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ARTIGO/ARTICLE

The avifauna of Brejinho das Ametistas, Bahia, Brazil: birds in a *caatinga-cerrado* transitional zone, with comments on taxonomy and biogeography

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ABSTRACT: Brejinho das Ametistas (14°15'46"S; 42°31'28"W) is situated in a transitional zone between the *caatinga* and the *cerrado*, in southern Bahia. Here, we present an avifaunal survey conducted between October 2007 and May 2011, totaling 467 h of sampling effort in different vegetation types of this area, which include *cerrado sensu stricto*, "campos rupestres", "carrascos", arboreal and shrubby *caatingas*, and gallery forests. We recorded 259 bird species in the region, of which two are threatened: *Penelope jacucaca* and *Phylloscartes roquettei*. We also provide comments on taxonomy and/or range extensions for some taxa, such as *Formicivora iheringi*, *Sclerurus scansor* aff. *cearensis*, *Lepidocolaptes squamatus*/*wagleri*, *Syndactyla dimidiata*, *Hylocryptus rectirostris* and *Cyanoloxia moesta*. In comparison to two other transitional areas of *caatinga-cerrado* along the Espinhaço Range - the northern Chapada Diamantina (Bahia) and the southern Central Espinhaço (Minas Gerais) - Brejinho das Ametistas shelters less Atlantic Forest birds, probably because the region presents lower elevations and is located in the rain shadow of the "Planalto de Conquista", in eastern Bahia. An analysis of patterns of distribution of endemic and typical birds of the *caatinga* and *cerrado* suggests a gradient in which endemic and typical *cerrado* bird species richness decrease from south to north, but this is not the case for *caatinga* birds, which present similar richness along this gradient.

KEY-WORDS: Bird survey; *caatinga*; *cerrado*; geographic distribution; taxonomy.

INTRODUCTION

The avifaunal composition of transitional zones between the *caatinga* and the *cerrado* morphoclimatic domains is very complex in eastern Brazil (Parrini *et al*. 1999, Vasconcelos & D'Angelo Neto 2007, Santos 2008, Lopes *et al*. 2010). Despite the fact that endemic and typical species of both regions can be found side-by-side in these areas, their distribution depends on the mountain slope, elevation, phytophysiognomies and specific microhabitats (Parrini *et al*. 1999, Carvalhaes 2001, Vasconcelos & D'Angelo Neto 2007, Santos 2008). Avifaunal inventories for ecotonal areas in the Espinhaço Range, an important area of bird endemism in Brazil (Vasconcelos 2008), are available for two sites: the Chapada Diamantina region, in central Bahia state (Parrini *et al*. 1999, Carvalhaes 2001, Carvalhaes & Machado 2008), and the central mountains of northern Minas Gerais state (Vasconcelos & D'Angelo Neto 2007). In both areas, endemic and/or typical birds of the *caatinga* and the *cerrado* have been recorded.

Brejinho das Ametistas is located in a transitional zone between the *caatinga* and the *cerrado* regions. Though the 19th century naturalists Johann Baptist von Spix and

Carl Friedrich Philipp von Martius crossed this region (Caetité) along their expedition through the Brazilian hinterlands, no avifaunal records were mentioned in their report (Spix & Martius 1981). Prince Maximilian of Wied-Neuwied did not sample this locality, but he crossed neighboring areas, in a region he named "Campos Geraës", on the boundaries of the states of Minas Gerais and Bahia, where he collected bird specimens, some of them considered types of several taxa (Wied 1831, 1940, Allen 1889). Besides Wied's records, the only available ornithological information for this area is the recent record of *Phylloscartes roquettei* (Albano 2009, Santos *et al*. 2009) and some bird records mentioned by Albano (2010).

Thus, the aim of this paper is to present an avifaunal inventory of Brejinho das Ametistas, an area located in southern Bahia state, between both sites previously sampled in the Espinhaço Range (Chapada Diamantina and Central Espinhaço). We also comment on the avifaunal biogeography based on endemic and/or typical species of both *caatinga* and *cerrado* regions, and discuss on distribution, taxonomy and natural history of some rare, little known and threatened bird species.

MATERIALS AND METHODS

Study Area

Brejinho das Ametistas (14°15'46"S; 42°31'28"W; elevation: 880 m a.s.l.) is located in Caetité municipality, c. 20 km south of the city of Caetité, in south-central Bahia state, northeastern Brazil (Figure 1). The area is situated on a plateau (750-1,100 m a.s.l.) that acts as a watershed between the hydrographic basins of Rio São Francisco

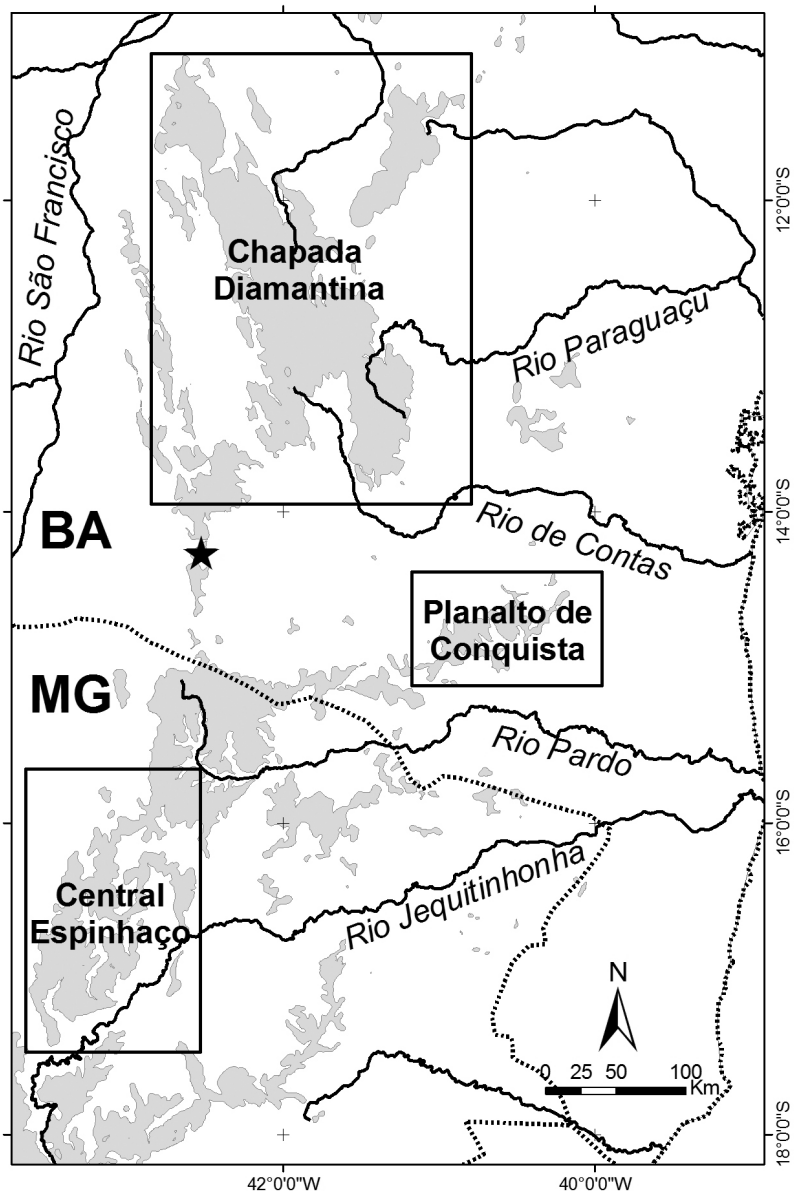

FIGURE 1. Map showing the sampled area around Brejinho das Ametistas (star) and other montane areas discussed in the text. Areas above 900 m are shaded. Brazilian states: BA = Bahia; MG = Minas Gerais.

(on the western slope) and Rio de Contas (on the eastern slope). Vegetation in this area is extremely complex, depending on soil, mountain slope and elevation. The higher and flatter areas of the plateau are mainly covered by typical phytophysiognomies of the *cerrado* domain, locally named "gerais" (Figure 2). These vegetation types are represented by savannas named "*cerrado sensu stricto*" (see Ribeiro & Walter 1998). Small areas of "campos rupestres" (see Vasconcelos 2011), growing on ironstone or quartzite outcrops, are also found in this area. Ecotones with the *caatinga* in these higher areas are represented by a dense and shrubby physiognomy (Figure 3), known as "carrasco" (see Prado 2003, Zappi 2008). This impenetrable vegetation shares the botanical taxa of the *cerrado* and the *caatinga* domains (Prado 2003, MFV *pers. obs.*). Arboreal and shrubby *caatingas* (see Andrade-Lima 1981, Fernandes 1995, Zappi 2008) are found mainly on mountain slopes (Figures 4 and 5). Both physiognomies are leafless during the dry season. Gallery forests (following Ribeiro & Walter 1998) are restricted to river drainages that flow to western and eastern slopes of the plateau. Some of these forests reach more than 20 m in height and represent the most humid habitat for birds in the study area (Figure 6). Small areas of aquatic habitats, such as man-made small dams ("açudes") and

FIGURE 2. Typical *cerrado* vegetation ("gerais") in the highest areas of the Caetité plateau. Photo by L. N. Souza.

FIGURE 3. Dense "carrasco" vegetation in the surroundings of Brejinho das Ametistas. Photo by L. N. Souza.

FIGURE 4. Arboreal *caatinga* vegetation in the study area. Photo by L. N. Souza.

FIGURE 5. Shrubby *caatinga* vegetation in the surroundings of Brejinho das Ametistas. Photo by L. N. Souza.

