

PREDATION BY THE RUFOUS-BANDED MINER, *GEOSITTA RUFIPENNIS*, ON THE LIZARD *LIOLAEMUS LEOPARDINUS*

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ABSTRACT

The South American Rufous-banded Miner, *Geositta rufipennis*, is known as a ground-gleaning omnivore. There is no record of predation by the species on animals other than invertebrates. Here we present photographs and describe video images of the first record of predation in the wild by an adult *G. rufipennis* on a neonate leopard lizard, *Liolaemus leopardinus*. This predation took place at El Colorado, Chile, while we were conducting research on parental behavior of *L. leopardinus* during the austral summer of 2013. The occurrence of predation on lizards by *G. rufipennis* has never been reported before. Our documentation broadens our knowledge of the feeding habits and behavior of *G. rufipennis* and also adds this species to the list of *L. leopardinus* predators.

Key words: Aves, Squamata, *Liolaemus*, Predation

RESUMEN

Predación del Minero cordillerano, *Geositta rufipennis*, sobre la lagartija *Liolaemus leopardinus*. El Minero cordillerano, *Geositta rufipennis*, es omnívoro y forragea en el suelo. No se tiene registro de que la especie deprende otros animales mas que invertebrados. Aquí presentamos fotografías y describimos imágenes de vídeo del primer registro de depredación en la naturaleza de un lagarto leopardo neonato, *Liolaemus leopardinus*, por un adulto *G. rufipennis*. La depredación tuvo lugar en El Colorado, Chile, mientras investigábamos el comportamiento del cuidado parental de *L. leopardinus* durante el verano austral de 2013. La ocurrencia de depredación de lagartos por *G. rufipennis* no se ha reportado con anterioridad. Nuestra documentación amplía nuestro conocimiento de los hábitos de alimentación y comportamiento de *G. rufipennis* y también añade esta especie a la lista de depredadores de *L. leopardinus*.

Palabras clave: Aves, Squamata, *Liolaemus*, Depredación

INTRODUCTION

The Rufous-Banded Miner, *Geositta rufipennis* (Burmeister 1860), is a mid-sized South American terrestrial bird (Passeriformes: Furnariidae) with a length (tip of beak to tip of tail) of 16-17 cm and body mass of 25-54 g (del Hoyo *et al.* 2003, Jaramillo 2011). In Chile, the species can be found from Antofagasta to Aysén, and is common above 1000 m in the Andes (Chester 2008) in arid zones with no trees and sparse vegetation, cliffs, steep slopes, or rocky zones (Ridgely and Tudor 2009, Jaramillo 2011). The species is considered to be omnivorous; it feeds on arthropods, seeds and leaf buds, which are gleaned from the ground (del Hoyo *et al.* 2003). The literature records no case of *G. rufipennis* attacking, preying on, or consuming any animal species other than invertebrates. Here we report *G. rufipennis* preying on a neonate of the leopard lizard, *Liolaemus leopardinus* (Müller and Hellmich 1932). This saxicolous lizard is endemic to central Chile. Fox and Shipman (2003) and Fox and Núñez in a pilot study in 2005 showed that *L. leopardinus* forms social groups. Adult females give birth to up to four neonates from mid-March to mid-April. Neonates are small, with a snout-vent length of ca. 40 mm and mass of ca. 1.8 g; at this stage they are defenseless and vulnerable.



FIGURE 1. Two-meter diameter open-top enclosure containing leopard lizards, *Liolaemus leopardinus* (one adult male, two adult pregnant females and a juvenile), located at El Colorado, Chile, during the austral summer of 2013.



FIGURE 2 (left). A neonate and the head of an adult leopard lizard, *Liolaemus leopardinus*, found close to the opening of the natal chamber in an open-top outdoor enclosure located at El Colorado, Chile, during the austral summer of 2013.
FIGURE 3 (right). Rufous-banded Miner, *Geositta rufipennis*, pecking at and flipping over a neonate leopard lizard, *Liolaemus leopardinus*.



FIGURE 4. Rufous-banded Miner, *Geositta rufipennis*, in proximity to the entrance of the natal chamber of a leopard lizard, *Liolaemus leopardinus*, located in an open-top outdoor enclosure at El Colorado, Chile, during austral summer of 2013.

