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A CRYPTIC NEW SPECIES OF ANTPITTA (FORMICARIIDAE: *GRALLARIA*) FROM THE PERUVIAN ANDES

GARY R. GRAVES[1]

ABSTRACT.—Two morphologically similar antpittas, *Grallaria rufula* and *G. blakei*, sp. nov., are sympatric on Cordillera Colan and Cordillera Carpish in the Peruvian Andes. These taxa appear to replace one another elevationally: *G. rufula*—2590 to 3450 m; *G. blakei*—2135 to 2470 m. *G. blakei* differs from Peruvian populations of *G. rufula* in having barring on the lower belly and much darker reddish-brown plumage. A unique specimen from the geographically isolated Cordillera Yanachaga may represent an undescribed subspecies of *G. rufula* or *G. blakei*, or an undescribed third species. *Received 30 June 1986, accepted 7 Nov. 1986.*

Four or more antpitta species of the genus *Grallaria* occur along an elevational gradient at nearly every humid forest locality in the main chain of the Andes from Venezuela and Colombia south to northern Bolivia. Up to eight species have been collected along an elevational gradient in the Central Cordillera of the Colombian Andes. In this region and others, the morphological distinction between sympatric species has been clear-cut. The only taxonomic difficulty regularly encountered has been deciding the status of allopatric taxa (e.g., Schulenberg and Williams 1982).

Here I report an exception to previously known patterns in the genus. Two morphologically similar antpittas occur sympatrically in at least two localities along the forested Amazonian slope of the Eastern Andes in Peru. One of these taxa is *Grallaria rufula*, a widespread, polytypic, high-elevation (2300–3350 m) species. The other taxon represents an undescribed cryptic species with a more restricted geographic distribution and

[1] Dept. Vertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

Two small rufous sympatric Peruvian antpittas of the genus *Grallaria*, *G. blakei*, sp. nov. (upper) and *G. rufula* (lower) from a mixed media painting by John P. O'Neill.

lower altitudinal range (2135–2470 m). Specimens of the new species were first collected in the Cordillera Carpish, Department of Huánuco, in the 1960s. Although Tallman (1974) incorrectly identified these as *Grallaria rufula obscura,* he noted that they were larger and darker than specimens of *G. rufula* collected at higher elevations and suggested that two biological species were involved.

Populations of the new species are easily separated by plumage from Peruvian and Bolivian populations of *G. rufula*; however, some specimens of *G. rufula* from western Colombia are more similar in overall appearance to the new species than they are to Peruvian and Bolivian populations of *G. rufula.* To determine to which taxon the Colombian birds can be assigned, I revised *G. rufula* on the basis of morphology, plumage, and elevational distribution (Graves, in prep.). This preliminary study indicated that the Colombian birds represent an undescribed taxon, presumably a subspecies of *G. rufula,* and that the new species is apparently restricted to Peru. In this paper I focus on the most easily resolvable systematic issue—the discrimination of sympatric species in the Peruvian Andes.

Grallaria blakei, sp. nov.

CHESTNUT ANTPITTA

HOLOTYPE.—Louisiana State University Museum of Zoology No. 64228; adult female from the east slope of the Cordillera Carpish, near the Carretera Central, ca 2400 m, Department of Huánuco, Peru; collected 17 August 1968 by John P. O'Neill; original number 3292.

DIAGNOSIS.—*Grallaria blakei* is similar to *Grallaria rufula* in color of plumage and size and shape, but may be distinguished from all populations of *G. rufula* by possessing the following combination of characters: dark reddish-brown dorsum, head, and breast, without contrasting feather tips (clay colored [*G. r. saltuensis*] to dark brown in *G. rufula*); indistinct barring on feathers of lower belly (unmarked or with teardrop shaped markings in *G. rufula*); dark brown undertail coverts (white to dark brown in *G. rufula*); thicker bill and tarsi; and by lacking a contrasting eyering or prominent central stripes on flank feathers.

