

A REVISION OF THE GENUS FORMICARIUS BODDAERT.

BY

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The present attempt to elucidate the species and local forms of the Genus *Formicarius* was brought about by a peculiar combination of circumstances. The U. S. National Museum has for a long time possessed specimens of two forms from Central America, one represented by specimens from Costa Rica and Nicaragua; the other by examples from Panama; and, although unquestionably distinct forms, all were labelled "*Formicarius hoffmanni*." Further, while *F. hoffmanni* was described from a Costa Rica specimen, the description made it clear that the Panama birds in the National Museum and not those from Costa Rica represented that species, a fact to be explained only on the supposition that this Panama form extended into some part of Costa Rica from which the National Museum had no specimens, perhaps, on the Pacific side, a hypothesis which specimens recently received from the Costa Rica National Museum have proven to be correct. To add to my perplexity, the leading authorities on Neotropical ornithology ascribed another species (*F. analis*) to Costa Rica which could not be recognized among the many specimens examined. In short, I found it quite impossible to properly label the material examined with the assistance of Volume xv of the "Catalogue of Birds in the British Museum," or that portion of the *Biologia Centrali-Americana, Aves*, including this genus.

After bringing together a series of nearly sixty specimens, however, from various collections, the matter is made quite clear regarding a number of doubtful points, though the material is still far from adequate for a satisfactory treatment of the subject, immense areas of South America and considerable portions of Central America being absolutely unrepresented.

As one result of this accumulation of material, it has been ascertained that three very distinct forms of the *analis* section of the genus occur in Costa Rica, the commonest of which, or at least the one having the most extensive range there, appears to have been universally confounded with *F. hoffmanni*, while that referred to *F. analis*, is really not that species at all, but a very distinct one, ranging from Costa Rica to western Ecuador, which Mr. Cherrie has named, in manuscript, *F. nigricapillus*. It is also found that between *F. hoffmanni* and *F. crissalis*, or in the district extending from the island of Trinidad through Venezuela to the interior of Colombia, is interposed a form of somewhat in-

intermediate but definite and very constant characters, which I have named *F. saturatus*. Of *F. crissalis* I have seen but one specimen; of *F. analis* only two (possibly three), and none of *F. rufipectus* or its nearly (possibly not different), *F. thoracicus*.

In the case of few specimens of a given form, or what are supposed to be the same form, it is of course difficult to tell whether certain obvious differences represent individual or local variations; but, as has so often been the case in other instances, it has been found that the larger the series of specimens the more uniform are their characters, and consequently the various local forms thus represented can be more easily defined.

My thanks are due for the loan of specimens to the authorities of the Museo Nacional de Costa Rica, the Boston Society of Natural History, the American Museum of Natural History, New York City, and Messrs. Salvin and Godman, of London, England, all of whom have lent me important specimens, without which no satisfactory conclusions could have been reached. The considerable series of specimens which I have thus been able to bring together suggests very strongly the probability that *F. analis* (Laftr. & D'Orb.), *F. crissalis* (Cab.), *F. hoffmanni* (Cab.), *F. moniliger* Sel., and the three forms which I am obliged to describe as new, are not distinct species, but merely more or less differentiated geographical races of one widely distributed species, which ranges from southern Mexico to Bolivia; and that when we have specimens from the very considerable areas of continental tropical America from which examples of the genus have not yet been examined it will become necessary to characterize and name still other forms. However this may prove to be, I find that the ten forms of the *F. analis* section treated below can easily be made out from the comparatively scant material which I have been able to compare: *

* The following table will show the number and source of the specimens examined in the preparation of this paper:

No.	Species.	Collection.					
		U. S. National Museum.	Costa Rica National Museum.	American Museum of Natural History.	Boston Society of Natural History.	Collection Messrs. Salvin and Godman.	Collection C. W. Richmond.
1	<i>F. caymanensis</i> Bodd.	12					
2	<i>F. nigritrons</i> Goud.			3			
3	<i>F. analis</i> (Laftr. & D'Orb.)			1			
4	<i>F. nigricapillus</i> Cherric.	1				12	
5	<i>F. crissalis</i> (Cab.)					1	
6	<i>F. saturatus</i> Ridgw.	1		11	(?) 1		
7	<i>F. hoffmanni</i> (Cab.)	3		4	(?) 1		
8	<i>F. umbrosus</i> Ridgw.	2		9		3	
9	<i>F. moniliger</i> Sel.	12					
10	<i>F. pallidus</i> Lawr.			1		1	
11	<i>F. rufipectus</i> Salv.						
12	<i>F. thoracicus</i> Tacz. & Berl.						4
	Total	19	13	25	2	11	4

Genus **FORMICARIUS** BODDAERT.

Formicarius BODD. Tabl. P. E. 1783, 43. Type, *F. cayanaensis* BODD.

"*Myrmorhis* HERRM. Tab. Affin. Anim. 1783, 235." Type.

Myrmecophaga LACÉP. Mém. l'Inst. Paris, II, 1801, 507. Type undeterminable.

Myiothera ILLIG. Prodr. 1811, 218. Type, *Turdus colma* GM., = *Formicarius cayanaensis* BODD.

Myrmothera, part, VIEILL. Analyse, 1816, 43, 70. Type (none specified, and no species named; includes "Befroi, et quelques autres fourmilliers de Buffon").

Myiarcha SWAINS. Classif. B. II, 1837, 230. Type, *Turdus colma* GMEL., = *Formicarius cayanaensis* BODD.

GEN. CHAR.—Wing exceeding tail in length by at least the length of the tarsus, much rounded (first quill shortest, third to fifth longest), the primaries strongly curved. Tail rounded, the difference between the shortest and longest feathers about equal to length of gonys or a little less. Tarsus about two and a half times as long as bill from nostril, distinctly scutellate on both anterior and posterior divisions. Middle toe more than half as long as tarsus. Inner toe with the tip of its claw reaching to or slightly beyond base of middle claw; outer toe a little shorter, its basal phalanx united to middle toe; hind toe decidedly shorter than lateral toes, but with claw nearly as long as the digit. Bill shorter than head (exposed culmen about as long as distance from nostril to posterior angle of eye), slightly compressed anteriorly, somewhat depressed at base, the tip obviously notched. Nostrils exposed, obliquely longitudinal, with overhanging membrane. Rictal bristles short, inconspicuous. Eyes large, the region immediately behind and beneath naked. Plumage normally compact; general color uniform brown above (the head sometimes rusty or black); dusky, grayish, or brownish below, sometimes with the chest rusty, the under tail coverts also usually rusty, and the throat black; inner webs of remiges with basal portion buffy, ochraceous, or tawny, the under wing coverts similar, but tipped with black.

The genus most nearly related to *Formicarius* is, apparently, *Phlogopsis* REICHENBACH, with which it is compared by Mr. Salvin (Proc. Zool. Soc., London, 1866, p. 73), as follows:

The genus *Formicarius* seems well defined, and separable from the allied forms by several trenchant characters. The plumage consists of short, moderately firm feathers, giving the bird a compact appearance very different from that of *Phlogopsis*, all members of which genus have softer and longer feathers, more like those of *Pithys* and its affines. The region behind the eye is naked; in *Phlogopsis* the entire circle is bare. The supranasal feathers of *Formicarius* are short and compact; in *Phlogopsis* they are long and prominent. The scutella of the tarsi of the former are distinct and divided, while *Phlogopsis* has a single shield on the front of the tarsus. The nostril of *Formicarius* is oblong and situated nearer the base of the bill than that of *Phlogopsis*, which is round. The hind claw is longer and less curved. The tail is shorter, stiffer, and less rounded.

