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Second record of *Cynomops planirostris* (Peters, 1866) (Chiroptera: Molossidae) for Misiones province, Argentina

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ABSTRACT
Cynomops planirostris has a discrete distribution in the northern region of Argentina, mainly recorded in the Yungas Forest, with a few localities from the Dry and Humid Chaco, Delta and Islands of the Paraná River, and Fields and Weed lands ecoregions. Here we present a new locality for the country. The specimen was obtained through an occasional collection, which represents the second record for Misiones province and the first for the Paranaense Forest of Argentina, extending its distribution approximately 230 km to the northeast of the country. This record evidence our lack of knowledge of the bat fauna and highlights the need to include alternative sampling methods to detect these species.
Keywords: distribution, Paranaense Forest, skull, southern dog-faced bat, urban area

RESUMEN - Segundo registro de *Cynomops planirostris* (Peters, 1866) (Chiroptera: Molossidae) para la provincia de Misiones, Argentina
Cynomops planirostris tiene una distribución discreta en la región norte de Argentina, registrándose principalmente en la Selva de Las Yungas, con unas pocas localidades en las ecorregiones del Chaco Seco y Húmedo, Delta e Islas del Río Paraná y Campos y Malezas. Aquí presentamos una nueva localidad para el país. El ejemplar fue obtenido mediante una colecta ocasional, lo que representa el segundo registro para la provincia de Misiones y el primero para la Selva Paranaense de Argentina, extendiendo su distribución aproximadamente 230 km al noreste del país. Este registro evidencia nuestro desconocimiento de la fauna de murciélagos y resalta la necesidad de incluir métodos de muestreo alternativos para detectar estas especies.
Palabras clave: áreas urbanas, cráneo, distribución, moloso de pecho blanco, Selva Paranaense

The dog-face bats *Cynomops* Thomas, 1920 is a Neotropical genus from the Molossidae family that currently contains nine recognized species: *Cynomops abrasus* (Temminck, 1827), *C. freemani* Moras et al., 2018, *C. greenhalli* Goodwin, 1958, *C. kuizha* Arenas-Viveros et al., 2021, *C. mastivus* Thomas, 1911, *C. mexicanus* (Jones & Genoways, 1967), *C. milleri* (Osgood, 1914), *C. planirostris* (Peters, 1866), and *C. tonkigui* Moras et al., 2018 (Simmons & Cirranello 2024). *Cynomops paranus* (Thom-

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as, 1901) is a small species whose validity as nominal species is under discussion (see Moras et al., 2018; López Berrizbeitia & Díaz 2021). For instance, Moras et al. (2018) proposed that *C. paranus* is a junior synonym of *C. planirostris*, based on a phylogenetic analysis with molecular and morphological data, while Barquez & Díaz (2020) consider that the specimen cited from Corrientes province in Argentina is a full species. *Cynomops* occurs from southern Mexico to northern Argentina, including Trinidad and Tobago (Eger 2008; Moras et al. 2018). This genus comprises fast-flying aerial insectivore bats that hunt in open spaces, usually above canopy level (Denzinger et al. 2018). *Cynomops* has been recorded in a variety of habitats, including forests, open vegetation, arboreal savannas, disturbed and fragmented habitats, and urban areas (e.g., Jung & Kalko 2011; Aguiar et al. 2021; López Berrizbeitia & Díaz 2021).

Three species of *Cynomops* are recognized in Argentina (Barquez & Díaz 2020): *C. abrasus*, one of the larger species of the genus, which is distributed in two populations from Formosa, Santiago del Estero and Misiones (Barquez & Díaz 2020); *C. paranus* is a small species with a single record from Corrientes province (Barquez & Díaz 2020); *C. planirostris* is another small species of the genus and one of the species with the largest geographic range of distribution in South America (López Berrizbeitia & Díaz 2021).

In Argentina, *C. planirostris* is distributed in the northwest and northeast with a large gap between these areas (López Berrizbeitia & Díaz 2021; Pavé et al. 2022, 2024). The largest number of records occurs mainly in the Yungas Forest in the provinces of Salta and Jujuy, and with a single locality in the Dry Chaco of Salta (Barquez & Díaz 2020). Idoeta et al. (2012) reported the first record from southern Misiones in the Fields and Weedlands ecoregion, extending its distribution to the northeast, while Argoitia et al. (2021) reported a specimen from Corrientes province in the Humid Chaco ecoregion. Recently, Pavé et al. (2022, 2024) reported a specimen of *C. planirostris* from Santa Fe province in the Delta and Islands of the Paraná River, expanding its latitudinal distribution and increasing the number of ecoregions occupied by this bat species in Argentina.

