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OBSERVATIONS ON BATS OF CÓRDOBA AND LA PAMPA PROVINCES, ARGENTINA

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Bat faunas of a particular region or area generally are less known than other groups of mammals because of the difficulties associated with collecting bats. In central Argentina, particularly in Córdoba and La Pampa Provinces, earlier reports have included a number of localities for several bat species for which information regarding distribution, reproductive data, measurements, and habitat information is available (Crespo et al., 1961; Fornes and Massoia, 1967; De Santis and Justo, 1978; Montalvo et al., 1988; Siegenthaler et al., 1990a; 1990b; Bárquez and Ojeda, 1992; Vaccaro, 1992; Mares et al., 1995). Nevertheless, little is known about the presence of some bat species in a particular area, and therefore information regarding reproduction, meristics, and ecology is lacking. In addition to the species mentioned in this report, *Histiotus macrotus* (Poeppig, 1835) and *Molossus ater* (E. Geoffroy, 1805) are known from single locality records for Córdoba Province: Villa Cura Brochero, San Alberto Department (Bárquez and Ojeda, 1992) and Alta Gracia, Santa

María Department (Fornes and Massoia, 1967), respectively.

In central Argentina, it is possible to observe the convergence of a wide array of phytogeographical regions, such as the Monte Desert, dominated by creosote-bushes (*Larrea* sp.); the Espinal, generally considered an extension of the Chaco or an impoverished Chaco without quebracho trees, is characterized by xerophilous scrub forests dominated by *Prosopis* trees; the Pampean grasslands; and towards the west and south, the Patagonian shrub-steppe (Cabrera, 1976). In each of these regions, an intermingling of subtropical and temperate faunas occurs. The Pampean Sierras, interspersed in an otherwise overwhelmingly flat country, offer the opportunity for the development of endemism and the isolation of species of Patagonian or Andean affinities (Polop, 1989). Additionally, salt flats with their associated biota of halophylous communities, conform distinct units in the landscape, and harbor a unique mammalian fauna (Braun and Mares, 1995).

METHODS AND MATERIALS

Since 1980, collections and observations of bats were made in different localities (Figure 1), but espe-

cially in the south of Córdoba Province. In La Pampa Province, most specimens were obtained during La

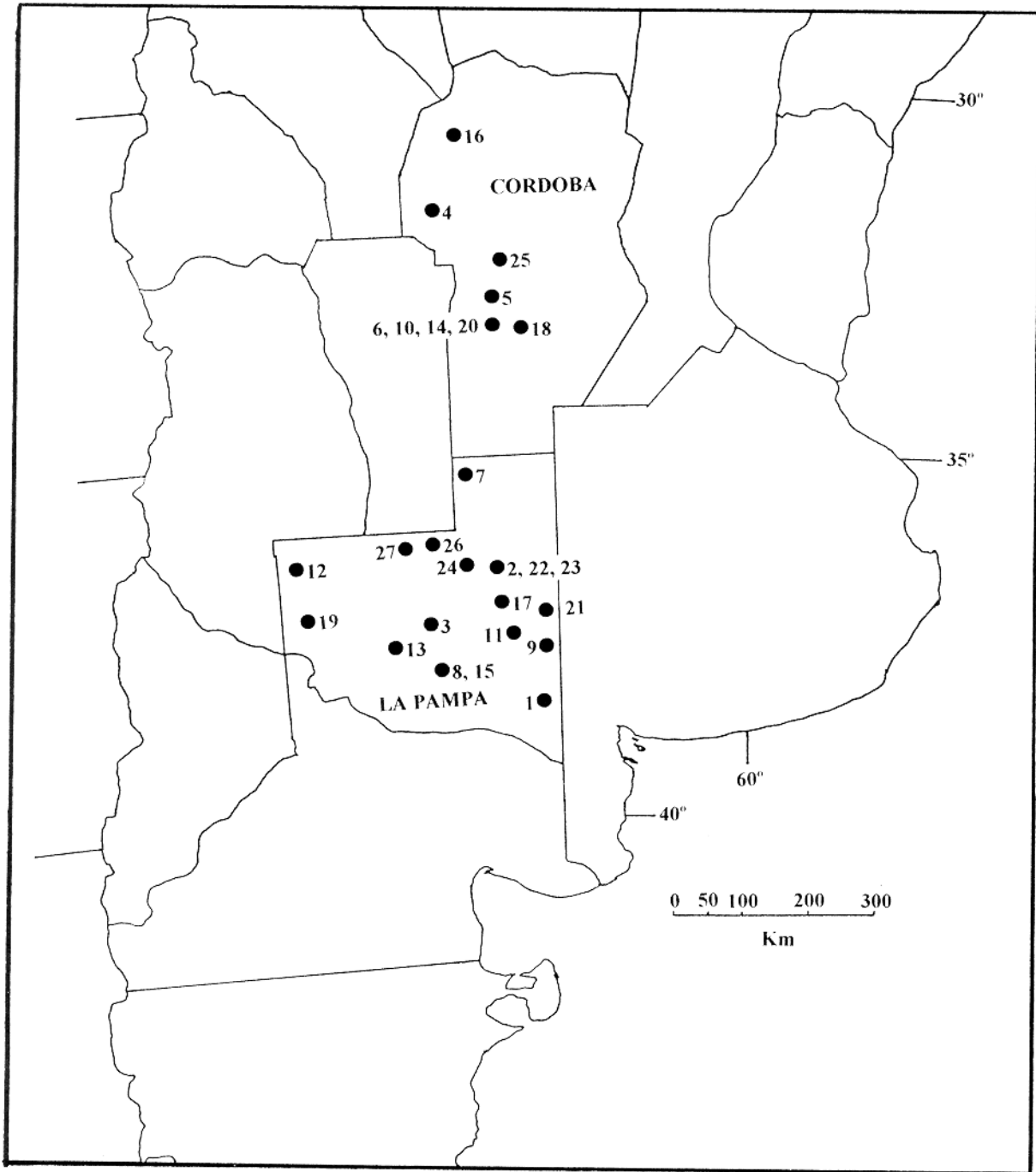


Figure 1. Map of central Argentina depicting collecting localities in Córdoba and La Pampa provinces. Locality numbers referred to the gazetteer.

