

**New records of the enigmatic *Clytocyttarus atrogularis*
(Thamnophilidae) in Amazonian Brazil, with remarks on
plumage, natural history, and distribution**

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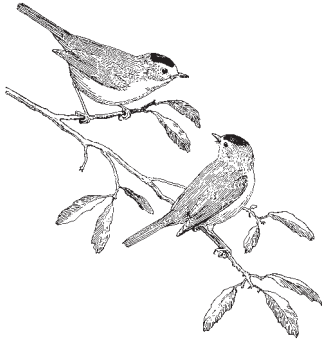
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NEW RECORDS OF THE ENIGMATIC *CLYTOCTANTES ATROGULARIS* (THAMNOPHILIDAE) IN AMAZONIAN BRAZIL, WITH REMARKS ON PLUMAGE, NATURAL HISTORY, AND DISTRIBUTION

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ABSTRACT.—*Clytoctantes atrogularis* Lanyon, Stotz and Willard, 1990 (Thamnophilidae) is one of the most mysterious and poorly known birds of the Neotropics. Endemic to Amazonian Brazil, it was known only from the holotype and two sight records at the type locality in Rondônia, and a sighting of a pair with a recording on the Sucunduri River in Amazonas. Here we review the distribution and report five new records in the states of Mato Grosso, Amazonas, and Rondônia, considerably increasing the known range of the species. We present the first detailed descriptions of males, for which the plumage was previously unknown. The records presented herein were made in *terra firme* forest with understories dominated by *Lepidocaryum* palms and also with sparse *Guadua* spp. of bamboo, demonstrating that the bird species occurs in habitats other than those previously described. Stomach contents of six individuals included mostly ants and their eggs, possibly obtained by opening stems of *Guadua* spp. The high rate of deforestation that characterizes a large part of the range of *C. atrogularis* could be causing declines in local populations. Received 12 August 2015. Accepted 16 April 2016.

Key words: Amazonia, *Clytoctantes*, natural history, Rondonia Bushbird, Thamnophilidae.

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Clytoctantes atrogularis Lanyon, Stotz and Willard, 1990 (Thamnophilidae) is one of the most enigmatic and poorly known of all Neotropical birds. It was discovered in 1986 and described based on a single female specimen mist-netted in *terra firme* forest at “Cachoeira Nazaré” on the west (left) bank of the Machado (Ji-Paraná) River, in Rondônia, southern Amazonian Brazil (Lanyon et al. 1990). Two sight-records at the type locality of a male-plumaged bird were also reported, but no other documented record was made even after thousands of hours of surveys in the area (Lanyon et al. 1990).

After remaining a mystery and unrecorded for more than a decade, BMW observed a pair of *C. atrogularis* on 20 July 2004 and made the first tape-recording of the species' voice on the left bank of the Sucunduri River, in the state of Amazonas, ~460 km north of the type-locality (Whitney 2005). The recorded alarm call closely resembled the homologous vocalization of *Neotantes niger* (Whitney 2005). In early 2005, *C. atrogularis* was found using playback of BMW's recordings and tape-recorded more extensively at the Reserva Biológica do Jaru, Rondônia (Buzzetti 2010), not far from the type-locality, where it was expected to occur (Lanyon et al. 1990). A year later, an undocumented sighting of a female was reported at the Rio Roosevelt in southern Amazonas (Whittaker 2009; E. Endrigo, pers. comm.). In August 2012, the species was recorded again in Rondônia when a female was mist-netted in a densely vegetated *campina* close to the village of Nova Mutum, ~100 km southwest of Porto Velho (Guilherme and Souza Santos 2013), bringing the total number of localities reported for the species to five.

Few data exist on the natural history of *C. atrogularis*, and even the most basic information concerning plumage and habitat preferences are poorly known. Here, we report on five new records of the species from 2007–2014, in the states of Mato Grosso, Amazonas, and Rondônia, including the first specimens since collection of the holotype, and provide information on plumage, habitat, diet, behavior, distribution, and conservation status.

METHODS

Systematic and opportunistic searches for *Clytoctantes atrogularis* were conducted in areas of

expected occurrence in the states of Mato Grosso, Amazonas, and Rondônia between 2007 and 2014. In all sites, mist-nets were used in order to census the local avifauna or intentionally capture *Clytoctantes* individuals in previously known territories, and captured individuals were photographed. Vocalizations were documented using the digital recorders Zoom H4n (Zoom Corp., Tokyo, Japan), Marantz PMD660 (Marantz America LLC, Mahwah, NJ, USA), Sony PCM-D50 (Sony Corp., Tokyo, Japan), Sound Devices 702 (Sound Devices LLC, Reedsburg, WI, USA), and Sennheiser ME66 microphones (Sennheiser Electronic GmbH & Co. KG, Wedemark, Germany).

