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## Nota

# NOTEWORTHY FIELD OBSERVATIONS OF CAVE ROOSTING BATS IN HONDURAS

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**ABSTRACT.** We present behavioral and ecological observations of three Neotropical bat species roosting in caves in Honduras. We observed alopecia (or significant hair loss) in a large colony of *Phyllostomus hastatus*. Two individual *Sturnira ludovici* were captured exiting an abandoned gold mine shaft at La Tigra National Park. We also present an unverified record for the emballonurid bat *Balantiopteryx io* (endemic to northern Mesoamerica) captured in a cave in Masca, Honduras. This location increases the distribution of this species by approximately 60 kilometers due east into a new ecosystem and across country borders.

**RESUMEN.** Destacables observaciones de campo sobre murciélagos de cuevas en Honduras. Se presentan observaciones conductuales y ecológicas de tres especies de murciélagos neotropicales que usan cuevas en Honduras. Observamos alopecia (significativa pérdida de cabello) en *Phyllostomus hastatus*. Dos individuos de *Sturnira ludovici* fueron capturados saliendo de un eje de mina de oro abandonada en Parque Nacional La Tigra. Además, presentamos el registro no verificado para el murciélago emballonurido *Balantiopteryx io* (endémico del norte de Mesoamérica), recogido en una cueva en Masca, Honduras. Esta localización ampliaría, de ser verificada, la distribución de esta especie aproximadamente 60 km al este, en un nuevo ecosistema y a través de límites geográficos.

**Key words:** Alopecia. *Balantiopteryx io*. Cave roosting. Honduras. *Sturnira ludovici*.

**Palabras clave:** Alopecia. *Balantiopteryx io*. Honduras. Refugios en cuevas. *Sturnira ludovici*.

Bats and bat diversity are necessary for healthy ecosystems, but are typically understudied. Bats provide countless ecosystem services (Kunz et al., 2011) but still exhibit high risk for population declines and potential extinctions (Hutson et al., 2001). Unknown roosting preferences in some species (Reid, 2009) and roost vulnerability highlight the importance of protecting bat roosts (Sheffield et al., 1992). Notable destruction and vandalism of roosts across Latin America (Medellín and Gaona, 2000;

Medellín, 2003) highlights this conservation and management challenge. Education (Tuttle, 1979) and cave conservation (McCracken, 1989) are paramount to maintaining viable bat populations. Data needed to promote these efforts are obtained through focused research objectives and ecological observations. Notes and observations of single sampling events are useful as building blocks for directed research to better understand the habits, requirements, and conservation needs of wildlife. We pres-

ent ecological observations and occurrences requiring further study to clarify roosting and foraging behaviors as well as distribution and conservation needs of three Neotropical bat species.

*Phyllostomus hastatus* (Pallas, 1767)

Locality: Masca, Rio Masca: Piedra Cocha, 5 ♂, 3 ♀ (all captured and released, unbanded). On 11 March 2011, we captured eight individuals in a mist net set inside the cave, in front of the entryway to a closed chimney-like cavern where greater than 100 individuals of these species were roosting. We noticed that many individuals showed significant signs of hair loss (alopecia); some were nearly bald with yellow-stained skin. Three males of the eight captured had completely missing hair ventrally, around the eyes, back of neck, and rump, while one of those had a large bubble under the skin on its back. Pedersen et al. (2009) found frugivorous bats in the Lesser Antilles to exhibit alopecia due to ingestion of volcanic ash, ultimately causing a zinc deficiency, and hair loss. It is possible that bats in Masca are either ingesting volcanic ash, or under local stress; potentially ingesting toxics from intentional fires to eradicate vampire bats, or some other source.

*Sturnira ludovici* (Anthony, 1924)

Locality: San Juancito, Parque Nacional La Tigra: Cueva #1, 2 ♀ (captured and released, unbanded). On 7 March 2011, we captured two non-reproductive adult females in a 6 m mist net, doubled back on its self to form a "V" shape in front of an abandoned mine shaft. Both had forearm measurements of 46 mm and live weights were 22.4 g and 24.4 g. These individuals were captured exiting the mine shaft 85 min. and 115 min., respectively, after dusk. Roost sites were previously unknown for this species (LaVal and Rodriguez-Herrera, 2002; Reid, 2009) and we believe that these females were day roosting in this man-made, former gold mine shaft. Though we did not enter the mine, the entrance to this shaft is approximately 2 m wide by 1.5 m tall with a small amount of standing water inside, situated at 1645 m in elevation. Along with *S. ludovici*, *Anoura geoffroyi* (n=2), *Carollia perspicillata* (n=1),

*C. sowelli* (n=11), and *Eptesicus fuscus* (n=1) were captured in the same net.

*Balantiopteryx io* (Thomas, 1904)

Locality: Masca, Rio Masca: Piedra Cocha, 4 ♂, 2 ♀ (all captured and released, unbanded). On 11 March 2011, we captured these six individuals in a harp trap placed at the entrance of a small cavern within the cave. Individual forearm lengths were measured with a ruler and live weights were taken with a small digital pocket balance. Bats were aged by visual inspection for ossification of wing joints while reproductive status was assessed by visual inspection and stomach palpation to determine if females were pregnant (Racey, 1974). Average live weight of males was 4.60 g and females averaged 4.45 g. Forearm measurement for all four males was 39.0 mm, the two females were 37 mm and 38 mm, and all were non-reproductive adults. Several resources were used for species identification in lieu of voucher specimens (Timm and LaVal, 1997; Reid, 2009); forearm measurements from our bats were consistent with Reid (2009), without overlap with *B. plicata*. Due to its endemism and roost disturbance, this species is listed as Vulnerable on the IUCN Red List (Lim et al., 2008). The range of this species extends from Veracruz through the Guatemalan highlands and the Maya Mountains of Belize (Reid, 2009); upon verification these individuals from Masca, Honduras [15° 39' 45.25"N, -088° 7'53.66"W], would be the first records from this country and extend the known range across the Guatemalan border by about 60 km. Along with *B. io*, *Saccopteryx bilineata* (n=2) and *Phyllostomus hastatus* (n=8) were captured during the same sampling event. This cave is highly vandalized with writing on most of its walls and obvious charring on the main ceiling from fires inside the cave, possibly from a mis-informed vampire bat eradication effort, though we did not encounter vampire bats at Piedra Cocha.

These occurrences and observations are based on single sampling events. Therefore, we do not conclude that *S. ludovici* is an obligate man-made mine roosting species. Only multi-night tracking with radio telemetry of several individuals at Parque Nacional La Tigra can im-

prove the understanding of roosting behavior of *S. ludovici* there. T. H. Fleming (2003) tracked individuals in a population of *Carollia* at Santa Rosa National Park, Costa Rica, and only after concerted efforts, found them using both caves and underground tunnels. This amount of effort leads to comprehensive data and the myriad of mine sizes and configurations at La Tigra would make for an interesting study about the roosting preferences of *S. ludovici*.

Piedra Cocha in Masca, Honduras, is an important site for both *B. io* (endemic) and *Phyllostomus hastatus*, with the large social harems present in the former species. Tourism is unlikely to disturb Piedra Cocha with the nearly vertical climb up to the cave, but local vandalism is high and likely having an impact on roosting bat species. *B. io* is a species of high conservation concern and this situation supports the continued need for bat conservation and vampire bat education programs in northwestern Honduras and across all of Mesoamerica. Much remains to learn about the natural history of tropical bats through dedicated research in order to conserve them along with their associated habitat.

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