

Loxodontomys micropus (Rodentia: Cricetidae)

PABLO TETA, ULYSES F. J. PARDIÑAS, DANIEL E. UDRIZAR SAUTHIER, AND GUILLERMO D'ELÍA

Departamento de Ecología, Genética y Evolución, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Ciudad Universitaria, Avenida Intendente Güiraldes 2160, Pabellón II, 4° Piso, C1428EHA Ciudad Autónoma de Buenos Aires, Argentina; anthea@yahoo.com.ar (PT)

Unidad de Investigación Diversidad, Sistemática y Evolución, Centro Nacional Patagónico, CC 128, 9120 Puerto Madryn, Chubut, Argentina (UFJP, DEUS)

Departamento de Zoología y Centro de Investigación en Ecosistemas de la Patagonia, Universidad de Concepción, Casilla 160-C, Concepción, Chile (GD)

Abstract: *Loxodontomys micropus* (Waterhouse, 1837) is a cricetid commonly called the southern pericote. A moderately large, heavy-bodied rodent, it is 1 of the 2 species in the genus *Loxodontomys*. This cricetid occurs in southern Chile and southwestern Argentina. It prefers humid, dense grasslands, meadows, shrubby steppes, and mixed or open-canopied *Nothofagus* forests. *L. micropus* is categorized as of least concern. DOI: 10.1644/837.1.

Key words: Argentina, Chile, cricetid, Patagonia, Phyllotini, rodent, Sigmodontinae, southern pericote

Published 27 July 2009 by the American Society of Mammalogists
Synonymies completed 20 September 2008

www.mammalogy.org



Loxodontomys Osgood, 1947

Mus: Waterhouse, 1837:17. Part, not *Mus* Linnaeus, 1758.

Habrothrix: Fitzinger, 1867:81. Part, not *Abrothrix* Waterhouse, 1837.

Hesperomys: Burmeister, 1879:217. Part, not *Hesperomys* Waterhouse, 1839.

Akodon: Trouessart, 1898:536. Part, not *Akodon* Meyen, 1833.

Phyllotis: Allen, 1905:60. Part, not *Phyllotis* Waterhouse, 1837.

Euneomys: Thomas, 1916:143. Part, not *Euneomys* Coues, 1874.

Auliscomys: Gyldenstolpe, 1932:95. Part, not *Auliscomys* Osgood, 1915.

Loxodontomys Osgood, 1947:172. Type species *Mus micropus* Waterhouse, 1837, by monotypy.

CONTEXT AND CONTENT. Order Rodentia, suborder Myomorpha, superfamily Muroidea, family Cricetidae, subfamily Sigmodontinae, tribe Phyllotini. The genus *Loxodontomys* includes 2 extant species, *L. micropus* (Waterhouse, 1837) and *L. pikumche* Spotorno et al., 1998.

Loxodontomys micropus (Waterhouse, 1837) Southern Pericote

Mus micropus Waterhouse, 1837:17. Type locality “Interior plains of Patagonia in lat. 50°, near the banks of the

Santa Cruz” (Waterhouse 1839:62), Santa Cruz Province, Argentina.

Mus (*Ab[rothrix]*.) *micropus*: Waterhouse, 1837:21. Name combination.

Hesperomys micropus: Burmeister, 1879:217. Name combination.

Habrothrix micropus: Fitzinger, 1867:81. Name combination.

Akodon micropus: Trouessart, 1898:563. Name combination.

Phyllotis micropus: Allen, 1905:60. Name combination.

Euneomys (*Auliscomys*) *micropus*: Thomas, 1916:143. Name combination.



Fig. 1.—An adult male *Loxodontomys micropus* from El Maitén, northwestern Chubut Province, Argentina.

Euneomys micropus alsus Thomas, 1919:202. Type locality “Maiten, W. Chubut. 700 meters,” Chubut Province, Argentina (= El Maitén; 42°03'S, 71°10'W).

Auliscomys micropus micropus: Gyldenstolpe, 1932:95. Name combination.

Auliscomys micropus alsus: Gyldenstolpe, 1932:95. Name combination.

Phyllotis [(*Auliscomys*)] *micropus micropus*: Ellerman, 1941:455. Name combination.

Phyllotis [(*Auliscomys*)] *micropus alsus*: Ellerman, 1941:455. Name combination.

Phyllotis (*Auliscomys*) *micropus fumipes* Osgood, 1943:214. Type locality “Quellon, Chiloe Island, Chile,” (= Quellón, Chiloé, 43°07'S, 73°35'W, X Región).

[*Phyllotis* (*Loxodontomys*)] *micropus*: Osgood, 1947:172. Name combination.

Phyllotis micropus: Hershkovitz, 1962:391. Name combination.

[*Loxodontomys*]. *micropus*: Massoia, 1983:129. First use of current name combination.

CONTEXT AND CONTENT. Context as for genus. Three subspecies have been recognized, although their validity has not been tested by contemporary approaches (Cabrera 1961; Osgood 1943):

L. m. micropus (Waterhouse, 1837). See above.

L. m. alsus (Thomas, 1919). See above.

L. m. fumipes (Osgood, 1943). See above.

NOMENCLATURE NOTES. Osgood (1947) described *Loxodontomys* as a subgenus of *Phyllotis* to include *micropus*, a taxon described by Waterhouse (1837). Based on phenetic analyses of karyotypic and morphological data, Simonetti and Spotorno (1980) transferred *micropus* from *Phyllotis* to *Auliscomys*. The generic status of *Loxodontomys* was supported by morphological (Braun 1993; Steppan 1993, 1995) and molecular-based phylogenies (D'Elía 2003; Smith and Patton 1999). *Loxodontomys* was included in the tribe Phyllotini by Olds and Anderson (1989), Braun (1993), and Steppan (1993, 1995). Morphological analyses indicate that *Loxodontomys* is a sister genus to the *Reithrodon* group (Ortiz et al. 2000; Steppan 1993, 1995; Steppan and Pardiñas 1998). However, molecular-based phylogenies have shown that this group is not part of the phyllotine radiation and also that it is polyphyletic (D'Elía 2003; see also D'Elía et al. 2006a, 2006b; Engel et al. 1998; Smith and Patton 1999); in addition, molecular-based phylogenies place *Loxodontomys* within the phyllotine clade and sister to *Auliscomys*, in agreement with phenetic studies of morphological variation (D'Elía 2003; Smith and Patton 1999; Spotorno et al. 2001). Pine et al. (1979) called attention to the fact that the name *Loxodontomys* may not be properly available. However, Steppan (1995:84) consid-

ers this not to be the case because a genus-group comparison was implicit in Osgood's description. Here, we follow Steppan (1995) in considering that *Loxodontomys* Osgood, 1947, is available.

The type of *Mus micropus* was taken by Charles Darwin during his navigation of the Santa Cruz River between 18 April and 5 May 1834 (Waterhouse 1839); no specific locality was recorded along the about 240 km traveled between the mouth of the river in the Atlantic Ocean and the upper course near the Andean Cordillera. Hershkovitz (1962:392) wrote “the type of *micropus* was taken ... perhaps in the vicinity of the present locality of La Argentina, Province of Santa Cruz, southern Argentina.” However, we note that La Argentina (= Estancia La Argentina, northern coast of Lago Argentino, 50°10'S, 72°37'W) is more than 70 km west of the most interior point reached by Darwin along the course of the Santa Cruz River (see Cueto et al. 2008).

Etymologically, the generic epithet is probably inspired in *Loxodonta*, from Greek *loxo*, meaning slanting, and *odonta*, meaning tooth, whereas the specific epithet is from the Greek *micros*, meaning small, and *pous*, meaning foot.

DIAGNOSIS

Some difficulties of identification may be encountered because some individuals of *Loxodontomys micropus* reach sexual maturity at a very young age (12 g; head and body 80 mm) compared with other adults of up to 100 g (head and body 150 mm). *L. micropus* (Fig. 1) is distinguished from *Phyllotis xanthopygus* (yellow-rumped pericote) by its shorter tail and smaller ears (Pearson 1995). *L. micropus* differs radically in external and cranial characters (Fig. 2) from the slender, silky-furred, white-bellied, long-tailed, hairy-tailed *Graomys griseoflavus* (common pericote), which also has a divergent-sided supraorbital region (Hershkovitz 1962). Species of *Reithrodon* have similar large body size, but they possess grooved incisors, a much shorter tail, and their hind feet have furry soles (Pearson 1995). Species of *Euneomys* are paler, shorter-tailed, and have grooved upper incisors (Pearson 1995). *L. micropus* is mainly distinguished from *L. pikumche* (pikumche pericote) by its karyotype. *L. micropus* has a diploid number (2n) of 34 (fundamental number [FN] = 36–37) with telocentric autosomes except for 1 small pair that is metacentric, whereas *L. pikumche* has 2n = 32 (FN = 34) with 4 pairs of metacentric autosomes. Also, *L. micropus* has hyperopistodont incisors, with tripartite (Y-shaped) upper incisor dentine fissure, and M3, m2, and m3 each have 2 roots. *L. pikumche* has opistodont upper incisors with a short (comma-shaped) dentine fissure, and M3, m2, and m3 each have 3 roots.



