

First record of *Abrothrix jelskii* (Thomas, 1894) (Mammalia: Rodentia: Cricetidae) in Salta province, northwestern Argentina: Filling gaps and distribution map

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ABSTRACT: *Abrothrix jelskii* is one of the lesser-known species in the genus *Abrothrix*, and it has only been recorded in a few localities in highland environments along the central Andean range. In Argentina, existing records are restricted to just one locality in Jujuy province. We have recently recorded this species in Salta Province, extending its known distribution 150 km northward in northwestern Argentina and 175 km further to the southeast compared to existing records from localities in southern Bolivia. Ten other rodent species were also recorded in the same area, with some of these records, such as those for *Auliscomys sublimis*, *Akodon boliviensis*, and *Phyllotis* sp., being noteworthy as well.

Abrothrix is the most diverse and widely distributed genus of the tribe Abrotrichini (D'Elfá *et al.* 2007). At present, eight living species of *Abrothrix* are recognized, which mainly distribute along the central and southern Andean range (Teta *et al.* 2011). Despite an increasing number of published contributions in recent years (*e.g.*, Feijoo *et al.* 2010; Lessa *et al.* 2010; Teta *et al.* 2011), current knowledge regarding *Abrothrix* is uneven among species.

Abrothrix jelskii (Thomas, 1894) is one of the lesser-known species in this genus. Up until recently, it had only been recorded in a few Central Andean localities, from central Peru through western Bolivia and into northwestern Argentina, and mainly in highland environments above 3500 m altitude (Anderson 1997; Tarifa and Yensen 2001; Musser and Carleton 2005; Tarifa *et al.* 2007). In Argentina, this species was previously known from only one locality in Jujuy province, on the Tilcara Range which covers the central and eastern areas of this province (Teta *et al.* 2006; Díaz and Barquez 2007; Ferro 2010) (see Figure 1).

During recent surveys conducted in northwestern Argentina, we have recorded *A. jelskii* for the first time in Salta province. Specimens were caught just south of the Argentina- Bolivia border in the Santa Victoria range, 13 km northwest of Lizoite at 4265 m elevation (-22.20225° S, -65.21113° W; Figure 1). This record extends the known distribution for this species in Argentina by about 150 km to the north, and the locality is also approximately 175 km to the southeast of the closest previously existing locality in southern Bolivia (Lípez, Potosí department; Anderson, 1997).

The environment of the collecting locality corresponds to the Altos Andes Ecoregion (*sensu* Burkart *et al.* 1999), which is characterized by sparse grasslands dominated

by *Stipa ichu*, plants with compact growth habits such as *Azorella compacta*, and rocky outcrops (Figure 2). The three specimens of *A. jelskii* (deposited in the Museo Argentino de Ciencias Naturales “Bernardino Rivadavia” under numbers MACN 24832, MACN 25186 and MACN 25192; see Figures 3 and 4) were caught in a stone wall

