

Sección Especial

EL ÚLTIMO NATURALISTA TIPÓLOGO:

CONTRIBUCIONES EN HONOR A ELIO MASSOIA (1936-2001)

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Nota



SOUTHERNMOST OCCURRENCE OF *Deltamys kemp* (RODENTIA, CRICETIDAE) IN ARGENTINA: PALEONTOLOGICAL AND NEONTOLOGICAL EVIDENCE TO ASSESS ITS CURRENT DISTRIBUTION

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ABSTRACT. We report the southernmost locality for the sigmodontine rodent *Deltamys kemp* Thomas, 1917, in Arroyo Las Tijeras (36°22'43" S, 56°50'12" W, General Lavalle county) near the coast of Buenos Aires province (Argentina), extending the range of the species ca. 150 km S. This record is a wake-up call about the presence of Brazilian fauna well beyond their southernmost suspected limit. Several lines of evidence point to considering *D. kemp* as a very recent immigrant in Argentina.

RESUMEN. Registro más austral de *Deltamys kemp* (Rodentia, Cricetidae) en Argentina: evidencia paleontológica y neontológica para evaluar su distribución. Reportamos la localidad más austral para el roedor sigmodontino *Deltamys kemp* Thomas, 1917: Arroyo Las Tijeras (36°22'43" S, 56°50'12" W, Partido de General Lavalle), cerca de la costa de la Provincia de Buenos Aires (Argentina), extendiendo el rango geográfico de la especie ca. 150 km hacia el sur. Este registro constituye una llamada de alerta acerca de la presencia de fauna brasileña bastante más al sur que lo sospechado. Varias líneas de evidencia indican que *D. kemp* puede ser un inmigrante muy reciente en la fauna Argentina.

Palabras clave: Akodontini, Buenos Aires, Río de la Plata.

Key words: Akodontini, Buenos Aires, Río de la Plata.

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Deltamys is an akodontine genus endemic to the Rioplatan area (Argentina and Uruguay) and Rio Grande do Sul (Brazil; Pardiñas & Teta 2015). It was for many years subsumed under *Akodon*, despite its early recognition by Thomas (1917), but today is considered a distinct genus. This status is supported by several morphological, karyological, and, to a lesser extent, molecular synapomorphies (Thomas 1917; Massoia 1964; Gentile De Fronza et al. 1981; Sbalqueiro et al. 1984; Castro et al. 1991; Bianchini & Delupi 1994; González & Massoia 1995; D'Elía et al. 2003; Smith & Patton 2007; Teta et al. 2007; Quintela et al. 2017). Furthermore, a recently described Brazilian species was added to the diversity of the genus (*Deltamys araucaria*; see Quintela et al. 2017; Pardiñas 2018) so that it is no longer considered monotypic. Also, strong evidence suggests the existence of still undescribed species for other populations in Brazil (Montes et al. 2008; Ventura et al. 2011; Quintela 2014). Populations from Argentinean and Uruguayan territories are referred to the type species, *D. kempfi*, applying the subspecies *D. k. kempfi* Thomas, 1917, and *D. k. langguthi* González and Massoia, 1995, respectively (see González & Pardiñas 2002).

In Argentina, *D. kempfi* occurs in a very narrow coastal band from approximately 34° S to 35° S, characterized by riparian vegetation and periodic flooding (Pardiñas & Teta 2015). The southernmost previously known occurrence for this mouse was described by Udrizar Sauthier et al. (2005) at Reserva El Destino (35°08' S; 57°23' W; Buenos Aires province, Argentina). Here we document a new locality, listed in Pardiñas and Teta (2015:220) that substantially extends (ca. 150 km S) the southern limit to the south corner of Samborombón Bay (Fig. 1).

