

position of the male. The aggressiveness and therefore the hierarchical position of a male relates to the presence of a chick. Pairs without chicks tend to be lower in the order. For example, the dominant pair of the 5 marked pairs had 1 chick in 1977. In 1978, they were chickless and were dominated by 2 previously subordinate pairs, both with chicks.

The frequency of agonistic encounters involving adult Florida cranes increased during the period when young of the previous year were separated from the family group (February and March). The frequency remained high until just before the eggs hatched, then the level declined and the number of encounters remained low until several weeks after hatching. This lowered aggression period corresponds with the period in which Bennett (Auk 95:411–413, 1978) noticed little response from territorial cranes to the play back of tape recorded calls.

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Notes on the Slender Antbird.—The Slender Antbird (*Rhopornis ardesiaca*), first collected somewhere in eastern Brazil by Prince Maximilian von Wied (Beiträge zur Naturgeschichte von Brasilien, Vol. 3, 1831), was until recently known from 3 specimens: the male type, another male from Ituaçu, in south-central Bahia, and a female from the town of Boa Nova just down the Rio de Contas (Naumberg, Bull. Am. Mus. Nat. Hist. 76:231–276, 1939). Emil Kaempfer collected the last 2 specimens in 1928. Naumberg suggested that Kaempfer's "Boa Nova" was another town with the same name, northwest across the Rio São Francisco; but Kaempfer was at the second Boa Nova in 1927, not 1928. Moreover, Wied is likely to have collected the type near the first Boa Nova, which he passed en route from Vitória da Conquista to Salvador.

From 3–9 December 1974, we studied Slender Antbirds in patches of dry forest on Fazenda Alvorada, just north of the first Boa Nova (14°20'S, 40°11'W). A good, if scattered, population exists in these patches, which are gradually being cleared for cattle pastures. In 1977, H. Sick collected a male at Boa Nova after we mentioned our observations to him.

Habitat and foraging.—Boa Nova lies at 700 m elev., below 800–1000 m ridges of the northern end of a broad plateau that stretches southwest past Vitória da Conquista nearly to the valley of the Rio Pardo in the state of Minas Gerais (Fig. 1). This plateau is the main ridge of southeastern Bahia, forming a border between wet coastal forests (which include some patches of dry forest in the upper basins of small rivers) and the desert scrub or "caatinga" of the interior.

The natural vegetation of this rolling plateau varied within short distances from wet cloud forests (1500–2000 mm annual rainfall) on the eastern escarpments to caatinga in such rain-shadow areas as the lee slopes around Boa Nova, but the summit was mainly a dry forest (800–1000 mm rainfall) with many "cipós" or lianas—a "mata de cipó." The scattered remaining patches of dry forest have a strange appearance, with scattered white trunks of small trees above a dense layer of midstory trees and vines. The understorey is fairly open, but blocked here and there by lianas and by patches of huge terrestrial bromeliads (*Aechmea* sp.). In the forest, bromeliads tend to sit high on tree trunks; but at the borders between dry

