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Use of abandoned nests of [olden-winged Cacique *Cacicus chrysopterus* (Vigors, 1825) by Chacoan mouse opossum *Cryptonanus chacoensis* (Tate, 1931)

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ABSTRACT

All Paraguayan specimens of the Chacoan mouse opossum have been taken on the ground despite simultaneous trapping efforts in trees. Two *C. chacoensis* individuals were discovered on two separate occasions resting on a large mass of leaves within fallen *C. chrysopterus* nests, 101.6 cm and 246 cm above the ground. A third fallen *C. chrysopterus* nest was discovered on a tree, 109.7 cm off the ground, containing a leaf mass approximately 1,550 m from the first nest and 132 m from the second. These findings suggest that the Chacoan mouse opossum may opportunistically use bird nests for roosting.

Key Words: Didelphidae, Icteridae, mammals of South America, nest use, Ñeembucú

RESUMEN - Uso de nidos abandonados de cacique alidorado *Cacicus chrysopterus* (Vigors, 1825) por la comadreja ágil chaqueña *Cryptonanus chacoensis* (Tate, 1931). Todos los especímenes paraguayos de la comadreja ágil chaqueña han sido capturados en el suelo a pesar de los esfuerzos simultáneos de captura en los árboles. Dos individuos de *C. chacoensis* fueron descubiertos en dos ocasiones separadas descansando sobre una gran masa de hojas dentro de nidos de *C. chrysopterus*, a 101,6 cm y 246 cm sobre el suelo. Se descubrió un tercer nido caído de *C. chrysopterus* en un árbol, a 109,7 cm del suelo, que contenía una masa de hojas aproximadamente a 1550 m del primer nido y a 132 m del segundo. Estos hallazgos sugieren que la comadreja ágil chaqueña puede utilizar de manera oportunista nidos de pájaros como dormitorio.

Palabras Clave: Didelphidae, Icteridae, mamíferos de América del Sur, Ñeembucú, uso de nidos

The chacoan mouse opossum *Cryptonanus chacoensis* (Tate, 1931) is the smallest Paraguayan mouse opossum (Smith 2009). It occurs throughout northern Argentina, Paraguay, southern Bolivia, and Mato Grosso, Brazil (Voss et al. 2005; Umetsu & Pardini

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2007; Voss et al. 2009) and possibly Uruguay (Voss et al. 2009; Teta & Martin 2016). Long confused with the agile gracile mouse opossum *Gracilinanus agilis* (Burmeister, 1854), the diagnostic characteristics of *Cryptonanus chacoensis* were clarified by Voss et al. (2005). *Cryptonanus chacoensis* specimens have self-colored pelage, a mammae count of 4-1-4 = 9, small molars, P2 smaller than P3, and an incomplete anterior cingulum of M3 (Voss et al. 2005). In Paraguay, this is a widespread species occurring in palm savanna, forested marsh, and seasonally-inundated grassland, typically with a cover of spiny terrestrial bromeliads (Massoia & Fornes 1972; Smith et al. 2012). Voss et al. (2005) described capture sites in hollow logs, in woodpiles, on wet ground in a marsh, on the ground in high grass at the edge of a marsh, and at the base of fruiting bromeliad stalks. All Paraguayan specimens have been taken on the ground despite simultaneous trapping efforts in trees (Smith et al. 2012; Owen et al. 2018); however, the prehensile tail and digit arrangement indicate that they are capable of climbing. Breeding and nesting by *C. chacoensis* individuals in trees have been reported by a study conducted in Argentina (Massoia & Fornes 1972).

The golden-winged cacique *Cacicus chrysopterus* (Vigors, 1825) is a fairly common Icterid throughout Paraguay, reaching its greatest abundance in the Paraguay River Basin (Castillo et al. 2005). Golden-winged cacique nests are characteristically black in color, pendant-shaped, and often located at the end of a thin branch or vine in mid-forest. They are usually between 40 and 80 cm long and built at heights of 3 to 5 m off the ground. The narrow oval entrance is located in the middle or upper part of the nest at a point where the tube becomes a pouch-constituting egg chamber, typically about 20 cm from the bottom (Belton 1985; Giacomo et al. 2005). Constructed exclusively of hyphae from the genus *Marasmius*, the fibers are woven into a narrow tube that gradually widens into a pouch about 9 cm in diameter at the lower end. The sides of the pouch are tightly woven but thin enough so light can be seen through, revealing the content of the nest. At the bottom, however, the material is woven into a thick cushion approximately 15 mm thick. There is no nest lining (Belton 1985; Chatellenaz & Ferraro 2000; Giacomo et al. 2005). Nests have not been documented to be reused but have often been found after being blown out of trees during a storm (pers. obs.).

