

**LISTA DE ESPECIES DE PECES DE AGUA
DULCE PARA
CURSOS CONTINENTALES DE URUGUAY**

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CLASE : CHONDRICHTHYOS

ORDEN : MYLIOBATIFORMES

FAMILIA : potamotrygonidae

ESPECIES : Potamotrygon brachyurus (Günther, 1877)	Raya de agua dulce
Potamotrygon hystryx (Müller & Henle, 1841)	Raya de agua dulce
Potamotrygon motoro (Müller & Henle, 1841)	Raya de agua dulce

CLASE: OSTEICHTHYES

ORDEN : CLUPEIFORMES

FAMILIA : Clupeidae

ESPECIES : Brevoortia aurea (Spix & Agassiz, 1829)	Lacha
Pellona flavipinnis (Valenciennes, 1836)	Lacha de agua dulce

ORDEN : CYPRINIFORMES

FAMILIA : Cyprinidae

ESPECIE : Cyprinus carpio carpio (Linnaeus, 1758)	Carpa
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ORDEN : CHARACIFORMES

FAMILIA : Hemiodontidae

ESPECIE : Apareiodon affinis (Steindachner, 1879)	Virolo
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FAMILIA : Curimatidae

SUB_FAMILIA : Curimatinae

ESPECIES : Cyphocharax platanus (Günther, 1880)	Sabalito
Cyphocharax spilodus (Vari, 1987)	Sabalito
Cyphocharax voga (Hensel, 1870)	Sabalito
Potamorhina squamoralevis (Braga & Azpelicueta 1883)	Sabalito
Steindachnerina biomata (Braga & Azpelicueta 1887)	Sabalito
Steindachnerina brevipinna (Eingenmann & Eigenmann, 1889)	Sabalito

SUB-FAMILIA : Prochilodonidae

ESPECIE : Prochilodus lineatus (Valenciennes, 1849)	Sábalo
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SUB-FAMILIA : Anostomatinae

ESPECIES : Leporinus frederici acutidens (Valenciennes, 1847)	Boga
Leporinus fasciatus (Bloch, 1797)	Boga
Leporinus obtusidens (Valenciennes, 1836)	Boga
Leporinus striatus (Kner, 1858)	Boga
Leporinus frederici (Bloch, 1794)	Boga lisa
Schizodon fasciatus (Agassiz, 1829)	Boga lisa
Schizodon platae (Garman, 1890)	Boga lisa
Hoplias malabaricus (Bloch, 1796)	Tararira

FAMILIA : Characidae**SUB-FAMILIA : Characidae**

ESPECIES : <i>Charax stenopterus</i> (Cope, 1884)	Dientudo
<i>Cynopotamus argenteus</i> (Valenciennes, 1836)	Dientudo jorobado
<i>Galeocharax humeralis</i> (Valenciennes, 1879)	Dientudo jorobado
<i>Roeboides prognathus</i> (Boulenger, 1895)	Dientudo jorobado
<i>Roeboides bonariensis</i> (Steindachner, 1879)	Dientudo jorobado
<i>Acetrorhynchus pantaneiro</i> (Menezes, 1992)	Dientudo paraguayo
<i>Oligosarcus hepsetus</i> (Steindachner, 1867)	Dientudo
<i>Oligosarcus jenynsi</i> (Günther, 1864)	Dientudo

SUB-FAMILIA : Bryconinae

ESPECIES : <i>Brycon orbignyanus</i> (Valenciennes, 1849)	Salmón criollo
<i>Salminus maxillosus</i> (Valenciennes, 1850)	Dorado
<i>Triportheus paranensis</i> (Günther, 1874)	Machete

SUB-FAMILIA: Glandulocaudinae

ESPECIES : <i>Diapoma speculiferum</i> (Cope, 1894)	Mojarra
<i>Glandulocauda terofali</i> (Gery, 1964)	Mojarra
<i>Pseudocorynopoma doriac</i> (Perugia, 1891)	Mojarra de velos