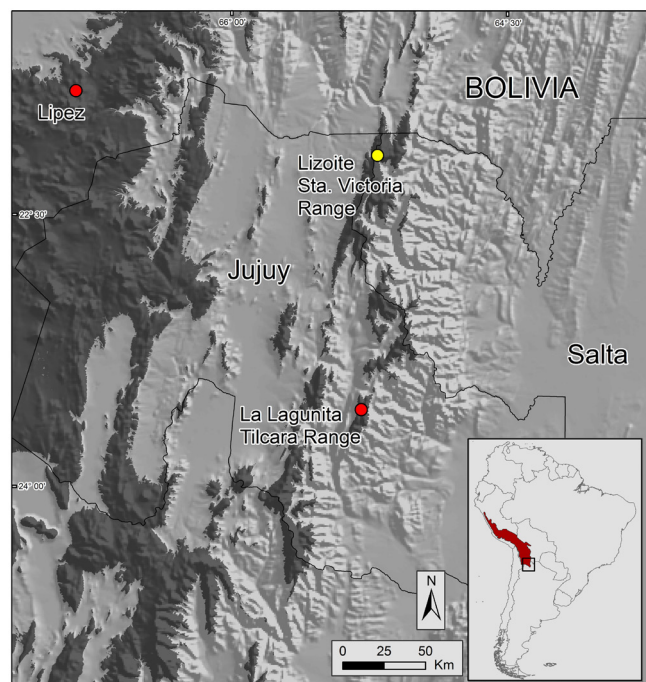


FIGURE 1. Collection localities for *Abrothrix jelskii* in southern Bolivia and northwestern Argentina. Red dots indicate previously published records and yellow dot the new record for Salta province. Darker gray areas indicate land above 3800 m elevation. The red area in the inset map shows the distribution of *A. jelskii* (*sensu* records provided in Thomas 1913, 1921, 1926; Sanborn 1947; Anderson 1997; Díaz and Barquez 2007).

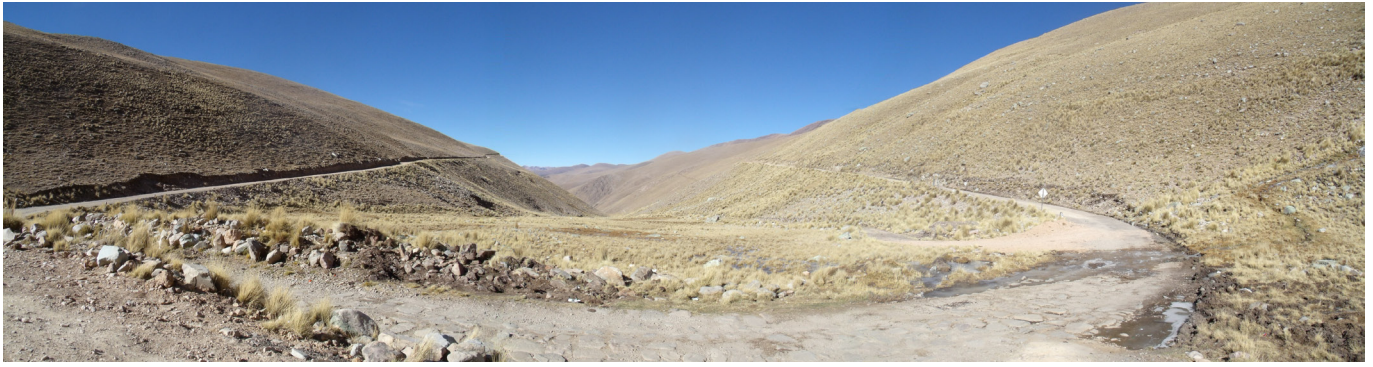


FIGURE 2. Panoramic view of the Altos Andes environment in the Lizoite area, the first collection locality for *Abrothrix jelskii* in Salta province, Argentina.

located in a humid ravine known as “vega” by the local people.

The three specimens are characterized by the striking coloration typical of this species, with the dorsal and ventral parts strongly contrasting with each other, and the ferruginous tone present in the nose, ears, feet and tail. A white spot behind the ears is also evident (Figure 3). In the skull the rostrum is relatively short with the nasals surpassing posteriorly the level of the lacrimals. The zygomatic notches are narrow and shallow, and the zygomatic plate is narrow and slanting backward. The mesopterygoid fossa is broad and the parapterygoid fossae are excavated. The tympanic bullae are large and have short Eustaquian tubes. In the mandible the masseteric crest extends to the anterior border of m1 and the capsular projection are not well developed (Figure 4). The procingulum in M1 has a vestigial anteromedian flexus. The anteroloph is well developed but the mesoloph is vestigial. The M2 has an anteroloph and a mesoloph very reduced. An enamel ring is present in the M3. In the m1 a distinguishable anteromedian flexid and a well-developed anterolabial cingule is observed. The m3 is “S” or “Z” shaped. External and cranial measurements for the collected specimens are summarized in Table 1.