Fig. 2.—Dorsal, ventral, and lateral views of the skull and lateral view of the mandible of adult male *Loxodontomys micropus* from Estancia La Ensenada, Santa Cruz, Argentina (Colección de Mamíferos del Centro Nacional Patagónico [CNP] 536). Condylolincisive length = 31.5 mm.

GENERAL CHARACTERS

Loxodontomys micropus is a moderately large, heavy-bodied phyllotine. Fur is thick, lax, and lusterless. Ears are large. Feet are stout. Fifth hind toe is long, reaching to the end of the 1st phalanx of the 4th toe. Palms and soles are slightly scutulated and naked, except on heel. Tail is 75% of

the length of head and body, sparsely furred, and with the terminal portion nearly uniform (Braun 1993; Hershkovitz 1962; Osgood 1943). The general color of *L. micropus* varies from gray to brownish, grizzled with brownish yellow and intermixed with dusky black dorsally, whereas the ventral surface is lighter, often washed with white or yellow (Gyldenstolpe 1932; Mann Fischer 1978; Osgood 1943; Pearson 1958). The scale pattern of dorsal guard hairs is lanceolate (Chehébar and Martín 1989). Individual, local, and seasonal differences in *L. micropus* are slight. Geographic variation, if it exists, is not appreciable (Hershkovitz 1962). The putative subspecies *L. m. alsus* is most similar to *L. m. micropus*, but almost without the strongly buffy suffusion, the general tone being more slate-gray above and clearer grayish with only a slight buffy wash on the venter (Gyldenstolpe 1932; but see Hershkovitz 1962). According to Osgood (1943), *L. m. fumipes* is most similar to *L. m. micropus*, but has the upper side of all feet darker, somewhat brownish or sooty instead of whitish. Ranges of body measurements (mm) of types were: total length, 237–242; length of tail, 81–117; length of hind foot, 27–32; and length of ear, 19.3 (Gyldenstolpe 1932; Osgood 1943). Means (mm) of total length (range, *n*) in adult male and female specimens, respectively, from northwestern Argentine Patagonia were: 133.1 (118–154, 20) and 131.5 (124–147, 25—Pearson 1983). Average measurements (mm) for 22 specimens from Aysén, southern Chile (Kelt 1994), were: total length, 224.0; length of tail, 95.5; length of hind foot, 27.9; and length of ear, 20.5. The mean body mass (g) of 146 trapped individuals of all ages in northwestern Argentine Patagonia was 57.6, with a range from 10.5 to 105 g. Body mass of adult males varied from 50 to 103 g and they were not significantly heavier than those of females (45–105 g), nor were males longer than females (Pearson 1983). The mean body mass of 22 specimens from Aysén, southern Chile, was 62.67 g (Kelt 1994).

The skull is robust. The interorbital region is narrow and the sides are slightly concave, with the borders square or raised. Hershkovitz (1962:477) stated that in *L. micropus* interfrontal fontanelles “are common, though rarely well developed” Only 1 specimen (American Museum of Natural History [AMNH] 14290, from Río Chico, Santa Cruz, Argentina) of 14 *L. micropus* examined by Gardner and Anderson (2001) had a fenestra. Nasals are broader than the interorbital constriction. Zygomatic arches are markedly expanded toward the posterior end. Zygomatic plate is narrow and high, with a rounded anterodorsal border and a straight or slightly concave anterior border. Premaxillo–maxillar suture is straight. Incisive foramina are well opened, ending at the level of the paracone and protocone of M1. Mesopterygoid fossa is distinctly narrower than the parapterygoid fossa. Posterior border of palatal bridge has a short, blunt median process. Internal carotid bounded by both auditory bulla and occipital. Sphenopal-

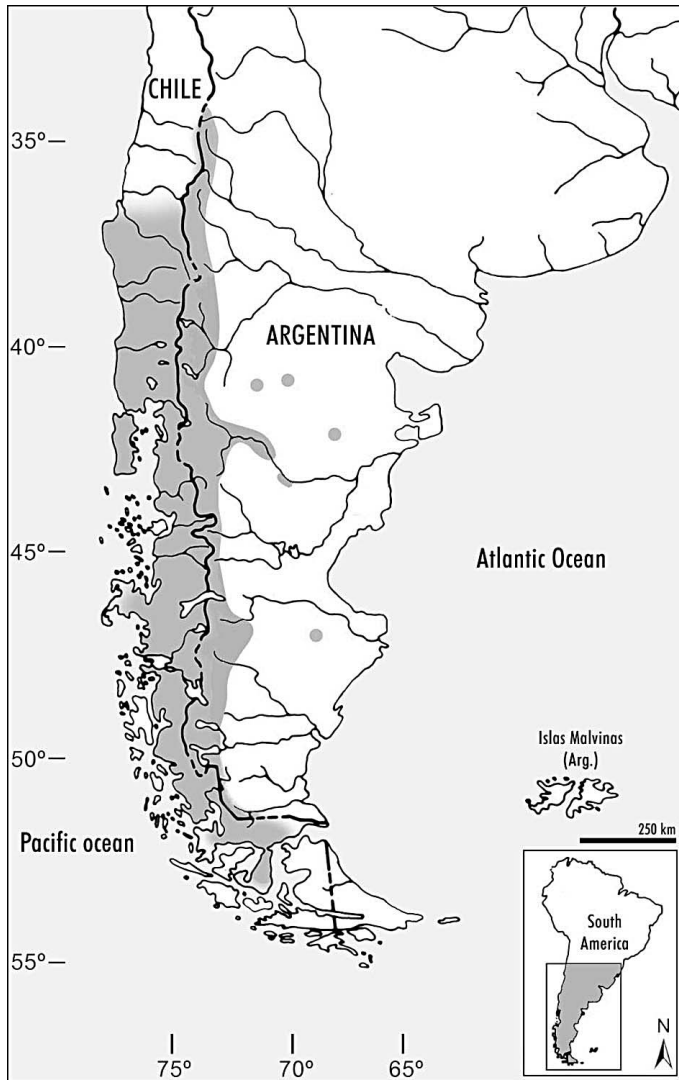


Fig. 3.—Geographic distribution of *Loxodontomys micropus* based on compiled localities from several sources and museum collections. Diffuse gray area indicates uncertain limits; gray points indicate isolated populations recorded in central Patagonia.

atine foramen is absent or nearly ossified. Squamosal fenestra is present between squamosal groove and masticatory–buccinator trough. Mandible is robust and short, with large coronoid process and marked capsular projection. Posterior border of mandibular symphysis is sharply angled (Braun 1993; Hershkovitz 1962; Stepan 1993, 1995). Average measurements (mm) of skull and mandible for 22 individuals (Kelt 1994) were: greatest length of skull, 31.41; length of nasal bone, 13.07; length of maxillary diastema, 7.60; length of maxillary toothrow, 5.98; length of palate, 14.09; breadth across rostrum, 4.89; width of braincase, 13.79; zygomatic width, 17.83; width of incisors (measured at the alveolus), 3.48; length of mandibular diastema, 3.41; length of mandibular toothrow, 6.08; and greatest length of mandible, 16.79. Measurements (mm) for upper ($n = 9$) and

lower ($n = 7$) molars of *L. micropus* from Santa Cruz, Argentina (Pardiñas 1997), were: length of M1, 2.47; width of M1, 1.68; length of M2, 1.60; width of M2, 1.53; length of M3, 1.49; width of M3, 1.34; length of M1–3, 6.00; length of m1, 2.38; width of m1, 1.53; length of m2, 1.63; width of m2, 1.58; length of m3, 1.89; width of m3, 1.40; and length of m1–3, 5.94.