Pampa Vertebrate Survey Plan de Relevamiento de los Vertebrados de la Provincia de La Pampa (RVP) collecting activities (Siegenthaler et al., 1990 *a, b*). Col-

lecting areas were generally rural settings in agricultural and grazing land, and sites with buildings in which roosts and maternity colonies were sometimes found.

Bats were captured with the use of mist nets and by hand. Nets were placed in tree groves, around buildings, in discharge tunnels and mine shafts, and on the faces of cliffs. On a few occasions, an air rifle or a .22-caliber firearm with dust shot were used to obtain crevice dwelling mastiff bats (*Eumops perotis*) and out of reach tree bats (*Lasiurus cinereus*). Skeletal remains of two specimens (*Tadarida brasiliensis*, *Eptesicus diminutus*) were obtained from barn owl (*Tyto alba tuidara*) pellets. Measurements were made with digital calipers and forearm length was taken on fresh speci-

mens. Linear measurements are in millimeters. Times are in hours. On a few occasions, embryos were collected and some specimens were karyotyped. Specimens were prepared as skins and skulls. Specimens from La Pampa Vertebrate Survey (RVP) are deposited in the Museo Provincial de Historia Natural, Santa Rosa, La Pampa, Argentina. The mammal collections of the Universidad Nacional de Rio Cuarto (UNRC), Rio Cuarto, Córdoba, Argentina, and the Museum of Texas Tech University (TTU), Lubbock, Texas, also were used for obtaining information and measurements.

ACCOUNTS OF SPECIES

Family Phyllostomidae

Desmodus rotundus

(E. Geoffroy, 1810)

Specimens examined (20).— Córdoba Province: Calamuchita Department, Segunda Usina, (TTU 64320 and UNRC 111-112); Pocho Department, Chancani, Estancia Aguas Blancas (TTU 66464-66475 and UNRC 113-116); Rio Cuarto Department, 10 km W Espinillo, Estancia La Cautiva (UNRC 110).

Comments.— This species has been sighted commonly in Córdoba Province (Crespo et al., 1961, Bárquez and Ojeda, 1992).

At Segunda Usina, a colony of about 15 males inhabiting the discharge tunnel of the dam, was netted when exiting. Species collected at the same location included *Myotis levis dinellii* and *Histiotus montanus*. Other bats collected nearby included *Eumops perotis*, *E. bonariensis bonariensis*, *Tadarida brasiliensis*, *Lasiurus blossevillii*, and *Lasiurus cinereus*, thus making Segunda Usina the locality with the highest diversity of bat species in this report. At this place, Chaco Serrano forest, cliffs, rock outcroppings, and hills were characteristic features. At Estancia Aguas Blancas, Chancani, a horizontal shaft at an abandoned gold mine surrounded by Chacoan scrub forests provided a home for hundreds of vampire bats. At the time of capture (2 April 1983), pregnant females possessed embryos with

crown-rump lengths of 34 and 37 mm and forearm lengths of 21 and 24. In June 1995, several specimens were netted 100 m from the mine while exiting at dusk (1900) and upon returning to the mine at 2100. Two nursing young (forearm length 49) were found with their mothers. At an abandoned house at Estancia La Cautiva, Espinillo, a single male for this species was found roosting inside a closet. This record represents the southernmost locality in Argentina. The vampire has benefited from human activities which have provided food (livestock) and refuges (buildings, mines, tunnels), thus, probably allowing for an expansion into areas not previously inhabited by the species (Crespo et al., 1961). The distribution of the vampire bat is limited by its capacity to withstand cold temperatures; it would be distributed within the limits of the 10° C minimal winter isotherm. In the present case, this locality is almost outside these limits (McNab, 1973).

Means and ranges of selected measurements for 16 adult specimens (9 males, 7 females) from Córdoba Province, Pocho Department, Chancani, Estancia Aguas Blancas, are: forearm length (65.06, 62.00-69.00); greatest length of skull (25.02, 24.13-26.11); condylobasal length (22.74, 21.66-23.44); least interorbital breadth (5.39, 4.93-5.94); zygomatic breadth (12.34, 11.78-13.08); breadth of braincase (12.66, 12.39-13.32); length of maxillary tooththrow (3.66, 3.40-4.06); mandibular tooththrow (4.79, 4.38-5.12); and greatest length of mandible (15.51, 14.74-16.22).

Family Vespertilionidae

Eptesicus diminutus

Osgood, 1915

Specimens examined (1).— La Pampa Province: Loventué Department, Victorica (Escuela Agro Ganadera) (from owl pellet, RVP 227).

Additional records.— The only record for this species (as *Eptesicus fidelis*) in La Pampa Province was provided by De Santis and Justo (1978) for Toay Department, 25 km S Luan Toro.

Comments.— The only reference for the habitat that this bat species utilizes in La Pampa is given by De Santis and Justo (1978), in which they stated that it inhabits cavities in Caldén trees (*Prosopis caldenia*), in a general habitat of Espinal forests. There are very few records of this bat in Argentina, which is distributed in Buenos Aires, Santa Fé, Misiones, Jujuy, Corrientes, Salta, and Tucumán Provinces (Bárquez and Ojeda, 1992, Mares et al., 1996).

