



Adult males of *Antilophia galeata* (left) and *Antilophia bokermanni* sp. Nov. (right). Painting and pictures by Galileu Coelho.

A new species of *Antilophia* (Passeriformes: Pipridae) from Chapada do Araripe, Ceará, Brazil

Galileu Coelho¹ and Weber Silva²

¹Universidade Federal de Pernambuco, Departamento de Zoologia, Av. Prof. Moraes Rego, 1235, 50670-420, Recife, Pernambuco, Brasil.

²Universidade Federal do Ceará, Laboratório de Herpetologia, C.P. 52856, 60151-970, Fortaleza, Ceará, Brasil.

Recebido em 15 de maio de 1998; aceito em 17 de agosto de 1998

RESUMO. Uma nova espécie de *Antilophia* (Passeriformes: Pipridae) da Chapada do Araripe, Ceará, Brasil. Uma nova espécie de soldadinho, do gênero *Antilophia* (Pipridae), é descrita com base em dois espécimes (um macho e uma fêmea) coletados nas florestas úmidas da Chapada do Araripe, Ceará, Brasil. A nova espécie difere de *Antilophia galeata*, sua espécie-irmã amplamente distribuída nas florestas de galeria e semi-decíduas da região do cerrado, principalmente pela cor dominante da plumagem do macho adulto, que é branca ao invés de negro. A descoberta desta nova espécie reforça a necessidade de se criar uma grande unidade de conservação de uso indireto (reserva biológica ou parque nacional) para proteger a biodiversidade da Chapada do Araripe.

PALAVRAS-CHAVE: Aves, *Antilophia*, Pipridae, Ceará, Brasil

ABSTRACT. We describe a new species of Neotropical manakin of the genus *Antilophia* (Pipridae) based on two specimens (a male and a female) from the humid forests of the Chapada do Araripe, Ceará, Brazil. The new form differs from *Antilophia galeata*, its sister-species, which is widely distributed in the gallery and semi-deciduous forests of the cerrado region, mostly by the dominant color in the adult male plumage, which is white rather than black. The discovery of this new species highlights the need to protect permanently a large area of the Chapada do Araripe by creating a large biological reserve or a national park.

KEY WORDS: Aves, *Antilophia*, Pipridae, Ceará, Brazil.

The genus *Antilophia* (Pipridae) has only one species (Helmeted Manakin, *Antilophia galeata*), whose range encompasses gallery and semi-deciduous forests of central Brazil, eastern Bolivia and northeastern Paraguay (Pinto 1944, Sick 1984, Ridgely and Tudor 1994; figure 1). This species is regarded as endemic of the Cerrado Region (Silva 1995).

One of us (GC) heard a vocalization similar to that of the Helmeted Manakin in a humid forest located at the base of the Chapada do Araripe, near Nascente do Farias (7°19'57"S, 39°24'45"W), Barbalha, Ceará, on 19 November 1994 and 20 November 1995. In December 1996, we recorded the vocalization and made the first sight records of the bird. It resembled a Helmeted Manakin in both shape and behavior, but differed completely in plumage color. In May 1997, one of us (WS) collected two specimens. After comparisons with specimens of Helmeted Manakin from the collection of the Museu Paraense Emílio Goeldi (MPEG), we found that this bird represented a new species that we describe as:

Antilophia bokermanni sp. nov.

Araripe Manakin

Soldadinho-do-Araripe

Holotype: Ornithological Collection of the Universidade Federal de Pernambuco, number 1130, collected by Weber

Silva on 18 May 1997 in the Chapada do Araripe, Nascente do Farias (7°19'57"S, 39°24'45"W), Arajara district, municipality of Barbalha, Ceará, Brazil, ca. 800 m above sea level. The specimen is an adult male (testes 2 x 1 mm, skull completely pneumatized).

Diagnosis. *Antilophia bokermanni* can be distinguished from its nearest relative *A. galeata* by the following characters: (a) adult male with plumage basically white rather than black, with the exception of the remiges and rectrices, which are black, and the top of the head and upper back, which are Carmine (#8; capitalized color names and numbers from Smithe 1975); (b) adult female with throat, belly and undertail coverts paler (Grayish-Olive, #43) than *A. galeata* (Olive-Green, #48).

