



Mastozoología Neotropical

ISSN: 0327-9383

ulyses@cenpat.edu.ar

Sociedad Argentina para el Estudio de los
Mamíferos
Argentina

Giménez, Analía L.; Giannini, Norberto P.; Schiaffini, Mauro I.; Martín, Gabriel M.
NEW RECORDS OF THE RARE *Histiotus magellanicus* (CHIROPTERA, VESPERTILIONIDAE) AND
OTHER BATS FROM CENTRAL PATAGONIA, ARGENTINA

Mastozoología Neotropical, vol. 19, núm. 2, julio-diciembre, 2012, pp. 213-224

Sociedad Argentina para el Estudio de los Mamíferos
Tucumán, Argentina

Available in: <http://www.redalyc.org/articulo.oa?id=45725085001>

- How to cite
- Complete issue
- More information about this article
- Journal's homepage in redalyc.org

redalyc.org

Scientific Information System

Network of Scientific Journals from Latin America, the Caribbean, Spain and Portugal

Non-profit academic project, developed under the open access initiative

NEW RECORDS OF THE RARE *Histiotus magellanicus* (CHIROPTERA, VESPERTILIONIDAE) AND OTHER BATS FROM CENTRAL PATAGONIA, ARGENTINA

**Analía L. Giménez¹, Norberto P. Giannini², Mauro I. Schiaffini¹,
and Gabriel M. Martín¹**

¹Laboratorio de Investigaciones en Evolución y Biodiversidad (LIEB), Facultad de Ciencias Naturales, Universidad Nacional de la Patagonia San Juan Bosco, Sarmiento 849, 9200 Esquel, Chubut, Argentina [Correspondence: <al.gimenez@hotmail.com>]. ²Cátedra de Biogeografía, Facultad de Ciencias Naturales e Instituto Miguel Lillo, Universidad Nacional de Tucumán, Miguel Lillo 205, 4000 San Miguel de Tucumán, Tucumán, Argentina.

ABSTRACT: *Histiotus magellanicus* (Philippi, 1866) is a poorly known Patagonian bat. Here we report on nine newly captured specimens and one unpublished locality from museum specimen that significantly improve our knowledge of this species' distribution, by incorporating two Argentine provinces and reducing the distributional gap between northern and southern historical records. The new records confirm *H. magellanicus* as a Subantarctic Forests endemic. In addition, we report new specimens and localities from four poorly known Patagonian bats for Chubut province: *Histiotus macrotus*, *Myotis chiloensis*, *Lasiurus varius* (Vespertilionidae) and *Tadarida brasiliensis* (Molossidae).

RESUMEN: Nuevos registros del raro *Histiotus magellanicus* (Chiroptera, Vespertilionidae) y otros murciélagos de Patagonia Central, Argentina. *Histiotus magellanicus* (Philippi, 1866) es un murciélago patagónico muy pobremente conocido. Aquí reportamos nueve especímenes recientemente capturados y un espécimen de colección cuya localidad no había sido reportada hasta el momento. Las localidades aportadas mejoran considerablemente nuestro conocimiento de su distribución, incorporando a ella dos nuevas provincias argentinas y reduciendo considerablemente el vacío de datos entre los registros históricos del norte y sur de Patagonia. Los nuevos registros confirman a *H. magellanicus* como especie endémica de la ecorregión del Bosque Subantártico. Adicionalmente reportamos especímenes y localidades nuevos para la provincia de Chubut representando cuatro especies patagónicas pobremente conocidas: *Histiotus macrotus*, *Myotis chiloensis*, *Lasiurus varius* (Vespertilionidae) y *Tadarida brasiliensis* (Molossidae).

Key words. Central Patagonia. Distribution. Molossidae. Vespertilionidae.

Palabras clave. Distribución. Molossidae. Patagonia Central. Vespertilionidae.

INTRODUCTION

The Argentine bat fauna is currently represented by four families (Noctilionidae, Phyllostomidae, Vespertilionidae and Molossidae), 27 genera and 61 species (Barquez and Díaz, 2009). The greatest species richness is found

in the Chaco, Paranaean and Yungas ecoregions (Barquez et al., 1999). By contrast, Patagonia (sensu lato) represents one of the regions with lowest bat diversity, due primarily to severe climatic conditions such as extreme annual rainfall (in some areas less of 200 mm), temperature regimes (towards southwest absolute

minimum temperatures are lower than $-20\text{ }^{\circ}\text{C}$) and strong winds (wind speed varies between 15 and 22 km h^{-1} in the center-west part of the region; Paruelo et al., 1998). Nonetheless, Patagonia is interesting as a region for the study of bats given the particular eco-physiological adaptations of the species (Pearson and Pearson, 1989; Pearson, 1995); in this sense, low rates of metabolism in insectivorous bats lead to long life spans and short reproductive seasons; and bats from temperate zones either migrate or enter seasonal torpor to evade the shortage of food during the winter (McNab, 1982). Likewise, Patagonia is very interesting due to the occurrence of endemic species (see Barquez, 2006).

One such species, the southern big-eared brown bat *Histiotus magellanicus* (Philippi, 1866), is very poorly known. Its type locality is located in the Magellan Strait of southern Chile (Philippi, 1866; Barquez et al., 1993, 1999; Barquez, 2006) and the species epithet refers to it (Braun and Mares, 1995). Actually, the species occurs only in southern Chile and Argentina (Cabrera, 1958; Mares et al., 1995; Barquez et al., 1999; Simmons, 2005). In Chile, the distribution of *H. magellanicus* extends from the Magellan Strait northward to the province of Valdivia, including Chiloé Island (Cabrera, 1958). Peña and Barria (1972) extended the known distribution south of Magellan Strait by reporting a new locality in Puerto Toro.

In all, just eight localities have been recorded for the species to date. In Argentina, distributional records are particularly scarce and the species is only known from three localities in the provinces of Neuquén, Santa Cruz and Tierra del Fuego (Mares et al., 1995; Barquez and Zoratti, 1998; Barquez et al., 1999; Barquez and Díaz, 2009). On the basis of these records, *H. magellanicus* inhabits the Sub-Antarctic phytogeographic province (see Barquez et al., 1999) and the Valdivian Temperate Forests and Magellanic Subpolar Forests ecoregions (sensu Olson et al., 2001). The oldest records date from the first half of the 20th century, and the most recent published specimen was captured in 1998 in Los Glaciares National Park (Santa Cruz Province, Barquez and Zoratti, 1998).