DISTRIBUTION

Loxodontomys micropus occurs in southern Chile and southwestern Argentina (Fig. 3). In Argentina it ranges from about 35°S south to southernmost Santa Cruz Province. In Chile it ranges along the Andes from about Ñuble Province (VIII Región) south to the Strait of Magellan (Magallanes Province, XII Región), including Chiloé Island (Hershkovitz 1962; Osgood 1943; Reise and Venegas 1987; Tamayo and Frassinetti 1980). Punta Arenas is the southernmost documented locality (Pine et al. 1979). *L. micropus* is absent on Tierra del Fuego Island (Hershkovitz 1962; Osgood 1943; Pearson 1958). In Argentina, this species has been caught in the provinces of Neuquén, Río Negro, Chubut, and Santa Cruz (Hershkovitz 1962). Specimens from Mendoza Province, Argentina, were referred to this species, mostly based on morphological characteristics (Jayat et al. 2006; Pardiñas et al. 2008). The presence of *L. pikumche* (a species endemic to central Chile) in Mendoza, as has been suggested by Spotorno et al. (1998), needs adequate documentation. *L. micropus* is mostly restricted to forests, meadows, and mesic brushy habitats in the Andean foothills at elevations from sea level to 3,000 m. The known distribution of *L. micropus* has been considerably expanded to the east with the recent finding of several isolated populations in central basaltic plateaus and hills of Chubut, Río Negro, and Santa Cruz (Teta et al. 2002).

FOSSIL RECORD

Loxodontomys micropus was found in several archeological deposits of the latest Pleistocene–Holocene in the Argentinean and Chilean Patagonia (Andrade and Teta 2003; Pardiñas 1998, 1999a, 1999b; Pearson 1987; Pearson and Pearson 1993; Rebane 2002; Teta et al. 2005). Some of these records, especially those of the last 3,000 years, are extralimital to the current distribution of this species, suggesting that *L. micropus* has had a more continuous distribution in steppe areas during the cold-humid phases of the late Holocene (Pardiñas 1999b; Teta et al. 2005).

Some extinct presumed Phyllotini, such as *Olympicomys* and *Ichthyurodon*, from Plio–Pleistocene deposits of eastern Argentina, show similarities with *Loxodontomys* (Stepan and Pardiñas 1998). *Ichthyurodon* shares with *Loxodontomys* the tendency to exhibit involution in lower molars; whether

this trait is a convergence or whether it indicates common ancestry is a debatable issue.

At least 3 extinct species are described under *Auliscomys*, a genus considered phylogenetically close to *Loxodontomys*. They are *A. formosus*, the oldest known South American sigmodontine (Pardiñas and Tonni 1998; Reig 1978), and *A. fuscus* and *A. osvaldoreigi* recently identified from upper Pliocene deposits (Quintana 2003). Although *formosus* seems to belong to *Auliscomys* sensu stricto (i.e., excluding *micropus*), *osvaldoreigi* and *fuscus* can be clearly removed from this genus and arranged under *Olympicomys* and *Panchomys*, pending whether they are valid species or synonyms of *O. vossi* and *P. steppani*, respectively (Pardiñas 1997; Pardiñas et al. 2002).

FORM AND FUNCTION

Loxodontomys micropus has 4 pairs of mammary glands: pectoral, postaxial, abdominal, and inguinal (Gyldenstolpe 1932). Counts of vertebrae in *L. micropus* (7 specimens) yield 13 T, 6–7 L, and 28–29 Ca.

Dental formula is i 1/1, c 0/0, p 0/0, m 3/3, total 16 (Steppan 1993, 1995). Upper incisors are opisthodont, with orange frontal enamel and without grooves (however, 1 specimen from Punta Arenas, Chile, has the left upper incisor distinctly grooved according to Osgood [1943:213]). Molars are hypsodont with slightly alternating main cusps and flat crowns in adults (sensu Hershkovitz 1962). Mesoloph/lophids (including mesostyle/stylids) and enterostyle/stylids are absent, as in many phyllotines (see Steppan 1995). The molars of *L. micropus* have been selected as a good example of an “involution” process; that is (Hershkovitz 1962:93 and figs. 17.C and 17.D): “the whole or part of a planed molar crown may be modified into a C-, or E-, or S-shaped pattern by varying degrees of penetration of each of the enamel folds.” M1 is trilophodont; main lophes are oriented at about 45°; and folds penetrate to the middle line of the molar. The laminated procingulum is compressed anteroposteriorly and oblique in orientation, without evidence of an anteromedian flexure; the anteroloph appears as a short enamel spur. M2 is similar to M1 in occlusal design. M3 is slightly smaller than M2, with a departing morphological pattern evidenced by a persistent free connection between hypoflexus and paraflexus producing a posterior continuous lamina; paracone is labially projected by a short paralophule. The m1 is elongated and trilophodont with a compressed procingulum, without anteromedian flexid, rotated lingually; a strong anterolabial cingulum connects the procingulum with protocone in adult individuals. The m2 shows an E or epsilon pattern. The m3 is simplified and slightly smaller relative to m2, with a clearly S or sigmoid pattern (Hershkovitz 1962). Number of roots per molar is: M1, 3 (occasionally 4); M2, 3; M3, 3; m1, 4–3–2; m2, 2–3; and m3, 2 (Pearson 1995).

Phallus morphology was studied for 3 specimens of *L. micropus*; their description was given combined with those of 2 *Auliscomys* species (*boliviensis* and *sublimis*—see Spotorno 1986:120–121): “These phalli vary in shape from a barrel to an elongated form. The lateral processes are less developed than the central one, and distally, they have small lateral hooks. The proximal baculum is always long and generally slender, except *micropus*; the base is notched in *micropus* and *sublimis*. Urethral processes are long [and unilobed, see Braun 1993] in *micropus* and *sublimis*, but not in *boliviensis*.” The distal bacular cartilage is tridigitate, with the medial digit longer than the lateral digits. The lateral digits have small lateral hooks (Braun 1993). The medial ventral prostates are 1.5–3 times as long as the lateral ventral prostates; the lateral ventral prostates appear unusually small and are closely pressed against the lateral surfaces of the tract; vesiculars are medially lobed along their greater curvatures; subterminal flexures are rounded and smooth (Voss and Linzey 1981).

ONTOGENY AND REPRODUCTION

The reproductive season of *Loxodontomys micropus* starts at the beginning of the spring and lasts until the end of summer (Kelt 1994; Pearson 1983). In southern Chile, limited activity continues into early autumn (Kelt 1994). All overwintered adults are in breeding condition by spring, and by the end of November a few of the young-of-the-year have large testes and vesicular glands (Pearson 1983). In Chile, 21 of 25 males with descended testes were captured in November and December (Kelt 1994). Breeding males had testes of 8 mm or longer and vesicular glands of 10 mm or longer (Pearson 1983). All overwintered females were pregnant or parous in spring (Pearson 1983). In northwestern Argentine Patagonia, pregnant females were caught early in November, and lactating females in mid-November (Pearson 1983). In Chile, 9 of 13 parous females and 14 of 18 pregnant females were taken in November and December, whereas 13 postpartum females were collected in April (Kelt 1994). By mid-February and March, few animals remain reproductively active, and in April most females were either nulliparous or lactating (Kelt 1994). Pine et al. (1979) recorded pregnant females from Chile in January and March, and lactating females in mid-March. Two specimens caught in January had uterine swellings equaling 5 and 12 mm (Pine et al. 1979). In Argentina, average number of embryos was 4.01 (range 1–7, $n = 27$ —Pearson 1983); in Chile the average was 4.8 (range 4–5, $n = 5$ —Greer 1965; Pine et al. 1979). There was no relationship between the number of fetuses and the age of female (Pearson 1983).

Juveniles were recorded in spring and in higher numbers and proportions during summer and autumn (Pearson 1983). The young become independent at a very early age



Fig. 4.—One of the habitat types occupied by *Loxodontomys micropus*; dense *Nothofagus* underbrush where *L. micropus* reaches high densities in western Santa Cruz Province, Argentina (Río Ñires; in the background Cerro Punta de Vacas).

(Pearson 1983). Both sexes were reproductively active after reaching 48 g of body mass (Pearson 1983).