Here, we report the second record of *C. planirostris* in Misiones province and the fourth for northeast Argentina extending its eastern distribution. Our data, also represent the first record to the Paranaense Forest ecoregion in the strict sense (*sensu* Brown & Pacheco 2006) on the country and fills a geographic information gap between the populations of Argentina, Brazil and Paraguay. Our specimen of *C. planirostris* was collected from the ground at the building of the Instituto de Biología Subtropical (IBS-nodo Iguazú) and Centro de Investigación del Bosque Atlántico (CeIBA), Puerto Iguazú, Misiones, Argentina (latitude -25.5945044; longitude -54.5733135 172 m a. s. l.) on July 22, 2018 (Fig. 1). The voucher specimen (CM-LGE 462) is an adult male that was preserved in 70% ethanol with skull extracted after recording the basic external measurements. It was deposited in the Mammal Collection of the Laboratorio de Genética Evolutiva (CM-LGE) of the Instituto de Biología Subtropical (IBS)-nodo Posadas, CONICET-UNaM. The specimen was collected under the authorization of the Ministerio de Ecología y Recursos Naturales Renovables of Misiones province (Collection Permit N° 001/2018). Collecting of the specimen was made fol-

lowing the ethical guidelines approved by the American Society of Mammalogists (Sikes et al. 2016).

External and cranial measurements were registered in millimeters, following Giménez & Giannini (2016), and Barquez & Díaz (2020) (Table 1), using a digital caliber with a sensitivity of 0.01 mm, and include: total length; tail length; hindfoot length; ear length; forearm length; greatest length of skull (excluding incisors); condylobasal length; least interorbital breadth; postorbital constriction; breadth of braincase; zygomatic breadth; mastoidal breadth; palatal length; length of maxillary toothrow; width across upper canines; length of mandible; length of mandibular toothrow.

Our specimen shares the diagnostic external characters for this species as described by Moras et al. (2016, 2018), and López Berrizbeitia & Díaz (2021): the dorsal pelage is grayish brown, and the ventral coloration is paler than the dorsum, with the gular and midventral regions pale buff colored; dorsal hairs are bicoloured, with the basal half pale buff; ears are wide and rounded, close together at the base (2.3 mm apart). The tragus is small, while the antitragus is well developed, rounded with a broad base, and a smooth face; characteristics that define this genus and distinguish it from *Molossops* (López Berrizbeitia & Díaz 2021).

Skull has some features that also distinguish *Cynomops* from *Molossops*, such as a more robust mandible and skull, and a skull with a well-developed lambdoid crest; 1/2 incisors in *Cynomops* versus 1/1 in *Molossops*. Besides this, morphology of the skull of *C. planirostris* is similar to other species of the genus, particularly with the smaller ones; for example, *C. abrasus* is a syntopic species with a greatest length of skull more than 18.39 mm, whereas *C. planirostris* has a skull length of less than 17.5 mm (López Berrizbeitia & Díaz 2021), including the specimen reported here (15.61 mm; see Table 1). Other diagnostic characters of the species, which also presents our specimen, include: a skull with a relatively low and short rostrum with a well-developed lacrimal ridge that slopes smoothly to the forehead (Fig. 2). Basisphenoid pits are present but weakly developed, incisive foramina and accessory foramen are located closer together and form an equilateral triangle (Fig. 2D; Moras et al. 2016).

Our article documents the presence of *C. planirostris* in the city of Puerto Iguazú, Misiones, Argentina, extending its distribution about 230 km to northeast of its previous record in the Parque Provincial Cañadón de Profundidad (Idoeta et al. 2012). Furthermore, this record is the fourth from the northeast of the country and the first one the Paranaense Forest of Argentina. Interestingly, the few records of *C. planirostris* in the northeast Argentina are limited to a single locality in each ecoregion. At the moment, just one locality is known for the Fields and Weedlands (Idoeta et al. 2012), one in the Humid Chaco (Argoitia et al. 2021), one in the Delta and Islands of the Paraná River (Pavé et al. 2022), and our record, that represent the first in the Paranaense Forest. All of this may indicate that *C. planirostris* has a low abundance or that traditional sampling methods, such as mist nets, have a strong bias towards species that forage in open spaces (Denzinger et al. 2018). Therefore, alternative sampled methods such as acoustic methods should be used to assess both the populations and geographic distribution of this species. In addition, our record fills an

information gap between the populations of northeastern Argentina and those of southern Brazil and eastern Paraguay (see López Berrizbeitia & Díaz 2021).