KEY TO THE SPECIES.

a¹. Top of head and hind neck rufescent or tawny, conspicuously different from color of back; outer web of exterior feather of alula light tawny or buff.

- b*¹. Forehead bright tawny or rufescent, like crown, etc. (Brazil.) 1. *F. cayanensis*.
*b*². Forehead black or dusky. (Amazon Valley.) 2. *F. nigrifrons*.
*a*². Top of head dull brownish, not conspicuously different from color of back or else black; outer web of exterior feather of alula grayish brown.
*b*¹. Chest black or some shade of grayish or grayish brown.
*c*¹. Sides of neck similar in color to hind neck, not rufescent or cinnamonaceous.
*d*¹. Top of head brown, like back, with only centers of feathers blackish; chest slate-gray, in contrast with black of throat; smaller. (Upper Amazon Valley, Bolivia to northeastern Peru.) 3. *F. analis*.
*d*². Top of head, also chest, black; larger. (Pacific coast district, from western Ecuador to Costa Rica.) 4. *F. nigricapillus*.
*c*². Sides of neck rufescent or cinnamonaceous.
*d*¹. Under tail coverts wholly tawny, rusty, or chestnut.
*e*¹. Forehead concolor with crown,—not rufescent.
*f*¹. White loreal spot large, conspicuous; under parts clear brownish gray, becoming nearly white on belly; under tail coverts clear tawny. (British Guiana.) 5. *F. crissalis*.
*f*². White loreal spot small, sometimes obsolete; under parts nearly uniform deep brownish gray; under tail coverts rufous-tawny. (Trinidad, Venezuela, and coast of Colombia.) 6. *F. saturatus*.
*e*². Forehead distinctly rufescent, different from crown. (Under tail coverts, as in *F. crissalis*; general color of under parts much browner than in either *F. crissalis* or *F. saturatus*.) (Isthmus of Panama, north to western Costa Rica.) 7. *F. hoffmanni*.
*d*². Under tail coverts only partly (if at all) tawny, rusty, or chestnut, the longer (posterior) feathers being dusky margined with brown.
*e*¹. No rusty collar across fore neck. (Eastern Costa Rica and Nicaragua.) 8. *F. umbrosus*.
*e*². A distinct rusty collar across fore neck.
*f*¹. Darker; rusty brown above, the pileum much darker. (Eastern Mexico, Guatemala, and British Honduras.) 9. *F. moniliger*.
*f*². Paler; light grayish brown above, the top of head not darker. (Yucatan.) 10. *F. pallidus*.
*b*². Chest rufous or chestnut.
*c*¹. Top of head rusty brown; chest chestnut-rufous. (Veragua; Ecuador.) 11. *F. rufipectus*.
*c*². Top of head black; chest dark rufous or chestnut. (Eastern Ecuador.) 12. *F. thoracicus*.

Formicarius cayanensis Boddaert.

- Formicarius cayanensis* BODD., Tabl. P. E., 1783, 50 (based on Le Têtema, de Cayenne Buff., P. Enl., 821).—GRAY, Gen. B., 1, 211; Hand-l. 1., 1869, 298, No. 4418.—SCL., P. Z. S., 1857, 46 (Guiana; Brazil); 1858, 277 (Cayenne; Brit. Guiana; north and southeast Brazil).
Formicarius cayanensis SCL., Catal. 1862, 190 (Brazil).—SALV., P. Z. S., 1866, 74 (Guiana; Cayenne; Brazil).—PELZ., Orn. Bras., II, 1868, 168 (Brazil).—SCL. and SALV., Nom. Neotr., 1873, 75.
Myrmornis cayanensis CAB. and HEINE, Mus. Hein., II, 1859, 7 (Brazil).
Turdus colma GMEL. S. N., 1, 1788, 827.
Myrmothera colma VIEILL. Enc. Méth., 1723, 681, 683.
Myiothera colma CAB. in Schomb. Guiana, III, 1818, 686. BONAP.—Consp., 1, 1850, 205 (s. Brazil).
Formicarius colma SCL., Cat. B. Brit. Mus., xv, 1890, 302 (São Paulo, Bahia, and southeast Brazil; Peru?)

Myrmothera tetena VIEILL., Enc. Méth., 1823, 683.

Myioturdu8 tetena MAX., Beitr., III, pt. 2, 1831, 1038.—MÉNÉTRI., Mem. Ac. St. Peters. sér. vi (Sc. Nat.), 1835, 466.

Myiothera tetena BONAP., Consp. I, 1850, 205 (Cayenne: north Brazil).—BURM., Syst. Ueb., III, 1856, 46.

Myrmothera fuscicapilla VIEILL., N. D., XII, 1817, 112; Enc. Méth., 1823, 681.

Myiothera ruficeps SPIX, Av. Bras., I, 1823, 72, pl. 72, fig. 1.

Formicarius ruficeps PELZ. Orn. Bras., II, 1868, 90, 168 (Walde do Cravari, Matto Grosso; Boden; Borba; Pará).

HAB.—Southeastern Brazil (São Paulo; Bahia).

SP. CHAR.—Entire pileum and hind neck bright rufous-tawny (paler laterally, often clouded with dusky medially); sides of head (including lores and superciliary region), chin, throat, and chest black, changing gradually into sooty grayish brown or dull sooty slate on under parts of the body; upper parts olivaceous, the tail blackish terminally, the outer web of external feather of alula and basal portion of remiges and under wing coverts buff or pale tawny.

Adult male (No. 32871, U. S. Nat. Mus., "Brazil"; E. Verreaux):—Pileum and hind neck russet-tawny, paler (light ochraceous) laterally, the median portion clouded with darker by the showing through of the dusky bases of the feathers; rest of upper parts plain grayish olive; the outer webs of the remiges inclining to Prout's brown, and the terminal half (approximately) of the tail blackish brown; outer web of exterior feather of alula ochraceous-buff; primary coverts plain blackish brown; under wing coverts buff, tipped with brownish black, the larger (more posterior) feathers almost wholly of the latter color; inner webs of remiges ochraceous-buff for basal third or more. Sides of head (including lores and superciliary region), sides of neck, chin, throat, and chest black; remaining under parts dull brownish gray, tinged with olive laterally, the ventral region suffused with grayish white. Bill, black; legs and feet, brownish. Total length (skin), 7.10; wing, 3.20; tail, 2.20; exposed culmen, 0.62; tarsus, 1.18; middle toe, 0.72.

"Lores and throat varied with whitish." (SCLATER.)

The series which I have been able to examine of this species is very unsatisfactory. There are only four specimens, all adults, but only one of them sexed.

An example in the National Museum collection, supposed to be from Santa Catarina, Brazil (No. 24049, Lemuel Wells, coll.), is essentially like the one described above, but has the colors rather deeper throughout, the rusty color of pileum, etc., richer, the upper parts more decidedly olive, and the lateral under parts much more olivaceous. Wing, 3.30; tail, 2.20; tarsus, 1.18; middle toe, 0.75.

Two specimens from Bahia in the collection of the American Museum of Natural History are similar in color to the example described above, except that the color of the pileum is much brighter and more uniform—rich rufous-tawny, passing into ochraceous along the edges—

with little, if any, visible clouding of dusky along the median line. Their measurements are as follows: No. 43537: Length (skin), 6.75; wing, 3.45; tail, 2.10; exposed culmen, 0.70; tarsus, 1.23; middle toe, 0.72. No. 43538: Length (skin), 6.10; (tail not grown out); wing, 3.40; exposed culmen, 0.68; tarsus, 1.25; middle toe, 0.75.

