

Rediscovery of the Cryptic Forest-Falcon *Micrastur mintoni* Whittaker, 2002 (Falconidae) in the Atlantic forest of southeastern Brazil

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ABSTRACT: The population of *Micrastur gilvicollis* from eastern Brazil has been attributed to *Micrastur mintoni*, a forest raptor described in 2002 based primarily on a large series of specimens especially from Amazonian and only three historic specimens from the Atlantic rainforest. The last records of *M. mintoni* in Atlantic forest were obtained in 1972 (museum specimens) and the literature suggests that it could have been extinct from the easternmost part of its geographic distribution. Herein, we provide a recent documented record of *M. mintoni* for the Atlantic forest, confirming the rediscovery of the species from northern Espírito Santo, southeastern Brazil. Our record is documented by photographs and audio recording from Reserva Natural Vale, municipality of Linhares, obtained on 29 July 2012. The loss of habitat, the natural rarity and furtive behavior of this falcon seems to explain why it remained unrecorded for 40 years in the Atlantic forest.

KEY-WORDS: Amazonia; distribution; Espírito Santo; Linhares; *Micrastur gilvicollis*; new record; play-back; taxonomy.

INTRODUCTION

The Cryptic Forest-falcon, *Micrastur mintoni*, was described in the past decade based on a series of 53 specimens from Amazonia south of the Amazon and east of the Madeira rivers and northeastern Bolivia, and eastern Brazil from southern Bahia to northern Espírito Santo (Whittaker 2002). The holotype is an adult female collected at Caxiuanã, state of Pará, Brazil, deposited in the Museu Paraense Emílio Goeldi (MPEG 54849).

M. mintoni is a cryptic raptor of discrete habits and its vocalization is most often the best way of detection and the main feature that distinguish it from other species of the genus (Whittaker 2002). In describing *Micrastur mintoni*, Whittaker (2002) restricted the distribution of *M. gilvicollis* to the Amazon rainforest, north of the Amazon and west of the Madeira rivers in Brazil and neighboring countries (for example, Guiana, Venezuela, Ecuador and Peru). Hence, the previous records of *M. gilvicollis* from eastern Brazil were assigned to the new taxon described by him. The disjunct occurrence of *M. mintoni* in Atlantic forest was recognized by the author based on three specimens housed in scientific collections: two from southern Bahia and one from northern state

of Espírito Santo. The old collecting dates of those specimens and the current scenario of the Atlantic rainforest devastation, prompted Whittaker (2002) to state that “the status of the disjunct population in eastern Brazil is critical, if not already extinct”. Accordingly, the last record for this population was a specimen collected at Cachoeira Grande, Bahia, in 1933 (*cf.* Pinto 1938).

Herein, we provide a recent documented record of *M. mintoni* from the Atlantic forest of southeastern Brazil, also discussing on the recorded vocalizations associated with this record.

MATERIAL AND METHODS

Our record was obtained at Reserva Natural Vale (headquarters at 19°08'15"S; 40°03'49"W; ~50 m a.s.l.), Municipality of Linhares, state of Espírito Santo, Brazil. This reserve (hereafter RNV) has approximately 22,000 ha and its vegetation, comprised of pristine lowland forest, is one of the main Atlantic forest remnants in Brazil (see Garay *et al.* 2004 for further details). Our expedition to RNV occurred during 28 - 31 July 2012. We have surveyed the avifauna in this reserve since 2010

as part of our research (authorization ICMBio/SISBIO N° 25830-01) on the altitudinal distribution of birds in the Central Atlantic forest corridor (*sensu* MMA 2002).

The taxonomic identification of the specimen we report here was based on diagnostic characters (plumage and vocalization) provided by Whittaker (2002). The photograph was taken with a Nikon D300 camera coupled to a Nikon Af VR 80-400mm f/4.5-5.6 ED lens. We recorded the vocalizations of *M. mintoni* using an Olympus LS-10 Linear PCM recorder. The sonograms were elaborated through the software Sound Ruler, version 9.6, with FFT-length = 256 points, Overlap between FFTs = 0.9 and Window type = Hanning.

In addition, we visited the ornithological collection of the Museu de Biologia Prof. Mello Leitão (MBML), municipality of Santa Teresa, Brazil, to try to locate specimens of *M. mintoni* collected in the state of Espírito Santo.