Description of the holotype: Plumage basically white, with remiges and rectrices black. Bend and edge of the wing white. Pileum Carmine (#8) narrowing from the nape toward the interscapular region; base of pileum feathers is white. Forehead with projected feathers, a bit longer than the bill. Underwing coverts white. Upperwing coverts mostly white with some feathers presenting the inner vane black. Uppertail and undertail coverts white. Soft part colors: bill Cinnamon-Brown (#33) x Olive-Brown (#28); iris Russet (#34); tarsus and feet Dusky Brown (#19).

Measurements of the holotype (in mm): total length 155.0;

culmen from the base 13.3; wing (flattened) 78.0; tail 66.0; tarsus 18.0.

Paratype: Ornithological Collection of the Universidade Federal de Pernambuco, number 1131, collected by Weber Silva on 17 May 1997 in the same locality of the holotype. The specimen is a subadult female (ovarium 6 x 2 mm, skull 75% pneumatized).

Description of the paratype: Upperparts Greenish-Olive (#49), throat and breast Greenish-Olive, belly Grayish-Olive (#43). Remiges Brownish-Olive (#29) x Dark-Grayish Brown (#20) with the edges Grayish-Olive. Upper surface of the rectrices Brownish-Olive x Dark-Grayish-Brown with edges Greenish-Olive. Lower surface a bit paler than the upper surface. Projected feathers of the forehead a bit shorter than the bill.

Measurements (in mm): Total length 150.0, culmen 13.6, wing (flattened) 76.0, tail 59.0 and tarsus 18.6.

Etymology: It is a great pleasure to name this distinctive neotropical manakin for the late Dr. Werner C. A. Bokermann (1929-1995), in honor of his significant contributions to Brazilian zoology, including several important papers about the natural history of Brazilian birds (see Alvarenga 1995).

Range: Known only from the type-locality (figure 1).

Natural History: *Antilophia bokermanni* inhabits tall and evergreen second-growth forests in the surroundings of the

Nascente do Farias, the latter located within a small cave at the base of the Chapada do Araripe. There is no reason to suppose that this species is restricted to this special place. Thus, we predict that it will be found in similar habitats around Chapada do Araripe.

Antilophia bokermanni was found generally in pairs in the understory of the forest or near the forest edge, moving occasionally to open areas nearby, such as low second-growth forest or isolated bushes. We recorded *A. bokermanni* feeding on small fruits (*Cordia* sp., Boraginaceae) at the edge of the forest. The song of *A. bokermanni* is very similar to that of *A. galeata*, as it is also composed of a distinctive series of fast notes with rollicking cadence (Ridgely and Tudor 1994). A comparison of one song sample of *A. bokermanni* with samples of *A. galeata*, shows a remarkable difference in the modulation of the first three notes, which is always increasing in *A. galeata* (fig. 2A) but decreasing in *A. bokermanni* (figure 2B). Despite this difference, we suggest that more samples are required to evaluate if these differences are an artifact of the small sample available for comparisons.

REMARKS

Antilophia bokermanni is a very distinctive species in a genus that was, until now, regarded as monotypic. Prum (1992) suggested *Chiroxiphia* as the sister-genus of