2. *Formicarius nigrifrons* Gould.

Formicarius nigrifrons GOULD, Ann. N. H., ser. 2, xv, May, 1855, 344 (Chamicuros, e. Peru; mus. J. Gould); P. Z. S., 1855, 68 (Chamicuros).—SCL., P. Z. S., 1855, 145 (Bogota); 1857, 47 (Colombia; Amazonia); 1858, 68 (Rio Napo, e. Ecuador); 277 (Colombia; e. Peru); Catal., 1862, 190 (Bogota); Cat. B. Brit. Mus., xv, 1890, 303 (Cayenne, Brit. Guiana, Bogota, Sarayaen, e. Ecuador, Chamicuros, e. Peru).—SALV., P. Z. S., 1866, 74 (e. Peru; Colombia); Ibis, 1885, 429 (Camaeusa, Brit. Guiana).—SCL. and SALV., P. Z. S., 1873, 277 (e. Peru); Nom. Neotr., 1873, 75 (Colombia; e. Peru).—TACZAN., P. Z. S., 1882, 32 (n. e. Peru); Orn. du Pér., II, 1884, 77 (Yurimaguas and Chamicuros, e. Peru).

Myrmornis nigrifrons CAB. and HEINE, Mus. Hein., II, 1859, 7 (Cayenne).

Formicarius cayanensis (nec BODD.) PELZ., Orn. Bras., 1868, 90, 168 (Rio Negro, Mari-batanas, Barra Mai, and Rio Branco).

HAB.—Guiana to the Amazon and Colombia.

SP. CHAR.—Similar to *F. cayanensis* BODD., but with whole forehead glossy black.

Adult male (No. 32872, U. S. Nat. Mus., Rio Napo, e. Ecuador; E. Verreaux).—Entire forehead and lores glossy black; sides of head (including narrow superciliary line), sides of neck, chin, throat, chest, and breast "dead" black; rest of under parts dark sooty gray, the anal region mixed with whitish. Crown, occiput, nape, and hind neck deep rufous-fawny, paler, or more ochraceous, laterally, darker (almost chestnut) on the crown, where the feathers are blackish immediately beneath the surface; rest of upper parts clear bister-brown, the tail darker, inclining to brownish black on about the terminal half; outer web of outermost feather of alula deep buff; primary coverts wholly brownish black; basal third (approximately) of inner webs of primaries ochraceous-buff; smaller under wing coverts light buff, tipped with blackish, the larger coverts chiefly blackish. Bill, black; legs and feet, brown. Total length (skin), 6.00; wing, 3.15; tail, 1.95; exposed culmen, 0.60; tarsus, 1.15; middle toe, 0.70.

Young male (No. 16718, Amazon R., Lieut. Herndon, U. S. N.).—Similar to the adult, but forehead less extensively black, the lores and suborbital region largely rusty, chin and throat white squamated with black, chest dark sooty brownish gray, rest of under parts lighter and duller brownish gray than in adult, and upper parts browner (ranging from clear bister on back toummy brown on upper tail coverts).

Three adults from British Guiana in the collection of the American Museum of Natural History differ from the single example from the upper Amazon (Rio Napo) in much larger bill and in having a distinct

plumbeous cast to the under parts, even the chest being washed with this color. They measure as follows:

No.	Locality.	Wing.	Tail.	Exposed culmen.	Tarsus.	Middle toe.
43534	British Guiana	3.20	1.90	0.72	1.17	0.70
43535	Cayenne	3.32	1.82	0.70	1.22	0.75
43536	British Guiana	3.20	1.90	0.75	1.10	0.65

Whether the Guiana and Upper Amazon birds thus differ constantly I am unable to state with certainty; but in view of the great uniformity in coloration in the three Guiana birds and their constantly much larger bills I have little doubt that such will prove to be the case, and therefore propose, provisionally, the name *Formicarius nigrifrons glaucopectus** for the Guiana bird.

3. *Formicarius analis* (Lafresnaye).

Myiothera analis LAFR.,† *Mag. de Zool.*, 1837 ("Synopsis Avium"), Cl. II, p. 14 (Yuricareas et Chiquitos, Bolivia).—D'ORB., *Voy. Ois.*, "1835-1844," 191, pl. 6 *bis*, fig. 1. ? *Myiothera analis* BONAP. *Consp.* 1, 1850, 205 (Brazil).

Formicarius analis SCL., *P. Z. S.*, 1857, 46, part (Bolivia); 1858, 277, part (Bolivia); *Cat. B. Brit. Mus.*, xv, 1890, 304, part (loc. in e. Peru and e. Ecuador).—SALV., *P. Z. S.*, 1866, 74, part (Bolivia).—SCL. and SALV., *P. Z. S.*, 1867, 751 (Xeberos and Chayvetas, e. Peru); *Nom. Neotr.*, 1873, 75, part (Bolivia).—TACZAN., *P. Z. S.*, 1882, 32 (Huambo, n. e. Peru); *Orn. Pér.*, II, 1884, 78 (Yurimagnas, Xeberos, Chayvetas, Huambo, and Paucal, e. Peru).—ALLEN, *Bull. Am. Mus.*, N. H., II, No. 2, 1889, 98 (Yungas, Bolivia).—SALV. and GODM., *Biol. Centr. Am. Aves*, II, pt. 29, 1892, 235, part (Bolivia).

HAB.—Bolivia and eastern Peru.

SP. CHAR.—Whole top of head olivaceous-brown, like back, but centers of feathers dusky; sides of neck similar in color to top of head, but rather lighter—not at all inclining to cinnamonaceous or rufous; under tail coverts varying from bright rufous-tawny to tawny-chestnut—always uniform.

Adult female (coll. Salvin and Godman, Yquitos, Bolivia, August 24, 1878, II. Whitely).—Feathers of pileum dull blackish broadly margined with sepia-brown, producing a scaled appearance; rest of upper surface clear olive-sepia or bister, deepening into a warmer brown (approaching Vandyke brown) on secondaries and brightening into almost mummy brown on upper tail coverts; outer web of exterior feathers of alula deep broccoli brown; primary coverts, wholly blackish dusky; tail blackish brown terminally, browner basally. Lores, suborbital and malar regions, chin, and throat dull black, the first with

* Type, No. 43536. *Am. Mus. Nat. Hist.*, British Guiana; Alexander.

† "LAFR. et D'ORB." are usually quoted as the describers of this species, but the former only can properly be considered as its describer. It is true that Lafresnaye, in the article cited above, quotes "D'Orb., *Voy. dans l'Amér. merid.*, pl. 6 *bis*," but neither this plate nor the description in D'Orbigny's "Voyage" were published until several years after the publication of Lafresnaye's description.

an indistinct central spot of white; sides of neck light bister, like hind neck. Chest dull slate color, the remaining under parts (except under tail coverts) lighter gray, tinged with olive on sides and flanks and inclining to whitish gray on lower part of belly. Under tail coverts wholly clear deep tawny. Bill, blackish; legs and feet, horn color. Total length (skin), 6.40; wing, 3.52; tail, 2.18; exposed culmen, 0.75; tarsus, 1.20; middle toe, 0.72.