This shows that *H. magellanicus* has not been recorded in Argentina over the last 14 years in the literature. This paucity in captures had the consequence of specimens of this species being very scarce in mammal collections, but this might be due to lack of studies in the region, misidentified specimens, or both. Some authors have placed *H. magellanicus* in synonymy with *H. montanus* (Koopman, 1993) or as subspecies of the latter (Osgood, 1943; Cabrera, 1958; Handley and Gardner, 2008). However, we follow Barquez et al. (1993, 1999) who recognized this taxon as a full species based on morphological characters and an almost allopatric distribution with only a narrow contact zone in NW Patagonia. *Histiotus montanus* is known from at least 15 localities in Neuquén, Río Negro, Chubut and Santa Cruz provinces (Daciuk, 1977; Fornes and Massoia, 1967; Barquez and Zoratti, 1998; Barquez et al., 1999; Barquez, 2006; Giménez, 2010) of which only three in Valdivian Temperate Forests, and remainder are in Patagonian Steppe. *H. magellanicus* is considered exclusive of Valdivian Temperate Forests (Barquez et al., 1999). *H. magellanicus* (**Fig. 1A**) differs from its congeners *H. macrotus* and *H. montanus* (**Fig. 1B**) by its darker hair, wing membranes, and ear coloration, and shorter ears (Barquez et al., 1993). Both coloration and ear length can be considered highly variable, environmentally related, and thus questionable taxonomic characters. The darker coloration of *H. magellanicus* can be related with the humid environments to which it is restricted (Valdivian Temperate Forests and Magellanic Subpolar Forests, sensu Olson et al., 2001). Likewise, ear length is very important because its shape and size are closely related with the frequency ranges of ecolocation in each species (e.g., larger pinna, lower frequencies) (Obrist et al., 1993; Gannon et al., 2001; Siemers and Swift, 2006). The ears of *H. magellanicus* are on average shorter than those of *H. montanus*; in *H. magellanicus* the ears are proportionally longer than broad, the tragus is broad at its base and very narrow at the tip and is shorter than in *H. montanus*; on the contrary in the latter the ears are as long as broad, and the tragus is proportionally broader at the tip. These

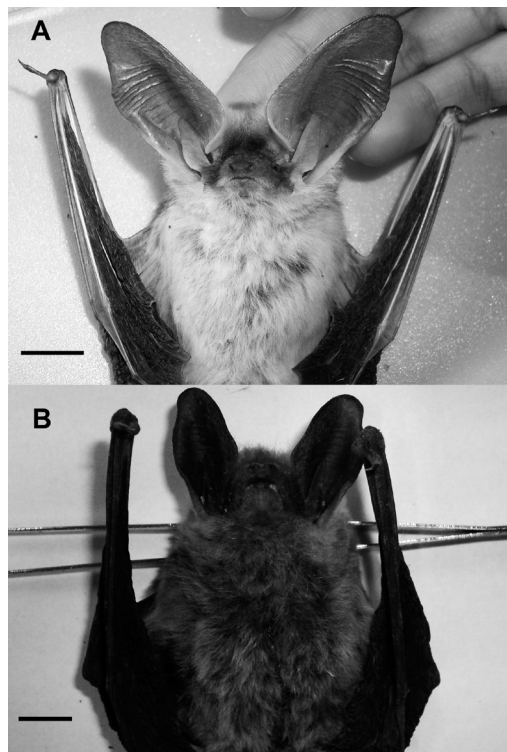


Fig. 1. Specimens of *Histiotes montanus* (A; LIEB-M-744) and *H. magellanicus* (B; LIEB-M-854). Scale = 10 mm.

differences suggest that sensory ecology plays a key role in within-guild niche differentiation between closely related bat species (Siemers and Swift, 2006). Therefore, we believe that differences in coloration, length and ear shape merit consideration in treating *H. magellanicus* as a full species, different from *H. montanus* (see **Fig. 1**).

Histiotes magellanicus has been classified in the Data Deficient category of the Red Book of Argentine Mammals (Díaz and Ojeda, 2000). The lack of knowledge is not limited to *H. magellanicus* but encompasses the majority of Patagonian bats, and this applies even to basic taxonomy and distribution. Studies of Patagonian mammals have focused predominantly on non-volant small mammals (e.g., Pearson and Pearson, 1982; Pardiñas et al., 2003; Pardiñas et al., 2009), carnivore ecology (e.g., Donadio et al., 2001; Zapata et al., 2008; Fasola et al., 2009) and ungulate ecology (e.g., Montes et al., 2000; Baldi et al., 2004; Vila et al.,

2009) and only a few studies have referred specifically to bats (Baud, 1979; Pearson and Pearson, 1989; Pearson, 1995; Giménez, 2010). In Central Patagonia (i.e., Río Negro and Chubut provinces, Argentina) nine bat species have been recorded: *H. macrotus* (see Giménez, 2010), *H. montanus*, *Myotis aelleni*, *M. chiloensis*, *Lasiurus varius*, *L. cinereus* (only recorded in Río Negro Province) (Vespertilionidae), *Eumops patagonicus* (only recorded in Chubut province), *Molossops temminckii* (only recorded in Chubut province) and *Tadarida brasiliensis* (Molossidae; Barquez et al., 1993; Barquez et al., 1999; Barquez, 2006). Here we present the first records of *H. magellanicus* for Chubut and Río Negro provinces (Argentina), adding four new localities to the distribution of this rare species, and report new localities for another four Patagonian bats for Chubut province: *H. macrotus*, *M. chiloensis*, *L. varius* and *T. brasiliensis*.

MATERIALS AND METHODS

Specimens were collected in NW Chubut Province, Argentina (**Fig. 2**). This area comprises two different ecoregions, the Valdivian Temperate Forests (Olson et al., 2001) also known as Patagonian Forests (Burkart et al., 1999), and the Patagonian Steppe (Burkart et al., 1999; Olson et al., 2001). The Patagonian Forests is characterized by a humid and temperate climate, with vegetation dominated by trees such as *Nothofagus* (southern beeches in the Nothofagaceae, formerly in Fagaceae), *Austrocedrus chilensis* (Cupressaceae), *Embothrium coccineum*, *Lomatia hirsuta* (Proteaceae), and an understory dominated by a shade-tolerant bamboo *Chusquea culeou* (Poaceae, Bambusoideae; Burkart et al., 1999). The Patagonian Steppe is characterized by a temperate cold and dry weather, with shrubs of *Berberis* spp. (Berberidaceae) and *Schinus* spp. (Anacardiaceae), *Adesmia* spp. (Fabaceae) and a variety of grasses in the genera *Festuca*, *Poa* (Poaceae, Pooidea) and *Stipa* (Poaceae, Stipoideae; Aguiar y Sala, 1998). The contact between these ecoregions forms an ecotone of varied extension, from a few (<5) to several (>15) kilometers (Schlichter and Laclau, 1998). A steep environmental gradient develops along the ecotone, mostly due to a sharp decrease in precipitation from ca. 2000 mm to less than 350 in a W-E distance of just 50 km. The ecotone is characterized by seasonal rainfall and the presence of *Austrocedrus chilensis*, *Maytenus boaria*