SUB-FAMILIA : Tetragonopterinae

ESPECIES : <i>Astyanax abramis</i> (Jenyns, 1842)	Mojarra
<i>Astyanax bimaculatus</i> (Linnaeus, 1758)	Mojarra
<i>Astyanax eigenmanniorum</i> (Cope, 1894)	Mojarra
<i>Astyanax fasciatus</i> (Cuvier, 1819)	Mojarra
<i>Astyanax albarnus</i> (Hensel, 1870)	Mojarra
<i>Astyanax scabripinnis</i> (Messner, 1962)	Mojarra
<i>Astyanax stenthalinus</i> (Messener, 1962)	Mojarra
<i>Bryconamericus boops</i> (Eigenmann, 1908)	Mojarra
<i>Bryconamericus stramineus</i> (Eigenmann, 1908)	Mojarra
<i>Bryconamericus iheringi</i> (Boulenger, 1897)	Mojarra
<i>Hyphessobrycon anisitzi</i> (Eigenmann, 1907)	Mojarra
<i>Hyphessobrycon bifasciatus</i> (Ellis, 1911)	Mojarra
<i>Hyphessobrycon reticulatus</i> (Ellis, 1911)	Mojarra
<i>Hyphessobrycon luctkeni</i> (Boulenger, 1897)	Mojarra
<i>Hyphessobrycon meridionalis</i> (Ringuelet, 1978)	Mojarra
<i>Moenkhausia sancta – filomenae</i> (Steindachner, 1907)	Mojarra
<i>Moenkhausia dichoura</i> (Kner, 1858)	Mojarra
<i>Markiana nigripinnis</i> (Perugia, 1891)	Ipiau
<i>Hollandichthys multifasciatus</i> (Eigenmann & Norris, 1900)	Mojarra
<i>Tetragonopterus argenteus</i> (Cuvier, 1817)	Mojarra

SUB-FAMILIA : Cheirodontinae

ESPECIES : <i>Cheirodon interruptus</i> (Jenyns, 1842)	Mojarra
<i>Serrafinnus piaba</i> (Luckten, 1974)	Mojarra
<i>Odontostilbe microcephala</i> (Eingenmann, 1907)	Mojarra

SUB-FAMILIA : Characidiinae

ESPECIES : *Characium fasciatum* (Reinhardt, 1866)
Characidium rachowi (Regan, 1913)

Mariposita
 Mariposita

SUB-FAMILIA : Serrasalminae

ESPECIES : *Piaractus brachiponus* (Cuvier, 1817)
Mylossoma orbignyanum (Valenciennes, 1848)
Mylossoma paraguayensis (Norman, 1929)
Serrasalmus rhombeus (Linneus, 1776)
Serrasalmus nattereri (Kner, 1860)
Serrasalmus spilopleura (Kner, 1860)

Pacú
 Pacusito
 Pacusito
 Piraña
 Piraña
 Piraña

SUB-FAMILIA : Stethaprioninae

ESPECIE : *Ephippicharax orbicularis paraguayensis* (Eigenmann, 1907)

Mojarra

ORDEN : SILUROFORMES**FAMILIA : Ariidae**

ESPECIES : *Genidens genidens* (Valenciennes, 1840)
Netuma arba (Lacépède, 1903)

Bagre de Mar
 Mochuelo

FAMILIA : Doradidae

ESPECIES : *Megalodoras laevigatulus* (Berg, 1901)
Oxydoras kneri (Bleeker, 1855)
Pterodoras granulatus (Valenciennes, 1821)
Rinodoras dorbigny (Kröyer, 1855)

Armado
 Armado chanco
 Armado
 Marieta

FAMILIA : Auchenipteridae

ESPECIES : *Auchenipterus nuchalis* (Spix, 1829)
Trachelyopterus albicrux (Berg, 1901)
Trachelyopterus ceratophysus (Kner, 1857)