A single collecting trip at a small creek (Arroyo las Tijeras, Province of Buenos Aires; Fig. S1) produced 12 sigmodontine rodents identified in the field as *Oxymycterus rufus* (1 specimen) and *Akodon azarae* (11). This material was initially preserved in fluid, and in a subsequent parasitological examination by Marcela Lareschi a typical *Deltamys* mite (see Lareschi & Gettinger 2009) was collected from a very young specimen of those which had been referred to *A. azarae*. A detailed inspection of this animal (housed at Colección de Mamíferos del Centro Nacional Patagónico [CNP]; Puerto Madryn, Chubut, Argentina) confirmed its identification as *D. kempfi*, further reinforced when the skull was removed and cleaned. Here we describe molars following Reig (1977).

The specimen (CNP 2377) is preserved as a cleaned skull and the carcass in fluid. It is a male and was collected in Arroyo las Tijeras, General Lavalle, Buenos Aires (36°22'43" S, 56°50'12" W, 1 m a.s.l.) by one of the authors (MR) on 23 October, 2008. Since the CNP 2377 is a very young individual with the third upper molar lacking wear (Fig. 2A), useful external characters to distinguish *D. kempfi* from other small akodontines (e.g., *Akodon*; see Massoia 1964), such as the velvety fur or the small eye are not fully expressed. However, a set of craniodental traits permits a supported identification, including very narrow zygomatic plate, narrow parapterygoid plates, and a unique configuration of the occlusal surface of the molars. The latter are characterized by a typical "bilobed" pattern in the first lower molar, clearly present from young (Fig. 2C) to old individuals (Fig. 2E), including an ephemeral metaflexid, an early fusion between procingulum and metaconid, a very shallow anteromedian flexid, and a late emerging median murid. Differences with respect to the sympatric *Akodon azarae* are trenchant (e.g., well-developed anteromedian flexid, large anterolabial cingulum; Fig. 2D).

Misidentification of *D. kempfi* as *A. azarae* and *Necromys obscurus* is a recurrent topic and highlights the external resemblances among these akodontines. Massoia (1961) reported *N. obscurus* from northeastern Buenos Aires province based on a *D. kempfi* specimen (see Massoia 1964). The animals referred to *N. obscurus* by Barlow (1969) represent largely *D. kempfi* (see Ximénez et al. 1972:24). Barlow (1969:23) tacitly advanced the synonymy between both species, indicating "I examined the types of *A. obscurus* [*Necromys obscurus*] and *A. kempfi* [*Deltamys kempfi*] in the British Museum (Nat. Hist.) and found the type of the latter to be a subadult specimen of *obscurus*." Here, we were "rescued" from a mistake thanks to parasitological evidence.

Contrary to the widespread occurrence of *D. kempfi* in Uruguay (see González & Martínez Lanfranco 2010; and the references cited therein), the species in Argentina is generally rare (but see below). In fact, the range of the species in the Buenos Aires province is apparently restricted to a narrow coastal fringe (Fig. 1; Table 1). Several lines of evidence concur to advance, as a working hypothesis, that the occurrence of *D. kempfi* in Argentina, especially from Ciudad Autónoma de Buenos Aires to the south, is a very recent event (the last century?). These are (1) *D. kempfi* has no fossil record in Argentina, despite the existence of several Holocene assemblages in appropriate areas and the verified occurrence of

