

## ARTÍCULO ORIGINAL

## FRESHWATER GASTROPODS FROM DEL PLATA BASIN, ARGENTINA. CHECKLIST AND NEW LOCALITY RECORDS

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### ABSTRACT

The greatest floral and faunal biodiversity estimated from Argentina -not including molluscs - is found in three subtropical forests belonging to the del Plata Basin, two of them at the northeastern part of Argentina (NEA). The aim of this study is to show new records as well as an update of the distribution of the freshwater Gastropoda species in the main NEA rivers: Iguazú, Paraná, Paraguay, and Uruguay. At NEA, 66 species belonging to 9 families are known from literature records. According to the preferences of habitats in this area littoral and bottom species, could be recognized. The former includes 33 species belonging to Ampullariidae, Ancyliidae, Lymnaeidae, Physidae, and Planorbidae, and the latter with 33 species of Lithoglyphidae, Cochliopidae, Thiaridae, and Chilinidae. In this paper, 30 species of 8 families were recorded, 25 of them are littoral whereas only 5 species inhabiting the bottom were found, because of the high level of the rivers. Two new records were registered for the country, both belonging to Ancyliidae: *Gundlachia ticaga* and the genus *Laevapex*. Thus, now there are 68 species at NEA. Twenty-three species increase the number of localities. Planorbidae was the family with more collected species (13). No Thiaridae species were found.

**KEY WORDS:** Freshwater gastropods; Paraguay River; Uruguay River; Paraná River; Argentina.

### RESUMEN

**Gasterópodos de agua dulce de la Cuenca del Plata, Argentina. Lista y nuevos registros.** La mayor diversidad en flora y fauna estimada para la Argentina -que no incluye a los moluscos- se encuentra en tres selvas subtropicales pertenecientes a la Cuenca del Plata, dos de ellas presentes en el Noreste argentino (NEA). El objetivo de este trabajo es mostrar nuevos registros así como también realizar una actualización de la distribución de especies de gasterópodos en los principales ríos del NEA: Iguazú, Paraná, Paraguay y Uruguay. Para el NEA, fueron registradas de la literatura 66 especies, pertenecientes a nueve familias. De acuerdo a las preferencias de hábitats, en esta área se pueden reconocer dos tipos de especies: litorales y de fondo. Las primeras incluyen 33 especies que pertenecen a Ampullariidae, Ancyliidae, Lymnaeidae, Physidae y Planorbidae, y las últimas con 33 especies de Lithoglyphidae, Cochliopidae, Thiaridae y Chilinidae. En el presente trabajo se registraron 30 especies y ocho familias, 25 de ellas pertenecen al grupo de especies litorales. Solo cinco especies habitantes del fondo fueron encontradas, debido al nivel alto de los ríos. Dos nuevas entidades fueron registradas por primera vez para el país, ambas pertenecientes a la familia Ancyliidae: *Gundlachia ticaga* y el género *Laevapex*. De esta manera, se alcanza el número de 68 especies para el NEA. Veintitrés especies ampliaron el número de registros y/o distribución. Planorbidae fue la familia con más especies colectadas (13). No se registraron especies de Thiaridae.

**PALABRAS CLAVES:** Gasterópodos de agua dulce; Río Paraguay; Río Uruguay; Río Paraná; Argentina.

### INTRODUCTION

Argentina is situated in South of South America, from 21°-65°S and 53°-73°W, with a total area of 2780403 km<sup>2</sup>. The climate varies from subtropical in the North to temperate-cold in the South, with temperatures ranging, on yearly average, from 21.1° to - 5.6°C. The biogeographical schemes of Cabrera and Willink (1973) and Burkart *et al.* (1999) estimated the greater biodiversity

(without molluscs) at three areas of subtropical forests. Two of them belong to the Northeast of Argentina (NEA): Misiones (in the NE bordering with Brazil) and riverine gallery forest (at the sides of the main tributaries of del Plata Basin: Paraguay, Uruguay and Paraná rivers). The third subtropical forest corresponds to the "Yungas", located in the Center-North of Argentina (Tucumán, Salta and Jujuy provinces).

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Del Plata Basin drains about one-fourth of the South American continent and covers a surface of 3100000 km<sup>2</sup>. It comprises the Bermejo, Paraguay-Paraná, and the Uruguay River systems; it is shared by Argentina, Bolivia, Brazil, Paraguay, and Uruguay. This Basin includes territory in several provinces of central and northern Argentina: Salta, Jujuy, Formosa, Tucumán, Chaco, Córdoba, Santiago del Estero, Santa Fe, Misiones, Corrientes, Entre Ríos, and Buenos Aires.

The NEA area, 296414 km<sup>2</sup>, includes Chaco, Corrientes, Entre Ríos, and Misiones provinces, and comprises 10.7% of Argentinian territory. The NEA hydrogeographical pattern is basically structured on the great rivers: Paraná, Uruguay, Iguazú, and Paraguay. Part of them constitutes provincial and national borders. A zone of great interest is the waterfalls in upper Iguazú, before they join the Paraná. These are the greatest waterfalls in Argentina, at the Parque Nacional Iguazú (PNI), and reach a height of some 70 to 75 m, and provide special ecological conditions and characteristics that allow the survival of endemic or typical species of those places (Gómez & Chebez

(i.e. Yaciretá and Urugua-í) and the project "Hidrovia" ("waterway"), are causing rapid changes in the structure and dynamics of water environments and their biota, pollution of water from big urban areas and conflicts of interests concerning navigation and hydroelectric use.

Toward the Northwest of the country, the climate is drier, therefore, the number of streams and rivers and the richness of freshwater gastropods is reduced; the total absence of species of Lithoglyphidae and Thiaridae is noticeable. Only Cochliopidae shows an increase in the number of species. Toward the south of Argentina (Patagonia), Lithoglyphidae, Physidae, and Ancyliidae are represented by single species; two or three species of Planorbidae and Lymnaeidae are encountered; most of the species of Chiliniidae (10) and numerous Cochliopidae are present. In this area one species of Glacidorbidae appears and no species of Ampullariidae and Thiaridae have been found.