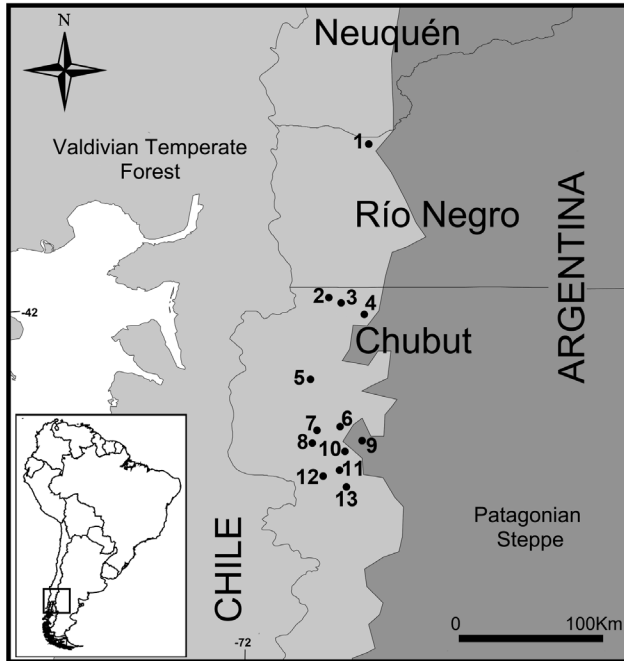


Fig. 2. Locality records for Central Patagonia bats: 1. Nahuel Huapi National Park, Río Negro Province; 2. Establecimiento Sr. Paladino; 3. Establecimiento La Sequoia; 4. Reserva El Coihue; 5. Lago Rivadavia; 6. Arroyo La Camioneta, Cerro La Torta; 7. Cascada Irigoyen, Los Alerces National Park; 8. Villa Futalaufquen, Los Alerces National Park; 9. Esquel; 10. Arroyo Esquel, at ca. 10 km from Esquel; 11. Capilla, in Trevelin; 12. Escuela Provincial N° 740 in Aldea Escolar; 13. Estancia Las Vacas Pampas.

(Celastraceae) and *Schinus patagonicus*, and several shrubs and grasses such as *Festuca pallescens* and *Stipa* spp. (Schlichter and Laclau, 1998).

Several bat surveys were carried out during the Austral spring and summer of 2008-2009, 2010 and 2011. Bats were captured using five mist nets (6 m long, 2 m high, 38.1 mm inches mesh) that were opened at late afternoon for a period of ca. five hours, depending on bat activity. Mist nets were located across water courses and forest trails and in open areas with low vegetation cover. All mist-netting localities were georeferenced with a Global Positioning System (GPS) device (Garmin® E-Trex Legend H).

Bats captured were identified following Barquez et al. (1993, 1999) and Barquez and Díaz (2009). Due to the paucity of information on Patagonian bats we also present external and craniodental measurements summarizing data from all captured specimens (**Table 1**). External measurements followed Barquez et al. (1999), Norberg and Rayner (1987) and include: body weight (W), total length (TTL), head-body length (HBL), tail length (TL), ear length (EL), tragus length from medial notch to tip (TrL), forearm length (FL), hind foot length with (HLn) and without nail (HL), ulna length (UL), thumb length (ThL), fifth finger length (c), wingspan (b), extended wing length (a), and third finger length (m). Body

weight is reported in grams and all other external measurements in mm. Craniodental measurements (in mm) were taken with a digital caliper to the nearest 0.01 mm; these include: condylobasal length (CBL), zygomatic breadth (ZW), height of braincase (HB), cranial width (CW), palate width between lingual edge of upper third molars (MW), upper and lower toothrow length (from the anterior margin of the canine to the posterior margin of the last molar; CM^2 and CM^3 , respectively), postorbital constriction (PC), rostrum length (RL), palatal length (PL), upper and lower canine length (C^1L and C^2L , respectively), width between upper canines (C^1W), third upper premolar length (P^3L), mandible length and height (ML and MH, respectively), and coronoid height (CH). All specimens were deposited in the Mammal Collection of the Laboratorio de Investigaciones en Evolución y Biodiversidad (LIEB), Facultad de Ciencias Naturales, Universidad Nacional de la Patagonia San Juan Bosco sede Esquel (Chubut, Argentina).

RESULTS

Nine individuals of *H. magellanicus* were captured at three localities of Chubut province, and we report on one additional specimen examined in the mammal collection of Museo La Plata (Buenos Aires province, Argentina) from Río Negro province (**Fig. 3**), whose locality has not been published. In total, we captured 20 bats from four different species and two families (Vespertilionidae and Molossidae) in 12 new localities at NW Chubut province (**Figs. 2, 3**). Overall we report new localities for *H. magellanicus*, *H. macrotus*, *M. chiloensis*,

Table 1

Summary of external measurements of bat species captured during this study. Abbreviations: n sample size, X mean, SD standard deviation. Abbreviations for measurements in the text.

| | <i>H. macrotus</i> (n=3) | | | <i>H. magellanicus</i> (n=8) | | | <i>M. chiloensis</i> (n=18) | | | <i>L. varius</i> (n=2) | | | <i>T. brasiliensis</i> (n=7) | | |
|-----|-----------------------------|----------|-----------|---------------------------------|------------|-----------|--------------------------------|-----------|-------|---------------------------|-----------|---------|---------------------------------|---------|--|
| | X±SD | Range | X±SD | Range | X±SD | Range | X±SD | Range | X | Range | X±SD | Range | X±SD | Range | |
| W | 9.5±1.3 | 8.6-10.4 | 12.1±2.8 | 10.3-17.6 | 7.6±0.8 | 6.4-8.6 | 11.3 | 10.1-12.4 | 11.3 | 10.1-12.4 | 12.2±1.2 | 11-13.5 | 12.2±1.2 | 11-13.5 | |
| TLL | 114.5±9.2 | 108-121 | 113.5±5.6 | 103-119 | 46.7±3.2 | 39.5-54 | 112.5 | 104-121 | 112.5 | 104-121 | 100.5±6.7 | 91-110 | 100.5±6.7 | 91-110 | |
| HBL | 56±12.7 | 47-65 | 64.6±3.3 | 59-69 | 86.3±4.0 | 76.5-91 | 59 | 53-65 | 59 | 53-65 | 60.8±3.1 | 56-65 | 60.8±3.1 | 56-65 | |
| TL | 58.5±3.5 | 56-61 | 48.9±4.9 | 43-57 | 39.6±2.5 | 37-45 | 53.5 | 51-56 | 53.5 | 51-56 | 38.5±2.6 | 35-42 | 38.5±2.6 | 35-42 | |
| EL | 34±1.4 | 33-35 | 24.5±0.9 | 23-26 | 13.6±1.2 | 11.5-15.5 | 13.5 | 13-14 | 13.5 | 13-14 | 14±1.7 | 12-16 | 14±1.7 | 12-16 | |
| TrL | 15.3±0.4 | 15-15.5 | 11.8±0.4 | 11-12 | 7.7±0.8 | 6.5-10 | 6.5 | 6-7 | 6.5 | 6-7 | 3.7±0.5 | 3-4 | 3.7±0.5 | 3-4 | |
| FL | 48.7±0.5 | 48.4-49 | 47±1.4 | 44.6-48.7 | 38.7±0.9 | 37.1-40.2 | 40.7 | 40.3-41.6 | 40.7 | 40.3-41.6 | 43.7±1.3 | 42-44.9 | 43.7±1.3 | 42-44.9 | |
| HLn | 8.8±0.5 | 8.5-9.2 | 8.9±0.9 | 7.3-10 | 7.7±0.6 | 6.6-9.2 | 7.1 | 6.8-7.3 | 7.1 | 6.8-7.3 | 8.5±0.7 | 7.7-9.5 | 8.5±0.7 | 7.7-9.5 | |
| HL | 6.5±1.4 | 5.5-7.5 | 7.8±1.1 | 5.4-8.9 | 6.4±0.5 | 5.5-7.3 | 5.9 | 5.9-5.9 | 5.9 | 5.9-5.9 | 7.4±0.5 | 6.8-8 | 7.4±0.5 | 6.8-8 | |
| UL | 21.5±0.9 | 20.9-22 | 20.6±1.1 | 18.7-22 | 16.3±0.7 | 14.9-17.2 | 19.7 | 19.5-20 | 19.7 | 19.5-20 | 13.1±0.8 | 12-14 | 13.1±0.8 | 12-14 | |
| ThL | 6.9±0.7 | 6.4-7.4 | 7.0±0.7 | 6-8 | 6.1±0.4 | 5.3-6.8 | 6.7 | 6.4-7 | 6.7 | 6.4-7 | 6.7±0.5 | 6-7.5 | 6.7±0.5 | 6-7.5 | |
| c | 65±8.5 | 59-71 | 61.9±1.6 | 59-64 | 49.7±2.6 | 46-55 | 56 | 55-57 | 56 | 55-57 | 49.8±10.4 | 41-64 | 49.8±10.4 | 41-64 | |
| b | 314±10.6 | 306-321 | 307.4±8.6 | 298-320 | 254.5±25.5 | 228-352 | 300.5 | 296-305 | 300.5 | 296-305 | 303.4±4.1 | 298-308 | 303.4±4.1 | 298-308 | |
| a | 144±2.1 | 142-145 | 135±6.3 | 125-146 | 112.5±4.3 | 102-119 | 133.5 | 129-138 | 133.5 | 129-138 | 134.4±2.5 | 132-138 | 134.4±2.5 | 132-138 | |
| m | 82±4.2 | 79-85 | 76.1±6.6 | 62-83 | 61.3±2.9 | 56-65 | 85.5 | 82-89 | 85.5 | 82-89 | 78.2±3.2 | 75-82 | 78.2±3.2 | 75-82 | |

