



A new Paraguayan departmental record for *Lasiurus (Dasypterus) ega* (Chiroptera: Vespertilionidae) with an updated distribution map for the species and comments on migratory status

Nuevo registro departamental en Paraguay de *Lasiurus (Dasypterus) ega* (Chiroptera: Vespertilionidae), con un mapa de distribución actualizado y comentarios sobre su estado migratorio

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Paul Smith^{1,2,*}  & Roberto Derna³

¹Fauna Paraguay, Encarnación, dpto. Itapúa, Paraguay. www.fauparaguay.com.

²Para La Tierra, Centro IDEAL, Mariscal Estigarribia 321 c/ Tte. Capurro, Pilar, dpto. Ñeembucú, Paraguay, www.paralatierra.org.

³Laboratorio Müller, Encarnación, Paraguay

*Corresponding author: fauparaguay@gmail.com.

Abstract: The first record of *Lasiurus (Dasypterus) ega* (Chiroptera: Vespertilionidae) from Itapúa department in Paraguay is documented. The species is known to be a migrant, but an analysis of the dates of records and the available breeding data for the species is consistent with a complex pattern of resident and passage migrants, the latter using the Paraguay River as a flyway through the Humid Chaco ecoregion. This pattern is similar to that seen in some migrant birds.

Key Words: breeding, migration, Humid Chaco, Paraguay River, southern yellow bat.

Resumen: Se documenta el primer registro de *Lasiurus (Dasypterus) ega* (Chiroptera: Vespertilionidae) en el departamento de Itapúa, Paraguay. Se sabe que la especie es migratoria, pero un análisis de las fechas de los registros y los datos reproductivos disponibles es consistente con un patrón complejo de individuos residentes y migrantes de paso, estas últimas utilizando el río Paraguay como una ruta migratoria a través de la ecorregión del Chaco Húmedo. Este patrón es similar al observado en algunas aves migratorias.

Palabras Clave: Chaco Húmedo, migración, murciélago cola peluda amarillo, reproducción, Río Paraguay.

The southern yellow bat *Lasiurus (Dasypterus) ega* is a Vespertilionid with a wide range from the southern USA to east-central Argentina (Baker *et al.*, 1971; Barquez *et al.*, 1993; Eisenberg, 1989; Redford & Eisenberg, 1992). Many members of the genus *Lasiurus* are migratory (Rhoads, 1895; Griffin, 1940; Barbour & Davis, 1969), and northern populations of *L. ega* are known to adopt a sex discriminant migratory strategy with males becoming scarce at certain times of year whilst females are present year-round (Kurta & Lehr, 1995). The species has also been stated to be migratory in the Neotropics (Herskovitz, 1963; Tamsitt *et al.*, 1964; Owen & Camp, 2021).

In Paraguay the species was first reported by de Azara (1801) as *chauve-souris septième* or *chauve-souris brun-blanchâtre* (Smith & Teta, 2022). It is widespread across the country in all habitats and ecoregions, having been recorded in each of the political departments except Amambay, Caaguazú, Caazapá and Itapúa departments (López-González, 2005; Smith, 2024; Smith *et al.*, 2024). The species has been inferred to be an “out of country” migrant in Paraguay with a statistically significant link between the species and the dry season and a strong association with the Humid Chaco (Owen & Camp, 2020). However, that publication did not discriminate between sex when examining migratory patterns.



Here we document the first record of the species from Itapúa department, provide a simple analysis of seasonality by sex and an updated distribution map for the species in Paraguay with comments on potential movement patterns.

Methods

Paraguayan specimen data was compiled from Vert Net for sexed specimens from the Chaco region (west of the Paraguay River) and the Oriental region (east of the Paraguay River), and monthly total numbers were plotted.

Results

On 4 March 2025 an adult female *Lasiurus ega* was photographed roosting on a window in an urban setting at Laboratorio Müller, Av. Bernardino Caballero at the junction with Av. Francia, Encarnación department (Fig. 1). The species was confidently identified because of its



Figure 1. Adult female *Lasiurus ega* roosting on a window at Laboratorio Müller, Encarnación, departamento Itapúa, Paraguay, 5 March 2025 (Roberto Derna).