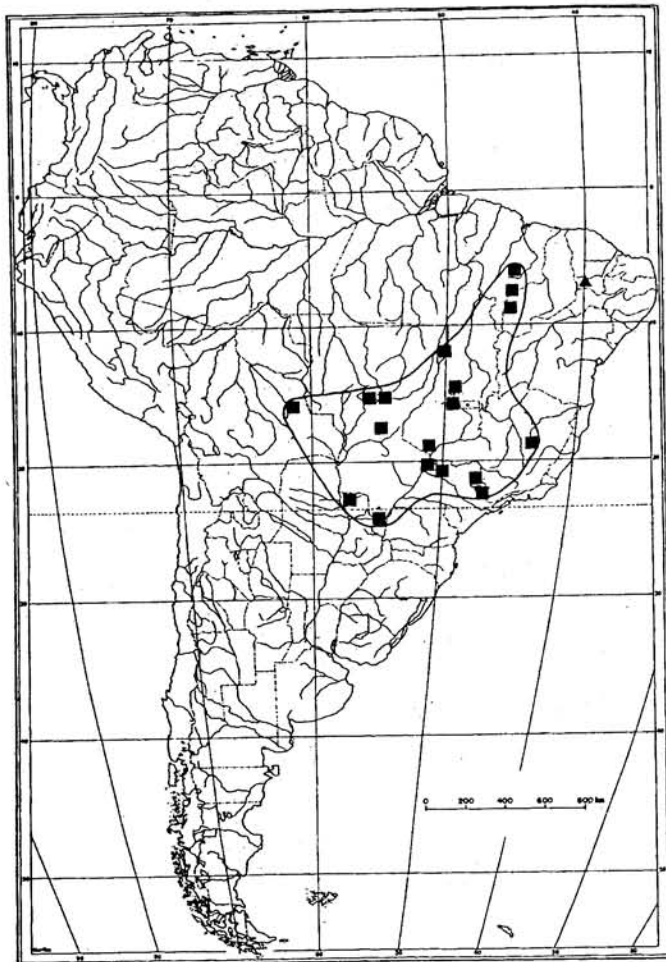


Figure 1. Ranges of *Antilophia bokermanni* (triangle) and *A. galeata* (squares).

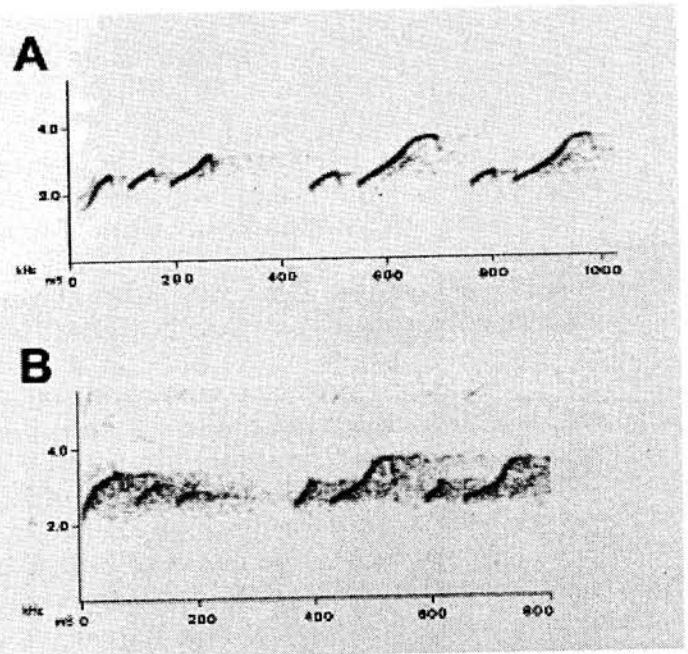


Figure 2. Sonograms of (A) *Antilophia galeata* (JV 141/6, recorded by J. Vielliard on 21 March 1975 in Olhos D'Água, Minas Gerais; deposited at the Arquivo Sonoro Elias Coelho, Universidade Federal do Rio de Janeiro), and (B) *Antilophia bokermanni* (recorded by Galileu Coelho on 15 December 1996 in Nascente do Farias, Araripe, Barbalha, Ceará). Sonograms were prepared by Luiz Antônio Pedreira Gonzaga, in the Bioacoustics Laboratory of the Department of Zoology, Universidade Federal do Rio de Janeiro, using the software Canary (Bioacoustics Research Program, Cornell Laboratory of Ornithology, U.S.A.). The sounds were digitalized in 44.1 kHz, 16 bits; filter bandwidth 267 Hz; window function blackman.

Table 1. Measurements of *Antilophia bokermanni* and *A. galeata*. For *A. galeata*: means are indicated in the first line with standart deviation in parenthesis, range in the second line, and sample size in the third line.

Species	Sex	Culmen	Wing	Tail	Tarsus
<i>A. bokermanni</i>	Male	13.3	78.0	66.0	18.0
	Female	13.6	76.0	59.0	18.6
<i>A. galeata</i>	Male	13.2 (0.3)	77.4 (3.6)	67.6 (4.5)	19.4 (1.2)
		12.6-13.6	70.0-81.0	57.9-72.0	17.4-21.0
		8	8	8	8
	Female	13.2 (1.2)	74.7 (4.1)	63.4(3.2)	18.6 (0.4)
		12.0-14.4	70.1-78.0	60.8-67.0	18.3-19.0
		3	3	3	3

Antilophia, based on a cladistic analysis of the syringe morphology of almost all Neotropical manakins. An analysis of the syringe morphology of *A. bokermanni* will be a useful tool to evaluate this phylogenetic hypothesis.