Measurements of wing chord, tail, bill (from nares to tip), tarsus, and nail of hallux were taken to the nearest 0.1 mm by VQP and refer to the specimens deposited at the Museu de Zoologia da Universidade de São Paulo (MZUSP) only (including the holotype). Measurements of total length, wing span, and mass were taken (by different people) from the specimens collected prior to preparation and include the pair deposited at the Louisiana State University Museum of Natural Science (LSUMNS). Stomach contents were analyzed and preserved at MZUSP. For comparison, we examined specimens of *Clytoctantes alixii* housed in the American Museum of Natural History (AMNH), including the types; National Museum of Natural History, Smithsonian Institution (USNM); Louisiana State Museum of Natural Science (LSUMNS); and Academy of Natural Sciences of Drexel University, Philadelphia (ANSP).

RESULTS

On 6 November 2007, DMMO, TCR, FO and BF mist-netted a male *Clytoctantes atrogularis* in the Parque Estadual Igarapés do Juruena (08° 57' 21.5" S 59° 20' 48.5" W), in the municipality of Colniza, northwestern Mato Grosso state (Fig. 1). This represented the first individual captured since the description of the species and the first record for Mato Grosso, a range extension of 300 km northeast from the type locality in Rondônia. It was mist-netted in the understory of a tall *terra firme* forest close to areas that had been selectively logged. Understory and midstory vegetation was characterized by the presence of