Eptesicus furinalis

(d'Orbigny, 1847)

Specimens examined (21).— Córdoba Province: Pocho Department, Chancani, Estancia Aguas Blancas (UNRC 117); Rio Cuarto Department, Coronel Baigorria, Estancia San Gonzalo headquarters (TTU 64321). La Pampa Province: Capital Department, Santa Rosa (TTU 64322-64332, UNRC 118-121), 10 km E Santa Rosa, Estancia Don Hipólito (RVP 228); Guatraché Department, Guatraché (RVP 231); Loventué Department, 30 km W Victorica, Estancia La Elenita (RVP 143); Toay Department, Cachirulo (RVP 229), Parque Luro (RVP 230).

Additional records.— La Pampa Province: Lihuel Calel Department, 10 km N Cuchillo C6, Estancia El Alamo (from owl pellet; Tiranti, 1992). Toay Department, 25 km S Luan Toro, Estancia La Florida and Loventué Department, Carro Quemado (De Santis and Justo, 1978). For Córdoba Province this species is recorded from in Bialet Massé (Punilla Department); and Cruz del Eje (Cruz del Eje Department) (Bárquez and Ojeda, 1992).

Comments.— In Santa Rosa, La Pampa Province, these bats were captured repeatedly with *Tadarida brasiliensis* in a warehouse where the bats roosted in cracks and holes among cinder blocks and beams. In Estancia La Elenita, a bat was found roosting under the bark on the trunk of a Caldén. In Santa Rosa, many *Eptesicus furinalis* individuals were young of the year, volant juveniles with cartilaginous metacarpo-phalangeal joints (24 January 1991). Lactating females were found in Santa Rosa on 13 December 1990.

Localities in La Pampa Province mostly represent remnants or modified patches of the Espinal Biome including deforested land. The southern portion of the Espinal is composed of Caldén forests. These are open forests with trees 8 to 10 m in height and a ground cover of grasses (Cabrera, 1976; Cano et al., 1980).

In Estancia San Gonzalo, Coronel Baigorria, Córdoba Province, one specimen, a lactating female, was netted on 4 January 1991 in riparian forest of mostly exotic tree species along Chucul Creek. The surrounding habitat was agricultural and grazing land. Other bat species present at this locality were *Tadarida brasiliensis*, *Lasiurus blossevillii*, and *Myotis levis dinellii*.

In Estancia Aguas Blancas, Chancani, Pocho Department, Córdoba Province, a specimen was captured with a mist net along an irrigation canal surrounded by Chacoan scrub vegetation.

Means and ranges of selected measurements of nine adult specimens (1 male, 8 females) from La Pampa, Capital Department, Santa Rosa, are: forearm length (43.62, 42.20-46.20), greatest length of skull (16.29, 15.80-16.67); condylobasal length (15.86, 15.20-16.56); least interorbital breadth (4.07, 3.94-4.30); zygomatic breadth (11.58, 11.24-11.89); breadth of braincase (7.82, 7.69-8.00); length of maxillary tooththrow (6.13, 6.01-6.24); mandibular tooththrow (6.67, 6.47-6.96); and greatest length of mandible (12.07, 11.78-12.54).

Histiotus montanus

(Philippi and Landbeck, 1861)

Specimens examined (10).— Córdoba Province: Calamuchita Department, Segunda Usina (TTU 64333); Río Cuarto Department, Espinillo, Estancia La Cautiva (TTU 66476-66480, UNRC 122-125).

Additional records.— Córdoba Province: San Alberto Department, Pampa de Achala (Polop, 1989). Also, Bárquez and Ojeda (1992) provided various localities of this species in this province.

Comments.— The long-eared bat was found occasionally in buildings in Córdoba Province, Río Cuarto Department, Espinillo, Estancia La Cautiva. Roosts included the spaces between wooden beams and the channels of metal or fibercement roof sheets, in which the bats were in a horizontal position. On one occasion, 11 pregnant females were observed inside a big crack in the wall of a small building. A few of these were collected (1 November 1983) and had embryos with crown-rump lengths of 15-16. Inside a window frame of an abandoned house, 40-50 adults and volant juveniles were observed forming a big clump, giving the idea that this bat forms maternity colonies. Lactating females and volant juveniles were found 27 December 1984. The surrounding habitat was riparian forest alongside the Cuarto River, with patches of grasslands, and crops, and tree groves nearby.

Means and ranges of selected measurements of four adult females from Córdoba Province, Río Cuarto Department, Espinillo, Estancia La Cautiva, are: forearm length (48.00, 46.00-50.00); greatest length of skull (17.86, 17.55-18.13); condylobasal length (17.05, 16.74-17.24); least interorbital breadth (4.35, 4.18-4.43); zygomatic breadth (11.47, 11.26-11.67); breadth of braincase (8.41, 8.21-8.59), length of maxillary tooththrow (6.44, 6.38-6.51); madibular tooththrow (6.99, 6.94-7.01); and greatest length of mandible (12.41, 12.21-12.53).

Means and ranges of selected measurements of subadult (volant young with cartilaginous metacarpophalangeal joints) specimens (1 male, 4 females) from the same locality as above are: forearm length (47.40, 46.00-49.00); greatest length of skull (17.43, 17.14-17.63); condylobasal length (16.36, 15.85-16.86); least

interorbital breadth (4.36, 4.21-4.44); zygomatic breadth (10.43, 10.28-10.55); breadth of braincase (8.15, 7.89-8.35); length of maxillary tooththrow (6.19, 6.00-6.32); madibular tooththrow (6.82, 6.62-6.96); and greatest length of mandible (11.96, 11.58-12.42).