Despite a relative low level of trapping effort (450 trap nights by using Museum Special snap traps and Sherman traps baited with oat), many other rodent species were captured in the same area, including the sigmodontines *Akodon albiventer* (MACN 25189), *Akodon boliviensis* (MACN 25187), *Auliscomys sublimis* (MACN 25188), *Calomys musculus* (MACN 25190), *C. lepidus* (MACN 25195), *Phyllotis* sp. (MACN 25191), *Phyllotis xanthopygus*

(MACN 25196), and *Andinomys edax* (MACN 25193); the octodontid *Octodontomys gliroides* (MACN 25197); and the cavid *Galea leucoblephara* (MACN 25194) (Figure 5). For some of these species, the new records from this locality are also remarkable and deserve to be highlighted. *Auliscomys sublimis*, for example, had only eight previous records in Argentina, and only two in Salta province (Díaz et al. 2000; Díaz and Barquez 2007; Ortiz et al. 2010; Jayat et al. 2011), while only six records of *Akodon boliviensis* existed for this province and only nine for all of northwestern region of Argentina (Ferro 2010; Jayat et al. 2010). This last species was also the dominant small mammal in the collecting area, representing about 50% of the specimens trapped. Another noteworthy record for this locality is that of *Phyllotis* sp., a form belonging to the *osilae* group, which had never been recorded at this elevation in Argentina (Jayat et al. in prep.).



FIGURE 3. One of the three specimens of *Abrothrix jelskii* (Male, MACN 24832) caught in the Lizoite area.



FIGURE 4. Dorsal (upper left), ventral (upper right) and lateral (middle) views of the skull and labial view (bottom) of the mandible of one of the specimens of *Abrothrix jelskii* (Male, MACN 25186) caught in the Lizoite area. Scale bar = 10 mm.

These new records are also especially significant because the Altos Andes Ecoregion has been the least-studied environment in northwestern Argentina in terms of its sigmodontine fauna (Ortiz *et al.* 2000; Jayat *et al.*

2011). This ecoregion, which lies largely above 4000 m elevation, encompasses areas that have remained virtually unsurveyed in terms of their small mammal communities (Jayat *et al.* 2011). With the sole exception of the La

