

Continental mollusc fauna of the Great Porto Alegre central region, RS, Southern Brazil

A. Ignacio Agudo-Padrón & Paulo Lenhard

Project Avulsos Malacológicos, Caixa Postal (P.O. Box) 010, 88010-970 Centro, Florianópolis, Santa Catarina, SC, Brasil; emails: ignacioagudo@gmail.com; paulolenhard@gmail.com.

ABSTRACT Actual available knowledge about the diversity and conservation status of the molluscan fauna occurring in the continental geopolitical space of the central section of Great Porto Alegre, Rio Grande do Sul State, RS, area of the Biome “Pampa” in Southernmost Brazil is analyzed and discussed. Geographically located on the right bank of the Jacuí Delta (in the homonymous basin) and legally protected under the category of “State Ecological Park”, next to Guaíba Lake where the Gravataí and Sinos rivers (severely polluted by the anthropogenic indiscriminate action) empty, the region holds 66 malacological species and subspecies - 42 gastropods (23 limnic and 19 terrestrial) and 24 bivalves, included in 45 Genera, 24 Families and two Classes - about 1/3 of the total number of species in the State. Fourteen are introduced and invasive alien species, i.e. 11 Gastropoda (one limnic, 10 terrestrial) and 3 bivalves. Finally, at least 8 native bivalves (Unionoida) are contained in National and State Red Lists of Endangered Fauna.

KEY WORDS Continental mollusc fauna, Gastropoda, Bivalvia, Central Great Porto Alegre, Southernmost Brazil region.

Received 14.08.2011; accepted 8.10.2011; printed 30.12.2011

INTRODUCTION

Located in the Central section of Great Porto Alegre Metropolitan region (Agudo-Padrón, 2009a) (Fig. 1), on the right margin of the river basin denominated “Delta do Jacuí”, legally protected under the environmental category “Delta do Jacuí Ecological State Park”, and possessing a rarefied human occupation, mixing in different degrees rural and urban activities, the little Municipal Districts of Cachoeirinha, Canoas, and Gravataí (Fig. 2), domain of Biome “Pampa” within the basin of the Gravataí and Sinos rivers, today severely polluted by the indiscriminate human actions (Etchichury & Barbieri, 2009), are the geographical areas (see Menegat et al., 2006), reported in this brief note, where malacological research is being systematically developed starting from Spring 2004 (Agudo-Padrón, 2007).

Previous general informations about the mollusc fauna existent in the Southern State of Rio Grande do Sul, RS, are concentrate in recent

available literature (Agudo-Padrón, 2008a, 2009a-f, 2010; Agudo-Padrón & Lenhard, 2009a, b; Agudo-Padrón, 2011a).

I. CACHOEIRINHA MUNICIPAL DISTRICT

Geographical, environmental and biotic general informations on this geopolitical space comprising the basin of the Gravataí and Sinos rivers (Medeiros et al., 2002; Agudo-Padrón, 2009a) and hosting a total of 42 species (32 Gastropoda and 10 Bivalvia), are concentrated in several published contributions as well as in some unpublished regional technical reports (Lanzer, 1996; Agudo-Padrón, 2007, 2008b, c, 2009a, e, f; Agudo-Padrón & Oliveira, 2008a, b; Agudo-Padrón & Silveira, 2008; Agudo-Padrón & Lenhard, 2009a; Agudo-Padrón et al., 2008, 2009, 2010; Gomes et al., 2011).

At least two native snail-eating-snakes species, *Sibynomorphus neuwiedi* (Ihering, 1911) and *Sibynomorphus ventrimaculatus*