Lasiurus blossevillii

(Lesson and Garnot, 1826)

Specimens examined (11).— Córdoba Province: Calamuchita Department, Segunda Usina (UNRC 132); Río Cuarto Department, Río Cuarto, (UNRC 126-131), Coronel Baigorria, Estancia San Gonzalo headquarters (TTU 66481-66482). La Pampa Province: Capital Department, 10 km E Santa Rosa, Estancia Don Hipólito (RVP 232), Guatraché Department, Laguna Chillhué (RVP 233).

Additional records.— La Pampa Province: Maracó Department, General Pico, as *L. borealis blossevillii* (Crespo, 1974). Bárquez and Ojeda (1992) provided various localities for Córdoba Province as *L. borealis*.

Comments.— *Lasiurus blossevillii* has a complicated taxonomic history. This taxon sometimes is treated as a subspecies of *borealis*, but may in fact warrant specific status. Baker et al. (1988), using information derived from protein electrophoresis, separated *borealis* from *blossevillii*, regarding the latter as a full species and considered *Lasiurus borealis* to be restricted to the eastern United States. Later, Morales and Bickham (1995) postulated that the northern and southern populations of *Lasiurus blossevillii* may represent separate species.

Most *Lasiurus blossevillii* specimens were found in pine and *Celtis* sp. trees in Segunda Usina, and acacia and palm trees in Río Cuarto. In Santa Rosa (10 km W), La Pampa, one volant juvenile with cartilaginous metacarpophalangeal joints was netted with two *Eptesicus furinalis* individuals in the yard of a rural home (11 February 1989). The habitat of the area was Espinal with Caldén trees. One female specimen was obtained while clinging to small twigs on a barranca in Laguna Chillhué (8 May 1988). In Estancia San Gonzalo, Coronel Baigorria, two volant juveniles with cartilaginous metacarpophalangeal joints were netted

in riparian habitat alongside the nascent Chucul Creek, with forests of *Ligustrum*, *Salix*, and *Populus*, with patches of grasslands, crops, and tree groves in the surrounding areas (13 January 1990). Volant juveniles (with cartilaginous metacarpal phalangeal joints) and a lactating female were found on 6 January 1983 at Rio Cuarto. The bats formed clumps composed of adult females and young. One clump was made up of nine individuals, and two clumps of 4 individuals, were located in the upper branches of acacia trees.

Means and ranges of selected measurements of six adult specimens (2 males, 4 females) from Córdoba Province, Rio Cuarto Department, Rio Cuarto, are: forearm length (42.83, 41.00-44.00); greatest length of skull (12.13, 11.58-12.60); condylobasal length (11.98, 11.53, 12.46); least interorbital breadth (4.31, 4.16-4.40); zygomatic breadth (9.01, 8.74-9.33); breadth of braincase (7.54, 7.21-7.76); length of maxillary tooththrow (4.01, 3.72-4.27); mandibular tooththrow (4.70, 4.38-5.06); and greatest length of mandible (8.85, 8.09-9.30).

Lasiurus cinereus
(Beauvois, 1796)

Specimens examined (4).— Córdoba Province: Calamuchita Department, Segunda Usina (UNRC 135); Rio Cuarto Department, Rio Cuarto (UNRC 133-134). La Pampa Province: Toay Department, ca. 30 km W Santa Rosa, Estancia Quitrahué (RVP 234).

Additional records.— Córdoba Province: Punilla Department, Bialeto Massé (Bárquez and Ojeda, 1992). La Pampa Province: Maracó Department, Colonia San José (Montalvo et al., 1988).

Comments.— Hoary bats were found roosting in acacia trees in Rio Cuarto and tala trees (*Celtis* sp.) in Segunda Usina. In Rio Cuarto, three specimens, an adult lactating female and volant juveniles, were obtained in an acacia bola tree, whereas other individuals roosted isolated from one another (6 January 1983).

An unusual find of this species was made inside a warehouse in Estancia Quitrahué, Toay Department, La Pampa Province (29 October 1993), where the general area habitats are Espinal forests.

Selected measurements of two adult specimens (1 male, 1 female respectively) from Córdoba Province, Rio Cuarto Department, Rio Cuarto, are: forearm length 53.00, 54.00; greatest length of skull 14.23, 15.74; condylobasal length 14.42, 15.74; least interorbital breadth 5.26, 5.74, zygomatic breadth 11.20, 12.12; breadth of braincase 9.32, 9.48; length of maxillary tooththrow 5.13, 5.62; mandibular tooththrow 5.84, 6.34; and greatest length of mandible 11.01, 12.30.

Lasiurus ega
(Gervais, 1856)

Specimens examined (2).— Córdoba Province: Rio Cuarto Department, Rio Cuarto (UNRC 136-137).

Additional records.— Córdoba Province: Besides Rio Cuarto, the species has been recorded for Colón Department, Rio Ceballos and Capital Department, Córdoba (Bárquez and Ojeda, 1992). La Pampa Province: Capital Department, Santa Rosa (as *Dasypterus*; Montalvo et al., 1988); Maracó Department, General Pico (Crespo, 1974).

Comments.— In Rio Cuarto, the southern yellow bat was obtained among the dead leaves of palm trees and yuccas. This species has been reported to roost in palm trees (Fornes and Massoia, 1967; Crespo, 1974), and it seems possible that this bat could have benefited by finding suitable habitat owing to the planting of palm trees.