FIGURE 6. Interior of well-preserved gallery forest. Photo by L. N. Souza.

natural marshes also occur in the study area. Pastures and other areas subject to human use occur in the surrounding ranches and farms.

Sampling of Avifauna

Bird surveys were conducted on a radius of c. 15 km around Brejinho das Ametistas. Birds were observed and/or recognized by their vocalizations along transects and random walking across the different phytophysionogmies described above.

CD, LNS and MFV sampled the area on the following dates: between 22 and 27 October 2007, between 28 April and 6 May 2008, and between 20 and 26 August 2008. This totaled about 200 h of sampling effort. Whenever possible, vocalizations were tape-recorded by MFV with a Sony TCM-5000EV tape-recorder and a Sennheiser ME-66 microphone. Copies of these vocalizations were deposited in the Arquivo Sonoro Prof. Elias Coelho (ASEC), at the Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil. LNS took photographs with a Sony DSC-H7 camera. Specimens were collected with 10 mist nets and a blowpipe (operated by MFV) and they have been deposited in the Coleção Ornitológica do Departamento de Zoologia da Universidade Federal de Minas Gerais (DZUFMG), Belo Horizonte, Minas Gerais, Brazil.

JFP, RP and GAS conducted bird surveys around Brejinho das Ametistas between 16 and 17 October 2008 and between 31 January and 3 February 2009, totaling c. 40 h of sampling effort. GAS took photographs with a Sony Cyber-Shot H-50 camera. Vocalizations were recorded with a Panasonic RR-US450 recorder. Some of these tape-recordings have been deposited in Wiki Aves (2012).

CA surveyed the region between 11 and 17 October 2009, on 23 December 2009 and on 23 May 2011, with a total of 50 h of fieldwork. Birds were photographed with a Canon 40D camera with Canon 300 mm F2.8 lens. Vocalizations were recorded with Edirol R-09 recorder and a Sennheiser ME-66 microphone. Some photographs and tape-recordings have been archived on Wiki Aves (2012) and Xeno-Canto (2012).

CRMA sampled the area between 4 and 8 July 2008 and between 2 and 6 February 2009, with 10 days of fieldwork and 67 h of sampling effort. Vocalizations were recorded with a Marantz PMD660 recorder and a Sennheiser ME-66 microphone. Photographs were obtained with Panasonic DMC-FZ18 and DMC-FZ50 cameras. Specimens were collected with a shotgun (cal. 8 mm) and have been deposited in the Coleção do Setor de Ornitologia do Museu Nacional (MNRJ), Rio de Janeiro, Brazil.

SSS and FPFN conducted bird surveys in the region between 13 and 19 March 2010 and between 3 and 5 April 2011, totaling 110 h of sampling effort. Vocalizations were recorded with a Sony PCM-D50 recorder and a Sennheiser ME-67 microphone. Copies of these recordings have been archived on Wiki Aves (2012) and will be also deposited in the Fonoteca Neotropical Jacques Vielliard (FNJV), at the Universidade Estadual de Campinas, Campinas, Brazil. Photographs were obtained with digital cameras (Sony Alpha 100 with 18-80 mm and 70-300 mm lenses and Canon EOS 50D with 100-300 mm lens).

Taxonomy follows the Comitê Brasileiro de Registros Ornitológicos (2011). Classification of endemic and typical birds of the *caatinga* were based on Ridgely & Tudor (1989, 1994), Stotz *et al*. (1996), Sick (1997), Olmos *et al*. (2005), Vasconcelos & D'Angelo-Neto (2007) and Santos (2008). Endemic and typical bird species of the *cerrado* followed Silva (1995a, b) and Sick (1997), except those restricted to eastern Brazilian mountain tops (see Vasconcelos 2008). Atlantic Forest endemics were based on Brooks *et al*. (1999).

RESULTS AND DISCUSSION

Avifaunal Survey

We recorded a total of 259 bird species in the study area (Appendix), of which two are threatened (following Machado *et al.* 2005, BirdLife International 2012): *Penelope jacucaca* (vulnerable in the world and in Brazil) and *Phylloscartes roquettei* (globally endangered and critically endangered in Brazil). If the identity of *Sclerurus scansor cearensis*, which was recorded in the area (see below), were confirmed, this would be an additional threatened taxon in the region, also considered vulnerable in Brazil (Machado *et al.* 2005, Girão & Albano 2008).

A total of 90 (34.7%) species was restricted to a single habitat in the study area (Table 1). Thus, habitat heterogeneity is probably important to the overall species richness. *Cerrado* was the richest habitat, with 122 species recorded and with the highest percentage of exclusive species (8.1%). Gallery forests and *caatingas* (arboreal and shrubby) also presented high species richness. Nevertheless, gallery forests showed highest percentage of exclusive species (7.3%) in comparison to both types of *caatinga* (0.8% to 4.2%). Both types of "campos rupestres" and "carrasco" showed the lowest percentage of exclusive species because these habitats shelter several birds that also live in the *caatingas* and *cerrado*.

Species Accounts

Penelope jacucaca

This rare guan is threatened by deforestation and hunting pressure (Silveira 2008). Thus, it is important to

TABLE 1. Bird species richness in habitats of Brejinho das Ametistas, Caetité, Bahia, Brazil.
Habitats: (AA) anthropogenic/disturbed habitats; (AC) arboreal *caatinga*; (AE) aerial; (AQ) aquatic; (CE) *cerrado*; (CI) "campo rupestre" on ironstone outcrop; (CQ) "campo rupestre" on quartzite outcrop; (CR) "carrasco"; (GF) gallery forest; (PA) pasture; (SC) shrubby *caatinga*.

Habitats	Total species	Exclusive species	(%) Exclusive species
AA	56	5	1.9
AC	90	11	4.2
AE	20	9	3.5
AQ	33	19	7.3
CE	122	21	8.1
CI	25	0	0
CQ	24	1	0.4
CR	37	1	0.4
GF	95	19	7.3
PA	30	2	0.8
SC	89	2	0.8
Total	259	90	34.7

report new localities for the species, since new reserves can be created for its conservation. It was recorded only twice in the study region: on 22 October 2007, in the edge of a gallery forest and a "campo rupestre" (14º18'S; 42º31'W) and on 25 August 2008 in the border of a gallery forest close to a shrubby *caatinga* (14º07'S; 42º29'W). In both occasions, three individuals were observed by CD and LNS.

Claravis pretiosa

Seasonal movements of this species are poorly understood (Sick 1997, Magalhães 1999). In our study area, it was detected only during the samplings conducted between April and May 2008 and between January and February 2009, when it was relatively abundant in the gallery forests of the study area, where a native grass (Poaceae: *Lasiacis* sp.) was seeding. Several individuals were tape-recorded by MFV. On 2 May 2008, a female (DZUFMG 6088) was collected by MFV, CD and LNS in a gallery forest (14°20'S; 42°32'W). It had a developed ovary (13 x 7.3 mm) with a large ovum reaching 4.2 mm, which indicates it was in breeding condition. This specimen's crop contained 105 seeds (probably from the grass) and 46 snail shells (Mollusca: Gastropoda), reaching 2.5 mm long. Snails represent a rare dietary item among Brazilian Columbidae and they have been reported in the diet of *Columbina talpacoti*, *Zenaida auriculata* and *Leptotila rufaxilla* (Hempel 1949, Schubart *et al.* 1965, Cintra *et al.* 1990, Sick 1997). Nevertheless, the available information for *C. pretiosa* is that it feeds only on seeds (Moojen *et al.* 1941, Schubart *et al.* 1965, Goodwin 1983). Thus, this appears to be the first record of this species feeding on snail shells. The reason for the consumption of this item could be related to the breeding condition of this bird, as those shells are a likely source of calcium for eggshell production.

Formicivora iheringi

Records of this little known antwren are concentrated in the eastern Espinhaço Range, in areas drained by hydrographic basins of rivers that flow directly from this mountainous complex to the Atlantic Ocean ("bacias do leste"), such as the Rios Jequitinhonha, de Contas, Paraguaçu and Itapicuru (Hellmayr 1909, Sick & Teixeira 1979, Ridgely & Tudor 1994, Parrini *et al.* 1999, D'Angelo-Neto *et al.* 2001, Zimmer & Isler 2003, D'Angelo-Neto & Vasconcelos 2004). On 3 May 2008, a male (testes 0.7 x 0.5 mm) was collected by MFV, CD and LNS in a shrubby caatinga (14°18'S; 42°33'W). This specimen (DZUFMG 6120) is a subadult based on its skull ossification (20% pneumatized) and on the following plumage features: a narrow black area in the breast holding feathers with grayish tips, throat feathers margined with light gray (Figure 7A), and brownish distal webs of remiges (Figure 7B) - see D'Angelo-Neto *et al.* (2001) for discussion on plumage variation in this species. This specimen weighted 7.5 g and presents the following measurements (in mm): total length 124.0; wing 52.0; tail 52.1; culmen (total) 13.8; nares to bill tip 7.6; tarsus 16.8. These measurements are inside the range of those presented by D'Angelo-Neto *et al.* (2001), except for total length, which is slightly larger in this specimen. The present record represents a range extension for this species towards the interior of Bahia (see maps in Ridgely & Tudor 1994, Zimmer & Isler 2003, Infonatura 2007). It is also the first species' record for the Rio São Francisco

hydrographic basin, since it was recorded in a drainage that flows to the western slope of the plateau.

FIGURE 7. Subadult male of *Formicivora iheringi* (DZUFMG 6120) showing the narrow black area on the breast with feathers with grayish tips and throat feathers margined with light gray (A); and remiges with brownish distal webs (B). Photos by M. F. Vasconcelos.

