



OBSERVATIONS AT A YELLOW-EARED TOUCANET (*SELENIDERA SPECTABILIS*) NEST

Luis Sandoval^{1,2} · Alan Rodríguez³

¹Escuela de Biología, Universidad de Costa Rica, San Pedro, San José, Costa Rica, CP 11501-2090.

²Museo de Zoología, Universidad de Costa Rica, San Pedro, San José, Costa Rica, CP 11501-2090.

³Rainforest Adventures Park, Braulio Carrillo, Costa Rica.

E-mail: Luis Sandoval · biosandoval@gmail.com

Abstract · What little we know of the breeding biology of *Selenidera* toucanets comes from only two of the eight species. For most species the breeding season is approximated through indirect evidence (e.g., gonad size in collected specimens and juvenile observation), but few nests have been found. Here, we describe nest architecture, parental care behavior, and chick characteristics of the Yellow-eared Toucanet (*S. spectabilis*) based on a single nest found in Costa Rican mid-elevation forest. The nest was inside a natural cavity of a live tree, contrary to the previous report of an old woodpecker nest in a snag. Both parents provide insects and fruits to the chicks inside the nest. The chicks hatch with closed eyes, pale pink skin, and a bicolor beak.

Resumen · Descripción de la arquitectura del nido del Tucancillo Orejiamarillo (*Selenidera spectabilis*)

La biología reproductiva de las especies de *Selenidera* es poco conocida y se limita a dos especies, aunque para todas las especies los períodos reproductivos son conocidos de forma indirecta (basado sobre tamaños de gónadas en especímenes colectados y observación de juveniles). Aquí describimos la arquitectura del nido, cuidados parentales, y las características de los polluelos al nacer del Tucancillo Orejiamarillo (*S. spectabilis*), utilizando información de un único nido encontrado en los bosques de elevaciones intermedias de Costa Rica. El nido fue una cavidad natural de un árbol vivo, contrario al reporte previo que reportaba el uso de un nido viejo de carpintero dentro de un árbol muerto en pie. Ambos padres proveen frutos e insectos a los pichones en el nido. Los pichones al nacer poseen los ojos cerrados, una piel rosada pálida, y un pico bicolor.

Key words: Breeding biology · Cavity nest · Costa Rica · Nest architecture · Ramphastidae

INTRODUCTION

The Yellow-eared Toucanet (*Selenidera spectabilis*) is one of the eight species of *Selenidera* toucanets (Short & Horne 2002, Lutz et al. 2013), and is the northernmost representative of the genus, occurring as far north as Honduras (Stiles & Skutch 1989, Short & Horne 2002). Of the remaining species, six species are Amazonian, and one is endemic to southeastern Brazil (Short & Horne 2002). The Yellow-eared Toucanet inhabits forests from sea level to 1500 m a.s.l., southward from NE Honduras, throughout Nicaragua, Costa Rica and the Caribbean coast of Panama to Darién (where it occurs in both coasts). Its range in South America reaches northwest and center-west of Colombia and extreme northwest of Ecuador (Hilty & Brown 1986, Stiles & Skutch 1989, Ridgely & Greenfield 2001, Short & Horne 2002). Throughout its distribution, this toucanet inhabits secondary forest with high canopies and forest edges (Stiles & Skutch 1989, Short & Horne 2002).

The breeding biology of *Selenidera* toucanets is poorly known. For the eight species, Short & Horne (2002) estimated breeding seasons are based largely on information from collected specimens in breeding conditions and observations of juveniles in the field (Jennings 1993, Short & Horne 2002, Camargo Guaraldo & Staggemeier 2009). Nest and egg descriptions are known for only two species (Guianan Toucanet *S. piperivora* and Spot-billed Toucanet *S. maculirostris*), and nest heights with substrates are mentioned in passing for an additional two species (Red-billed Toucanet *S. reinwardtii* and Yellow-eared Toucanet) (Short & Horne 2002, Camargo

Receipt 27 May 2017 · First decision 13 March 2017 · Acceptance 14 August 2018 · Online publication 16 August 2018

Communicated by Marcos Raposo © The Neotropical Ornithological Society



Figure 1. Tree used for Yellow-eared Toucanet (*Selenidera spectabilis*) for nesting at Rainforest Adventures Atlantic Park, Pococí, Limón province, Costa Rica. A) View of the natural cavity inside a live tree used for nesting. B) Cavity entrance close-up with the two perpendicular white lines indicating where the entrance diameter was measured (photos: L. Sandoval).