Selected measurements of an adult male from Córdoba Province, Rio Cuarto Department, Rio Cuarto, are: greatest length of skull 15.34; condylobasal length 15.04; least interorbital breadth 4.90; zygomatic breadth 11.15; breadth of braincase 8.64; length of maxillary tooththrow 5.10; mandibular tooththrow 6.12; and greatest length of mandible 11.72.

Lasiurus salinae
Thomas, 1902

Specimens examined (1).— La Pampa Province: Atreucó Department, N border of Salinas Grandes de Hidalgo (RVP 235).

Comments.— This represents the first record for La Pampa Province of this species of tree bat, which was originally described as a subspecies of *L. borealis* by Thomas (1902). Bárquez (1987) synonymized this taxon with *Lasiurus borealis blossevillii*, but recently Mares et al. (1995) tentatively revalidated it to species rank. This species apparently inhabits the halophytic communities that surround salt flats. As stated by Mares et al. (1995), this bat is darker than the otherwise similar *Lasiurus blossevillii*, with which it is sympatric in some localities. Previous records include localities in Catamarca, San Juan, Tucumán, and Córdoba Provinces (Mares et al. 1995). The bat was found dormant in a small hollow at 2 m height in the loess bank surrounding the salt flat of Salinas Grandes on 2 May 1989. This locality in La Pampa Province is indeed a large salt flat which harbors halophytic communities in its margins, and is surrounded by Chacoan-like Espinal thorn-scrub forests. The adjacent areas are pastures and croplands. Braun and Mares (1995) have shown that these salt flats harbor a unique mammalian fauna, which has a unique and shared evolutionary history with the accompanying biota. The finding of specialized mammals that inhabit these salt flats, such as *Andalgalomys* and *Salinomys* (Braun and Mares 1995), provide additional biogeographic support for the recognition of *Lasiurus salinae* as a distinct species. Nevertheless, genetic studies are needed before the systematic status of this species can be resolved.

Selected measurements of an adult male from La Pampa Province, Atreucó Department, Salinas Grandes de Hidalgo, are: forearm 39.00; greatest length of skull 11.65; condylobasal length 11.70; least interorbital breadth 4.28; zygomatic breadth 9.04; breadth of braincase 7.58; length of maxillary toothrow 4.13; mandibular toothrow 4.42; and greatest length of mandible 8.44.

Myotis levis dinellii

I. Geoffroy, 1824

Specimens examined (37).— Córdoba Province: Calamuchita Department, Segunda Usina (TTU 64334, UNRC 147-148); Cruz del Eje Department, Palo Parado (TTU 64335-64336); Pocho Department, Chancani, Estancia Aguas Blancas (TTU 66483-66488, UNRC 149-152); Rio Cuarto Department, 10 km W Espinillo, Estancia La Cautiva (UNRC 138), Paso del Durazno

(UNRC 139-140), La Gilda (UNRC 141-142), Coronel Baigorria, Estancia San Gonzalo headquarters (TTU 64337-64345, 66489-66491, UNRC 143-146). La Pampa Province: Caleu Caleu Department, Almacén El 52 (RVP 180, TTU 64346-64347); Lihuel Calel Department, Estancia Los Ranqueles (RVP 135-137); Utracán Department, Chacharramendi (RVP 236).

Additional records.— La Pampa Province: Chical Co Department, Agua de Torres (as *Myotis chiloensis dinellii*; De Santis and Justo, 1978). Bárquez and Ojeda (1992) provide several locality records for these bats in Córdoba Province.

Comments.— At our localities in Córdoba province, this bat, along with *Tadarida brasiliensis*, was the most common species. Both were found together in most rural buildings that were suitable as roosts. Pregnant females collected in Espinillo had embryos of 5 and 12 (1 November 1983), 13 and 16 mm (11 and 15 November 1981). In Paso del Durazno, pregnant females had embryos measuring 17 and 20 (27 November 1981). In Estancia San Gonzalo, Coronel Baigorria, volant juveniles were found on 14 January 1990, and lactating females were taken on 4 January 1991. Roosts in buildings included the spaces between wooden beams and between bricks used in sheet metal roofs. Some of the bigger cracks were shared with *Tadarida brasiliensis*.

Some specimens were netted at Segunda Usina in the opening of a discharge tunnel, along with *Desmodus rotundus* and *Histiotus montanus*.

In La Pampa, Caleu Caleu Department, Almacén El 52, three specimens were netted outside an abandoned house on 24 October 1990. There, the bats probably roosted in the cracks in the adobe and brick walls. The surrounding habitat in this area was Espinal Caldén forests.

The La Pampa localities are in the Espinal and the wide Espinal-Monte Desert ecotone, which is formed by a mosaic of low forests (*Prosopis caldenia*, *P. flexuosa*), and the shrublands. In Estancia Los Ranqueles, *Myotis levis dinellii* inhabited a small warehouse along with *Tadarida brasiliensis*, where a loud and smoky diesel engine generated electricity.

Means and ranges of selected measurements of 16 adult specimens (4 males, 12 females) from Córdoba, Rio Cuarto Department, Coronel Baigorria, Estancia San Gonzalo headquarters, are: forearm length (36.97, 35.00-38.00); greatest length of skull (14.56, 14.20-15.06); condylobasal length (13.88, 13.38-14.56); least interorbital breadth (3.59, 3.40-3.72); zygomatic breadth (8.92, 8.65-9.43); breadth of braincase (6.99, 6.68-7.48); length of maxillary toothrow (5.55, 5.36-5.73); mandibular toothrow (5.84, 5.23-6.06); and greatest length of mandible (10.50, 10.07-11.00).

Family Molossidae

Eumops bonariensis bonariensis

(Peters, 1874)

Specimens examined (1).— Córdoba Province: Calamuchita Department, Segunda Usina (UNRC 153).