Figure 2. Same individual dorsal view showing widely separated ears, creamy-yellowish pelage and extended, V-shaped uropatagium furred basally on the dorsal surface, 5 March 2025 (Paul Smith).

short, rounded, well-separated ears, uniformly creamy-yellow pelage, and extended, V-shaped uropatagium that was furred basally on the dorsal surface (Fig. 2); these characteristics in combination being diagnostic for the species

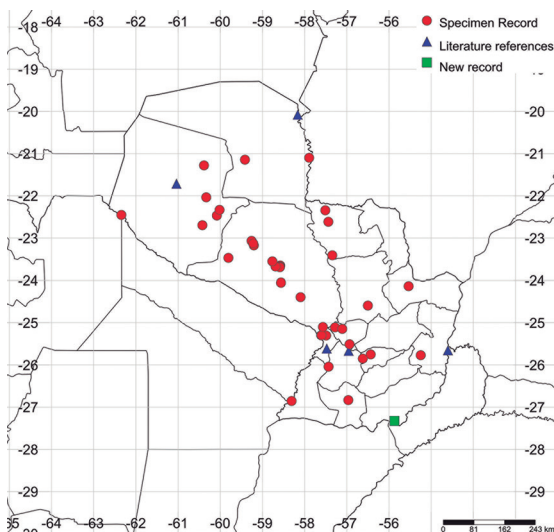


Figure 3. Updated Paraguayan distribution map for *Lasiurus ega*.

Table 1 (start). Paraguayan localities by department for *Lasiurus ega* with sources of records (specimen number or literature reference).

Department (Number of specimens)	Localities, estimated coordinates, specimen numbers and literature sources
ALTO PARAGUAY (18):	Estancia Parra-cué [-21.0985 -57.892] (TTU 99079-99080, MNHNP 5766-5767); Estancia Tres Marías [-21.2786 -60.3855] (TTU 999085-88, MNHNP 5769-76); Laguna Placenta [-21.1436 -59.4143] (TTU 99095, MNHNP 5768); Estación Biológica Tres Gigantes [-20.0782 -58.1634] (iNaturalist user lAguirre, observation 320460)
ALTO PARANÁ:	Puerto Bertoni [-25.6536 -54.6020] (Bertoni 1914, 1939)
BOQUERÓN (5):	419 Km by Rd. NW Villa Hayes Hayes [-22.4665 -60.0804] (AMNH 248357); Base Naval Pedro P. Peña [-22.4526 -62.3441] (MNHNP 5778); Estancia La Gama, aprox. 200 Km SW Colonia Neuland [-22.6958 -60.4235] (MNHNP 0851); Estancia San Jorge [-22.0351 -60.3321] (MNHNP 5777); Filadelfia [-22.3333 -60.0166] (MNHNP 0317). Teniente Ochoa [-21.7134 -61.0383] (Wetzel y Lovett, 1974).
CANINDEYÚ (2):	<i>Reserva Natural Bosque Mbaracayú</i> [-24.1339 -55.5344] (CZPLT 771, 773).
CENTRAL (43):	5 Km E Asunción [-25.3022 -57.4894] (MVZ 144918); Asunción, comer of Kubitschek and General Franco [-25.2965 -57.6075 <i>approximate, no such address</i>] (MVZ 141885, 144892-98); Asunción, Recoleta [-25.2970 -57.5973] (AMNH 248358; UMMZ 124403-08, 133774, 125726-28; MVZ 144827, 144899-917, 144991-92); San Lorenzo [-22.3430 -57.5094] (USNM 461895). Colonia Nueva Italia [-25.6120 -57.4761] (Handley, 1960).
CONCEPCIÓN (4):	8 Km E Concepción, by rd. [-23.4094 -57.3439] (MVZ 144919-20); Parque Nacional Serranía San Luis [-22.6153 -57.4372] (TTU 99444, MNHNP 5779).
CORDILLERA (9):	12 Km N Tobatí, by rd. [-25.1451 -57.1073] (MVZ 144929); 20 Km N Altos, by rd. [-25.1093 -57.2794] (MVZ 144921-25); Salto del Piraretá, 10 Km S Piribebuy [-25.5097 -56.9343] (MVZ 144926-28).
GUAIRÁ (3):	Itapé [-25.8500 -56.6200] (AMNH 217525-26); Villa Rica [-25.7500 -56.4333] (USNM 105639).
ITAPÚA:	Laboratorio Müller, Encarnación [-27.3270 -55.8723] (This paper)
MISIONES (1):	2.7 Km N San Antonio, by rd. [-26.8329 -56.9642] (UMMZ 124409).
ÑEEMBUCÚ (1):	<i>Barrio San Miguel, Pilar</i> [-26.8540 -58.3087] (CZPLT 985)
PARAGUARÍ (2):	Carapeguá [-25.7689 -55.2470] (MNHNP 1625); Lago Ypoá [-26.0413 -57.4323] (TTU 99627). Sapucay [-25.6677 -56.9555] (Thomas, 1901).