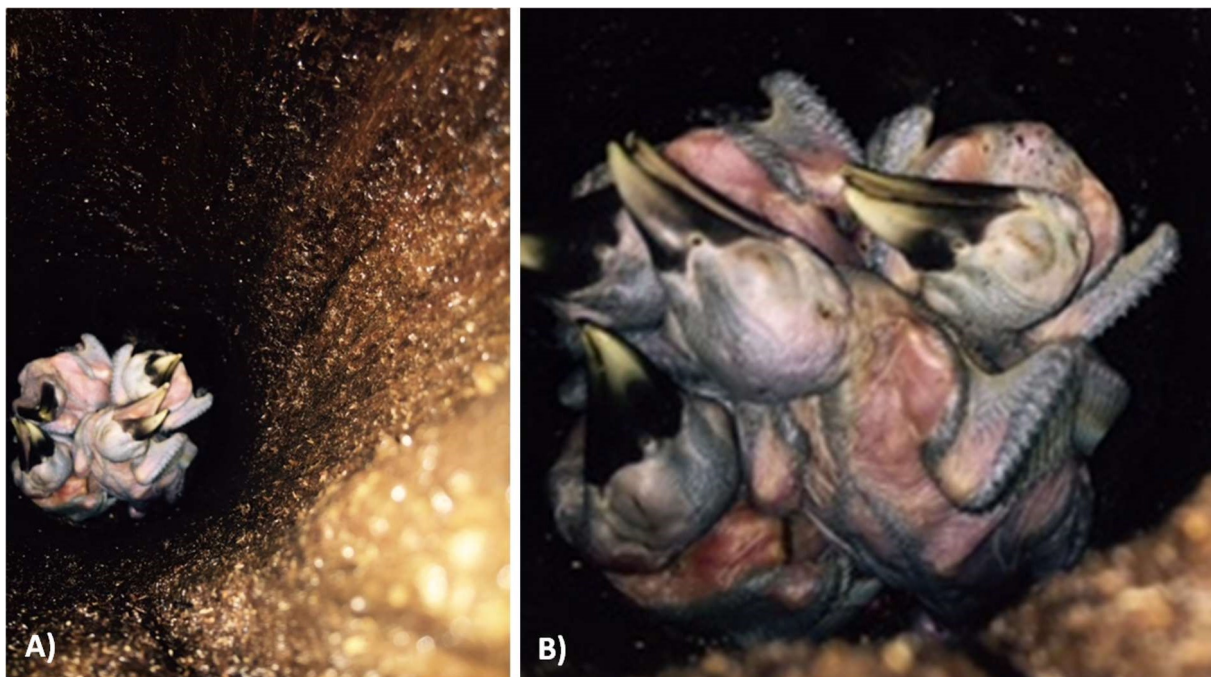


Figure 2. Yellow-eared Toucanet (*Selenidera spectabilis*) chicks inside the nest at Rainforest Adventures Atlantic Park, Pococí, Limón province, Costa Rica on 1 May 2017. A) Four chicks inside the nest. B) Close-up of the chick to appreciate the bicolor beak, closed eyes, and skin color (photos: L. Sandoval).

Guaraldo & Staggemeier 2009, Cziulik 2010). Here we provide the first details of the nest, nestlings, and breeding biology of the Yellow-eared Toucanet from a nest found in Costa Rica.