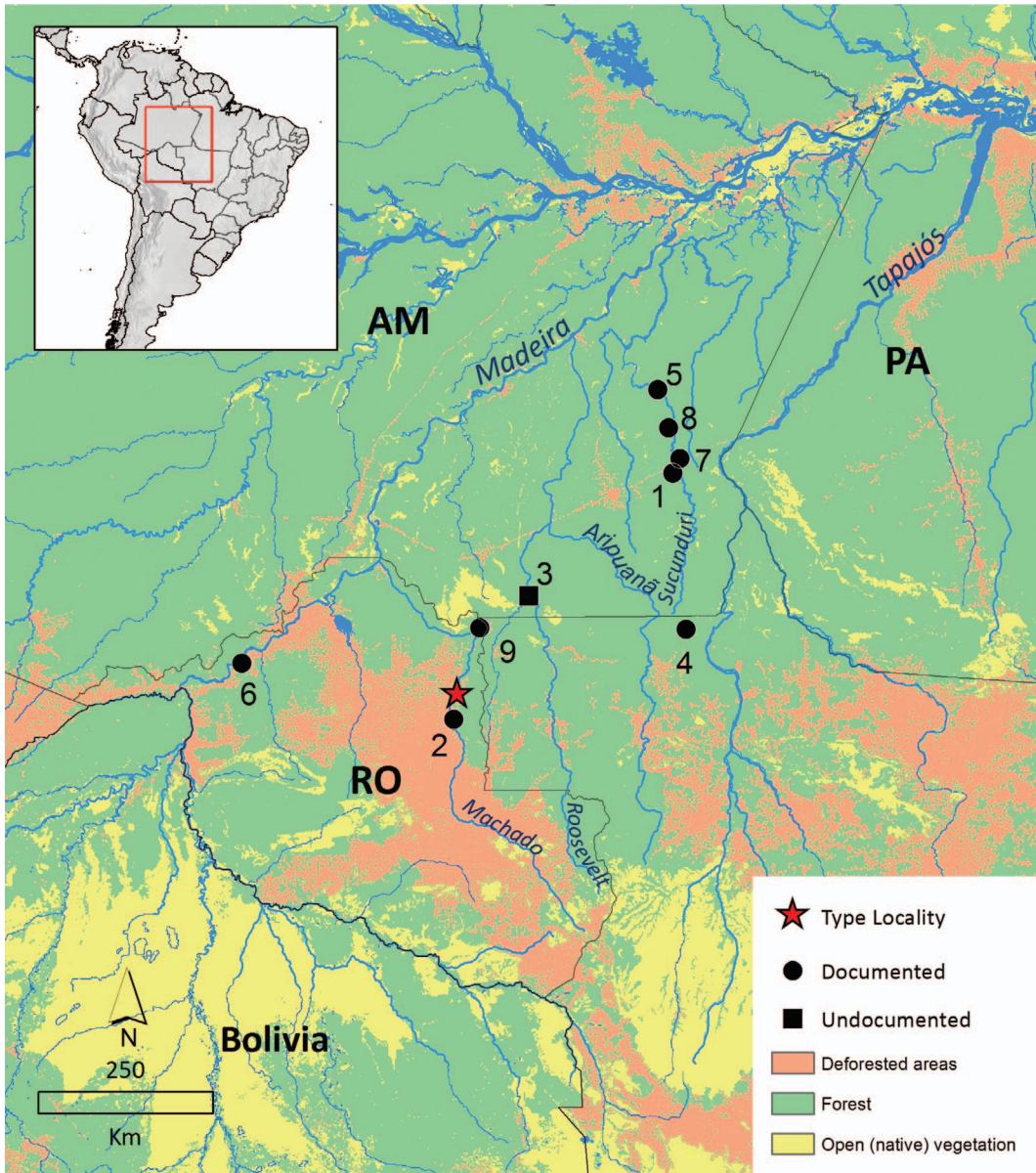


FIG. 1. Map of the currently known localities of *Clytoctantes atrogularis* in southern Amazonian Brazil. Red star represents the type-locality, “Cachoeira Nazaré”, Rondônia; black dots represent the following records, in chronological order: 1 - left bank of Sucunduri River, Amazonas (Whitney 2005); 2 - Reserva Biológica do Jaru, Rondônia (Buzzetti 2010); 3 - left bank of Rio Roosevelt, Amazonas (Whittaker 2009; E. Endrigo, pers. comm.); 4 - Parque Estadual Igarapés do Juruena, Mato Grosso (this study); 5 - left bank of Sucunduri River, Amazonas (this study); 6 - Mutum-Paraná, Porto Velho, Rondônia (Guilherme and Souza Santos 2013); 7 - right bank of the Sucunduri River, Amazonas (this study); 8 - right bank of Sucunduri River, Amazonas (this study); and 9 - Igarapé São João, Machadinho d’Oeste, right bank of Machado River, Rondônia.



FIG. 2. *Terra firme* forest with understory dominated by *Lepidocaryum tenue* (“caraná”) palms, habitat where *Clytoctantes atrogularis* was found in both banks of the Sucunduri River, Amazonas, Brazil. Photo by TVV Costa.

Inga marginata, *Campomanesia* sp., *Helycostilis* sp., *Brosimum* sp., *Jacaranda* sp., *Copaifera* cf. *multijuga*, *Bactris* spp., and *Geonoma* sp. Other bird species captured in the same line of nets were *Tinamus tao*, *Thamnomanes caesius*, *Hylophylax naevius*, *Dendrocincla merula*, *Sclerurus mexicanus*, *Philydor erythrocerum*, *Phoenicircus nigricollis*, *Pipra rubrocapilla*, *Habia rubica* and *Ramphocelus carbo*. This male *Clytoctantes atrogularis* presented an overall dark-gray plumage with a black bib (chin and throat), and plain (unspotted) upperwing coverts; it had a black bill and clear brown iris (Fig. 3b). Many of the primaries and other wing feathers were lightly washed brownish, indicating that the bird was in a subadult (pre-definitive) plumage. After being photographed and banded, the bird was released.

On 26 July 2012, at ~0700 hrs Amazon Time (AMT), TVVC located an individual singing spontaneously on the left bank of the Sucunduri River (05° 48' 12" S 59° 15' 24" W), municipal-

ity of Borba, state of Amazonas. This represented the northernmost known locality for the species and is roughly 130 km from the nearest record (Whitney 2005) on the same bank of that river (Fig. 1). The bird was in a fairly tall, undisturbed *terra firme* forest with a dense understory dominated by *Lepidocaryum tenue* (“caraná”) palms, with some reaching >3 m in height (Fig. 2). The loudsong consisted of long sequences of regularly spaced, essentially identical whistled notes (Fig. 4a, ML 25216291). A recording was made and after playback, a male approached immediately, delivering its typical alarm calls (Fig. 4c). It was not seen well at the time and departed after a few seconds. After persisting with playback, the bird responded far away with alarm calls and subsequently called at intervals of >5 mins at one point falling silent for >20 mins. After continued playback of the calls, the male approached quietly and perched at close range but out of sight in the dense understory, and started