Sclerurus scansor

On 2 May 2008, MFV, CD and LNS collected two females of this species in a gallery forest (14°20'S; 42°32'W). These specimens (DZUFMG 6089, 6090) were compared to those of *S. s. scansor* housed in DZUFMG. In overall aspect, their plumage is paler than the nominate form, with a brighter rufous breast (Figure 8). Their throat feathers also lack any grayish margin (Figure 8), which suggests that these specimens represent the subspecies *S. s. cearensis* (see Snethlage 1924, Remsen 2003, Grantsau 2010). A preliminary analysis also showed that these two specimens from Brejinho das Ametistas present measurements and body masses smaller than those of the nominate form from Minas Gerais, with no overlap (Table 2). Based on the original description of *S. s. cearensis* (Snethlage 1924), wing measurements of these specimens fall inside the range of this taxon (82-87 mm), but the tarsus and bill of *S. s. cearensis* (17 mm and between 20-21.5 mm, respectively) are shorter than those of the specimens from Brejinho das Ametistas (Table 2). Tape-recordings of the song of this taxon in the study area were obtained by CA on 23 December 2009 and they are very similar to those of *S. s. cearensis*. Thus, this appears to represent the southernmost record of *S. s. cearensis*, extending its known range c. 480 km to the southwest (see map in Girão & Albano 2008). Nevertheless, specimens from Brejinho das Ametistas were not directly compared to the type specimens of *S. s. cearensis* and it is still necessary to analyze more specimens and vocalizations to understand the patterns of geographical variation in *S. scansor*.

FIGURE 8. From left to right: two specimens of *Sclerurus scansor* aff. *cearensis* (DZUFMG 6089, 6090) from Brejinho das Ametistas, Bahia, and one of *S. s. scansor* (DZUFMG 6539) from Mariana, Minas Gerais. Photo by M. F. Vasconcelos.

Lepidocolaptes squamatus/wagleri

The expected taxon of the complex *L. squamatus/wagleri/falcinellus* occurring in the study area, on the right bank of Rio São Francisco, is *L. squamatus* (Silva & Straube 1996, Marantz *et al*. 2003). Nevertheless, Albano (2010) reported *L. wagleri* in Brejinho das Ametistas, a taxon known to be restricted to the opposite bank of the Rio São Francisco. The only available specimen of the complex *L. squamatus/wagleri/falcinellus* from the study area, a male (DZUFMG 6571), was obtained by MFV, CD and LNS in a gallery forest (14°20'S; 42°32'W) on 25 August 2008. In comparison to other specimens of the complex *L. squamatus/wagleri/falcinellus* housed in DZUFMG (n = 18) and based on descriptions of the three forms (Silva & Straube 1996, Marantz *et al*. 2003, Grantsau 2010), it presents intermediate plumage features between *L. squamatus* and *L. wagleri*. Its crown present brown feathers with small buff spots edged with black, typical of *L. squamatus*, instead of the weak shaft streaks found on the crown of *L. wagleri* (Figure 9A). The breast of this specimen is also similar to *L. squamatus*, with streaks presenting conspicuous dark borders, but its belly is typical of *L. wagleri*, with streaks holding inconspicuous dark borders (Figure 9B). Thus, probably the study area is a contact zone of both taxa. Silva & Straube (1996) mentioned that they found only an intermediate specimen (a male from Coribe, Bahia, c. 215 km northwest of Brejinho das Ametistas) between both taxa amidst a total of 86 specimens analyzed. In DZUFMG we also found another intermediate specimen: a male from Arinos, Minas Gerais, c. 430 km southwest of Brejinho das Amestistas, which presents all characters of *L. wagleri* (the expected taxon occurring in this area), but with the typical crown of *L. squamatus*. Thus, more studies involving plumage and genetic variation are still necessary to understand the patterns of hybridization between both taxa, sometimes considered subspecies (Marantz *et al*. 2003) or full species (CBRO 2011).

Syndactyla dimidiata

On 1 May 2008, two males - an adult (DZUFMG 6153) and an immature (DZUFMG 6152) - of this species were collected by MFV, CD and LNS in gallery forest (14°20'S; 42°32'W). The plumage of the immature is in accordance with that described by Vaurie (1980), with a whitish, spotted brown throat and a barred aspect in the breast and abdomen (Figure 10). Nevertheless, rectrices of DZUFMG 6152 (immature) are similar to those of DZUFMG 6153 (adult), but not acuminate and narrower, as described by Vaurie (1980) and Remsen (2003; Figure 10). Furthermore, immature's forecrown is slightly less rufescent than adult's one. This record extends the range of *S. dimidiata* c. 430 km eastwards (see maps in Ridgely & Tudor 1994, Remsen 2003, Infonatura 2007) and probably represents the first record for Bahia, since no evidence for its presence in this state has been found in the literature (Vaurie 1980, Sick 1997, Remsen 2003, Robbins & Zimmer 2005, Grantsau 2010). It is also one of the few species' records on the right bank of the Rio São Francisco; others were obtained in the Central Espinhaço Range (Vasconcelos *et al.* 2006, Vasconcelos & D'Angelo Neto 2007) and in the Serra da Canastra region (Silveira 1998), in Minas Gerais.

Hylocryptus rectirostris

On 3 February 2009, GAS, JFP and RP observed one individual of this species and tape-recorded its vocalizations in a gallery forest (14°17'S; 42°28'W). On 5 February 2009, CRMA tape-recorded the vocalizations of another individual in a dense "carrasco" (14°18'S; 42°28'W). CA also photographed and tape-recorded one individual in a gallery forest (14°18'S; 42°31'W) on 17 October 2009 (see photo in Albano 2010:61). These are the northernmost records of this species (see maps in Ridgely & Tudor 1994, Remsen 2003, Infonatura 2007). They also represent the species' rediscovery in Bahia state almost 200 years after Wied's collection at "Campos Geraës", on the boundaries of Bahia and Minas Gerais states (Wied 1831). Wied's record is based on a female specimen of *Opetiorynchus rectirostris* (basonym of *Hylocryptus rectirostris*), which is housed in the American Museum of Natural History (registration number AMNH 5223; Wied 1831, Allen 1889, LeCroy & Sloss 2000).

FIGURE 9. From left to right: specimen of *Lepidocolaptes wagleri* from Manga, Minas Gerais (DZUFMG 6010), with pale shafts on the crown; specimen of *L. squamatus*/*wagleri* from Brejinho das Ametistas (DZUFMG 6571) with crown pattern similar to another specimen of *L. squamatus* from Santa Teresa, Espírito Santo (DZUFMG 680) (A). Underparts of the same specimens showing the inconspicuous dark borders on the streaks of *L. wagleri* (left - DZUFMG 6010); mixed pattern with streaks holding dark borders on breast, but inconspicuous on belly (center - DZUFMG 6571), and entire underparts with streaks with conspicuous dark borders of *L. squamatus* (right - DZUFMG 680) (B). Photos by M. F. Vasconcelos.

Polystictus superciliaris* and *Embernagra longicauda

These two species are considered endemic to the eastern Brazilian mountaintops, living mainly in the "campos rupestres" and "campos de altitude" vegetation types, but also occurring marginally in high plateaus covered by "gerais" vegetation (D'Angelo-Neto & Queiroz 2001, Vasconcelos & D'Angelo-Neto 2007, Vasconcelos 2008). This is the case of our study area, where both species were recorded in those "gerais", usually with the presence of an "arnica" species (Asteraceae: *Lychnophora* sp.), and frequently on the plateau borders, where there are rocky outcrops.

Arremon franciscanus

This recently described species is known from a few localities in the southern *caatinga* and is represented by only eight male specimens deposited in three Brazilian collections (Raposo 1997, D'Angelo Neto & Vasconcelos 2003, Kirwan *et al.* 2004, Vasconcelos *et al.* 2006). We collected eight additional specimens in our study area, including the first female specimens (DZUFMG 6135, 6140, 6141, 6554), which will be described in a further contribution (Vasconcelos *et al.* in prep.).

FIGURE 10. From left to right: adult (DZUFMG 6153) and immature (DZUFMG 6152) of *Syndactyla dimidiata* from Brejinho das Ametistas. Photo by M. F. Vasconcelos.

TABLE 2. Morphometrics (mm) and body mass (g) of specimens of *Sclerurus scansor* aff. *cearensis* from Brejinho das Ametistas, Bahia, and specimens of nominate form from Minas Gerais, Brazil. Brazilian states: BA = Bahia; MG = Minas Gerais.

Specimen	Locality	Collectors	Subspecies	Sex	Nares to tip	Culmen (total)	Wing	Tarsus	Tail	Total length	Body mass
DZUFMG 6089	Brejinho das Ametistas, Caetité, BA	MFV, CD and LNS	aff. *cearensis*	Female	16.8	23.0	87.0	20.9	62.8	184.0	32
DZUFMG 6090	Brejinho das Ametistas, Caetité, BA	MFV, CD and LNS	aff. *cearensis*	Female	15.7	23.0	83.2	21.3	61.9	187.0	30
DZUFMG 3084	Mata do Cambraia, Perdões, MG	MFV	*scansor*	Male	17.1	24.8	89.0	23.3	66.4	208.0	-
DZUFMG 4146	Mata do Cambraia, Perdões, MG	MFV	*scansor*	Female	18.4	26.4	87.9	23.9	63.0	196.0	-
DZUFMG 4147	Mata do Cambraia, Perdões, MG	MFV	*scansor*	Male	17.2	24.5	93.1	23.8	66.8	192.0	-
DZUFMG 5617	Taperinha, Camanducaia, MG	MFV	*scansor*	Female	19.8	26.8	90.6	24.2	65.0	207.0	40
DZUFMG 6539	Vertente Sul da Serra do Caraça, Mariana, MG	MFV	*scansor*	Male	17.7	25.7	95.2	23.6	72.3	208.0	39
DZUFMG 888	Serra do Caraça, Santa Bárbara, MG	J. Jacintho	*scansor*	Male	17.1	24.5	90.0	23.4	68.6	-	-

Cyanoloxia moesta

On 23 May 2011, an adult male was observed in an arboreal *caatinga* (14º18'S; 42º32W), when attracted while CA imitated the song of *Glaucidium brasilianum*. The bird was photographed by Augusto Faustino during a birdwatching tour. This appears to be the first record of this species for Bahia state (see maps in Ridgely & Tudor 1989, Infonatura 2007). The present record also fills the gap between the southeastern Brazilian known species' range and sparse records in the states of Maranhão and Tocantins (Snethlage 1928, Pacheco *et al.* 2007). Together with the recently reported records for western Minas Gerais and Mato Grosso states (Lopes *et al*. 2011), this species has been shown to be widespread in Brazil.