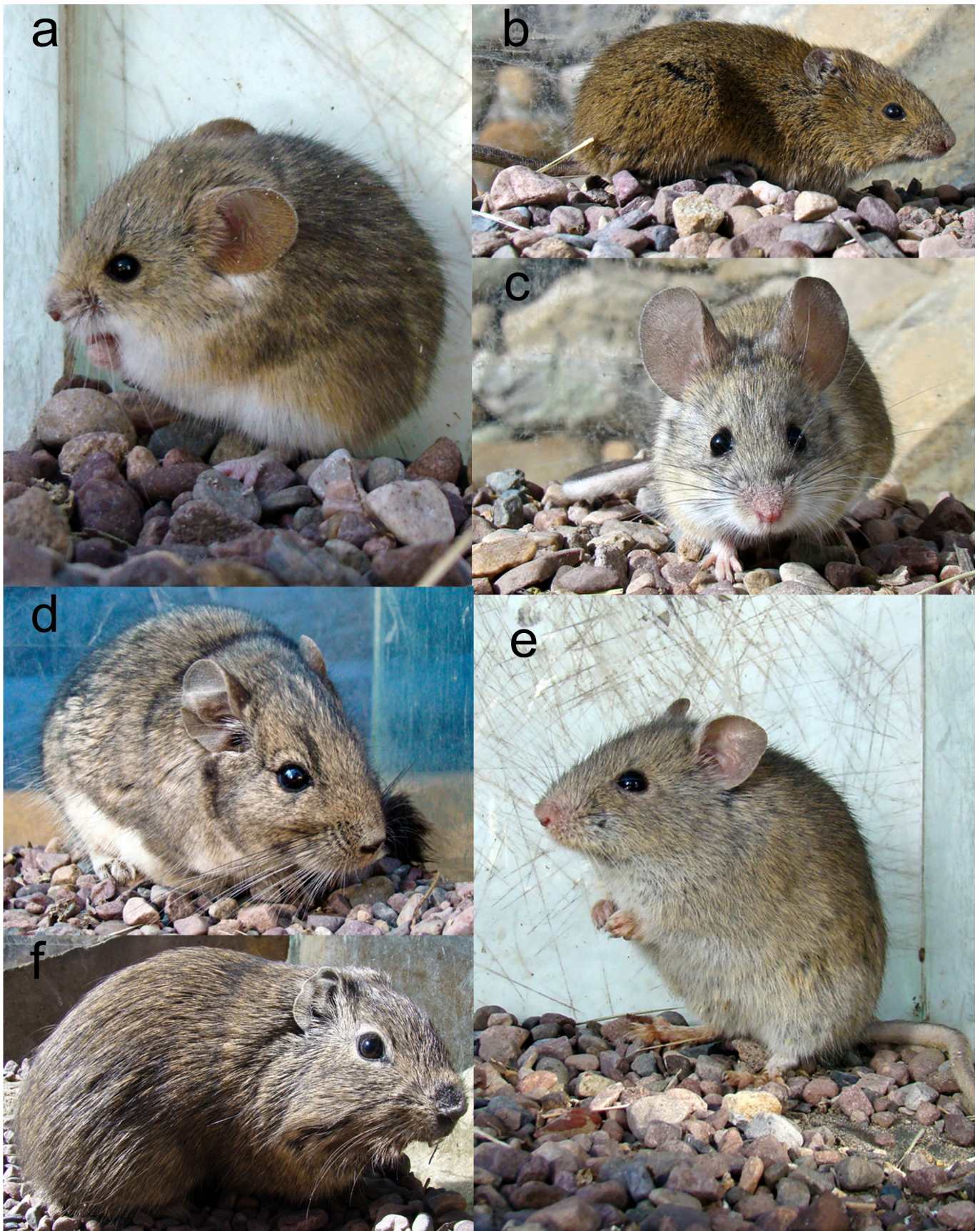


FIGURE 5. Some of the 11 rodent species recorded in the Lizoite area: a) *Calomys lepidus* (Female, MACN 25195); b) *Akodon boliviensis* (Male, MACN 25187); c) *Phyllotis xanthopygus* (Male, MACN 25196); d) *Octodontomys gliroides* (Male, MACN 25197); e) *Andinomys edax* (Male, MACN 25193); f) *Galea leucoblephara* (Male, MACN 25194).

Lagunita locality in Jujuy province, with 14 small rodent species recorded, all of the known Altos Andes localities had records of fewer than six species. Although we captured 11 rodent taxa in the Lizoite area, the richness of small mammals could be even higher because at least six additional species (*Abrothrix andinus*, *Necomys amoenus*, *Phyllotis caprinus*, *Neotomys ebriosus*, *Abrocoma cinerea*, and *Ctenomys* spp.) must also be present in the area according to their known distributions and presence in nearby collecting areas (e.g., Pardiñas and Ortiz 2001; Braun and Mares 2002; Jayat et al. 2006, 2008; Ferro 2010). The high number of species observed for the rodent fauna in the Lizoite area suggests a higher richness for small terrestrial mammals at very high altitudes (above 3800 m) in the Santa Victoria Range, rather than at intermediate altitudes as is the general pattern found for both northwestern Argentina and other regions around the world (Ferro 2010). This pattern in small-mammal species richness at such high altitudes has also been documented by Ferro (2010) in the Tilcara Range, where the La Lagunita locality is found.

All these findings reveal how little is still known about the small mammal faunas of Argentinean high-altitude regions, and they confirm the need for intensive surveys in the Altos Andes Ecoregion as well as in other areas such as the Puna, Monte de Sierras y Bolsones, and other adjacent ecotonal zones.

TABLE 1. External and cranial measurements for the three specimens of *Abrothrix jelskii* caught in the Lizoite area, Salta Province, Argentina. Acronyms are as follow: TBL, Total body length; TL, Tail length; HFL, Hind foot length (all these measurements in mm); W, weight (in g); MSL, maximum skull length; MTRL, molar toothrow length; ZB, zygomatic breadth; ZPB, zygomatic plate breadth; IOC, interorbital constriction; BB, braincase breadth; BL, bullar length.