Buzo, Hoción
 Torito
 Torito

FAMILIA : Pimelodidae**SUB-FAMILIA : Pimelodinae**

ESPECIES : *Pimelodella gracilis* (Valenciennes, 1840)
Bergiella platanus (Steindachner, 1908)
Bergiaria westermanni (Lutken, 1874)
Pimelodus albicans (Valenciennes, 1840)
Parapimelodus valenciennisi (Köyer, 1874)
Pimelodus argenteus (Perugia, 1891)
Pimelodus brevis (Marini, Nichols & La Monte, 1933)
Luciopimelodus argentinus (Mac Donagh, 1939)
Luciopimelodus pati (Valenciennes, 1840)
Megalonema platanum (Günther, 1880)
Pimelodus maculatus (Lacépède, 1903)

Bagrecito
 Bagre trompudo
 Bagre trompudo.
 Bagrecito
 Misionero
 Bagre
 Bagre
 Pati
 Pati bastardo
 Bagre amarillo

FAMILIA : Pimelodidae**SUB-FAMILIA : Pseudopimelodinae**

ESPECIE : *Pseudopimelodus zungaro* (Valenciennes, 1840)

Manguruyú amarillo

SUB-FAMILIA : Sorubinae

ESPECIES : Hemisorubim platyhynchos (Valenciennes, 1840)	Dormilón
Paulicea luctkeni (Steindachner, 1876)	Manguruyú
Pseudoplatystoma coruscans (agassiz, 1829)	Surubí
Sorubim lima (Schneider en Bloch, 1801)	Cucharón
Pseudoplatystoma fasciatum (Linnaeus, 1758)	Surubí atigrado

FAMILIA : Rhamdinae

ESPECIES : Heptapterus mustelinus (Cuvier & Valenciennes, 1840)	Bagre anguila
Microglanis parahibae (steindachner, 1882)	Manguruyú de las Piedras
Rhamdia quelen (Quoy & Gaimard, 1924)	Bagre sapo
Rhamdia hilarii (Valenciennes, 1840)	Bagre sapo
Rhamdia microps (Eignmann, & Fisher, 1917)	Bagre sapo
Rhamdia sapo (Valenciennes, 1840)	Bagre negro

FAMILIA : Ageneiosidae

ESPECIES : Ageneiosus brevifilis (Valenciennes, 1940)	Mandu
Ageneiosus valenciennesi (Bleeker, 1864)	Manduví

FAMILIA : Aspredinidae

ESPECIE : Bunecephalus dorial (Boulenger, 1902)	Guitarrita
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FAMILIA : Trychomycteridae**SUB-FAMILIA : Trichomycterinae**

ESPECIE : Trichonyceterus angustirostris (Devincenzi, 1942)	
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SUB-FAMILIA : Stegophilinae

ESPECIE : Homodiaetus maculatus (Steindachner, 1879)	Chupa - chupa
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FAMILIA : Callichthyidae

ESPECIES : Callichthys callichthys (Linnaeus, 1758)	Cascarudo Tamboatá
Corydoras aeneus (Gill, 1858)	Doradillo
Corydoras paleatus (Jenyns, 1842)	Doradillo
Corydoras undulatus (Regan, 1904)	Doradillo
Hoplosternum litoralis (Hancock, 1928)	Cascarudo

FAMILIA : Loricariidae**SUB-FAMILIA : Hypoptopmatinae**

ESPECIES: Otoncinclus flexilis (Cope, 1894)	Limpiavidrios
Otoncinclus nigricauda (Boulenger, 1891)	Limpiavidrios

SUB-FAMILIA : Loricariinae

ESPECIES: Farlowella hahni (Meiken, 1937)	Vieja de cola
Loricariichthys anus (Valenciennes, 1836)	Vieja de cola
Loricariichthys maculata (Bloch, 1794)	Vieja de cola
Loricaria typus (Bleeker, 1862)	Vieja de cola
Loricaria apeltogaster (Boulenger, 1895)	Vieja de cola
Paraloricaria vetula (Valenciennes, 1840)	Vieja de cola
Ricola macrops (Regan, 1904)	Vieja de cola
Rinelocaricaria felipponei (Fowler, 1943)	Vieja de cola
Rinelocaricaria lima (Kner, 1854)	Vieja de cola
Rinelocaricaria pareiacantha (Fowler, 1943)	Vieja de cola