DESCRIPTION OF HOLOTYPE.—All color comparisons were made under Examolites® (Macbeth Corp.). The crown, nape, back, scapulars, wings, rump and tail are uniform brown; averaging Chestnut (capitalized color names are from Ridgway 1912), and brightening to Burnt Sienna on the preocular region, orbital feathers, auriculars, throat, and breast; and merging into Cinnamon-Brown and then Prout's Brown on the flanks, thighs, and undertail coverts. The center of the lower belly is light buffy-gray; the outer portion of the feathers banded with indistinct darker gray bars. Soft part colors in life: bill black, iris brown, feet and tarsi slate.

MEASUREMENTS OF HOLOTYPE (mm).—Wing chord, 78.5; bill length (from anterior edge of nostril), 11.0; bill width (anterior edge of nostril), 5.4; tarsus length, 38.0; narrowest medio-lateral width of tarsus, 1.6; middle toe length (sum of outer two phalanges and claw), 21.8.

DISTRIBUTION.—Known from three localities (Fig. 1) in the Eastern Andes of Peru: (1) the north-facing slope of the Cordillera Carpish, below Carpish Pass, Department of

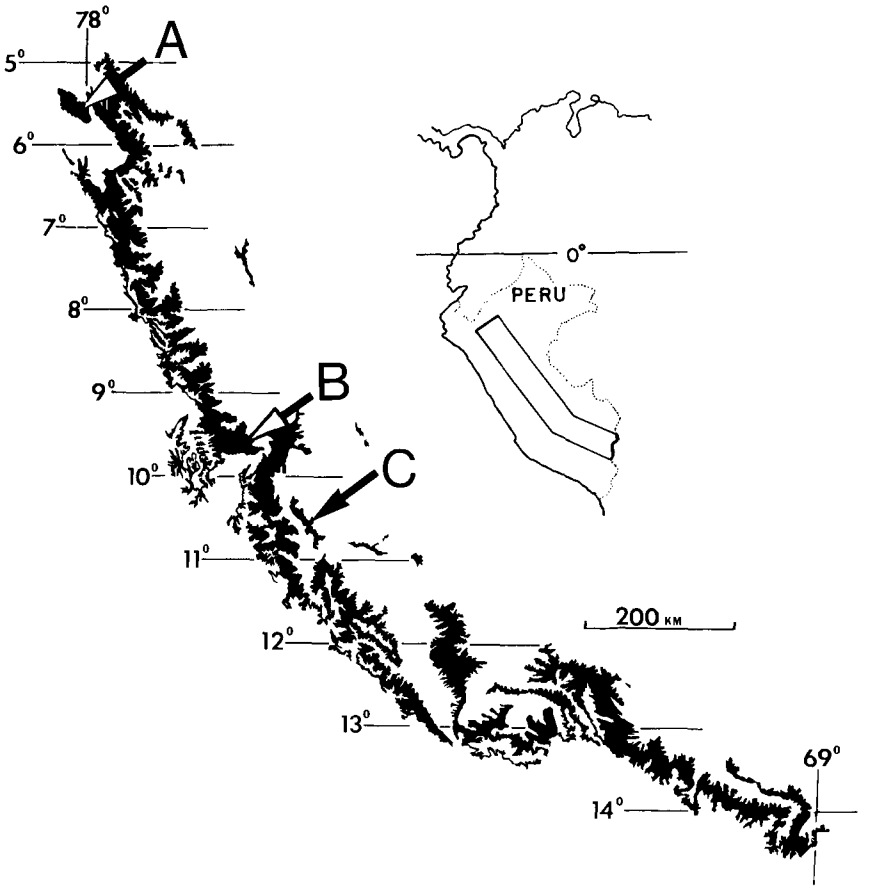

FIG. 1. Specimen localities for *Grallaria blakei* (A, B) and species indeterminate (C) in humid forest (ca 1200–3400 m) along the eastern slope of the Peruvian Andes. A. Specimens collected NE Florida and on Cordillera Colán, Dpto. Amazonas. B. Cordillera Carpish, Dpto. Huánuco. C. Cumbre de Ollón, Dpto. Pasco. Adapted from Graves (1985).