Table 1 (end). Paraguayan localities by department for *Lasiurus ega* with sources of records (specimen number or literature reference).

Department (Number of specimens)	Localities, estimated coordinates, specimen numbers and literature sources
PRESIDENTE HAYES (104):	107 Km NW Villa Hayes, by rd. [-24.3940 -58.0960] (MVZ 144930-33); 213 Km NW Villa Hayes, by rd. [-23.6751 -58.6886] (MVZ 144935-39); 230 Km NW Villa Hayes, by rd. [-23.5528 -58.7642] (MVZ 144940-43); 295 Km NW Villa Hayes by rd. [-23.1737 -59.2033] (MVZ 144990); 300 Km NW Villa Hayes, by rd. [-23.1296 -59.2178] (MVZ 144891); Estancia Juan de Zalazar, 0.3 Km S of Line Camp [-23.0679 -59.2575] (UCONN 16430-32); Estancia La Victoria [-23.6506 -58.5793] (TTU 99683, 99686-87, 99689, 99692-93, 99699-701, 99706-07, MNHNP 5780-5789); Estancia Samaklay [-23.4701 -59.8071] (TTU 99750, 99752, MNHNP 5790, 5797-801); Retiro Mandeyú, 20 Km SW Km 205 Transchaco Highway [-24.0534 -58.5604] (MVZ 144985-89); Rincón Charrúa, 275 Km NW Villa Hayes, by rd. [-25.1000 -57.5666] (MVZ 144944-84, 144993-145002); Villa Hayes (AMNH 248356).
SAN PEDRO (2):	<i>Arroyo Tapiracuayi, 8 Km northwest of San Estanislao, south of the arroyo</i> [-24.5933 -56.5003] (MHNG-MAM-1746.030, 1746.060).

(Díaz *et al.*, 2011). The individual was briefly captured for morphometrics and found to have a forearm of 46 mm. This is the first report of

the species in Itapúa department.
Localities of known reports of the species are provided in Table 1 along with their sources (specimen numbers or literature reference) and an updated distribution map is provided in Fig. 3.

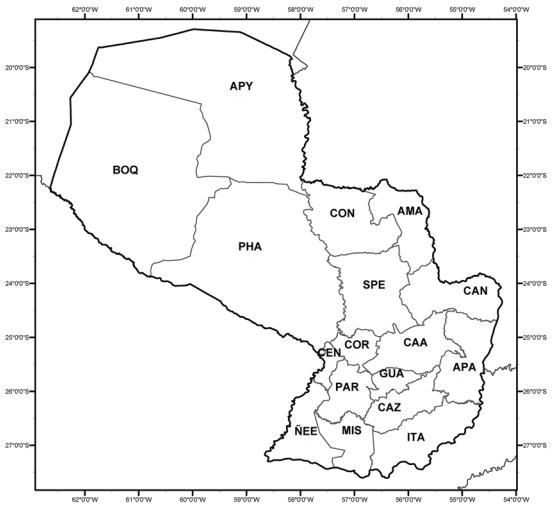


Figure 4. Map showing the political departments of Paraguay as follows: **Chaco region:** APY) Alto Paraguay. BOQ) Boquerón. PHA) Presidente Hayes. **Oriental region:** AMA) Amambay. APA) Alto Paraná. CAA) Caaguazú. CAN) Canindeyú. CAZ) Caazapá. CEN) Central. CON) Concepción. COR) Cordillera. GUA) Guairá. ITA) Itapúa. MIS) Misiones. ÑEE) Ñeembucú. PAR) Paraguari. SPE) San Pedro.

