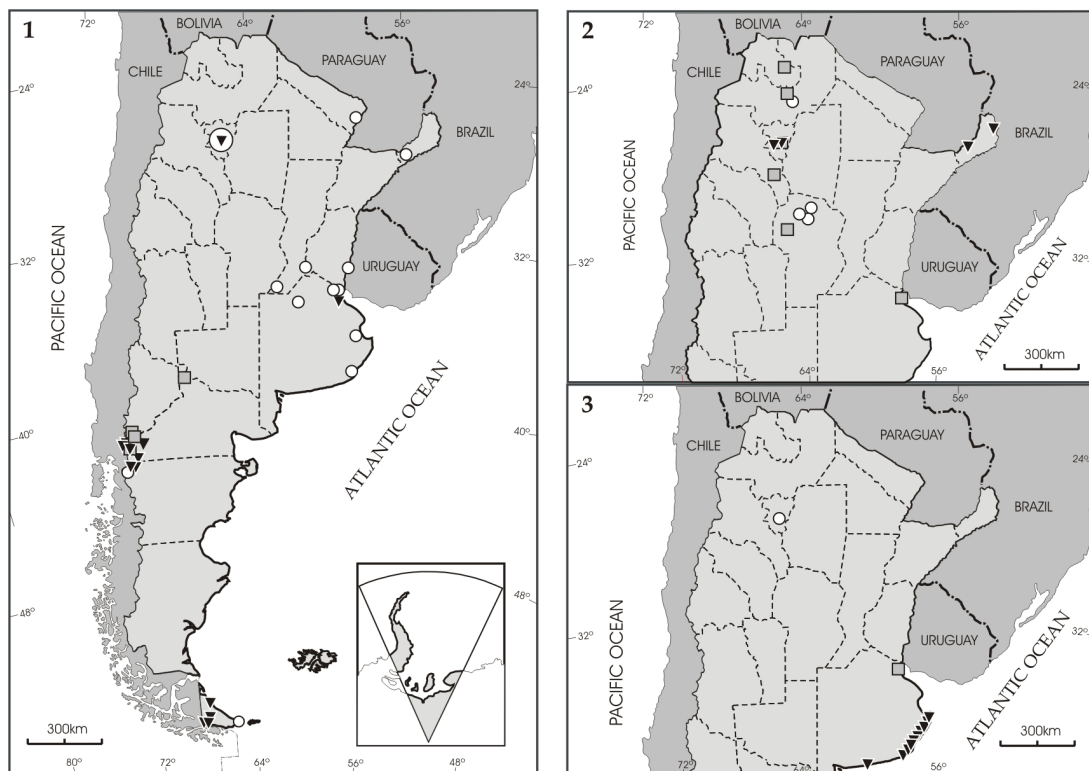
INTRODUCTION

With a variety of climates and habitats, Argentina provides many opportunities for the establishment of exotic species. In Argentina, the oldest exotic mollusks recorded (18th century), belonging to the genus *Otala* Schumacher, 1817 (Quintana, 1999), were imported for food, although most species were inadvertently introduced with plants. During the rapid process of economic modernization beginning in the second half of the nineteenth century, numerous urbanization and landscaping developments affected public and private spaces. Thousands of ornamental plants, shrubs and trees were shipped from Europe usually with soil. The recording of

exotic mollusks in Argentina began in the nineteenth century, mainly by Adolfo Doering, who in the 1870s-80s created the first national catalog of terrestrial mollusks. During the twentieth century, there was an increase in observations of this exotic fauna (Miquel, 1988; Miquel & Parent, 1997; Miquel *et al.*, 1995, 2007b; Gutiérrez Gregoric *et al.*, 2013).

Currently, over 20 exotic terrestrial species are found in Argentina. This paper presents the unpublished records of *Oxychilus draparnaudi* (Beck, 1837) and *Opeas* (*Opeas*) *pumilum* (Pfeiffer, 1840) and extends the distribution of seven species, including three micromolluscs, two Helicoidea and two Limacoidea.