METHODS

This description is based on a single nest found on 27 May 2016, at Rainforest Adventures Atlantic Park,



Figure 3. Different food items provided to the Yellow-eared Toucanet (*Selenidera spectabilis*) chicks by adults at Rainforest Adventures Atlantic Park, Pococí, Limón province, Costa Rica. A) A cicada, B) an *Ardisia* sp. fruit, and C) cavity interior where is possible to observe *Ardisia* sp. fruits (solid arrow) and unidentified fruit (broken arrow) (photos A and B: A. Rodríguez, C: L. Sandoval).

Pococí, Limón province, Costa Rica (10°11' N, 83°55' W, 550 m a.s.l.), and observed during the 2016 and 2017 breeding seasons. The nest was inside a natural cavity of a live tree of *Carapa guianensis* (Meliaceae). The area of the nest was a hilly secondary mature forest next to main road, with a canopy of approximately 30 m and emergent trees. The mean annual rainfall is 4000 mm and temperature is 24°C (Sánchez et al. 2016). The nest dimensions (i.e., entrance diameter and thickness of walls) were measured using an analog caliper (Spi, error ± 0.01 mm). We measured cavity depth (roof to bottom) introducing a flexible stick inside the cavity until reaching the bottom, and then a metallic ruler to measure the cavity length.

RESULTS

The nest was found on 27 May 2016, when both parents were feeding the chicks inside the nest. On 29 June 2016, the nest was empty, and on the same day both adults were observed feeding two juveniles at

50 m from the nest. The nest was built inside a live tree cavity on the main trunk (Figure 1A) of *Carapa guianensis* (Meliaceae). The cavity entrance was approximately 6 m from the base of the trunk, but at 12 m from the ground, due to the tree's location at the edge of a cliff. The entrance was 66.9 x 54.4 mm in diameter (height x width; Figure 1B) and the distance between the front and back wall was 142 mm. The thicknesses of lateral walls were 17.5 mm and 24.2 mm, and the thickness of front wall was 32.7 mm. The cavity depth was 640 mm.

The nest was observed again in use on 27 April 2017, when an adult was observed leaving the nest. We reviewed the nest content on 1 May 2017 and observed four recently born chicks (Figure 2). We estimated that chicks were less than one week old, based on the lack of feathers and closed eyes. Based on our observation, chicks were born with closed eyes, a very pale pink skin, and a bicolored beak that was dark at the base and yellowish to white in the tip (Figure 2).

Inside the nest, on 25 July 2016 we found *Ardisia* sp. (Myrsinaceae) and another unidentified fruit (Figure 3C). On 1 May 2017, we observed both parents carrying fruits (*Ardisia* sp.) and cicadas to feed the chicks (Figure 3A–B). Both parents arrived indirectly to the nest, arriving first on branches or leaves of closer trees and palms (respectively), in front of the nest. After arriving to a near-by perch, they jumped between branches and leaves slowly approaching the nest while constantly tilting their head in different directions (including towards the ground) in a hyper-vigilant manner. After arriving at the nest, the adults remained at the entrance and peered about before entering completely, but returned to the entrance to peer out, usually < 5 sec after entering. During 30 min of observations parents arrived in three occasion to provide food to the chicks.

DISCUSSION

The nest of Yellow-eared Toucanet was inside a natural cavity on a live tree, contrary to reported by Stiles & Skutch (1989) who reported a nest for this species inside of old woodpecker nests on a snag, without most information on nest characteristics. However, nests inside of live trees were reported for another species in the genus, the Spot-billed Toucanet (*S. maculirostris*) (Camargo Guaraldo & Staggemeier 2009). The reuse of the same cavity during consecutive years could be a response to a limitation in the occurrence of suitable nest sites around the observation area. This area had high levels of humidity year-round (Hartshorn 1983), reducing the abundance and permanence of cavities in snags or live trees because wood degraded fast (Sandoval & Barrantes 2009). Previous breeding success can also influence cavity reuse (Newton 1994, Holt & Martin 1997), with pairs preferentially returning to previously successful locations.