Measurements of *A. bokermanni* are within the variation found in *A. galeata* (table 1), except for the female's tail, which is smaller in *A. bokermanni* than in *A. galeata*. Measurements of a large series of both species are required to determine if this difference is statistically significant.

One could suggest that *A. bokermanni* is a hybrid, such as several odd Neotropical manakin taxa described in the last century (Parkes 1961). This hypothesis, however, can be rejected for two reasons. First, we recorded three individuals around the type locality, all of which had the distinctive white plumage of *A. bokermanni*. Second, the only manakin recorded in Chapada do Araripe, other than *A. bokermanni*, is *Neopelma pallescens* (Nascimento 1996), a species whose shape and plumage color have very little in common with the new species.

The discovery of this new species in the Chapada do Araripe adds urgency to the proposal that a large area of this region should be permanently protected. The Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) has a 39,000 ha National Forest located within the Chapada do Araripe, the Araripe National Forest, surrounded by a large Environmental Protection Area (Área de Proteção Ambiental – APA). However, Brazilian National Forests and Environmental Protection Areas cannot be regarded as places of permanent protection, as they lack the legal basis to prevent future exploitation and disturbance (Fearnside and Ferraz 1995).

The Chapada do Araripe was included among the areas with highest priority for conservation (Conservation International *et al.* 1994) by the participants of Brazil's Northeastern Atlantic Forest Workshop. Wege & Long (1995) indicated the Chapada do Araripe as one of the key

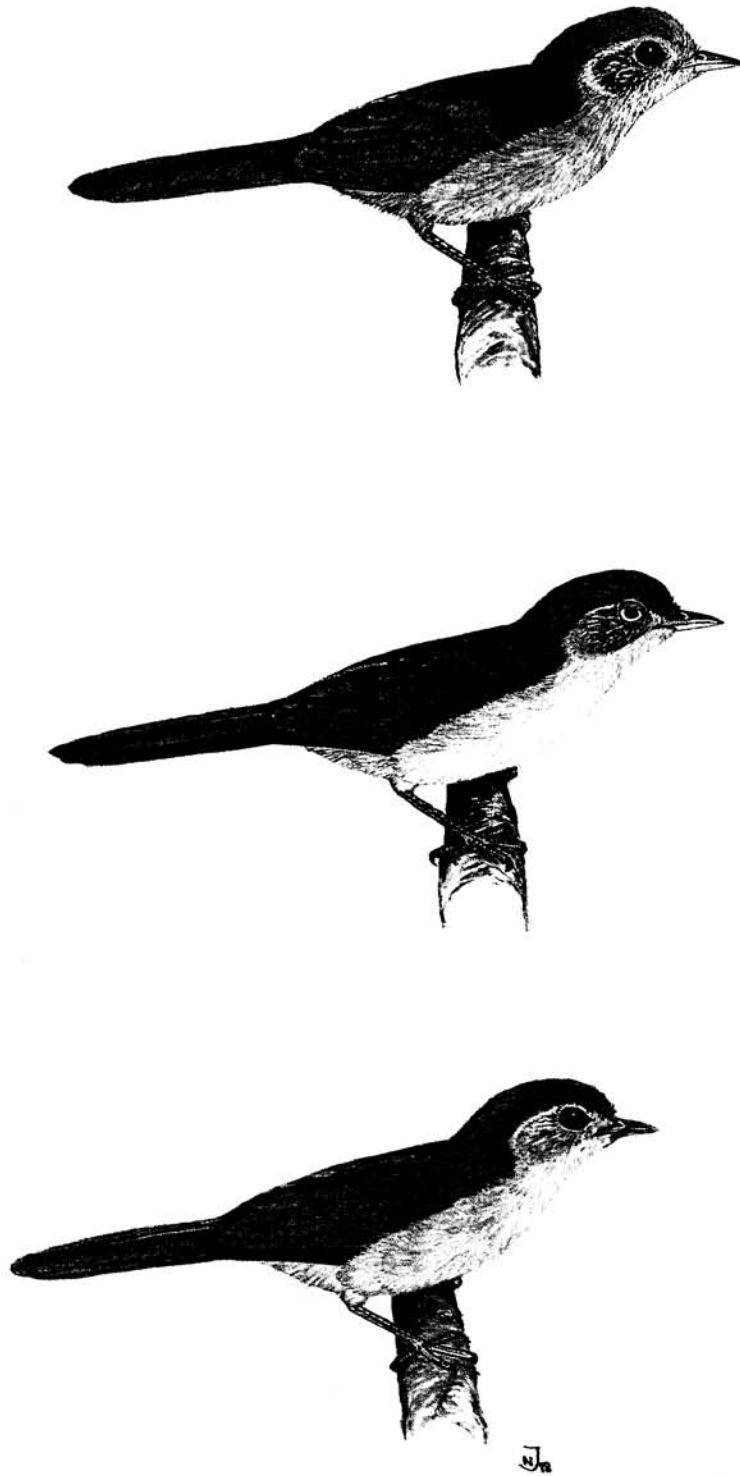
areas in the Neotropical Region for the protection of threatened birds. Based on these informations, we suggest that the Araripe National Forest and a large portion of the Environmental Protection Area should be converted to a place of permanent protection (*e.g.*, Biological Reserve or National Park), which will prevent future logging within the limits of this important area. In addition, the government of the states of Ceará and Pernambuco could provide economic incentives for landowners to create a buffer zone around this protected area. In this buffer zone, experiments could be developed to identify sustainable management strategies to provide an economic return to the local population as well as to stop the ever-growing loss of the biological resources of the Chapada do Araripe through illegal deforestation.