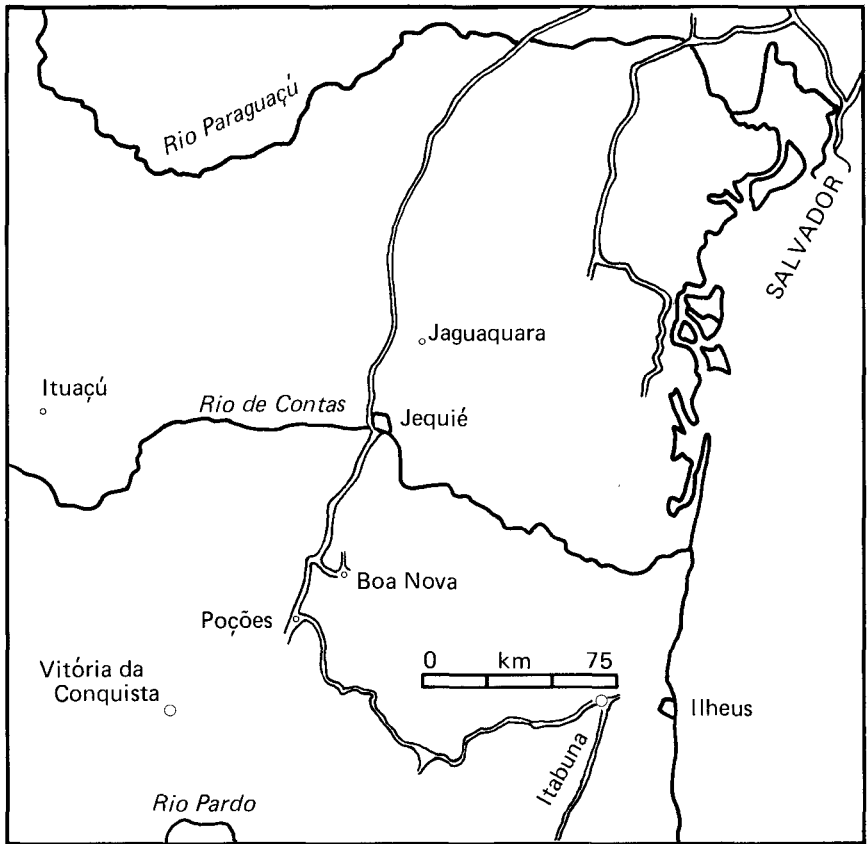


FIG. 1. Coastal Bahia, Brazil, showing the region inhabited by Slender Antbirds. The only roads shown are ones traveled by the authors.

forest and caatinga, or between dry forest and pastures, there is enough light for the bromeliads to descend to the ground. These bromeliads, and surrounding undergrowth near the forest edge, are the habitat of Slender Antbirds.

Just inside the forest borders—occasionally in tall scrub nearby—the antbirds hop on the ground, low vines and on the tops of bromeliad leaves, pausing now and then to swipe dead leaves from atop the bromeliads or from spots on the ground. They wander silently much of the time, peering up and down and capturing small grasshoppers or other insects by short flights or by hopping down to peck. We found them surprisingly like Gray Catbirds (*Dumetella carolinensis*) of North America in their appearance and actions, although they stay on the ground much more.

Members of a pair wander separately or together, often disappearing among the dense bromeliads for 15 min or more, only to reappear less than 5 m from where they entered. Each pair we watched seemed to have a very limited home range, barely 50 m across; but home ranges of pairs were usually separated by 100 m or more because patches of bromeliads

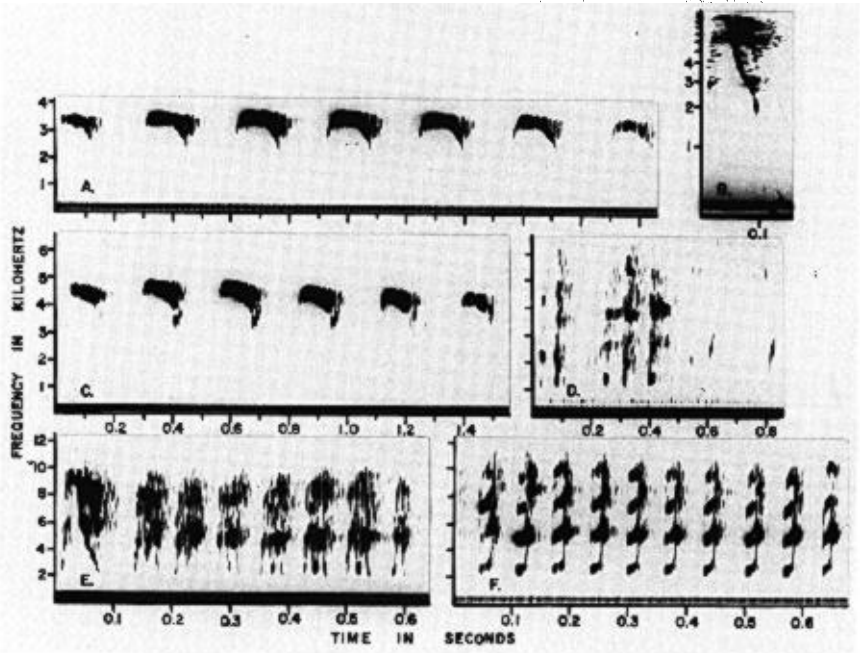


FIG. 2. Audiospectrographs of Slender Antbird vocalizations: (A) song of male; (B) alarm chip (logarithmic scale); (C) song of female; (D) faint chirps and grunts of a pair; (E) rattle, starting with a chip; (F) rattle of another bird.

were seldom close together. Occasionally we found birds hopping on the ground through fairly open undergrowth between patches of bromeliads, and once 2 such pairs were singing as they hopped along a presumed territorial boundary. In the center of the main forest tract of Fazenda Alvorada, we encountered only 1 bird near a bromeliad zone in a treefall clearing. Maximum densities were in a rather scrubby second-growth woodlot, where pairs were 100–200 m apart.