Comments.— The single specimen representing the only record for Córdoba Province was collected from the beams of a small warehouse with a galvanized steel roof. *Tadarida brasiliensis* and *Myotis levis dinellii* also were taken from this site.

Selected measurements of an adult from Córdoba Province, Calamuchita Department, Segunda Usina, are: greatest length of skull (19.80), condylobasal length (18.54), least interorbital breadth (4.59), zygomatic breadth (12.12), breadth of braincase (10.29), length of maxillary toothrow (7.44), mandibular toothrow (8.12), and greatest length of mandible (13.92).

Eumops perotis

(Schinz, 1821)

Specimens examined (5).— Córdoba Province: Calamuchita Department, Segunda Usina (TTU 64348-64352).

Additional records.— For Córdoba Province, Bárquez and Ojeda (1992) gave two localities in addition to Segunda Usina (Embalse Rio Tercero). They are in Sobremonte Department, Los Hoyos, and Capital Department, Córdoba.

Comments. In Segunda Usina, a colony of mastiff bats estimated to be around 20 individuals was located in March 1980 in a big crevice in the face of a 30 m high cliff with overhanging vegetation of Chaco Serrano. Any intent of counting the individual bats as they flew out was hampered by their extreme wariness. On several occasions the bats emitted very loud chirps while waiting to exit the crevice.

Two pregnant females were obtained at Segunda Usina, one with an embryo measuring 4 (20 September 1981), and the other with an embryo measuring 40 and a forearm length of 23 (1 December 1980).

Means and ranges of selected measurements of five adult male specimens from Córdoba, Calamuchita Department, Segunda Usina, are: forearm length (79.40, 77.00-81.00); greatest length of skull (32.06, 31.65-32.64); condylobasal length (31.14, 30.73-31.56); least interorbital breadth (5.69, 5.60-5.75); zygomatic breadth (19.35, 18.82-19.79); breadth of braincase (13.24, 12.95-13.60); length of maxillary toothrow (12.68, 12.55-12.83); mandibular toothrow (13.92, 13.56-14.22); and greatest length of mandible (23.67, 23.49-23.88).

Molossus molossus

(Pallas, 1766)

Specimens examined (2).— Córdoba Province: Rio Cuarto Department, Rio Cuarto (UNRC 50, 154).

Additional records.— This species recently has been reported in La Rioja Province by Vaccaro (1992).

Comments.— Both specimens of this species in Córdoba were obtained in the city of Rio Cuarto. In one case, a small group of about six individuals was inside a ventilation shaft of an air conditioner outside a room of a sixth floor apartment building (September 1986). The single specimen that could be captured was a pregnant female. The other specimen was netted among hundreds of *Tadarida brasiliensis* during pest control activities at the Universidad Nacional de Rio Cuarto campus.

Selected measurements of an adult specimen from Córdoba Province, Río Cuarto Department, Río Cuarto, Universidad Nacional de Río Cuarto campus, are: greatest length of skull (17.35), condylobasal length (16.17), least interorbital breadth (4.13), zygomatic breadth (11.10), breadth of braincase (9.60), length of maxillary tooththrow (6.32), mandibular tooththrow (6.94) and greatest length of mandible (12.12).

Tadarida brasiliensis
(I. Geoffroy, 1824)

Specimens examined (27).— Córdoba Province: Río Cuarto Department, Río Cuarto (UNRC 155), Las Higueras (UNRC 156), La Gilda (UNRC 157-158), Coronel Baigorria, Estancia San Gonzalo headquarters (TTU 64354-64356); Calamuchita Department, Segunda Usina (UNRC 159); Cruz del Eje Department, Palo Parado (TTU 64353). La Pampa Province: Capital Department, Santa Rosa (TTU 64357-64361, UNRC 160-162); Toay Department, Parque Luro (RVP 237); Lihuel Calel Department, Lihuel Calel National Park (observed); Estancia Los Ranqueles (RVP 138); Limay Mahuida Department, La Feforma (RVP 39); Loventué Department, Victorica (Escuela Agro Ganadera) (from owl pellet; RVP 238); Estancia La Elenita (RVP 144-145); Chical Co Department, La Humada (RVP 14-16); Rancul Department, Estancia Las Delicias (RVP 171); Puelén Department, Puesto Los Pajaritos, 5km N (RVP 239).

Additional records.— Córdoba Province: Punilla Department, Bialeto Massé, La Cumbre; San Javier Department, Carrizal, Villa Dolores, (Bárquez and Ojeda, 1992). La Pampa Province: Loventué Department, Carro Quemado (De Santis and Justo 1978); Puelén Department, Casa de Piedra (from owl pellet; Montalvo et al. 1984).

Comments.— The Brazilian free-tailed bat is one of the most common species we encountered. Free-tailed bats were found in abandoned and inhabited buildings both in rural and urban settings. In Río Cuarto, specimens of *Molossus molossus* occasionally were netted with this species outside buildings.

In Segunda Usina, a specimen was obtained from a crack in the face of a cliff. In La Pampa, this bat was widespread. Information from the RVP localities place this species in a wide array of habitat situations. In Puesto Los Pajaritos, one individual was found sharing a crack in a boulder with a lizard (*Liolaemus austromendocinus*) in the slope of a barranca of sedimentary rocks. In Lihuel Calel National Park, a small colony of this species inhabited a crack on a small rock face.

Pregnant females were obtained in Estancia La Cautiva, Espinillo, Río Cuarto Department, Córdoba, (1 November 1983) with embryos (crown rump 15), and in Paso del Durazno (27 November 1981) with embryos 25 and 27 and with forearm lengths of 13 and 14. Lactating females were obtained in Río Cuarto on 21 December 1980, in Coronel Baigorria on 4 January 1991, and in Santa Rosa on 13 December 1990.