L. varius and *T. brasiliensis* (see below). We include external (**Table 1**) and craniodental (**Table 2**) measurements of the examined specimens.

Order Chiroptera
Family Vespertilionidae
Histiotus magellanicus (Philippi, 1866)

Nine females were captured from three new localities (**Fig. 3**): Reserva El Coihue, 42° 09'44.4"S 71°18'35.4"W (LIEB-M 857, LIEB-M 858, LIEB-M 859, LIEB-M 860, LIEB-M 861), 2 km N from El Hoyo, 42°02'54.8"S 71°31'02.7"W (LIEB-M 864), and Arroyo La Camioneta, Cerro La Torta, 42°50'26.3"S 71°27'15"W (LIEB-M 854, LIEB-M 855, LIEB-M 856). Reserva El Coihue is located East of Provincial Road 70 between Epuypén and El Maitén. The bats were caught in a mixed forest of native (*Austrocedrus chilensis*) and exotic trees (*Pinus* spp.); three individuals were captured in mist nets together with *H. macrotus*. The locality 2 km N from El Hoyo is a cattle ranch surrounded by native forest and some exotic species such as fruit and walnut trees where we found one dead specimen (not included in **Table 1**). Arroyo La Camioneta, Cerro La Torta is a moderately disturbed *Nothofagus* forest with a shrubby understory; the bats were captured while flying over a stream. All localities are below 1010 m.a.s.l. In addition, we detected one specimen deposited in the Mammal Collection of Museo La Plata (MLP 10.IX.35.8), collected in 1922 by Albert Merkle in Nahuel Huapi, Río Negro (**Fig. 1**). This specimen was correctly identified and labeled although its locality was not reported previously.

Fig. 3. Localities records for *H. magellanicus*. Previously known localities: 1. Mafil, Valdivia; 2. Villa La Angostura, 19 km along Hwy; 3. Quellon, Isla de Chiloe; 4. Río Inio, Isla de Chiloe; 5. Puerto Pratt, Last Hope Inlet, Patagonia; 6. Los Glaciares National Park; 7. Estancia Viamonte; 8. Puerto Toro, Isla Navarino. New localities: 9. Nahuel Huapi National Park; 10. Reserva El Coihue; 11. 2 km N El Hoyo; 12. Arroyo La Camioneta, Cerro La Torta.

Histiotus macrotus (Poepig, 1835)

Two females and one male of the greater leaf-eared bat were captured at two localities (**Fig. 2**): Reserva El Coihue (LIEB-M 853 female) and Esquel 42°54'49"S 71°18'39"W (LIEB-M 846 male and LIEB-M 845 female). In Reserva El Coihue we captured one individual over a trail in a mixed forest of native and exotic trees. The other individuals were caught in a small urban area (Esquel town, ca. 750 ha), surrounded by natural open and forested habitats and pine-tree plantations.

Myotis chiloensis (Waterhouse, 1840)

Ten females and five males of the Chilean *Myotis* were captured from four new localities (**Fig. 2**): Cascada Irigoyen, Los Alerces National Park, 42°51'38.5"S 71°36'05.8"W (LIEB-M 812 male, LIEB-M 815 male, LIEB-M 0813 female, LIEB-M 814 female); Estancia Las Vacas Pampas on Provincial Road 17 at ca. 15 km from Trevelin, 43°11'47"S 71°25'27"W (LIEB-M 816 male, LIEB-M 818 male, LIEB-M 819 male, LIEB-M 830 female, LIEB-M 832 female, LIEB-M 836 female, LIEB-M 822 male, LIEB-M 825 male, LIEB-M 831 male); Arroyo La Camioneta, Cerro La Torta (LIEB-M 840 female); and Lago Rivadavia, 42°32'54"S 71°38'26.5"W (LIEB-M 841 female). Lago Rivadavia and Cas-

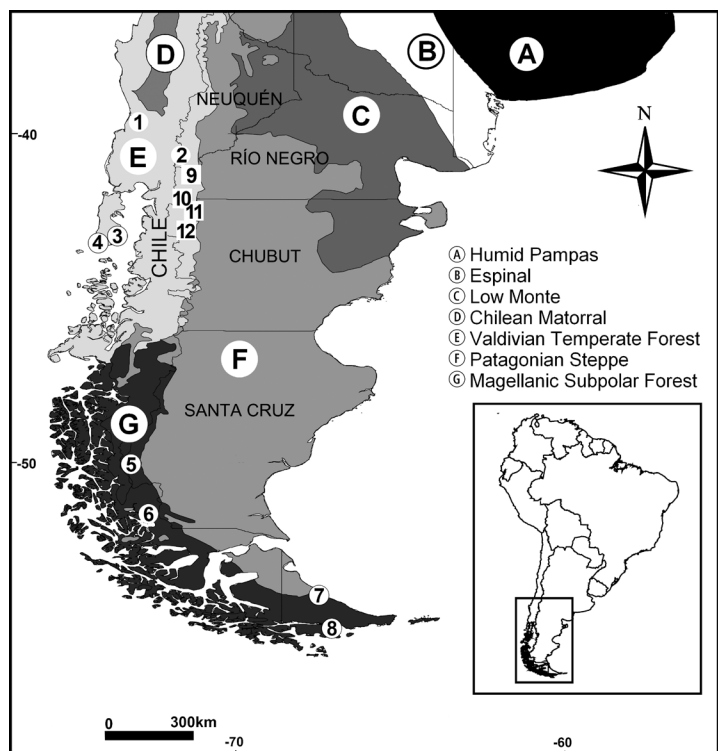


Table 2

Summary of craniodental measurements of bats captured during this study. Abbreviations: n sample size. X mean. SD standard deviation. Abbreviations for measurements in the text.

