

# Range extensions and breeding biology observations of the Sooty Swift (*Cypseloides fumigatus*) in the states of Bahia, Goiás, Minas Gerais and Tocantins

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**ABSTRACT:** Here we present the first records of the Sooty Swift (*Cypseloides fumigatus*) for three Brazilian states (Bahia, Goiás, and Tocantins), expanding the species' range into northeastern and central Brazil and the northern part of the Cerrado biome, in addition to three new records for the state of Minas Gerais. We also present data on the breeding biology of *C. fumigatus* in a Cerrado landscape in the municipality of Ponte Alta do Tocantins, state of Tocantins, where 13 active nests were located.

**KEY-WORDS:** Apodidae, Brazil, Cerrado, distribution, nesting.

## INTRODUCTION

Field identification of any of the 10 swifts in the genus *Cypseloides*, distributed from Canada to Argentina, is one of the most challenging tasks for field ornithologists, and knowledge of even basic facets of the life history of many species is scanty (Chantler & Driessens 2000). The current Brazilian checklist (CBRO 2011) includes four species of *Cypseloides*: *C. cryptus*, *C. lemosi*, *C. fumigatus* and *C. senex*, with a fifth - *C. niger* recently having been proven to occur in Brazil (Beason *et al.* 2012) but not yet officially accepted. The Sooty Swift (*Cypseloides fumigatus*) has a wide distribution throughout South America occurring from eastern Bolivia to Paraguay, Argentina and southern Brazil (Figure 1, Sick 1997, Chantler & Driessens 2000). In Brazil it has been recorded from southern Rio Grande do Sul to Espírito Santo, Minas Gerais and in the northeast of Ceará (Chantler & Driessens 2000, Vasconcelos *et al.* 2006, Stopiglia & Raposo 2007, Albano & Girão 2008).

Previously it was thought that Brazilian populations of *C. fumigatus* were confined to the Atlantic Forest until the publication of Vasconcelos *et al.* (2006) who reported the species from the Cerrado biome, in the municipalities of Conceição do Mato Dentro and Unaí, both in the state of Minas Gerais, for the first time. Subsequently, Albano

& Girão (2008) recorded the species from the Serra do Baturité, in northeast Ceará, from a lower mountain semideciduous forest, where the vegetation is more



**FIGURE 1:** Map adapted from Chantler & Driessens (2000) showing the known distribution of *C. fumigatus* in South America in light gray. Circles indicate previously documented records (Pichorim *et al.* 2001, Buzzetti 2002, Vasconcelos *et al.* 2006, Stopiglia & Raposo 2007, Albano & Girão 2008) and triangles indicate our new records in the states of Bahia, Goiás, Minas Gerais and Tocantins.

similar physiologically to the Atlantic rainforest than to the surrounding Caatinga (Tabarelli & Santos 2004).

In this study we report seven new sites for the species in the Cerrado biome, including the first records for the states of Bahia, Goiás and Tocantins (the northern Cerrado biome), in addition to presenting information on the species' breeding biology in Tocantins.

## METHODS

Our initial records of *C. fumigatus* were made opportunistically in the municipalities of Lençóis, state of Bahia (BA); Brumadinho, Nova Ponte and Uberlândia, state of Minas Gerais (MG); Rio Verde and Alto Paraíso de Goiás, state of Goiás (GO); and Ponte Alta do Tocantins, state of Tocantins (TO), followed by a more detailed study at the latter site. We collected data on the species' reproductive biology at the Sussuapara Canyon, municipality of Ponte Alta do Tocantins, TO (10°44'S; 47°29'W). This latter site is located next to the TO-255 highway and is approximately 60 m long, 15 m high and 2 m wide (NATURATINS 2003). A partially dammed stream bisects the road and forms a small waterfall in the canyon, which is surrounded by riparian forests with an abundance of bryophytes on the rock walls.