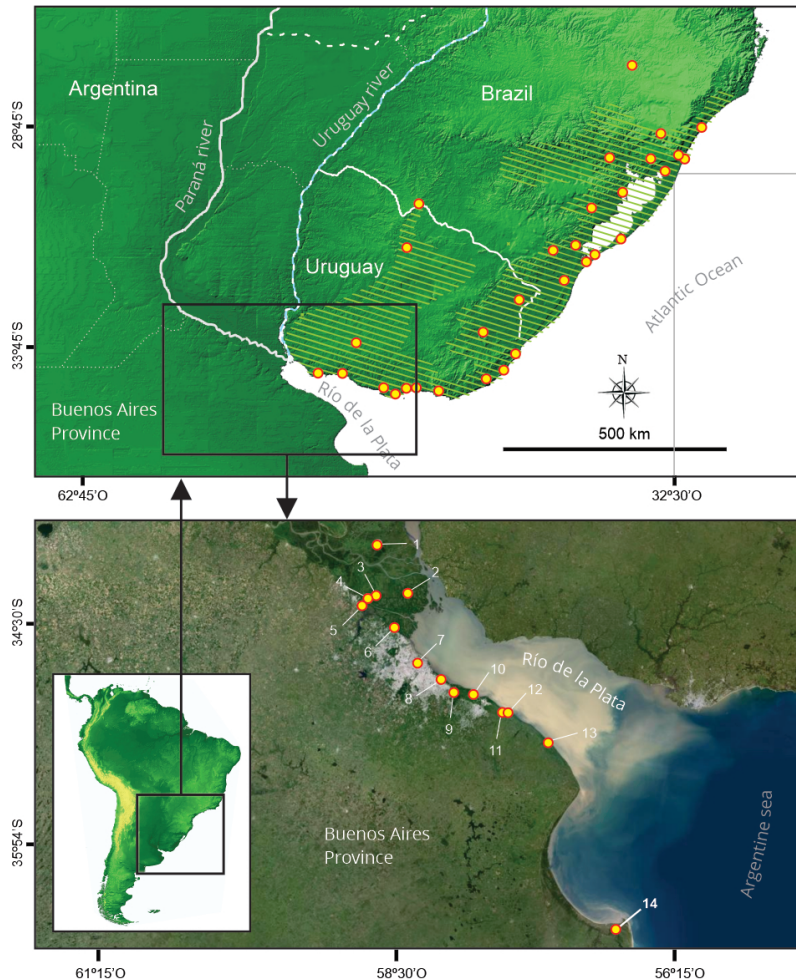


Fig. 1. Reported localities superimposed on a schematic distribution for *Deltamys* in Brazil and Uruguay (upper panel; based on González & Martínez Lanfranco (2010) [Uruguayan records] and Quintela et al. (2017) [Brazilian records]); and for *Deltamys kempii* in Argentina (lower panel), highlighting the southernmost record reported in this note (#14). For the locality reference numbers, see **Table 1**.

other rare sigmodontines such as *Bibimys* (e.g., López et al. 1991; Pardiñas 1999; Teta et al. 2004, 2013). Conversely, *Deltamys* was recorded for a Holocene sequence in Brazil (see Stutz et al. 2020); (2) *D. kempii* inhabits exclusively coastal plains formed during Late Holocene as a gradual process after a sea-level peak during Middle Holocene (Parker & Marcolini 1992; Cavallotto et al. 2004); (3) the single location where *D. kempii* is recorded with some abundance is the Reserva Ecológica Costanera Sur (Ciudad Autónoma de Buenos Aires), described as "... a coastal protected area, next to the La Plata River, few blocks away from the heart of the city and government buildings, and was built by gaining land

to the water using demolitions debris and silts from the river..." (Teta et al. 2007:44). There, the muroid community is dominated by the cricetids *D. kempii* and *Oligoryzomys flavescens*, and the introduced murids *Mus domesticus* and *Rattus norvegicus* (Teta et al. 2007); and (4) DNA sequence analysis and phylogeographic studies show that the single Argentinean population included, sister to one Uruguayan, is well nested among Brazilian haplotypes, suggesting a recent origin (Montes et al. 2008; Quintela 2014).

Passive dispersal of several animals as a subproduct of the movement of large masses of floating vegetation (largely composed by *Eichhornia* spp., *Panicum* spp., *Polygonum* spp., etc.), is a recurrent

Fig. 2. *Deltamys kemp* (CNP 2377; Arroyo las Tijeras, General Lavalle, Buenos Aires, Argentina). A. Palatal region (scale = 2 mm). B. Left upper tooththrow in occlusal view. C. First lower molar in occlusal view (scale = 1 mm). D. First lower molar of a young individual of *Akodon azarae* (scale = 1 mm). E. First lower molar of an adult individual of *D. kemp* (CNP 3086; La Balandra, Buenos Aires, Argentina; scale = 1 mm). Acronyms: ac, anterolabial cingulum; af, anteromedian flexid; f1, first lobe; f2, second lobe; m, metaflexid; mu, median murid; po, posterolophid.