Rinelocaricaria thrissoceps (Fowler, 1943)	Vieja de cola
Spatuloloricaria nudiventris (Valenciennes, 1836)	Vieja de cola

FAMILIA : Loricariidae

SUB-FAMILIA : Hypostomatinae

ESPECIES : Hypostomus commersoni (Valenciennes, 1840)	Vieja de agua
Hypostomus laplatae (Eigenmann, 1907)	Vieja de agua
Hypostomus microstomus (Eber, 1987)	Vieja de agua
Hypostomus punctatus (Valenciennes, 1840)	Vieja de agua

ORDEN : GYMNOTIFORMES

FAMILIA : Stenopygydae

ESPECIES : Eigenmannia trilineata (López &Castello, 1966)	Señorita
Eigenmannia virescens (Valenciennes, 1840)	Señorita

FAMILIA : Ramphichthyidae

ESPECIE : Ramphichthys rostratus (Linnaeus, 1766)	Bombilla
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FAMILIA : Gymnotidae

ESPECIE : Gymnotus carapo (Linnaeus, 1758)	Carapo
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SUB-FAMILIA : Apterodontinae

ESPECIE : Apterodontus albifrons (Linnaeus, 1758)	
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ORDEN : GADIFORMES

FAMILIA : Phycidae

ESPECIES : Urophysis cirrata (Goode & Bean, 1896)	Brótola
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ORDEN : BATRACHOIDIFORMES

FAMILIA : Batrachoididae

ESPECIES : Porichthys porosisimus (Cuvier, 1829)	Bagre sapo
Thalassophryne montevidensis (Berg, 1893)	Bagre sapo

ORDEN : MUGILIFORMES

FAMILIA : Mugilidae

ESPECIE: Mugil planatus (Günther, 1880)	Lisa
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ORDEN : ATHERINIFORMES

FAMILIA : Atheridae

ESPECIES : Odontesthes perugiae (Evermann & Kendall, 1906)	Pejerrey
Odontesthes retropinnis (De Buen, 1953)	Pejerrey
Odontesthes bonariensis (Cuvier & Valenciennes, 1835)	Pejerrey
Odontesthes humensis (De Buen, 1953)	Pejerrey

ORDEN : CYPRINODONTIFORMES

FAMILIA : Poeciliidae

SUB-FAMILIA : Gambusinae

ESPECIES : Cnesterodon decemmaculatus (Jenyns, 1842)	Madrecita
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Phalloceros caudmaculatus (Hensel, 1868)	Madrecita
SUB-FAMILIA : Poecilopocinae	
ESPECIE : Phallothyichus januaris (Hensel, 1842)	Madrecita
FAMILIA : Anablepidae	
ESPECIE : Jenynsia lineata (Jenyns, 1842)	Overito
FAMILIA : Aplocheilidae	
ESPECIES : Cynolebias adloffii (Ahl, 1924)	Cinolebias
Cynolebias alexandri (López &Castello, 1974)	Cinolebias
Cynolebias bellotti (Steindachner, 1881)	Cinolebias
Cynolebias cinereus (Amato, 1986)	Cinolebias
Cynolebias cheradophilus (Vaz-Ferreira, et al. 1967)	Cinolebias
Cynolebias gymnoventris (Amato, 1986)	Cinolebias
Cynolebias luteotlamulatus (Vaz-Ferreira, et al. 1967)	Cinolebias
Cynolebias nigripinnis (Regan, 1912)	Cinolebias
Cynolebias prognathus (Amato, 1986)	Cinolebias
Cynolebias viarius (Vaz-Ferreira et al, 1967)	Cinolebias
Cynolebias wolterstorffi (Ahl, 1924)	Cinolebias
ORDEN : SYMBRANCHIFORMES	
FAMILIA : Synbranchidae	
ESPECIES : synbranchus marmoratus (Bloch, 1795)	Anguila
ORDEN : SCORPAENIFORMES	
FAMILIA : Triglidae	
ESPECIES : Prionotus punctatus (Bloch, 1797)	Rubio
Prionotus nudigula (Guinsburg, 1833)	Rubio
FAMILIA : Dactylopteridae	
ESPECIE : Dactylopterus volitans (Linnaeus, 1758)	Golondrina
ORDEN : PERCIFORMES	
FAMILIA : Carangidae	
ESPECIE : Parona Signata (Jenynsa, 1841)	Palometa
FAMILIA : Gerridae	
ESPECIE : Eucinostomus gula (Quoy & Guimard, 1824)	Mojarra
FAMILIA : Sciaenidae	
ESPECIES : Pachyurus bonariensis (Steindachner, 1879)	Corvina
Plagioscion macdonaghi (Daneri, 1954)	Corvina
ORDEN : PLEURONECTIFORMES	
FAMILIA : Achiridae	
ESPECIES : Achirus jenynsi (Günther, 1862)	Lenguado de agua dulce
Achirus lineatus (Linnaeus, 1758)	Lenguado de agua dulce