Nine families and 66 species have been reported from the southern end of the del Plata Basin at the Paranense rainforest, in Northeastern Argentina (NEA) (Table 1). This Basin presents the highest number of species and families from Argentina. Three groups of gastropods join in this region with clearly different patterns of distribution. 1. The first include Planorbidae, Physidae, Lymnaeidae, Ancyliidae and Ampullariidae, families with large distribution that reach their more southern distribution in this sector; 2. Chiliniidae, with southern distribution, reaching their North limit at NEA (Castellanos & Miquel, 1991); 3. Lithoglyphidae is almost entirely endemic to the studied region. These two last families are endemic to the Neotropical Region.

According to their habitat preferences, it is possible to categorize them in two groups: littoral and bottom species. The first include Ampullariidae, Ancyliidae, Lymnaeidae, Physidae and Planorbidae and the second type comprises Lithoglyphidae, Cochliopidae, Thiaridae, and Chiliniidae.

The aim of this work is to show new records and to provide an update of freshwater gastropods present in the Northeastern area of Argentina.

#### MATERIAL AND METHODS

Between 10 and 26 July 2000, 26 stations were surveyed on the right margin of low Paraguay River, Chaco province, and on the left margin of the Paraná riverbed, Corrientes. Besides, between 11 and 25 September 2002, 40 stations belonging to the Basin of Uruguay River, in Argentinian territory from Entre Ríos to Misiones) and in the Paraná River and their tributaries from Puerto Iguazú to Posadas, Misiones (Fig. 1 and Table 2) were surveyed. Samplings were carried out on the basis of a previous revision of

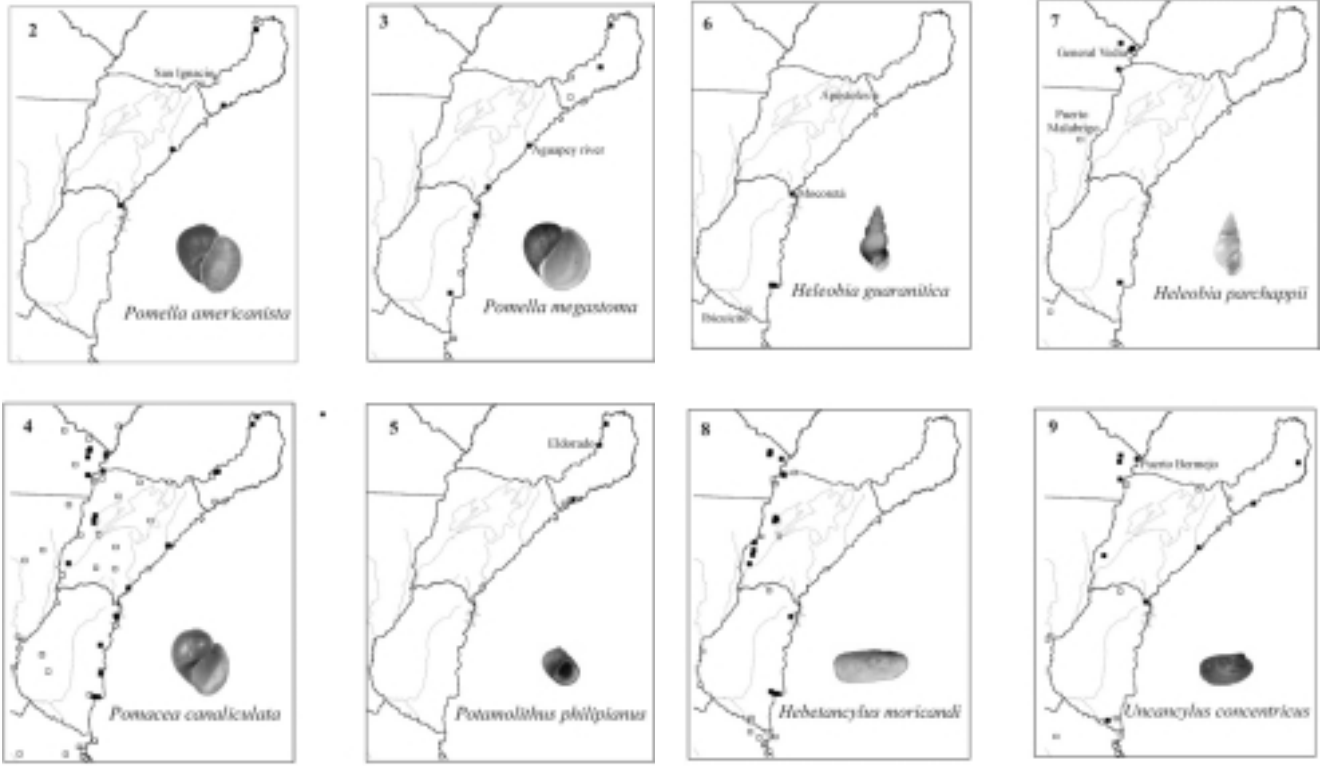


Figure 1. Map of Argentina with detail of main rivers and cities in northeastern Argentina (NEA). Sampling areas in gray.