An adult in the collection of the American Museum of Natural History (No. 30700 *bis.*) from Yungas, Bolivia, altitude 6,000 feet, (H. H. Rusby) is brighter bister brown above, with the dark centers of the feathers of the pileum far less distinct; the white loreal spot much larger; the sides of the neck and postocular region appreciably different in hue from the hind neck and other upper parts (deep wood brown instead of light bister) and the under parts are paler and less pure gray, the entire chest, as well as sides and flanks, being strongly tinged with light brownish. The under tail coverts, however, are colored exactly as in the Yquitos specimen. Length (skin), 6.50; wing, 3.40; tail, 2.00; exposed culmen, 0.70; tarsus, 1.22; middle toe, 0.72.

What will doubtless prove a local form of this species, approaching *F. nigricapillus* CHERRIE in its characters, is represented in the collection of Messrs. Salvin and Godman by an adult from Sarayacu, north-eastern Peru (C. Buckley). This differs from the Bolivian specimens in its much darker coloration throughout, the upper surface ranging from dark sepia on the head to mummy brown on upper tail coverts, the under parts ranging from dark sooty slate on the chest to deep-olive-gray on sides and flanks. The under wing coverts and axillars have their basal portion bright tawny, and the under tail coverts, instead of being deep clear tawny, are rich chestnut. The white loreal spot is about as well developed as in the Yquitos specimen. Total length (skin), 5.70; wing, 3.57; tail, 2.05; exposed culmen, 0.72; tarsus, 1.25; middle toe, 0.71.

Of this very easily recognized form I have seen three specimens, all mentioned above. These agree minutely, in essential features, with the original description and colored figure by Lafresnaye and D'Orbigny, in which the cinnamonaceous coloring on the sides of the neck in all the related species (except *F. nigricapillus* CHERRIE) is conspicuously absent, and no doubt represent the true *F. analis*. In the Lafresnaye collection, for sometime the property of the Boston Society of Natural History, are the alleged types of *F. analis*; but they certainly are *not* the types of that species, since they unquestionably belong to the forms subsequently separated as *F. crissalis* by Cabanis and *F. saturatus* by the author of the present paper, and are probably from Guiana or lower Amazonia and some part of Colombia, respectively. (See remarks under *F. crissalis* and *F. saturatus*, on pages 671 and 679)

According to D'Orbigny, the naked postocular space is whitish in life, the eyes red, and the feet violet; but Taczanowski (Orn. Pér., II,

p. 78) gives the fresh colors of an adult female from Yurimaguas as follows: "Bill, horn-black; feet, gray; iris, deep brown."

4. *Formicarius nigricapillus* Cherrie.

Formicarius analis (nec *Myothera analis* LAFR.) SCL. P. Z. S. 1863, 294 (Babahoyo, w. Ecuador); Cat. 1862, 190 (Esmeraldas, w. Ecuador); Cat. B. Brit. Mus. xv. 1890, 304, part (Esmeraldas, Balzar Mts., and Sta Rita, w. Ecuador).—SALV. P. Z. S. 1866, 74, part (Costa Rica; Veragua); 1867, 145 (Sta Fé, Veragua).—LAWR. Am. Lyc. N. Y., ix, 1868, 110 (Veragua).—SCL. and SALV. Nom. Neotr. 1873, 75, part (Panama; Costa Rica).—SALV. and GODM. Biol. Centr.-Am., Aves, II, pt. 30, 1892, 235, part (Tucurrique, Costa Rica; Veragua; w. Ecuador).—TACZAN and BERL. P. Z. S. 1885, 118 (Esmeraldas, w. Ecuador).

HAB.—Costa Rica to western Ecuador.

SP. CHAR.—Similar to *F. analis* (LAFR.) in the entire absence of rufous on sides of neck, etc., but larger (the bill conspicuously so), and very much darker throughout in coloration, the entire head and fore neck (sometimes chest also) being deep black, instead of this color being confined to cheeks and throat.

Adult male (Coll. Salvin and Godman, Costa Rica, 1869, J. Carniol).—Entire head (including whole of the lores), neck (except hind neck) and chest deep black, fading gradually on the breast into dark sooty slate color, this fading into dull sooty slate on sides of abdomen, the middle of the belly paler and browner, the sides and flanks strongly washed with olivaceous; under tail coverts bright russet, becoming gradually darker on the more posterior feathers, the longest of which are mainly dusky blackish with their tips and edges mummy brown; under wing coverts and axillars buff (varying in intensity on different feathers) each feather broadly and abruptly tipped with black; remiges with the basal portion of their inner webs dull cinnamon. Upper parts, including hind neck, rich dark brown (intermediate between "mummy" and "bister," the feathers brownish black beneath surface), changing gradually to deep chestnut on upper tail coverts and to a less reddish hue (nearly pure "bister") on outer webs of wing coverts and tertials; outer webs of remiges (except tertials) grayish brown. Tail brownish black. Bill entirely deep black; legs and feet brownish. Total length (skin), 7.50; wing, 3.70; tail, 2.00; exposed culmen, 0.90; tarsus, 1.30; middle toe, 0.82.

Adult female (type, No. 128852*, U. S. Nat. Mus., Buena Vista, Costa Rica, August 16, 1892, Castro y Fernandez).—Similar to the male, as described above, but upper surface not quite so bright a brown, the breast and sides of belly more slaty, and under tail coverts rather paler; legs and feet brownish black. Total length (contracted skin), 6.40; wing, 3.55; tail, 2.02; exposed culmen, 0.90; tarsus, 1.15; middle toe, 0.85.

An adult (sex not indicated) from Sta Rita, western Ecuador, in the collection of Messrs. Salvin and Godman ("Villagomez, per C. Buck-

* No. 8284, Museo Nacional de Costa Rica.

ley") is most like the female from Costa Rica but is even less castaneous or rufescent above (nearly pure "bister" on the back) and more extensively slaty beneath, while the hind neck, instead of being similar in color to the back (as in both Costa Rica specimens), is dark slate color, like the chest, and the under tail coverts bright rufous-tawny. It very likely represents a local race. Its measurements are as follows: Total length (skin), 7.00; wing, 3.70; tail, 2.28; exposed culmen, 0.89; tarsus, 1.30; middle toe, 0.80.

This species undoubtedly comes nearest to *F. analis* (Laf.), which replaces it in Bolivia and eastern Peru (and eastern Ecuador?), but may be easily recognized by its perfectly black pileum (the whole top of the head in *F. analis* being olive-brownish, like the back), darker under tail coverts with their longer feathers chiefly dusky, and decidedly larger size, the bill especially. From the other two species found in Costa Rica it may at once be distinguished, in addition to its black pileum, by the entire absence of any cinnamomeous coloring about the head or neck, and by the absence of any trace of white on the lores.

5. *Formicarius crissalis* (Cabanis).

Myiothera analis (nec LAFR.) CAB. in Schomb. Guiana, III, 1848, 686 (Roraima, Br. Guiana).

Formicarius analis SCL. P. Z. S. 1858, 277, part (Cayenne; Brit. Guiana; Para?).

Myrmornis crissalis CAB. J. F. O. 1861, 96 (Roraima).

Formicarius crissalis SCL. and SALV. P. Z. S. 1867, 576 (Pará).—SALV. P. Z. S. 1866, 75, part (Guiana; Cayenne; Pará).—SCL. Cat. B. Brit. Mus. XV, 1890, 305, part (Cayenne; Guiana).—SALV. and GODM. Biol. Centr.-Am., Aves, II, pt. 30, 1892, 234, in text (Guiana).