Aquatic species introduced in Uruguay

F. Amestoy, M. Spinetti and G. Fabiano

Introduction

The introduction of exotic aquatic species in Uruguay has been specifically banned by the fishery law since 1969. The country is also a cosigner of the Code of Practices for the Introduction of Exotic Species in the River Plate basin, approved in 1991 by the Commission of Continental Fisheries for Latin America (FAO-COPESCAL) in Lima, Peru. Despite the present regulations against introducing exotic species, the presence of several introduced aquatic organisms in our ecosystems has been confirmed. This paper deals with those species introduced intentionally or by accident as well as the ones used in aquaculture, but excludes information related to certain ornamental species.

Materials and methods

Between 1983 and 1994, 23 limnological surveys were performed in order to study the fishery resources of the Uruguay river (CARU 1990, 1993) and afterwards (from 1987 to 1988) 8 more surveys for fish stock assessment were conducted in the upper and middle River Plate (CARP 1990). From 1990 to 1994, similar studies were also carried out in the Negro river (DI-

PRODE-INAPE 1993) (Fig. 1). In all cases, the sweep per defined area method was used as well as experimental fishing with multi-mesh gillnets. The Ponar dredge was used to sample benthos. Information collected through interviews with private fish producers is also considered in this paper.

Results and discussion

A list of exotic aquatic species found in Uruguay, the dates they were first reported, and their present area of distribution are presented in Table 1. These species showed different adaptative success in colonization. The common carp (*Cyprinus carpio*) and the Asiatic clam (*Corbicula* spp.) were the best-adapted.

Asiatic clam *Corbicula* spp. (VON MÜHLFELD, 1811)

The first report of this species in the River Plate dates from 1979 when it was found in the Argentine border (ITUARTE 1979). In 1986, the presence of two species of this genus, *C. flumi-*

Table 1. Introduced aquatic species in Uruguay and their present distribution.

Species	Common name	Y.I.*	Origin	Distribution
<i>Corbicula fluminea</i>	Asiatic clam	1986	Argentina	1, 2, 3, 4
<i>C. largillierti</i>		1986	Argentina	
<i>Limnoperna fortunei</i>	Asiatic mussel	1994	Argentina	2
<i>Cyprinus carpio</i>	Common carp	1987	Argentina	1, 2, 4, 5
<i>C. carpio</i> var. <i>especularis</i>	Mirror carp	1987	Argentina	1, 2
<i>Acipenser baeri</i> **	Sturgeon	1995	Russia	
<i>Carassius carassius</i> **	Coi carp	1990	Brazil	
<i>C. gibelio</i> **	Carpa Coi	1990	Brazil	
<i>Oncorhynchus mykiss</i> **	Rainbow trout	1990	Brazil	
<i>Salmo trutta</i> **	Trout	1957	Brazil	
<i>Rana catesbiana</i> **	Bull frog	1986	Brazil	
<i>Gracilaria</i> spp. **	Agarigenous algae	1990	South Africa	
<i>Halotis rufescens</i> **	Red abalon	1993	USA	

* YI, year of introduction.

