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NEW RECORDS OF *Monodelphis kunsii* (DIDELPHIMORPHIA, DIDELPHIDAE) FROM BRAZIL

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ABSTRACT: We review the known distribution of *Monodelphis kunsii* from South America and reported nine new localities of occurrence in Mato Grosso do Sul state, southwestern Brazil. These new records fill the gap on geographic distribution of *M. kunsii* in southwestern Brazil. The species presents wide geographic range including distinct habitats. The lack of studies in southwestern Brazil and the non-utilization of pitfall traps can be the main factors responsible for the lack of knowledge on distribution of small mammal species to this region.

RESUMO: Novos registros de *Monodelphis kunsii* (Didelphimorphia, Didelphidae) para o Brasil. Nos revisamos o conhecimento da distribuição de *Monodelphis kunsii* para América do Sul e informamos nove localidades de ocorrência no Estado de Mato Grosso do Sul, sudoeste do Brasil. Estes novos registros cobrem uma lacuna na distribuição de *M. kunsii* no sudoeste do Brasil. Os espécimes apresentaram ampla distribuição geográfica incluindo diferentes habitats. A falta de estudos no sudoeste do Brasil e a não utilização de armadilhas pitfall podem ser os principais fatores responsáveis pela falta de conhecimento na distribuição das espécies de pequenos mamíferos para esta região.

Key words. Biogeography. Ecoregions. Pitfall traps. Pygmy short-tailed opossum. South America.

Palabras clave. América do Sul. Biogeografia. Catita. Ecorregiões. Pifall traps.

Monodelphis kunsii Pine, 1975 is a small and terrestrial marsupial with 71-94 mm of body-head, tail with 41-42 mm and approximately 19 g of body mass (Pine, 1975; Anderson, 1982). Dorsal pelage is brown and ventral pelage is uniform cream. Tail is partly prehensile although short, is covered by diminutive hair, being bicolored, brown above and pale below. This specie does not have pouch (Anderson, 1982; Rossi and Bianconi, 2011).

The first records of *M. kunsii* in South America are from northern and southern Bolivia (Pine, 1975; Anderson, 1982) and Central Brazil (Mares et al., 1989). In the last decade several studies have contributed to the knowledge on distribution of this marsupial, with new records from Brazil (Carvalho et al., 2002), Bolivia (Vargas et al., 2003), Argentina (Jayat and Miotti, 2005) and Paraguay (de la Sancha et al., 2007).

Recently, Gettinger et al. (2011) revised the distribution of *M. kunsii* in South America extending the known species range 430 km northward, into the eastern edge of Amazonian region, in the state of Para. Therefore, *M. kunsii* is distributed into eastern, southern and western Bolivia, eastern Paraguay, northern Argentina and Brazil, at central and eastern edge Amazonia (de la Sancha et al., 2007; Gettinger et al., 2011).

Despite recent studies, the distribution of *M. kunsii* through southwestern Brazil is still poorly known (Godoi et al., 2010), as evidenced by the gap existing in the distribution of this species (Gettinger et al., 2011). The aim of this study is to contribute to the knowledge on the distribution of *M. kunsii* for southwestern Brazil and revise the actual known distribution of this species in South America.

The state of Mato Grosso do Sul is located in southwestern Brazil, a region that represents a great gap on the occurrence of small mammal species (Vieira and Palma, 2005). This region is occupied especially by three biomes, Cerrado (60% of the state), Pantanal (25%) and Atlantic Forest (15%) (IBGE, 2004).

The results presented here were collected between 2009-2011 in nine localities distributed in three biomes, in municipalities of Angélica, Chapadão do Sul, Corumbá, Maracaju, Nova Alvorada do Sul, Nova Andradina, Ponta Porã, Rio Brilhante and Sonora. We used sherman traps, wire traps and pitfall traps for capturing small mammals. Sixty traps (30 wire and 30

Sherman traps) were used by locality during three consecutive nights in four field expeditions, totaling 6480 trap-nights. Additionally, in each locality we used four sample units composed by four buckets of 60 or 108 l arranged in transects or "Y". Each sample unit was sampled by three consecutive nights during four field expeditions, totaling 1728 bucket-nights. For revision of the known distribution of *M. kunsii* in South America, we include data based in previous studies (Appendix).