Huánuco, 2135–2400 m (FMNH No. 275632; LSUMZ Nos. 64228, 74096, 74098, 75098, 75243); (2) Cordillera Colán, SE La Peca, Department of Amazonas, 8100 ft (2470 m) (LSUMZ No. 88068); and (3) 30 (road) km NE Florida, Department of Amazonas, 2200 m (LSUMZ No. 116973). Probably occurs more or less throughout the intervening area.

SPECIMENS EXAMINED.—*G. rufula*: Colombia: (by mountain range and department): Sierra Nevada de Santa Marta—Magdalena (CM 1 ♂, 2 ♀♀; USNM 1 ♂, 2 ♀♀). Serranía de Perijá—La Guajira/Cesar (USNM 2 ♂♂, 2 ♀♀). Eastern Cordillera—Norte de Santander (FMNH 2 ♂♂); Santander/Boyacá (CM 2 ♂♂; USNM 1 ♂, 1 ♀); Cundinamarca (AMNH 2 ♂♂). Central Cordillera—Risaralda/Quindío (AMNH 3 ♂♂); Cauca (ANSP 1 ♀; FMNH 2 ♂♂); Nariño (ANSP 1 ♂, 1 ♀; FMNH 1 ♀). Western Cordillera—Antioquia (AMNH 1 ♀; USNM 1 ♀); Cauca (AMNH 1 ♀; LACM 1 ♀).

Ecuador: (AMNH 11 ♂♂, 4 ♀♀; ANSP 2 ♂♂, 1 ♀; LSUMZ 1 ♂; UMMZ 1 ♂; MVZ 2 ♂♂, 1 ♀; MLOC 1 ♂).

Peru: (by department): Piura/Cajamarca (AMNH 2 ♂♂, 1 ♀; LSUMZ 3 ♂♂, 5 ♀♀; USNM 1 ♂). Amazonas (LSUMZ 8 ♂♂, 3 ♀♀). San Martín/La Libertad (LSUMZ 1 ♂, 6 ♀♀). Huánuco (north of Río Huallaga) (ANSP 1 ♂, 1 ♀; FMNH 2 ♂♂, 1 ♀; LSUMZ 5 ♂♂, 4 ♀♀). Huánuco (south of Río Huallaga)/Pasco (FMNH 1 ♀; LSUMZ 11 ♂♂, 14 ♀♀). Junín/Ayacucho (AMNH 3 ♂♂, 1 ♀; LSUMZ 2 ♂♂, 4 ♀♀). Cuzco (AMNH 1 ♀; FMNH 2 ♀♀; LSUMZ 5 ♂♂, 2 ♀♀; USNM 3 ♂♂, 3 ♀♀). Puno (LSUMZ 3 ♂♂, 5 ♀♀).

Bolivia: (by department): La Paz (LSUMZ 7 ♂♂, 3 ♀♀). Cochabamba (ANSP 1 ♀; CM 1 ♂; DMNH 1 ♀; LSUMZ 6 ♂♂, 6 ♀♀).

Species indeterminate: Peru: Cumbre de Ollón, Dpto. Pasco (LSUMZ 1 ♀).

ETYMOLOGY.—I take great pleasure in naming this new species for Emmet Reid Blake of the Field Museum of Natural History for his many significant contributions to our knowledge of the systematics, taxonomy, and biogeography of Neotropical birds.

DISCUSSION

Plumage variation.—There is no consistent sexual difference in plumage among the Carpish specimens of *Grallaria blakei.* One specimen (LSUMZ No. 74098 ♂, 2 August) has traces of streaked juvenal plumage scattered over the head, nape, throat, wing coverts, and breast. Another (LSUMZ No. 75243 ♂, 22 November) has a few juvenal feathers on the hind crown. The characteristic barring on the lower belly of adult *G. blakei* is present in both of these specimens.

Two specimens from the Department of Amazonas (Cordillera Colán, LSUMZ No. 88068 ♀; NE Florida LSUMZ No. 116973 ♀) differ from those of the type locality in having brighter underparts and less distinct barring on the lower belly. Montane forest is nearly continuous along the Amazonian slope of the Eastern Andes from the Río Marañón south to the Huallaga canyon; thus, these populations are probably in direct genetic contact. Were it not for this hypothesized, but unproven, cline in plumage characters, the Amazonas population could be validly described as a new subspecies.