| | <i>H. macrotus</i> (n=2) | | <i>H. magellanicus</i> (n=5) | | <i>M. chiloensis</i> (n=14) | | <i>L. varius</i> (n=1) | | <i>T. brasiliensis</i> (n=3) | |
|------------------|-----------------------------|------------|---------------------------------|-----------|--------------------------------|-------|---------------------------|-------------|---------------------------------|--|
| X | Range | X±SD | Range | X±SD | Range | X±SD | Range | X±SD | Range | |
| CBL | 17.09-17.79 | 17.38±0.36 | 17.01-17.84 | 13.9±0.30 | 13.5-14.40 | 13.32 | 15.97±0.30 | 15.75-16.31 | | |
| ZW | 10.76-11.42 | 11.53±0.18 | 11.37-11.79 | 9.1±0.30 | 8.7-9.60 | 9.77 | 10.07±0.17 | 9.88-10.21 | | |
| HB | 6.03-6.09 | 6.1±0.04 | 6.04-6.12 | 5.3±0.10 | 5.1-5.50 | 5.74 | 5.74±0.18 | 5.53-5.86 | | |
| CW | 9.57-9.75 | 9.39±0.19 | 9.13-9.57 | 7.7±0.20 | 7.5-8.00 | 8.14 | 9.42±0.16 | 9.23-9.52 | | |
| MW | 6.86-7.22 | 7.39±0.21 | 7.24-7.68 | 5.7±0.50 | 4.0-6.30 | 6.65 | 7.14±0.25 | 6.92-7.41 | | |
| CM ³ | 6.15-6.63 | 6.79±0.13 | 6.66-6.95 | 5.6±0.10 | 5.3-5.80 | 4.73 | 6.21±0.09 | 6.11-6.27 | | |
| CM ₃ | 4.624.81 | 4.59±0.10 | 4.51-4.73 | 4.0±0.10 | 3.8-4.10 | 4.76 | 4.17±0.06 | 4.12-4.23 | | |
| PC | 4.81-4.91 | 4.89±0.07 | 4.83-4.98 | 4.8±0.20 | 4.6-5.10 | 3.18 | 4.69±0.07 | 4.63-4.76 | | |
| RL | 8.09-8.37 | 8.41±0.43 | 7.87-8.91 | 7.4±0.20 | 7.0-7.80 | 5.69 | 7.01±0.16 | 6.92-7.19 | | |
| PL | 2.44-2.59 | 2.51±0.20 | 2.33-2.75 | 3.8±0.10 | 3.6-4.00 | 2.29 | 2.16±0.00 | 2.16-2.16 | | |
| C'L | 4.91-5.08 | 5.11±0.26 | 4.82-5.35 | 1.5±0.10 | 1.3-1.80 | 5.36 | 4.24±0.42 | 3.89-4.71 | | |
| C ₁ L | 1.33-1.64 | 1.57±0.14 | 1.38-1.71 | 1.0±0.30 | 0.5-1.50 | 1.52 | 1.47±0.05 | 1.43-1.53 | | |
| C'W | 12.21-12.77 | 12.71±0.23 | 12.44-12.99 | 10.7±0.30 | 10.1-11.10 | 9.91 | 11.57±0.32 | 11.28-11.91 | | |
| P'L | 1.49-1.54 | 1.57±0.19 | 1.45-1.85 | 1.3±0.10 | 1.0-1.60 | 1.45 | 1.66±0.13 | 1.52-1.78 | | |
| ML | 2.15-2.41 | 2.17±0.17 | 1.94-2.33 | 1.1±0.20 | 0.8-1.40 | 2.08 | 2.15±0.09 | 2.06-2.23 | | |
| MH | 6.82-7.36 | 7.25±0.25 | 6.99-7.57 | 6.0±0.20 | 5.3-6.30 | 5.43 | 6.94±0.36 | 6.56-7.27 | | |
| CH | 3.75-3.98 | 4±0.14 | 3.83-4.11 | 2.9±0.10 | 2.8-3.20 | 3.17 | 3.32±0.07 | 3.24-3.37 | | |

cada Irigoyen are located within temperate-forest habitats with mixed stands of *Nothofagus* spp. and *Austrocedrus chilensis* near water courses, with low human impact. Estancia Las Vacas Pampas is an open field disturbed by cattle, with some patches of native vegetation including *Nothofagus antarctica*, surrounded by native forest of *Nothofagus* spp. All of the bats captured at this site were roosting in an abandoned house.

Likewise two males and one female were captured from the exact type locality of *Myotis aelleni* (Fig. 2): Establecimiento La Sequoia, on National Road 40 near El Hoyo, 42°04'59.7"S 71°29'22.2"W (LIEB-M 842 male, LIEB-M 843 male, LIEB-M 844 female). As these specimens did not exhibit the diagnostic characters of *M. aelleni*, they were originally assigned to *M. chiloensis*. However, a genetic test awaits to confirm or reject distinctiveness between these species designations. It is important to emphasize that we netted at the exact locality from where the type specimen and series of *M. aelleni* were collected by M. A. Kovacs between 1969 and 1977 (Baud, 1979). The building where specimens were collected is conserved to date. The habitat is temperate forest with some exotic trees, such as fruit trees and *Pinus* spp.

Lasius varius (Poeppig, 1835)

Two females of the Chilean red bat were captured from two localities (Fig. 2): Reserva El Coihue (LIEB-M 862) and Arroyo Esquel, at ca. 10 km from Esquel, 42°58.8'27"S 71°23.7'60"W (LIEB-M 863). The latter record is from an ecotone habitat on National Road 259, at the edge of the Esquel stream. This record is 100 km south from the nearest and recently reported locality for Chubut Province at Lago Puelo National Park (Vidóz and González, 1994).

Family Molossidae

Tadarida brasiliensis (I. Geoffroy, 1824)

Seven males of the Brazilian free-tailed bat were captured from four new localities (Fig. 2): Estancia Las Vacas Pampas (LIEB-M 865). Capilla, in Trevelin 43°05.4'56"S 71°28'26"W (LIEB-M 0753, LIEB-M 758, LIEB-M 759). Villa Futalaufquen, Los Alerces National Park 42°53'42.6"S 71°36'56.4"W (LIEB-M 866). Escuela Provincial N° 740 in Aldea Escolar 43°08'03"S 71°33'39"W (LIEB-M 0881). The localities reported herein represent four new records for Valdivian Temperate Forests (sensu Olson et al., 2001) and the ecotone between this and the Patagonian Steppe.