FIG. 3. Male and female individuals of *Clytoctantes atrogularis* captured in Mato Grosso, Amazonas and Rondônia states, southern Amazonian Brazil. a) detail of the head of an individual netted at Machadinho d'Oeste, right bank of Machado River, Rondônia, in 2013; b) sub-adult male netted at Igarapés do Juruena, Mato Grosso, in 2007; c) and d) adult male netted on Machadinho d'Oeste, right bank of Machado River, Rondônia, in 2013; e) adult female netted at the left bank of Sucunduri River, Amazonas, in 2012; and f) adult female netted at the right bank of Sucunduri River, Amazonas, in 2013. Photos by AGC (a, c, d), DO (b) and FS (e, f).

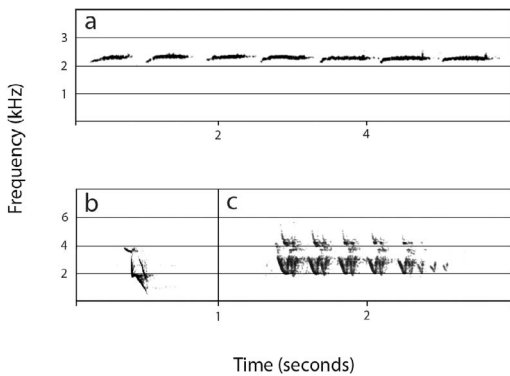


FIG. 4. Spectrograms depicting the loudsong (a) and calls (b, c) of male *Clytoctantes atrogularis*. (a) Left bank of the Sucunduri River, Amazonas, Brazil, 26 Jul 2012 (TVV Costa, ML 25216291). (b) Right bank of the Sucunduri River, Amazonas, Brazil, 26 Jan 2014 (VQ Piacentini, ML 213197). (c) Left bank of the Sucunduri River, Amazonas, Brazil, 26 Jul 2012 (TVV Costa, uncatalogued).

to sing the loudsong again, which was also recorded. The loudsong after playback did not differ from the first, spontaneous one. After ~3 mins singing, the bird stopped and left unnoticed, keeping silent for roughly 15 mins more. After this time and while playing back the loudsong and the calls periodically, the male appeared again, perching for a few secs ~5 m away on a horizontal leaf of a *Lepidocaryum* palm, where it was collected. This individual was the first specimen of *Clytoctantes atrogularis* collected since the species' description, and the first male (LSUMZ 184794). Its plumage was dark, blackish-gray with a subtly blacker bib, and a concealed white interscapular patch; a few brownish feathers in the head; and brownish primaries, secondaries, and greater secondary and primary coverts, as well as mixed brown and black lesser and median coverts and scapulars, all of which indicate that it was a sub-adult individual. On the evening of 26 July, at roughly 1700 hrs, MGH, RST, GFS, and BMW returned to the spot where the male was collected and succeeded in finding a female-plumaged individual. This bird called sporadically as it moved secretively through denser sections of the understory of *Lepidocaryum* and sang briefly several times (ML 182913, 185518). On the morning of 27 July, around 0600 hrs, FS, MAR, GDR and GFS returned to the location, erected three mist-nets, played the loudsong constantly,

and succeeded in capturing and collecting a female (Fig. 3e; MZUSP 96887). The plumage of this individual is chestnut overall, with chin, throat, and upper breast black, and flanks faintly washed gray, fitting the description of the holotype and the female seen by Whitney (2005) ~130 km south.

On 24 June 2013, around 0630 hrs, FS found a female *C. atrogularis* after a playback trial on the right bank of the Sucunduri River, about 4.8 km below the BR-230 ("Transamazônica") highway (06° 46' 03" S 59° 04' 44" W), municipality of Borba, state of Amazonas. The bird responded with a few alarm calls before flying into a mist-net set nearby. The site was a *terra firme* forest with a fairly open understory dominated by *caraná* palms (*Lepidocaryum tenue*) close to a treefall gap and low-lying area with a small stream. Further searches for the species at the same site over the following 4 days were unproductive. Eight days later, on 2 July 2013, around 1600 hrs, VQP heard an individual giving the alarm call in an area of *terra firme* forest with a dense understory of *Lepidocaryum* on the right bank of the Sucunduri River, about 60 km below the "Transamazônica" highway (06° 15' 43" S 59° 04' 05" W), Amazonas. After a few playback trials without any vocal response, a male approached and was mist-netted. This male was a fully adult bird (skull 100% ossified, no bursa, no molt limit) with the overall plumage pattern very much like the male collected in the left bank of the Sucunduri River in the previous year, although without any brown in the wing or head. Despite subsequent playback trials on the same and the following days, no other individual was found in the area.