Argentina ratified by Law 24,375 the



Figs. 1-3. 1: Distribution of *Deroceras* (*Agriolimax*) *reticulatum* (Müller, 1774) Agriolimacidae (▼); *Limax* (*Limax*) *maximus* Linnaeus, 1758 Limacidae (■) and *Paralaoma servilis* (Shuttleworth, 1852) Punctidae (○) in Argentina. 2: Distribution of *Bradybaena* (*Bradybaena*) *similaris* (Rang, 1831) Bradybaenidae (▼) *Hawaiiia minuscula* (Binney, 1840) Pristilomatidae (■) and *Vertigo* (*Vertigo*) *ovata* Say, 1822 Vertiginidae (○) in Argentina. 3: Distribution of *Theba pisana pisana* (Müller, 1774) Helicidae (▼), *Oxychilus draparnaudi* (Beck, 1837) Oxychilidae (■) and *Opeas* (*Opeas*) *pumilum* (Pfeiffer, 1840) Subulinidae (○) in Argentina.

Convention on Biological Diversity. In Article 8, the law states that the parties must prevent the introduction of exotic species and establish regulations that were necessary for the protection of resources (Secretaría de Ambiente y Desarrollo Sustentable de la Nación 2012).

MATERIALS AND METHODS

The materials belong to Argentinean scientific collections: Instituto y Fundación Miguel Lillo (IFML, San Miguel de Tucumán), Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN, Ciudad Autónoma de Buenos Aires) and Museo de La Plata (MLP, Facultad de Ciencias Naturales y Museo, La Plata). Species were identified through conchological and anatomical study. Photographs were taken in the Scanning Electronic Microscope of the MACN.

SYSTEMATIC

OXYCHILIDAE

Oxychilus draparnaudi (Beck, 1837)

(Figs. 3, 4 A, B)

After Pilsbry (1946), some diagnostic features are the transparent, strongly and convex depressed shell; the umbilicus, contained about 6 times in main diameter; the glossy, pale brown above, much paler beneath; 5 ½ moderately convex whorls, slowly increasing to the last, which is very much wider; and the oblique, lunate aperture with a thin lip.

O. draparnaudi is a species described from France, and its natural range includes Western Europe and Mediterranean region. Now, it is found in Russia, North America, north and South Africa, Asia, Australia and New Zealand (Barker, 1999). This is the first report for Argentina.

O. draparnaudi is a highly synanthropic spe-

cies that can be found in gardens, waste lands and disturbed forests. Possessing gregarious habits, it is omnivorous, but with strong predatory tendencies on other mollusks and their eggs (Barker, 1999). It is a greenhouse pest that kills young plants and seedlings (Berg, 1994). In Argentina, it was found living under a willow trunk in the northeast of Buenos Aires province (L. Dalmer, pers. comm. 2011) (Virgillito, 2012).

Dried materials examined: MACN-In 38402. Ecological reserve, Vicente López, Buenos Aires. Col. L. Dalmer, 2011. 10 specs. MACN-In 39395. Ecological Reserve, Vicente López, Buenos Aires. Col. L. Dalmer, 2011. 31 specs.

Wet materials examined: MACN-In 38402. Ecological reserve, Vicente López, Buenos Aires. 2 specs.

SUBULINIDAE

Opeas (Opeas) pumilum (Pfeiffer, 1840) (Figs. 3, 4 C, D)

In accord with Pilsbry (1946), the shell is very minutely perforate, conic, with a very obtuse apex; the surface is not very glossy and is densely, sharply sculptured with irregular and strong striae, deeply curved, or arcuate; the outer lip is thin and so much retracted above as to appear incised at the suture; the aperture is well rounded below, and the columellar lip is reflexed.

This is a species described from Bristol (England) and occurring in Europe, but its native range is tropical America. In Argentina, it is found in Tucumán province, which is the first record of the species in our country. A previous mention of this species in Argentina (Rumi *et al.*, 2010) corresponds to forms of genus *Lamellaxis* Strebel, 1882 (MLP 9611 and 11309) (Virgillito, 2012).

Dried materials examined: Argentina: IFML 15451. Tucumán, 430 m. Leg. W. Weyrauch, 1967. 15 specs.

