

## Description of the nest and eggs of two *Myrmeciza* antbirds endemic to the Atlantic Forest of Brazil

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São descritos pela primeira vez em detalhe os ninhos e ovos do papa-formiga-de cauda-ruiva *Myrmeciza ruficauda* e do papa-formiga-da-grota *M. loricata*, a partir de três ninhos da primeira espécie, encontrados na Estação Ecológica de Murici, Alagoas, entre setembro e outubro de 2002, e um ninho da segunda espécie encontrado em Penedo, Rio de Janeiro, em dezembro de 2000. São escassas na literatura as informações sobre a nidificação de ambas as espécies. Os quatro ninhos mostraram-se bastante semelhantes, todos eles situados junto ao solo, em meio à vegetação de sub-bosque. A estrutura dos ninhos era formada basicamente por uma plataforma de folhas secas e pequenos gravetos, apoiada diretamente sobre o solo, e que suportava uma taça forrada com folhas secas e fibras finas. Comparam-se os ninhos aqui encontrados com ninhos conhecidos de outras espécies do gênero *Myrmeciza*, e discute-se a semelhança entre os mesmos e uma possível relação entre a arquitetura dos ninhos e as relações filogenéticas das espécies deste gênero particularmente heterogêneo.

The family *Thamnophilidae*, *sensu* Sibley & Monroe<sup>12</sup>, is restricted to the Neotropical region and comprises 209 species<sup>21</sup>. It presents a large degree of variation

in size and colour patterns, and a significant proportion of species inhabit humid forests<sup>11</sup>. The genus *Myrmeciza* comprises 20 species<sup>21</sup> and exhibits a



Figure 1. Nest 1 of Scalped Antbird *Myrmeciza ruficauda*, Murici Ecological Station, Alagoas, Brazil (Dante Buzzetti)



Figure 2. Nest 3 of Scalped Antbird *Myrmeciza ruficauda*, Murici Ecological Station, Alagoas, Brazil (Dante Buzzetti)



Figure 3. Male White-bibbed Antbird *Myrmeciza loricata* at the nest, Penedo, Rio de Janeiro, Brazil (Dante Buzzetti)



Figure 4. Nest and eggs of White-bibbed Antbird *Myrmeciza loricata*, Penedo, Rio de Janeiro, Brazil (Dante Buzzetti)

broad range of morphological and behavioural variation (including such extremes as Yapacana *M. disjuncta*, White-bibbed *M. loricata* and Ferruginous-backed Antbirds *M. ferruginea*), which renders the genus probably paraphyletic. Nests of several species within the genus are undescribed, and improved knowledge in this sense could assist in defining natural groupings among these taxa and even relationships with other genera (see Zimmer & Isler<sup>21</sup>). The Thamnophilidae present a wide variation of nest architectures<sup>13</sup>, and it is not inconceivable to use this information in the manner performed for another trachaeophone group, the Furnariidae<sup>22</sup>, to infer phylogenetic relationships.

Scalloped Antbird *Myrmeciza ruficauda* and White-bibbed Antbird *M. loricata* are two closely related species endemic to the Atlantic Forest of Brazil. The former is distributed from southern Espírito Santo and east Minas Gerais to S Bahia, along the coastal lowlands, with an isolated population (subspecies *soror*) widely distributed in the Pernambuco centre<sup>9</sup> of endemism in Alagoas, Pernambuco and Paraíba states<sup>11</sup>. The other species is found along the strip of coastal forests from extreme western Rio de Janeiro to central Bahia, mostly in lower montane habitats (above 700 m), being replaced at lower elevations and southwards by its sister species, Squamate Antbird *M. squamosa*<sup>11,21</sup>.

*M. ruficauda* is a relatively rare species, currently classified as Endangered<sup>2</sup>, although the subspecies *soror* apparently occurs at much higher densities than the nominate further south<sup>3</sup>. *M. loricata* is a common inhabitant of forests throughout its range, but is still poorly known in life, and virtually no breeding data are available for either species<sup>3,4,6</sup>. Here we describe the nest and eggs of *M. ruficauda* and *M. loricata*; we also describe two stages of the fledgling plumage of the former species, and present

some information concerning the breeding behaviour of both species. Finally, we place our findings in the context of what is already known of the breeding biology of this genus.