ACKNOWLEDGMENTS

We thank Dr. José Maria C. da Silva (UFPE) for guidance, criticism and support during the development of this project. Roberto Otoch helped WS in organizing a field trip to Chapada do Araripe, prepared the specimens and suggested the species name. Cícera Azevedo identified the plant used by *A. bokermanni*. Dante Teixeira sent important references to GC. Celso Ximenes provided us with the geographic coordinates of the type locality. For tireless assistance in the field, we thank Sandoval Costa and his son João Everardo Costa. We are extremely grateful to Luiz Pedreira Gonzaga, from Universidade Federal do Rio de Janeiro (UFRJ), who prepared the sonograms, and to Fundação José Bonifácio, which provided support to the Arquivo Sonoro Elias Coelho (ASEC), UFRJ. We thank Elizabeth Höfling, Regina Macedo and an anonymous referee for comments that improved the manuscript. Finally, we are very grateful to Dr. Antônio Saraiva, a great conservationist and owner of the ranch where we found the new species. He provided us with all manner of support during our field trips.

REFERENCES

- Alvarenga, H. M. F. (1995) In memoriam: Werner C. A. Bokermann. *Ararajuba* 3:101-102.
- Conservation International, Fundação Biodiversitas and Sociedade Nordestina de Ecologia (1994) *Prioridades para a conservação da biodiversidade da Mata Atlântica do Nordeste* (mapa síntese).
- Fearnside, P. M. and J. Ferraz (1995) A conservation gap analysis of Brazil's Amazonian vegetation. *Conservation Biology* 9:1134-1147.
- Nascimento, J. L. X. (1996) *Aves da Floresta Nacional do Araripe, Ceará*. Brasília: IBAMA.
- Parkes, K. C. (1961) Intergeneric hybrids in the family Pipridae. *Condor* 63:345-350.
- Pinto, O. M. O. (1944) *Catálogo das aves do Brasil*, 2ª parte. São Paulo: Secretaria de Agricultura.
- Prum, R. O. (1992) Syringeal morphology, phylogeny, and evolution of the neotropical manakins (Aves: Pipridae). *American Museum Novitates* 3043:1-65.
- Ridgely, R. and Tudor, G. (1994). *Birds of South America*, vol. 2. Princeton, New Jersey: Princeton Univ. Press
- Sick, H. (1984) *Ornitologia brasileira, uma introdução*. Brasília: Editora Univ. Brasília.
- Silva, J. M. C. (1995) Biogeographic analysis of the South American Cerrado avifauna. *Steenstrupia* 21:49-67.
- Smithe, F. B. (1975) *The Naturalist's color guide and supplement*. New York: American Museum of Natural History.
- Wege, D. C. and A. J. Long (1995) *Key areas for threatened birds in the Neotropics*. Cambridge: BirdLife International.



Acima: *Hylophilus poicilotis* (MN 35169) provenientes do Rio de Janeiro; ao meio, *H. amaurocephalus*, espécime também coletado no Rio de Janeiro (MN 38613); e abaixo, *H. amaurocephalus*, espécime proveniente da Bahia (MN32090). O desenho mostra parte do polimorfismo apresentado pela última espécie. Prancha: Jorge B. Nacinovic (nacinovi@pontocom.com.br).