Biogeography

Based on other avifaunal surveys conducted north (Chapada Diamantina, Bahia - Parrini *et al.* 1999, Carvalhaes 2001, Carvalhaes & Machado 2008, RP *pers. obs.*) and south (Central Espinhaço, Minas Gerais - Vasconcelos & D'Angelo-Neto 2007) of Brejinho das Ametistas, it is possible to discuss the biogeography of the regional avifauna.

When comparing the present bird checklist to the avifaunas of the northern Chapada Diamantina and the southern Central Espinhaço mountains, one would expect two gradients:

1) endemic and typical *caatinga* bird species richness would decrease from Chapada Diamantina (inside the *caatinga* region) towards Central Espinhaço (in the *cerrado- caatinga* boundaries).

2) endemic and typical *cerrado* bird species richness would decrease from Central Espinhaço towards the Chapada Diamantina.

Once Brejinho das Ametistas is located between these two areas, it should present intermediate conditions of endemic and typical bird species of both *caatinga* and *cerrado* along this north-south gradient. Nevertheless, bird species endemic or typical of the *caatinga* do not decrease expressively from north to south. For example, the three sites present almost the same species richness of *caatinga* birds (Table 3): Chapada Diamantina (25 species - 16 endemic and nine typical), Brejinho das

Ametistas (24 species - 16 endemic and eight typical) and Central Espinhaço (23 species - 15 endemic and eight typical). This suggests that, from an ornithogeographical point of view, the dry forests of northern Minas Gerais state could be considered true *caatingas*. Nevertheless, these areas are usually mapped in the *cerrado* biome (IBGE 2004). The only *caatinga* birds occurring in the Chapada Diamantina and Brejinho das Ametistas that do not reach Central Espinhaço are *Penelope jacucaca*, *Gyalophylax hellmayri* and *Cranioleuca semicinerea* (Table 3). *Hydropsalis vielliardi* and *Knipolegus franciscanus* were not recorded in these two northern sites (Table 3). *Hydropsalis hirundinacea* was recorded in the Chapada Diamantina and it has been observed south of Brejinho das Ametistas, in the municipalities of Jacaraci, southern Bahia, and Monte Azul, northern Minas Gerais (MFV *pers. obs.*), so it probably will be found in the study area.

On the other hand, *cerrado* bird species richness

TABLE 3. Endemic (EN) and typical (TY) birds of the *caatinga* recorded in three areas along the central-northern Espinhaço Range, eastern Brazil. Sources: Central Espinhaço, Minas Gerais (Vasconcelos & D'Angelo Neto 2007); Brejinho das Ametistas, Bahia (present study); Chapada Diamantina, Bahia (Parrini *et al.* 1999, Carvalhaes 2001, Carvalhaes & Machado 2008, RP *pers. obs.*).

Species	Central Espinhaço	Brejinho das Ametistas	Chapada Diamantina
Nothura boraquira[TY]	X	X	X
Penelope jacucaca[EN]		X	X
Columbina picui[TY, 1]	X	X	X
Aratinga cactorum[EN]	X	X	X
Hydropsalis vielliardi[EN]	X		
Hydropsalis hirundinacea[TY, 2]			X
Anopetia gounellei[EN]	X	X	X
Picumnus pygmaeus[EN]	X	X	X
Sakesphorus cristatus[EN]	X	X	X
Thamnophilus capistratus[EN]	X	X	X
Myrmorchilus strigilatus[TY, 3]	X	X	X
Herpsilochmus sellowi[EN]	X	X	X
Formicivora iheringi[TY]	X	X	X
Hylopezus ochroleucus[EN]	X	X	X
Gyalophylax hellmayri[EN]		X	X
Cranioleuca semicinerea[TY]		X	X
Pseudoseisura cristata[EN]	X	X	X
Megaxenops parnaguae[EN]	X	X	X
Knipolegus franciscanus[TY]	X		
Cyanocorax cyanopogon[TY]	X	X	X
Cantorchilus longirostris[TY, 4]	X	X	X
Compsothraupis loricata[TY]	X	X	X
Paroaria dominicana[EN]	X	X	X
Sporophila albogularis[EN]	X	X	X
Arremon franciscanus[EN]	X	X	X
Icterus jamacaii[EN]	X	X	X
Agelaioides fringillarius[EN]	X	X	X
Total endemic	**15**	**16**	**16**
Total typical	**8**	**8**	**9**
Total	**23**	**24**	**25**

[1] Subspecies *Columbina picui strepitans*.
[2] Subspecies *Hydropsalis hirundinacea hirundinacea* and *H. h. cearae*.
[3] Subspecies *Myrmorchilus strigilatus strigilatus*.
[4] Subspecies *Cantorchilus longirostris bahiae*.
If the above subspecies prove to be full species, then they would be considered endemic species of the *caatinga*.

showed the expected gradual decrease from south to north. Table 4 shows that Central Espinhaço presents a higher species richness (15 species - 10 endemic and five typical) than Brejinho das Ametistas (nine species - six endemic and three typical) and Chapada Diamantina (ten species - six endemic and four typical). It is noteworthy that two *cerrado* endemics that are restricted to gallery forests (*Syndactyla dimidiata* and *Hylocryptus rectirostris* - see Silva 1995b, Silva & Vielliard 2000), occur in the Central Espinhaço and Brejinho das Ametistas, but are absent from the Chapada Diamantina (Table 4).

Both Chapada Diamantina and Central Espinhaço present many species of the Atlantic Forest, while these species are almost absent in Brejinho das Ametistas. The only species related to the Atlantic Forest in this area are *Conopophaga lineata* and *Sclerurus scansor* (*sensu* Brooks *et al*. 1999). Despite the fact that Brejinho das Ametistas has a similar continentality to the Chapada Diamantina and to the Central Espinhaço mountains, these latter are significantly higher, surpassing 1,400 m in elevation above sea level and reaching more than 2,000 m in the Chapada Diamantina. Thus, these higher areas act as orographic barriers to the moisture that comes from the Atlantic Ocean, which favors the occurrence of humid forests (with many Atlantic Forest bird endemics) on their eastern slopes. Furthermore, Brejinho das Ametistas is located in the rain shadow of the eastern "Planalto de Conquista". This area, despite sharing a similar elevation with Brejinho das Ametistas (around 1,000 m), is located closer to the Atlantic Ocean and collects the majority of the oceanic moisture (Maia & Lage 2005, Souza *et al*. 2008). Thus, the *caatinga* is the predominant vegetation type that covers both slopes of Caetité plateau and the only Atlantic Forest birds that were able to reach this region made it through the humid gallery forests (see Silva 1996).

Finally, it is important to stress that our study site is considered a putative vicariant barrier for two montane bird taxa: the allospecies *Augastes scutatus*/*A. lumachella* and the tapaculos *Scytalopus diamantinensis*/*S. petrophilus* (Whitney *et al*. 2010). In the case of *Augastes* spp., the typical habitat of these hummingbirds ("campos rupestres") occupies a very small area on the Caetité plateau (where Brejinho das Ametistas is located) and is mainly covered by xerophytes of the *caatinga*. For the two possible sister-species of tapaculos, the study area probably acts as a barrier due to the absence of cloud forests and higher elevations with suitable micro-climates. Nevertheless, the area is not a barrier for two other montane taxa (*Polystictus superciliaris* and *Embernagra longicauda*), which occur in the "gerais" of this plateau, probably connecting populations of these species with records in the northern mountains of Minas Gerais (Vasconcelos & D'Angelo-Neto 2007, Vasconcelos 2008) and in the Chapada Diamantina region (Parrini *et al*. 1999, Carvalhaes & Machado 2008).

TABLE 4. Endemic (EN) and typical (TY) birds of the *cerrado* recorded in three areas along the central-northern Espinhaço Range, eastern Brazil. Sources: Central Espinhaço, Minas Gerais (Vasconcelos & D'Angelo Neto 2007); Brejinho das Ametistas, Bahia (present study); Chapada Diamantina, Bahia (Parrini *et al.* 1999, Carvalhaes 2001, Carvalhaes & Machado 2008, RP *pers. obs.*).