VERTIGINIDAE

Vertigo (Vertigo) ovata Say, 1822 (Figs. 2, 4 E)

This species is a native of North America from Alaska to northern Mexico, and it was described from Philadelphia (Barker, 1999). Today, its distribution is almost worldwide. In Argentina, it was recorded in northern and central regions (Salta and Córdoba provinces) and also observed in Jujuy (Fernández, 1973).

Dried materials examined: Argentina: MACN-

In 6968. Cerro Colorado, Córdoba. 5 specs. MACN-In 35635. Banks of Juramento river, Juramento, Salta. 14 specs. MLP 8897-2. Gully of Tulumba river, Tulumba, Córdoba. 5 specs. MLP 9211-4. Gully of Macha river, Macha, Córdoba. 1 spec. MLP10845. Gully of Macha river, Macha, Córdoba. 25 specs. MLP 10846. Gully of stream of Cerro Colorado, Córdoba. 8 specs. MLP 10847. Macha, Córdoba. 14 specs. MLP 10849. 3 specs. MLP 10848. 1 spec. MLP 10850. Gully of Macha river, Macha, Córdoba. 1 spec.

PUNCTIDAE

Paralaoma servilis (Shuttleworth, 1852) (Figs. 1, 4 F, G, H)

It was described from the Canary Islands, although its natural range was probably some Pacific islands. Currently, it is found worldwide. In South America, it has been reported from Colombia, Brazil, Peru and Bolivia (Miquel *et al.*, 2007a). In Argentina, it is found from tropical and temperate regions to the south, in Misiones, Tucumán, Formosa, Santa Fe, Entre Ríos, Buenos Aires, Chubut and Tierra del Fuego provinces. It was found under a log and among fallen leaves of *Eucalyptus* sp., among mosses and lichens on rocks, in shady and moist habitats, and in fallen leaves of *Nothofagus betuloides* (Mirb.) (cherry, "guindo") and *Drimys winteri* (Forst.) (cinnamon, "canelo"). Before being recognized as an exotic species, *P. servilis* was described several times as new (Miquel *et al.*, 2007a).

Dried materials examined: *Radiodiscus misionensis*: Holotype. MLP 11.398; Paratypes (2 adults + 1 juv.). MLP 11.402. Leandro N. Alem, Misiones, Argentina. Paratype. MACN-In 26.638. Leandro N. Alem, Misiones, Argentina. *Zilchogyra cleliae*: Paratype. MLP 11.545. In garden of Instituto Miguel Lillo, Tucumán, Argentina. 430 m; Paratypes (9). MCN 1.645. Escola de Mestria Agrícola Canadá, Viamão, RS, Brasil. Paratype. MCN 1.098. Gramado, RS, Brasil. On leaves of *Eucalyptus*. Argentina: IFML 764. Río de los Sosa, Monteros, Tucumán, Argentina. 600 - 900 m. 1 spec. IFML 990. Horco Molle, Tucumán. 4 specs. IFML 10980. In garden, San Miguel de Tucumán. 2 specs. IFML 15439. Gully, near of Tafi del Valle, Tucumán. 2 specs. IFML 15440. Aconquija, Tucumán. 63 specs. IFML 15441. Nosalito mountain range, 1100 m. 1 spec. IFML 15442. Horco Molle, Tucumán. 2 specs. MACN-In 27248. Peralta Ramos Park, Mar del Plata, Buenos Aires. 14 specs. MACN-In 35672. Muñoz hills, Tafi del Valle, Aconquija,