The study area was located at a site called “Estancia Santa Ana” east of the city of Pilar in Ñeembucú, Paraguay (latitude -26.844839; longitude -58.031180). This area of 7 km² includes a mosaic of habitats, including wetlands, grassland, and gallery forests. Previous *C. chrysopterus* nests have been located within these gallery forests (pers. obs.).

On the 7th of September 2021 at 10:05, a single *C. chacoensis* individual was discovered in an old *C. chrysopterus* nest (Fig. 1) that had fallen onto a *Plinia rivularis* tree, 101.6 cm above the ground. An additional hole, presumably made by an individual of *C. chacoensis*, was present on the lower side of the nest, apart from the original entrance hole located at the top of the nest. The *C. chacoensis* individual was visible inside the nest, resting on a large mass of leaves.

The opossum was an adult female and identified following the diagnostic characters described by Voss et al. (2005) (Fig. 2) and had the following measurements: total



length= 216 mm; tail length= 112 mm; hind foot length= 15 mm; ear length= 14 mm; and weight= 20 g. The nest chamber was stuffed with an unstructured mass of dried leaves of various plant species, with a total mass of 1.7 g. Some old egg fragments were also observed at the top of the leaf pile.

On the 15th of September 2021, at 10:40, a second fallen *C. chrysopterus* nest was discovered on a *Plinia rivularis* tree 109.7 cm off the ground, approximately 1,550 m from the first nest. This nest also had a new entrance hole located on the side, and contained a leaf mass. This nest also contained a similar undefined mixture of dried leaves with a total mass of 11.3 g. One intact cacique egg was also found at the base of the pile, in addition to some eggshell fragments.

On the 2nd of December 2021, at 8:45, a second *C. chacoensis* individual was discovered resting on a mass of leaves in another *C. chrysopterus* nest that had fallen onto a *Plinia rivularis* tree, 246.0 cm above the ground. This nest was approximately 1,680 m from the first nest and 132 m from the second. The opossum was identified as an adult male (Voss et al. 2005), and had the following measurements: total length= 221 mm; tail length= 124 mm; hind foot length= 11 mm; ear length= 11.5 mm; and weight= 29.3 g. This nest also had a new entrance hole located on the side. This nest also contained a similar undefined mixture of dried leaves with a total mass of 7.9 g. No cacique egg fragments were found. The measurements of the opossums found here fall within the average measurements for this species (Voss et al. 2005).

These new findings are the first evidence of the reuse of birds' nests for roosting by the Chacoan mouse opossum. This species has commonly been documented on the ground, suggesting a distinctive terrestrial presence (Voss et al. 2005; Smith et al. 2012; Owen et al. 2018). However, Massoia & Fornes (1972) discovered seven *C. chacoensis* individuals off the ground in a single nest constructed from an assemblage of *Erithrina cristagalli* and bromeliads. The nest was found 1.60 m above the ground on branches of *Erithrina cristagalli* and other species like *Salix* sp. The nests Massoia & Fornes (1972) mentioned seem to be woven for the purpose, whereas the preconstructed cacique nests appeared to be used opportunistically, and were slightly altered. We have documented this species at least 1 m off the ground, similar to the observations of Massoia & Fornes (1972), demonstrating it is capable of arboreal locomotion and willing to climb up to a certain height. This suggests they may seek potential refuge off the ground from possible predation. The only confirmed predator of the genus *Cryptonanus* is the barn owl *Tyto alba* (Scopoli, 1769), where unidentified members of the genus were found in the pellets of these owls (Teta & Contreras 2003). However, documented predators of the genus *Gracilinanus*, which has been commonly misidentified in previous references (Voss et al. 2005), include the ocelot *Leopardus pardalis* (Linnaeus, 1758) (Bianchi & Mendes 2007), the coati *Nasua nasua* (Linnaeus, 1766) (Ferreira et al. 2013), the white-tailed hawk *Geranoaetus albicaudatus* (Vieillot, 1816) (Granzinoli & Motta-Junior 2006), and the striped owl *Asio clamator* (Vieillot, 1807) (Motta-Junior et al. 2004). The contrasting reports suggest that further investigation is needed to understand the apparent variation in vertical occupancy patterns of *C. chacoensis*, and determine if the use of *C. chrysopterus* nests is a common occurrence.



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Figure 1. *Cryptonanus chacoensis* individual found in a *Cacicus chrysopterus* nest, observed on 07 September 2021.



Figure 2. *Cryptonanus chacoensis* individual (CZPLT).

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