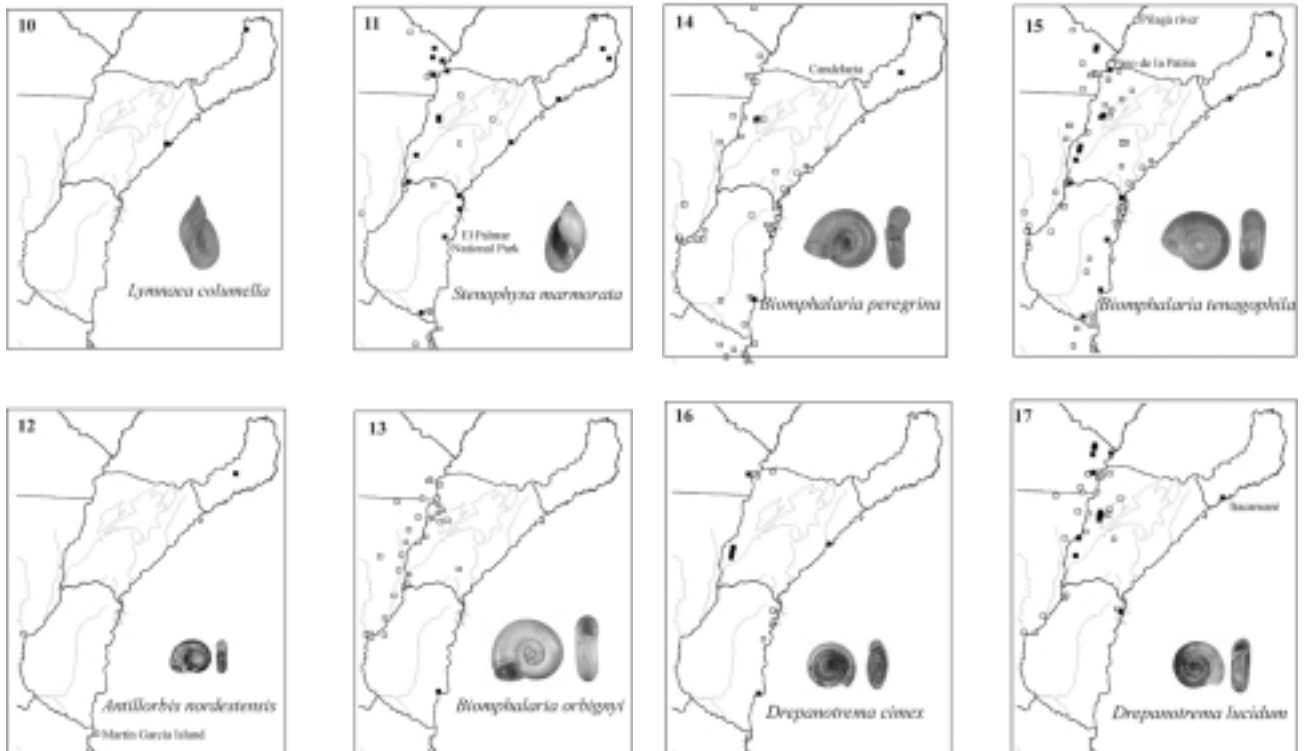
1996). The great number of dams built at NEA rivers

freshwater snails records in NEA which allowed to identify discontinuities in the records in areas which could potentially be occupied by gastropods. Special

attention was given to the search of those species that are only cited from their type locality or present scarce or only one record.



Figures 2-17. Species found for the first time for a province or for a river of the del Plata Basin in the NEA. Empty squares: Previous records. Full squares: Records from field work.



Snails were collected using sieves (15 cm diameter, 1.4 mm mesh size) for the vegetable substrates, or by hand with squares of 10 x 10 cm for bottom without plants. With regard to the Ampullaridae that usually bury under unfavorable conditions, when they were not detected in the sampling, we removed a sector of the bottom. The material was relaxed in 0.1% w/v pentobarbital and then the soft parts were fixed in a solution of Railliet-Henry (2% acetic acid, 5% formalin and 93% distilled water v/v).

Part of the material was deposited at Museo de La Plata, La Plata, Argentina (MLP) collections. Other material was not still entered to the collection of the MLP, since it is being used by the specialists for other research activities.

Previous molluscan locality records were obtained from collections of Museo de La Plata and Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Fundación Miguel Lillo and Centro de Ecología Aplicada del Litoral, were the types and paratypes deposited were revised. In addition, records from references were included, *i.e.*: Hylton Scott (1954, 1957, 1960); Paraense & Deslandes (1958); Parodiz (1965); Paraense (1974, 1985); Castellanos & Fernández (1976); Olazarri (1977, 1980, 1983, 1984); Castellanos & Miquel (1980); Fernández (1981 a, b); Bonetto *et al.*, (1982); Tassara & Bechara (1983); López Armengol (1996); Rumi (1986); Bonetto & Tassara (1988); Rumi *et al.* (1997); Miquel & Parent (1996). Records of the reference from Table 1 were also included.

### RESULTS AND DISCUSSION

In this paper, two new records were registered for the country, both belonging to Ancyliidae: *Gundlachia ticaga* (Marcus & Marcus, 1962) and one uncertain species of *Laevapex* Walker, 1903. Both species were registered for Misiones province, the first one for Cuña Pirú stream and the second for Parque Nacional Iguazú. *Gundlachia ticaga* was mentioned by Barbosa (2003) for Argentina, but without precise localities.

Thirty freshwater gastropod species belonging to 8 families were found. (Table 3). Twenty-five of them occur in the littoral. Planorbidae showed the highest number of recorded species, 13 out of the 15 species present in the surveyed area.

Sampling of the bottom species was limited due to the high water level of the Uruguay and Paraná rivers, caused by intense rainfalls in Brazil during the sampling periods. Only one species of Chiliniidae (*Chilina megastoma* Hylton Scott, 1958 from Parque Nacional Iguazú), two species of *Heleobia* (Cochliopidae) and two *Potamolithus* species (Lithoglyphidae) were recorded, although they were cited in several other places.