Cynomops planirostris occurs mainly in natural environments and protected areas of Argentina (López Berrizbeitia et al. 2019). It has recently been recorded in peri-urban and urban areas of Corrientes and Santa Fe provinces (Argoitia et al. 2021; Pavé et al. 2022). Our specimen was also found in an urban environment. This is consistent with the literature, which indicates that this species is common in many cities in Brazil; in fact, it is often characterized as a species well adapted to urban environments (Aguiar et al. 2021). Lastly, according to the most recent biogeographic analysis of bats from Argentina, the northern Yungas and the Paranaense Forests are the areas with the highest bat diversity in the country (Sandoval Salinas et al. 2021). Our registry increases the number of bat species recorded for Iguazú department, with a total of 23 species at the moment (see Massoia et al. 2012; Barquez & Díaz 2020; Olmedo et al. 2024). This shows that the north of Misiones is one of the areas with the greatest bat diversity of the country, only matched by a few sites in the Yungas Forests of Jujuy and Salta provinces (see Gamboa Alurralde et al. 2016; Sánchez 2016).

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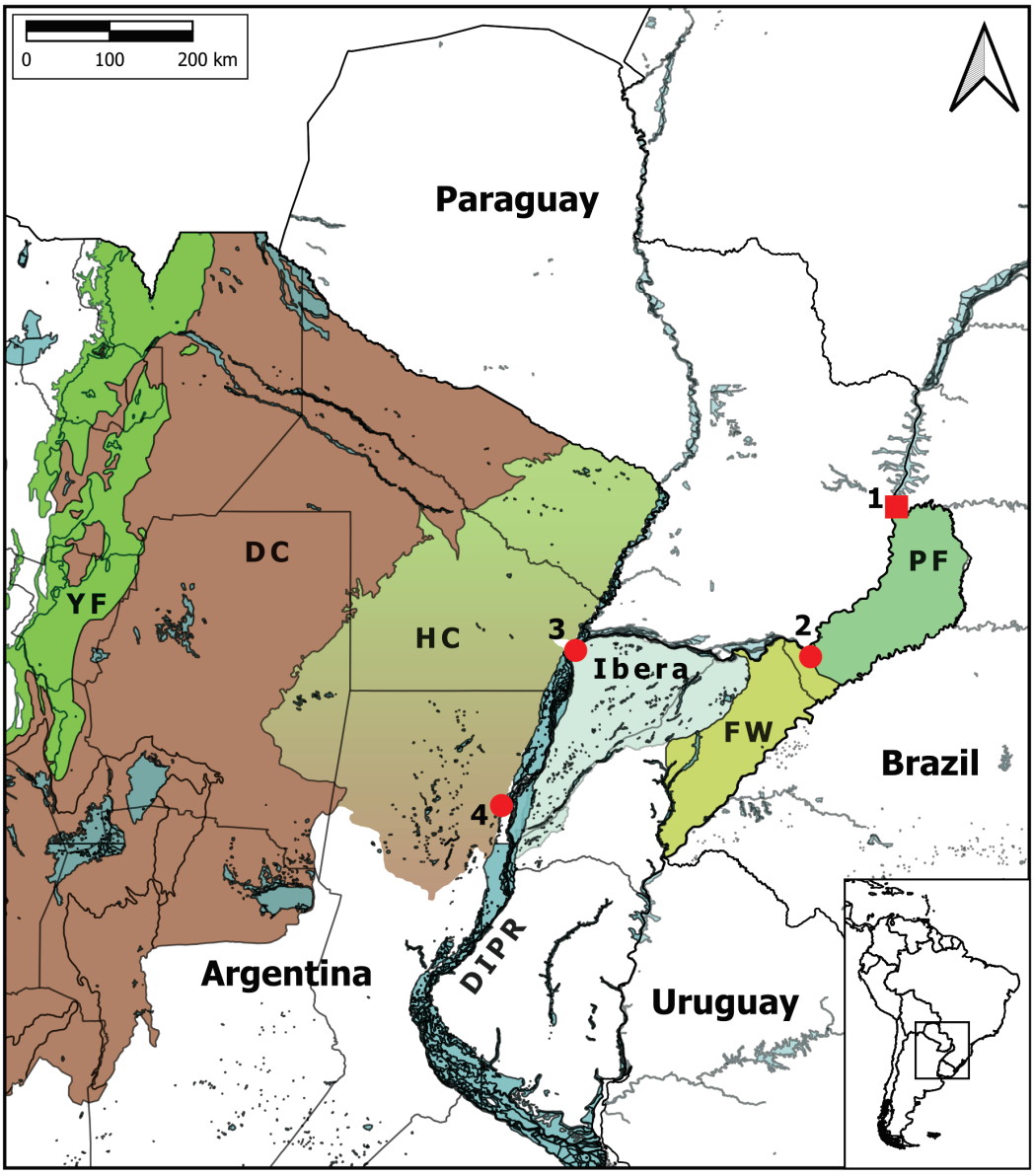