DISCUSSION

In this study we report new records of *H. magellanicus* for Chubut and Río Negro provinces (Argentina), increasing the number of known bat species to eight for both provinces. As previously mentioned, in Argentina *H. magellanicus* has been only found in the provinces of Neuquén, Santa Cruz and Tierra del Fuego (Barquez, 2006). Cabrera (1958) reported this species for southern Santa Cruz province, but Barquez et al. (1999) examined the corresponding specimens and concluded that they represented *H. montanus*. Nevertheless Barquez and Zoratti (1998) recorded this species for Santa Cruz province. Only three specific localities of this species have been reported for Argentina: estancia Viamonte in Tierra del Fuego province (see Barquez et al., 1999), 19 km N of Villa La Angostura in Neuquén province (Mares et al., 1995) and Los Glaciares National Park (Seccional Río Mitre) in Santa Cruz province (Barquez and Zoratti, 1998). So this bat appears as one of the least known species of Argentina regarding geographical distribution. Localities we report herein are important in reducing a gap of ca. 1000 km in the known distribution of *H. magellanicus* in Argentina (between Neuquén and Santa Cruz), with the first valid records of *H. magellanicus* for Chubut and Río Negro provinces. A previous record of this species from Chubut is provided on the website of the "Argentine Biodiversity Information System" for Lago Puelo National Park (Chubut province). However, no voucher or measurements were taken to distinguish it from the congeneric *H. macrotus* and *H. montanus*, both with records for western Chubut province. Although this species is likely to occur in Lago Puelo National Park, we recommend this specific record be dismissed until a voucher is collected.

The new records presented here for *H. magellanicus* were located only in Valdivian Temperate Forests, which are coincident with previous accounts for both Argentina and Chile. However the species has been recorded also in the Magellanic Subpolar

Forests ecoregion (sensu Olson et al., 2001) for both Chile and Argentina. Barquez (2006) includes Patagonian Steppe in the probable distribution of *H. magellanicus* in Argentina, although no specimen has been recorded in this environment. The available evidence suggests that this bat is an endemic of the Subantarctic forest restricted to Valdivian Temperate and Magellanic Subpolar Forests districts. It is also important to emphasize that many records date from the beginnings of the 20th century and should be corroborated with new captures. Regarding altitude, none of the records were above 1010 m.a.s.l., which agrees with the suggestion that *H. magellanicus* occurs below 1200 m.a.s.l. (Handley and Gardner, 2008).

By comparison, the distribution of *H. magellanicus* in Argentina is much more restricted than that of its congener *H. montanus*, which is widely distributed in the region with 15 known localities, of which only 3 are in Valdivian Temperate Forests (Isla Victoria, Neuquén; E Cónдор Lago Perito Moreno, and El Bolsón, Río Negro), 10 are located in the Patagonian Steppe, one in ecotone between these two environments, and one in Low Monte (sensu Olson et al., 2001) (see Barquez et al., 1999; Giménez, 2010). From these records, we can assume that *H. montanus* inhabits primarily the Patagonian Steppe and similarly open environments northward) while *H. magellanicus* is restricted to the Valdivian Temperate Forests.

Despite *H. macrotus* being widespread in western Argentina (Barquez et al., 1999), only five records were known from Patagonia from three provinces: two in Río Negro (estancia El Cónдор; Pearson and Pearson, 1989; and Bariloche 20 km E; Pearson, 1995); one in Neuquén (Villa La Angostura 19 km N; Barquez et al., 1999); and two in Chubut (estancia El Principio and Escuela de Idioma Gales, Trevelin; Giménez, 2010). Here we present two new localities for Chubut Province, one in Valdivian Temperate Forests and another in Ecotono habitat. *H. macrotus* seems able to inhabit both forested and steppe habitats, and can also be found in suburban areas in the region (Giménez, 2010). *Histiotus macrotus* is syntopic

with *H. magellanicus*, which is very similar in both craniodental and wing morphology, and if this resemblance is assumed to reflect niche similarity, detailed ecological or trophic studies are needed to identify the underlying mechanism that allows their coexistence in Subantarctic forests (see Arlettaz, 1999).

Another species endemic of Patagonian ecoregions is *M. chiloensis* and here we report four new localities. Although this species has the highest number of records in Patagonia (15, including Neuquén, Río Negro, Chubut and Tierra del Fuego provinces; Barquez, 2006) only three were known for Chubut province (El Hoyo de Epuyén, lago Futalaufquen and 3 km N of Tecka; Barquez et al., 1999). Therefore, we doubled the known records in this province. *M. chiloensis* is one of the southernmost occurring bat species and the southernmost occurring *Myotis* (Koopman, 1967). We only captured *M. chiloensis* in Valdivian Temperate Forests; however it has also been recorded in the Patagonian Steppe (see Pearson and Pearson, 1989; Barquez et al., 1999). We report here specimens from the exact type locality of *M. aelleni*. It is noteworthy that the taxonomic status of *M. aelleni* is still unclear, and that the form has only been recorded from two close (ca. 15 km) localities. Pearson and Pearson (1989) also captured specimens from the type locality and identified them as *M. chiloensis*, in contrast with the statement by Baud (1979). A detailed study on the identity of this species is sorely needed.

Lasiurus varius has been recorded from two new localities, approximately 100 km south of the nearest locality for Chubut province (Vidoz and González, 1994). Dabbene (1902) recorded this species from Tierra del Fuego, which was mapped by Gardner and Handley (2008) as the southernmost record for the species. However, Barquez et al. (1999) and Barquez and Díaz (2009) excluded this record from their reviews because no voucher specimen could be located. In Argentina, previous records indicate that the species extends throughout Patagonian provinces, with 11 localities, most of them from Neuquén (Barquez, 2006). The species inhabits environments of the Valdiv-

ian Temperate Forests, Patagonian Steppe and Low Monte ecoregions (sensu Olson et al., 2001; see Barquez, 2006). We recorded one locality in the Valdivian Temperate Forests and the other in an ecotone between this and Patagonian Steppe. This agrees with previous records in adjacent areas of the Patagonian Steppe in Neuquén (see Barquez et al., 1999) although these are also very close to Valdivian Temperate Forests. It is important to emphasize that this species might migrate, just like other species of *Lasiurus* (e.g., *L. blossevillii* and *L. cinereus*; La Val and La Val, 1979; Barquez et al., 1999).

Lastly, we present new localities for *T. brasiliensis*. Although this is one of the most widespread species of bats with many records in Argentina (Wilkins, 1989; Barquez, 2006), only 12 localities were from Patagonia (sensu lato), mostly in Neuquén and Río Negro provinces (Barquez et al., 1999). Until now, the Brazilian free-tailed bat has not been recorded from NW Chubut province, with localities only known from the Patagonian coast (Península Valdés; Daciuk, 1974; Rada Tilly; Nabte et al., 2011; a third locality was referred only as Chubut, see Barquez et al., 1999). We added here four new localities from the Valdivian Temperate Forests and the ecotone between it and the Patagonian Steppe. Records from the Valdivian Temperate Forests belong to an open forest (partly disturbed) and a small settlement. This species has narrow and long wings for enduring flight in open areas (Norberg and Rayner, 1987; Canals et al., 2001). Its presence in forested areas might be related to higher-altitude occurrence, occupation of disturbed areas, or feeding above the canopy.