RESULTS

On 29 July 2012, while working in the eastern part of the RNV and walking on the Gavea road, we heard

a spontaneous vocalization of a bird we believed to be *Micrastur mintoni*. This vocalization was uttered from the middle forest stratum (about 6 m above the ground) at about 10:00 a.m. The bird flew before we were able to tape these vocalizations. Then, we played topotypic vocalizations of *M. mintoni* available in Minns *et al.* (2010), to attract the putative falcon back. After the play-back, one adult *Micrastur* appeared in the forest edge, enabling us to take some photos. At this time, it uttered another vocalization type (hereafter Vocalization 1: Magnago 2013a). After more play-back, the falcon uttered a vocalization similar to the spontaneous one detected prior to play-back (hereafter Vocalization 2: Magnago 2013b). The bird then flew up into the middle stratum of the forest. It sang again only after landing in places of low visibility to the observer. The photo we took assured us that the species was indeed *M. mintoni*, probably an adult female (Figure 1). A few minutes later, the falcon flew back into the forest, where it again uttered vocalization 2.

The vocalization 1 consisted of a series of isolated notes structurally similar to each other (Figure 2). The duration of this vocalization is variable and may continue for more than a minute. The notes have mean



FIGURE 1. Adult specimen of *Micrastur mintoni* observed at Reserva Natural Vale, municipality of Linhares, state of Espírito Santo, southeastern Brazil. (Photo: G. R. M.)

duration of 0.29 s (SD: ± 0.03 ; n = 6) and were uttered in intervals of 1.07 s (SD: ± 0.09 ; n = 5). The frequency is uttered in 1,495 Hz (central value). The vocalization 2 (Figure 3) presented a mean duration of 1.88 s (SD: ± 0.17 ; n = 5) and was uttered in intervals of 1.12 s (SD: ± 0.10 ; n = 5). It contained between 13 to 15 notes and

the duration of the notes varied from 0.04 to 0.12 s. The first and last notes of the series had less energy and were more spaced between each other; the interval between them varied between 0.05 to 0.13 s. This vocalization was uttered at a mean frequency of 1,441 Hz (SD: ± 157 ; n = 5).

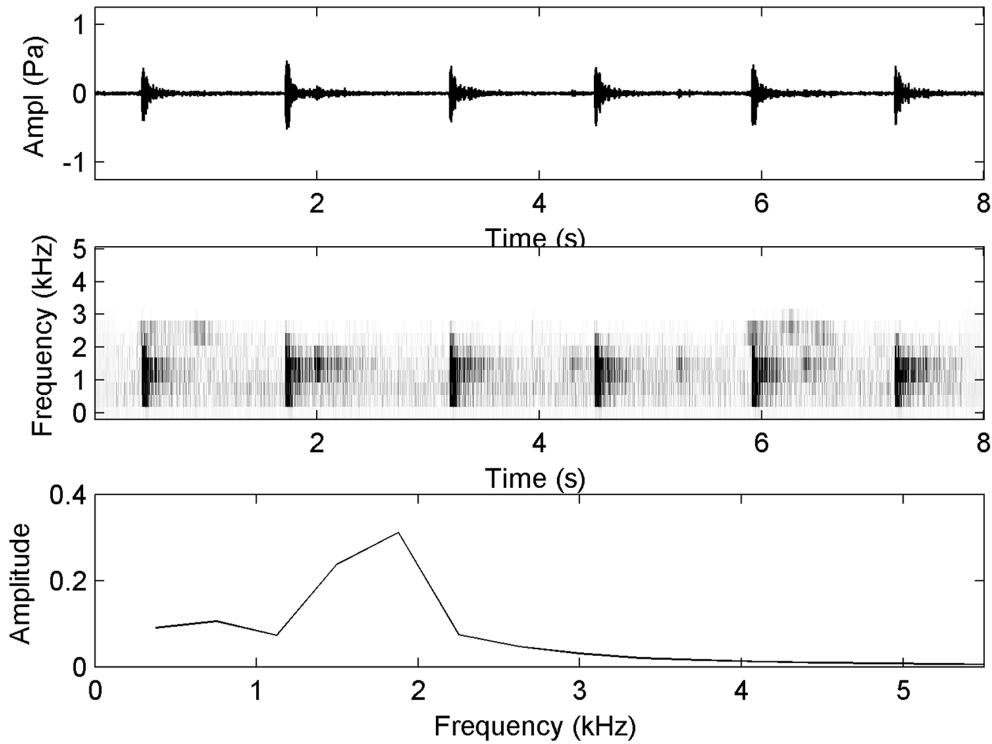


FIGURE 2. Oscillogram (a), sonogram (b) and power spectrum (c) of vocalization-type 1 of *Micrastur mintoni* recorded at Reserva Natural Vale, municipality of Linhares, southeastern Brazil, on 29 July 2012.