Three visits were made to Sussuapara Canyon, in February 2009, February 2010 and November 2010. The site was first visited on 9 February 2009 when voucher field-photographs were obtained. From 18 – 21 February 2010 we undertook six hours of observations per day, totalling 24 hours. Watches began at dawn (around 06h00) and continued throughout the day until there was insufficient light to continue (around 18h00). We used a ladder to access the nests and measurements were taken with tape measures. We made sound-recordings of this colony using a Sony ICD – P620 recorder and took digital photographs with a Canon Rebel XSi camera and Sigma 150-500 mm lens. On 13 and 14 November 2010 nests were observed for two hours per day with the same protocols. We archived our digital field photographs and sound-recordings on the Brazilian ornithological database Wikiaves <http://www.wikiaves.com.br>, these digital vouchers are searchable by the catalogue numbers listed in the text.

## RESULTS AND DISCUSSION

### New distributional data

#### Minas Gerais

On 6 January 2012, W. N. and C. de Lima recorded at least seven individuals foraging over an area of *campo limpo* near the Parque Estadual do Rola Moça, in the

district of Casa Branca, municipality of Brumadinho (20°05'S; 44°01'W). The birds were first located by their calls, which were recorded (Alves 2012). The landscape at this site includes rocky outcrops and is very close to a waterfall locally known as "Cachoeira da Ostra", which may prove to be a breeding site for this species.

#### Goiás

On 9 January 2010 a mixed group of three *C. fumigatus* individuals and *S. zonaris* was observed by D. P. and R. B., hawking over "cerradão" in the municipality of Rio Verde (18°22'S; 50°93'W). They were identified by their calls and voucher photographs were obtained and archived (e.g. Bessa 2010).

On 22 January 2012 A. C. L. and N. Moura photographed (e.g. Figure 2; Lees 2012a, b) a group of circa 25 *Cypseloides* swifts hawking high over humid Cerrado 10 km west of Alto Paraíso de Goiás (14°09'S; 47°35'W) and encountered a second group of 10 individuals 3 km west of the city the following day over open Cerrado (14°09'S; 47°32'W). Although no sound recordings were obtained these birds were assigned to *C. fumigatus* based on structure and their uniform black colouration, with no sign of the contrasting pale head typical of *C. senex*.

#### Tocantins

On 9 February 2009, R. N. B. discovered a colony of unknown *Cypseloides* swifts nesting at the Sussuapara Canyon, in the municipality of Ponte Alta do Tocantins, (10°44'S; 47°29'W), identification was later confirmed as *C. fumigatus* by W. N. on 22 January 2010 helped by M. Vasconcelos and based on the species characteristic observed in pictures, such as its sooty brown coloration, and lack of a pale contrasting forehead. Given a high degree of philopatry in *Cypseloides* swifts (Fichberg *et al.* 1996a, b, Pichorim *et al.* 2001, Vasconcelos *et al.* 2006,

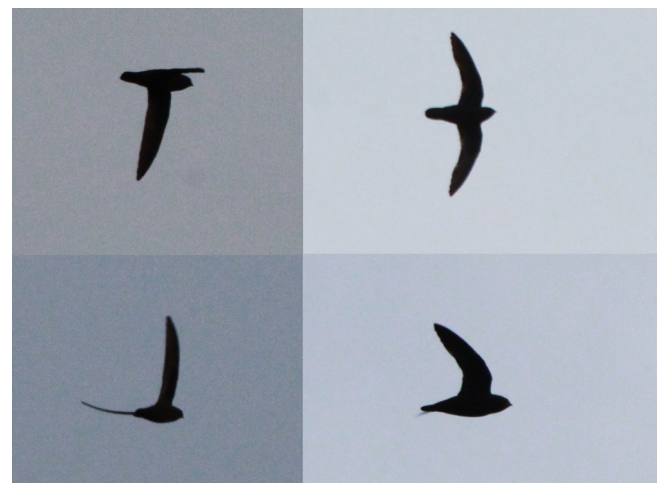


FIGURE 2: Composite image of *C. fumigatus* individuals observed in Alto Paraíso de Goiás, state of Goiás (photo: A. C. L.).

Stopiglia & Raposo 2007, Whittaker & Whittaker 2008), a second visit was made, on 18 to 21 February 2010, to gather information on the population's biology. During this visit photographs and voucher sound recordings were obtained (e.g. Biancalana 2010a, b, c, d, f).