Many species are registered for the first time for provinces or rivers of NEA, for example: *Pomella americanista* (Ihering, 1919) (Fig. 2), *Pomella megastoma* (G. B. Sowerby I, 1825) (Fig. 3) *Pomacea canaliculata* (Lamarck, 1822) (Fig. 4), *Potamolithus philippianus* Pilsbry, 1911 (Fig. 5), *Heleobia guaranitica* (Doering, 1884) (Fig. 6), *Heleobia parchappii* (d'Orbigny, 1835) (Fig. 7), *Hebetancylus moricandi* (d'Orbigny, 1837) (Fig. 8), *Uncancylus concentricus* (d'Orbigny, 1835) (Fig. 9), *Lymnaea columella* Say, 1817 (Fig. 10), *Stenophysa marmorata* (Guilding, 1828) (Fig. 11), *Antillorbis nordestensis* (Lucena, 1954) (Fig. 12), *Biomphalaria orbignyi* Paraense, 1975 (Fig. 13), *Biomphalaria peregrina* (d'Orbigny, 1835) (Fig. 14), *Biomphalaria tenagophila* (d'Orbigny, 1835) (Fig. 15), *Drepanotrema cimex* (Moricand, 1839) (Fig. 16) and *Drepanotrema lucidum* (Pfeiffer, 1839) (Fig. 17).

Specimens belonging to *Felipponea* spp., cited for a small area of Uruguay River, and *Biomphalaria oligoza* Paraense, 1974, recorded from the Córdoba province – outside the region of NEA – and for San Pedro, Corrientes were neither found.

Native species of Thiaridae, *Aylacostoma guaraniticum* (Hylton Scott, 1951), *A. chloroticum* Hylton Scott, 1954 and *A. stigmaticum* Hylton Scott, 1954 reported from Posadas - Ituzzaingó areas, were not found. In Argentina, these species were the only mentioned as recently extinct in natural environments. They were recorded in the Apipé falls, which became a modified environment, due to the construction of the hydroelectric Yaciretá dam (Quintana & Mercado Laczkó, 1997). The same could have happened with *Chilina guaraniana* Castellanos & Miquel, 1980 (Type locality: Posadas), affected by the same dam, and with *Potamolithus concordianus* Parodiz, 1966 (Type locality: Concordia) affected for Salto Grande dam. These two species are only known for their type locality.

The majority of the bottom species records (Lithoglyphidae mainly) were obtained previous to the construction of dams in Uruguay, Paraná, and Iguazú rivers. The consequent regulation of the range of fluctuations in water levels of rivers produced an alteration in the regimen of spatial and temporal exposition of the bottom. This could cause changes in the diversity and behavior of the benthic biota, for example the displacement of some species toward the margins of the river, in search of similar conditions to the existent ones previous to the filled. However, in general, it was not possible to verify that the snails have been displaced. It is premature to consider the species not found in this field work as extinct. New field works in coming years will allow to determine which species are extinct or in risk of extinction, as in the case of the local Thiaridae.

*Melanoides tuberculatus* (Müller, 1774) (Thiaridae) is a recently introduced species from Asia, found in Yaciretá dam, near Posadas, Misiones province (Peso & Quintana, 1999). In Brazil it is considered as an invasive species able to displace native species (Fernandez *et al.*, 2003). In Argentina, *M. tuberculatus* has only been cited once in a single locality, being so far not considered an invader species yet.

In this study, the presence and distribution of several species have been verified and enlarged, respectively, mainly in Misiones province which had not been explored at a malacological level, except for Parque Nacional Iguazú and Posadas. This same

situation occurs in many provinces of Argentina where there are records of very few localities for freshwater gastropods, as is the case with the Patagonic provinces, mainly Chubut and Santa Cruz, and the provinces of the western region of the country, Mendoza, San Juan, La Rioja, San Luis y Catamarca. Further extensive field works are necessary for those areas in order to verify the persistence of many species of the bottom of the environment of NEA. These works would also facilitate to carry out a comparative regional study to determine the areas and species of greater conservation value in Argentina.

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#### REFERENCES

- BONETTO, A. A.; BECHARA, J. A.; TASSARA, M. P. 1982. Los moluscos de la familia Planorbidae en el área del río Paraná Medio. *Physis*, Secc. B 41: 1-6.
- BONETTO, A. A.; TASSARA, M. P. 1988. Notas sobre el conocimiento limnológico de los gasterópodos paranenses y sus relaciones tróficas. I. Ampullariidae. *Ecosur* 14/15(25/26): 55-62.
- BOUCHET, P.; ROCROI, J. P. 2005. Classification and nomenclator of Gastropod families. *Malacologia* 47: 1-397.
- BURKART, R.; BÁRBARO, N.; SÁNCHEZ, R.O; GÓMEZ, D.A. 1999. Eco-Regiones de la Argentina. Buenos Aires: APN, PRODIA. 43 p.
- CABRERA, A. L.; WILLINK, A. 1973. Biogeografía de América Latina. Washington D.C.: OEA. 120 p.
- CASTELLANOS, Z. A. DE. 1981. Mollusca, Gasteropoda, Thiaridae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET). 15 (3): 5-18.
- CASTELLANOS, Z.A. DE; FERNÁNDEZ, D.. 1976. Mollusca, Gasteropoda, Ampullariidae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15(1): 1-33.
- CASTELLANOS, Z. A. DE; GAILLARD, M. C. 1981. Mollusca, Gasteropoda, Chiliniidae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15 (4): 23-51.
- CASTELLANOS, Z. A. DE; LANDONI, N. 1981. Mollusca, Gasteropoda, Lymnaeidae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15(5): 53-82.
- CASTELLANOS, Z.A. DE; MIQUEL, S. E.. 1980. Notas complementarias al género *Chilina* Gray (Mollusca Pulmonata). *Neotrópica* 26: 171-178.
- CASTELLANOS, Z. A.; MIQUEL, S. E. 1991. Distribución de los Pulmonata, Basommatophora. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15(9): 1-9.
- COWIE R.; THIENGO, S. 2003. The apple snails of the Americas (Mollusca: Gastropoda: Ampullariidae: *Asolene*, *Felipponea*, *Marisa*, *Pomacea*, *Pomella*): a nomenclatural and type catalog. *Malacologia* 45: 41-100.
- DOS SANTOS, S. B. 2003. Estado actual do conhecimento dos ancilídeos na América do Sul (Mollusca: Gastropoda: Pulmonata: Basommatophora). *Revista de Biología Tropical* 51 (Suppl. 3): 191-224.
- FERNÁNDEZ, D. 1981a. Mollusca, Gastropoda, Physidae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15(6): 83-98.
- FERNÁNDEZ, D. 1981b. Mollusca, Gasteropoda, Ancyliidae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15(7): 99-114.
- FERNÁNDEZ, M. A.; THIENGO, S.; SIMONE, L. R. L. 2003. Distribution of the introduced freshwater snail *Melanoides tuberculatus* (Gastropoda: Thiaridae) in Brazil. *The Nautilus* 117: 78-82.
- GAILLARD, M. C.; CASTELLANOS DE, Z. A. 1976. Mollusca, Gasteropoda, Hydrobidae. Fauna de Agua Dulce de la República Argentina, PROFADU (CONICET) 15(2): 1-40.
- GÓMEZ, S. E.; CHEBEZ, J. C. 1996. Peces de la Provincia de Misiones. *Irr*. Chebez, J.C. Fauna Misionera. Catálogo Sistemático y Zoogeográfico de los vertebrados de la