Tucumán. 26° 49' 41" S- 65° 42' 22" W, 2300-2400 m. 8 specs. MACN-In 36.106. Ecological reserve El Bagual, Formosa. 1 spec. MACN-In 36.107. El Nandubaysal, Gualaguaychú, Entre Ríos. 2 specs. MACN-In 36.108. Ecological reserve El Bagual, Formosa. 4 specs. MACN-In 36.258. Urquiza Park, Rosario, Santa Fe. 3 specs. MACN-In 37510. Junín, Buenos Aires. 1 spec. MACN-In 37521. Otamendi, Buenos Aires. 1 spec. MACN-In 37524. Luján river, F.C.G.B.M., Luján, Buenos Aires. 1 spec. MACN-In 38201. Buen Suceso bay, Tierra del Fuego. 33 specs. MLP 7.531-3. Horco Molle, Lomas de Imbaud, Yerba Buena, Tucumán. 1 spec. MLP 10.124. Cochuna river, Cochuna, Tucumán. 1100 m, 35 km to Concepción, on the road to Andalgalá. 5 specs. MLP 12.011. Venado Tuerto, Santa Fe. 2 specs. MLP 12.043. Castelli, Buenos Aires. 70 specs. MLP 12.049. National Park Lago Puelo, Chubut. 1 spec.

Remark: samples MLP 7,777; 10,508; 10,924 and 10,152 were determined by one of the authors (SEM) in 2005 and 2011, with the exception of batch MLP 10027-3, which corresponds to *Radiodiscus crenulatus* (Hylton Scott, 1958).

PRISTILOMATIDAE

Hawaiiia minuscula (Binney, 1840)

(Figs. 2, 4 I)

Seemingly nearctic, the species was described from Ohio (USA) (Baker, 1941). Currently, it can be found almost everywhere in the world. In South America, it was recorded in Peru and Ecuador (Weyrauch, 1967). In Argentina, it occurs in Jujuy, Salta, Tucumán, Catamarca, Córdoba and Buenos Aires (Miquel *et al.*, 2007b).

Dried materials examined: Argentina: IFML 10914. Jesús María, Córdoba. 5 specs. IFML 15435. In gardens of San Miguel de Tucumán. 2 specs. IFML 15436. Colonial Hotel, Salta. 22 specs. IFML 15437. Jesús María, Córdoba. 9 specs. IFML 15438. Salta. 13 specs. MACN-In 20377 y 20377-1. Buenos Aires city. 6 specs. and 19 juv. MLP 11172. Catamarca city, Catamarca. 29 specs. MLP 11174. Jesús María, Córdoba. 55

specs. MLP 11175. Valle Grande, Jujuy. 1 spec. MLP 11614. Buenos Aires city. 5 specs.

LIMACIDAE

Limax (Limax) maximus Linnaeus, 1758

(Figs. 1, 4 J)

The species is naturally distributed in western and southern Europe and probably in North Africa, and its type locality is Sweden (Barker, 1999). According to Barker (1999), today it is found in Scandinavia, Russia, Ukraine, Canada, USA, Hawaii, Mexico, South America, Australia and New Zealand. In Argentina, it is found in North Patagonia: Neuquén and Río Negro provinces (Fernández, 1973).

Wet materials examined: MACN-In 36160. Villa La Angostura, Neuquén. 1 spec. MACN-In 36161. Bariloche, Río Negro. 1 spec. MACN-In 36166. Bonito river, Puerto Manzano, Neuquén. 7 specs. MACN-In 36173. Bariloche, Río Negro. 1 spec. MACN-In 36174. Casa de Piedra, Río Negro. 4 specs. MACN-In 36175. Casa de Piedra, Río Negro. 3 specs. MACN-In 39377. Camping Inacayal, Villa La Angostura, Neuquén. 2 specs.