Species	Central Espinhaço	Brejinho das Ametistas	Chapada Diamantina
Heliactin bilophus[TY]	X	X	X
Melanopareia torquata[EN]	X	X	X
Veniliornis mixtus[TY]	X		
Geositta poeciloptera[EN]			X
Syndactyla dimidiata[EN]	X	X	
Hylocryptus rectirostris[EN]	X	X	
Euscarthmus rufomarginatus[TY]	X	X	X
Antilophia galeata[EN]	X	X	X
Cyanocorax cristatellus[EN]	X	X	X
Saltatricula atricollis[EN]	X	X	X
Neothraupis fasciata[TY]	X	X	X
Cypsnagra hirundinacea[TY]	X		X
Porphyrospiza caerulescens[EN]	X		X
Poospiza cinerea[EN]	X		
Charitospiza eucosma[EN]	X		
Basileuterus leucophrys[EN]	X		
Total endemic	**10**	**6**	**6**
Total typical	**5**	**3**	**4**
Total	**15**	**9**	**10**

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APPENDIX

Checklist of birds recorded at Brejinho das Ametistas, Caetité, Bahia, Brazil.
Evidence: (E1) specimen housed at DZUFMG; (E2) specimen housed at MNRJ; (F) photograph; (G) tape-recording; (O) observation; (V) vocalization.
Habitats: (AA) anthropogenic/disturbed habitats; (AC) arboreal *caatinga*; (AE) aerial; (AQ) aquatic; (CE) *cerrado*; (CI) "campo rupestre" on ironstone outcrop; (CQ) "campo rupestre" on quartzite outcrop; (CR) "carrasco"; (GF) gallery forest; (PA) pasture; (SC) shrubby *caatinga*.
Authors: (A) CD, MFV and LNS; (B) JFP, RP and GAS; (C) CRMA; (D) CA; (E) SSS and FPFN.

Taxon	English Name	Evidence	Habitats	Authors
Tinamiformes Huxley, 1872				
Tinamidae Gray, 1840				
Crypturellus noctivagus (Wied, 1820)	Yellow-legged Tinamou	G, O, V	AC, SC	B, C
Crypturellus parvirostris (Wagler, 1827)	Small-billed Tinamou	G, V	AC, CE, CQ, GF, SC	A, B, C, E
Crypturellus tataupa (Temminck, 1815)	Tataupa Tinamou	V	CE, GF	B, C, E
Rhynchotus rufescens (Temminck, 1815)	Red-winged Tinamou	O, V	CE, PA	B, C, D, E
Nothura boraquira (Spix, 1825)	White-bellied Nothura	V	CE, PA	A, B, E
Anseriformes Linnaeus, 1758				
Anatidae Leach, 1820				
Dendrocygna viduata (Linnaeus, 1766)	White-faced Whistling-Duck	O, V	AQ	B, E
Amazonetta brasiliensis (Gmelin, 1789)	Brazilian Teal	O	AQ	B, E
Nomonyx dominica (Linnaeus, 1766)	Masked Duck	O	AQ	B
Galliformes Linnaeus, 1758				
Cracidae Rafinesque, 1815				
Penelope jacucaca Spix, 1825	White-browed Guan	O	GF, SC	A
Podicipediformes Fürbringer, 1888				
Podicipedidae Bonaparte, 1831				
Tachybaptus dominicus (Linnaeus, 1766)	Least Grebe	O	AQ	B, E
Podilymbus podiceps (Linnaeus, 1758)	Pied-billed Grebe	O	AQ	B
Suliformes Sharpe, 1891				
Phalacrocoracidae Reichenbach, 1849				
Phalacrocorax brasilianus (Gmelin, 1789)	Neotropic Cormorant	O	AQ	B
Pelecaniformes Sharpe, 1891				
Ardeidae Leach, 1820				
Butorides striata (Linnaeus, 1758)	Striated Heron	O	AQ	A, B, E
Bubulcus ibis (Linnaeus, 1758)	Cattle Egret	F, O	AA	A, B, C, E

Taxon	English Name	Evidence	Habitats	Authors
Ardea alba Linnaeus, 1758	Great Egret	O	AE, AQ	B, C, E
Egretta thula (Molina, 1782)	Snowy Egret	O	AQ	B, E
Cathartiformes Seebohm, 1890				
Cathartidae Lafresnaye, 1839				
Cathartes aura (Linnaeus, 1758)	Turkey Vulture	F, O	AE	A, B, C, D, E
Cathartes burrovianus Cassin, 1845	Lesser Yellow-headed Vulture	O	AE	A, B, C, D, E
Coragyps atratus (Bechstein, 1793)	Black Vulture	O	AE	A, B, C, D, E
Sarcoramphus papa (Linnaeus, 1758)	King Vulture	V	AE	A
Accipitriformes Bonaparte, 1831				
Accipitridae Vigors, 1824				
Leptodon cayanensis (Latham, 1790)	Gray-headed Kite	O	GF	A, D
Accipiter bicolor (Vieillot, 1817)	Bicolored Hawk	F, G, O, V	AC	C, D
Geranospiza caerulescens (Vieillot, 1817)	Crane Hawk	O	GF	A
Heterospizias meridionalis (Latham, 1790)	Savanna Hawk	O	CE	B
Rupornis magnirostris (Gmelin, 1788)	Roadside Hawk	F, O, V	AA, AC, AE, CE, GF, PA, SC	A, B, C, D, E
Parabuteo unicinctus (Temminck, 1824)	Harris's Hawk	O	SC	E
Geranoaetus albicaudatus (Vieillot, 1816)	White-tailed Hawk	F, O	AE	A, B
Buteo brachyurus Vieillot, 1816	Short-tailed Hawk	F, O	AE	C, D, E
Buteo albonotatus Kaup, 1847	Zone-tailed Hawk	O	AE	A
Falconiformes Bonaparte, 1831				
Falconidae Leach, 1820				
Caracara plancus (Miller, 1777)	Southern Caracara	F, O	AC, AE, AQ, CE, SC	A, B, C, E
Milvago chimachima (Vieillot, 1816)	Yellow-headed Caracara	F, O, V	AA, AE, CE, SC	A, B, C, D, E
Herpetotheres cachinnans (Linnaeus, 1758)	Laughing Falcon	O, V	AC, CE	B, C, E
Micrastur semitorquatus (Vieillot, 1817)	Collared Forest-Falcon	V	CE	B
Falco sparverius Linnaeus, 1758	American Kestrel	O	AA, CE	B, E
Falco femoralis Temminck, 1822	Aplomado Falcon	O	AA, CE	B, C, D, E
Gruiformes Bonaparte, 1854				
Rallidae Rafinesque, 1815				
Aramides cajanea (Statius Muller, 1776)	Gray-necked Wood-Rail	V	AQ	B
Porzana albicollis (Vieillot, 1819)	Ash-throated Crake	V	AQ	E
Gallinula galeata (Lichtenstein,1818)	Common Gallinule	O, V	AQ	B
Porphyrio martinica (Linnaeus, 1766)	Purple Gallinule	O	AQ	B, E

Taxon	English Name	Evidence	Habitats	Authors
Cariamiformes Furbringer, 1888				
Cariamidae Bonaparte, 1850				
Cariama cristata (Linnaeus, 1766)	Red-legged Seriema	O, V	AA, AC, CE, SC	A, B, C, E
Charadriiformes Huxley, 1867				
Charadriidae Leach, 1820				
Vanellus chilensis (Molina, 1782)	Southern Lapwing	O, V	AA, AQ	B, E
Recurvirostridae Bonaparte, 1831				
Himantopus mexicanus (Statius Muller, 1776)	Black-necked Stilt	F, O	AQ	E
Scolopacidae Rafinesque, 1815				
Tringa solitaria Wilson, 1813	Solitary Sandpiper	O	AQ	B
Jacanidae Chenu & Des Murs, 1854				
Jacana jacana (Linnaeus, 1766)	Wattled Jacana	O, V	AQ	B, E
Columbiformes Latham, 1790				
Columbidae Leach, 1820				
Columbina minuta (Linnaeus, 1766)	Plain-breasted Ground-Dove	O, V	CE, GF	B
Columbina talpacoti (Temminck, 1811)	Ruddy Ground-Dove	O, V	AA, AC, CI, SC	A, B, C, E
Columbina squammata (Lesson, 1831)	Scaled Dove	F, G, O, V	AA, AC, AQ, CE, CI, PA	A, B, C, E
Columbina picui (Temminck, 1813)	Picui Ground-Dove	F, G, O, V	AA, CE, PA	A, B, C, E
Claravis pretiosa (Ferrari-Perez, 1886)	Blue Ground-Dove	E1, G, O, V	GF	A, B
Columba livia Gmelin, 1789	Rock Dove	O	AA	B
Patagioenas picazuro (Temminck, 1813)	Picazuro Pigeon	O, V	AA, CE, SC	A, B, D, E
Patagioenas cayennensis (Bonnaterre, 1792)	Pale-vented Pigeon	O, V	CE, GF	B
Zenaida auriculata (Des Murs, 1847)	Eared Dove	E1, O	AA, CE, CI, CQ, CR, GF, SC	A, B, C, D, E
Leptotila verreauxi Bonaparte, 1855	White-tipped Dove	E1, G, O, V	AC, CE, GF, SC	A, B, C, D
Leptotila rufaxilla (Richard & Bernard, 1792)	Gray-fronted Dove	V	AC, GF	A, C, E
Psittaciformes Wagler, 1830				
Psittacidae Rafinesque, 1815				
Primolius maracana (Vieillot, 1816)	Blue-winged Macaw	O, V	AE, CE, GF, SC	A, B, C, D, E
Diopsittaca nobilis (Linnaeus, 1758)	Red-shouldered Macaw	O	CE, SC	A
Aratinga aurea (Gmelin, 1788)	Peach-fronted Parakeet	O, V	AE	A
Aratinga cactorum (Kuhl, 1820)	Cactus Parakeet	F, G, O, V	AA, AC, CE, CI, CQ, CR, PA, SC	A, B, C, D, E
Forpus xanthopterygius (Spix, 1824)	Blue-winged Parrotlet	F, O, V	AA, AE, AQ, CE, SC	A, B, C, D, E
Brotogeris chiriri (Vieillot, 1818)	Yellow-chevroned Parakeet	O, V	AC	D
Pionus maximiliani (Kuhl, 1820)	Scaly-headed Parrot	G, O, V	AE, CE, SC	A, B, C, D, E