- provincia de Misiones (Argentina). Monografía 5. Buenos Aires: L.O.L.A. pp. 39-67.
- HYLTON SCOTT, M. I. 1954. Dos nuevos Melanidos del Alto Paraná (Mollusca, Prosobranchia). *Neotrópica* 1(3): 45-48.
- HYLTON SCOTT, M. I. 1957. Anotaciones sobre la morfología de *Tropicorbis peregrinus* (d'Orbigny) (Planorbidae). *Revista del Museo de La Plata (nueva serie) Zoología* 7: 1-22.
- HYLTON SCOTT, M. I. 1960. Nueva familia de Pulmonados Basommatóforos (Mollusca). *Neotrópica* 6: 65-69.
- LÓPEZ ARMENGOL, M. F. 1985. Estudio sistemático y bioecológico del género *Potamolithus* (Hydrobiidae) utilizando técnicas de taxonomía numérica. Tesis Doctoral (Nº455), Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata.
- LÓPEZ ARMENGOL, M. F. 1996. Taxonomic revision of *Potamolithus agapetus* Pilsbry, 1911 and *Potamolithus buschii* (Frauenfeld, 1865) (Gastropoda: Hydrobiidae). *Malacologia* 38: 1-17.
- LÓPEZ ARMENGOL, M. F.; DARRIGRAN, G. 1998. Distribución del género neotropical *Potamolithus* Pilsbry & Rush, 1896 (Gastropoda: Hydrobiidae) en el estuario del Río de la Plata. *Iberus* 16(2): 67-74.
- MIQUEL, S. E.; PARENT, H. 1996. Moluscos Gasterópodos de la provincia de Santa Fe, Argentina. *Malacological Review* 29: 107-112.
- OLAZARRI, J. 1977. Informe preliminar sobre moluscos del área de influencia de la futura represa de Salto Grande. *In: Reunión sobre Aspectos del Desarrollo Ambiental*, 4, Salto (Uruguay)-Concordia (Argentina) pp. 1-25.
- OLAZARRI, J. 1980. La formación del embalse de Salto Grande y sus efectos sobre la malacofauna fluvial. *In: Resúmenes Jornadas de Ciencias Naturales del Uruguay*, Montevideo. pp. 21-22.
- OLAZARRI, J. 1983. *Drepanotrema anatinum* (d'Orbigny, 1835) (Mollusca: Gastropoda), en la cuenca del río Uruguay Medio. *Boletín de la Sociedad Zoológica del Uruguay (Segunda Epoca)* 1: 25-28.
- OLAZARRI, J. 1984. *Biomphalaria straminea* (Dunker, 1884), en la cuenca del río Uruguay. *Historia Natural* 4(29): 285-288.
- PARAENSE, W. L. 1974. *Biomphalaria oligoza* n.n. for *Tropicorbis philippianus* (Dunker) sensu Lucena. *Revista Brasileira de Biología* 34: 379-386.
- PARAENSE, W. L. 1985. *Biomphalaria intermedia* in Matto Grosso do Sul, Brazil and Misiones, Argentina (Pulmonata: Planorbidae). *Memorias do Instituto Oswaldo Cruz* 80: 247-250.
- PARAENSE, W. L.; DESLANDES, N. 1958. The genera *Australorbis*, *Tropicorbis*, *Biomphalaria*, *Platyaphius* and *Taphius* (Pulmonata, Planorbidae). *Revista Brasileira de Biología* 18: 65-80.
- PARAENSE, W. L.; POINTIER, J. P. 2003. *Physa acuta* Draparnaud, 1805 (Gastropoda: Physidae): a study of topotypic specimens. *Memorias do Instituto Oswaldo Cruz* 98: 513-517.
- PARODIZ, J. J. 1965. The hydrobid snails of the genus *Potamolithus* (Mesogastropoda: Rissoacea). *Sterkiana* 20: 1-38.
- PESO, J. G.; QUINTANA, M. G. 1999. Otro molusco de origen asiático introducido en la Cuenca del Plata: *Melanooides tuberculata* en el embalse de Yacretá, Argentina/Paraguay (Prosobranchiata: Thiaridae). *In: IV Congreso Latinoamericano de Malacología*, Coquimbo, Chile, Resumen 41.
- QUINTANA, M. G.; MERCADO LACZKÓ, A. C. 1997. Biodiversidad en peligro. Caracoles de los rápidos en Yacretá. *Ciencia Hoy* 7(41): 22-31.
- RUMI, A. 1986. *Estudio morfológico, taxonómico y bioecológico de los Planórbidos argentinos*. Tesis Doctoral Nº461, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata. 208 p.
- RUMI, A. 1991. La Familia Planorbidae Rafinesque, 1815 en la República Argentina. *Fauna de Agua Dulce de la República Argentina*, PROFADU (CONICET) 15(8): 1-51.
- RUMI, A.; TASSARA, M. P.; BONETTO, A. A. 1997. Distribución de las especies de Planorbidae en la Argentina y su relación con el riesgo de esquistosomiasis. *Ecosur* 17: 1-19.
- TASSARA, M. P.; BECHARA, J. A. 1983. Sobre la presencia de *Biomphalaria oligoza* Paranense, 1974 (Gastropoda, Planorbidae) en la cuenca del Río Paraná Medio. *Neotrópica* 29: 215-219.
- TAYLOR, D. W. 2003. Introduction to Physidae (Gastropoda: Hygrophila); biogeography, classification, morphology. *Revista de Biología Tropical* 51: 1-287.
- TAYLOR, D. W. 2004. Revisión Morfológica de caracoles dulceacuícolas, familia Physidae. *Comunicaciones de la Sociedad Malacológica del Uruguay* 8: 279-282.