Discussion

The southern yellow bat *Lasiurus ega* is a widespread and often common species, that may be expected to occur in all Paraguayan

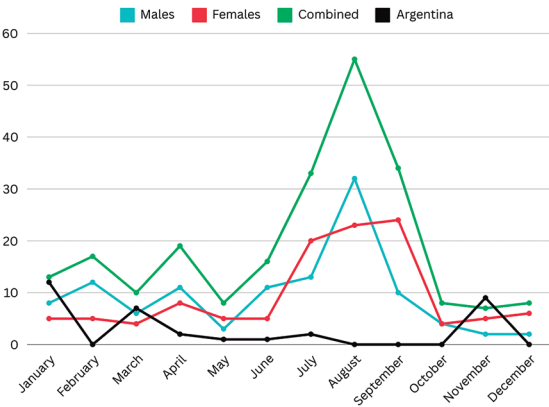


Figure 5. Temporal distribution of Paraguayan and Argentinian specimens of *Lasiurus ega*.

Table 2. Number of monthly records of Paraguayan *Lasiurus ega* separated by sex (male vs female) and region of the country (Chaco versus Oriental region).

MONTH	CHACO REGION		ORIENTAL REGION		TOTALS
	MALES	FEMALES	MALES	FEMALES	
JANUARY	8	3	4	1	16
FEBRUARY	12	4	0	1	17
MARCH	6	4	0	1	11
APRIL	10	7	1	1	19
MAY	3	5	0	0	8
JUNE	10	0	1	5	16
JULY	10	12	3	8	33
AUGUST	20	22	12	1	55
SEPTEMBER	10	22	0	2	34
OCTOBER	4	4	0	0	8
NOVEMBER	2	3	0	2	7
DECEMBER	2	6	0	0	8
TOTALS	97	92	21	22	232

departments (Fig. 4). Nonetheless, there are far more specimen reports from the Chaco region of Paraguay (n=189), west of the Paraguay River, than there are in the Oriental region (n=43), east of the Paraguay River where its presence remains undocumented in four departments, all of which are broadly associated with the Atlantic Forest ecoregion.

The raw data for seasonality of Paraguayan reports predictably supports the conclusions of Owen & Camp (2021) that the species is an out of country migrant associated with the Dry Season (Table 2, Fig. 5) and with a preference for the Humid Chaco ecoregion. The specimen data suggests a peak in the presence of the species in the country from June to August with numbers dropping off again in September, however individuals are present throughout the year suggesting that the species is a partial migrant. There is no indication of proposed sexual differences in movements attributed to some northern populations (Kurta & Lehr, 1995).

This seasonal peak in populations is somewhat unexpected however. A migratory movement to Paraguay for the dry, cool months may seem counter-intuitive for an insectivore, this being the time of year when insect populations are at their lowest, especially when compared to the wet, hot months (van Dijk *et al.*, 2024). Though the Argentinian specimen data available to us is extremely limited, a slight peak in populations can be inferred from November to January.

Thus, this peak in dry season records in the Humid Chaco of Paraguay may in fact represent a southward passage migration along the Paraguay River, which augment resident populations during this period. This is a pattern similar to that seen in many bird species which use this river as a flyway and many of which show differential southbound and northbound migrations reflecting seasonal differences in available resources along such flyways (Antas, 1983). As it is the floodplain of the Paraguay

river which feeds the Humid Chaco ecoregion, the association with this habitat observed by Owen & Camp (2021) is to be expected, and this river flows south into the Rivers Paraná and Plate, the latter floodplain representing the most southerly populations of the species in Argentina (Barquez *et al.*, 1999).

Myers (1977) provided some fascinating insights into the unusual reproductive strategies of this species based on Paraguayan specimens, noting that mating begins in May, but females do not begin ovulation until August and birthing and lactation are in late November and December. Predictably male testes reach their maximum size in April ready for the mating period. There is no differential capture rate between males and females in Paraguay during November and December which might have been attributable to females being less active during the birthing peak, thus the reduction in numbers of specimens post-September can be assumed to be a real reduction in populations.

This raises the interesting possibility that much of the breeding behaviour of the species may take place far distant from the birthing areas. That some individuals do indeed give birth in Paraguay is evidenced by the presence of lactating females during the birthing season (Myers, 1977), but that others do not is the logical conclusion of the steep drop off in captures corresponding to the onset of the wet season.

Much remains to be learned about the movement patterns of this bat, but it seems likely that the species employs a multimodal migration pattern, which in Paraguay likely comprises both resident and non-breeding migratory populations that pass through the country.

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