Taxon	English Name	Evidence	Habitats	Authors
Cuculiformes Wagler, 1830				
Cuculidae Leach, 1820				
Piaya cayana (Linnaeus, 1766)	Squirrel Cuckoo	F, O, V	AC, CE, GF	A, B, C, D, E
Coccyzus melacoryphus Vieillot, 1817	Dark-billed Cuckoo	O, V	AC, CE, GF	B, E
Crotophaga ani Linnaeus, 1758	Smooth-billed Ani	O, V	AA, CE	A, B, E
Guira guira (Gmelin, 1788)	Guira Cuckoo	O, V	AA, CE, PA	A, B, C, E
Tapera naevia (Linnaeus, 1766)	Striped Cuckoo	O, V	CE, SC	A, B, C, D, E
Strigiformes Wagler, 1830				
Tytonidae Mathews, 1912				
Tyto alba (Scopoli, 1769)	Barn Owl	O	AA, CI	A, E
Strigidae Leach, 1820				
Megascops choliba (Vieillot, 1817)	Tropical Screech-Owl	O, V	AC, CE, GF	B, C, D, E
Glaucidium brasilianum (Gmelin, 1788)	Ferruginous Pygmy-Owl	O, V	AC, CE	B, C, E
Athene cunicularia (Molina, 1782)	Burrowing Owl	F, O, V	AA, CE, PA	A, B, C, E
Caprimulgiformes Ridgway, 1881				
Nyctibiidae Chenu & Des Murs, 1851				
Nyctibius griseus (Gmelin, 1789)	Common Potoo	V	CE	B
Caprimulgidae Vigors, 1825				
Lurocalis semitorquatus (Gmelin, 1789)	Short-tailed Nighthawk	O, V	CE, GF	B
Hydropsalis albicollis (Gmelin, 1789)	Pauraque	O, V	AA, GF, SC	A, B, D, E
Hydropsalis parvula (Gould, 1837)	Little Nightjar	V	CE	B
Hydropsalis torquata (Gmelin, 1789)	Scissor-tailed Nightjar	E1, F	CI, CR	A, D
Chordeiles pusillus Gould, 1861	Least Nighthawk	O, V	AC	D
Apodiformes Peters, 1940				
Apodidae Olphe-Galliard, 1887				
Streptoprocne biscutata (Sclater, 1866)	Biscutate Swift	O	AE	B
Trochilidae Vigors, 1825				
Anopetia gounellei (Boucard, 1891)	Broad-tipped Hermit	E1, F, O	CR, SC	A, B, D, E
Phaethornis pretrei (Lesson & Delattre, 1839)	Planalto Hermit	E1, O, V	AA, CE, CI, CQ, GF, SC	A, B, C, D, E
Eupetomena macroura (Gmelin, 1788)	Swallow-tailed Hummingbird	O, V	AA, AC, CE, CI	A, B, C, D, E
Colibri serrirostris (Vieillot, 1816)	White-vented Violet-ear	G, V	CI, CQ, CR	A, B, D
Chrysolampis mosquitus (Linnaeus, 1758)	Ruby-topaz Hummingbird	E1, O	CE, PA	B, C
Chlorostilbon lucidus (Shaw, 1812)	Glittering-bellied Emerald	E1, F, O, V	CE, CI, CQ, CR, GF, PA, SC	A, B, C, D, E
Thalurania furcata (Gmelin, 1788)	Fork-tailed Woodnymph	E1, O	AA, CE, GF, SC	A, B, D
Polytmus guainumbi (Pallas, 1764)	White-tailed Goldenthroat	O	CR	A

Taxon	English Name	Evidence	Habitats	Authors
Amazilia versicolor (Vieillot, 1818)	Versicolored Emerald	E1, E2, V, O	AC, CE, CQ, GF	A, C
Amazilia fimbriata (Gmelin, 1788)	Glittering-throated Emerald	E1, E2, G, O, V	CE, CQ, GF, SC	A, B, C, D, E
Heliactin bilophus (Temminck, 1820)	Horned Sungem	F, O	CE, CQ	A, B, C, D, E
Heliomaster squamosus (Temminck, 1823)	Stripe-breasted Starthroat	F, O	CE, CQ	A, B, C
Calliphlox amethystina (Boddaert, 1783)	Amethyst Woodstar	O	SC	A
Galbuliformes Fürbringer, 1888				
Galbulidae Vigors, 1825				
Galbula ruficauda Cuvier, 1816	Rufous-tailed Jacamar	F, G, O	AC, GF	A, B, D, E
Bucconidae Horsfield, 1821				
Nystalus chacuru (Vieillot, 1816)	White-eared Puffbird	O, V	CE	D
Nystalus maculatus (Gmelin, 1788)	Spot-backed Puffbird	F, O, V	AC	B, C, D, E
Piciformes Meyer & Wolf, 1810				
Picidae Leach, 1820				
Picumnus pygmaeus (Lichtenstein, 1823)	Spotted Piculet	E2, O, V	AC, CE, SC	A, B, C, D, E
Melanerpes candidus (Otto, 1796)	White Woodpecker	O, V	AC, SC	E
Veniliornis passerinus (Linnaeus, 1766)	Little Woodpecker	F, O, V	AC, CE, GF, SC	A, B, C, D, E
Piculus chrysochloros (Vieillot, 1818)	Golden-green Woodpecker	O	AC, SC	A, B, D
Colaptes melanochloros (Gmelin, 1788)	Green-barred Woodpecker	O, V	AA, CE, GF, PA	A, B, C, D, E
Colaptes campestris (Vieillot, 1818)	Campo Flicker	O, V	CE	B
Celeus flavescens (Gmelin, 1788)	Blond-crested Woodpecker	O, V	AC, CE, SC	A, B, C, D, E
Dryocopus lineatus (Linnaeus, 1766)	Lineated Woodpecker	F, O	AC, CE, PA	C, D, E
Campephilus melanoleucos (Gmelin, 1788)	Crimson-crested Woodpecker	O, V	GF, AC, SC	A, B, D
Passeriformes Linnaeus, 1758				
Melanopareiidae Irestedt, Fjeldså, Johansson & Ericson, 2002				
Melanopareia torquata (Wied, 1831)	Collared Crescentchest	O, V	CE	A, B, D, E
Thamnophilidae Swainson, 1824				
Taraba major (Vieillot, 1816)	Great Antshrike	F, O, V	AC	B, C, D, E
Sakesphorus cristatus (Wied, 1831)	Silvery-cheeked Antshrike	E1, F, G, O, V	AC, CR, SC	A, B, C, D, E
Thamnophilus capistratus Lesson, 1840	Caatinga Antshrike	E1, F, O, V	AC, CE, SC	A, B, C, D, E
Thamnophilus torquatus Swainson, 1825	Rufous-winged Antshrike	E1, G, O, V	CE	B, C, D, E
Thamnophilus pelzelni Hellmayr, 1924	Planalto Slaty-Antshrike	E1, E2, F, G, O, V	AC, CR, GF, SC	A, B, C, D, E
Myrmorchilus strigilatus (Wied, 1831)	Stripe-backed Antbird	E1, G, O, V	AC, CR, SC	A, B, C, D, E
Herpsilochmus sellowi Whitney & Pacheco, 2000	Caatinga Antwren	E1, F, G, O, V	AC, CR, SC	A, B, D, E
Herpsilochmus atricapillus Pelzeln, 1868	Black-capped Antwren	E2, F, G, O, V	AC, GF, SC	A, B, C, D, E

