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Research note

New records and range extension of *Promops centralis* (Chiroptera: Molossidae)

Nuevo registro y ampliación de la distribución de Promops centralis *(Chiroptera: Molossidae)*

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Abstract

We captured *Promops centralis* and recorded its echolocation calls in Bahía de Kino, Sonora, which represents the first record of this species for the state of Sonora, Mexico. Our new record extends the distribution of *P. centralis* at least 1,300 km northwest from the northernmost known locality, Cuautla, Jalisco. Until now, there was no evidence of the occurrence of *P. centralis* in the deserts of northern Mexico. These new records are ecologically significant as they show that this species also occurs in extreme dry areas such as the Sonoran Desert. Our findings suggest that *P. centralis* may be more widely distributed than previously thought.

Keywords: Aerial insectivores; Bahía de Kino; Echolocation; Molossids; Northern Mexico

Resumen

Se capturó al murciélago *Promops centralis* y se grabaron sus llamadas de ecolocalización en la localidad de Bahía de Kino, Sonora; este es el primer registro de la especie para el estado de Sonora, México. Este nuevo registro amplía la distribución de *P. centralis* por lo menos 1,300 km al noroeste de la localidad más norteña previamente conocida, Cuautla, Jalisco. Hasta ahora no existía evidencia de la presencia de *P. centralis* en los desiertos del norte de México. Este nuevo registro es de importancia ecológica ya que por primera vez se muestra que esta especie puede subsistir en áreas extremadamente secas como el Desierto de Sonora. Nuestro hallazgo sugiere que *P. centralis* puede estar más ampliamente distribuido de lo que se pensaba con anterioridad.

Palabras clave: Insectívoros aéreos; Bahía de Kino; Ecolocalización; Molósidos; Norte de México

The Molossidae is a diverse group of bats (fourth largest bat family, ca. 100 species), with most of the species occurring in tropical and subtropical regions (Simmons, 2005). Molossids are typical open space bats that hunt high up in the air and roam over large distances. They are rarely captured in mist nets so there is a general lack of information on many species. The genus *Promops* is restricted to the New World and currently encompasses 3 species (Gregorin & Chiquito, 2010): *Promops centralis*, *Promops nasutus* and *Promops davisoni*. *P. centralis* is the most widely distributed, from Mexico (Jalisco to Yucatán) throughout South America, from Colombia, Ecuador, and Peru, to the

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Figure 1. (A) Artificial pond where we captured *Promops centralis*. (B) The pond (red dot) is mainly surrounded by crops. This area is very dry and these water bodies are the only source of fresh water nearby.

Amazon basin in Brazil, western Bolivia, Paraguay, northeastern Argentina and the northern coast of Brazil, Guianas, and Venezuela (Eger, 2008; Pacheco, Cadenillas, Salas, Tello, & Zeballos, 2009; Simmons, 2005). Despite its large distributional range, little is known about the ecology of this species. Like most molossids, *P. centralis* possesses long and narrow-tipped wings (high wing loading and aspect ratio) which are well suited to fly at high speed but are less suited for high maneuverability (Freeman, 1981; Norberg & Rayner, 1987). In accordance, these bats are known to forage in open areas above the forest canopy or in open landscapes (Jung, Molinari, & Kalko, 2014; Kalko, Estrada-Villegas, Schmidt, Wegmann, & Meyer, 2008). *P. centralis* occurs in a very diverse range of habitats such as rain forest, tropical dry forest and pine-oak (Arita, 1997; Sánchez-Cordero, Bonilla, & Cisneros, 1993; Simmons & Voss, 1998), pastures (MacSwiney, Bolivar, Clarke, & Racey, 2006), and has even been reported in urban areas (Jung & Kalko, 2011; Regueras & Magaña-Cota, 2008). The echolocation calls of *P. centralis* are very conspicuous as they are characterized by upward frequency modulation similar to the genus *Molossops* (Jung et al., 2014). Within sequences up- and downward modulated calls can alternate irregularly. Species-specific variation of echolocation calls has been previously described in detail (while assigning it to *Cynomops mexicanus* by MacSwiney et al., 2006).

In Mexico, this species has been recorded from Jalisco southward throughout the west coast to the Yucatán Peninsula. We report here the capture of this species for the first time in the extreme north of Mexico, in the state of Sonora, where there was no record of this species in the northern desert habitats of Mexico.

Field work was conducted on the nights of the 8th and 9th of April 2014 in Bahía de Kino, Sonora. Our study site was one of the few artificial water reservoirs in this area (28°50′1.09″ N, 111°35′57.20″ W). The pond had a size of ca. 90 m × 90 m with some palm trees close to the edge of the water and mainly surrounded by crops (Fig. 1). However, the pond is relatively close to the natural vegetation typical for the Sonoran Desert, dominated by small shrubs and columnar cacti (Mexican giant cardon: *Pachycereus pringlei*, saguaro: *Carnegiea gigantea*, organ pipe cactus: *Stenocereus thurberi*) (Van Devender, 2002). We used mist nets for capturing bats and acoustic monitoring to record the echolocation calls of all the bats flying near the study site. Captured bats were identified using a bat identification guide (Medellín, Arita, & Sánchez-Herrera, 2008). Acoustic recordings were obtained using a real time acoustic ultrasound recording device (batcorder, ecoObs GmbH, Nürnberg, Germany) located at 1.5 m above the ground. Both, mist netting and use of the acoustic recording device started at sunset and ended at midnight. We followed the guidelines for the use of wild mammal species in research as recommended by the American Society of Mammalogists (Sikes & The Animal Care and Use Committee of the American Society of Mammalogists, 2016). All captures were carried out under permission of the Secretaría de Medio Ambiente y Recursos Naturales, Mexico (FAUT-0001).

In total we captured 12 individuals of 2 bat families (Vespertilionidae and Molossidae). We identified 2 individuals of *P. centralis*, 1 in each capture night, both individuals presented the characteristic morphological features of *P. centralis*: upper lip without grooves (Fig. 2A), forearm less than 56 mm, dark pelage (darker in the dorsal part than in the ventral part) and the incisors protruding substantially from the front of the canines (Fig. 2B). The first captured individual was an adult male, reproductively inactive, with a forearm of 54.8 mm, the time of capture was around 22:00 h. The collected individual was deposited in the National Collection of Mammals, UNAM, Mexico (catalog number 47626). The second individual, captured around 20:00 h and released after taking measurements and photographs, was an adult male, reproductively inactive with a forearm of 55.4 mm.

We analyzed 13 echolocation sequences ($n = 206$ upward modulated echolocation calls) of *P. centralis*. Corroborating with previous publications, this species has very particular echolocation calls (Jung et al., 2014), which are easily identified using acoustic recordings for species inventory. Contrary to most molossids, their search calls are upward modulated quasi-constant frequency calls with a variable upward modulated

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