Means and ranges of selected measurements of eight adult specimens (3 males, 5 females) from La Pampa Province, Capital Department, Santa Rosa, are: forearm length (44.10, 43.00-45.70); greatest length of skull (16.88, 16.51-17.06); condylobasal length (16.03, 15.82-16.28); least interorbital breadth (4.06, 3.97-4.19); zygomatic breadth (10.05, 9.84-10.29); breadth of braincase (8.38, 8.15-8.58); length of maxillary tooththrow (6.09, 5.98-6.20); mandibular tooththrow (6.72, 6.65-6.89); and greatest length of mandible (11.74, 11.57-11.91).

DISCUSSION

As Mares et al. (1995) have stated, information on bats in Argentina is still scanty. Some species of bats are known from some provinces by very few records. For example, the presence of *Eumops b. bonariensis* and *Molossus molossus* is confirmed for Córdoba Province by one and two specimens, respec-

tively, each species from a single locality. For Córdoba Province, *Histiotus macrotus* is known only from a single record (Bárquez and Ojeda 1992), and *Molossus ater*, collected years ago, has not been found since (Fornes and Massoia 1967).

All of the species mentioned in this report form part of the widespread Chacoan fauna, in which most of them are regarded as common or abundant (Bárquez and Ojeda 1992). Clearly, the Espinal allows for the southward penetration of species linked to these scrub forests. In La Pampa, *Eptesicus furinalis* and *E. diminutus*, for example, appear to be restricted to areas

of *Prosopis caldenia* forests. Other species seem to reach their southernmost limits in this province, as in the case of *Myotis levis dinellii*. Nevertheless, it is expected that species of Patagonian or Andean affinities, such as *Myotis chiloensis* or *Lasiurus varius*, could be found eventually in western La Pampa.

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LITERATURE CITED

- Baker, R. J., J. C. Patton, H. H. Genoways, and J. W. Bickham. 1988. Genic studies of *Lasiurus* (Chiroptera: Vespertilionidae). Occas. Papers Mus., Texas Tech Univ. 117: 1-15.
- Bárquez, R. M. and R. A. Ojeda. 1992. The bats (Mammalia: Chiroptera) of the Argentine Chaco. Annals of Carnegie Museum 61(3): 239-261.
- Braun, J. K. and M. A. Mares. 1995. A new genus and species of phyllotine rodent (Rodentia: Muridae: Sigmodontinae: Phyllotini) from South America. J. Mamm. 76: 504-521.
- Cabrera, A. L. 1976. Regiones fitogeográficas argentinas. Enciclopedia Argentina de Agricultura y Jardinería. Editorial ACME., Buenos Aires, Argentina. 85 pp.
- Cano, E., B. Fernández and M., Montes. 1980. Vegetación. In: E. Cano [Ed.]. Inventario Integrado de los Recursos Naturales de la Provincia de La Pampa (Clima, Geomorfología y Vegetación). Instituto Nacional de Tecnología Agropecuaria, Provincia de La Pampa and Universidad Nacional de La Pampa. Instituto Salesiano de Artes Gráficas, Buenos Aires, Argentina. 493 pp.
- Crespo, J. A., J. M. Vanella, B. D. Blood and J. M. De Carlo. 1961. Observaciones ecológicas del vampiro "*Desmodus r. rotundus*" (Geoffroy) en el norte de Córdoba. Revista del Museo Argentino de Ciencias Naturales "B. Rivadavia"; Zool., 6(4): 131-160.

- Crespo, J. A. 1974. Comentarios sobre nuevas localidades para mamíferos de la Argentina y de Bolivia. *Rev. Mus. Arg. Ciencias Naturales "B. Rivadavia"*; Zool., 11(1): 1-31.
- De Santis, L. J. M and E. R. Justo. 1978. Observaciones sobre algunos quirópteros de la provincia de La Pampa. *Neotropica* 24(72): 161-163.
- Fornes, A. and E. Massoia. 1967. Procedencias argentinas nuevas o poco conocidas para murciélagos (Noctilionidae, Phyllostomidae, Vespertilionidae y Molossidae). Segundas Jornadas Entoepidemiológicas Argentinas. I. (1965): 133-145.
- Mares, M. A., R. M. Bárquez and J. K. Braun. 1995. Distribution and ecology of some Argentine bats (Mammalia). *Annals of Carnegie Museum* 64(3): 219-237.
- Mares, M. A., R. M. Bárquez, J. K. Braun and R. A. Ojeda. 1996. Observations on the mammals of Tucumán Province, Argentina. I. Systematics, distribution, and ecology of the Didelphimorphia, Xenarthra, Chiroptera, Primates, Carnivora, Perissodactyla, Artiodactyla, and Lagomorpha. *Annals of Carnegie Museum* 65(2): 89-152.
- McNab, B. K. 1973. Energetics and the distribution of vampires. *J. Mamm.* 54: 131-144.
- Montalvo, C. I., E. R. Justo and L. J. M. De Santis. 1984. Alimentación de *Tyto alba* (Strigiformes, Tytonidae) en la Provincia de La Pampa. II. *Neotropica* 30(84): 250-252.
- Montalvo, C., E. Justo and L. De Santis. 1988. Nota sobre algunos mamíferos de la provincia de La Pampa (Argentina). *Univ. Nac. La Pampa Ser. Suplem. No 4*: 177-180.
- Morales, J. C. and J. W. Bickham. 1995. Molecular systematics of the genus *Lasiurus* (Chiroptera: Vespertilionidae) based on restriction-site maps of the mitochondrial ribosomal genes. *J. Mamm.* 76: 730-749.
- Polop, J. J. 1989. Distribution and ecological observations of wild rodents in Pampa de Achala, Córdoba, Argentina. *Studies on Neotropical Fauna and Environment* 24: 53-59.
- Siegenthaler, G., E. Fiorucci, S. Tiranti, P. Borráz, M. Urioste and A. García. 1990a. Informe de avance del Plan de Relevamiento de los Vertebrados de la Provincia de La Pampa. *Agro Pampeano, Ministerio de Asuntos Agrarios*, 18: 38-48.
- Siegenthaler, G., E. Fiorucci, S. Tiranti, P. Borráz, M. Urioste, J. Gobbi and A. García, 1990b. Plan de Relevamiento de los Vertebrados de la Provincia de La Pampa. *Agro Pampeano, Ministerio de Asuntos Agrarios*, 19: 5-11.
- Thomas, O. 1902. On mammals collected at Cruz del Eje, Central Córdoba. *Annals and Magazine of Natural History, ser. 7*, 9: 237-245.
- Tiranti, S. I. 1992. Barn owl prey in southern La Pampa, Argentina. *J. Raptor Res.* 26(2): 89-92.
- Vaccaro, O. B. 1992. Comentarios sobre nuevas localidades para quirópteros de Argentina (Vespertilionidae y Molossidae) (Mammalia: Chiroptera). *Revista del Museo Argentino de Ciencias Naturales "B. Rivadavia"*. Zool. 16(3): 27-36.

