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Thomas D. Lambert

Michaela K. Halsey

Jacob W. Dittel

Scott A. Mangan

Erika Delfosse

*See next page for additional authors*

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**Authors**

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## Short Note

## First record of Alston's Woolly Mouse Opossum (*Micoureus alstoni*) from the canal area of Central Panama

Thomas D. Lambert<sup>1\*</sup>, Michaela K. Halsey<sup>1</sup>, Jacob W. Dittel<sup>2</sup>, Scott A. Mangan<sup>3</sup>, Erika Delfosse<sup>2</sup>, Gregory H. Adler<sup>2</sup> and Stefan A. Schnitzer<sup>3,4</sup>

<sup>1</sup> Department of Biology, Frostburg State University, Frostburg, MD 21532, USA, e-mail: tdlambert@frostburg.edu

<sup>2</sup> Department of Biology and Microbiology, University of Wisconsin-Oshkosh, Oshkosh, WI 54901, USA

<sup>3</sup> Department of Biological Sciences, University of Wisconsin-Milwaukee, Milwaukee, WI 53201, USA

<sup>4</sup> Smithsonian Tropical Research Institute, Apartado 0843-03092, Balboa, Panama

\*Corresponding author

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Knowledge of the range and distribution of species is crucial to our understanding of ecological and evolutionary processes. Unfortunately, obtaining such knowledge for mammals is difficult because it requires extensive time and effort. Indeed, it is probable that a complete species list does not exist for any site in the neotropics, even for the exhaustively studied Barro Colorado Nature Monument (BCNM) in Central Panama (Voss and Emmons 1996). Here, we report the first record of Alston's Woolly Mouse Opossum (*Micoureus alstoni*) from this heavily studied region.

*Micoureus alstoni* was described by Allen (1900) from the 'Tres Rios' region of Costa Rica; the species is known to range from Belize to northern Colombia but has been conspicuously absent from most of Panama (Emmons and Feer 1997). Although the taxonomy of mouse opossums is unresolved and the genus is currently in need of revision, all indications are that *M. alstoni* is a valid species and not a subspecies of *Micoureus cinereus*, as has been suggested (Cardillo et al. 2004, Wilson and Reeder 2005). On 20 June 2010, we captured a 150-g adult male on the Gigante Peninsula (9°06'27"N, 79°51'03"W) of the BCNM. This capture represents a ~500-km extension from the known Colombian population and a ~300-km extension from the known population in Bocas del Toro, Panama (Figure 1). Gigante Peninsula is covered with tropical moist forest; the forest is a patchwork of mostly younger (<80 years) forest with some areas of older, tall-canopy, undisturbed forest. We captured the *M. alstoni* in an area of older forest on the southern part

of the peninsula. The four 5×5 quadrants around the capture location had fewer trees (mean 8.4, SD 2.8) and more lianas (mean 9.3, SD 8.1) than the plot as a whole (mean trees 10.1, SD 4.8; mean lianas 8.7, SD 5.5), potentially indicating that *M. alstoni* prefers older forest with few large trees and ample connectivity among those trees. Central Panama is highly seasonal with regard to rainfall, receiving a mean of approximately 2600 mm of rain per year, with 90% occurring during the rainy season (April–December) (Windsor 1990). Elevation at the capture location was 90 m a.s.l. The single individual was captured in a Tomahawk live-trap (40.6×12.7×12.7 cm, Tomahawk Live Trap Co., Tomahawk, WI, USA) placed on the ground near the buttress of a large tree. The trap was baited with fresh ripe plantain, peanut butter, and bird seed and had been set in that location for five consecutive nights prior to the capture.

The specimen displayed all of the key characters to differentiate it from other similar species, including having fur extending approximately 3 cm onto the base of the tail (a feature lacking in either of the two mouse opossum species known to occur in the area: *Marmosa robinsoni* and *Micoureus phaea*). Additionally, the underbelly of the specimen had a yellowish tint, whereas *M. robinsoni* underbellies are reddish or salmon in color and *M. phaea* are gray or brown. Furthermore, at 150 g, the individual was substantially larger than either *M. robinsoni* (up to 130 g) or *M. phaea* (~60 g) (Emmons and Feer 1997). In fact, the captured individual was at the upper weight limit of *M. alstoni* and large body size is one of the distinguishing characteristics of this species (Reid 2009). Unfortunately, collection of individuals or DNA is not permitted within the BCNM without prior permission. Thus, the individual could not be taken as a voucher. However, the individual was carefully examined by T.D.L., who has extensive experience with numerous species of mouse opossums (Lambert et al. 2003, 2005, 2006). Additionally, the authors extensively deliberated over the potential identity of the specimen, including discussions between T.D.L. and G.H.A., both of whom have worked with numerous mouse opossum species and are intimately familiar with the small mammal fauna of Central Panama. Given the distinct morphological characteristics of the individual combined with its large size, the authors are confident that the individual was correctly identified as *M. alstoni*.

This capture is significant in that it extends the range of *Micoureus alstoni* and fills a large and noticeable gap in its distribution. Indeed, it is probable that *M. alstoni* ranges across Panama, occurring either at low abundance or residing exclusively in particular habitats that have not yet been well surveyed. Indeed, much of the small mammal research that



**Figure 1** Map of Central America showing the previously known distribution of *Micoureus alstoni* (shaded gray), one extending from southern Belize into the Bocas del Toro region of western Panama, and the second in northern Colombia, with the new record from Central Panama indicated. The new capture represents a ~500-km extension from the Colombian portion of the range and ~300-km extension from the Bocas del Toro portion.

has been conducted in Central Panama has focused either on small islands (Adler and Seamon 1991) or along forested streams in mainland forest (Adler et al. 1998, Tomblin and Adler 1998), with only one contemporary survey of Barro Colorado Island and adjacent mainland peninsulas having been conducted (Lambert and Adler 2000), and this study mostly sampled younger areas of the forested mainland peninsulas. However, it is not clear whether the newly discovered population is still in genetic contact with other populations. Although large areas of forest still exist across the isthmus, much of this forest is highly degraded second growth and connectivity can be limited; more extensive surveys combined with genetic analysis are needed to resolve this issue. This capture demonstrates the need for extensive mammal surveys throughout the neotropics and indicates that the faunal lists for even the most extensively studied sites are likely to be incomplete. Continued work is needed and researchers need to be ever vigilant of the potential of capturing new species.

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