We found no *Rhopornis* following army ants within the main woodlot; there the related White-winged Fire-Eyes (*Pyriglena leucoptera*) and White-bibbed Antbirds (*Myrmeciza loricata*) split the niche of the Slender Antbird. Its niche is essentially that of another slender and long-legged forest-edge antbird, the White-bellied Antbird (*M. longipes*), a species that follows army ants occasionally in Panama, Trinidad and other areas.

Song and vocal behavior.—The simple and loud *peer peer peer peer peer* song of Slender Antbirds (Fig. 2A, C) is audible up to 500 m from the forest edge, and seems well adapted for birds that live widely scattered along forest edges in isolated patches of dense cover. Songs began 15–60 min after the first light and after the first songs of other diurnal birds, hence between 05:20 and 06:00. Sessions of song were irregular, mostly during the morning; few birds sang at any time. Songs were rare after 13:00 or 14:00. Often the male started singing when the female disappeared, she would finally answer him a few times, and the two would move together again. One male sang off-and-on for nearly 2 h (05:40–07:30)

until the female appeared. At times, 2 males or 2 pairs sang back and forth for short periods, mostly in boundary disputes.

When the pair met and foraged close together, they exchanged faint *sif* or *prit* and other notes (Fig. 2D), some rather like the "bubbling" call of White-backed Fire-Eyes. The male occasionally started a "serpentine-song" of the type common in antbirds: an alternating series of slow and fast chirps, *eu, eu, u-u-u-u-u, eu, eu, eu, eu . . .* and so on. One male fed his mate a small grasshopper after serpentine-singing. Another pair carried small insects to a patch of bromeliads and rattled repeatedly at the observer; but on other days the female rattled only near another patch of bromeliads. Otherwise there was no evidence of breeding activity.

Individual birds varied widely in their reactions to us. Some foraged quietly and tamely, others quickly fled to dense vegetation and others scolded vigorously. None was as difficult to observe as are antbirds of the rain forest, perhaps because Slender Antbirds live next to good cover rather than in open undergrowth. The usual alarm calls are a sharp chipping and a loud rattling. Chipping is a loud sibilant *tsiek!* or *psief!* (Fig. 2B) as the bird pounds the tail downward before or after fleeing to cover. At times the call becomes a loud *feeyou!* or *phew!*, perhaps a different note. An approaching or mobbing bird opens the beak widely and rattles loudly, *wi-i-i-i-i-dit!* (Fig. 2E, F). The song and all these alarm calls are like calls of Black-headed Antbirds (*Percnostola rufifrons*), but also resemble calls of antbirds of the genera *Myrmeciza* and *Pyriglena*. The song and rattle are especially like those of all the species of *Pyriglena*, and can be confused with notes of *Pyriglena leucoptera* at Boa Nova. The songs of Narrow-billed Antbirds (*Formicivora theringi*), common in lower midlevels of dry forest at Boa Nova, are like slow and faint versions of the songs of Slender Antbirds. Competitive mimicry (Cody, *Ann. Rev. Ecol. Syst.* 4:189–211, 1973) in voice seems possible, although the 3 species do not overlap much in foraging.

Conservation.—Dry forest in central southern Bahia is rapidly being cleared for cattle, according to CEPLAC, the Cocoa Institute at Itabuna and Renato Aragao, former director of the Institute Brasileiro de Desenvolvimento Florestal at Salvador. The initial stages of clearing for cattle, creating many zones of forest edge, probably benefit Slender Antbirds. However, patches of forest are decreasing in size and length of edge. At Fazenda Alvorada, cutting a corner of the woodlot near the ranch houses to plant corn and beans had trapped 1 pair of Slender Antbirds in a patch 50 × 100 m. Early each morning they hopped out through newly felled trees, searched a bit and gave alarm notes, and soon returned to bromeliads in the decreasing bit of forest. Another edge of the main woods was recently cleared to plant introduced grass, even though wide areas of pasture nearby were reverting to scrub. On the far side of the main woodlot, a neighbor was also clearing new areas. One can see cleared slopes all around Boa Nova, so the fate of Slender Antbirds is certainly in doubt. The pattern in similar areas in São Paulo state has been to clear all forests, then plant eucalyptus or pine for crops when hills start to erode and pastures are no longer worth weeding.

