

# First record of *Myocastor coypus* (Molina 1782) (Mammalia, Rodentia) for the state of Mato Grosso do Sul, Brazil, and its distribution in southern South America

Primer registro de *Myocastor coypus* (Molina 1782) (Mammalia, Rodentia) para el estado de Mato Grosso do Sul, Brasil y su distribución en el sur de Sudamérica

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## Abstract

This study presents the first record of *Myocastor coypus* in the state of Mato Grosso do Sul, in addition to detailing its distribution within southern South America, highlighting where it is considered native or exotic in Brazil. On April 23, 2018, at approximately 18:00, an adult specimen with a 40 cm BL (body length) was registered after being run over on a side road near wetlands and a dam in a rural area in the municipality of Bataguassu, eastern state of Mato Grosso do Sul. It is not possible to state the origin of the *M. coypus* reported in the present study; whether it was introduced or dispersed naturally through the flooded areas of the Paraná River, since the species has records on the border of the states of Mato Grosso do Sul and Paraná.

**Keywords:** Expansion of distribution, exotic, nutria, coypu, South America

## Resumen

Este estudio presenta el primer registro de *Myocastor coypus* en el estado de Mato Grosso do Sul, además de señalar su distribución al sur de América del Sur, destacando dónde se considera nativo y exótico en Brasil. El 23 de abril de 2018, aproximadamente a las 6:00 pm, se registró, con un LC (longitud corporal) de 40 cm, un espécimen adulto atropellado en un camino lateral cerca de humedales y una represa, en un área rural en el municipio de Bataguassu, al este del estado de Mato Grosso do Sul. No es posible determinar el origen de *M. coypus* reportado en el presente estudio; tampoco es posible establecer si fue introducido o dispersado de forma natural por las zonas pantanosas del río Paraná, ya que la especie tiene registros en la frontera de los estados de Mato Grosso do Sul y Paraná.

**Palabras claves:** expansión de la distribución, exótico, nutria, coipo, Sudamérica

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*Myocastor coypus* (coypu / nutria) is a rodent (Lacher et al., 2020; Patton et al., 2015) of the Myocastoridae family (Wilson and Reeder, 2005), an excellent swimmer which easily colonizes available habitats (Bueno, 2013). It is a large rodent 1-10 kg (Bonvicino et al., 2008; Paglia et al., 2012), body 40-60 cm; tail 30-45cm (Oliveira and Bonvicino, 2006), with dorsal yellowish-grey fur, streaked with black hair, the sides are lighter, the ventral region is whitish with a cylindrical tail (Oliveira and Bonvicino, 2006; Woods et al., 1992). Feet are much longer than hands, and contain five digits, four of which are connected by a membrane and the fifth is free (Oliveira and Bonvicino, 2006; Woods et al., 1992). Hands have four digits, long, flexible and free; the incisors are highlighted and bright orange yellow (unlike those in rats which are brown-yellow), with white marks on the muzzle (Bueno, 2013; Oliveira y Bonvicino, 2006; Woods et al., 1992). They are abundant in freshwater, brackish and saltwater marshes, but they may also live along lentic lakes and streams (Nowak, 1999), with a preference for humid areas with emerging vegetation and areas with succulent vegetation along the banks (Greer, 1966). Although they feed mainly on vegetable matter, they can occasionally prey on molluscs and the eggs of waterfowl (Angelici et al., 2012; Scaravelli, 2002).

The species is native from southern South America, occurring in Argentina, Bolivia, Chile, Paraguay, Uruguay, and southern Brazil (Guichón et al., 2003; Oliveira and Bonvicino, 2006; Woods et al., 1992). In Brazil, its original distribution includes the states of Rio Grande do Sul, Santa Catarina, and Paraná (Bavaresco et al., 2017; Bonvicino et al., 2007; Cherem et al., 2004; Moojen, 1952), but it has been introduced in other states, such as São Paulo (De Vivo et al., 2011), or dispersed to Rio de Janeiro (Bueno, 2013). The bathing rat was introduced in several countries around the world for the value of its skin and its meat, including Italy (Bertolino and Ingegno, 2009; Prigioni et al., 2005) and Great Britain (Harris, 1995), Finland and North America (Guichón et al., 2003), causing damage to the natural environment of the invaded areas (Genovesi et al., 2009). There are reports of the presence of this species also across Asia, including Japan, China, South Korea, and Thailand and in Africa (Kenya, Zimbabwe,

Zambia, and Botswana) (Carter and Leonard, 2002). Thus, *M. coypus* has been introduced on all continents, except Australia and Antarctica (Bueno, 2013) and on the Caribbean islands (Borroto-Páez and Woods, 2012). According to Woods et al. (1992), the species may have been introduced in certain regions of the world in the hope of reducing populations of undesirable aquatic plants.