ECOLOGY

Population characteristics.—Population densities of *Loxodontomys micropus* in a uniform forest of *Nothofagus antarctica* at La Veranada, 43 km south-southwest of Bariloche (Argentina), varied from 5.1 individuals/ha in May to 1.7–4.2 individuals/ha in November (Pearson and Pearson 1982). In a mixed forest of *N. dombeyi* and *N. pumilio* at Río Castaño Overo, 44 km west of Bariloche (Argentina), 0.9, 1.1, and 4.1 individuals/ha were recorded in the months of May, November, and April, respectively (Pearson and Pearson 1982). In small mammal communities of Nahuel Huapi National Park, Río Negro and Neuquén provinces, and adjacent areas of northwestern Argentine Patagonia, the probability of capturing *L. micropus* in different habitats was: forest, 0.08; shrub, 0.18; bush steppe, 0.02; bunch grass, 0.06; weeds, 0.17; turf, 0.02; rocky habitats, 0.02; and bare areas, 0.41 (Pearson 1987, 1995). In Patagonia, sex ratio of a sample of 151 individual of all ages was insignificantly biased toward females (55%). The spring ratio was equal, but the autumn ratio was only 35% male based on 37 captures. Greer (1965) also reported an excess of females in populations from central Chile. Autumn populations consist mostly of young of the year; these will have matured to the old adult class by the next November, at which time a new cohort is entering the trappable population (Pearson 1983). Early spring recruitment strongly skews the age structure toward very young animals, whereas by autumn these animals are mature. Two females that weighed 60 and 65 g when captured and released in May were

recaptured 5.5 months later and had gained 14 and 13 g, respectively (Pearson 1983).

Space use.—*Loxodontomys micropus* lives in forest if there is sufficient ground cover. In precordilleran shrubby steppes of northwestern Argentine Patagonia it has been caught in humid, dense grasslands or among bushes such as *Berberis* or the thorny *Colletia spinosissima* (Monjeau 1989; Pearson 1983). In Chile, this species is found in bushy forests of *Nothofagus pumilio* and *N. antarctica*, and in *N. dombeyi* (Fig. 4) and *Araucaria araucana* forests, with dense, low vegetation of *Chusquea* (Reise and Venegas 1987). In Osorno (X Región, Chile), 1 specimen was caught in a mixed forest of *Laurelia philippiana*, *Saxegothaea conspicua*, and *Nothofagus dombeyi* (Pine et al. 1979). In Aysén (southern Chile), *L. micropus* was found in meadows with lush grasses and loose soils and in open-canopied or 2nd-growth forests of *N. dombeyi* or *N. antarctica* (Kelt 1994). Along an elevational transect through temperate rain forests in Valle de La Picada (Osorno, Chile), *L. micropus* was taken more commonly in shrubby habitats of *Nothofagus dombeyi* and *Drimys winteri* at higher elevations (Patterson et al. 1989, 1990).

Diet.—*Loxodontomys micropus* is primarily herbivorous. Stomachs may be filled with up to 10 g of chewed green leaves and fungi (Pearson 1983). In individuals from Chile, stomachs were found to contain seeds (17%), fruits (28%), flowers (20%), other vegetal tissues (23%), and fungi (6%—Merve et al. 1988). In humid, dense grasslands of northwestern Patagonia, stomach contents of *L. micropus* consisted mainly of grasses, such as *Carex*, *Festuca argentina*, *Juncus*, *Poa pratensis*, and *Stipa* (Monjeau 1989).

Diseases and parasites.—A considerable list of ectoparasites has been reported for *Loxodontomys micropus*. Those from individuals obtained in Argentina include 1 specific sucking louse, *Hoplopleura auliscomydis* (Anoplura: Hoplopleuridae; described from specimens collected in Collon Cura, Neuquén—Castro et al. 2001), and several fleas (Siphonaptera), *Craneopsylla minerva wolffhugeli* (Stephanocircidae; on specimens from Estancia La Ensenada, Santa Cruz—Sánchez 2007), *Ctenoparia topali* (Hystrichopsyllidae; on specimens from Lago Ñorquinco, Neuquén), *Agastopsylla boxi gibbosa* (Ctenophthalmidae; type host: *L. micropus*, type locality: Cerro Chapelco, Neuquén), and *Tetrapsyllus (Tetrapsyllus) tantillus* (Rhopalopsyllidae; on specimens from Arroyo Chapelco and Lago Ñorquinco, Neuquén—Beaucournu and Alcover 1989). From Chilean specimens, numerous fleas have been reported (Alarcón 2000, 2003; Beaucournu and Gallardo 1991, 1992) including *Ctenoparia intermedia*, *C. jordani*, *C. topali* (Hystrichopsyllidae); *Agastopsylla boxi boxi*, *Chiliopsylla allophyla allophyla* (Ctenophthalmidae); *Barreropsylla excelsa*, *Sphinctopsylla ares* (Stephanocircidae); and *Ectinorus (Ectinorus) ixanus*, *Ectinorus (Ichyonus) onychius onychius*, *Listronius ulus*, *Tetrapsyllus (Tetrapsyllus) rhombus*, and *Tetrapsyllus (T.) tantillus* (Rhopalopsyllidae). Only 1 endoparasite, the nematode *Stylestrongilus valdivianus* (Trichostrongyloidea;

Heligmonellidae), has been recovered from *L. micropus*; it infects the small intestine of Chilean specimens (Durette-Desset and Murúa 1979; see also Pérez-Ponce de León et al. 2000).

Hantavirus antibody (Andes strain) was detected in 1 of 10 *L. micropus* caught in Bolsón, northwestern Argentine Patagonia (Cantoni et al. 2001), and in 1 individual from Palmucho, BioBío, VIII Región, Chile (Ortiz et al. 2004; Pavletic 2000). There is another seropositive individual reported for Aysén, Chile (Cerdeira and Sandoval 2004). Apparently, these infections were produced by “spill-over” from the main reservoir of this virus, the sigmodontine *Oligoryzomys longicaudatus* (Murúa and Padula 2004).

Interspecific interactions.—In forested areas of Argentina, *Loxodontomys micropus* is associated with the marsupials *Dromiciops gliroides* (monito del monte) and *Rhyncholestes raphanurus* (long-nosed caenolestid) and the sigmodontine rodents *Abrothrix longipilis* (long-haired akodont), *A. olivaceus* (olive-colored akodont), *Chelemys macronyx* (Andean long-clawed akodont), *Geoxus valdivianus* (Valdivian long-clawed akodont), *Irenomys tarsalis* (large-footed irenomysa), *Oligoryzomys longicaudatus* (long-tailed colilargo), and *Rattus norvegicus* (brown rat—Monjeau et al. 1997, 1998; Pearson and Pearson 1983). In the sub-Andean ecoprovince of Patagonia, at the forest-steppe ecotone, *L. micropus* was trapped syntopically with *A. longipilis*, *A. olivaceus*, *C. macronyx*, *Eligmodontia morgani* (west Patagonian laucha), and *O. longicaudatus* (Monjeau 1989; Pearson 1987). Small mammals recorded in southern Chile with *L. micropus* include *A. longipilis*, *A. olivaceus*, *C. macronyx*, *Ctenomys coihaiquensis* (Coihaique tuco-tuco), *D. gliroides*, *Euneomys chinchilloides* (Tierra del Fuego euneomys), *G. valdivianus*, *I. tarsalis*, *Mus musculus* (house mouse), *O. longicaudatus*, *Phyllotis xanthopygus*, *R. norvegicus*, and *Reithrodon auritus* (hairy-soled conyrat—Kelt 1994, 1996; Patterson et al. 1989, 1990).

Throughout its range, *L. micropus* is preyed on by *Tyto alba* (common barn owl) and *Bubo magellanicus* (Magellanic horned owl—Donázar et al. 1997; Iriarte et al. 1990; Massoia 1983; Massoia et al. 1991, 1994; Massoia and Lartigau 1995; Massoia and Pardiñas 1994; Montserrat et al. 2005; Nabte et al. 2006; Pardiñas and Massoia 1989; Pillado and Trejo 2000; Teta et al. 2001; Travaini et al. 1997; Trejo and Grigera 1998; Udrizar Sauthier et al. 2005; Yañez et al. 1978). In addition, in northwestern Argentine Patagonia, *L. micropus* is a minor component of the diet of *Caracara plancus* (crested caracara—Travaini et al. 2001) and *Geranoaetus melanoleucus* (black-chested buzzard-eagle—Massoia and Pastore 1997; Trejo et al. 2006). Remains of this species also have been recovered in feces of *Galictis cuja* (lesser grison) and *Lycalopex culpaeus* (culpeo fox) from Neuquén Province in Argentine Patagonia (Corley et al. 1995; Delibes et al. 2003). In Chile, *L. micropus* is an important prey item of *Asio flammeus* (short-eared owl) in agricultural landscapes of Osorno (Martínez et al. 1998). In

temperate rain forests of southern Chile, *L. micropus* is a component of the diet of *Puma concolor* (puma), *Lycalopex griseus* (gray fox), *Lycalopex fulvipes* (Darwin’s fox), *Leopardus geoffroyi* (Geoffroy’s cat), and *Strix rufipes* (rufous-legged owl—Elgueta et al. 2007; Johnson and Franklin 1991; Martínez and Jaksic 1996, 1997; Rau et al. 1991; but see Figueroa et al. 2006).

