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A NEW SPECIES OF *THAMNOPHILUS* ANTSHRIKE (AVES: THAMNOPHILIDAE) FROM THE SERRA DO DIVISOR, ACRE, BRAZIL

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Abstract.—We describe a new species of *Thamnophilus* antshrike—*T. divisorius* (Acre Antshrike)—from the Serra do Divisor of Acre, Brazil. The new species is known from a single small ridge (though we expect that it is present on other, unexplored ridges in the Acre Arch uplands), and is common in the interior of shrubby woodlands on poor soil physiognomically similar to white-sand habitats in the Guianas and Amazonia. *Thamnophilus divisorius* is sister to *T. insignis* (Streak-backed Antshrike), a narrow endemic of pantepui, and forms a well-supported clade with that species and *T. amazonicus* (Amazonian Antshrike). *Thamnophilus divisorius* occurs in a remote region within a national park in Brazil; despite its limited range, we are optimistic about its future survival. *Received 16 May 2003, accepted 24 June 2004.*

Resumo.— Descrevemos uma nova espécie de tamnofilídeo (*Thamnophilus divisorius*, Choca-do-Acre) oriunda da serra do Divisor, Acre, Brasil. A nova espécie é conhecida de apenas um único cume de serra (embora é esperada existir em outras áreas similares ainda não pesquisadas nos arredores), e é comúm no interior de bosques de vegetação baixa crescendo em solos pobres que lembram habitats de campina de areia branca e vegetações afins nos Guianas e na Amazônia. É filogeneticamente mais próximo de *Thamnophilus insignis* (Choca-de-Roraima), espécie de distribuição restrita à região de pantepui, e forma um clade com *Thamnophilus amazonicus* (Choca-canela). *Thamnophilus divisorius* ocorre numa região remota dentro de um parque nacional e, apesar de ter uma distribuição extremamente restrita, estamos otimistas sobre a sua sobrevivência no futuro.

In July 1996, the field phase of a management plan for the Parque Nacional da Serra do Divisor (PNSD) in Acre, Brazil, was initiated. The project was funded by The Nature Conservancy International of Alexandria, Virginia, and coordinated in Brazil by the national office of The Nature Conservancy in Brasília, D.F., the nongovernmental organization S.O.S. Amazônia in Rio Branco, Acre, and the national and regional offices of the Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis (IBAMA). One key aspect of the project was a rapid ecological evaluation (REA; Sobrevila and Bath 1992) of the park's flora and fauna. The ornithology section of the Museu Paraense Emílio Goeldi (MPEG) in Belém, Pará, was responsible for the avifaunal inventory; B.M.W., D.C.O., and the technician D. C. Pimentel Neto conducted the field work. Although the first phase encompassed only 18 field days, with observations divided among six sites in the northern sector of the park, we documented several species of birds previously unknown or poorly known in Brazil, including a striking *Thamnophilus* antshrike new to science, which we propose to name:

Thamnophilus divisorius sp. nov.
Acre Antshrike
Choca-do-Acre (Portuguese)

Holotype.—MPEG no. 52754; adult male, from Morro Queimado, in the Serra da Jaquirana (one of the easternmost ridges in the Serra do Divisor), above the left bank of the rio Moa in Parque Nacional da Serra do Divisor, Municipality of Mâncio Lima, Acre, Brazil (07°26′36″S, 73°40′28″W); ~500 m; collected 10 July 1996 by B.M.W., prepared by D. C. Pimentel Neto. Tape-recorded by B.M.W., Macaulay Library of Natural Sounds (MLNS),

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Cornell Laboratory of Ornithology, Ithaca, New York, no. 79060; Arquivo Sonoro Elias P. Coelho (ASEC), Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil, no. BMW 054/10; and Isler inventory, Alexandria, Virginia, no. BMW.125:21.