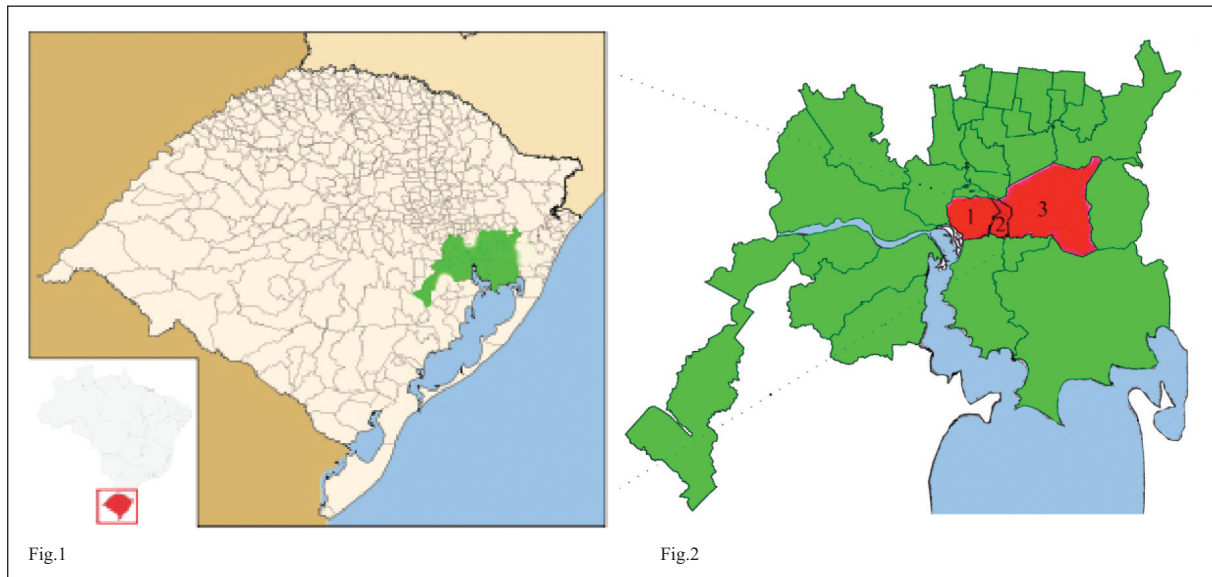


Figure 1. Great Porto Alegre Metropolitan Central region (green color), Rio Grande do Sul State – RS, Southernmost Brazil.
 Figure 2. Municipal Districts territories of Canoas (1), Cachoeirinha (2) and Gravataí (3), red color.

(Boulenger, 1885) (Reptilia: Serpentes, Dipsadidae), are registered for this Municipal District territory (Agudo-Padrón & Sostizzo, 2009). Moreover, two molluscivore birds species specialized in predation and consumption of freshwater mussels and snails occur in swamp environments.

II. CANOAS MUNICIPAL DISTRICT

45 species (22 Gastropoda and 23 Bivalvia) have been reported. Data are included in regional technical reports (Agudo-Padrón & Lenhard, 2009c, d; Agudo-Padrón, 2011a-c) and some other contributions (Medeiros et al., 2002; Mansur & Pereira, 2006).

At least one native snail-eating-snakes species, *Sibynomorphus ventrimaculatus* (Boulenger, 1885) (Reptilia: Serpentes, Dipsadidae), is registered for this Municipal District territory (Agudo-Padrón, 2008c). Two molluscivore birds species specialized in predation and consumption of freshwater mussels and snails species occur in swamp environments.

III. GRAVATAÍ MUNICIPAL DISTRICT

Twenty-seven mollusc species (24 Gastropoda and 3 Bivalvia) are included in some technical contributions (Veitenheimer-Mendes et

al., 1992; Agudo-Padrón & Lenhard, 2009a; Ohlweiler et al., 2009; Gomes et al., 2010; 2011) and unpublished regional technical reports (Agudo-Padrón, 2008d).

At least two native snail-eating-snakes species, *Sibynomorphus neuwiedi* (Ihering, 1911) and *Sibynomorphus ventrimaculatus* (Boulenger, 1885) (Reptilia: Serpentes, Dipsadidae), are registered for this Municipal District territory (Agudo-Padrón & Sostizzo, 2009).

RESULTS

A total of 66 continental species and subspecies (42 Gastropoda – 23 limnic/freshwater and 19 terrestrial – and 24 Bivalvia) included in 45 Genera, 24 Families and 2 Classes, equivalent to about 33% of the total number of species known for the State of Rio Grande do Sul - RS (Agudo-Padrón, 2009d), are present in such a little geopolitical territory reported in this paper. Among them, at least twelve (9 terrestrial and 3 freshwater/limnic) are introduced invading exotic forms (Agudo-Padrón & Lenhard, 2010).