Formicarius hoffmanni (nec CAB.) SALV. Dis. 1885, 429 (Camaçua, Br. Guiana).

SP. CHAR.—Similar to *F. analis* (Laf.), but postocular region and sides of neck distinctly cinnamomeous, in marked contrast with color of hind neck.

Adult male (coll. Salvin and Godman, Carimagua River, British Guiana, December 7, 1885, H. Whitely).—Feathers of pileum blackish, broadly margined with bister brown, producing a distinctly scaled appearance; rest of upper parts bright bister brown, deeper, warmer, brown on wing coverts and secondaries, brighter on upper tail coverts. Tail warm bister brown, with exposed terminal half blackish. Postocular region (sides of occiput and terminal portion of ear coverts) and sides of neck vinaceous-brown (intermediate between Mars brown and fawn color); lores, margin of orbital region (except posteriorly) cheeks, chin, and throat, deep black, the first with a large central spot of white. Chest dull slate-gray, changing to paler gray on sides and flanks (which are tinged with olive on outermost feathers), and lightening into pale gray on lower breast and belly, the lower portion of the latter quite white; under tail coverts clear bright tawny. Bill black; legs and feet horn brownish. Total length (skin), 6.75; wing, 3.60; tail 2.10; exposed culmen, 0.72; tarsus, 1.30; middle toe, 0.80.

*Not the description, which is entirely that of *F. saturatus* Ridgw.

Of this form I have seen but the one specimen of known locality described above. One of the alleged types of *Myothera analis* LAFR. in the museum of the Boston Society of Natural History (Lafresnaye collection, No. 5052) is apparently referable to this form, though I have not been able to compare it with Guiana specimens, having returned it before the one described above was received. The entire belly is dull white, and the breast and sides very pale brownish gray, without any olive tinge, while the under tail coverts are bright tawny. Its measurements are as follows: Wing, 3.65; tail, 2.00; exposed culmen, 0.80; tarsus, 1.35; middle toe, 0.82.

6. *Formicarius saturatus* Ridgway.

Myrmornis analis (nec *Myothera analis* LAFR.) CAB. and HEINE, Mus. Hein. II, 1859, 7 (Porto Cabello, Venezuela).

Formicarius analis SCL. P. Z. S. 1858, 277, part (Trinidad).

Formicarius crissalis (nec CAB.) SCL. Catal. 1862, 191 (Trinidad).—SALV. P. Z. S. 1866, 75, chiefly* (Trinidad).—SCL. and SALV. P. Z. S. 1867, 576, part (Trinidad); 1869, 252 (San Esteban, Venezuela).—CHAPM. Bull. Am. Mus. N. H., No. —, 1893. — (Trinidad.)

Formicarius hoffmanni (nec CAB.) LÉOT. Ois. Trinid. 1866, 187.—FINSCH, P. Z. S. 1870, 568 (Trinidad).

HAB.—Trinidad, Venezuela, and northeastern Colombia.

SP. CHAR.—Intermediate in coloration between *F. crissalis* and *F. hoffmanni*; agreeing with the former in the darker pileum, without rusty on forehead; more restricted rusty color on side of neck, etc., and purer gray under parts, but differing in much darker coloration (especially lower parts), more intense rufescent color of sides of neck, and smaller (sometimes almost obsolete) white loreal spot.

Adult male (Type No. 59315, American Museum of Natural History, Princetown, Trinidad, March 24, 1893, Frank M. Chapman).—Feathers of pileum dull black centrally, broadly margined with sepia-brown, producing a distinctly scaled appearance; rest of upper parts clear bistre brown, deepening into Vandyke brown on secondaries and brightening into burnt-umber on upper tail coverts. Lores, orbital region (bordering even the posterior margin of naked postocular space), cheeks, ear coverts (except terminal portion), chin, throat, and fore neck, deep black, the first with a small central spot of white; sides of head and neck immediately posterior to the black area, rusty brown or burnt-umber. Chest dull deep slate color; sides and flanks similar but somewhat paler, the belly still paler, though not approaching white, even on the lower portion; under tail coverts entirely clear cinnamon-rufous. Bill wholly deep black; legs and feet dark horn color. Total length (skin), 6.85; wing, 3.60; tail, 2.32; exposed culmen, 0.75; tarsus, 1.25; middle toe, 0.72.

Adult female (No. 59313, same locality and collector, March 11, 1893).—Exactly like the adult male, as described above, except that the sec-

* Description entirely.

ondaries and upper tail coverts are less rufescent, the reddish-brown color on sides of neck less intense, the sides more washed with brown, and the under tail coverts very slightly paler and duller. Total length (skin), 6.80; wing, 3.55; tail, 2.12; tarsus, 1.18; middle toe, 0.75.

This new form is based on a series of fifteen adult specimens, ten of which are from the island of Trinidad (Frank M. Chapman), one from San Esteban, Venezuela (A. Goering), one from Remedios, Colombia (T. K. Salmon), and two from unknown localities. These specimens are so uniform in their characters there can be no doubt that they represent a race easily distinguished from either *F. hoffmanni* or *F. crissalis*, though doubtless grading into both, as these almost certainly do with other forms.

The ten Trinidad specimens are so much alike that the only differences observable are exceedingly slight variations in the amount of reddish tinge to the brown of the upper parts, the size and distinctness of the white loreal spot (in none is it nearly so large as in the single example of *F. crissalis* examined, its average size being about the same as in *F. hoffmanni*), and in the exact hue of the under tail coverts. As to the last-mentioned character, the variation is all but inappreciable, the extremes being what may be termed deep tawny* and chestnut-tawny. In all the specimens examined, even including those from Venezuela and Colombia and the two from unknown localities, the black of the throat has a very definite posterior outline, but is not so sharply contrasted with the color of the chest as in *F. hoffmanni*, nor is there ever any tendency of the rufescent color on the sides of the neck to form an incipient collar across the fore neck, as is often the case in *F. hoffmanni*. The black of the throat is also much more extended posteriorly, occupying the entire fore neck, than in the single specimen of *F. crissalis*, in which the fore neck is slate-gray, like the chest.

An adult male from San Esteban, Venezuela (A. Goering) and another from Remedios, Colombia (T. K. Salmon), in the collection of Messrs. Salvin and Godman, do not differ from the Trinidad specimens, except that in the former the upper parts are very slightly browner, though the exact hue is approached very closely by one or two specimens.

In the National Museum collection is a specimen from unknown locality which agrees in most respects with this form, but is still more intensely colored, the under tail coverts being rich chestnut and the upper parts a redder brown. It may be more fully described as follows:

Adult (No. 116222, U. S. Nat. Mus., H. K. Coale).—Above rich bistre brown, tinged with Vandyke, somewhat darker on top of head, and deepening on upper tail coverts into a rich burnt-umber or chestnut-brown; tail seal brown, with a broad terminal band (about 0.60 of an

*That is, a color a little more saturated than the "tawny" of my "Nomenclature of Colors" (Pl. v, Fig. 1).

inch wide on middle feathers) of brownish black; lores, orbits, anterior half of ear coverts, malar region, chin, throat, and foreneck uniform black; the first with a distinct central spot of white. Sides of occiput and neck and terminal half of ear coverts, burnt umber or brownish chestnut; under surface of body, deep brownish slate, darker and clearer on chest; under tail coverts, rich chestnut. Bill wholly deep black; legs and feet dusky horn color. Length (skin), 6.00; wing, 3.50; tail, 2.00; exposed culmen, 0.80; tarsus, 1.22; middle toe, 0.80.