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Table 1. Species recorded in northeastern Argentina (NEA). +: New entities registered for Argentina. \*: Nomenclature in revision.

**CLASS GASTROPODA****Subclass Orthogastropoda****Superorder Caenogastropoda****Or. Architaenioglossa**

## Fam. Ampullariidae

- Asolene platae* (Maton, 1809)  
*Asolene puelchella* (Anton, 1839)  
*Asolene spixii* (d'Orbigny, 1835)  
*Felipponea neritiniiformis* (Dall, 1919)  
*Felipponea elongata* (Dall, 1921)  
*Felipponea iheringi* (Pilsbry, 1933)  
*Marisa planogyra* Pilsbry, 1933  
*Pomacea canaliculata* (Lamarck, 1822)  
*Pomacea insularum* (d'Orbigny, 1835)  
*Pomacea scalaris* (d'Orbigny, 1835)  
*Pomella americanista* (Ihering, 1919)  
*Pomella megastoma* (G.B. Sowerby I, 1825)

**Or. Sorbeoconcha**

## Fam. Thiaridae

- Aylacostoma guaraniticum* (Hylton Scott, 1951)  
*Aylacostoma chloroticum* Hylton Scott, 1954  
*Aylacostoma stigmaticum* Hylton Scott, 1954  
*Melanoides tuberculatus* (Müller, 1774)

## Fam. Cochliopidae

- Heleobia guaranitica* (Doering, 1884)  
*Heleobia parchappii* (d'Orbigny, 1835)  
*Heleobia piscium* (d'Orbigny, 1835)

## Fam. Lithoglyphidae

- Potamolithus agapetus* Pilsbry, 1911  
*Potamolithus buschii* (Frauenfeld, 1865)  
*Potamolithus callosus* Pilsbry, 1925  
*Potamolithus catharinae* Pilsbry, 1911  
*Potamolithus concordianus* Parodiz, 1966  
*Potamolithus conicus* (Brot, 1867)  
*Potamolithus dinochilus* Pilsbry, 1896  
*Potamolithus doeringi* Pilsbry, 1911  
*Potamolithus hidalgoi* Pilsbry, 1896  
*Potamolithus iheringi* Pilsbry, 1896  
*Potamolithus lapidum* (d'Orbigny, 1835)  
*Potamolithus microthauma* Pilsbry, 1896  
*Potamolithus orbignyi* Pilsbry, 1896  
*Potamolithus paranensis* Pilsbry, 1911

- Potamolithus peristomatus* (d'Orbigny, 1835)  
*Potamolithus petitianus* d'Orbigny, 1840  
*Potamolithus philipianus* Pilsbry, 1911  
*Potamolithus quadratus* Pilsbry & Ihering, 1911  
*Potamolithus rushii* Pilsbry, 1896  
*Potamolithus simplex* Pilsbry, 1911  
*Potamolithus tricostatus* (Brot, 1867)

**Superorder Heterobranchia****Or. Pulmonata**

## Fam. Chiliniidae

- Chilina fluminea* (Maton, 1809)  
*Chilina gallardoii* Castellanos & Gaillard, 1981  
*Chilina guaraniana* Castellanos & Miquel, 1980  
*Chilina megastoma* Hylton Scott, 1958  
*Chilina rushii* Pilsbry, 1896

## Fam. Lymnaeidae

- Lymnaea columella* Say, 1817  
*Lymnaea viatrix* (d'Orbigny, 1835)

## Fam. Ancyliidae

- Hebetancylus moricandi* (d'Orbigny, 1837)  
*Uncancylus concentricus* (d'Orbigny, 1835)  
*Gundlachia ticaga* (Marcus & Marcus, 1962) +  
*Laevapex* sp. +

## Fam. Planorbidae

- Antillorbis nordestensis* (Lucena, 1954)  
*Acrorbis petricola* Odhner, 1937  
*Biomphalaria occidentalis* Paraense, 1981  
*Biomphalaria intermedia* (Paraense & Deslandes, 1962)  
*Biomphalaria oligoza* Paraense, 1974  
*Biomphalaria orbignyi* Paraense, 1975  
*Biomphalaria peregrina* (d'Orbigny, 1835)  
*Biomphalaria straminea* (Dunker, 1848)  
*Biomphalaria tenagophila* (d'Orbigny, 1835)  
*Drepanotrema anatinum* (d'Orbigny, 1835)  
*Drepanotrema cimex* (Moricand, 1839)  
*Drepanotrema depressissimum* (Moricand, 1839)  
*Drepanotrema heloicum* (d'Orbigny, 1835)  
*Drepanotrema kermatooides* (d'Orbigny, 1835)  
*Drepanotrema lucidum* (Pfeiffer, 1839)

## Fam. Physidae

- Physa acuta* Draparnaud, 1805\*  
*Stenophysa marmorata* (Guilding, 1828)\*

**Ampullariidae:** For the nomenclature of these species the revision carried out by Cowie & Thiengo (2003) was followed.