Our encounters with the nests of these species occurred during general avian surveys, and for the most part, were the result of luck. Nest measurements were taken with callipers and ruler, and the eggs were measured with callipers. Coordinates and altitudes were taken with a GPS. The nests were collected in plastic boxes, and are currently housed in DRCB's personal nest collection.

### The nest of Scalloped Antbird *Myrmeciza ruficauda*

Three nests were found, all of the subspecies *soror*, in different areas of Murici Ecological Station, Alagoas, during September and October 2002, after the core of the rainy season.

The first nest (number 1) was discovered by JMB on 17 September 2002 in the grounds of the Federal University of Alagoas experimental station, at c.515 m (09°15'S 35°50'W), when an individual, whose sex was not determined, was flushed from the nest. The bird quickly escaped, hopping on the ground with wings extended and tail fanned, flapping the wings in a type of distraction display, and uttering strong alarm calls. Regular intensity alarm calls were heard nearby, probably from the other member of the pair. The habitat was old secondary forest with a regenerated structure, 20 m tall, with mostly narrow dbh trees, and relatively open undergrowth, near the top of a hill. The forest on the slopes had patches that seemed primary, with a larger number of taller trees remaining.

The nest was on the ground, within a slight depression, and consisted of a deep cup-shaped structure in a dense platform and walls of dead leaves, some sticks and dead leaves of an introduced

**Table 1.** Measurements of the nests and eggs of Scalloped Antbird *Myrmeciza ruficauda* and White-bibbed Antbird *Myrmeciza loricata*. NA = Not available. No eggs were found in Nest 3.

Species	<i>Myrmeciza ruficauda</i>			<i>Myrmeciza loricata</i>
	Nest 1	Scalloped Antbird Nest 2	Nest 3	White-bibbed Antbird
<b>Nest measurements (cm)</b>				
Diameter of the incubation cup	7.5 x 6.4	6.2 x 6.0	6.8 x 6.3	5.7 x 5.5
Depth of the incubation cup	8.0	6.0–7.6 <sup>a</sup>	4.5	5.8
External diameter of the nest structure	14.7 x 11.3	15.5 x 13.0	19.5 x 18.0	13.2 x 15.5
Total height of the nest structure	9.0	11.0–12.5 <sup>a</sup>	15.0	12.0
Height of the nest above the ground <sup>b</sup>	0.0	9.5	8.0	0.0
<b>Eggs</b>				
Measurements (mm)	23.40 x 16.20 22.90 x 16.20	NA	–	21.00 x 16.40 23.00 x 16.15
Weight (g)	3.0 2.8	NA	–	NA

<sup>a</sup>one side of the structure's wall protruded beyond the rest

<sup>b</sup>measured to the bottom of the nest structure

Cyperaceae, among the bases of some small plants that covered it, and supported on one side by a vine (Fig. 1). The inner cup consisted of smaller dead leaves, including those of a small, undergrowth Palmaceae, layered with *Marasmius* sp. and some pale yellow fibres. Measurements are presented in Table 1.

The two eggs were dirty whitish, profusely marked with dark purple spots and lines, denser at the large end, but somewhat concentrated also on the small end. Measurements are presented in Table 1.

A second nest (number 2) was located on 3 October 2002 by JMB at Fazenda Angelim, at c.450 m (09°12'S 35°51'W), when an adult was flushed from it, flying at least 5 m away. The area was low (<12 m) secondary woodland, with open undergrowth (8–10 years old), near the top of a hill. Again, the nest was placed on the ground, by a road and near a clearing with dense edges. It was within three clumps of an introduced Cyperaceae, atop leaf litter and held in place by the clumps of grass, being thus somewhat elevated above ground. It consisted of a platform of large dead leaves of dicots and the same Cyperaceae. This structure and its walls were similar to those of the previous nest. The nest cup was layered with smaller dead leaves (some of the Cyperaceae), *Marasmius* sp. and rootlets. Measurements are given in Table 1. There were two eggs, similar in coloration to those described above, but it was not possible to measure them.

The third nest (number 3) was found on 12 October 2002 by DRCB and JMB at Fazenda Bananeiras, at c.550 m (09°12'S 35°52'W). The habitat consisted of tall, selectively logged, primary forest, c.20 m tall, with relatively dense undergrowth. The nest was beside an abandoned logging path, within an area of irregular terrain. It was on the ground, placed among clumps of the same Cyperaceae as the previous nest, and also somewhat elevated, supported by a platform and walls of dead leaves (Fig. 2), as described for the other two nests. The cup was lined with *Marasmius* sp. Measurements are shown in Table 1. No eggs, eggshells or nestlings were found, and it appeared that the nest had been used until some days before our discovery.