One of the alleged types of *F. analis* (Lafre.) in the collection of the Boston Society of Natural History (Lafresnaye collection, No. 5053) appears, from the memoranda which I made during its inspection a year or more ago, to be referable to this form. Its measurements are as follows: Total length (mounted specimen), 6.70; wing, 3.70; tail, 2.20; exposed culmen, 0.80; tarsus, 1.22.

The other alleged type of *F. analis* (Lafresnaye collection No. 5052), on the same evidence, is *F. crissalis* (CAB.) (See p. 671.)

Compared with *F. hoffmanni* (CAB.), *F. saturatus* differs as follows: The pileum is darker and decidedly less reddish brown, without any cinnamomeous tinge on the forehead. The sides of the occiput and neck are far less distinctly cinnamomeous, being merely tinged with this color. The general color of the upper parts is very decidedly less russet, being of a nearly pure olive-brown with the rump less tinged with rusty brown, and the upper tail coverts duller rusty brown. The under parts are decidedly darker and more uniform; the whole chest and breast nearly clear slate color; the belly lighter but not approaching white; and there is much less of an olive tinge on sides and flanks; the under tail coverts are of a deeper or brighter tawny cinnamou-rufous.

7. *Formicarius hoffmanni* (Cabanis).

Myrmornis hoffmanni CAB. J. f. O. 1861, 95 (Costa Rica).

Formicarius hoffmanni SCL. and SALV. P. Z. S. 1864, 357 (Panama); (?) 1879, 526 (Antioquia, Colombia); Nom. Neotr. 1873, 75, part (Panama, Costa Rica?)—LAWR. Ann. Lyc. N. Y. IX, 1868, 110 (Costa Rica).—SALV. P. Z. S. 1866, 75 (Panama; Costa Rica); 1870, 195 (Bugaba, Veragua).—SCL. Cat. B. Brit. Mus., XV, 1890, 304, excl. syn. part (Panama; Veragua).—SALV. and GODM. Biol. Centr.-Am. Aves, II, pt. 30, 1892, 234, part (Las Trojas,* Costa Rica; Chiriqui, Bugaba, Lion Hill, Obispo, Paraiso Station, and Chepo, Isthmus of Panama; "Colombia").

Formicarius analis (nec *Myothera analis* LAFR.) LAW. Ann. Lyc. N. Y. VII, 1861, 326 (Panama).

HAB.—Isthmus of Panama, Veragua, and southwestern Costa Rica.

SP. CHAR.—Similar to *F. moniliger* SCL., but paler, especially below, with the under tail coverts entirely clear rufous-tawny; without a distinct rusty collar across the fore neck, and with top of head much paler brown, becoming distinctly rusty or cinnamomeous on the forehead.

*But not other specified Costa Rican nor Nicaraguan localities, which refer to *F. umbrosus* RIDGW.

Adult male (No. 53779, Panama, J. McLeannan)—Forehead warm brown (intermediate between Prout's brown and Vandyke brown); rest of pileum bright bistre, the centers of the feathers, especially on crown, blackish; rest of upper parts bright bistre, inclining to mummy brown on rump and secondaries and passing into nearly a burnt-umber hue on upper tail coverts; tail warm bistre brown, the terminal third (approximately) blackish. Loes, orbits, cheeks, chin, and throat black, the first with a central spot of white; sides of hinder head and sides of neck chestnut-cinnamon or mars brown, this extending narrowly across the fore neck along the hinder edge of the black throat patch; chest and upper breast brownish gray, abruptly defined against the narrow cinnamomeous collar; sides and flanks light olive-brown, tinged with grayish; lower breast and entire belly pale dull buff, the feathers pale grayish beneath the surface; under tail coverts wholly bright rufous-tawny. Bill black; legs (in dried skin) pale brown, toes darker. Length (skin), 6.50; wing, 3.40; tail, 2.18; exposed culmen, 0.78; tarsus, 1.20; middle toe, 0.70.

Adult female (No. 53780, U. S. Nat. Mus., Panama; J. McLeannan).—Similar to the male, but rather brighter brown above, without the narrow cinnamomeous collar across fore neck (the grayish olive of the chest directly touching the black throat patch), under parts more tinged with olive, and longer under tail coverts rather darker and duller tawny-rufous. Length (skin), 6.10; wing, 3.40; tail, 2.00; exposed culmen, 0.75; tarsus, 1.25; middle toe, 0.70.

Four additional adults (not sexed) from Panama belonging to the American Museum of Natural History, New York City, and an adult male in the collection of Messrs. Salvin and Godman agree in all essential particulars with the birds described above; three of them show an indication of the cinnamomeous collar across the fore neck, but in none is it nearly so distinct as in the specimen described. An adult from Lion Hill, near Aspinwall, in the National Museum collection is likewise similar. The adult male in Messrs. Salvin and Godman's collection (Panama, McLeannan) differ slightly from the specimens described above in being a very little darker below, particularly on the belly, and in having the cinnamomeous collar across the fore neck much less distinct, though still strongly indicated.

Four specimens from southwestern Costa Rica lent me by the authorities of the Costa Rica National Museum are quite like Panama examples, though averaging a little larger. The localities represented are Trojas, near Cobagre (altitude about 3,600 feet), and Buenos Aires, all on the Pacific side.

A specimen in Messrs. Salvin and Godman's collection from Bugaba, Chiriqui (E. Aree), likewise agrees closely with Panama examples, except that the under parts are unusually dark, particularly on the chest. Another specimen from Chiriqui (precise locality not stated), in the same collection, is equally dark, though of a clearer slate-gray color

below, and the crissum is so deep a rusty hue as to be almost chestnut. In fact, this example agrees so closely with specimens of *F. saturatus* in the coloration of the under parts, throughout, that were it not for the more cinnamomeous forehead, and the locality, it might be referred to that form. Possibly it may be from the Atlantic side of Chiriqui, and if so would indicate the probability that *F. saturatus* follows the Colombian littoral on that coast to Chiriqui and there grades into *F. hoffmanni*.

Putting aside this one specimen, the remaining fourteen examples of *F. hoffmanni* can be easily distinguished from any of the fifteen specimens of *F. saturatus* by the following characters: The postocular region and sides of the neck are much more extensively and distinctly cinnamomeous; the top of the head is lighter, more reddish brown, with the forehead conspicuously rusty or cinnamomeous; the under parts are paler, less uniform, and more brownish gray; the cinnamon or rufous on the sides of the neck usually follows the posterior margin of the black throat patch, forming an incipient, or occasionally continuous though narrow, collar across the fore neck, and the under tail coverts are of a decidedly lighter rufous-tawny.

3. *Formicarius umbrosus* Ridgway.

Formicarius hoffmanni (nec *Myrmornis hoffmanni* CAB.) BOUC. P. Z. S. 1878, 62 (San Carlos, Costa Rica).—ZELED. Proc. U. S. Nat. Mus. VIII, 1885, 108 (Costa Rica); AN. MUS. NAC. C. R. 1887, 115 (Costa Rica).—SALV. and GODM. Biol. Centr. Am., Aves. II, pt. 30, 1892, 234, part (Los Sábalos, Nicaragua; San Carlos, Jimenez, and Pacuare, Costa Rica).

Formicarius hoffmanni NUTTING, Proc. U. S. Nat. Mus., VI, 1883, 405 (Los Sábalos, Nicaragua).

HAB.—Atlantic slope of Costa Rica and Nicaragua.