Systematic arrangement are in line with Simone (2006) and Thomé et al. (2006, 2007). Specimens collected during this study were deposited in the Invertebrate Department of the Museum of Natural Science of the Lutheran University of Brazil – MCNU (Agudo-Padrón, 2011b).

Registration and/or collection localities:

- 1 – Cachoeirinha Municipal District
- 2 – Canoas Municipal District
- 3 – Gravataí Municipal District

SYSTEMATIC SPECIES LIST

Class Gastropoda

Subclass Prosobranchia / Caenogastropoda

Family Ampullariidae

- *Asolene platae* (Maton, 1809)^{1,3}
- *Pomacea canaliculata* (Lamarck, 1819)
(Figs. 3-6)^{1,2,3}

Family Hydrobiidae

- *Heleobia* species^{1,2}
- *Littoridina cuzcoensis* (Pilsbry, 1911)³

Subclass Gymnophila

Family Veronicellidae

- *Belocaulus angustipes* (Heynemann, 1885)¹
- *Belocaulus willibaldoi* Ohlweiler, Mota & Gomes, 2009 (Figs. 7,8)^{1,2,3}
- *Phyllocaulis soleiformis* (d'Orbigny, 1835)
(Figs. 9,10)^{1,2}
- *Phyllocaulis tuberculatus* (Martens, 1868)³
- *Phyllocaulis variegatus* (Semper, 1885)¹

Subclass Pulmonata

Family Ancyliidae

- *Burnupia ingae* Lanzer, 1991^{1,2}
- *Ferrisia gentilis* Lanzer, 1991^{1,2,3}
- *Gundlachia ticaga* (Marcus & Marcus, 1962)³
- *Hebetancylus* (= *Gundlachia*) *moricandi*
(d'Orbigny, 1837)^{1,2}
- *Uncancylus* (= *Gundlachia*) *concentricus*
(d'Orbigny, 1835)^{1,2}



Fig.3



Fig.4



Fig.5



Fig.6

Figures 3-6. Native limnic apple snails *Pomacea canaliculata* (Fig. 3), and typical regional habitats (Figs. 4-6). Photo P. Lenhard.

Family Chiliniidae

- *Chilina fluminea* (d'Orbigny, 1835)³

Family Physidae

- *Aplexa* (*Stenophysa*) *marmorata* (Guilding, 1828)^{1,2,3}
- *Physa acuta* (= *cubensis*) Draparnaud, 1805¹

Family Lymnaeidae

- *Lymnaea* (= *Pseudosuccicnea*) *columella* Say, 1817³

Family Planorbidae

- *Antillorbis nordestensis* (Lucena, 1954)^{1,2,3}
- *Biomphalaria oligoza* Paraense, 1975^{1,2,3}



Fig.7



Fig.8



Fig.9



Fig.10



Fig.11



Fig.12

Figures 7,8. Native slugs *Belocaulus willibaldoi*. Photos P. Lenhard.

Figures 9,10. Native slug *Phyllocaulis soleiformis* (Fig. 9), common species in regional gardens, vegetated squares, agronomic enterprises and wastelands (Fig. 10). Photos P. Lenhard.

Figures 11,12. Little exotic invasive slug *Deroceras laeve* (Fig. 11), severe pest in regional agronomic enterprises and gardens (Fig. 12). Photos P. Lenhard.

- *Biomphalaria peregrina* (d'Orbigny, 1835) ³
- *Biomphalaria tenagophila tenagophila* (d'Orbigny, 1835) ^{1,2,3}
- *Biomphalaria tenagophila guaibensis* Paraense, 1984 ¹
- *Drepanotrema anatinum* (d'Orbigny, 1935) ³
- *Drepanotrema depressissimus* (Moricand, 1839) ^{1,2,3}
- *Drepanotrema heloicum* (d'Orbigny, 1835) ³
- *Drepanotrema kermatoides* (d'Orbigny, 1835) ³
- *Drepanotrema lucidum* (Pfeiffer, 1839) ³

Family Succineidae

- *Omalonyx convexus* (Heynemann, 1868) ^{1,2}

Family Milacidae

- *Milax gagates* (Draparnaud, 1801) ¹
- *Lehmannia valentiana* (Férussac, 1821) ^{1,3}