On 30 September 2013, after a few playback attempts, FA and AGC mist-netted a subadult male in a tall *terra firme* forest with understory of *Lepidocaryum* on the right bank of the Machado River (08° 53' 50.31" S 61° 34' 47.42" W), at the village of Tabajara, municipality of Machadinho d'Oeste, eastern Rondônia state, about 100 km north of the type locality. Later on that same day, a pair was found on the same area and was voice-recorded by FA. Almost 4 months later on 26 January 2014, VQP found, voice-recorded, and collected a pair at the same site. A previously unknown, single-note contact call was recorded (Fig. 4b, ML 213197), as well as some distress calls of the female in the hand. The contact calls were delivered in a sequence of seven or eight by

TABLE 1. Morphometric data of six specimens of *Clytoctantes atrogularis*. Measurements are given in mm and weight is given in g.

Specimen number	Locality (main region)	Sex	Wing	Tail	Culmen	Tarsus	Hallux ^a	Claw of hallux	Total length	Wingspan	Weight
TM6-084	Machado	M	81.5	61.2	15.3	27.9	12.23	11.71	174	256	35.5
TM6-061	Machado	M	77.8	59.6	15.1	26.5	12.18	11.53	184	250	36
MZUSP96888	Sucunduri	M	79.6	61.6	13.8	24	11.24	9.59	172	260	33
MZUSP66111 ^b	Machado	F	76.4	61.5	14.9	26.8	12.14	11.45	-	-	31
TM6-083	Machado	F	76.5	61	14.6	27.6	12.73	11.51	161	252	34
MZUSP96887	Sucunduri	F	79	59.5	14.3	25.6	12.23	9.46	166	235	33.9

^a Measurement taken without the claws.^b Holotype.

the male after the female approached him and climbed up a vertical perch, thus apparently coming into his view. A second, apparently solitary male was found and tape-recorded ~650 m away on that same morning, in an area of tall *terra firme* forest with few *Lepidocaryum* palms and close to a tree-fall gap. The bird was singing spontaneously and approached after a whistled imitation of its song, after which it began singing at a slightly faster pace than usual, and was voice-recorded by VQP. The bird sang for several minutes, sometimes also delivering alarm calls. The bird could be heard at a distance of some 250 m through the forest. After walking about 1300 m from this second male, VQP found yet another individual, or possibly a pair of *C. atrogularis* that began alarm-calling by the side of the trail and moved about 50 m away. After a playback trial, a female came into view while still delivering alarm calls but soon began to deliver the same contact calls given by the male of the first pair. We could not locate this female or the second male on two following days, despite several playback trials.

Our morphometric data show males to be slightly larger and heavier than females (Table 1). There are no appreciable differences between birds from the different regions (Machado and Sucunduri river basins), except for the size of the claws of the hallux. Birds from the Machado River (both males and females, $n = 3$) have the claws of the hallux between 20–22% larger than those of the Sucunduri River birds ($n = 4$).

Analyses of the stomach contents from six of the seven specimens recently collected revealed a diet largely based on ants (both adults and eggs), belonging to the genera *Camponotus*, *Pheidole*, and *Pachycondyla*. Even though the ants could be identified only to generic level, the species within each genus, from different birds, seem to be the same (M. Ulysséa, pers. comm.). Besides ants, stomach contents also revealed fragments of other insects (Table 2).

DISCUSSION

Plumage.—At the time of the description of *Clytoctantes atrogularis*, only the plumage of the

TABLE 2. Stomach contents of six specimens of *Clytoctantes atrogularis*.