GAZETTEER

Localities are listed in alphabetical order. Numbers correspond to numbered localities in Figure 1.

1. Almacén El 52: Caleu Caleu Department: La Pampa Province: *Myotis levis dinellii*.
2. Cachirulo: Toay Department: La Pampa Province: *Eptesicus furinalis*.
3. Chacharramendi: Utracán Department: La Pampa Province: *Myotis levis dinellii*.
4. Chancani, Estancia Aguas Blancas: Pocho Department: Córdoba Province: *Desmodus rotundus*, *Eptesicus furinalis*, *Myotis levis dinellii*.
5. Coronel Baigorria, Estancia San Gonzalo headquarters: Rio Cuarto Department: Córdoba Province: *Eptesicus furinalis*, *Lasiurus blossevillii*, *Myotis levis dinellii*, *Tadarida brasiliensis*.
6. Espinillo, Estancia La Cautiva: Rio Cuarto Department: Córdoba Province: *Desmodus rotundus*, *Histiotus montanus*, *Myotis levis dinellii*.
7. Estancia Las Delicias: Rancul Department: La Pampa Province: *Tadarida brasiliensis*.
8. Estancia Los Ranqueles: Lihuel Calel Department: La Pampa Province: *Myotis levis dinellii*, *Tadarida brasiliensis*.
9. Guatraché: Guatraché Department: La Pampa Province: *Eptesicus furinalis*.
10. La Gilda: Rio Cuarto Department: Córdoba Province: *Myotis levis dinellii*, *Tadarida brasiliensis*.
11. Laguna Chillhué: Guatraché Department: La Pampa Province: *Lasiurus blossevillii*.
12. La Humada: Chical Co Department: La Pampa Province: *Tadarida brasiliensis*.
13. La Reforma: Limay Mahuida Department: La Pampa Province: *Tadarida brasiliensis*.
14. Las Higueras: Rio Cuarto Department: Córdoba Province: *Tadarida brasiliensis*.
15. Lihuel Calel National Park: Lihuel Calel Department: La Pampa Province: *Tadarida brasiliensis*.
16. Palo Parado: Cruz del Eje Department: Córdoba Province: *Myotis levis dinellii*, *Tadarida brasiliensis*.
17. Parque Luro: Toay Department: La Pampa Province: *Eptesicus furinalis*, *Tadarida brasiliensis*.
18. Paso del Durazno: Rio Cuarto Department: Córdoba Province: *Myotis levis dinellii*.
19. Puesto Los Pajaritos, 5 km N: Puelén Department: La Pampa Province: *Tadarida brasiliensis*.
20. Rio Cuarto: Rio Cuarto Department: Córdoba Province: *Lasiurus blossevillii*, *Lasiurus cinereus*, *Lasiurus ega*, *Molossus molossus*, *Tadarida brasiliensis*.
21. Salinas Grandes de Hidalgo, N border: Atreucó Department: La Pampa Province: *Lasiurus salinae*.
22. Santa Rosa: Capital Department: La Pampa Province: *Eptesicus furinalis*, *Tadarida brasiliensis*.
23. Santa Rosa, 10 km E, Estancia Don Hipólito: Capital Department: La Pampa Province: *Eptesicus furinalis*, *Lasiurus blossevillii*.
24. Santa Rosa, ca. 30 km W, Estancia Quitrahué: Toay Department: La Pampa Province: *Lasiurus cinereus*.
25. Segunda Usina: Calamuchita Department: Córdoba Province: *Desmodus rotundus*, *Histiotus montanus*, *Lasiurus blossevillii*, *Lasiurus cinereus*, *Myotis levis dinellii*, *Eumops bonariensis bonariensis*, *Eumops perotis*, *Tadarida brasiliensis*.
26. Victorica (Escuela Agro Ganadera): Loventué Department: La Pampa Province: *Eptesicus diminutus*, *Tadarida brasiliensis*.
27. Victorica, 30 km W, Estancia La Elenita: Loventué Department: La Pampa Province: *Eptesicus furinalis*, *Tadarida brasiliensis*.

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