The only previous reports of the species' nest<sup>3,8</sup> did not provide a description. However, a nest found in Bahia was placed at 20 cm in the base of a forktail palm clump (E. O. Willis & Y. Oniki *in litt.* 2003), matching in general shape and location with those here reported.

On 27 September 2002, JMB noted a single downy fledgling near nest 1. It constantly delivered two call types as it hopped clumsily in the leaf litter, within 5 m of the nest. No eggshells were found at or near the nest, nor any signs of the second egg or

nestling. The bird was entirely chestnut-sepia, somewhat rufescent, buffier and brighter dorsally and darker on the head and breast. It had a slight dark waving on the back. The tertials, median and greater wing-coverts and alulae—which were beginning to grow—were broadly tipped cinnamon-buff. It had a pale yellow gape and dark bill, eyes and feet. This nestling must have been in the nest for a maximum of ten days, possibly eight or nine.

On 12 October 2002 nest 2 was visited again, and no trace of the eggs or eggshells was found, nor were any fledglings found nearby. However, the adults were in the vicinity, constantly alarm-calling, and we suspect that fledglings were present. Assuming that the fledglings had not been predated, we estimate that the nestlings remained in the nest at most eight days.

On 25 September 2002 JMB located a different pair being followed by a grown juvenile through the dense undergrowth of the forest edge (by a small clearing beside a road), at Fazenda Bananeiras, Murici Ecological Station. This juvenile had the appearance of a young *Turdus* thrush, with the head heavily spotted buff, less so dorsally. The underparts appeared checkered pale buff-grey with the centre of the feathers dark grey.

### A nest of White-bibbed Antbird *Myrmeciza loricata*

One nest was found by DRCB, on 31 December 2000, beside an abandoned logging path near the Pico do Penedinho, within Penedo Municipal Park, at Penedo, Itatiaia, Rio de Janeiro, at c.900 m (22°25'S 44°31'W). It was located when the female flushed from the nest, 1 m from the observer's feet. The bird quickly escaped by hopping on the ground with flapping wings extended and the tail fanned, in a distraction display much like that described above for Scalloped Antbird, and gave strong alarm calls, while the song of the male was heard nearby minutes after. Ten minutes later the female returned to the nest, but left it again soon after, and one hour later the male was incubating (Fig. 3). The habitat was secondary forest, in transition to semi-deciduous forest, with much leaf litter and relatively open undergrowth, mostly of slender trees and a regenerated structure (20 years old), 12–15 m high, near the top of a hill.

The nest was on the ground and consisted of a deep cup on a dense platform of sticks and walls of sticks and dead leaves, some of bamboo. It was placed among the bases of some plants that covered it, and supported on one side by the trunk of a bush (Fig. 4). It was also supported by a mass of leaf litter and was thus slightly elevated from the ground. Green leaves covered the nest 30 cm above it (Fig. 3). The inner cup was constructed of smaller dead bamboo leaves and other dead leaves. The cup was

lined with some brown and pale yellow fibres. Measurements of the nest are given in Table 1. The two eggs were whitish, profusely marked with dark purple spots and lines, denser at the large end (Fig 4). Measurements of the eggs are shown in Table 1.

Euler<sup>4</sup> reported a nest of this species found in November within a bamboo stand, placed atop sticks and dead leaves on the ground, consisting of a 'badly constructed cup' of twigs and leaf stalks, thus largely echoing our description. His description and measurements of the two eggs also coincide with our data.

## Discussion

From these data, it can be inferred that *M. ruficauda* breeds in the Murici area in the period following the heavy rains in midwinter. However, one nest containing two eggs was found at neighbouring Pedra Talhada Biological Reserve, Quebrangulo, Alagoas, by A. Studer<sup>3</sup> on 15 April 1985. A nest of the nominate race, containing two eggs, was found at Ituberá, Bahia, on 19 November 1974<sup>8</sup>, matching previous knowledge of this form's breeding biology<sup>3</sup>. Perhaps *M. ruficauda* lays two clutches during the course a single breeding season. Our estimate of a maximum of 8–10 days for the nestling (hatching to fledging) of *M. ruficauda*, if confirmed, would be among the lowest recorded for antbirds<sup>15</sup>.