Miscellaneous.—In captivity, numerous adults can live amicably in the same cage (Pearson 1983). Captives ate fungi of several kinds, including llao llao (*Cyttaria*); leaves of *Vicia*, *Oenothera*, and *Mulinum spinosum*; and blossoms of dandelion (*Taraxacum officinale*), *Colletia spinosissima*, and *Mulinum spinosum*. They ate stems of *Calceolaria*, but not the blossoms (Pearson 1983).

Loxodontomys micropus is mostly nocturnal, but may exhibit diurnal activity at times (Kelt 1994; Pearson 1983). In humid, dense grasslands of northwestern Patagonia, *L. micropus* excavates tunnel systems, with numerous entrances and food chambers. Tunnels are 4 cm in diameter (Monjeau 1989). *L. micropus* climbs skillfully (Pearson 1983).

GENETICS

Specimens from 3 Chilean localities at Malleco, Valdivia, and Aysén have been karyotyped. *Loxodontomys micropus* has a diploid number (2n) of 34 and a fundamental number (FN) of 36 or 37 (Venegas 1974; Walker and Spotorno 1992). All autosomes are telocentric; except 1 small pair that is metacentric. The X chromosome is telocentric and the Y chromosome is a small submetacentric (Spotorno and Walker 1979; Walker and Spotorno 1992). Constitutive heterochromatin is confined to centromeric regions of almost all chromosomes; telomeric nucleolar organizing regions were detected in the following 4 chromosomal pairs: 3, 6, 9, and 11 (Walker and Spotorno 1992).

No published study has assessed the genetic variation of different populations of *L. micropus*; unpublished preliminary results (C. Cañon et al., in litt.) based on cytochrome-b gene sequences show that *L. micropus* has little phylogeographic structure.

CONSERVATION

Loxodontomys micropus is categorized as of least concern in Argentina (Díaz and Ojeda 2000; Reca et al. 1996) and Chile (Muñoz-Pedreros and Yañez 2000; see also Baillie 1996; Johnson et al. 1990). Populations are protected in several national parks, reserves, and other protected areas of Argentina and Chile, including Epu Lauquen, Lanín, Los Arrayanes, Nahuel Huapi, Los Alerces, Perito Moreno, Los Glaciares, and Bosques Petrificados in Argentina (Heinonen Fortabat and Chebez 1997); and Alto Bío Bío, Nahuelbuta,

Puyehue, and Torres del Paine in Chile (Greer 1965; Johnson et al. 1990; Reise and Venegas 1987).

REMARKS

Specimens housed in mammal collections are abundant, especially in institutions in the United States: 249 individuals, mainly from Argentina, are in the Museum of Vertebrate Zoology (Berkeley, California); 50 individuals, mainly from Santa Cruz, Argentina, are in the National Museum of Natural History (Washington, D.C.); and 78 individuals, mainly from Chile, are in the Field Museum of Natural History (Chicago). Argentinean collections (Colección de Mamíferos del Centro Nacional Patagónico, Puerto Madryn, Chubut; Museo de Ciencias Naturales “Bernardino Rivadavia,” Buenos Aires; Museo de La Plata, La Plata) and Chilean collections (Museo Nacional de Historia Natural, Santiago de Chile; Museo de Zoología de la Universidad de Concepción, Concepción; Colección del Instituto de Ecología y Evolución de la Universidad Austral de Chile, Valdivia; Colección Zoológica del Instituto de la Patagonia, Universidad de Magallanes, Punta Arenas) currently have smaller series.

The association between the louse *Hoplopleura reducta* (Phthiraptera, Anoplura, Hoplopleuridae) and its type host *Loxodontomys micropus* (from Lago Blanco, Chubut, Argentina) was discarded because the real host is *Eligmodontia morgani*, another widespread phyllotine (see Castro and Cicchino 1998; Durden and Musser 1994).

ACKNOWLEDGMENTS

Marcela Lareschi and Juliana Notarnicola provided information about parasites. Bruce D. Patterson and an anonymous reviewer greatly improved this manuscript with their comments.

LITERATURE CITED

- ALARCÓN, M. E. 2000. Estado actual del conocimiento de los sifonápteros presentes en Chile (Insecta: Siphonaptera). *Gayana* 64:1–17.
- ALARCÓN, M. E. 2003. Sifonapterofauna de tres especies de roedores de Concepción, VIII Región—Chile. *Gayana* 67:16–24.
- ALLEN, J. A. 1905. I. The Mammalia of southern Patagonia. Reports of the Princeton University Expeditions to Patagonia, 1896–1899. Vol. 3. Zoology. The University, Princeton, New Jersey.
- ANDRADE, A., AND P. TETA. 2003. Micromamíferos (Rodentia y Didelphimorphia) del Holoceno tardío del sitio arqueológico Alero Santo Rosario (Provincia de Río Negro, Argentina). *Atek Na* 1:273–287.
- BAILLIE, J. 1996. *Auliscomys micropus*. In International Union for Conservation of Nature and Natural Resources. 2006. 2006 IUCN Red list of threatened species. www.iucnredlist.org, accessed 7 September 2007.
- BEAUCOURNU, J. C., AND J. A. ALCOVER. 1989 (1990). Pucea récoltées dans la province de Neuquén (Argentine); description de 4 nouveaux taxa (Insecta: Siphonaptera). *Annales de Parasitologie Humaine et Comparée* 64:489–505.
- BEAUCOURNU, J. C., AND M. H. GALLARDO. 1991. Catalogue provisoire des puces du Chili. 1ère partie (Insecta: Siphonaptera). *Bulletin de la Société Française de Parasitologie* 9:237–270.
- BEAUCOURNU, J. C., AND M. H. GALLARDO. 1992. Catalogue provisoire des puces du Chili. 2ème partie (Insecta: Siphonaptera). *Bulletin de la Société Française de Parasitologie* 10:93–130.
- BRAUN, J. K. 1993. Systematic relationships of the tribe Phyllotini (Muridae: Sigmodontinae) of South America. Special Publication, Oklahoma Museum of Natural History, Norman.
- BURMEISTER, G. 1879. Description physique de la République Argentine d'après des observations personnelles et étrangères. Tome troisième: animaux vertébrés. Première partie: mammifères vivants et éteints. Paul-Emile Coni Ed., Buenos Aires, Argentina.
- CABRERA, A. 1961. Catálogo de los mamíferos de América del Sur. Revista del Museo Argentino de Ciencias Naturales “Bernardino Rivadavia.” *Ciencias Zoológicas* 4:309–732.
- CANTONI, G. P., ET AL. 2001. Seasonal variation in prevalence of antibody to hantaviruses in rodents from southern Argentina. *Tropical Medicine and International Health* 6:811–816.
- CASTRO, D. DEL C., AND A. C. CICHINO. 1998. Anoplura. Pp. 125–139 in Biodiversidad de artrópodos Argentinos. Una perspectiva biotaxonomía (J. J. Morrone and S. Coscaron, eds.). SUR, La Plata, Argentina.
- CASTRO, D. DEL C., A. GONZALEZ, AND M. DREON. 2001. A new species of sucking louse (Insecta, Anoplura) parasitic on *Auliscomys* (Mammalia, Rodentia) in Argentina. *Journal of Parasitology* 87: 263–266.
- CERDA, J., AND R. SANDOVAL. 2004. Wild rodents [sic] population fluctuations in the region of Aysen and their relationship to the hantavirus cardiopulmonary syndrome (HCPS) epidemiology. In *Boletín Veterinario Oficial*. www.bvo.sag.gov.cl, accessed 25 September 2007.
- CHEHÉBAR, C., AND S. MARTÍN. 1989. Guía para el reconocimiento microscópico de los pelos de los mamíferos de la Patagonia. *Doñana Acta Vertebrata* 16:247–291.
- CORLEY, J. C., G. J. FERNÁNDEZ, A. F. CAPURRO, A. J. NOVARO, M. C. FUNES, AND A. TRAVAINI. 1995. Selection of cricetine prey by the culpeo fox in Patagonia: a differential prey vulnerability hypothesis. *Mammalia* 59:315–325.
- COUES, E. 1874. Synopsis of the Muridae of North America. *Proceedings of the Academy of Natural Sciences of Philadelphia* 26:173–196.
- CUETO, G. R., P. TETA, AND P. DE CARLI. 2008. Rodents from southern Patagonian semi-arid steppes (Santa Cruz Province, Argentina). *Journal of Arid Environments* 72:56–61.
- D'ELIA, G. 2003. Phylogenetics of Sigmodontinae (Rodentia, Muridae, Cricetidae), with special reference to the akodont group, and with additional comments on historical biogeography. *Cladistics* 19:307–323.
- D'ELIA, G., L. LUNA, E. M. GONZÁLEZ, AND B. D. PATTERSON. 2006a. On the Sigmodontinae radiation (Rodentia, Cricetidae): an appraisal of the phylogenetic position of *Rhagomys*. *Molecular Phylogenetics and Evolution* 38:558–564.
- D'ELIA, G., A. A. OJEDA, F. MONDACA, AND M. H. GALLARDO. 2006b. New data of the long-clawed mouse *Pearsonomys annectens* (Cricetidae, Sigmodontinae) and additional comments on the distinctiveness of *Pearsonomys*. *Mammalian Biology* 71:39–51.
- DELIBES, M., A. TRAVAINI, S. C. ZAPATA, AND F. PALOMARES. 2003. Alien mammals and the trophic position of the lesser grison (*Galictis cuja*) in Argentinean Patagonia. *Canadian Journal of Zoology* 81:157–162.
- DIAZ, G. B., AND R. A. OJEDA. 2000. Libro rojo de los mamíferos de la Argentina. Sociedad Argentina para el Estudio de los Mamíferos, Mendoza, Argentina.
- DONÁZAR, J. A., A. TRAVAINI, O. CEBALLOS, M. DELIBES, AND F. HIRALDO. 1997. Food habits of the great horned owl in northwestern Argentine Patagonia: the role of introduced lagomorphs. *Journal of Raptor Research* 31:364–369.
- DURDEN, L. A., AND G. G. MUSSER. 1994. The sucking lice (Insecta, Anoplura) of the world: a taxonomic checklist with records of mammalian hosts and geographical distributions. *Bulletin of the American Museum of Natural History* 218:1–90.