Monodelphis kunsii (Fig. 1) was captured in nine localities in Mato Grosso do Sul state, southwestern Brazil, in areas of Atlantic Forest, Cerrado and Pantanal. We captured 22 individuals as result of a long work of monitoring in fragments of Mato Grosso do Sul state. The individuals captured were marked and release in the same localities of capture. The unique specimen collected was deposited at the Universidade Federal de Mato Grosso do Sul zoological collection under the number ZUFMS-MA 10001.

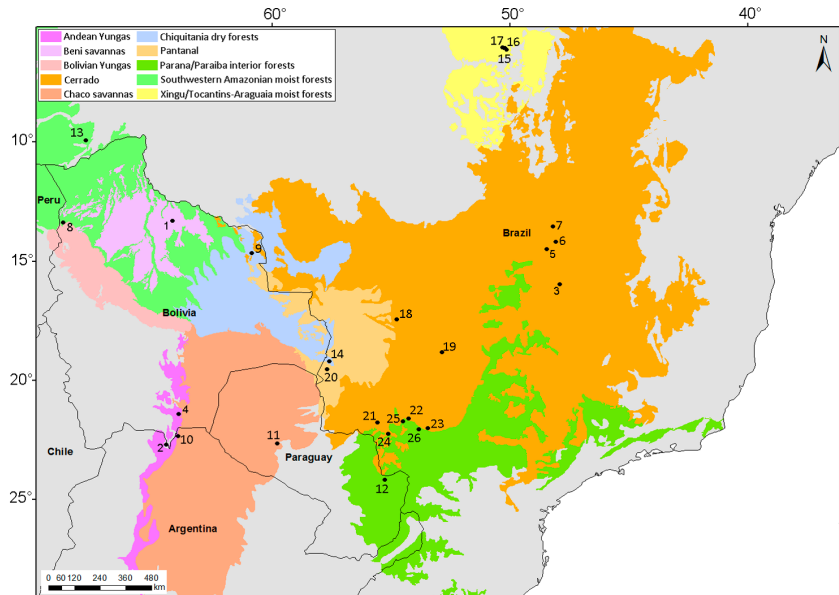
Monodelphis kunsii occurs in 10 ecoregions in South America, according classification of Olson et al. (2001), including open areas and different types of forests. The northern limit in its distribution is the eastern edge of Amazonian Forest in Para state, Brazil (ecoregion of Xingu/Tocantins-Araguaia moist forest). The southern limit seems to be the Reserva da Biosfera del Bosque Mbaracayú, Canindeyú, Paraguay (ecoregion of Parana/Paraíba interior forest), western limit in the Iturral de PNAAMI Alto Madidi, La Paz, Bolivia (ecoregion South-western Amazonian moist forest) and eastern limit in the Reserva de Jacob, Nova Ponte, Minas Gerais, Brazil (Cerrado) (Fig. 2).

Monodelphis kunsii has a wide geographical distribution in South America. The data presented here indicates that *M. kunsii* is also widely distributed in southwestern



Fig. 1. Pygmy short-tailed opossum *Monodelphis kunsii* captured at Sonora municipality, Mato Grosso do Sul, Brazil.

Fig. 2. Recording localities of *Monodelphis kuns* superimposed to ecoregions according Olson et al. (2001). For the reference numbers see Appendix.



Brazil, covering a gap in its geographical distribution (Gettinger et al., 2011). We recorded the species in three different biomes (Atlantic Forest, Cerrado and Pantanal) presents in Mato Grosso do

Sul state, in different types of forests (semi-deciduous forests, alluvial forests and gallery forests) and even in cultivated forests (e.g. *sansão-do-campo Mimos* *caesalpineafolia*).

In few studies *M. kuns* was captured by Sherman traps (Jayat and Miotti, 2005; de la Sancha et al., 2007). In this study all individuals were captured exclusively by Pitfall traps, as demonstrated by other authors (Vargas et al., 2003; Godoi et al., 2010; Cáceres et al., 2011; Gettinger et al., 2011) reinforcing the importance of this kind of traps to species sample.