Sample	Sex	Location	Contents
LSUMZ 184794	male	Sucunduri River	<i>Camponotus</i> sp. of ant <i>Pheidole</i> sp. of ant (minor workers)
MZUSP 96887	female	Sucunduri River	<i>Pachycondyla</i> sp. of ant <i>Camponotus</i> sp. of ant
MZUSP 96888	male	Sucunduri River	One 2-cm caterpillar Eggs (40+) and adults of <i>Camponotus</i> sp. of ant
LSUMZ 184795	female	Sucunduri River	Fragment of insects (including ants)
TM6-083	female	Machado	<i>Camponotus</i> spp. of ants (2 species)
TM6-084	male	Machado	<i>Pachycondyla</i> sp. of ant <i>Camponotus</i> sp. of ant <i>Pheidole</i> sp. of ant (major workers)



FIG. 5. Lateral view of the specimens collected on Sucunduri (Amazonas state) and Machado (Rondônia state) rivers showing the general uniformity of plumage across different areas. From left to right: MZUSP 66111 (holotype), female, left bank of Machado; MZUSP 96887, female, left bank of Sucunduri; LSMZ 184795, female, right bank of Sucunduri; MZUSP 96888, male, right bank of Sucunduri; MZUSP [uncataloged], male, right bank of Machado; LSMZ 184794, male, left bank of Sucunduri.

female was known; the male plumage has remained imperfectly known. The first mention of the male was made by D. Stotz in Lanyon et al. (1990) at the time of the discovery of the species, based on his two sight records at the type locality. Those authors reported the male as appearing entirely black, and hypothesized that it would possess, like the female, unmarked upperwing coverts. In the first documented record of the species after its description, Whitney (2005) also reported the male as appearing entirely black, but that individual was seen only in poor light and insufficiently for a detailed description. All the male individuals captured on the Sucunduri and Machado rivers, as well as the one captured in Mato Grosso, present dark gray plumage, instead of black, with a subtly blacker bib, a concealed white interscapular patch, and unmarked upperwing coverts. The specimen collected in 2012 on the left bank of the Sucunduri River, the two males collected on the Machado River, and the individual

captured in Mato Grosso in 2007 have most of the remiges dusky brown, as well as some scattered brown feathers in the crown, indicating that they are subadult birds. The male collected in 2013 on the right bank of the Sucunduri was a fully adult bird in definitive plumage, possessing no traces of brown in the wings or elsewhere.

The male plumage of *Clytoctantes atrogularis* is now confirmed to be quite similar to that of its present congener, *C. alixii*, which occurs in northern Colombia and western Venezuela. The most distinguishing plumage character between males of these species is the black-spotted pattern of the upperwing coverts in adult *C. alixii* (Figs. 3, 5, 6). All male specimens of *C. alixii* we have examined ($n = 9$, including the holotype) show these black spots. It is remarkable, however, that most illustrations of *Clytoctantes alixii* in reference works fail to show or describe this feature (e.g., de Schauensee and Phelps 1978, Hilty and Brown 1986, Hilty 2003, Zimmer and Isler 2003), with



FIG. 6. Lateral view of specimens of *Clytoctantes alixii*. Male USNM 392834 (top), juvenile male 392832 (middle) and female 392836 (bottom). Note the black spots in the upperwing coverts of the male.

the notable exception of Restall et al. (2006). Also, we noted that the plates in Hilty and Brown (1986) and Ridgely and Tudor (1994, 2009) show the upperwing coverts of the adult male with distinct white spotting, which is actually restricted to the female and juvenal plumage of *C. alixii* (Fig. 6). Unfortunately, the juvenal plumage of *C. atrogularis* remains unknown. Based on the subadult males we have collected and the pattern seen in *C. alixii*, we expect that the juvenile *C. atrogularis* will prove to be wholly or mostly brown.

Habitat.—The few data available concerning habitat preferences of *Clytoctantes atrogularis* are those presented by Lanyon et al. (1990), Whitney (2005), and Guilherme and Souza Santos (2013). The species has been reported to occur in the understory of *terra firme* forest dominated by dense vine tangles, close to treefall gaps, and also in somewhat disturbed forest bordering man-made second-growth with scattered *babaçu* palms (*Attalea speciosa*) and *Heliconia* species. Our record in Mato Grosso was made in *terra firme* near a

selectively logged area, reinforcing the observation of Whitney (2005) that the species can tolerate some habitat alteration, and his hypothesis that *C. atrogularis* could potentially benefit from slight disturbance. Our records along the Sucunduri and Machado rivers were made in undisturbed, tall *terra firme* forest, mostly with understory heavily dominated by dense growth of *Lepidocaryum tenue* (Fig. 2), sometimes near treefall gaps or small streams, and also with sparse *Guadua* spp. of bamboo. The 2012 and 2013 records from both banks of the Sucunduri River indicate that *terra firme* with *Lepidocaryum* palm-dominated understory is another important habitat of *Clytoctantes atrogularis*.