Figure 1. Map showing biogeographical regions occupied by populations of *Cynomops planirostris* in the Northeast of Argentina. The NEA locations correspond to: Puerto Iguazú (1) and Parque Provincial Cañadón de Profundidad in Misiones province (2; Idoeta et al., 2012), Campus Universitario Deodoro Roca in Corrientes province (3; Argoitia et al., 2021) and Rio San Javier in Santa Fe province (4; Pavé et al., 2022, 2024). Abbreviations: DC, Dry Chaco; HC, Humid Chaco; FW, Fields and Weedlands; PF, Paranaense Forest; DIPR, Delta and Islands of the Paraná River. The new record for northeastern Argentina is indicated by a red square. Adapted from Brown & Pacheco (2006).

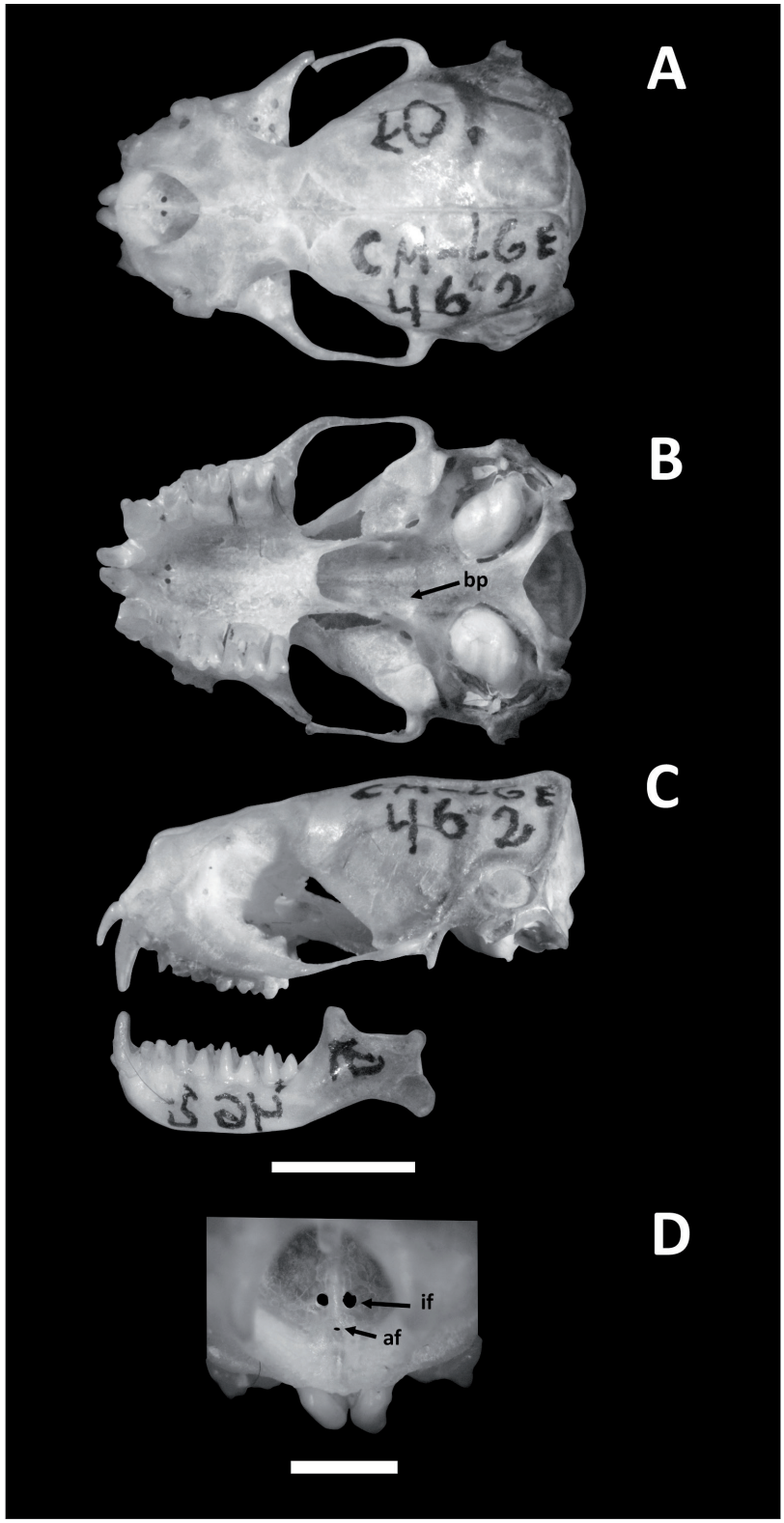

Figure 2. Skull of the male specimen of *Cynomops planirostris* (CM-LGE 462) captured in Puerto Iguazú city. (A), (B) and (C), dorsal, ventral and lateral views; (D) dorsal views of the skull showing the incisive foramina (if) and accessory foramen (af, see arrow). Note the skull with a relatively low and short rostrum, and with basisphenoid pits (bp) weakly developed (see arrow in B). Scale = 5 mm for A, B and C, and scale = 2 mm for D.

Table 1. External and cranial measurements (in mm) of the specimen of *Cynomops planirostris* (CM-LGE 462) reported here, compared to specimens reported by Idoeta et al. (2012) from Misiones; Pavé et al. (2022) from Santa Fe; Argoitia et al. (2021) from Corrientes. Institutional abbreviations are: CM-LGE, Mammal Collection of the Laboratorio de Genética Evolutiva of the Instituto de