Diagnosis: Morphology.—Allocation of the new species to the genus *Thamnophilus* is difficult to justify objectively on the basis of morphology, because characters of diagnostic value have not been identified for the genus and because the present group of ~25 species (as currently classified) may not be monophyletic. The type species of *Thamnophilus* is *T. doliatus* (Barred Antshrike), which is barred black-and-white in the male plumage, and mostly rufous-brown in the female plumage. These factors notwithstanding, the new species is most similar morphologically to members of *Thamnophilus*. Adult males are readily distinguished from other *Thamnophilus* species by a combination of the following characters: entirely dark-bluish-gray plumage with somewhat blacker hood, wings, and tail, and mottled grayish (rather than mostly white) underwing coverts. Adult females differ distinctively from other *Thamnophilus* species in having almost uniformly bluish-gray facial region and upperparts with slightly darker wings and tail, and entirely brownish-orange underparts. Both sexes may show minute pale spots (white in male, buff-orange in female) at tips of some upperwing coverts; both sexes have small but more conspicuous spots at the tips of the outer two rectrices; those are reduced to fringes or are absent on the next one or two rectrices.

Diagnosis: Voice.—The loudsong (following Willis 1967) of *T. divisorius* is similar in pattern, structure, and auditory quality to that of *T. doliatus* (especially the nominate form), which aligns *T. divisorius* more objectively with the genus *Thamnophilus* than does its morphology. That alignment is supported anecdotally: on the morning of its discovery, *T. divisorius* was heard and tape-recorded by B.M.W. for nearly an hour before being seen, and it was clear from its song that it was an unnamed *Thamnophilus* antshrike. *Thamnophilus divisorius'* loudsong differs from the song of all other *Thamnophilus* species by the following combination of characteristics: (1) it accelerates in pace (progressively shorter internote intervals) for approximately half its duration, slowing slightly and gradually through the final two or three notes; (2) its terminal note, and often the penultimate note, is louder, longer, and of slightly higher peak frequency than the rest of the series, but does not differ dramatically in structure or tonality. Recorded calls appear to be less clearly differentiated from those of several other *Thamnophilus* species.

Distribution.—Known only from the type locality, the new species probably occurs on other, physiognomically similar ridges in the Acre (sometimes called Serra do Moa) Arch uplands in the Serra do Divisor of Acre, perhaps extending to the continuous Sierra Contamana in Ucayali, Peru (Fig. 1).

Description of holotype.—(See cover plate.) Alphanumeric color designations were determined from direct comparison with the Munsell (1994) soil color chart. Crown from base of bill to nape semi-glossy black with a few scattered albino feathers in forehead and occipital–nuchal regions; not crested. Sides of head and neck a flatter black, less intense and lacking gloss. Feathers of back and scapulars same black as sides of head, widely margined with subtly paler bluish black (nearest Gley 2, 2.5/1/5PB), imparting a weakly mottled effect, which is seen to vary with viewing angle. Rump and uppertail coverts dark bluish gray (Gley 2, 3/1/5PB). No white interscapular patch; those feathers instead dull grayish. Throat subtly grayer than sides of head but darker than remainder of underparts, which—together with black head and neck region—contributes to a weakly hooded effect. Underparts from breast to undertail coverts, including elongated, loosely integrated flank feathers, uniform dark bluish gray, concolor with rump. Upperwing coverts and tertials same semiglossy black as crown. Tiny feathers at base of outer primary whitish; feathers at bend of wing mixed gray and whitish. Underwing coverts with gray centers and whitish tips, or a single, whitish, internal band encircling gray center, producing a mottled appearance. Primaries blackish, subtly paler on outer edges (visible on folded wing), all except outermost with contrasting wide silvery-white margins 1–2 mm on inner webs, especially visible on ventral surface, those margins becoming progressively more extensive from outermost primary (which is shorter and wholly blackish) to innermost. Tail graduated, same semiglossy black as crown and upperwing coverts. Outermost rectrix with white tip 1.5 mm wide, extending to both webs; tips present but decreasing in size on next

FIG. 1. Composite LANDSAT image of the northern half of Parque Nacional da Serra do Divisor (white outline), Acre, Brazil. The single confirmed locality of *Thamnophilus divisorius*, "Morro Quiemado," is indicated by an × ; it is slightly north of the Rio Moa in the Serra da Jaquirana. The view from the ridge, looking northwest, is shown in Figure 2. The ridge system comprising the Acre Arch uplands appears as a textured band running northwest into Ucayali, Peru; a somewhat disjunct system south of the Moa appears to be lower in relief. These areas are virtually unexplored biologically. We expect that *T. divisorius* will eventually be found on most, perhaps all, of the higher ridges in the region.

three pairs of rectrices; two central pairs with worn tips but apparently lacking any white. Soft parts in life: iris clear chestnut brown; maxilla black; mandible black; legs and feet dull bluish gray; soles yellow.