CONCLUSION

In the present contribution we recorded *H. magellanicus* as a new species for Chubut and Río Negro provinces of Argentina and increased the number of known bat species to eight for both provinces. On *H. magellanicus*, we argue that for authors unconvinced of its validity as distinct from *H. montanus* at the species level (i.e., those treating the former as a subspecies of the latter; e.g., Handley

and Gardner, 2008), the distributional data reported here are still important in shaping the distribution of the form *magellanicus* regardless of this controversy. These records reduced a gap of ca. 1000 km in the distribution of *H. magellanicus* in Argentina, and we were able to restrict this species as endemic to the Subantarctic Forests. In addition, we presented 12 new localities in NW Chubut province for four bat species, including three that only occur in Patagonia (Barquez et al., 1999). Lack of studies on flying mammals from Southern Argentina has allowed various knowledge gaps to persist even at the level of basic taxonomic and distributional data. In this work we hope to have contributed to improving the quality and precision of distributional data of Patagonian bat species, critical to any attempt to apply conservation policies (Racey and Entwistle, 2003). The craniodontal measurements provide additional information for identification of Patagonian bat species, without the need to rely exclusively on external characters. Further work in the field should contribute new records for the bat fauna of this region, and provide more specimens for detailed analyses of intraspecific and interspecific variability.

ACKNOWLEDGMENTS

We thank Mr. Ors Kovacs for kindly showing us the type locality of *Myotis aelleni*; Mr. Paladino, Mr. Williams and Mr. Jones for allowing us access to their farms; Mr. Oses for permission to enter Reserva El Coihue; and Mariel Boquet and Gabriel Bauer for donating two specimens used in this study. Guillermo Omad and Leticia Pafundi assisted during field work. Administración de Parques Nacionales (proyecto 1049) and Dirección de Fauna y Flora Silvestre de la provincia del Chubut (36/08 DFyFS, 20/2010 DF y FS-SSRN, 004/2011 DF y FS-SSRN) kindly granted the capture permits. We thank Diego Verzi and Itatí Olivares for access to the collection of Museo La Plata. We thank financial support afforded by Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) and Universidad Nacional de la Patagonia San Juan Bosco PI 031. NPG thanks CONICET and PICT 2008-1798.

LITERATURE CITED

- AGUIAR MR and OE SALA. 1998. Interactions among grasses, shrubs, and herbivores in Patagonian grass-shrubs steppes. *Ecologia Austral* 8:201-210.
- ARLETTAZ R. 1999. Habitat selection as a major resource partitioning mechanism between the two sympatric

- sibling bat species *Myotis myotis* and *Myotis blythii*. Journal of Animal Ecology 68:460-471.
- BALDI R, A PELLIZA-SBRILLER, D ELSTON, and S ALBON. 2004. High potential for competition between guanacos and sheep in Patagonia. Journal of Wildlife Management 68:924-938.
- BARQUEZ RM. 2006. Orden Chiroptera. Pp. 56-86, in: Mamíferos de Argentina, sistemática y distribución (RM Barquez, MM Díaz and RA Ojeda, eds.). Sociedad Argentina para el Estudio de los Mamíferos (SAREM), Mendoza.
- BARQUEZ RM and C ZORATTI. 1998. La distribución de los murciélagos del genero *Histiotus* (Vespertilionidae) en la provincia de Santa Cruz, Argentina. Pp. 70, in: Libro de Resúmenes XIII Jornadas Argentinas de Mastozoología.
- BARQUEZ RM and MM DÍAZ. 2009. Los murciélagos de Argentina: clave de identificación. Programa de Conservación de los Murciélagos de Argentina (PCMA). Publicación Especial N° 1, Tucumán.
- BARQUEZ RM, NP GIANNINI, and MA MARES. 1993. Guide to the bats of Argentina. Oklahoma Museum of Natural History, Norman, Oklahoma.
- BARQUEZ RM, MA MARES, and JK BRAUN. 1999. The bats of Argentina. Special Publications of the Museum of Texas Tech University, Lubbock.
- BAUD JF. 1979. *Myotis aelleni*, nov. spec., chauve-souris nouvelle d' Argentine (Chiroptera: Vespertilionidae). Revue Suisse de Zoologie 86:267-278.
- BRAUN JK and MA MARES. 1995. The mammals of Argentina: An etymology. Mastozoología Neotropical 2:173-206.
- BURKART R, NO BÁRBARO, RO SÁNCHEZ, and DA GÓMEZ. 1999. Eco-regiones de la Argentina. Administración de Parques Nacionales, Programa Desarrollo Institucional Ambiental, Buenos Aires.
- CABRERA A. 1958. Catálogo de los mamíferos de América del Sur. Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" e Instituto Nacional de Investigación de las Ciencias Naturales, Ciencias Zoológicas 4:1-308.
- CANALS M, J IRIARTE-DÍAZ, R OLIVARES, and F NOVOA. 2001. Comparación de la morfología alar de *Tadarida brasiliensis* (Chiroptera: Molossidae) y *Myotis chiloensis* (Chiroptera: Vespertilionidae), representantes de dos diferentes patrones de vuelo. Revista Chilena de Historia Natural 74:699-704.
- DABBENE R. 1902. Fauna Magallánica. Mamíferos y aves de la Tierra del Fuego e islas adyacentes. II. Mamíferos. Anales del Museo Nacional de Buenos Aires 3:348-351.
- DACIUK J. 1974. Notas faunísticas y bioecológicas de Península Valdés y Patagonia. XII. Mamíferos colectados y observados en la Península Valdés y zona litoral del golfo San José y Nuevo (provincia de Chubut, República Argentina). Physis Sección C 23:23-39.
- DACIUK J. 1977. Notas faunísticas y bioecológicas de Península Valdés y Patagonia. XX. Presencia de *Histiotus montanus montanus* (Philippi y Landbeck, 1861) en la Península de Valdés (Chiroptera, Vespertilionidae). Neotrópica 23:45-46.
- DÍAZ GB and RA OJEDA (Comp. and eds.). Libro rojo de mamíferos amenazados de la Argentina. Sociedad Argentina para el Estudio de los Mamíferos (SAREM), Mendoza.
- DONADIO E, S DI MARTINO, M AUBONE, and A NOVARO. 2001. Activity patterns, home-range, and habitat selection of the common hog-nosed skunk, *Conepatus chinga* (Mammalia, Mustelidae) in northwestern Patagonia. Mammalia 65:49-54.
- FASOLA L, C CHEHÉBAR, DW MACDONALD, G PORRO, and MH CASSINI. 2009. Do alien North American Mink compete for resources with native South American river otter in Argentinean Patagonia? Journal of Zoology 277:187-195.
- FORNES A and E MASSOIA. 1967. Procedencias nuevas o poco conocidas para murciélagos (Noctilionidae, Phyllostomidae, Vespertilionidae y Molossidae). Segundas Jornadas Entomoepidemiológicas Argentinas 1:133-145.
- GANNON WL, RE SHERWIN, TN DECARVAKHO, and MJ O'FARRELL. 2001. Pinnae and echolocation call differences between *Myotis californicus* and *M. ciliolabrum* (Chiroptera: Vespertilionidae). Acta Chiropterologica 3:77-91.
- GARDNER AL and CO HANDLEY JR. 2008. Genus *Lasiurus* Gray, 1831. Pp. 457-468, in: Mammals of South America, Volume 1, Marsupials, Xenarthrans, Shrews and Bats (AL Gardner, ed.). The University of Chicago Press, Chicago and London.
- GIMÉNEZ AL. 2010. Primeros registros de *Histiotus macrotus* (Chiroptera: Vespertilionidae) en la provincia del Chubut, Argentina. Mastozoología Neotropical 17:375-380.
- HANDLEY CO JR. and AL GARDNER. 2008. Genus *Histiotus* P. Gervais, 1856. Pp. 450-457, in: Mammals of South America, Volume 1, Marsupials, Xenarthrans, Shrews and Bats (AL Gardner, ed.). The University of Chicago Press, Chicago and London.
- KOOPMAN KF. 1967. The southernmost bats. Journal of Mammalogy 48:487-488.
- KOOPMAN KF. 1993. Order Chiroptera. Pp. 137-241, in: Mammals Species of the World: a taxonomic and geographic reference (DE Wilson and DM Reeder, eds.). 2da Edition. Smithsonian Institution Press, Washington.
- LA VAL, RK and ML LA VAL. 1979. Notes on reproduction, behavior, and abundance of thered bat, *Lasiurus borealis*. Journal of Mammalogy 60:209-212.
- McNAB BK. 1982. Evolutionary alternatives in the physiological ecology of bats. Pp. 151-200, in: Ecology of Bats (TH Kunz, ed.). Plenum, New York.
- MARES MA, RM BARQUEZ, and JK BRAUN. 1995. Distribution and ecology of some Argentine bats. Annals of Carnegie Museum 64:219-237.
- MONTES C, DA DE LAMO, and J ZAVATTI. 2000. Distribución de abundancias de guanacos (*Lama guanicoe*) en los distintos ambientes de Tierra del Fuego, Argentina. Mastozoología Neotropical 7:23-31.
- NABTE MJ, A ANDRADE, A MONJEAU, JL HERNANDEZ, D VAQUERO, and SL SABA. 2011. Mammalia, Chiroptera, Molossidae, *Tadarida*