**Thiaridae:** Castellanos (1981) criteria (where the synonymy list of each species is found) and also Quintana & Mercado Lackzó (1997) criteria were followed.

**Cochliopidae:** The synonymic list of this family was published by Gaillard & Castellanos (1976) based on studies of the shell and penis morphology.

**Lithoglyphidae:** López Armengol (1985) published the synonymy list of this family, then completed by López Armengol & Darrigran (1998).

**Chiliniidae:** Castellanos and Gaillard (1981) did the synonymic list of this family.

**Lymnaeidae:** Castellanos & Landoni (1981) did the synonymic list of this family.

**Ancyliidae:** dos Santos (2003) was followed. Fernandez (1981b) published the synonymic list of this family. Ancyliidae is considered as a family, although Bouchet & Rocroi (2005) include the tribu Ancylini into Planorbidae.

**Ancyliidae:** dos Santos (2003) was followed. Fernandez (1981b) published the synonymic list of this family. Ancyliidae is considered as a family, although Bouchet & Rocroi (2005) include the tribu Ancylini into Planorbidae.

**Physidae:** Paraense & Pointier (2003) consider *Physella cubensis* (Pfeiffer 1839) as a synonym of *Physa acuta*. However Taylor (2003 and 2004) places *P. acuta*, within the genus *Haitia* Clench & Aguayo, 1932, besides point out that *S. marmorata* would not reach the Argentine territory and the specimens from Argentina could belong to other entities, "*Stenophysa*" *minor*, still not published. Thus, it was decided not to innovate in the denomination of the referred material until these questions are solved.

Table 2. Localities and sampling points.

<i>Sites</i>	<i>Code</i>	<i>Latitude South</i>	<i>Longitude West</i>
<b>Misiones Province</b>			
Iguazú National Park	1	25° 41'	54° 27'
Urugua-í damming	2	25° 52' 29.6"	54° 33' 03.8"
Urugua-í River	3	25° 52' 42"	54° 33' 50"
Eldorado	4	26° 20' 56.2"	54° 37' 03"
Elena fall, Eldorado	5	26° 25' 26"	54° 41' 22"
Piray Guazú stream	6	26° 26' 36.3"	54° 08' 27"
San Pedro	7	26° 36' 57.3"	54° 05' 51.8"
Yabotí Mini stream, San Pedro	8	26° 38' 37.7"	54° 00' 12.4"
South of San Pedro	9	26° 39' 02.3"	54° 10' 09.1"
Pond near San Pedro	10	26° 40' 54.9"	53° 55' 43.3"
La Esmeralda, Biosfera Reserve	11	26° 46' 12"	53° 54' 49"
Tres de Mayo fall	12	26° 47' 28"	55° 00' 57.6"
Puerto Rico	13	26° 47' 28.1"	55° 00' 57.7"
Salto Encantado Provincial Park	14	27° 03' 36"	54° 49' 30"
Alegre stream	15	27° 05' 12.6"	54° 47' 01"
Cuña pirú	16	27° 05' 30"	54° 55' 23"
Santo Pipó	17	27° 07' 27.3"	55° 22' 48.9"
Cuña pirú stream, Aristóbulo del Valle	18	27° 08'	54° 54'
Apepú stream	19	27° 09' 15.2"	55° 25' 20.7"
Del Medio stream	20	27° 14' 51"	54° 59' 49.5"
Candelaria	21	27° 28'	55° 45'
San Javier	22	27° 50' 32.7"	55° 04' 52.6"
Itacaruaré	23	27° 52' 35.5"	55° 16' 34.5"
<b>Entre Ríos Province</b>			
Uruguay River, Federación	24	30° 58' 43"	57° 54' 59"
Federación port	25	30° 59' 25.6"	57° 54' 48.5"
Federación	26	31° 01' 47"	58° 03' 59.9"
Concordia	27	31° 23'	58° 01'
Concepción stream	28	31° 44' 22"	58° 18' 13"
Colón	29	32° 14'	58° 08'
Concepción del Uruguay	30	32° 26' 57"	58° 13' 36.7"
Galeguaychú River	31	33° 00' 56.4"	58° 29' 53"
Nandubaizal park, Galeguaychú	32	33° 03' 58"	58° 23' 12"
Uruguay River, Galeguaychú	33	33° 04'	58° 15' 27"
El Chajá stream	34	33° 37' 36"	58° 49' 10"

Malambo stream	35	33° 41' 46"	58° 50' 45"
Tabaré stream	36	33° 47'	58° 52'
<b>Corrientes Province</b>			
Stream near Paso de la Patria	37	27° 19' 38"	58° 33' 51"
Paso de la Patria	38	27° 20'	58° 36'
Pond near San Roque	39	28° 28' 16"	58° 42' 12"
Colonia Pando	40	28° 31' 17.9"	58° 39' 32.3"
Santa Lucia River	41	28° 34' 31"	58° 43' 19"
San Roque	42	28° 39' 31"	58° 42' 58"
Goya	43	29° 09' 21"	59° 16' 42"
Point near Goya	44	29° 21' 09"	59° 16' 42"
Machuca stream	45	29° 28' 38"	59° 18' 16"
San Martín	46	29° 37' 15"	59° 19' 56"
Pehuajó stream	47	29° 43'	59° 23'
Corrientes River	48	29° 48' 51"	59° 23' 33"
Guayquiraró River	49	30° 20' 10"	59° 30' 34"
Aguapey River	50	29° 06' 02"	56° 36' 21"
Alvear	51	29° 06' 39"	56° 33' 19"
Monte Caseros	52	30° 15' 02"	57° 37' 19"
Mocoretá River	53	30° 37' 36.6"	57° 58' 57"
<b>Chaco Province</b>			
Pond near Selvas del Río de Oro	54	26° 45' 09"	58° 58' 30"
Selvas de Río de Oro	55	26° 46' 32"	58° 56' 24"
Río de Oro River, Selvas del Río de Oro	56	26° 47' 13"	58° 57' 42"
Pond near Selvas del Río de Oro	57	26° 49' 59"	58° 59' 13"
Stream near Selvas del Río de Oro	58	26° 50' 44"	59° 00' 36"
Canguy Chico stream, General Vedia	59	26° 52' 47"	58° 35' 15"
Timbó pond	60	26° 53' 45"	58° 30' 38"
Canguy Grande stream, General Vedia	61	26° 54'	58° 37'
Puerto Bermejo	62	26° 55' 43"	58° 30' 17"
General Vedia	63	26° 55' 49"	58° 38' 33"
Río de Oro River, General Vedia	64	26° 56' 44"	58° 39' 10"
Cancha Larga	65	27° 04' 37"	58° 43' 51"
Resistencia	66	27° 27' 45"	58° 57' 16"