Measurements of holotype.—Bill width at anterior edge of nares 4.9 mm; bill depth at anterior edge of nares 5.7 mm; culmen from anterior edge of nares 13.0 mm; culmen from base (at skull) 20.8 mm; wing chords 75.6 (left) and 76.2 (right) mm; tail 65.2 mm; tarsus 21.6 mm; mass 23.0 g. Skull 100% ossified; left testis 7.9 × 4.8 mm.

Description of allotype.—(See cover plate.) MPEG no. 52751. Crown feathers from base of bill to occipital region blackish with dark bluish gray (Gley 2, 3/1/5PB) margins, imparting a weakly mottled effect. Sides of head and malar region same dark bluish gray (auricular feathers with orangish shafts), tinged with brownish on sides of neck. Remainder of upperparts uniform dark bluish gray, with individual feathers darkest toward center. Feathers of chin and throat deep ochraceous with cream-white center and gray base, such that throat

appears mottled; face versus throat contrast is strong. Remainder of underparts deep ochraceous or brownish orange (7.5YR 5/8), washed subtly darker at sides of breast (7.5YR 4/6) and brightest in midbelly. Underlying flank feathers extensively bluish gray with brownish-orange tips. Upperwings same blackish as crown; most lesser, median, and greater wing coverts weakly tinged brownish orange on outer webs near tips, not sufficiently strongly to form wingbars or a clear pattern of margination. Primary coverts blackish. Outer webs of inner primaries, secondaries, and tertials also faintly tinged brownish orange. Tiny feathers at bend of wing, and underwing coverts, same brownish-orange as breast and belly. Primaries blackish, marked with same pattern of pale margination on outer webs as in holotype, but color somewhat more buff (near 7.5YR 8/4). Tail as in holotype but pale tips limited to outer rectrix, reduced in size, and buff-orange instead of white. Soft parts in life: iris clear chestnut brown; maxilla dark gray; mandible dark gray with pale-horn base (visible only from below); legs and feet dull bluish gray, soles yellow.

Measurements of allotype.—Bill width at anterior edge nares 4.7 mm; bill depth at anterior edge nares 5.6 mm; culmen from anterior edge nares 11.5 mm; culmen from base (at skull) 20.6 mm; wing chords 71.6 (left) and 70.9 (right) mm; tail 63.8 mm; tarsus 21.0 mm; mass 22.7 g. Skull 100% ossified; ovarian mass 4.2 × 2.1 mm; size of largest ovum not recorded, oviduct smooth.

Specimens examined: Skins.—Thamnophilus divisorius: Brazil, Acre (four males, three females, one sex unknown; MPEG nos. 52748–52755). In addition, plumages of specimens of all other species of *Thamnophilus* were compared visually at the MPEG, Louisiana State University Museum of Natural Science (LSUMZ), and the Academy of Natural Sciences of Philadelphia (ANSP), though it was not possible to compare specimens at the latter directly with those of the new species.

Specimens examined: Tape recordings.—Thamnophilus divisorius: Brazil, Acre (7, representing at least 13 individuals and 4 vocalization types). All specimens were tape-recorded prior to collection. Recordings of all other species and most subspecies of *Thamnophilus* were compared superficially. Recordings of *T. divisorius* have been or will be deposited at MLNS, ASEC, MPEG, and the antbird research inventory of Phyllis and Morton Isler.

Biochemical specimens.—MPEG voucher specimen numbers, followed by biochemical sample numbers, are 52749 (PNSD 223), 52750 (PNSD 224), 52751 (PNSD 225; allotype), 52752 (PNSD 226), 52753 (PNSD 227), and 52754 (PNSD 228; holotype). Samples of liver and heart tissue are preserved in plastic tubes containing 20% DMSO and EDTA buffer solution, and are currently stored at MPEG. Among many tissue samples analyzed in construction of a phylogeny of the genus *Thamnophilus*, especially pertinent to this description were those of *T. amazonicus* (Amazonian Antshrike; LSUMZ No. B13045) and *T. insignis* (Streak-backed Antshrike; LSUMZ No. 7486).

Etymology.—The name *divisorius* is an latinized adjectival form of the Portuguese word *divisor* (i.e. boundary) and is given in recognition of the great importance of the Parque Nacional da Serra do Divisor, where the new antshrike was discovered. The English name, Acre Antshrike, and the Portuguese *Choca-do-Acre,* call attention to the Brazilian state of Acre where the park is located and where the state government plays a critical role in environmental protection of a large area of western Amazonian Brazil.