Measurements	<i>Abrothrix jelskii</i> specimens		
	MACN 24832 ♂ age class 2	MACN 25186 ♂ age class 3	MACN 25192 ♀ age class 3
TBL	(159)	181	171
TL	(64)	79	74
HFL	25	24	25
EL	17	18	18
W	28.50	31.50	28.50
MSL	26.70	28.40	27.28
MTRL	4.30	4.42	4.28
ZB	13.16	13.58	13.30
ZPB	1.98	2.12	2.16
IOC	4.62	4.90	4.62
BB	12.54	12.90	12.26
BL	5.30	5.74	5.36

ACKNOWLEDGMENTS: Institutional support was provided by the Instituto de Ambiente de Montaña y Regiones Áridas, Universidad Nacional de Chilecito (UNDeC), the Instituto de Ecología Regional, Laboratorio de Investigaciones Ecológicas de Las Yungas (UNT), and the Instituto Superior de Correlación Geológica (CONICET). This research was also supported by a grant to PEO from the Consejo de Investigaciones de la Universidad Nacional de Tucumán (CIUNT 26/G434).

LITERATURE CITED

Anderson, S. 1997. Mammals of Bolivia, taxonomy and distribution. *Bulletin of the American Museum of Natural History* 231: 1-652.
 Braun, J.K. and M.A. Mares. 2002. Systematics of the *Abrocoma cinerea* species complex (Rodentia: Abrocomidae), with a description of a new species of *Abrocoma*. *Journal of Mammalogy* 83(1): 1-19.
 Burkart, R., N. Barbaro, R.O. Sanchez and D.A. Gómez. 1999. *Eco-regiones de la Argentina*. Buenos Aires: Administración de Parques Nacionales, PRODA. 42 p.