The species is classified by the International Union for the Conservation of Nature (IUCN) as one of the 100 worst invasive alien species in the world, considered exotic in 44 countries (Global Invasive Species Database [GISD], 2020; Lowe et al., 2000). Among other impacts are its ability to compete for niches with native species, to destroy waterfowl nests in search of eggs (Angelici et al., 2012; Scaravelli, 2002), and due to their digging habits, to weaken and damage riverbanks (GISD, 2020; Guichón and Cassini, 2005). Also, according to Carter and Leonard (2002), they can feed on agricultural crops, including sugar cane, alfalfa, and other roots (Woods et al., 1992); in studies carried out in France and Brazil by Ménard et al. (2001) and El-Kouba et al. (2009), *M. coypus* is reported as a host of *Fasciola hepatica*. Howerth et al. (1994), studying a population of *M. coypus* in Louisiana (USA) registered *Toxoplasma gondii*, *Chlamydia psittaci* and *Leptospira* sp. serogroups.

On April 23, 2018, at approximately 18:00, an adult specimen with a 40 cm (figure 1) was recorded as being run over on a side road near wetlands and a dam in a rural area in the municipality of Bataguassu, east of the State of Mato Grosso do Sul (21° 44' 28.46" S; 52° 20' 8" W) (figure 2). The region was originally composed of savannah vegetation (Cerrado *sensu strictu* and Cerradão) (Pott et al., 2014). The climate according to the Köppen classification is the humid tropical (Aw), characterized by two well-defined seasons of dry winters (April - September) and rainy summers (October - March), with annual precipitation ranging between 1400 and 1700 mm, in which November, December and January are the rainiest months (Zavattini, 2009). The average temperature in the coldest month is over 18°C while the average annual maximum is between 27°C and 32°C, with absolute maximum between 35°C and 40°C while the absolute minimum can reach 0°C (Oliveira et

al., 2000; Walter, 2006). According to the Specialist Group on Invasive Species (ISSG), *M. coypus*, is one of the few mammal species that can be successfully considered invasive, present in forty-four countries (GISD, 2020). Considering the great capacity of dispersion and colonization of new habitats of *M. coypus* and in view of all the problems already presented, it is necessary to monitor this species in any new environments populated by it.

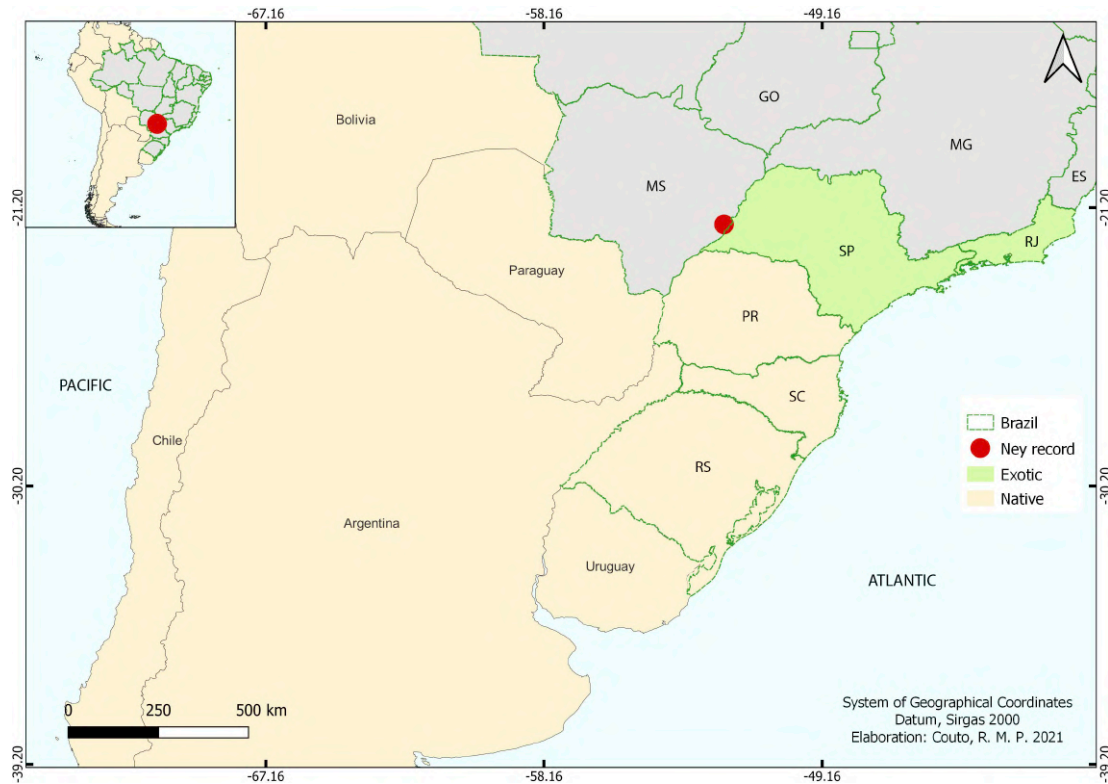
This study presents the first record of *Myocastor coypus* in the state of Mato Grosso do Sul and defined its distribution in the south of South America, highlighting where it is considered native or exotic within Brazil (table 1 and figure 2). This finding widens the distribution of *Myocastor coypus* in Brazil (figure 2). It is not known for certain which states (where it is non-native) the species arrived first. *M. coypus* is believed to have been introduced in the state of São Paulo due to the economic values related to its