- DURETTE-DESSET, M. C., AND R. MURÚA. 1979. Description de *Stilestrongylus valdivianus* n. sp. (Nematoda: Heligmonellidae), parasite d'un cricétidé du Chili. Bulletin du Muséum d'Histoire Naturelle, 4e Série 1:245–249.
- ELGUETA, E. I., J. VALENZUELA, AND J. R. RAU. 2007. New insights into the prey spectrum of Darwin's fox (*Pseudalopex fulvipes* Martin, 1837) on Chiló Island, Chile. Mammalian Biology 72:179–185.
- ELLERMAN, J. R. 1941. The families and genera of living rodents. Vol. II. Family Muridae. British Museum (Natural History) Publications, London, United Kingdom.
- ENGEL, S. R., K. M. HOGAN, J. F. TAYLOR, AND S. K. DAVIS. 1998. Molecular systematics and paleobiogeography of the South American sigmodontine rodents. Molecular Biology and Evolution 15:35–49.
- FIGUEROA, R. A., E. S. CORALES, D. R. MARTÍNEZ, R. FIGUEROA, AND D. GONZÁLEZ. 2006. Diet of the rufous-legged owl (*Strix rufipes*, Strigiformes) in an Andean *Nothofagus-Araucaria* forest, southern Chile. Studies on Neotropical Fauna and Environment 41: 179–182.
- FITZINGER, L. J. 1867. Versuch einer natürlichen Anordnung der Nagethiere (Rodentia). Sitzungsberichte der Akademie der Wissenschaften. Band 56. Abteilung 1(6).
- GARDNER, S. L., AND S. ANDERSON. 2001. Persistent fontanelles in rodent skulls. American Museum Novitates 3327:1–15.
- GREER, J. K. 1965. Mammals of Malleco Province Chile. Publications of the Museum, Michigan State University Biological Series 3: 49–152.
- GYLDENSTOLPE, N. 1932. A manual of neotropical sigmodont rodents. Kunglia Svenska Vetenskapsakademiens Handlingar, Stockholm, Serie 3 11(3):1–164.
- HEINONEN FORTABAT, S., AND J. C. CHEBEZ. 1997. Los mamíferos de los parques nacionales de la Argentina. Monografía Editorial Literature of Latin America, Buenos Aires 14:1–70.
- HERSHKOVITZ, P. 1962. Evolution of neotropical cricetine rodents (Muridae), with special reference to the phyllotine group. Fieldiana: Zoology 46:1–524.
- IRIARTE, J. A., W. L. FRANKLIN, AND W. E. JOHNSON. 1990. Diets of sympatric raptors in southern Chile. Journal of Raptor Research 24:41–46.
- JAYAT, J. P., P. E. ORTIZ, P. TETA, U. F. J. PARDIÑAS, AND G. D'ELÍA. 2006. Nuevas localidades argentinas para algunos roedores sigmodontinos (Rodentia: Cricetidae). Mastozoología Neotropical 13:51–67.
- JOHNSON, W. E., AND W. L. FRANKLIN. 1991. Feeding and spatial ecology of *Felis geoffroyi* in southern Patagonia. Journal of Mammalogy 72:815–820.
- JOHNSON, W. E., W. L. FRANKLIN, AND J. A. IRIARTE. 1990. The mammalian fauna of the [sic] northern Chilean Patagonia: a biogeographical dilemma. Mammalia 54:457–469.
- KELT, D. A. 1994. The natural history of small mammals from Aisén Region, southern Chile. Revista Chilena de Historia Natural 67: 183–207.
- KELT, D. A. 1996. Ecology of small mammals across a strong environmental gradient in southern South America. Journal of Mammalogy 77:205–219.
- LINNAEUS, C. 1758. Systema naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. 10th edition. Laurentii Salvii, Stockholm, Sweden.
- MANN FISCHER, G. 1978. Los pequeños mamíferos de Chile, marsupiales, quirópteros, edentados y roedores. Gayana: Zoología 40:1–342.
- MARTÍNEZ, D. R., R. A. FIGUEROA, C. L. OCAMPO, AND F. M. JAKSIC. 1998. Food habits and hunting ranges of short-eared owls (*Asio flammeus*) in agricultural landscapes of southern Chile. Journal of Raptor Research 32:111–115.
- MARTÍNEZ, D. R., AND F. M. JAKSIC. 1996. Habitat, abundance, and diet of rufous-legged owls (*Strix rufipes*) in temperate forest remnants of southern Chile. Ecoscience 3:259–263.
- MARTÍNEZ, D. R., AND F. M. JAKSIC. 1997. Selective predation on scansorial and arboreal mammals by rufous-legged owls (*Strix rufipes*) in southern Chilean rainforest. Journal of Raptor Research 31:370–375.
- MASSOIA, E. 1983. La alimentación de algunas aves del orden Strigiformes en la Argentina. El Hornero, Buenos Aires Número Extraordinario, 125–148.
- MASSOIA, E. 1988. Pequeños mamíferos depredados por *Geranoaetus melanoleucus* en el Paraje Confluencia, Departamento Collón Cura, provincia de Neuquén. Boletín Científico, Asociación para la Protección de la Naturaleza 9:13–18.
- MASSOIA, E., J. C. CHÉBEZ, AND S. HEINONEN FORTABAT. 1994. Depredación de pequeños mamíferos por *Bubo virginianus* en el Lago Cardiel, Departamento Lago Buenos Aires, provincia de Santa Cruz. Boletín Científico, Asociación para la Protección de la Naturaleza 26:17–21.
- MASSOIA, E., AND B. LARTIGAU. 1995. Mamíferos (Rodentia, Lagomorpha y Marsupialia) cazados por *Tyto alba* en el Río Limay, Departamento Pilcaniyeu, provincia de Río Negro. Boletín Científico, Asociación para la Protección de la Naturaleza 27: 15–18.
- MASSOIA, E., AND U. F. J. PARDIÑAS. 1994. La depredación de mamíferos por *Bubo virginianus* y *Tyto alba* en Cerro Casa de Piedra, Lago Burmeister, Parque Nacional Perito Moreno, provincia de Santa Cruz. Boletín Científico, Asociación para la Protección de la Naturaleza 26:6–12.
- MASSOIA, E., AND H. PASTORE. 1997. Análisis de regurgitados de *Geranoaetus melanoleucus* de la Ea. La Gloria, Dpto. Cushamen, Pcia. de Chubut. Boletín Científico, Asociación para la Protección de la Naturaleza 33:4–5.
- MASSOIA, E., J. J. PEREIRO, AND C. REBOLEDO. 1991. Análisis de regurgitados de *Bubo virginianus* en La Lipela, Departamento Los Lagos, provincia de Neuquén. Boletín Científico, Asociación para la Protección de la Naturaleza 19:53–57.
- MESERVE, P. L., B. K. LANG, AND B. D. PATTERSON. 1988. Trophic relationships of small mammals in a Chilean temperate rainforest. Journal of Mammalogy 69:721–730.
- MEYER, F. J. F. 1833. Beiträge zur Zoologie, Gesammelt auf einer Reise um die Erde. Zweite Abhandlung. Säugethiere. Nova Acta Physico-Medica Academiae Caesariae Leopoldino-Carolinae Naturae Curiosorum (Verhandlungen der Kaiserlichen Leopoldinisch-Carolinischen Akademie der Naturforscher) 16:599–600.
- MONJEAU, J. A. 1989. Ecología y distribución geográfica de los pequeños mamíferos del Parque Nacional Nahuel Huapi y áreas adyacentes. Ph.D. dissertation, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, La Plata, Argentina.
- MONJEAU, J. A., E. BIRNEY, L. GHERMANDI, R. SIKES, L. MARGUTTI, AND C. PHILLIPS. 1998. Plants, small mammals, and the hierarchical landscape classifications of Patagonia. Landscape Ecology 13: 285–306.
- MONJEAU, J. A., R. SIKES, E. BIRNEY, N. GUTHMANN, AND C. PHILLIPS. 1997. Small mammal community composition within the major landscape divisions of Patagonia, southern Argentina. Mastozoología Neotropical 4:113–127.
- MONTERRAT, A. L., M. FUNES, AND A. NOVARO. 2005. Respuesta dietaria de tres rapaces frente a una presa introducida en Patagonia. Revista Chilena de Historia Natural 78:425–439.
- MUNOZ-PEDREROS, A., AND J. YAÑEZ. 2000. Mamíferos de Chile. Editorial CEA, Valdivia, Chile.
- MURÚA, R., AND P. PADULA. 2004. Ecología y evolución de hantavirus en el Cono Sur de América. Archivos de Medicina Veterinaria 36: 1–20.
- NABTE, M., S. L. SABA, AND U. F. J. PARDIÑAS. 2006. Dieta del búho magallánico (*Bubo magellanicus*) en el Desierto del Monte y la Patagonia Argentina. Ornitología Neotropical 17:27–38.
- OLDS, N., AND S. ANDERSON. 1989. A diagnosis of the tribe Phyllotini (Rodentia, Muridae). Pp. 55–75 in Advances in neotropical mammalogy (K. H. Redford and J. F. Eisenberg, eds.). Sandhill Crane Press, Gainesville, Florida.
- ORTIZ, J. C., W. VENEGAS, J. A. SANDOVAL, P. CHANDIA, AND F. TORRES. 2004. Hantavirus en roedores de la Octava Región de Chile. Revista Chilena de Historia Natural 77:251–256.
- ORTIZ, P. E., U. F. J. PARDIÑAS, AND S. J. STEPPAN. 2000. A new fossil phyllotine (Rodentia: Muridae) from northwestern Argentina and relationships of the *Reithrodon* group. Journal of Mammalogy 81: 37–51.