Díaz, M.M., J.K. Braun, M.A. Mares and R.M. Barquez. 2000. An update of the taxonomy, systematics, and distribution of mammals of Salta Province, Argentina. *Occasional Papers, Sam Noble Oklahoma Museum of Natural History* 10: 1-52.
 Díaz, M.M. and R.M. Barquez. 2007. Los mamíferos silvestres de la Provincia de Jujuy, Argentina: sistemática y distribución; p. 417-578. In D.A. Kelt, E.P. Lessa, J. Salazar-Bravo and J.L. Patton (eds.). *The Quintessential Naturalist: Honoring the Life and Legacy of Oliver P. Pearson*. California: University of California Publications in Zoology 134.
 D'Elia, G., U.F.J. Pardiñas, P. Teta and J.L. Patton. 2007. Definition and diagnosis of a new tribe of sigmodontine rodents (Cricetidae: Sigmodontinae), and a revised classification of the subfamily. *Gayana* 71: 187-194.
 Feijoo M., G. D'Elia, U.F.J. Pardiñas and E.P. Lessa. 2010. Systematics of the southern Patagonian-Fueguian endemic *Abrothrix lanosus* (Rodentia: Sigmodontinae): phylogenetic position, karyotypic and morphological data. *Mammalian Biology* 75(2): 122-137.
 Ferro, L.I. 2010. *Micromamíferos del noroeste argentino: gradientes altitudinales y la transición bosque-puna-monte*. Unpublished PhD. thesis, Universidad Nacional de Tucumán, Tucumán, Argentina.
 Jayat, J.P., P.E. Ortiz and D. Miotti. 2008. Sigmodontinos (Rodentia: Cricetidae) de los pastizales de neblina del noroeste argentino. *Acta Zoológica Mexicana, nueva serie* 24(3): 137-178.
 Jayat, J.P., P.E. Ortiz, S. Pacheco and R.F. González. 2011. Distribution of sigmodontine rodents in Northwestern Argentina: main gaps in information and new records. *Mammalia* 75(1): 53-68.
 Jayat, J.P., P.E. Ortiz, U.F.J. Pardiñas, G. D'Elia and J. Salazar-Bravo. 2010. The *boliviensis* group of *Akodon* (Rodentia: Cricetidae) in northwestern Argentina: species limits, distribution and the description of a new species. *Zootaxa* 2409: 1-61.
 Jayat, J. P., P. E. Ortiz, P. Teta, U. F. J. Pardiñas, and G. D'Elia. 2006. Nuevas localidades argentinas para algunos roedores sigmodontinos (Rodentia: Cricetidae): *Mastozoología Neotropical* 13(1): 51-67.
 Lessa, E.P., G. D'Elia and U.F.J. Pardiñas. 2010. Genetic footprints of late Quaternary climate change in the diversity of Patagonian-Fueguian rodents. *Molecular Ecology* 19(15): 3031-3037.
 Musser, G.M. and M.D. Carleton. 2005. Superfamily Muroidea; p. 894-1531. In D.E. Wilson and D.M. Reeder (eds.). *Mammal species of the world: A taxonomic and geographic reference*. Third ed. Baltimore: Johns Hopkins University Press.
 Ortiz, P.E., S. Cirignoli, D.H. Podestá and U.F.J. Pardiñas. 2000. New records of sigmodontine rodents (Mammalia: Muridae) from High-Andean localities of Northwestern Argentina. *Biogeographica* 76: 133-140.
 Ortiz P.E., F.R. González, J.P. Jayat, U.F.J. Pardiñas, S. Cirignoli and P. Teta. 2010. Dieta del Búho Magallánico (*Bubo magellanicus*) en los Andes del noroeste argentino. *Ornitología Neotropical* 21(4): 591-598.
 Pardiñas, U.F.J. and P.E. Ortiz. 2001. *Neotomys ebriosus*, an enigmatic South American rodent (Muridae, Sigmodontinae): its fossil record and present distribution in Argentina. *Mammalia* 65(2): 244-250.
 Sanborn, C.C. 1947. Geographical races of the rodent *Akodon jelskii* Thomas. *Fieldiana Zoology* 31: 1-10.
 Tarifa, T. and E. Yensen. 2001. Mamíferos de los bosques de *Polylepis* de Bolivia. *Revista Boliviana de Ecología* 9: 29-44.
 Tarifa, T., J. E. Aparicio and E. Yensen. 2007. Mammals, amphibians, and reptiles of the Bolivian High Andes: an initial comparison of diversity patterns in *Polylepis* woodlands; p. 241-274. In D.A. Kelt, E.P. Lessa, J. Salazar-Bravo and J.L. Patton (eds.). *The Quintessential Naturalist: Honoring the Life and Legacy of Oliver P. Pearson*. California: University of California Publications in Zoology 134.
 Teta, P., U.F.J. Pardiñas and G. D'Elia. 2006. "Abrotrichinos"; p. 192-197. In R.M. Barquez, M.M. Díaz and R.A. Ojeda (eds.). *Mamíferos de Argentina: sistemática y distribución*. Tucumán: Sociedad Argentina para el Estudio de los Mamíferos.
 Teta, P., G. D'Elia, U.F.J. Pardiñas, J.P. Jayat and P.E. Ortiz. 2011. Phylogenetic position and morphology of *Abrothrix illutea* Thomas, 1925, with comments on the incongruence between gene trees of *Abrothrix* (Rodentia, Cricetidae) and their implications for the delimitation of the genus. *Zoosystematic and Evolution* 87(2): 227-241.
 Thomas, O. 1913. On small mammals collected in Jujuy by Señor E. Budin. *Annals and Magazine of Natural History* 8(11): 136-143.
 Thomas, O. 1921. On a further Collection of Mammals from Jujuy obtained by Sr. Budin. *Annals and Magazine of Natural History* 9(8): 608-617.
 Thomas, O. 1926. Two new mammals from north Argentina. *Annals and Magazine of Natural History* 17(9): 311-313.

RECEIVED: September 2012

ACCEPTED: July 2013

PUBLISHED ONLINE: September 2013

EDITORIAL RESPONSIBILITY: Ana Paula Carmignotto