A single specimen (LSUMZ No. 106081, ♀; wing chord, 79.8; culmen length, 11.2; bill width, 5.2; tarsus length, 39.9; tarsus width, 1.6; middle toe, 24.6) recently collected at 2500 m on Cumbre de Ollón, ca 12 km east of Oxapampa, Department of Pasco, may represent an undescribed subspecies of either *G. blakei* or *G. rufula,* or perhaps an undescribed third species. It is darker above than any of the known populations in the *rufula-blakei* species complex and lacks the ventral markings characteristic of *G. blakei.* Cumbre de Ollón is near the summit of the Cordillera Yanachaga, an outlying range separated from the main Andes by the Río Santa Cruz Valley (Schulenberg et al. 1984). T. Schulenberg (in litt.) recorded a single-noted call (song?) which he believed was given by the same taxon collected earlier by D. Wiedenfeld. Both Schulenberg and T.

Parker indicate that this vocalization was unlike that given by any population of *G. rufula* known to them. As unequivocal *G. rufula* was neither seen, netted, nor heard in this locality, the "rufous" population of *Grallaria* in the Cordillera Yanachaga is apparently an allopatric isolate. Although I suspect that this population is closely allied with *G. blakei,* more data are needed for a definitive analysis and taxonomic description.

A skeletal specimen (LSUMZ 70234) identified as *G. rufula* was collected at Ccarapa (2485 m), on the road from Tambo to the Río Apurímac, Department of Ayacucho, approximately 300 km southeast of the Cordillera Yanachaga. Along the same road, Weske (1972) recorded *G. rufula* from 3000 to 3600 m. Because of the robustness of the cleaned maxilla (bill width = 4.7 mm) and tarsometatarsus (tarsus width = 1.5 mm) and low elevation of collection, I suspect that this specimen represents the same taxon as the Cordillera Yanachaga specimen or perhaps *G. blakei.* Unfortunately, the individual was not fully adult (incompletely ossified ends of the long bones) and could not be compared profitably with the few available skeletons of *G. rufula.*

The two specimens taken south of the Río Huallaga suggest that *G. blakei* and its allies have a latitudinal range of at least 900 km along the eastern slope of the Peruvian Andes.

Reproductive condition.—None of the adult specimens from the Cordillera Carpish was in reproductive condition (LSUMZ No. 74097 ♂, 10 August; FMNH No. 275632 ♂, 21 October; LSUMZ No. 64228 ♀ (type), 10 August; LSUMZ No. 74096 ♀, 12 August). The female collected NE Florida (29 November) had an enlarged ovary (10 × 8 mm) with 3 mm ova. These data, and the occurrence of individuals with traces of juvenal plumage in August and November, suggest that breeding may be seasonal, probably from December through April or May.

Vocalizations.—Although the vocalizations of *G. rufula* are relatively well known, those of *G. blakei* have not yet been identified. For example, no songs or calls attributable to either *G. blakei* or *G. rufula* are known from the lower part (<2500 m) of the Paty Trail in the Cordillera Carpish, where only *G. blakei* has been collected (T. Parker, pers. comm.). Attempts to identify the vocalizations of *G. blakei* should be given high priority.

Morphological variation.—Measurements of females and males of *G. blakei* overlap in our small series (Table 1). *G. blakei* is statistically distinguishable ($P \leq 0.05$) from sympatric populations of *G. rufula* in several morphological characters (e.g., bill length, tarsus length, bill width). In general, *G. blakei* appears to be slightly more robust than *G. rufula.* This is expressed in the significantly wider bill and thicker tarsus of *G. blakei.*

A representation of *G. blakei* and *G. rufula* in multivariate morphological space is shown in Fig. 2. Separate Principal Component Analyses

TABLE 1

RANGES AND MEANS (±SD) OF MEASUREMENTS OF SYMPATRIC POPULATIONS OF *G. RUFULA* (CORDILLERA COLÁN SOUTH THROUGH CORDILLERA CARPISH) AND *G. BLAKEI* (WITHIN EACH SEX, CHARACTER MEASUREMENTS OF EACH SPECIES WERE COMPARED WITH STUDENT'S *t*-TEST)