Published descriptions of *Myrmeciza* antbird nests (Chestnut-backed *M. exsul*<sup>14,20</sup>, Ferruginous-backed *M. ferruginea*<sup>5,16</sup>, Sooty *M. fortis*<sup>18</sup>, Goeldi's *M. goeldi*<sup>17</sup>, Chestnut-tailed *M. hemimelaena*<sup>6</sup>, Dull-mantled *M. laemosticta*<sup>19</sup> and White-bellied *M. longipes*<sup>1</sup>) appear to show a range of variation with respect to their location, shape and supporting substrate, though not all descriptions provide the same amount of detail. It is noteworthy that although the nest of *M. squamosa*—the third Atlantic Forest representative of the genus—is undescribed, a detailed illustration of a bird sitting in a nest<sup>7</sup> depicts a structure very much like that described here for its putative closest relatives.

Regarding location, the nests of *M. ferruginea*, *M. fortis*, *M. goeldi*, *M. loricata*, *M. ruficauda* (and possibly *M. squamosa*, see above) were found on or near the ground. In contrast, the nest of *M. longipes* was at 1.5–2.0 m. on shrubs or tree ferns, and *M. exsul* also constructs nests supported atop some vegetable matter (such as a horizontal stem and litter), though much closer to the ground, at 0.1–0.4 m. The one described nest of *M. laemosticta* was low in a shrub, and a nest of *M. hemimelaena* was 0.28 m above ground on a small bank. Most species build a nest beside, or supported laterally by, a vertical plant shoot, such as a small understorey palm, a stem, vine or trunk, and all are supported from below. The nests of *M. exsul*, *M. goeldi* and *M. hemimelaena* seem to be rather hidden in dense

undergrowth. Instead, *M. ferruginea* and the two species of this study appear to build nests in more open situations.

The shape and construction of *Myrmeciza* nests appears consistent in that they are all open cups. Nest material seems to be similar as well, and all were constructed of dead leaves, sticks and fibres, with thin fibres, roots or rhizomorphs lining the nest cup, but never concealing its bottom. Differences seem to be in the type of structure that supports the incubation cup (being coarser or neater accumulations of plant detritus), and the extent to which these different materials are used (such as is the case with the two nests described here). The only nest that seems truly divergent is the domed nest of *M. fortis*. This type of nest does not even appear to be constructed by other species grouped with *fortis* by Ridgely & Tudor<sup>11</sup>.

Though a high level of homoplasy might be expected in nest architecture, we suggest that to some extent the perceived relative homogeneity, especially in the shape of the nests of *Myrmeciza* antbirds, arises from their brief descriptions, as well as incongruence in terminology and the extent to which details were presented by different authors. Finding the appropriate terms and presenting a clear written description is not straightforward. In this respect a degree of classification is desirable, such as exists for foraging behaviour<sup>10</sup>. However, even foraging behaviour variables cannot all be included in simple schemes, and nest characters are also difficult to analyse. For instance, we did not measure nest materials.

The nests of both Atlantic Forest species presented here are very similar to each other, and appear most similar to those of *M. ferruginea*, *M. hemimelaena* and possibly *M. squamosa*. A nest of *M. ruficauda* found in Bahia (see above) was considered to be similar in size and type to that of *M. exsul* (E. O. Willis & Y. Oniki *in litt.* 2003). Even though the nesting of several *Myrmeciza* species is now known, it still appears premature to speculate on the extent to which nest architecture identifies natural groupings, such as the subgenus *Myrmoderus*, of which *loricata* is the type. Its validity and member species must be tested using a thorough phylogenetic analysis of independent characters.

All *Myrmeciza* eggs thus far described are broadly similar, but conform to a widespread thamnophilid pattern, within which there appears to be little variation<sup>13</sup>.

Knowledge of the breeding habits of bird species is very important from several viewpoints. Beyond providing critical information to establish systematic links between species and support studies of evolution, basic data on reproduction are crucial for conservation action. In the case of *M. ruficauda*, a threatened forest species, even though

relatively common in the Murici region, it inhabits the last remaining forested patches of north-east Brazil, and we thus hope that these data contribute to conservation planning for this species, the region and other local threatened species.

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