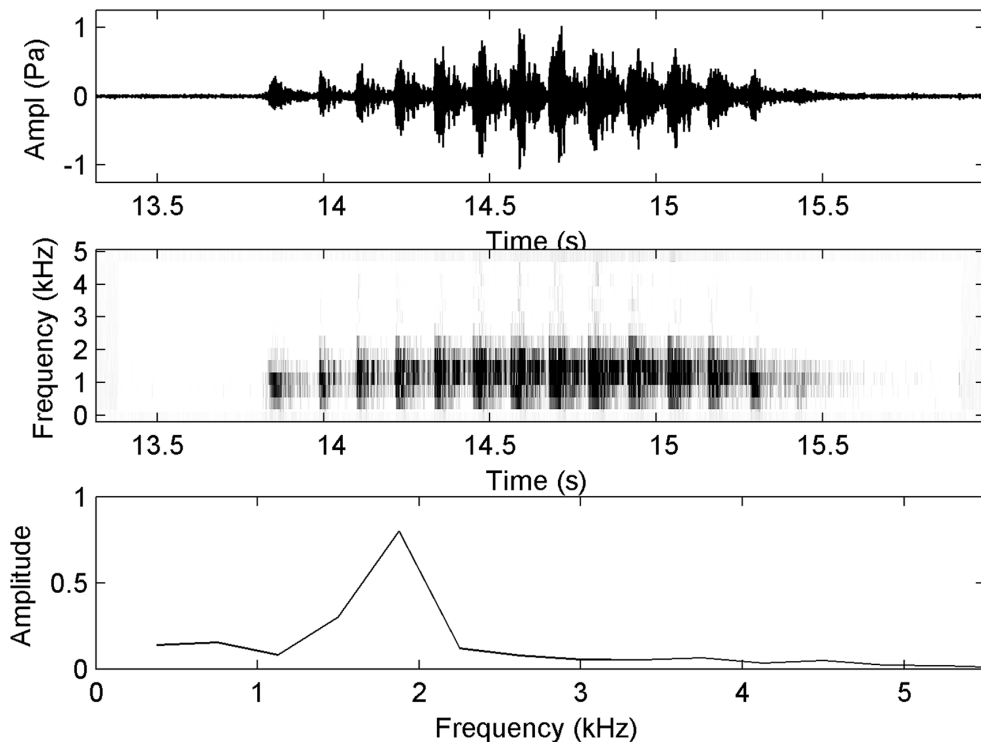


FIGURE 3. Oscillogram (a), sonogram (b) and power spectrum (c) of vocalization-type 2 of *Micrastur mintoni* recorded at Reserva Natural Vale, municipality of Linhares, southeastern Brazil, on 29 July 2012.

We found two specimens of *Micrastur mintoni* collected in the state of Espírito Santo, deposited at ornithological collection of the Museu de Biologia Prof. Mello Leitão. According to the data labels, they were both females, collected at the following localities: MBML-2114 (Figure 4a), Brejo Grande, Linhares, 30/may/1971

(collector unknown); and MBML-2115 (Figure 4b), Conceição da Barra, 01/Dec/1972 (collector unknown).

During our research we also recorded the vocalization of *Micrastur ruficollis* (Vieillot 1817), on 30 July 2012. One specimen was vocalizing in the forest understory and it was clearly observed after playback around 6:30 a.m.



FIGURE 4. Adult specimens (females) of *Micrastur mintoni* housed at the ornithological collection of Museu de Biologia Prof. Mello Leitão (Municipality of Santa Teresa, Brazil). Both were collected in northern state of Espírito Santo, southeastern Brazil: a) MBML-2114, Linhares, 30 May 1971; b) MBML-2115, Conceição da Barra, 01 Dec 1972.

DISCUSSION

The record we report here corroborate the current occurrence of *M. mintoni* in the Atlantic forest of southeastern Brazil. Furthermore, the first documented vocalizations of this population confirm beyond doubt that Whittaker (2002) was correct in assigning it to the newly described *Micrastur mintoni*. The record of this

species at RNV occurred four decades after the collection of the two specimens deposited at the MBML (MBML-2114, 2115), both from northern Espírito Santo and not far from the RNV. Therefore, we rectify Whittaker (2002), who stated that the specimen collected by M. O. Pinto in 1933 in the state of Bahia was the last record of *M. mintoni* in eastern Brazil.