<i>Physa acuta</i>												
<i>Stenophysa marmorata</i>	7192	7326				7191						
<b>Site</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>	<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	
<i>Asolene pulchella</i>												
<i>Pomella americanista</i>												
<i>P. megastoma</i>												
<i>Pomacea canaliculata</i>	7092			X		X		X	X			
<i>P. scalaris</i>												
<i>Heleobia guaranitica</i>												
<i>H. parchappii</i>												
<i>Potamolithus lapidum</i>												
<i>P. philippianus</i>												
<i>Potamolithus</i> sp.*												
<i>Hebetancylus moricandi</i>				7156		7160	7333	7332		7334	7336	
<i>Uncancylus concentricus</i>			X									
<i>Gundlachia ticaga</i>												
<i>Laevapex</i> sp.												
<i>Chilina megastoma</i>												
<i>Lymnaea columella</i>												
<i>Antillorbis nordestensis</i>												
<i>Acrorbis petricola</i>												
<i>Biomphalaria intermedia</i>												
<i>B. occidentalis</i>												
<i>B. orbignyi</i>												
<i>B. peregrina</i>						X						
<i>B. straminea</i>												
<i>B. tenagophila</i>	7038		7022	7179		X	X	X				7164
<i>Drepanotrema anatinum</i>	7030											
<i>D. cimex</i>												X
<i>D. depressissimum</i>												
<i>D. kermatoides</i>	7030	7040						7171				7173
<i>D. lucidum</i>						7149	X	7161	7150	7153		
<i>Physa acuta</i>					6521							
<i>Stenophysa marmorata</i>			7325	X				7318	7317			
<b>Site</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>	<b>51</b>	<b>52</b>	<b>53</b>	<b>54</b>	<b>55</b>	
<i>Asolene pulchella</i>												X
<i>Pomella americanista</i>												7279
<i>P. megastoma</i>						7082	X	7002				
<i>Pomacea canaliculata</i>			X			7082	X	X			X	
<i>P. scalaris</i>												
<i>Heleobia guaranitica</i>									X			
<i>H. parchappii</i>												X
<i>Potamolithus lapidum</i>								7002	7001			
<i>P. philippianus</i>												
<i>Potamolithus</i> sp.*												
<i>Hebetancylus moricandi</i>	7328		7327								7338	
<i>Uncancylus concentricus</i>	X					7341			X			
<i>Gundlachia ticaga</i>												
<i>Laevapex</i> sp.												

<i>Chilina megastoma</i>												
<i>Lymnaea columella</i>									7276	7277		
<b>Site</b>	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>	<b>61</b>	<b>62</b>	<b>63</b>	<b>64</b>	<b>65</b>	<b>66</b>	
<i>Antillorbis nordestensis</i>												
<i>Acrorbis petricola</i>												
<i>Biomphalaria intermedia</i>												
<i>B. occidentalis</i>												
<i>B. orbignyi</i>												
<i>B. peregrina</i>												
<i>B. straminea</i>					7181		7043	7039			7026	
<i>B. tenagophila</i>	7027		7148		7029						7026	7163
<i>Drepanotrema anatinum</i>											7026	
<i>D. cimex</i>	X	7176					7039					
<i>D. depressissimum</i>												
<i>D. kermatoides</i>							7043	7039				
<i>D. lucidum</i>		7151										7154
<i>Physa acuta</i>												
<i>Stenophysa marmorata</i>		7319			X		X			X		
<i>Asolene pulchella</i>												
<i>Pomella americanista</i>												
<i>P. megastoma</i>												
<i>Pomacea canaliculata</i>	X	7347	X		X		X				X	X
<i>P. scalaris</i>								X				X
<i>Heleobia guaranitica</i>												
<i>H. parchappii</i>				X		X				X		X
<i>Potamolithus lapidum</i>												
<i>P. philippianus</i>												
<i>Potamolithus</i> sp.*												
<i>Hebetancylus moricandi</i>	7337	7339							7330		X	
<i>Uncancylus concentricus</i>			7343		7344		X					7345
<i>Gundlachia ticaga</i>												
<i>Laevapex</i> sp.												
<i>Chilina megastoma</i>												
<i>Lymnaea columella</i>												
<i>Antillorbis nordestensis</i>												
<i>Acrorbis petricola</i>												
<i>Biomphalaria intermedia</i>												
<i>B. occidentalis</i>	X							7162				
<i>B. orbignyi</i>												
<i>B. peregrina</i>												
<i>B. straminea</i>							X					
<i>B. tenagophila</i>		7178										
<i>Drepanotrema anatinum</i>	7168	7169	7170		7346			7166	7348			7165
<i>D. cimex</i>												7174
<i>D. depressissimum</i>												
<i>D. kermatoides</i>												7172
<i>D. lucidum</i>	7157	7158	7159					7152				7155
<i>Physa acuta</i>												
<i>Stenophysa marmorata</i>			7321								7320	7322