- OSGOOD, W. H. 1915. New mammals from Brazil and Peru. *Field Museum of Natural History, Zoology Series* 10:187–198.
- OSGOOD, W. H. 1943. The mammals of Chile. *Field Museum of Natural History, Zoology Series* 30:1–268.
- OSGOOD, W. H. 1947. Cricetine rodents allied to *Phyllotis*. *Journal of Mammalogy* 28:165–174.
- PARDIÑAS, U. F. J. 1997. Un nuevo sigmodontino (Mammalia: Rodentia) del Plioceno de Argentina y consideraciones sobre el registro fósil de los Phyllotini. *Revista Chilena de Historia Natural* 70:543–555.
- PARDIÑAS, U. F. J. 1998. Roedores holocénicos del sitio Cerro Casa de Piedra 5 (Santa Cruz, Argentina): tafonomía y paleoambientes. *Palimpsesto, Buenos Aires* 5:66–90.
- PARDIÑAS, U. F. J. 1999a. Fossil murids: taxonomy, paleoecology, and paleoenvironments. *Quaternary of South America and Antarctic Peninsula* 12:225–254.
- PARDIÑAS, U. F. J. 1999b. Los roedores muroideos del Pleistoceno tardío–Holoceno en la región pampeana (sector este) y patagónica (República Argentina): aspectos taxonómicos, importancia bioestratigráfica y significación paleoambiental. Ph.D. dissertation, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, La Plata, Argentina.
- PARDIÑAS, U. F. J., G. D'ELIA, AND P. ORTIZ. 2002. Sigmodontinos fósiles (Rodentia, Muroidea, Sigmodontinae) de América del Sur: estado actual de su conocimiento y prospectiva. *Mastozoología Neotropical* 9:209–252.
- PARDIÑAS, U. F. J., AND E. MASSOIA. 1989. Roedores y marsupiales de Cerro Castillo, Paso Flores, Departamento Pilcaniyeu, provincia de Río Negro. *Boletín Científico, Asociación para la Protección de la Naturaleza* 13:9–13.
- PARDIÑAS, U. F. J., P. TETA, AND D. E. UDRIZAR. 2008. Mammalia, Didelphimorphia and Rodentia, south-western Mendoza Province, Argentina. *Check List* 4:218–225.
- PARDIÑAS, U. F. J., AND E. P. TONNI. 1998. La procedencia estratigráfica y edad de los más antiguos muroideos (Mammalia, Rodentia) de América del Sur. *Ameghiniana* 35:473–475.
- PATTERSON, B. D., P. L. MESERVE, AND B. K. LANG. 1989. Distribution and abundance of small mammals along an elevational transect in temperate rainforests of Chile. *Journal of Mammalogy* 70:67–78.
- PATTERSON, B. D., P. L. MESERVE, AND B. K. LANG. 1990. Quantitative habitat associations of small mammals along an elevational transect in temperate rainforests of Chile. *Journal of Mammalogy* 71:620–633.
- PAVLETIC, C. 2000. *Hantavirus*: su distribución geográfica entre los roedores silvestres de Chile. *Revista Chilena de Infectología* 17: 186–196.
- PEARSON, O. P. 1958. A taxonomic revision of the rodent genus *Phyllotis*. *University of California Publications in Zoology* 56: 391–477.
- PEARSON, O. P. 1983. Characteristics of a mammalian fauna from forests in Patagonia, southern Argentina. *Journal of Mammalogy* 64:476–492.
- PEARSON, O. P. 1987. Mice and the postglacial history of the Trafal Valley of Argentina. *Journal of Mammalogy* 68:469–478.
- PEARSON, O. P. 1995. Annotated keys for identifying small mammals living in or near Nahuel Huapi National Park or Lanín National Park, southern Argentina. *Mastozoología Neotropical* 2:99–148.
- PEARSON, O. P., AND A. K. PEARSON. 1982. Ecology and biogeography of the southern rainforests of Argentina. Pp. 129–142 in *Mammalian biology of South America* (M. A. Mares and H. H. Genoways, eds.). *Special Publications Series, Pymatuning Laboratory of Ecology, University of Pittsburgh, Pittsburgh, Pennsylvania*.
- PEARSON, O. P., AND A. K. PEARSON. 1993. La fauna de mamíferos pequeños de Cueva Trafal I, Argentina: pasado y presente. *Prähistoria* 1:73–89.
- PÉREZ-PONCE DE LEÓN, G., S. L. GARDNER, AND J. FALCÓN-ORDÁZ. 2000. Phylogenetic relationships among species of *Stilestrongylus* Freitas, Lent and Almeida, 1937 (Trichostrongyloidea: Heligmoellidae: Nippostrongylinae), parasites of myomorph rodents (Rodentia: Muridae) in the Neotropics. *Journal of Parasitology* 86:1326–1335.
- PILLADO, M. S., AND A. TREJO. 2000. Diet of the barn owl (*Tyto alba tuidara*) in northwestern Argentine Patagonia. *Journal of Raptor Research* 34:334–338.
- PINE, R. H., S. D. MILLER, AND M. L. SCHAMBERGER. 1979. Contributions to the mammalogy of Chile. *Mammalia* 43: 339–376.
- QUINTANA, C. 2003. Roedores cricétidos del Sanandresense (Plioceno Tardío) de la Provincia de Buenos Aires. *Mastozoología Neotropical* 9:263–275.
- RAU, J., M. TILLERIA, D. MARTINEZ, AND A. MUÑOZ. 1991. Dieta del *Felis concolor* (Carnivora, Felidae) en áreas silvestres protegidas del sur de Chile. *Revista Chilena de Historia Natural* 64:139–144.
- REBANE, K. 2002. The effects of historic climatic change and anthropogenic disturbance on rodent communities in Patagonia, Argentina. Honors thesis, Stanford University, Stanford, California.
- RECA, A. R., C. UBEDA, AND D. GRIGERA. 1996. Prioridades de conservación de los mamíferos de Argentina. *Mastozoología Neotropical* 3:87–118.
- REIG, O. A. 1978. Roedores cricétidos del Plioceno superior de la Provincia de Buenos Aires (Argentina). *Publicaciones del Museo Municipal de Ciencias Naturales de Mar del Plata “Lorenzo Scaglia”* 2:164–190.
- REISE, D., AND W. VENEGAS. 1987. Catalogue of records, localities, and biotopes from research work on small mammals in Chile and Argentina. *Gayana, Zoología* 51:103–130.
- SÁNCHEZ, J. 2007. Introducción al estudio de los ectoparásitos (Acari y Siphonaptera) de los roedores sigmodontinos de la Patagonia Austral (Santa Cruz y Tierra del Fuego). Tesis de Licenciatura, Universidad Nacional de la Patagonia San Juan Bosco, Trelew, Argentine Patagonia.
- SIMONETTI, J. A., AND A. O. SPOTORNO. 1980. Posición taxonómica de *Phyllotis micropus* (Rodentia: Cricetidae). *Anales del Museo de Historia Natural de Valparaíso* 13:285–297.
- SMITH, M. F., AND J. L. PATTON. 1999. Phylogenetic relationships and the radiation of sigmodontine rodents in South America: evidence from cytochrome *b*. *Journal of Mammalian Evolution* 6:89–128.
- SPOTORNO, A. E. 1986. Systematics and evolutionary relationships of Andean phyllotine and akodontine rodents. Ph.D. dissertation, University of California, Berkeley.
- SPOTORNO, A. E., H. COFRE, G. MANRÍQUEZ, Y. VILINA, P. A. MARQUET, AND L. I. WALKER. 1998. Una nueva especie de *Loxodontomys*, otro mamífero filotino en los Andes de Chile central. *Revista Chilena de Historia Natural* 71:359–373.
- SPOTORNO, A., AND L. WALKER. 1979. Análisis de similitud cromosómica según patrones de bandas G en cuatro especies chilenas de *Phyllotis* (Rodentia: Cricetidae). *Archivos de Biología y Medicina Experimental* 12:83–90.
- SPOTORNO, A. E., L. I. WALKER, S. V. FLORES, M. YEVENES, J. C. MARIN, AND C. ZULETA. 2001. Evolución de los filotinos (Rodentia, Muridae) en los Andes del Sur. *Revista Chilena de Historia Natural* 74:151–166.
- STEPPAN, S. J. 1993. Phylogenetic relationships among the Phyllotini (Rodentia: Sigmodontinae) using morphological characters. *Journal of Mammalian Evolution* 1:187–213.
- STEPPAN, S. J. 1995. Revision of the tribe Phyllotini (Rodentia: Sigmodontinae), with a phylogenetic hypothesis for the Sigmodontinae. *Fieldiana: Zoology (New Series)* 80:1–112.
- STEPPAN, S. J., AND U. F. J. PARDIÑAS. 1998. Two new fossil muroids (Sigmodontinae: Phyllotini) from the early Pleistocene of Argentina: phylogeny and paleoecology. *Journal of Vertebrate Paleontology* 18:640–649.
- TAMAYO, M., AND D. FRASSINETTI. 1980. Catálogo de los mamíferos fósiles y vivientes de Chile. *Boletín del Museo Nacional de Historia Natural (Chile)* 37:323–399.
- TETA, P., A. ANDRADE, AND U. F. J. PARDIÑAS. 2002. Novedosos registros de roedores sigmodontinos (Rodentia: Muridae) en la Patagonia central Argentina. *Mastozoología Neotropical* 9:79–84.
- TETA, P., A. ANDRADE, AND U. F. J. PARDIÑAS. 2005. Micromamíferos (Didelphimorphia y Rodentia) y paleoambientes del Holoceno tardío en la Patagonia noroccidental extra-andina (Argentina). *Archaeofauna* 14:183–197.