AGRIOLIMACIDAE

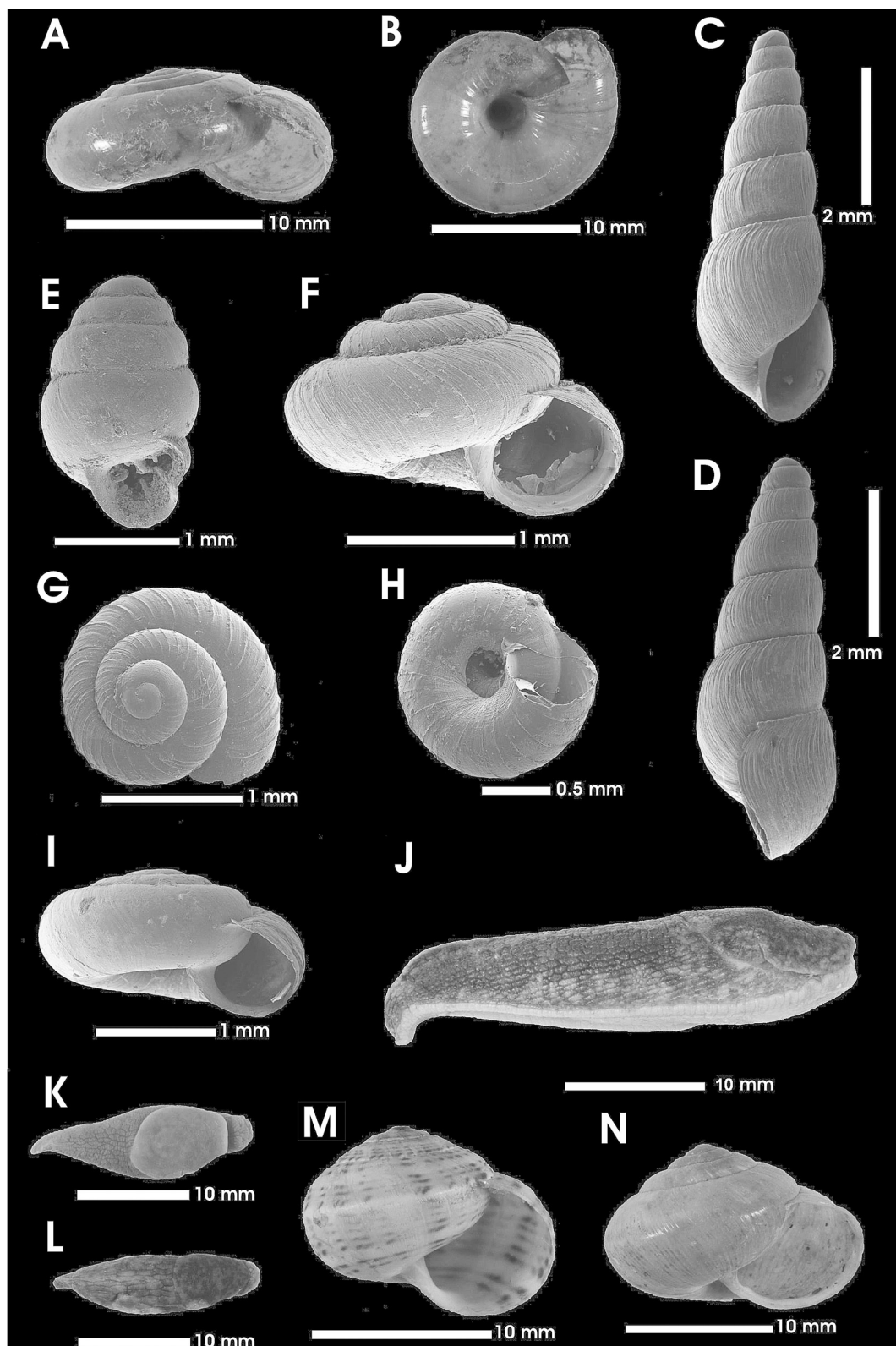
Deroceras (Agriolimax) reticulatum

(Müller, 1774)

(Figs. 1, 4 K, L)

Described from Frideriksdal, Denmark, its natural range covers Europe. It was transported to and established in central and northern Europe, North America and South America, Southern Africa, islands in the Atlantic and Indian Ocean, Australia and New Zealand (Barker, 1999). In Argentina, it ranges from the north to the south (Tucumán, Buenos Aires, Neuquén, Río Negro, Chubut and Tierra del Fuego provinces) (Fernández, 1973). It has been found under logs, rotting leaves and in damp places (Doering, 1875b; Fernández, 1973). It is a semelparous species, according to studies of populations in the southeastern Buenos Aires province (Clemente *et al.*, 2008). Previous records (Martín *et al.*, 2009)