** introduced for aquaculture.

1 = Uruguay River, 2 = River Plate, 3 = Negro River, 4 = Santa Lucía River, 5 = Coastal lagoons.

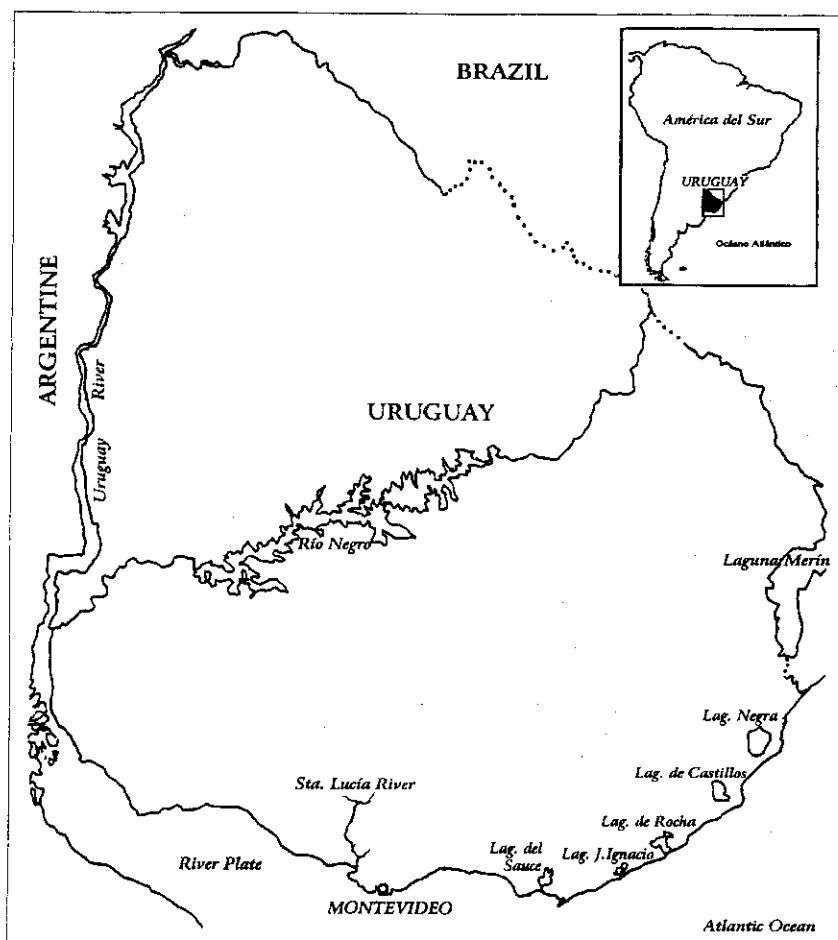


Fig. 1. Study area.

nea and *C. largillierii*, was confirmed in the Uruguay River from its mouth to 203 km upstream (Paysandu city), in the San Salvador River (from the source to its flow into the Uruguay River) and in the Negro River (from its mouth in the Uruguay River to the Palmar hydroelectric dam). Analysis of stomach contents of boga (*Leporinus obtusidens*), white catfish (*Pimelodus albicans*), armado común (*Pterodoras granulosus*), armado chancho (*Oxydoras kneri*), yellow catfish (*Pimelodus clarias*) and trunky catfish (*Iheringyctys westernmanni*) revealed that the Asiatic clam was one of the most important items. In the armado común, it represented up to 30 % of the total wet fish

weight. Between 1987 and 1989, the estimated total density of these molluscs near the Uruguay River mouth (at the coast at Nueva Palmira city) increased from 3,000 to 50,000 clams/ha (SPINETTI et al. 1992).

The actual area of distribution includes the Uruguay River from the Brazilian border to the outlet, the first third of the Negro River, and the River Plate (from the Paraná delta to the Santa Lucía River).