- TETA, P., C. PANTI, A. ANDRADE, AND A. E. PÉREZ. 2001. Amplitud y composición de la dieta de *Bubo virginianus* (Aves: Strigiformes: Strigidae) en la Patagonia noroccidental Argentina. *Boletín de la Sociedad Biológica de Concepción* 72:131–138.
- THOMAS, O. 1916. On the grouping of the South American Muridae that had been referred to *Phyllotis*, *Euneomys* and *Eligmodontia*. *Annals and Magazine of Natural History, Series 8*, 18:139–143.
- THOMAS, O. 1919. On small mammals collected by E. Budin in north-western Patagonia. *Annals and Magazine of Natural History, Series 9*, 3:199–212.
- TRAVAINI, A., J. A. DONÁZAR, O. CEBALLOS, AND F. HIRALDO. 2001. Food habits of the crested caracara (*Caracara plancus*) in the Andean Patagonia: the role of breeding constraints. *Journal of Arid Environments* 48:211–219.
- TRAVAINI, A., J. A. DONÁZAR, O. CEBALLOS, A. RODRÍGUEZ, F. HIRALDO, AND M. DELIBES. 1997. Food habits of common barn-owls along an elevational gradient in Andean Argentine Patagonia. *Journal of Raptor Research* 31:59–64.
- TREJO, A., AND D. GRIGERA. 1998. Food habits of the great horned owl (*Bubo virginianus*) in a Patagonian steppe in Argentina. *Journal of Raptor Research* 32:306–311.
- TREJO, A., M. KUN, AND S. SEIJAS. 2006. Dieta del águila mora (*Geranoaetus melanoleucus*) en una transecta oeste–este en el ecotono norpatagónico. *El Hornero* 21:31–36.
- TROUSSERT, E. L. 1898. *Catalogus mammalium tam viventium quam fossilium. Nova editio (prima completa). Fasciculus 3. Rodentia II.* (Myomorpha, Hystricomorpha, Lagomorpha). Pp. 453–664. R. Friedlander, Berlin, Germany.
- UDRIZAR SAUTHIER, D. E., A. ANDRADE, AND U. F. J. PARDIÑAS. 2005. Predation of small mammals by rufous-legged owl, great horned owl and barn owl, in Argentinean Patagonia forests. *Journal of Raptor Research* 39:163–166.
- VENEGAS, W. 1974. Variación cariotípica en *Phyllotis micropus micropus* Waterhouse (Rodentia, Cricetidae). *Boletín de la Sociedad de Biología de Concepción* 48:69–76.
- VOSS, R. S., AND A. V. LINZEY. 1981. Comparative gross morphology of male accessory glands among neotropical Muridae (Mammalia: Rodentia) with comments on systematic implications. *Miscellaneous Publications, Museum of Zoology, University of Michigan* 159:1–41.
- WALKER, L. I., AND A. E. SPOTORNO. 1992. Tandem and centric fusions in the chromosomal evolution of the South American phyllotines of the genus *Auliscomys* (Rodentia, Cricetidae). *Cytogenetics and Cell Genetics* 61:135–140.
- WATERHOUSE, G. R. 1837. [Characters of new species of the genus *Mus*, from the collection of Mr. Darwin] *Proceedings of the Zoological Society of London* 1837:15–21, 27–32.
- WATERHOUSE, G. R. 1839. *The zoology of the voyage of H. M. S. Beagle, under the command of Captain Fitzroy, R. N., during the years 1832 to 1836. Part II. Mammalia.* Smith, Elder and Co., London, United Kingdom.
- YÁÑEZ, J., J. RAU, AND F. JAKSIC. 1978. Estudio comparativo de la alimentación de *Bubo virginianus* (Strigidae) en dos regiones de Chile. *Anales del Museo de Historia Natural de Valparaíso (Chile)* 11:97–104.

Associate editors of this account were JOSEPH MERRITT and PAMELA OWEN. RON PINE reviewed the synonymies. Editor was MEREDITH J. HAMILTON.