Taxon	English Name	Evidence	Habitats	Authors
Formicivora iheringi Hellmayr, 1909	Narrow-billed Antwren	E1, G, O, V	GF, SC	A, D
Formicivora melanogaster Pelzeln, 1868	Black-bellied Antwren	E1, E2, F, G, O, V	AC, CR, SC	A, B, C, D, E
Formicivora rufa (Wied, 1831)	Rusty-backed Antwren	G, O, V	CE	A, B, D, E
Conopophagidae Sclater & Salvin, 1873				
Conopophaga lineata (Wied, 1831)	Rufous Gnateater	E1, O, V	GF	A, D
Grallariidae Sclater & Salvin, 1873				
Hylopezus ochroleucus (Wied, 1831)	White-browed Antpitta	E1, G, O, V	AC, CR, SC	A, B, C, D
Scleruridae Swainson, 1827				
Sclerurus scansor (Ménétriès, 1835)	Rufous-breasted Leaftosser	E1, G, O, V	GF	A, D
Dendrocolaptidae Gray, 1840				
Sittasomus griseicapillus (Vieillot, 1818)	Olivaceous Woodcreeper	E1, E2, V, O	GF, AC, SC	A, B, C, D
Xiphocolaptes albicollis (Vieillot, 1818)	White-throated Woodcreeper	O, V	AC	D
Dendroplex picus (Gmelin, 1788)	Straight-billed Woodcreeper	V	CE	B
Lepidocolaptes angustirostris (Vieillot, 1818)	Narrow-billed Woodcreeper	E1, F, G, O, V	AC, CE, SC	A, B, C, D, E
Lepidocolaptes squamatus (Lichtenstein, 1822)	Scaled Woodcreeper	E1, O	GF, AC, SC	A, D
Campylorhamphus trochilirostris (Lichtenstein, 1820)	Red-billed Scythebill	G, O, V	AC	A, B, D
Furnariidae Gray, 1840				
Furnarius figulus (Lichtenstein, 1823)	Wing-banded Hornero	O, V	AA	A, B, E
Furnarius leucopus Swainson, 1838	Pale-legged Hornero	F, O, V	AA, AC, AQ, CE	A, B, C, E
Furnarius rufus (Gmelin, 1788)	Rufous Hornero	O, V	AA, AC, CE, PA	A, B, C, E
Synallaxis frontalis Pelzeln, 1859	Sooty-fronted Spinetail	E2, G, O, V	AC, CR, GF, SC	A, B, C, D, E
Synallaxis albescens Temminck, 1823	Pale-breasted Spinetail	F, O, V	CE	A, B, E
Synallaxis hypospodia Sclater, 1874	Cinereous-breasted Spinetail	V	CE	C
Synallaxis scutata Sclater, 1859	Ochre-cheeked Spinetail	E1, F, G, O, V	GF, AC, SC	A, B, C, D
Gyalophylax hellmayri (Reiser, 1905)	Red-shouldered Spinetail	E1, E2, G, O, V	AC, CR, SC	A, B, C, D, E
Cranioleuca semicinerea (Reichenbach, 1853)	Gray-headed Spinetail	F, G, O, V	GF	A, B, C, D
Certhiaxis cinnamomeus (Gmelin, 1788)	Yellow-chinned Spinetail	O, V	AQ	B, E
Phacellodomus rufifrons (Wied, 1821)	Rufous-fronted Thornbird	O, V	AA, CE, CQ	A, B, C, D, E
Pseudoseisura cristata (Spix, 1824)	Caatinga Cacholote	F, G, O, V	AA, CE, PA	B, C, E
Syndactyla dimidiata (Pelzeln, 1859)	Russet-mantled Foliage-gleaner	E1, G, O, V	GF	A
Hylocryptus rectirostris (Wied, 1831)	Chestnut-capped Foliage-gleaner	F, G, O, V	CR, GF	B, C, D
Xenops rutilans Temminck, 1821	Streaked Xenops	O, V	GF	A
Megaxenops parnaguae Reiser, 1905	Great Xenops	E1, G, O, V	AC, CR, SC	A, B, C, D

Taxon	English Name	Evidence	Habitats	Authors
Rhynchocyclidae Tello, Moyle, Marchese & Cracraft 2009				
Tolmomyias sulphurescens (Spix, 1825)	Yellow-olive Flycatcher	E1, E2, G, O, V	AC, GF	A, B, C, D
Tolmomyias flaviventris (Wied, 1831)	Yellow-breasted Flycatcher	E2, G, O, V	AC, CR, GF, SC	A, B, C, D, E
Poecilotriccus plumbeiceps (Lafresnaye, 1846)	Ochre-faced Tody-Flycatcher	G, O, V	GF	A, B, C, D
Todirostrum cinereum (Linnaeus, 1766)	Common Tody-Flycatcher	G, O, V	AA, AC, CE, GF, SC, PA	A, B, C, D, E
Hemitriccus nidipendulus (Wied, 1831)	Hangnest Tody-Tyrant	E2, O, V	GF	A, B, C, D
Hemitriccus margaritaceiventer (d'Orbigny & Lafresnaye, 1837)	Pearly-vented Tody-tyrant	E1, E2, G, O, V	AC, CE, CI, CR, GF, SC	A, B, C, D, E
Leptopogon amaurocephalus Tschudi, 1846	Sepia-capped Flycatcher	O, V	AC	B, D
Phylloscartes roquettei Snethlage, 1928	Minas Gerais Tyrannulet	F, O, V	AC, GF	B, D
Tyrannidae Vigors, 1825				
Phyllomyias fasciatus (Thunberg, 1822)	Planalto Tyrannulet	E1, F, O, V	CE, GF, SC	A, B, C, D, E
Myiopagis caniceps (Swainson, 1835)	Gray Elaenia	G, O, V	AC, GF	A, B, C, D
Myiopagis viridicata (Vieillot, 1817)	Greenish Elaenia	G, O, V	AC	B, C, D, E
Elaenia flavogaster (Thunberg, 1822)	Yellow-bellied Elaenia	E1, O, V	CE, CI, SC	A, B, E
Elaenia cristata Pelzeln, 1868	Plain-crested Elaenia	E1, F, G, O, V	CE, CI, CQ, CR, SC	A, B, D, E
Elaenia chiriquensis Lawrence, 1865	Lesser Elaenia	O, V	CI, CQ, CR	A, B, E
Elaenia obscura (d'Orbigny & Lafresnaye, 1837)	Highland Elaenia	F, O, V	CE, GF	B, D
Elaenia spectabilis Pelzeln, 1868	Large Elaenia	E1, V	CE, CR, SC	B, E
Camptostoma obsoletum (Temminck, 1824)	Southern Beardless-Tyrannulet	F, G, O, V	CE, CI, CQ, GF, SC	A, B, C, D, E
Suiriri suiriri (Vieillot, 1818)	Suiriri Flycatcher	O, V	CE	B
Serpophaga subcristata (Vieillot, 1817)	White-crested Tyrannulet	F, O, V	CE, SC	A, B, D, E
Phaeomyias murina (Spix, 1825)	Mouse-colored Tyrannulet	E1, F, G, O, V	AC, CE, SC	A, B, C, D, E
Capsiempis flaveola (Lichtenstein, 1823)	Yellow Tyrannulet	O, V	GF	B
Polystictus superciliaris (Wied, 1831)	Gray-backed Tachuri	O, V	CE, CQ	B
Euscarthmus meloryphus Wied, 1831	Tawny-crowned Pygmy-Tyrant	E2, G, O, V	CR, SC	A, B, C, D, E
Euscarthmus rufomarginatus (Pelzeln, 1868)	Rufous-sided Pygmy-Tyrant	O, V	CE	A, D, E
Stigmatura napensis Chapman, 1926	Lesser Wagtail-Tyrant	F, G, O, V	AQ, CE, GF	B, C, D, E
Sublegatus modestus (Wied, 1831)	Southern Scrub-Flycatcher	O	CE, GF	A, B
Platyrinchus mystaceus Vieillot, 1818	White-throated Spadebill	O, V	GF	A
Myiophobus fasciatus (Statius Muller, 1776)	Bran-colored Flycatcher	G, V	CE, CR, SC	A, B, D, E
Hirundinea ferruginea (Gmelin, 1788)	Cliff Flycatcher	F, O, V	AA, CI	A, B, D
Lathrotriccus euleri (Cabanis, 1868)	Euler's Flycatcher	E1, F, O, V	AC, GF	A, B, D
Cnemotriccus fuscatus (Wied, 1831)	Fuscous Flycatcher	G, O, V	AC, CR, SC	A, B, C, D
Contopus cinereus (Spix, 1825)	Tropical Peewee	F, G, O, V	GF	A

Taxon	English Name	Evidence	Habitats	Authors
Satrapa icterophrys (Vieillot, 1818)	Yellow-browed Tyrant	O	CE	B
Xolmis irupero (Vieillot, 1823)	White Monjita	F, O	PA	B, C
Fluvicola nengeta (Linnaeus, 1766)	Masked Water-Tyrant	O, V	AA, AQ	A, B, E
Arundinicola leucocephala (Linnaeus, 1764)	White-headed Marsh-Tyrant	O	AQ	B
Colonia colonus (Vieillot, 1818)	Long-tailed Tyrant	F, O, V	AA, AC, CE, GF	A, B, C, D, E
Machetornis rixosa (Vieillot, 1819)	Cattle Tyrant	O, V	AA, PA	A, B, E
Legatus leucophaius (Vieillot, 1818)	Piratic Flycatcher	O, V	AC, GF	A, E
Myiozetetes cayanensis (Linnaeus, 1766)	Rusty-margined Flycatcher	V	AQ	A
Myiozetetes similis (Spix, 1825)	Social Flycatcher	F, G, O, V	AA, AQ, CE, GF	A, B, C, D, E
Pitangus sulphuratus (Linnaeus, 1766)	Great Kiskadee	O, V	AA, AQ, GF	A, B, C, D, E
Myiodynastes maculatus (Statius Muller, 1776)	Streaked Flycatcher	F, O, V	AC, GF	A, B, C, D, E
Megarynchus pitangua (Linnaeus, 1766)	Boat-billed Flycatcher	O, V	AC, AQ, CE, GF, SC	A, B, C, D, E
Empidonomus varius (Vieillot, 1818)	Variegated Flycatcher	F, O, V	AC, GF	A, B, C, D, E
Tyrannus melancholicus Vieillot, 1819	Tropical Kingbird	F, O, V	AA, AQ, CE, CI, GF, PA	A, B, C, D, E
Tyrannus savana Vieillot, 1808	Fork-tailed Flycatcher	O	AA	E
Sirystes sibilator (Vieillot, 1818)	Sirystes	O, V	GF	A
Casiornis fuscus Sclater & Salvin, 1873	Ash-throated Casiornis	O, V	AC	B, D
Myiarchus swainsoni Cabanis & Heine, 1859	Swainson's Flycatcher	O, V	CE, SC	A, B, C, D
Myiarchus ferox (Gmelin, 1789)	Short-crested Flycatcher	O, V	AC, CE, CR, SC	A, E
Myiarchus tyrannulus (Statius Muller, 1776)	Brown-crested Flycatcher	E1, G, O, V	AC, CE, CR, SC	A, B, C, D, E
Pipridae Rafinesque, 1815				
Antilophia galeata (Lichtenstein, 1823)	Helmeted Manakin	E1, O, V	GF	A, D
Tityridae Gray, 1840				
Myiobius atricaudus Lawrence, 1863	Black-tailed Flycatcher	E1, F, O	GF	A
Pachyramphus viridis (Vieillot, 1816)	Green-backed Becard	F, O, V	CE, PA	B, C, D
Pachyramphus polychopterus (Vieillot, 1818)	White-winged Becard	O, V	AC, GF	B, C, E
Pachyramphus validus (Lichtenstein, 1823)	Crested Becard	F, O, V	CE	B
Vireonidae Swainson, 1837				
Cyclarhis gujanensis (Gmelin, 1789)	Rufous-browed Peppershrike	E1, G, O, V	AC, CE, CR, GF, SC	A, B, C, D, E
Vireo olivaceus (Linnaeus, 1766)	Red-eyed Vireo	G, O, V	AC, GF	A, B, C, D, E
Hylophilus amaurocephalus (Nordmann, 1835)	Gray-eyed Greenlet	E1, F, G, O, V	AC, CR, GF, SC	A, B, C, D, E
Corvidae Leach, 1820				
Cyanocorax cristatellus (Temminck, 1823)	Curl-crested Jay	O, V	CE	B, E
Cyanocorax cyanopogon (Wied, 1821)	White-naped Jay	O, V	AC, SC	A, B, C, D, E