### Additional undocumented Records

#### Bahia

On 12 October 2011 C. A. observed and heard the calls of a group of six *C. fumigatus* individuals and many *Streptoprocne biscutata* hawking over an area of humid forest in the Chapada Diamantina region, municipality of Lençóis (12°33'S; 41°21'W). Subsequently on 14 November 2011 C. A. observed and heard the calls of a small group of six *C. fumigatus* individuals foraging with *S. biscutata*.

#### Minas Gerais

On 6 October 2001, D. P., G. Malacco and A. G. Franchin observed a group of *C. fumigatus* and *Streptoprocne zonaris* foraging above the Cerrado reserve and *veredas* (*Mauritia flexuosa* palm swamps) of the Clube Caça e Pesca in the municipality of Uberlândia, MG (19°00'S; 48°31'W).

On 6 September 2009, D. P., G. Malacco, C. S. Fontana and M. Repenning observed a group of *C. fumigatus* and *Streptoprocne zonaris* adjacent next to the MG-190 road in the municipality of Nova Ponte, MG (19°22'S; 47°74'W). These sites include a mosaic of land-uses including extensive agriculture and cattle pasture interspersed with typical Cerrado vegetation including

cerrado *sensu stricto*, *veredas*, campos de murundus (earthmound fields) and gallery forests.

The identifications in both cases were helped by the fact that *C. fumigatus* was flying for a considerable amount of time next to *Streptoprocne zonaris*, allowing comparison of size, shapes (tail, wings, proportions) and color. All observers had extensive previous experience with *C. senex*.

### *C. fumigatus* breeding biology in Tocantins

From 18 to 21 February 2010 the colony was found to be very active and thirteen nests were discovered in rock crevices. Measurements taken from three of them are listed in Table 1. These three nests were the only accessible ones, ranging from 1,49 m to 2,18 m above the ground. The remaining nests were 3 to 5 meters up and could not be checked safely, even with the aid of a ladder. All 13 nests were cup-shaped and composed of soil, roots and pebbles. The nests were sheltered from direct water spray but all were damp. All checked nests were occupied, one had an egg and two had chicks (Figure 3). The placement of the nests beyond the reach of direct waterfall spray and containing just a single egg or chick agrees with previously published reports for *Cypseloides fumigatus* (e.g. Pichorim *et al.* 2001, Vasconcelos *et al.* 2006). Nest metrics and architecture were also very similar to previous studies, including those of other *Cypseloides* species (e.g. Pichorim *et al.* 2001, Vasconcelos *et al.* 2006, Whittaker & Whittaker 2008).

Scratch marks observed on the rocks adjacent to the nests indicated frequent use. Adults observed at rest exhibited the typical plumage characteristics of *C.*

**TABLE 1:** Nest metrics for three *C. fumigatus* nests in Ponte Alta do Tocantins, state of Tocantins and previously published metrics.

P = Pichorim *et al.* (2001), V = Vasconcelos *et al.* (2006), B = Biancalana *et al.* (this paper, 2012), H = height from the ground to the nest, BW = nest width measured at the base, TW = nest width measured at the top, NH = nest height measured on the exterior from bottom to top, ND = internal nest depth.

Nest Metrics	P (chick)	V (nest)	V (nest)	B 1 (adult and chick)	B 2 (adult and egg)	B 3 (chick)
H (m)	-	-	-	1,49	2,18	2
BW (cm)	-	-	-	11	10,6	9,1
TW (cm)	-	-	-	10,2	9,5	7,8
NH (cm)	3	3,54	8,1	7,3	4	5,3
ND (cm)	1,3	2,34	1,53	1,8	1,4	1,5

*fumigatus* notably the overall dark brown coloration with the mantle slightly darker than the head and the rump (Figures 4 and 5, Chantler & Driessens 2000, Stopiglia & Raposo 2007).

The chicks were covered in dark gray down with white edges to the feathers on the wing coverts and many feathers in pin on the chin, throat and forecrown, giving a white blaze effect (Figure 6). One of the focal chicks was left alone throughout the observation period and remained facing the inner part of the nest with its eyes closed, possibly in a state of torpor. One chick was accompanied by an adult and rested with its head under the adult's belly (Figure 5). The birds would orientate themselves to defecate over the rim of the nest, probably to avoid accumulation of faeces within the nest.