Eight species groups have been consistently distinguished in the genera *Monodelphis*; among them, *M. kuns* is a monotypic and complex group. The geographic range includes southern Bolivia, northern Paraguay, and eastern Argentina, which, when combined with verified records from northern Bolivia and central Brazil, makes it rather biogeographically complex (Solari, 2010).

The lack of studies in southwestern Brazil and the non-utilization of Pitfall traps for small mammals sampling can be the main factors responsible by the absence of knowledge on distribution of different small mammal species in this region of Brazil.

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APPENDIX

Recording localities of *Monodelphis kunsii*:

1. Bolivia, Beni, Itenez, La Granja, west margin R. Itinamas, 13°18' S, 64°09' W, Pine (1975);
2. Bolivia, Tarija, Rio Lipeo, 22°41' S, 64°26' W, Anderson (1982);
3. Brazil, Distrito Federal, Brasília, 20 km S, 15°58' S, 47°55' W, Mares et al. (1989);
4. Bolivia, Tarija, Tapehua, 21°26' S, 63°55' W, Salazar et al. (1994);
5. Brazil, Goiás, Serra do Mesa, 55 km N Niquelandia, 14°28' S, 48°27' W, Carvalho et al. (2002);
6. Brazil, Goiás, Serra do Mesa, 20 km NW Colinas do Sul, 14°09' S, 48°04' W, Carvalho et al. (2002);
7. Brazil, Goiás, Serra do Mesa, 49 km SW Minacu, 13°31' S, 48°13' W, Carvalho et al. (2002);
8. Bolivia, La Paz, Iturralde, PNAAMI Alto Madidi, 13°20' S, 68°47' W, Vargas et al. (2003);
9. Bolivia, Santa Cruz, Parque Nacional Noel Kempff Mercado, 14°39' S, 60°53' W, Vargas et al. (2003);
10. Argentina, Salta, Gral. Jose de San Martín, Finca Fálcon, 28°18' S, 63°58' W, Jayat and Miotti (2005);
11. Paraguay, Presidente Hayes, Cruce de los Pioneros, 22°40' S, 59°46' W, de la Sancha et al. (2007);
12. Paraguay, Canindeyú, Reserva de Biosfera del Bosque Mbaracayú, 24°11' S, 55°16' W, de la Sancha et al. (2007);
13. Brazil, Acre, Alto Acre, 09°58' S, 67°48' W, Pine and Handley (2008);
14. Brazil, Mato Grosso do Sul, Maciço do Urucum, 19°12.332' S, 57°34.573' W, Godoi et al. (2010);
15. Brazil, Pará, Serra dos Carajás, 06°03'04" S, 50°12'24" W, Getttinger et al. (2011);
16. Brazil, Pará, Serra dos Carajás, 06°03'06" S, 50°11'49" W, Getttinger et al. (2011);
17. Brazil, Pará, Serra dos Carajás, 06°02'55" S, 50°15'35" W, Getttinger et al. (2011);
18. Brazil, Mato Grosso do Sul, Sonora municipality, 17°26'46" S, 54°45'20" W, this paper;
19. Brazil, Mato Grosso do Sul, Chapadão do Sul municipality, 18°49'07" S, 52°51'22" W, this paper;
20. Brazil, Mato Grosso do Sul, Maciço do Urucum, Corumbá municipality, 19°32'28" S, 57°40'50" W, this paper;
21. Brazil, Mato Grosso do Sul, Serra de Maracaju, Maracaju municipality, 21°47'12" S, 55°34'55" W, this report;
22. Brazil, Mato Grosso do Sul, Nova Alvorada do Sul municipality, 21°35'56" S, 54°15'24" W, this paper;
23. Brazil, Mato Grosso do Sul, Nova Andradina municipality, 22°00'11" S, 53°27'08" W, this paper;
24. Brazil, Mato Grosso do Sul, Ponta Porã municipality, 22°15'05" S, 55°07'52" W, this paper;
25. Brazil, Mato Grosso do Sul, Rio Brilhante municipality, 21°43'10" S, 54°29'56" W, this paper;
26. Brazil, Mato Grosso do Sul, córrego Engano, Angélica municipality, 22°04'23" S, 53°50'07" W, this paper.