Fig. 4 A-N. **A, B:** *Oxychilus draparnaudi* (Beck, 1837). MACN-In 38402. Ecological Reserve, Vicente López, Buenos Aires. **C, D:** *Opeas (Opeas) pumilum* (Pfeiffer, 1840). IFML 15451. Tucumán, 430 msnm. **E:** *Vertigo (Vertigo) ovata* Say, 1822. MACN-In 35635. Banks of Juramento river, Juramento, Salta. **F, G, H:** *Paralaoma servilis* (Shuttleworth, 1852). MACN-In 37510. Junín, Buenos Aires. **I:** MACN-In 37521. Otamendi, Buenos Aires. **J:** MACN-In 37524. Luján river, F.C.G.B.M., Luján, Buenos Aires. **K, L:** *Hawaiiia minuscula* (Binney, 1840). MACN-In 20377-1. Buenos Aires City. **M:** *Limax (Limax) maximus* Linnaeus, 1758. MACN-In 36175. Casa de Piedra, Río Negro. **N:** *Deroceras reticulatum* (Müller, 1774). 11: MACN-In 36184-2. Puelo lake, Chubut. 12: MACN-In 27232. Río Grande, Tierra del Fuego. **O:** *Theba pisana pisana* (Müller, 1774). MACN-In 36146. San Bernardo, Buenos Aires. **P:** *Bradybaena similis* (Rang, 1831). MACN-In 35896. San Ignacio, Misiones.



of this species correspond to *L. flavus* (Linnaeus, 1758) and *M. gagates* (Draparnaud, 1801) (MLP 12536; 12821 and 13346).

Wet materials examined: MACN-In 20065. Palermo, Buenos Aires. 3 specs. MACN-In 21185. Ushuaia, Tierra del Fuego. 19 specs. MACN-In 24714. Nahuel Huapi lake, Río Negro. 9 specs. MACN-In 26251. Tañi Viejo, Tucumán. 13 specs. MACN-In 27232. Río Grande, Tierra del Fuego. 24 specs. MACN-In 27233. Fagnano lake. Tierra del Fuego. 44 specs. MACN-In 27234. Martial mount, Ushuaia, Tierra del Fuego. 38 specs. MACN-In 27235. Lapataia, Tierra del Fuego. 24 specs. MACN-In 36159. Villa La Angostura, Neuquén. 3 specs. MACN-In 36178. Bariloche, Río Negro. 10 specs. MACN-In 36185. El Hoyo, Chubut. 1 spec. MACN-In 36187. Melipal, Otto mount, Bariloche, Río Negro. 8 specs. MACN-In 36158-2. El Bolsón, Río Negro. 1 spec. MACN-In 36163. Victoria island, Neuquén. 8 specs. MACN-In 36164-2. Victoria island, Neuquén. 4 specs. MACN-In 36169-1. Villa La Angostura, 7 Lagos route, Neuquén. 4 specs. MACN-In 36170-1. Bariloche, km 13. Río Negro. 2 specs. MACN-In 36171. Bariloche, Km 4, Río Negro. 4 specs. MACN-In 36172-1. Bariloche, Km 5, Río Negro. 2 specs. MACN-In 36173-2. Bariloche, Río Negro. 6 specs. MACN-In 36176-1. Nahuel Malal, Río Negro. 3 specs. MACN-In 36177-1. Botanical garden, Otto mount, Bariloche, Río Negro. 9 specs. MACN-In 36180-1. Bariloche, Río Negro. 4 specs. MACN-In 36181-2. El Manatí, Colonia Paso Flores, Río Negro. 3 specs. MACN-In 36182-1. Centro Regional Universitario Bariloche, Bariloche, Río Negro. 3 specs. MACN-In 36184-2. Puelo lake, Chubut. 5 specs. MACN-In 36186-4. Bariloche, Km 15,5, Río Negro. 9 specs. MACN-In 36188-1. Bariloche, Río Negro. 8 specs. MACN-In 36189-1. Bariloche, Km 8, Río Negro. 2 specs. MACN-In 36190-1. Nahuel Huapi lake, Bariloche, Río Negro. 2 specs. MACN-In 36191-2. Bariloche, Km 4,7, Río Negro. 2 specs.