The paucity of records of *M. mintoni* in southeastern

Brazil suggests that the species is indeed rare in the Atlantic forest, even in well preserved forests such as RNV. Other researchers have sampled birds at the Reserva Natural Vale (for example, Stotz 1993, Wege & Long 1995, Marsden *et al.* 2001, Simon 2007), but none of them recorded *M. mintoni* (formerly *M. gilvicolis*) in this area. Whittaker (2002) stated that: ...“during an intensive two-day search using tape playback during peak vocal activity... in April 2000, I surveyed about 15 km of trail... at reserve and failed to encounter the species”. From 2011 to 2012 we visited the RNV five times (4 days/expeditions, involving about 250 hours of fieldwork), but we were able to observe *M. mintoni* only once on 29 July 2012. Then, the rarity and secretive behavior of this falcon seems to explain why it remained unrecorded for 40 years in the Atlantic forest.

Our study reports for the first time *Micrastur mintoni* vocalizations from the Atlantic rainforest of eastern Brazil. The vocalizations 1 and 2 recorded at the RNV are congruent with both “territorial advertising song” and “excited cackling call” respectively described by Whittaker (2002). Then, the similarity between the homologous vocalizations recorded in the Amazonian (Caxiuanã, Pará) and in the Atlantic forest populations corroborates the taxonomic status advocated by Whittaker (2002) with regard to the disjunct population occurring in eastern Brazil. Furthermore, the positive reaction of the observed individual at RNV to the playback of topotypic vocalizations of *M. mintoni* recorded by Whittaker (see Minns *et al.* 2010) provides additional evidence that Amazonian and Atlantic forest populations belong to the same species.

Other publications reported on previous records of *M. mintoni* (formerly *M. gilvicolis*) from the state of Espírito Santo, which were not mentioned by Whittaker (2002). Sick (1997) refers to the distribution of this species in Espírito Santo without indication of locality. Ruschi (1977), Simon (2000) and Vieira *et al.* (2007) records suggest that the species occurs in the mountains region of that state. However, these records were not based on material-witness (specimens, recordings, and photographs), making it impossible to exclude the possibility that these records could not be attributed to another species of *Micrastur*. Therefore, the RNV seems to be the only area with recent records of *Micrastur mintoni* in the Atlantic forest. In addition to the RNV, there are other major protected areas (> 1.000 ha) in northern of Espírito Santo (*e.g.*, Reserva Biológica de Sooretama, Reserva Biológica Córrego do Veado, and Reserva Biológica Córrego Grande) and southern Bahia (*e.g.*, Reserva Biológica de Una, Reserva Michelin/Itubera, Parque Nacional do Pau Brasil, and Parque Nacional Monte Pascoal). Therefore, such reserves are areas of potential occurrence of *M. mintoni*. Thus, we encourage additional surveys in these localities.

Since the 1950's, deforestation has intensified in the state of Espírito Santo, where there is only about 8% of native forest remaining (IPEMA 2005, SEMA 2008). Currently, the native forest of the localities (Linhares and Conceição da Barra) where *M. mintoni* was collected in Espírito Santo were turned over mostly into grassland, eucalyptus plantations and urban areas. Therefore, we reinforce Whittaker's (2002) claim for additional modern records of the Cryptic-forest Falcon during field surveys in the Atlantic forest. Information about other localities of occurrence, population estimates and ecology will contribute to a better understanding of the current distribution and conservation strategies for this species in the Atlantic forest. According to the IUCN (2013) and MMA (2008), *M. mintoni* is not considered a threatened species (Least Concern). However, the population in eastern Brazil seems to be in a worrying situation. Then we recommend it to be a candidate species to make part on the review of the red list of the state of Espírito Santo (Simon *et al.* 2007).

Apparently, *M. mintoni* does not occur or is presumably extinct in northeastern Brazil. Roda & Pereira (2006) did not record this falcon in that region when they surveyed birds of prey from Alagoas to Rio Grande do Norte, between 1997 to 2005. Olmos *et al.* (2006) also did not record *M. mintoni* in other states of eastern Brazil. Therefore, to date, the state of Espírito Santo is the only one known to keep a relictual population of *M. mintoni* in the Atlantic forest.

According to published sources, *Micrastur semitorquatus* was the only species of the genus recorded at RNV (Quental 2009) prior to our records. Therefore, we confirm the occurrence of three syntopic species of *Micrastur* in this reserve, which consists an important area for conservation of birds in southeastern Brazil (Collar 1986, Bencke & Maurício 2006). There is an historical record of *Micrastur mirandollei* in northern Espírito Santo (Sick 1997), but this species has not been recorded at the RNV yet. Therefore, it represents another species of *Micrastur* awaiting to be rediscovered in the Atlantic forest (Andrew Whittaker, *in litt.*, September, 11th, 2013).

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