REMARKS

Variation in the type series.—The type series comprises the eight specimens listed above. Three adult males vary slightly from the holotype in having minute white spots or tiny whitish fringes on the outer webs at the tips of some (especially innermost) greater upperwing coverts. These whitish markings are discernible only on close examination. Specimen MPEG no. 52755 also has a tiny whitish fringe on the outer web of two scapular feathers, and MPEG no. 52752 has a single albino crown feather. The latter specimen also shows the most clearly defined blackish hood of all. Among females, MPEG nos. 52749 and 52750 show slightly less blackish in the crown than the allotype (described above). The most notable variation in the series of four female-plumaged specimens (including MPEG no. 52748, which is sex unknown, and represented by only the head and part of the upper breast, and most of one wing) is seen in the upperwing coverts. Specimen MPEG no. 52748 has pale brownish-orange fringes on the lesser, median, and greater coverts; no. 52749 has rather distinct orange-buff spots on the

outer webs of the median and greater coverts. The allotype and MPEG no. 52750 are closely similar, though the latter has slightly more distinct pale margins on the tertials. All specimens were judged to have 75–100% ossified skulls except female no. 52750, which was unossified. That specimen, a juvenile, also had the smallest ovary mass (2.3 × 1.1 mm) of the three known females. That its plumage so closely matches that of the allotype, which is apparently an adult female, indicates that the juvenal plumage of the female (at least) is almost indistinguishable from that of the adult female. Males have a well-developed hook with a slightly basad notch at the tip of the maxilla, which seems to be more formidable (for the bird's size) than those of most other *Thamnophilus* antshrikes. Female maxillas appear to be less strongly hooked, but there are no significant morphometric differences between the sexes. Some standard measurements are presented in Table 1.

Habitat.—The region of serras that straddles the Brazil–Peru frontier (the Serra do Divisor in Brazil) is known geologically as the Acre (or Serra do Moa) Arch and is postulated to be Mio-Pliocene in age (Jordan 1983, Mégard 1984). *Thamnophilus divisorius* is known from a single ridge in the more restricted Serra da Jaquirana, the easternmost of a series of narrow, roughly north–south ridges in the Serra do Divisor, which rises abruptly above a vast, level plain cloaked in tall forest (Fig. 2A). Soil here is extraordinarily thin, sandy, and well-drained owing to highly vertical relief and millenia of rainwater surface denudation. What little soil remains is buried beneath a deep humus of leaf litter and springy root masses. Consequently, plant diversity is limited and trees are conspicuously shorter in comparison with the surrounding forest, which is only slightly downslope. On the ridgeline, trees grow in high density; however, most are <20 cm diameter at breast height (dbh) and <15 m tall, with narrow canopies. Most taller trees are in the family Fabaceae. Understory is dominated by two species of plants: (1) extensive, homogeneous stands of an unidentified, smooth-leaved, 0.5–1 m tall, light-green terrestrial bromeliad; and (2) scattered thickets of *Gleichenia* sp. ferns intertwined with thin vines and tree trunks (Fig. 2B). Plants form impenetrable thickets where the broken canopy permits sunlight to reach the understory for much of the day. Several species of melastomes were also among the most common understory plants. A lightning strike that occurred in 1995 (information from local residents) burned ~0.25 ha of forest at the crest of the ridge and was hot enough to completely kill all vegetation. Vegetation on the poor soil had barely begun to grow back several months later (July 1996).

This floristically simple, low-stature ridge forest is physiognomically similar to "stunted woodland" habitats found on the upper slopes of summits across pantepui and in the white-sand "Amazon caatinga" habitats described in Anderson (1981). It is likewise similar to the varillal woodland described by Whitney and Alvarez (1998) and Alvarez and Whitney (2003), who also highlighted the patchy distribution of those habitats in Amazonia and their contribution to *terra firme* habitat mosaicism and overall species diversity of birds. Interestingly, *T. divisorius* was not found by B.M.W. during three days in April 1997 in a much more extensive, generally taller, and biologically more diverse "Amazon caatinga" woodland ~100 km east-southeast of the type locality (or ~50 km west-northwest of the town of Cruzeiro do Sul). Some areas of that caatinga woodland were structurally similar to

Table 1. Some standard measurements of *Thamnophilus divisorius*.