In a recent record from Rondônia, a female was mist-netted in dense, low-stature *campina* (Guilherme and Souza Santos 2013), which comprises a highly distinctive plant community growing on white-sand soils characterized by a low canopy and a high density of bush-like trees (Anderson 1981). The species has not otherwise been

recorded in such habitat, and we expect that the captured individual was in transit through the *campina*.

Diet.—General foraging behavior and characteristic body movements of *Clytoctantes atrogularis* were described by Whitney (2005), but no specific item of its diet has been identified. Our analyses of stomach contents of six specimens suggest the species feeds mainly, although not exclusively, on ants (including their eggs). The genera of ants found in the stomachs, *Camponotus*, *Pheidole*, and *Pachycondyla*, include some species that build their nests inside bamboo (Mackay and Mackay 2010; M. Ulysséa, pers. comm.). Given that some sites of collection presented stands of *Guadua* bamboo, we can infer that *Clytoctantes atrogularis* may explore bamboo stems in search of ants.

Distribution.—Our recent records indicate that *Clytoctantes atrogularis* is endemic to the Madeira-Tapajós interfluvium in central Amazonian Brazil, with its range apparently delimited by the Madeira River to the west extending eastward to somewhere between the Sucunduri and Tapajós rivers. The easternmost known record to date is that of Whitney (2005), only about 60 km west of the Tapajós River, yet still in the Madeira drainage. New records presented here extend its previously known range farther northward in the interfluvium and, importantly, to the right bank of the Sucunduri River. Few avifaunal surveys have been undertaken north and east of these localities, where the probably closely related (Whitney 2005) *Neotantes niger* is known to occur. *Neotantes niger* inhabits the understory and adjacent secondary growth of both *terra firme* and *várzea*, particularly in dense undergrowth around treefall gaps and along swampy forest streams (Zimmer and Isler 2003), which include some of the habitats where *C. atrogularis* may be found. Further studies should focus on determining whether they come into contact, and, if so, whether there is any habitat segregation or niche-partitioning between them. Concerning the southern part of its distribution in the Amazonas-Pará-Mato Grosso border region, it is still to be determined if *C. atrogularis* or any other bushbird occurs east of the Tapajós or Juruena rivers.

Our growing knowledge of the actual distribution of *C. atrogularis*, in concert with new data on morphological variation and genetic structure, may

shed light on the taxonomic status of the populations occurring on opposite sides of the Machado, Aripuanã, and Sucunduri rivers, three barriers recently recognized as playing important roles in delimiting the distribution of many taxa of Amazonian passerines in micro-endemic areas, including such antbirds as *Sciaphylax*, *Hypocnemis*, *Myrmoborus*, *Epinecrophylla*, *Herpsilochmus*, *Rhegmatorhina*, and *Phlegopsis* (Zimmer and Isler 2003; Cohn-Haft et al. 2007; Isler et al. 2007; Whittaker 2009; Fernandes et al. 2012, 2013; Whitney and Cohn-Haft 2013; Whitney et al. 2013a, b).

Conservation.—Although recent records have significantly increased the known distribution of *Clytoctantes atrogularis*, it nonetheless appears to be rare within its range. The species is obviously resistant to some degree of forest disturbance and it may even have evolved in successional forest habitats (Whitney 2005). The Parque Estadual Igarapés do Juruena is located in the northwestern portion of Mato Grosso and together with other conservation units and indigenous lands represents a large block of protected areas in the northern part of that state. The region of the Sucunduri River remains one of the most pristine areas in central Amazonia, even in the vicinity of the crossing of the BR-230 (“Transamazônica”) highway.

That said, the high rate of outright deforestation in the states of Mato Grosso and Rondônia has surely resulted in, and will continue to exacerbate the decline of *C. atrogularis* in those significant parts of its distribution. The most imminent threats stem from the expansion of the agricultural frontier, highway construction, and illegal logging (Menezes 2001; Fearnside 2002, 2006). Therefore, even though it occurs within large pristine areas, *Clytoctantes atrogularis* should be considered as Vulnerable under IUCN Red List criteria. Further study is needed to elucidate aspects of the biology of *Clytoctantes atrogularis* as well as assess any genetic structure that may exist among populations perhaps separated by small rivers and its conservation implications.

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