Slender Antbirds should be kept on the Endangered or Vulnerable lists of the International Council for Bird Preservation. Another species restricted to mata-de-cipó, *Formicivora theringi*, should probably be added to the list. A forest reserve of mata-de-cipó is certainly desirable, just as it would be good to have reserves in all distinctive types of vegetation, or even better to preserve a natural framework of vegetation in all regions. One idea for Boa Nova would be a reserve in conjunction with an agricultural experiment station, which is needed on the plateau because of its distinctive climate, soils, etc. The problem remains that species often disappear from reserves (Willis, *Ecol. Monogr.* 44:153–169, 1974), especially small ones. While the Slender Antbird has dense populations and may resist extinction, it could be lost.

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Notes on the Uniform Crake in Costa Rica.—Although the Uniform Crake (*Amaurolimnas concolor*) is found from Mexico to Bolivia and Brazil, and formerly occurred on Jamaica, virtually nothing is known of its habits. During fieldwork in 1971–1973 at Finca La Selva, in the wet lowlands of NE Costa Rica, I obtained information on the behavior and vocalization of this elusive bird, as well as the first unequivocal data on nesting of the species.

Although not reported for La Selva by Slud (Bull. Am. Mus. Nat. Hist. 121:49, 1960), the Uniform Crake is fairly common in forested swamps, heavy vine-tangled thickets along forested streams and in dense second growth adjoining forest, especially favoring the maze of hanging dead and decaying leaves in *Heliconia* thickets (cf. also Orians and Paulson, Condor 71:426, 1969; Kiff, Condor 77:101, 1975). In these dense, tangled habitats, the birds are not particularly shy and may approach a motionless observer closely, but seldom leave the densest available cover.

In life, *A. concolor* resembles a diminutive wood-rail (*Aramides* sp.) in build, posture and soft-part colors: red iris, greenish-yellow bill and orange to reddish legs. The bird usually has an erect stance and walks with head high and tail cocked, except while foraging. The tail may be pumped in agitation and is carried low as the bird scurries, mouselike, across an opening. The birds forage deliberately, walking slowly and pecking into leaf litter, hanging dead leaves and detritus. Apparently they also dig in soft mud, as I have observed birds with obviously muddy beaks on several occasions. I have seen Uniform Crakes seize, beat and swallow spiders (Lycosidae), a very small frog (*Eleutherodactylus* sp.) and a small lizard (*Anolis* sp.), which was killed with a few swift pecks, then swallowed headfirst.

Like *Aramides* wood-rails, the Uniform Crake possesses loud, arresting whistled calls that often provide the only clue to its presence. To date I have noted the following vocalizations:

(a) A series of 6–9 clear, upslurred whistles, in which successive notes first become louder and higher pitched, then accelerate, drop in pitch and fade away—*tooeee*, *Tooeee*, *Toooeee*, *TOOOEEE*, *Tooee*, *tooee-tuee-tui*. A bird giving this call was often answered by another some distance away. I could often decoy single birds to within 1–2 m by imitating it; this call is probably a territorial advertisement or “song.” At very high intensities (as when answering my imitation at very close range), the loudest notes of the call often had a flutelike break in the middle: *toourlee*, etc.

(b) At close range in the last-mentioned situations a soft, low-pitched, pigeon-like *cuuuuuuu* is audible, possibly an aggressive note.

(c) Two birds, perhaps a mated pair, may call back and forth with one or several clear, not very loud, whistled *toooo* notes, either level in pitch or slightly downslurred.

(d) A sharp, nasal *kek* is given by a startled bird.

The loud “song” of *A. concolor* was heard at La Selva chiefly from late August to December, which is probably the breeding season. On 14 November 1973, I found a nest with eggs in an area where I had seen and heard much *A. concolor* activity in the preceding 2 months.