	Culmen[a] (mm)	Wing chord[b] (mm)	Tail (mm)	Tarsus (mm)	Body mass (g)
Male	20.6 (range: 20.1–21.5) (n = 4)	72.8 (range: 70.8–76.2) (n = 4)	63.2 (range: 61.3–65.2) (n = 2)	21.0 (range: 20.5–21.6) (n = 4)	22.3[c] (range: 21.0–23.0) (n = 3)
Female	20.0 (range: 19.6–20.6) (n = 3)	70.8 (range: 70.3–71.6) (n = 3)	63.2 (range: 61.6–64.3) (n = 3)	20.8 (range: 20.6–21.0) (n = 2)	22.1 (range: 21.0–22.7) (n = 3)

[a]From base at skull.
[b]Both wings measured, with longest measurement included here.
[c]Lightest male (21.0 g) missing tail.

FIG. 2. Parque Nacional da Serra do Divisor, Acre, Brazil. (A) View from the easternmost ridge in the Serra da Jaquirana at "Morro Queimado," type locality of *Thamnophilus divisorius* (marked × in Fig. 1), looking northwest over the system of ridges forming the Acre Arch. The ridges are narrowly capped with a homogeneous shrubby woodland growing on deeply weathered soil physiognomically very different from forest only slightly downslope. The long, high ridge on the horizon, which is probably the one visible in Fig. 1 at ~07°22'S, 73°48'W, would be especially interesting to explore. (B) Microhabitat of *T. divisorius* at the type locality. Thin-trunked trees with narrow canopies partially shade a nearly impenetrable growth of an unidentified bromeliad and *Gleichenia* ferns. Photograph was taken in a relatively open place. (Photos by B.M.W., July 1996.)

the ridge forest (though the ground was level and poorly drained, with none of the unidentified terrestrial bromeliad present); almost all of the avian species encountered on the ridge were also found in the caatinga woodland. Although only one small area of the woodland was briefly surveyed, *T. divisorius* is such a conspicuous species by voice that we suspect that its apparent absence may be real. Multiple tape-recording playbacks of loudsongs from the type locality failed to elicit a response.

Behavior and ecology.—*Thamnophilus divisorius* is a common bird but is generally secretive and difficult to detect except by its vocalizations. Pairs foraged apart from mixed-species flocks (few of those were encountered on the ridge), keeping mostly within ~3 m (often within 1 m) of the ground within forest. Some individuals rose to as high as ~8 m after tape-recording playback. Birds advanced with short hops, stopping briefly on both horizontal (usually) or vertical perches, and frequently "hitched" (following Whitney and Pacheco 1994) upward on thin trunks and vines before hopping or flying a short distance to a new perch. Most foraging attack maneuvers were reaches and gleans to woody and herbaceous substrates within a few centimeters of the head, but males were twice seen to perform upward sally-strikes or sally-pounces of ~1 m in range to the undersides of leaves (terminology follows Remsen and Robinson 1990). Those strikes involved violent contact of the foreparts of the bird with foliage. Small arthropods were captured several times, including at least one caterpillar and a green orthopteran ~3 cm in length, which was beaten vigorously against a limb before being swallowed whole. Thus, foraging behavior was much like that of many other species of *Thamnophilus* (Whitney et al. pers. obs.). *Thamnophilus divisorius* did not display any distinctive wing or tail motions.

Vocalizations.—The loudsong (n = 6 adult males, 3 adult females, and 1–2 of unknown sex and age recorded) of *T. divisorius* is an unevenly paced series of approximately 15–25 (usually ~20) structurally similar notes that accelerates gradually, then slows slightly through the final two or three notes, the whole song lasting about 2 s (Fig. 3A). As the series accelerates, it also drops slightly in frequency (<0.3 kHz), then rises just slightly more than that through the final five or so notes to finish at ~2.0 kHz. The first note is separated from the second by an interval of 0.1–0.2 s, which is longer than that between any other pairs of notes. The terminal note, and often the penultimate, are structured like other notes of the series, but are both louder and slightly longer, as well as peaking at the highest frequency of all. Female loudsongs (specimens collected to document sex) are slightly lower in frequency (0.2–0.3 kHz) than those of males, as judged by the peak frequency of the terminal note.