MATERIALS AND METHODS

During early January of 2013, we built an open-top, outdoor enclosure (Figure 1) at our field site near El Colorado, Chile ($33^{\circ} 14' S$, $70^{\circ} 16' W$); to help us study parental behavior in *L. leopardinus*. The pen was circular in shape (2 m diameter) and the walls were galvanized sheeting 40 cm high. The enclosure held one adult male, two adult pregnant females, and one juvenile; lizards were unable to escape. Inside were natural sparse ground vegetation, various large, flat rocks, and a large, embedded rock with an interior refuge beneath it for the lizards. Lizards were collected from nearby natural sites. A week after lizards were released into the enclosure, we determined by focal observations from a distance that all subjects behaved normally (*e.g.*, basking, eating, social interactions, etc.) inside the enclosure.

We kept records of the mass of all lizards during February and April. In early April, sudden weight loss in one female suggested that it had given birth. On 11 April 2013, we visually confirmed the presence of a newborn close to the opening of the presumed natal chamber, a cavity beneath a large, partially embedded flat rock covered by soil and the shrub-like *Berberis empetrifolia* (Figure 2). After our finding, we placed a small, lightweight video camera (Kodak Play Sport Zx5) on a tripod inside the enclosure to record potential parental behavior. The video camera recorded from 1200 h to 1700 h during 8 days; all digital material was downloaded daily and analyzed by ES-B.

RESULTS

On 12 April 2013 we recorded a lizard neonate leaving its natal chamber. On the video it basks for several minutes and roams close to the chamber entrance. After some seconds, the neonate moves out of the field of view of the video camera. Minutes later a neonate rushes back to the natal chamber and a *G. rufipennis* shows up in the video; presumably the bird was chasing the neonate. A day later, on 13 April 2013, we recorded a ca. 12-min video in which it is possible to observe for a few seconds an adult *G. rufipennis* walking close to the natal chamber inside the enclosure. After this, the bird moves away from the field of view. Nevertheless, a few minutes later the bird flips a neonate that was out of view through the air. The neonate lands within view, immobile on its back. The bird enters the field of view, pecks intermittently at the neonate, and flips it around several times (Figure 3); these movements then carry the neonate out of view. Minutes later, an adult female lizard runs into view and stays motionless for a few seconds. The bird's tail remains visible; the adult lizard stays still and vigilant. Then the bird moves out of view. The lizard slowly swivels, apparently facing the off-field bird. After a few seconds, the bird approaches the lizard from the front and side and steps on its tail; the lizard reacts and quickly runs forward, moving out of the field of view, and the bird hops to the side. All three subjects are momentarily out of view. Seconds later, the bird shows up with the immobile, presumably dead neonate in its beak and proceeds to flay it against the ground, pecking at it, and picking it up by a limb and the body. The bird moves away from the neonate, then comes back and pecks at it, while all three individuals (bird, neonate, and adult lizard) are in proximity to each other, another adult female lizard runs close by the bird and scares it; however, the bird keeps pecking at the neonate and hitting it against a different rock. This behavior is performed for the next few minutes. After this, the bird flies away and after a few minutes flies back to continue its same behavior, pecking at the neonate, flipping it through the air and striking it against a small rock. Minutes later, both bird and neonate are out of view; it is uncertain if the bird flies away with the neonate. However, the bird returns to the field of view and sneaks into the opening of the natal chamber (Figure 4) which presumably contained more *L. leopardinus* littermates.

CONCLUSIONS

Our research required exhaustive visual observations of *L. leopardinus* behavior at the study site. A specific objective was to determine the predation pressure on *L. leopardinus* neonates. We knew that the Black-

billed Shrike-tyrant, *Agriornis montana*, is a predator on neonates (confirmed in the field). However, *G. rufipennis* as a lizard predator is a record new to science. Although we do not have any digital evidence of *G. rufipennis* actually eating a whole or part of a *L. leopardinus* neonate, the documented behavior indicates consumption is the next step. This video record contributes to the knowledge of feeding behavior of *G. rufipennis* and adds *G. rufipennis* as a predator of *L. leopardinus*.

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