Biología Subtropical, Universidad Nacional de Misiones; INALI, Instituto Nacional de Limnología, CONICET-Universidad Nacional del Litoral; CM-FaCENA, Mammal Collection of the Facultad de Ciencias Exactas y Naturales y Agrimensura, Universidad Nacional del Nordeste, Corrientes. Measurements of the specimens from Parque Provincial Cañadón de Profundidad in Misiones are expressed as the mean and range.

	Misiones				Santa Fe	Corrientes
Measurements	**CM-LGE 462**	**mean**	**range**	**n**	**INALI A703**	**CM-FaCENA 256**
Sex and age	♂, adult				♂, adult	♂, adult
Total length	86	91.6	89.00–94.00	5	89	88.1
Tail length	25.5	25.8	21.00–31.00	5	32	24.9
Hindfoot length	7	6.4	6.00–7.00	5	7.1	6.5
Ear length	13.5	13.6	13.00–14.00	5	13	13.3
Weight (g)	--	13.3	12.00–15.00	5	13	13.8
Forearm length	32.64	33.99	32.68–35.00	5	35.2	35.6
Greatest length of skull (excluding incisors)	15.61	15.89	13.30–17.80	5	18	16.7
Condylobasal length	15.23	15.31	14.80–16.50	5		16.6
Least interorbital breadth	6.89	6.60	6.20–7.18	5		6.8
Postorbital constriction	4.13	4.33	4.10–4.60	5	4.9	4.1
Breadth of braincase	8.30	8.05	7.80–8.30	5	8.5	8.2
Zygomatic breadth	11.15	10.98	10.56–11.58	5	12.5	11.6
Mastoid breadth	10.6	10.24	9.68–11.50	5	11.2	11.0
Palatal length	6.05	6.51	6.38–7.10	5	7.1	7.0
Length of maxillary toothrow	6.11	6.44	6.20–7.00	5	7.5	7.6
Width across upper canines	4.73	4.60	4.38–5.00	5	5.2	4.9
Length of mandible	11.66	12.54	12.14–13.58	5	13.5	13.3
Length of mandibular toothrow	6.81	6.80	6.58–7.50	5	8	7.8

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