On 13 November 2010 at 16h50, 20 individuals were observed foraging in the air for 30 minutes and five adults were observed sitting on nests, presumably incubating. On 14 November at 09h00 a group of 8 *C. fumigatus* were

observed foraging with *Tachornis squamata* for one hour and at 17h40 *C. fumigatus* were observed foraging with *S. zonaris* until sunset. During this visit voucher sound recordings also were obtained (e.g. Biancalana 2010e).

## DISCUSSION

Our observations confirm the speculation of Vasconcelos *et al.* (2006) that *C. fumigatus* would later be found at other sites within the Cerrado biome. These new records in combination with older ones from the Serra da Canastra region (Silveira 1998, Buzzetti 2002) considerably expand the global range of *C. fumigatus* and indicate that recently discovered 'disjunct' populations in the Cerrado (e.g. Vasconcelos *et al.* 2006) may not in fact be isolated from Atlantic Forest populations and that the species may be sparsely distributed throughout the Cerrado biome. Even the supposedly disjunct populations



FIGURE 3: *Cypseloides fumigatus* nest with a single egg at Sussuapara Canyon (photo R. Biancalana).



FIGURE 4: Adult *Cypseloides fumigatus* in its nest, the same of the previous figure. The scratches on the rock and the accumulated feces suggest the frequent use of the site (photo R. Biancalana).



FIGURE 5: Adult *Cypseloides fumigatus* and offspring in the nest (photo R. Biancalana).



FIGURE 6: *Cypseloides fumigatus* offspring, note the feathers in pin (photo R. Biancalana).

in Bolivia (Chantler & Driessens 2000), may not in fact be that isolated given the record from Rio Verde, which suggest that there might be other reproductive sites somewhere in Mato Grosso and Mato Grosso do Sul. The new record for Bahia expands the species distribution in northeastern Brazil (Parrini *et al.* 1999).

The records from Ponte Alta do Tocantins, extend the species area of occurrence 615 km into the northern part of the Cerrado biome, although they do not represent the northernmost global reports since Albano & Girão (2008) observed *C. fumigatus* in the municipality of Pacoti, state of Ceará over 1,000 km NE of the Sussuapara canyon. Although Stopiglia & Raposo (2007) conducted some specific surveys in suitable sites in Mato Grosso do Sul, they did so in a season (July) that is outside of the known breeding season of this species in the Cerrado and Atlantic Forest. It is thought that *C. fumigatus* leaves the breeding colonies after the breeding season ends (around March) (Fichberg *et al.* 1996a, b, Pichorim *et al.* 2001, Vasconcelos *et al.* 2006, this paper), so we recommend that surveys of potential reproductive sites are conducted during this period. The non-breeding distribution of these northern populations is unknown but this species is occasionally reported from Amazônia, with published sight records by B. M. Whitney from the Serra dos Carajás 570 km NW of Ponte Alta do Tocantins (Pacheco *et al.* 2007).

### Reproductive Data

The reproductive period in Tocantins appears to be similar from that previously described in the south and southeast of Brazil. The current literature suggests that the reproductive period extends from September to March (Fichberg *et al.* 1996a, b, Vasconcelos *et al.* 2006). Herein we reported observations of nests with eggs and young chicks in February, indicating that reproductive activity in Tocantins must extend at least until March. These similarities may be driven by favourable climatic conditions related to the onset and extent of the rainy season. Any sightings of out-of-range *Cypseloides* swifts in Brazil should be as fully documented as possible, preferably by both photographs and sound-recordings. The collection of voucher specimens from disjunct swift populations should be also encouraged to allow for a phylogeographic study whereby the level of natal philopatry and genetic variation within the species is evaluated. Field ornithologists should be alert to the possible occurrence of *C. fumigatus* anywhere in Brazil south of the Amazon and colonies of the species should be sought after anywhere with waterfalls. Any new colonies should be monitored carefully to quantify temporal variation in the species' breeding season throughout the species' range.

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