HELICIDAE

Theba pisana pisana (Müller, 1774)

(Figs. 3, 4 M)

The type locality of this species is the Circum-Mediterranean region (Zilch, 1960), with a natural distribution in Africa and Europe. Currently, it has been transported by humans to Australia and North America. In our country, it is located in Buenos Aires province (Parent & Miquel, 1999; Rumi *et al.* 2010).

Dried materials examined: Argentina: MACN-

In 10785-1. Mar del Plata, Buenos Aires. 2 specs. MACN-In 36146. San Bernardo, Buenos Aires. 2 specs. MLP 5651. In gardens of Mar de Ajó, Buenos Aires. 9 specs. + 6 juv. MLP 12360. Mar del Tuyú, Buenos Aires. 4 specs. + 1 juv. MLP 12495. Claromecó, Buenos Aires. 1 spec. MLP 12497. Costa del Este, Buenos Aires (36°26'25.9"S, 52°41'24.8"W). 5 specs. y 2 juv. MLP 12505. Villa Gesell, Buenos Aires (37°15'41.71"S, 56°53'04.4"W). 5 specs. MLP 12537. Mar del Tuyú, Buenos Aires. 164 specs. y 18 juv. Wet materials: MLP 12496. Aguas Verdes, Buenos Aires (36°38'11.4"S, 56°40'59"W). 73 specs. MLP 12498. Las Toninas, Buenos Aires (36°29'8.5"S, 56°41'32.7"W). 5 specs. MLP 12499. Mar de Ajó, Buenos Aires (36°43'10"S, 56°40'26"W). 47 specs. MLP 12500. Mar del Tuyú, Buenos Aires (36°34'58.1"S, 56°41'14.7"W). 28 specs. y 6 juv. MLP 12501. San Bernardo, Buenos Aires (36°41'13.8"S, 56°42'08.5"W). 4 specs. MLP 12502. San Clemente del Tuyú, Buenos Aires (36°21'50"S, 56°42'51"W). 33 specs. MLP 12503. Santa Teresita, Buenos Aires (36°32'19.9"S, 56°41'19.2"W). 1 spec. MLP 12504. Valeria del Mar, Buenos Aires (37°98'15"S, 56°53'20"W). 10 specs.

BRADYBAENIDAE

Bradybaena (Bradybaena) similis (Rang, 1831)

(Figs. 2, 4 N)

Its type locality and its native are ascribed to East Asia. Today it has been introduced to tropical and subtropical regions. In America, it was reported by Orbigny (1837) on the Brazilian coast (Rio de Janeiro and Bahia). In Argentina, it appears in Tucumán (Dragh, 1999) and Misiones provinces (Miquel *et al.*, 2007b). Dragh (1999) notes its presence in the soil and on stems and leaves of garden plants during the rainy season, but the specimens are found in the soil to a depth of 10 cm in autumn and winter.

Remark: It was first observed in Buenos Aires city by Doering (1875a), although this first population seems not have survived. Having been re-introduced in about 1950, its incorrect identification hid its presence in our country for several decades (Miquel *et al.*, 2007b).

Dried materials examined: Argentina: MACN-In 30444. San Antonio, Misiones. 1 spec. juv. MACN-In 35896. San Ignacio, Misiones. 5 specs. Wet materials: IFML 14990. Av. Belgrano 3500, San Miguel de Tucumán, Tucumán. 10 specs., on leaves. IFML 15419. In a house garden, Tañi Viejo, Tucumán. 127 specs.

Table 1. Records of exotic landsnails and slugs in Argentina. * Their specific identities were confirmed through anatomical examination (Virgillito, 2012)