Taxon	English Name	Evidence	Habitats	Authors
Hirundinidae Rafinesque, 1815				
Pygochelidon cyanoleuca (Vieillot, 1817)	Blue-and-white Swallow	O	AA, AE	A, B, E
Stelgidopteryx ruficollis (Vieillot, 1817)	Southern Rough-winged Swallow	O, V	AE, CE, PA	A, B, C, D, E
Progne tapera (Vieillot, 1817)	Brown-chested Martin	O, V	AE, CE	B, E
Progne chalybea (Gmelin, 1789)	Grey-breasted Martin	O, V	AA, CE	B, E
Troglodytidae Swainson, 1831				
Troglodytes musculus Naumann, 1823	Southern House-Wren	E1, G, O, V	AA, CE, CI, CQ, GF, PA, SC	A, B, C, D, E
Cantorchilus longirostris (Vieillot, 1819)	Long-billed Wren	E1, E2, F, G, O, V	AC, CR, SC	A, B, C, D, E
Polioptilidae Baird, 1858				
Polioptila plumbea (Gmelin, 1788)	Tropical Gnatcatcher	E1, G, O, V	AC, CR, GF, SC	A, B, C, D, E
Turdidae Rafinesque, 1815				
Turdus rufiventris Vieillot, 1818	Rufous-bellied Thrush	O, V	GF	A, B, D, E
Turdus leucomelas Vieillot, 1818	Pale-breasted Thrush	E1, G, O, V	AC, CE, GF, SC	A, B, C, D, E
Turdus amaurochalinus Cabanis, 1850	Creamy-bellied Thrush	E1, O, V	AC, CQ, GF	A, B, C, D, E
Turdus albicollis Vieillot, 1818	White-necked Thrush	E1, O	GF, AC, SC	A, D
Mimidae Bonaparte, 1853				
Mimus saturninus (Lichtenstein, 1823)	Chalk-browed Mockingbird	O	AA, CE, CR	A, B, E
Coerebidae d'Orbigny & Lafresnaye, 1838				
Coereba flaveola (Linnaeus, 1758)	Bananaquit	E1, G, O, V	AA, CE, GF, SC	A, B, C, D, E
Thraupidae Cabanis, 1847				
Saltator similis d'Orbigny & Lafresnaye, 1837	Green-winged Saltator	E1, F, O, V	AC, CR, GF, SC	A, B, C, D, E
Saltatricula atricollis (Vieillot, 1817)	Black-throated Saltator	F, O, V	CE, CI, CQ	A, B, C, D, E
Compsothraupis loricata (Lichtenstein, 1819)	Scarlet-throated Tanager	O, V	AC, CE	B, C, D, E
Nemosia pileata (Boddaert, 1783)	Hooded Tanager	O	AC, GF	B, C, D
Thlypopsis sordida (d'Orbigny & Lafresnaye, 1837)	Orange-headed Tanager	O, V	AC, SC	B, C, D
Tachyphonus rufus (Boddaert, 1783)	White-lined Tanager	O, V	AC, GF	A, B, C, D, E
Lanio pileatus (Wied, 1821)	Pileated-Finch	E1, F, G, O, V	AA, AC, CE, CI, GF, PA, SC	A, B, C, D, E
Tangara sayaca (Linnaeus, 1766)	Sayaca Tanager	F, O, V	AA, CE, GF, SC	A, B, C, D, E
Tangara cayana (Linnaeus, 1766)	Burnished-buff Tanager	E1, F, O, V	AA, CE, GF, SC	A, B, C, D, E
Neothraupis fasciata (Lichtenstein, 1823)	White-banded Tanager	F, O	CE	A, B, C, D, E
Schistochlamys ruficapillus (Vieillot, 1817)	Cinnamon Tanager	E1, F, O, V	CE, CI, CQ, CR, SC	A, B, C, D, E
Paroaria dominicana (Linnaeus, 1758)	Red-cowled Cardinal	O, V	AA, AQ, PA	A, B, C, E
Dacnis cayana (Linnaeus, 1766)	Blue Dacnis	V	GF	A, B, C
Hemithraupis guira (Linnaeus, 1766)	Guira Tanager	O, V	AC, CE, GF	A, B, C, D
Conirostrum speciosum (Temminck, 1824)	Chestnut-vented Conebill	O, V	AC, GF	A, B, C, D, E

Taxon	English Name	Evidence	Habitats	Authors
Emberizidae Vigors, 1825				
Zonotrichia capensis (Statius Muller, 1776)	Rufous-collared Sparrow	E1, F, G, O, V	AA, CE, CI, CQ, CR, PA, SC	A, B, C, D, E
Ammodramus humeralis (Bosc, 1792)	Grassland Sparrow	O, V	PA	B, C, D, E
Sicalis citrina Pelzeln, 1870	Stripe-tailed Yellow-Finch	G, O, V	CI, CQ	A, B, C
Emberizoides herbicola (Vieillot, 1817)	Wedge-tailed Grass-Finch	V	CQ	C, D
Embernagra longicauda Strickland, 1844	Pale-throated Serra-Finch	E2, F, G, O, V	CE, CQ	A, B, C
Volatinia jacarina (Linnaeus, 1766)	Blue-black Grassquit	O, V	AA, CE, PA	A, B, C, E
Sporophila plumbea (Wied, 1830)	Plumbeous Seedeater	O, V	CE	D, E
Sporophila lineola (Linnaeus, 1758)	Lined Seedeater	O, V	CE, SC	B, E
Sporophila nigricollis (Vieillot, 1823)	Yellow-bellied Seedeater	E1, E2, F, G, O, V	AA, CE, CI, CQ, PA, SC	A, B, C, D, E
Sporophila caerulescens (Vieillot, 1823)	Double-collared Seedeater	O, V	CE	A
Sporophila albogularis (Spix, 1825)	White-throated Seedeater	E1, F, O, V	GF, SC	A, B, E
Arremon franciscanus Raposo, 1997	São Francisco Sparrow	E1, E2, G, O, V	AC, CR, SC	A, B, C, D
Cardinalidae Ridgway, 1901				
Piranga flava (Vieillot, 1822)	Hepatic-Tanager	F, O	CE	A
Cyanoloxia moesta (Hartlaub, 1853)	Blackish-blue Seedeater	F, O	AC	D
Cyanoloxia brissonii (Lichtenstein, 1823)	Ultramarine Grosbeak	E1, F, G, O, V	CE, SC	A, B, C, D, E
Parulidae Wetmore, Friedmann, Lincoln, Miller, Peters, van Rossem, Van Tyne & Zimmer 1947				
Parula pitiayumi (Vieillot, 1817)	Tropical Parula	O, V	AC, GF	A, B, D, E
Geothlypis aequinoctialis (Gmelin, 1789)	Masked Yellowthroat	O, V	AQ	A, B, D
Basileuterus culicivorus (Deppe, 1830)	Golden-crowned Warbler	E1, G, O, V	GF	A, C, D
Basileuterus flaveolus (Baird, 1865)	Flavescent Warbler	E1, G, O, V	AC, CR, GF, SC	A, B, C, D, E
Icteridae Vigors, 1825				
Icterus pyrrhopterus (Linnaeus, 1766)	Epaulet Oriole	O, V	CE, SC	B, D, E
Icterus jamacaii (Gmelin, 1788)	Campo Troupial	F, O, V	AA, AQ, SC	A, B, C, E
Gnorimopsar chopi (Vieillot, 1819)	Chopi Blackbird	F, G, O, V	AA, AE, CE, CI, PA	A, B, C, D, E
Chrysomus ruficapillus (Vieillot, 1819)	Chestnut-capped Blackbird	O, V	AA, PA	A, B, E
Agelaioides fringillarius (Spix 1824)	Pale Baywing	O, V	AA, PA	B, C, E
Molothrus rufoaxillaris Cassin, 1866	Screaming Cowbird	O, V	CE, GF	B
Molothrus bonariensis (Gmelin, 1789)	Shiny Cowbird	O, V	AA, CE	A, B, C, D, E
Sturnella superciliaris (Bonaparte, 1850)	White-browed Blackbird	O, V	CE, GF	B
Fringillidae Leach, 1820				
Euphonia chlorotica (Linnaeus, 1766)	Purple-throated Euphonia	F, G, O, V	CE, GF, SC	A, B, C, D, E
Passeridae Rafinesque, 1815				
Passer domesticus (Linnaeus, 1758)	House Sparrow	O, V	AA	B