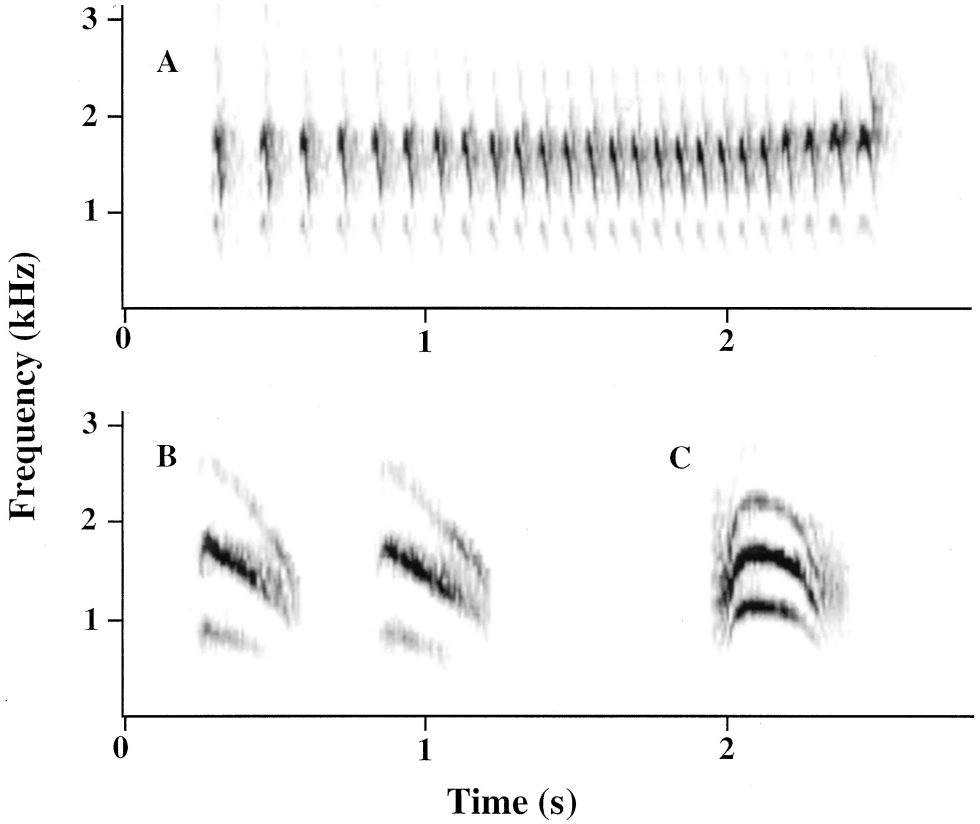

Fig. 3. Sound spectrograms of the three principal vocalizations recorded for *Thamnophilus divisorius*. (A) Typical male loudsong showing high-intensity terminal note. (B) Unmodulated two-note call, which is also given singly. (C) Unmodulated *caw* call with pronounced harmonics.

Three types of calls were recorded. One is a short, unmodulated (following Isler et al. 1998), slightly descending note with weak harmonics that is sometimes delivered in pairs, the two notes being separated by ~0.25 s (n = 2 recordings; Fig. 3B). It was given repeatedly on one occasion by an adult male after collection of either its mate or an offspring (sex and age not determined for that specimen). The most commonly heard call (n = 3 recordings) was a short, throaty growl believed to be homologous to the *caw* call described for the *T. punctatus* complex by Isler et al. (1997). The *caw* of *T. divisorius* is an unmodulated, nearly symmetrically hill-shaped note with pronounced harmonics (Fig. 3C). It is given by both sexes and appears to function primarily to communicate heightened awareness, such as when a potential threat is detected (e.g. a nearby observer). It is not normally delivered during routine foraging. The final call type recorded for *T. divisorius* is a quiet chatter, which was given by a juvenile (MPEG no. 52750) as it accompanied an adult male and female. The sound is almost certainly a food-solicitation call.

Phylogenetic relationships and origin.—DNA sequences from the mitochondrial cytochrome-*b* (951 base pairs [bp]), ND2 (1,013 bp), and ND3 (332 bp) genes, and from the nuclear introns 5 (528 bp) and 7 (939 bp) of the beta fibrinogen gene, were collected from the holotype (PNSD 228) and analyzed phylogenetically with sequences from other currently recognized species of *Thamnophilus.* Missing were some of the recently elevated forms of *T. punctatus* (Isler et al. 1997). Detailed methodologies on molecular data collection and analysis are available from R.T.B. or can be found in a forthcoming publication on the molecular systematics of *Thamnophilus* antshrikes.