SP. CHAR.—Similar to *F. hoffmanni* (CAB.), but colors more intense throughout, the under tail coverts dull rusty brown, with longer feathers chiefly dusky; rusty coloring on sides of neck darker and more restricted, and forehead same color as crown.

Adult male (type, No. 68243, Talamanca, Costa Rica, J. Cooper).—Pileum rich bistre brown, with centers of the feathers blackish, producing an indistinctly scaled appearance, these dusky centers more concealed on the forehead; rest of upper parts rich mummy brown, brightening into burnt-umber or almost chestnut on upper tail coverts. Lores, margin of bare orbital space, cheeks, chin, and throat black; post-ocular region, terminal portion of auricular region, and sides of neck rusty brown or light burnt-umber. Chest, sides, and flanks dull grayish brown (the sides washed with bistre), lightening on breast and belly into dull brownish gray or hair brown. Shorter under tail coverts bright russet, the longer feathers blackish, margined and tipped with light mummy brown. Bill black; "iris chocolate;" legs and feet horn brown. Total length (skin), 6.50; wing, 3.42; tail, 2.15; exposed culmen, 0.77; tarsus, 1.35; middle toe, 0.72.

Adult female (No. 68245, same locality and collector).—Similar to the adult male, as described above, but upper parts less reddish brown (nearer "bister" than "mummy." the upper tail coverts bright mummy brown instead of chestnut umber); chest and sides brownish slate-gray, the latter washed with olive-brown; middle line of breast and belly, also the anal region, dirty whitish. Total length (skin), 6.30; wing, 3.40; tail, 2.10; exposed culmen, 0.72; tarsus, 1.23; middle toe, 0.70.

Young female (No. 8108, Museo Nacional de Costa Rica, Jimenez, Costa Rica, July 11, 1892, A. H. Verrill).—Similar in general coloration to the adult female, but whole pileum uniform brownish black with tips of feathers more brown, chin and throat buff spotted with dull black, chest sooty blackish, feathers of belly tipped with brownish gray (producing an indistinct spotted or clouded appearance), and longer under tail coverts uniform black. Basal two-thirds of lower mandible light colored (dull yellowish in dried skin).

The nineteen adult specimens of this form show the same amount of individual variations as other forms. This variation affects chiefly the exact hue of the brown color of the upper parts (which ranges from rich mummy brown to clear bistre on the back and rich burnt-umber, almost chestnut, to mummy brown on the upper tail coverts, the average hue being intermediate) and the relative amount of brown and gray on the under parts. The adult male described above has the under parts more brown than any others in the entire series. The opposite extreme is represented by No. 91264, U. S. National Museum, from Los Sábalos, Nicaragua (adult male, May 17, 1883, C. C. Nutting), and No. 7170, Costa Rica National Museum, Reventazon, Costa Rica (adult male, February 21, 1892, N. Carranza), in which the under parts are a nearly uniform deep smoky slate color, darker on the chest, paler on the belly, only the sides and flanks being distinctly tinged with olive. In a few specimens (as No. 128349, adult male, Escondido River, Nicaragua, September 6, 1892, C. W. Richmond) the belly is quite extensively light colored—pale buffy grayish, sometimes inclining to soiled white toward the anal region. In the coloration of the under tail coverts there is practically no variation, the longer or more posterior feathers being always blackish, merely margined with rusty brown, only the shorter or more anterior feathers being uniform rusty, and this not nearly so light and tawny a hue as on the same feathers of *F. hoffmanni*. In none of the nineteen specimens does the rusty color of the sides of the neck show a tendency to extend across the fore neck, forming an incipient or occasionally distinct though narrow collar, as frequently occurs in *F. hoffmanni*; and, while the black of the throat always has a definite posterior outline, the color of the chest is sometimes so dark that the contrast is by no means conspicuous.

From *F. moniliger* this form may be readily distinguished by the entire absence of the rusty band across the fore neck and the more rusty shorter under tail coverts.

9. *Formicarius moniliger* Sclater.

Formicarius moniliger SCL., P. Z. S. 1856, 294 (Cordova, Vera Cruz, Mexico); 1857, 47; 1858, 278 (Vera Cruz; Mosquito coast); 1859, 383 (Playa Vicente, Oaxaca); Catal. 1862, 191, No. 1165 (Oaxaca); Cat. B. Brit. Mus. xv, 1890, 303, part (s. Mexico; Guatemala; Belize, Brit. Honduras).—SALV., Ibis, 1861, 353 (Chisee, centr. Guatemala); P. Z. S. 1866, 75 (Mexico and Guatemala).—SUMICH., Mem. Bost. Soc. N. H. i, 1869, 556 (near Protrero, Vera Cruz); La. Nat. v, —, 248 (do).—SCL. and SALV., Nom. Neotr. 1873, 75 (Mexico and Guatemala).—SALV. and GODM., Biol. Centr.-Am., Aves, II, pt. 30, 1892, 233, part (Cordova, Cerro de la Defensa, near Protrero, Atoyac, and Playa Vicente, s. Mexico; Cayo, Brit. Honduras; Vera Paz, Chisee, Kampamae, Choctum, and Tactic, Guatemala).

Myrmornis moniligera CAB., J. f. O. 1861, 96.

HAB.—Southern Mexico, Guatemala, and British Honduras.

SP. CHAR.—Above brown, more russet on upper tail coverts; chin, throat, cheeks, orbits, and lores black, the latter with a white spot; sides of neck and band across fore neck, immediately below black throat, dull cinnamon-chestnut; rest of under parts dull brownish gray, darker on chest, paler on belly; under tail coverts dusky, more or less tipped with light brown, this nearly uniform over shorter anterior feathers.

Adult male (No. 22367, "Mexique," Verreaux).—Pileum deep warm bistre, the feathers darker centrally; hind neck Vandyke brown; rest of upper parts rich brown (intermediate between mummy brown and bistre), brightening into burnt-umber on upper tail coverts. Lores, orbits, malar region, chin, and throat uniform dull black, the first with a distinct central spot of white; immediately behind this black area is a broad band of chestnut, beginning on the ear coverts, passing over the sides of the neck, and thence across the fore neck; chest dark olive-grayish; sides and flanks olive-brown or light bistre; breast and sides of abdomen brownish gray, considerably paler than chest, the feathers of the median portion of the abdomen margined at tips with buffy whitish, which predominates posteriorly; under tail coverts dusky, tipped with light fulvous-brown, this amounting to a mere terminal edging on the longer posterior feathers, but prevailing on the shorter anterior ones. Bill black, the lower mandible more brownish; legs and feet light brown (in dried skin). Length (skin), 6.80; wings, 3.45; tail, 2.00; exposed culmen, 0.80; tarsus, 1.25; middle toe, 0.75.

Adult female (Coll. Salvin and Godman, Atoyac, Vera Cruz, Mexico, April, D. W. S.).—Similar to adult male as described above, but darker, especially below, where the entire surface posterior to the rusty collar (except under tail coverts) is dark sooty gray, darkest on the chest and palest on the lower belly. The rusty collar across the fore neck much narrower (only about 0.10 to 0.15 of an inch), and the white loreal spot smaller. Total length (skin), 6.35; wing, 3.55; tail, 2.15; exposed culmen, 0.80; tarsus, 1.23; middle toe, 0.80.

Juv. (No. 43531, Am. Mus. Nat. Hist., Guatemala: Lawrence collection).—Upper parts colored as in the adult, lower parts also as in the

adult, except the throat, which has the black replaced by dull brownish dusky (almost exactly like color of chest), the feathers of the posterior portion tipped with rusty, forming a narrow, somewhat broken, band, much less distinct than in the adult. Upper mandible black, tipped with yellowish white; lower, brown, with yellowish-white tip.