Family Limacidae

- *Limacus flavus* (Linnaeus, 1758) ^{1,2}
- *Limax maximus* Linnaeus, 1758 ^{1,2}

Family Agriolimacidae

- *Deroceras laeve* (Müller, 1774) (Figs. 11,12) ^{1,2,3}

Family Philomicidae

- *Meghimatium pictum* (Stoliczka, 1873) ^{1,3}

Family Bulimulidae

- *Bulimulus angustus* Weyrauch, 1966 ^{1,2}
- *Bulimulus tenuissimus* (d'Orbigny, 1835) ¹

Family Megalobulimidae

- *Megalobulimus abbreviatus* (Bequaert, 1948) (Figs. 13-15) ^{1,2}



Fig.13



Fig.14



Fig.15

Figures 13-15. Native giant snails *Megalobulimus abbreviatus* (Bequaert, 1948) and its typical habitat in the Gravataí River basin region (borders of forests and fields). Photos P. Lenhard.



Fig.16



Fig.17



Fig.18



Fig.19



Fig.20



Fig.21

Figure 16. Collection place of the native mussel naiad *Anodontites patagonicus* in the Sinos River basin region (industrial provisioning channels). Photos P. Lenhard.

Figure 17. Collection place of the native giant mussel naiad *Anodontites trapessialis* in the Gravataí River basin region (fish farming dams). Photos P. Lenhard.

Figure 18. Collection place of the native mussel naiad *Leila blainvilleana* in the Gravataí River basin region (fish farming dams). Photos P. Lenhard.

Figure 19. Collection place of the native mussel naiad *Mycetopoda legumen* in the Gravataí River basin region (agricultural irrigation channels). Photos P. Lenhard.

Figures 20,21. Industrial piece incrustated with exotic invasive Asian golden mussels *Limnoperna fortunei* in the Sinos River basin region. Photos M. Pacheco and P. Lenhard.

Family Subulinidae

- *Rumina decollata* (Linnaeus, 1758) ¹
- *Subulina octona* (Bruguière, 1792) ¹

Family Helicidae

- *Helix (Cornu) aspersa* Müller, 1774 ^{1,2,3}

Family Bradybaenidae

- *Bradybaena similaris* (Férussac, 1821) ^{1,2,3}

Class Bivalvia

Order Unionoida

Family Hyriidae

- *Castalia martensi* (Ihering, 1891) ²
- *Diplodon delodontus* (Lamarck, 1819) ²
- *Diplodon multistriatus* (Lea, 1834) ²
- *Rhipidodonta charruana* (d'Orbigny, 1835) ^{1,2,3}
- *Rhipidodonta grata* (Lea, 1866) ^{1,2}

Family Mycetopodidae

- *Anodontites obtusus* (Spix, 1927) ²
- *Anodontites patagonicus* (Lamarck, 1819) (Fig. 16) ^{1,2}
- *Anodontites tenebricosus* (Lea, 1834) ²
- *Anodontites trapesialis* (Lamarck, 1819) (Fig. 17) ^{1,2}
- *Anodontites trapezeus* (Spix, 1827) ²
- *Leila blainvilleana* (Lea, 1835) (Fig. 18) ^{1,2}
- *Monocondylaea corrientesensis* d'Orbigny, 1835 ²
- *Monocondylaea minuana* d'Orbigny, 1835 ²
- *Mycetopoda legumen* (Martens, 1888) (Fig. 19) ^{1,2}

Order Veneroida

Family Corbiculidae

- *Cyanocyclas* (= *Neocorbicula*) *limosa* (Maton, 1809) ²
- *Corbicula fluminea* (Müller, 1774) ^{1,2}
- *Corbicula largillierti* (Philippi, 1844) ²

Family Sphaeridae

- *Eupera klappenbachi* Mansur & Veitenheimer, 1975 ^{1,2,3}
- *Pisidium forense* Meier-Brook, 1967 ³
- *Pisidium globulus* Clessin, 1888 ²
- *Pisidium* species ^{1,2}

- *Pisidium sterkianum* Pilsbry, 1897 ²
- *Sphaerium* species ^{1,2}

Order Mytiloida

Family Mytilidae

- *Limnoperna fortunei* (Dunker, 1857) (Figs. 20,21) ²

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