Characters	Males		Females	
	rufula (N = 16)	sp. nov. (N = 4)	*rufula* (N = 13)	sp. nov. (N = 4)
Wing chord	78.8–84.3	81.1–85.2	78.2–84.5	78.5–83.8
	81.3 (1.7)	83.2 (1.8)	81.6 (1.5)	81.6 (2.3)
Culmen length[a]	10.0–12.1[d]	11.0–11.9	9.9–12.0	10.5–11.0
	10.9 (0.5)	11.6 (0.4)	10.9 (0.6)	10.8 (0.2)
Bill width[a]	4.2–5.2[f]	5.3–5.6	4.2–5.2[e]	5.3–5.6
	4.8 (0.2)	5.5 (0.1)	4.9 (0.3)	5.5 (0.1)
Tarsus length	40.2–43.6[d]	42.7–43.4	39.3–43.2	38.0–42.2
	41.7 (1.0)	43.1 (0.3)	41.4 (1.3)	40.5 (1.8)
Tarsus width[b]	1.4–1.6[d]	1.5–1.8	1.4–1.6[e]	1.5–1.8
	1.5 (0.1)	1.6 (0.2)	1.5 (0.1)	1.7 (0.1)
Middle toe[c]	20.9–23.7[e]	23.3–24.8	21.5–23.3	21.5–23.3
	22.5 (0.9)	24.0 (0.6)	22.4 (0.5)	22.2 (0.8)

[a] Measured from anterior edge of nostril.
[b] Narrowest medio-lateral point on tarsometatarsus.
[c] Sum of outer two phalanges and claw.
[d] $P < 0.05$.
[e] $P < 0.01$.
[f] $P < 0.001$.

were performed on pooled groups of males (N = 80) and females (N = 66) (Table 2). In the plot of PCA scores for females, one sympatric *G. rufula* (LSUMZ 92475, Mashua, 3350 m, Dept. La Libertad) falls within the envelope outlined by the small sample of *G. blakei.* Although this specimen has a relatively thick bill (bill width = 5.0 mm) and tarsi (1.6 mm), the plumage shows no trend toward *G. blakei* in either color or pattern. Two specimens from allopatric populations in the Western Cordillera of Colombia (and the Cumbre de Ollón specimen) have high PCA I scores. They are very similar in external morphology to *G. blakei* but differ in several distinctive plumage characters and were collected at or above the upper elevational limit of that species (2400 and 3150 m). Nothing is known of these populations in life, and although I provisionally refer these to *G. rufula,* they may represent yet another undescribed species in the *rufula* complex. Males of *G. blakei* are relatively isolated from sympatric and allopatric populations of *G. rufula* in principal component space.