Species	First record	Collecting year
Pupilloidea		
<i>Pupisoma (P.) dioscoricola</i> (C.B. Adams, 1845)	Hylton Scott, 1960	1959
<i>Vertigo (V.) ovata</i> Say, 1822	Hylton Scott, 1946	1946
<i>Vallonia pulchella</i> (Müller, 1774)	Hylton Scott, 1948	1946
Achatinoidea		
<i>Achatina (L.) fulica</i> Bowdich, 1822	Gutiérrez Gregoric <i>et al.</i> , 2011	2010
<i>Ceciloides (C.) acicula</i> (Müller, 1774)	Miquel <i>et al.</i> , 1995	1994
<i>Lamellaxis (A.) gracilis</i> (Huton, 1834)	Strobel, 1874	1917
<i>Opeas (O.) pumilum</i> (Pfeiffer, 1840)	This work	1967
<i>Rumina decollata</i> (Linnaeus, 1758)	Miquel, 1988	1988
Punctoidea		
<i>Paralaoma servilis</i> (Shuttleworth, 1852)	Hylton Scott, 1957	1948
Gastrodontoidea		
<i>Oxychilus draparnaudi</i> (Beck, 1837)	This work	2011
Parmacelloidea		
<i>Milax gagates</i> (Draparnaud, 1801)	Hylton Scott, 1963	1929
Zonitoidea		
<i>Zonitoides (Z.) arboreus</i> (Say, 1816)	Hylton Scott, 1948	1913
<i>Hawaiia minuscula</i> (Binney, 1840)	Miquel <i>et al.</i> , 2007b	1950
Limacoidea		
<i>Limax (L.) maximus</i> Linnaeus, 1758*	Hylton Scott, 1963	2004
<i>Limacus flavus</i> (Linnaeus, 1758)*	Strobel, 1868	1919
<i>Lehmannia valentiana</i> (Férussac, 1823)*	Gutiérrez Gregoric <i>et al.</i> , 2013	1924
? <i>Deroceras (D.) laeve</i> (Müller, 1774)	Strobel, 1874	---
? <i>Deroceras (D.) agreste</i> Linnaeus, 1758	Fernández, 1973	---
<i>Deroceras (D.) invadens</i> Reise <i>et al.</i> , 2011*	Gutiérrez Gregoric <i>et al.</i> , 2013	2004
<i>Deroceras (A.) reticulatum</i> (Müller, 1774)*	Strobel, 1874	1931
Arionoidea		
<i>Arion intermedius</i> Férussac, 1819*	Gutiérrez Gregoric <i>et al.</i> , 2013	2003
Helicoidea		
<i>Theba pisana</i> (Müller, 1774)	Parent & Miquel, 1999	1920
<i>Otala lactea</i> (Müller, 1774)	Strobel, 1874	1918
<i>Otala punctata</i> (Müller, 1774)	Doering, 1875b	1998
<i>Crypthomphalus aspersa</i> (Müller, 1774)	Fernández, 1973	1949
<i>Bradybaena (B.) similaris</i> (Rang, 1831)	Doering, 1875b and Dragh, 1999	1956

DISCUSSION AND CONCLUSIONS

There are about 20 exotic terrestrial mollusks species in Argentina (Table 1). *P. servilis* and *D. reticulatum* are scattered throughout the country; *B. similaris* and *O. (O.) pumilum* are present in the tropical climates of the north; the temperate weather of the central region is propitious to *T. pisana* and *O. draparnaudi* settlement; cold southern regions were invaded by *L. maximus*; and finally, *V. ovata* and *H. minuscula* occupy broader areas of northern and central Argentina. Identifications of slugs *Deroceras laeve* (Müller,

1774) and *D. agreste* Linnaeus, 1758 (Fernández, 1973) appear to have been performed only with reference to their external features, according to the literature and the collections studied, so these reports are considered unconfirmed. Specimens from Misiones and Salta provinces (MACN-In 26221 and MACN-In 26222), determined by Hylton Scott as *D. laeve* contain young specimens, now in bad condition. *B. similaris* and *T. pisana* remain hidden in collections under incorrect determinations (Miquel *et al.*, 2007b) (Table 1). It is unclear whether some species are native or introduced, as in the case of *Pupisoma*

(*Ptychopatala dioscoricola* (C.B. Adams, 1845). This is the only American species of the subgenus, so it was suspected to be introduced (Rumi *et al.*, 2010). However, other authors believe that their dispersal to tropical areas of South America is not due to human action (Hausdorf, 2007). In Argentina, it is registered in Chaco and Tucumán provinces (Meyer & Weyrauch, 1964; Fernández, 1973) (MLP 10033 and 10034).

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