meat and skin (Bonvicino et al., 2007). For the other states, it is not known whether it was introduced, or the occupation occurred naturally.

It is not possible to state the origin of *M. coypus* reported in the present study, whether it was introduced or dispersed naturally in the swampy areas of the Paraná River, since the species has records on the border with the states of Mato Grosso do Sul and Paraná, where it is considered native, about 150 km from the record site (Aguiar et al., 2007). However, the record of an adult specimen may indicate the presence of other individual in the area and, considering the life cycle where sexual maturity varies between 3-10 months with a gestation of 127-138 days and with litters that vary of 5-13 pups (Oliveira and Bonvicino, 2006; Woods et al., 1992), has a great potential of becoming an invasive species in the state. It is necessary to implement monitoring programs to determine whether the species is present in the area,



**Figure 1.** *Myocastor coypus* record being run-over and dead on a side road near wetlands and a dam, in a rural area in the municipality of Bataguassu (21° 44' 28.46" S; 52° 20' 8" W), east of the State of Mato Grosso do Sul, Brazil (10 cm bar).



**Figure 2.** Distribution of *Myocastor coypus* in South America. Countries in Latin America and Brazilian states where the species is considered native in beige. Brazilian states where the species is considered exotic in green. Red dot indicates place of registration of the present study (Mato Grosso do Sul state).

**Table 1.** Reports of *Myocastor coypus* within Brazil microbiológico

State	City	Reference	State	City	Reference
PR	Bom Jesus do Sul	Wolfart et al., 2013	PR	Curitiba	El-Kouba et al., 2009
PR	Curitiba	GBIF, 2020	PR	Palotina	Bavaresco et al., 2017
PR	Ouro Verde	Aguiar et al., 2007	RJ	Três Rios	Bueno, 2013
PR	Quedas do Iguaçu	Juraszek et al., 2014	RS	Cruz Alta	GBIF, 2020
RS	Cachoeira do Sul	GBIF, 2020	RS	Mostardas	GBIF, 2020
RS	Cruzeiro do Sul	GBIF, 2020	RS	Quinta	GBIF, 2020
RS	Pareci Novo	Kasper et al., 2007	RS	Rio Grande	Espinelli et al., 2014
RS	Rincão Del Rei	GBIF, 2020	RS	Santa Vitória do Palmar*	GBIF, 2020
RS	Santa Izabel do Sul	Colares et al., 2010	RS	Tramandaí	GBIF, 2020
RS	Santa Vitória do Palmar	Colares et al., 2010	SC	Campo Belo do Sul	Kasper et al., 2012
SC	Campeche	GBIF, 2020	SC	Jaguarura	Cherem et al., 2004
SC	Florianópolis	Cherem et al., 2004	SC	Rio do Sul	GBIF, 2020
SC	Paulo Lopes	Cherem et al., 2004	SP	Cubatão	GBIF, 2020
SP	Araraquara	GBIF, 2020	SP	Guarulhos	GBIF, 2020
SP	Campinas	GBIF, 2020	SP	Jundiaí	GBIF, 2020
SP	Itatiba	GBIF, 2020	SP	Limeira	GBIF, 2020
SP	Jaguariúna	GBIF, 2020	SP	Piracicaba	GBIF, 2020
SP	Pedreira	Bonvicino et al., 2007	SP	Porto Ferreira	GBIF, 2020

\*Fossil records

PR = Paraná; RJ = Rio de Janeiro; RS = Espírito Santo; SC = Santa Catarina and SP = São

whether the presence is a result of natural expansion of nearby populations due to changes in the habitats or whether the animals have been introduced and can cause severe impacts on local ecosystems. Given that the record was obtained through an opportunistic way and since in this case we had no license to collect or transport wild animals, we performed a photographic record, and the image is deposited in the UFMS Reference Zoological Collection (ZUFMS-MNV00149).

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## CONFLICTS OF INTEREST

The authors express that there is no conflict of interest.

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