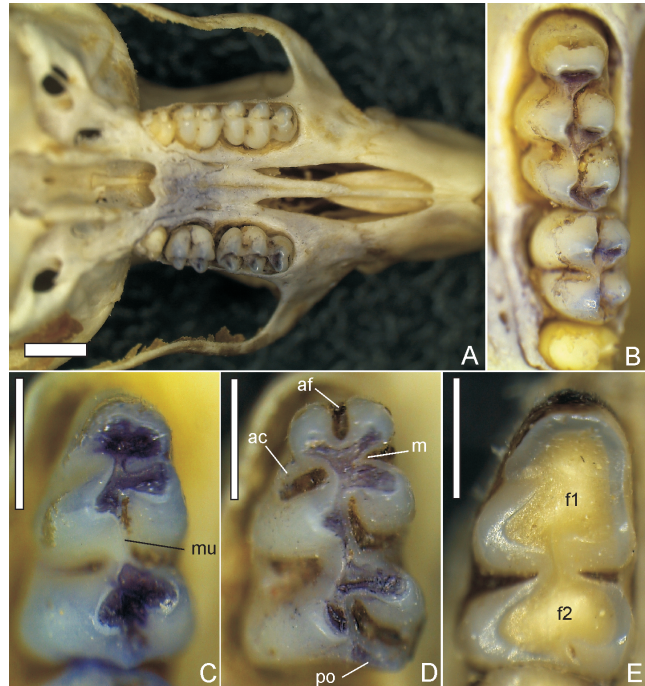


Table 1

Argentinean recording localities for *Deltamys kemp* (arranged by increasing latitude).

Number	Locality	Latitude S	Longitude W	Original reference
1	Arroyo Brazo Largo y Arroyo Brazo Chico, Islas del Ibicuy	33°48'	58°46'	Massoia (1983)
2	Arroyo Méndez Chico y Canal Arana, Delta del Paraná	34°08'	58°31'	Udrizar Sauthier et al. (2005)
3	Arroyo las Piedras y Arroyo las Cucarachas, Delta del Paraná	34°09'	58°47'	Massoia & Fornes (1964)
4	Canal 6 y Paraná de las Palmas, Estación Experimental INTA Delta del Paraná	34°09'	58°57'	Massoia & Fornes (1964)
5	Reserva Natural Otamendi	34°13'	58°54'	Babarskas et al. (2003)
6	Isla Ella, Delta del Paraná	34°22'	58°38'	Thomas (1917)
7	Reserva Ecológica Costanera Sur	34°36'	58°27'	Teta et al. (2007)
8	Quilmes	34°43'	58°15'	Massoia (1964)
9	Guillermo E. Hudson	34°48'	58°09'	Udrizar Sauthier et al. (2005)
10	Punta Lara	34°49'	57°59'	Massoia (1964)
11	Los Talas	34°56'	57°45'	Udrizar Sauthier et al. (2005)
12	La Balandra	34°56'	57°43'	D'Elía et al. (2003)
13	Reserva El Destino	35°08'	57°23'	Udrizar Sauthier et al. (2005)
14	Arroyo las Tijeras	36°22'43"	56°50'12"	Pardiñas & Teta (2015)

event in the Río de la Plata basin (see Guerrero et al. 2017 for a review). However, almost nothing is known about the impact of this process to produce viable populations of small mammals. Could periodical vegetation “rafts” transport *D. kemp* individuals to several coastal points of Río de la Plata from a

potential and better established source population in the Delta del Paraná area? Or even from the Uruguayan territory? To construct a solid hypothesis, more information is needed, especially from genetic markers. In any case, the unique geographic distribution of *D. kemp* in Buenos Aires province

points to its consideration as a very recent immigrant in a potentially dynamic southern expansion.

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ONLINE SUPPLEMENTARY MATERIAL

Supplement 1

Fig. S1. A) A close view, based on a satellite image (map data: Google, Maxar Technologies), of the general landscape where the new record (red dot) of *Deltamys kempi* was obtained in southern Samborombón Bay (note the extensive marshy area characterized by tidal channels); B) A view of the vegetation at the trapping site in Arroyo las Tijeras (photo: MR).