It is possible that *Corbicula* spp. came in ballast tanks as dead-weight in oil tankers or other vessels; on the other hand, the fact that large numbers are consumed in many countries of Asia could indicate an intentional introduction.

The recent introduction of the Asiatic mytilid *Limnoperna fortunei* (DUNKER 1857) in the inner River Plate (SCARABINO & VERDE 1994) seems to confirm the first hypothesis. The introduction could have occurred by way of vessels that reach different ports in the Paraná and Uruguay Rivers, by juvenile stages that get into filamentous algae which are carried by birds, or by transport into the digestive tracts of migratory fishes (MCMAHON 1982).

Studies on fish feeding show that *Corbicula fluminea* became an important link in the trophic chain of the upper River Plate and the lower Uruguay River, permitting the transfer of organic matter from sediments throughout benthophagous organisms to the rest of the trophic chain.

The explosive increase of density led to competition between individuals for space, as well as changes in the kind of substratum due to detritus accumulation. This could lead to interspecific competition causing the displacement of autochthonous species, and intraspecific competition causing the reduction or disappearance of clam populations of their own species (GARDNER et al. 1976). An increase in the number of empty valves in the sediment has been recorded in recent years, due to an increase in the mortality of the species. At present, it seems that a balance exists between the ecosystems noted, with many fish species preying on the molluscs and resulting in a natural control of clam populations.

Carp (*Cyprinus carpio* LINNAEUS, 1758)

Carp was introduced from Brazil, through the Uruguay River, and from Argentina, through the River Plate. During the 1960s, the species was introduced from Brasil for aquaculture in the NE of Uruguay. During the 1970s, the appearance of carp in River Plate surveys was extremely rare. Now, it is one of the most abundant species in the area, and there is a positive correlation of its biomass with the percentage of organic matter in the sediments. Densities of 300 kg/ha and mean values of 24 kg/ha were determined at Buenos Aires at the coast. In the upper River Plate the mirror carp (*Cyprinus carpio* var. *specularis*) was detected, though in small numbers.

During 1983 in the Uruguay River, at the beginning of the assessment program, the species

was not recorded from the area. In 1987, however, the common carp appeared in some exploratory sampling at densities less than 1 kg/ha. After 1989, the distribution was wider and the species was present in many samples. In 1991, many adult individuals were detected in Paso Severino dam waters in the Santa Lucía River basin. In 1993, the species was found in the Castillos warmwater lagoon, in the SE zone of the Atlantic coast of the country.

Despite the fact that the introduction of this species from Brazil occurred prior to that from Argentina, with first reports on its presence in the Uruguay River appearing in the 1980s (PRENSKI & BAIGÚN 1982), the temporal-spatial variation recorded in the River Plate-Uruguay River system indicates that the most important introduction into Uruguayan waters was from Argentina. The fact that this species has adherent eggs would make upstream dispersion easier, assuring its permanence in the area.

The common carp has been identified as responsible for the destruction of continental ecosystems due to its habit of disturbing bottom sediments, so excluding other organisms, causing an increase of turbidity, and oxygen depletion. In Argentina, it is considered that the introduction of the species has negatively affected the silverside (*Odontesthes bonariensis*) populations present in rivers and lakes (RINGUELET et al. 1967). In the area studied, the presence of the species is generally associated with the sabalo (*Prochilodus lineatus*), yellow catfish (*Pimelodus clarias*) and another bottom species, but it is more resistant than the others to adverse environmental conditions. A highly significant negative correlation was found between the presence of the common carp and low pH and dissolved oxygen concentration. The higher abundance was recorded in contaminated areas. Apparently, the common carp has not displaced the native species, but, rather, has colonized environments previously modified by man. In the Uruguay River, where urban contamination is lower as is organic matter content in the sediments, the presence of carp is less significant and the sabalo was the dominant fish captured.

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Authors' address:

F. AMESTOY, M. SPINETTI and G. FABIANO, Instituto Nacional de Pesca (INAPE), Constituyente 1497, Montevideo, Uruguay.

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