A Bayesian analysis (Huelsenbeck and Ronquist 2001) of the combined data using a GTR+G+I model resulted in 100% support for a sister relationship between *T. divisorius* and *T. insignis*, a restricted-range species found in the tepuis of southern Venezuela, Guyana, and northern border regions of Brazil (Zimmer and Isler 2003). Those two species form a well-supported clade with *T. amazonicus*, which occurs in lowland forest habitats, almost exclusively in blackwater and clearwater drainages, through most of the Amazon basin and Guianan shield (B. M. Whitney pers. obs.). The relationship was also found in the most likely tree (–ln L = 6357.9) from a heuristic search of the combined data using a GTR+G+I model (Swofford 2003). Although the tissue samples of *T. amazonicus* (from eastern Santa Cruz, Bolivia) and *T. insignis* (from Cerro de la Neblina, Amazonas, Venezuela) were collected at points distant from type localities of those taxa, voucher skins were examined; we are confident that they provided results that allowed accurate placement in the phylogeny, even if they should be subject to splitting at the species level in the future.

Thamnophilus divisorius, isolated in the Acre Arch ridge system and widely disjunct *T. insignis*, on the slopes of tepuis, have undergone a high degree of differentiation. Raw sequence divergence at cytochrome-*b* between *T. divisorius* and *T. insignis* was 7.9%; their sister relationship is thus rather distant. Morphology and vocalizations in *T. divisorius*, *T. insignis*, and *T. amazonicus* are not very helpful in recovering relationships, especially in regard to *T. divisorius*. However, the three species have maintained one common characteristic: all occupy structurally and physiognomically similar habitats that have especially nutrient-poor soils. The ability of ancestral stocks to colonize these floristically impoverished habitats (ridge forest in Acre, melastome-dominated woody scrub forest on the slopes of tepuis) has, in the case of the *T. amazonicus* clade, led to marked diversification at the species level.

Conservation.—The entire known population of *T. divisorius* is officially protected in the PNSD. The park encompasses one of the most biologically diverse areas on Earth. It covers a vast region (605,000 ha) and is located in the middle-western sector of upper Amazonia, including much of the Acre Arch uplands. Because PNSD comprises a remarkable diversity of forest habitats, it may help elucidate the speciation of many birds and mammals in particular, and the evolutionary history of Amazonian habitats in general. And because of its location in this region of Amazonia, PNSD contains forests and rivers that are important for migrating and overwintering birds from both the northern hemisphere (including Central America and northern South America), and from breeding areas well to the south in Bolivia, Paraguay, and Argentina. Unfortunately, however, PNSD includes only the left bank of the Rio Juruá. Because the river could prove to be an important barrier to genetic exchange between populations of birds and mammals (as are many other long rivers in the Amazon basin), the park should be expanded to encompass all representative habitats on the right bank of the river. For example, populations of the saddleback tamarin (*Saguinus fuscicollis*) and monk saki monkey (*Pithecia monachus*), both highly distinctive primates with sister-taxon replacements across the middle-upper Juruá, are unprotected east of the river.

Several important challenges must be met if PNSD is to maintain its integrity. All have to do with pervasive and increasing manmade alterations to the forest and rivers. These alterations include subsistence practices such as clearing of forest for homesteads and cultivation of food crops, raising of livestock, and hunting, which have been going on for decades in some areas. Although subsistence activities have steadily degraded the resources over the years, commercial practices have a more immediate and devastating potential. Those practices include wholesale timber extraction, hunting with trained dogs and highly skilled trackers for commercial sales in population centers such as Cruzeiro do Sul, gold mining, capture of parrots and other birds and mammals for the pet trade, and smuggling of narcotics and contraband from Peru.

Several hundred families live within the borders of PNSD, mostly along the rios Juruá, Azul, and Moa. Plans for relocating the residents to areas outside the park boundaries are underway, with orientation from the Brazilian National Colonization and Agrarian Reform Agency (INCRA). The first station for monitoring the park is being built and will be manned by local residents. These initiatives and the full implementation of the park's management plan,

including an ecotourism component, lead us to be optimistic about conservation prospects for the region's extraordinary biodiversity.

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