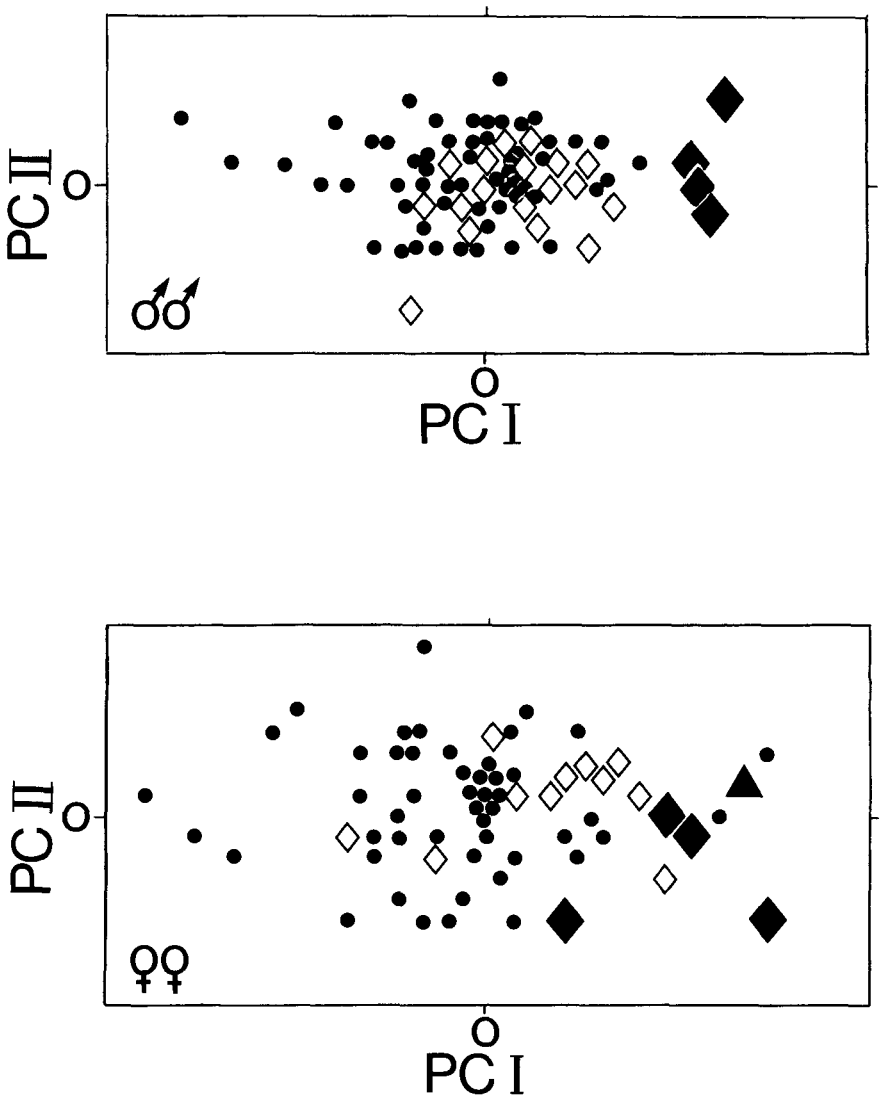

FIG. 2. Bivariate plots of factor scores for the first two unrotated principal components extracted from correlation matrices. Solid diamonds = *Grallaria blakei*. Solid triangle = species indeterminate from Cumbre de Ollón. Hollow diamonds = sympatric *G. rufula* (Cordillera Colán south to Cordillera Carpish). Solid circles = allopatric *G. rufula* (from localities beyond the known range of *G. blakei*).

TABLE 2
FACTOR LOADINGS FOR THE FIRST TWO PRINCIPAL COMPONENTS FROM SEPARATE ANALYSES OF MALES AND FEMALES

Variable	Males		Females	
	I	II	I	II
Wing chord	0.247	0.354	0.703	0.076
Bill length	0.706	0.327	0.446	−0.473
Bill width	0.771	0.194	0.808	−0.153
Tarsus	0.588	−0.606	0.388	0.785
Tarsus width	0.301	0.701	0.595	−0.457
Middle toe	0.708	−0.456	0.358	0.694
Variance explained				
Percent	38.9	22.3	33.0	26.0
Cumulative	38.9	61.2	33.0	59.0

Behavior and ecology.—All specimens of *G. blakei* have been netted or shot within 2 m of the forest floor in dense cloud forest. T. J. Davis noted that the stomach of one specimen (LSUMZ 116973) netted in "dense, stunted, humid forest" contained beetle remains. No other ecological information was recorded on specimen tags, and field observations have been limited to brief glimpses of individuals immediately before they were collected. As such, *G. blakei* is the most poorly known of the *Grallaria* species occurring in Peru.

In both localities where *G. blakei* and *G. rufula* are known to be sympatric, a distributional hiatus is found between their known elevational ranges: Cordillera Colán, *G. rufula*—2590 to 3290 m, *G. blakei*—2470 m; Cordillera Carpish, *G. rufula*—2740 to 3450 m, *G. blakei*—2135 to 2400 m. Whether this gap is real or an artifact of sampling is not known. Field parties should devote special effort to tape-recording the calls and collecting any "rufous" antpitta encountered below 2600 m.

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COLOR PLATE

The Frontispiece painting by John P. O'Neill has been made possible by an endowment established by George Miksch Sutton.