With two specimens from Mexico, four from Guatemala, and one from British Honduras, I am unable to appreciate any constant differences of coloration according to locality, except in the case of the last-mentioned example, which is lighter colored (extensively buffy-whitish) on the middle line of the breast and belly, with the upper parts of an appreciably lighter or clearer tawny-bistre. The darker specimens from Guatemala are quite as dark as the Vera Cruz specimen described above, but all the Guatemala examples are perhaps a little bit brighter in the color of their upper parts than those from Mexico, though the difference is so very slight that I strongly doubt its constancy in a large series. Certainly there are no variations of color in this series which even approximate the paleness of coloration which strongly characterizes Mr. Lawrence's *F. pallidus*, from Yucatan.

10. *Formicarius pallidus* Lawrence.

Formicarius (lapsus pennæ) pallidus LAWRE., Ann. N. Y. Acad. Sci., II, No. 9, May 29, 1882, 288 (Yucatan).

Formicarius pallidus LAWRE., Ann. N. Y. Acad. Sci. II, No. 9, 1882.

Formicarius mouilliger SCL., Cat. B. Brit. Mus., XV, 1890: 303, part.—SALV. and GODM., Biol. Centr.-Am., Aves, II, pt. 30, 1892, 233, part.

HAB.—Yucatan.

SP. CHAR.—Similar to *F. mouilliger* Scl., but very much paler throughout.

Adult (Type, No. 43543, American Museum of Natural History, Yucatan, G. F. Gaumer).—Above, plain light grayish brown,* deepening on lower ramp and upper tail coverts into a more tawny-olive or russet hue; tail rather light olive-brown, with inner webs and terminal portion of outer webs dusky. Chin, upper and middle portions of throat, and thence upward to and surrounding orbits, dull black; lores also black, but marked with a central spot of white about 0.15 of an inch long. Sides of head and neck immediately behind the black area deep cinnamon-rufous, continued in a band across lower throat; chest, sides, and flanks rather deep brownish gray, fading into dull white on the belly; under tail coverts light wood-brown, with indistinct paler shaft streaks, the longer feathers less buffy. Bill black; legs and feet horn-color. Length (skin), 6.80; wing, 3.65; tail, 2.25; exposed culmen, 0.85; tarsus, 1.25; middle toe, 0.80.

Another adult in the collection of Messrs. Salvin and Godman (Tizimin, Yucatan, G. F. Gaumer) agrees closely with the type, but is very slightly deeper olivaceous above, and the rusty collar across the fore

* Intermediate between olive and hair-brown, with a slight tinge of Isabella color.

neck is a duller, more cinnamomeous, hue. It does not, however, approach in intensity of coloration even the palest and dullest colored specimens of *F. moniliger* from Guatemala, Honduras, and other parts of the latter's range. Its measurements are as follows: Length, (stretched skin), about 8.00; wing, 3.55; tail, 2.23; exposed culmen, 0.82; tarsus, 1.20; middle toe, 0.80.

While there can be no doubt that this form is merely a pallid local race of *F. moniliger*, and should therefore be known as *Formicarius moniliger pallidus*, we have not yet the proof of such fact; and, in order to preserve uniformity of nomenclature in this paper, I have given it a binomial appellation, as I have done with forms which undoubtedly are conspecific with *F. analis*.

11. *Formicarius rufipectus* Salvin.

Formicarius rufipectus SALV., P. Z. S., 1866, 73, 74, pl. VIII (Veragua); 1867, 145 (do.).—SCL. and SALV., Nom. Neotr., 1873, 75 (Veragua).—SCL., Cat. B. Brit. Mus., XV, 1890, 306 (Veragua; Baisa, Ecuador?).—SALV. and GODM., Biol. Centr.-Am., Aves, II, pt. 30, 1892, 235 (Santiago de Veragua; Baisa, Ecuador?).
? *Formicarius thoracicus* "STOLZM. MS.," TACZAN. and BERL., P. Z. S., 1885, 101 (Machay, c. Ecuador).

HAB.—Veragua; eastern Ecuador?

SP. CHAR.—Above brownish black, the rump dusky rufous, the pileum tinged with rufous; lores and throat black; breast, crissum, and middle of the belly chestnut-rufous; sides of the body sooty; bill black; feet brown.

Total length, 7 inches; wing, 3.40; tail, 2.25; tarsi, 1.50; bill to the rictus, 1.10.

Similar to *F. analis* (D'ORB. and LAFR.), but at first sight distinguished by the chestnut-rufous breast. [Translation of the original description.]

According to Messrs. Salvin and Godman (Biol. Centr.-Am., Aves, II, pt. 30, pp. 235, 236), "this well-marked species comes next to *F. analis* [*i. e.*, *F. nigricapillus* Cherrie] in many of its characters, such as the absence of the white spot on the lores and the wholly black ear coverts. Its rufous breast, however, renders it readily distinguishable as well from *F. analis* as from all its congeners."

Never having seen a specimen of this very distinct species, I am unable to give a more detailed description of it.

(12?) *Formicarius thoracicus* Taczanowski and von Berlepsch.

Formicarius thoracicus "STOLZM. MS.," TACZAN. and BERL., P. Z. S., 1885, 101 (Machay, c. Ecuador).—SCL., Cat. B. Brit. Mus., XV, 1890, 301 footnote.—SALV. and GODM., Biol. Centr.-Am., Aves, II, pt. 30, 1890, 236, sub *F. rufipectus*.

HAB.—Eastern Ecuador (Machay, altitude 5,000 feet).

SP. CHAR.—Above dusky olive-brown; entire head, with throat, black; breast dark rufous; abdomen olive-brown; under tail coverts rufous; wings blackish, the upper coverts and the outer webs of the

remiges the same color as the back; the under wing coverts varied with ochraceous and black; tail black.

Adult male.—The black occupies the whole of the head, including the throat; the upper parts are brownish olive, much darker on the rump, and changing into rusty on the upper tail coverts; fore neck and breast very dark rust-red; abdomen sooty olive, much lighter than the back; under tail coverts dark rusty. Wings blackish, the upper coverts and outer webs of the remiges the same color as the back, the under wing coverts bright ochraceous with two large black cross-bands, the inner webs of the remiges russet at the base. Tail blackish. Bill horn-black; feet deep brownish gray; iris deep brown.

Female.—Resembles the male in all particulars, and is only distinguished by the less intense rusty on the breast, extended to the middle of the abdomen and continued as a wide stripe of russet-ocher to the under tail coverts.

Male.—Length of wing 89, tail 59, bill 27, tarsus 39 millimeters.

Female.—Total length 218, spread of wing 310, wing 89, tail 60, bill 27, tarsus 38 millimeters.

The above is a free translation of the original description, cited above.

Although Messrs. Salvin and Godman (*l. c.*) consider this bird as being probably the same as *F. thoracicus* Salv., there are features in the description which seem to indicate its distinctness. For example, the following points of disagreement in the descriptions may be cited:

	<i>F. rufpectus.</i>	<i>F. thoracicus.</i>
Upper parts	Brownish black	Dusky olive-brown.
Top of head and hind neck.....	Brownish black, tipped with rufous..	Black.

It may be, however, that the two birds are really the same species, and that their apparent differences may disappear in a larger series; but until such is proven to be the case I prefer to keep them separate.