The nest described here was active during the breeding season reported in literature for this portion of Central America, April to August (Stiles & Skutch 1989, Short & Horne 2002). Fruit abundance in forests close to the study area showed one peak from March to May (Loiselle & Blake 1991) correlating with the nest observation. This information suggests that toucanets are reproducing on a season when fruits are more abundant. Biparental care for nestlings as observed in this toucanet is a common behavior inside ramphastids, such as toucans, araçaris, and toucanets (Short & Horne 2002). Although we made relatively few direct observations of nestling diet, based on the food items remaining in the nest after fledging, it is clear that nestlings are fed a diet of both fruits and invertebrates. Though we did not witness it, it seems likely that the nestling diet also includes small vertebrates, as in related species (Remsen et al. 1993). We encourage others to report

information on *Selenidera* and other species of poorly known genera, as additional information is sorely needed before sound conservation practices can be developed and implemented.

ACKNOWLEDGMENTS

We want to thank Reimer Palma and Marvin Esquivel, who found and told us about the nest, and to Rainforest Adventure that allowed us to the visit and measure the nest. We want to thank to Harold Greeney and Olman Sandoval for all the help during the data collection. Finally, we want to thank Harold Greeney for valuable comments on a draft of this manuscript.

REFERENCES

- Cziulik, M (2010) *Cuidado parental de Selenidera maculirostris, Pteroglossus castanotis e Ramphastos toco (Piciformes – Ramphastidae), no interior de ninhos*. Tese de doutorado, Univ. Federal do Paraná, Curitiba, Brazil.
- de Camargo Guaraldo, A & VG Staggemeier (2009) Breeding of the Spot-billed Toucanet (*Selenidera maculirostris*) in the wild. *Wilson Journal of Ornithology* 121: 807–809.
- Hartshorn, G (1983) Plants: introduction. Pp 118–158 in Janzen, DH (ed). *Costa Rican natural history*. Chicago Univ. Press, Chicago, Illinois, USA.
- Hilty, SL & WL Brown (1986) *A guide to the birds of Colombia*. Princeton Univ. Press, Princeton, New Jersey, USA.
- Holt, R & K Martin (1997) Landscape modification and patch selection: the demography of two secondary cavity nesters colonizing clear-cuts. *The Auk* 114: 443–455.
- Jennings, J (1993) First breeding of the Guyana Toucanet. *AFA Watchbird* 20: 40–42.
- Loiselle, BA & JG Blake (1991) Temporal variation in birds and fruits along an elevational gradient in Costa Rica. *Ecology* 72: 180–193.
- Lutz, HL, JD Weckstein, JS Patané, JM Bates & A Aleixo (2013) Biogeography and spatio-temporal diversification of *Selenidera* and *Andigena* toucans (Aves: Ramphastidae). *Molecular Phylogenetics and Evolution* 69: 873–883.
- Newton, I (1994) The role of nest sites in limiting the numbers of hole-nesting birds: a review. *Biological Conservation* 70: 265–276.
- Remsen Jr, JV, MA Hyde & A Chapman (1993) The diets of Neotropical trogons, motmots, barbets and toucans. *Condor* 95: 178–192.
- Ridgely, RS & PJ Greenfield (2001) *The birds of Ecuador: status, distribution and taxonomy*. Cornell Univ. Press, Ithaca, New York, USA.
- Sánchez, JE, K Barboza-Conejo, C Sánchez, D Calderón-Franco & L Sandoval (2016) Description of the nest and eggs of the Green Thorntail (*Discosura conversii*). *Ornitología Neotropical* 27: 73–76.
- Sandoval, L & G Barrantes (2009) Relationship between species richness of wood excavator birds and cavity-adopters in seven tropical forests in Costa Rica. *Wilson Journal of Ornithology* 121: 75–81.
- Short, L & J Horne (2002) Family Ramphastidae (Toucans). Pp 220–272 in del Hoyo, J, A Elliott & J Sargatal (eds). *Handbook of the birds of the world. Volume 7: Jacamars to woodpeckers*. Lynx Edicions, Barcelona, Spain.
- Stiles, FG & AF Skutch (1989) *A guide to the birds of Costa Rica*. Cornell Univ. Press, Ithaca, New York, USA.