- brasiliensis* I. Geoffroy, 1824: Distribution extension. Check List 7:142-143.
- NORBERG UM and JMV RAYNER. 1987. Ecological morphology and flight in bats (Mammalia; Chiroptera): wing adaptations, flight performance. Foraging strategy and echolocation. Philosophical Transactions of the Royal Society of London B 316:335-427.
- OLSON DM, E DINERSTEIN, ED WIKRAMANAYAKE, ND BURGESS, GVN POWELL, EC UNDERWOOD, JA D'AMICO, I ITOUA, HE STRAND, JC MORRISON, CJ LOUCKS, TF ALLNUTT, TH RICKETTS, Y KURA, JF LAMOREUX, WW WETTENGEL, P HEDAO, and KR KASSEM. 2001. Terrestrial Ecoregions of the World: A New Map of Life on Earth. BioScience 51:933-938.
- OBRIST MK, MB FENTON, JL EGER, and PASCHLEGEL. 1993. What ears do for bats: a comparative study of pinna sound pressure transformation in Chiroptera. The Journal of Experimental Biology 180:119-152.
- OSGOOD WH. 1943. The mammals of Chile. Field Museum of Natural History, Zoological Series 30:1-268.
- PARDIÑAS UFJ, P TETA, S CIRIGNOLI, and DH PODESTÁ. 2003. Micromamíferos (Didelphimorphia y Rodentia) de norpatagonia extra-andina, Argentina: taxonomía alfa y biogeografía. Mastozoología Neotropical 10:69-113.
- PARDIÑAS UFJ, DE UDRIZAR-SAUTHIER, and P TETA. 2009. Roedores del extremo sudoriental continental de Argentina. Mastozoología Neotropical 16:471-473.
- PARUELO JM, A BELTRÁN, E JOBBÁGY, OE SALA, and RA GOLLUSCIO. 1998. The climate of Patagonia: general patterns and controls on biotic processes. Ecología Austral 8:85-101.
- PEARSON OP. 1995. Annotated keys for identifying small mammals living in or near Nahuel Huapi National Park or Lanin National Park, Southern Argentina. Mastozoología Neotropical 2:99-148.
- PEARSON OP and AK PEARSON. 1982. Ecology and biography of the southern rainforests of Argentina. Pp. 129-142, in: Mammalian biology of South America (MA Mares and HH Genoways, eds.). Special Publications Series, Pymatuning Laboratory of Ecology, University of Pittsburgh, Linesville, Pennsylvania.
- PEARSON OP and AK PEARSON. 1989. Reproduction of bats in southern Argentina. Pp. 549-566, in: Advances in Neotropical Mammalogy (KH Redford and JF Eisenberg, eds.). University of Florida, Gainesville, Florida.
- PEÑA LP and G BARRIA. 1972. Presencia de *Histiotus montanus magellanicus* Philp. y de *Myotis chiloensis chiloensis* Waterh. (Chiroptera), al sur del Estrecho de Magallanes. Anales del Museo de Historia Natural de Valparaíso 5:201-202.
- PHILIPPI, RA. 1866. Ueber ein paar neue Chilenische Säugethiere. (*Vespertilio magellanicus, capucinus, Desmodus d'Obigny* Waterh., *Canis patagonicus*). Archiv für Naturgeschichte 32:113.
- RACEY PA and AC ENTWISTLE. 2003. Conservation ecology of bats. Pp. 680-743, in: Bat ecology (TH Kunz and MB Fenton, eds.). The University of Chicago Press, Chicago and London.
- SCHLICHTER T and P LACLAU. 1998. Ecotono estepa-bosque y plantaciones forestales en la Patagonia norte. Ecología Austral 8:285-296.
- SIEMERS BM and SM SWIFT. 2006. Differences in sensory ecology contribute to resource partitioning in the *Myotis bechsteinii* and *Myotis nattereri* (Chiroptera: Vespertilionidae). Behavioral Ecology and Sociobiology 59:373-380.
- SIMMONS NB. 2005. Order Chiroptera. Pp. 312-529, in: Mammals species of the world (DE Wilson and DM Reeder, eds.). Johns Hopkins University Press, Baltimore, MD.
- SPEAKMAN JR and DW THOMAS. 2003. Physiological ecology and energetics of bats. Pp. 430-490, in: Bat ecology (TH Kunz and MB Fenton, eds.). The University of Chicago Press, Chicago and London.
- VIDOZ F and O GONZÁLEZ. 1994. Listado de mamíferos registrados en el Parque Nacional Lago Puelo desde Junio de 1992 hasta Abril de 1994. Administración de Parques Nacionales, Sistema de Información de Biodiversidad. <http://www.sib.gov.ar>
- VILAAR, GI GALENDE, and H PASTORE. 2009. Feeding ecology of the endangered huemul (*Hippocamelus bisulcus*) in Los Alerces National Park, Argentina. Mastozoología Neotropical 16:423-431.
- WILKINS KT. 1989. *Tadarida brasiliensis*. Mammalian Species 331:1-10.
- ZAPATA SC, DE PROCOPIO, R MARTINEZ-PECK, JI ZANÓN, and A TRAVAINI. 2008. Morfometría externa y reparto de recursos en zorros simpátricos (*Pseudalopex culpaeus* y *P. griseus*) en el sureste de la Patagonia Argentina. Mastozoología Neotropical 15:103-111.