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## THE AFRICAN CUCKOOS OF THE GENUS *CERCOCOCCYX*

BY JAMES P. CHAPIN

Restricted in range to tropical Africa, the genus *Cercococcyx* Cabanis<sup>1</sup> is allied to *Cacomantis* and *Cuculus*; but the cuckoos composing it are birds with relatively small bodies, large wings, and especially long rectrices. Their colors are dull dark gray or olive-brown above, often with slight green or bronze luster, and sometimes barred with light rufous brown. The underparts are buffy white to light buff, barred on throat and breast at least with blackish.

Some species of *Cuculus* dwell in forests, others are found usually in savannas with trees or bushes; but *Cercococcyx* is always confined to woodlands, and as a rule to heavy forest. Its representatives are of so wary a nature as to be difficult to collect. Fortunately for the ornithologist they have loud voices.

The first species to be discovered was *Cercococcyx mechowii*,<sup>2</sup> secured by Major von Mechow in northern Angola. The type is preserved in the Berlin Museum, where in 1921 I compared it with a male specimen procured by the American Museum Congo Expedition at Avakubi in the Ituri Forest. The outstanding characters of the species are the grayish cast of the crown, upper back, and rump, the back without barring in the adult, the upper tail-coverts with marginal spots or broken bars of whitish or light brown; and the relatively rich buff coloration of the tibial feathering and under tail-coverts, which are generally without dark markings in the adult. The outer webs of the remiges are conspicuously barred with light rufous brown, this barring usually extending to the larger secondary coverts.

In several museums of Europe and the United States I have examined twenty-four skins of *mechowii* from the following localities. Gold Coast: Commeridah; Cameroon: Bitye, River Ja, Assobam; Belgian Congo: Avakubi, Medje, Nala, Poko, Semliki Valley; Angola, presumably the northern part; Uganda: Mpanga Forest, Sezibwa River, Mabira Forest, Mpumu, Kyetuma.

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<sup>1</sup>1882, Journ. f. Orn., p. 230 (type: *C. mechowii* Cabanis).

<sup>2</sup>Cabanis, 1882, Journ. f. Orn., p. 230 (type locality: Angola).

There is little or no sexual difference in size. The specimen from the Gold Coast has the wing 130 mm., tail 170. Adults from Lower Guinea to Uganda are larger, with wing 132–146 mm., tail 179–206 mm. Additional specimens from Upper Guinea alone will show whether it is occupied by a smaller race of the species, but thus far I have found no color difference upon which to base subspecies.

After prolonged acquaintance with *Cercococcyx mechowii* in the Upper Congo, I can vouch for its strictly sylvan habits. It does not show itself even in clearings in the forest, and is only occasionally heard in second-growth woods. Typically a bird of untouched lowland forest, it may ascend to at least 5200 feet, as in the forest east of the Rutshuru Valley. Two very different kinds of notes are heard from this cuckoo. One is a triple high-pitched whistle, keeping in the same key, which I recall by the words "feet-feet-feet" or "wheet-wheet-wheet," and often reiterated during many minutes. The other is a descending series of many "silvery" notes, lasting perhaps three seconds, and not likely to be repeated soon. The same bird will often give both calls; but I think they are uttered only by males, which by careful stalking can be found perching amid leafy boughs, usually 15 to 40 feet above the ground.

For many years the genus *Cercococcyx* was believed to be monotypic, although as a matter of fact skins of another species lay unrecognized in the British Museum. This second species occurs almost throughout the range of *mechowii*, save in Uganda; and by virtue of its similarity it escaped detection until 1912, when the Vienna Museum received two examples from the forested mountains along the eastern edge of the Rutshuru Valley (Congo-Uganda border), where Rudolf Grauer had collected them at an altitude of 1600 meters. Dr. Sassi noticed the differences in coloration, and named the new form *Cercococcyx olivinus*,<sup>1</sup> pointing out at the same time that this species ranged westward to Cameroon and Togo, as evidenced by skins in the Berlin Museum.

The color-characters described by Sassi hold good. The back and rump of *olivinus* are of a dusky olive-brown, and the crown but little grayer. The barring on the outer webs of the remiges has all but disappeared, only faint marginal spots of rufous brown remaining. The ground-color of the breast is buffy white, much the same as in *mechowii*, but the blackish bars are often fewer or narrower, with a tendency to a point near the shaft of each feather. Still more diagnostic is the very

<sup>1</sup>Sassi, 1912, *Annalen Naturhist. Hofmus. Wien*, XXVI, pp. 341, 378 (type locality: Forest of eastern Border Mountains of Rutshuru Plain, 1600 m.). During a visit to this forest in May 1927, I heard both *mechowii* (up to 5200 ft.) and *olivinus* (up to 4400 ft.).

pale buff of tibiae and under tail-coverts. The under tail-coverts are unmarked in the adult, but the tibiae may have dark barring.

In various museums of Europe I have examined twenty-two skins of *Cercococcyx olivinus*, in addition to one in the Field Museum, one in the Museum of Comparative Zoölogy, and five collected by the American Museum Congo Expedition. One of the latter was compared with the type in Vienna. The list of localities whence the specimens came follows. Gold Coast: Fantee; Cameroon: River Ja, Bitye, Esamesa, Bipindi, Metet; Belgian Congo: Avakubi, Babonde, vicinity of Kilo, Bolovet (in Semliki Valley), Forest E. of Rutshuru Valley, Katapena (Lower Katanga); Angola: Ndala Tando.

My measurements show no sexual difference. Three birds from the Gold Coast and one from Fantee have wings 139–144 mm., tail 163–175. Twenty-four from Lower Guinea to the eastern Congo border: wing, 136–156 mm.; tail, 160–195.

The wing of *olivinus* averages some 8 mm. longer than that of *mechowi*, yet its tail averages 11 mm. shorter than that of *mechowi*, although in both measurements there is considerable overlapping. Comparison of wing and tail-length in the same adult individuals has shown that in *olivinus* the length of wing is from 76 to 88 per cent of that of the tail,<sup>1</sup> whereas in *mechowi* it is from 66 to 76 per cent. These proportions seem not to hold good for young birds.

The fact that these two lowland species of *Cercococcyx* have so nearly the same distribution might lead to the conclusion that they were simply based on differences due to sex or age, or represented color-phases of the same bird. I have collected adults of both sexes of both species. From a few measurements taken in the flesh it would seem that *olivinus* has a distinctly larger body than *mechowi*. Moreover, the voices of these cuckoos are so different that my "bird-boy" Nekuma told me they had distinct names in the Mangbetu tongue: "Makwakwa" for *mechowi*, and "Nekongoli" for *olivinus*.<sup>2</sup>

Males of *olivinus* give two distinct calls, and are heard at night more often than *mechowi*. The shorter one might be compared with the descending three-syllabled call of *Cuculus solitarius*, but the first syllable is weak, and from a distance only the two following may be audible: "(whi), whow, whow." These notes are frequently reiterated. The other kind of call is a protracted series of whistles, low in tone, which might be

<sup>1</sup>The tail must be measured with care from the base of the median rectrices, and the wing flattened along the rule.

<sup>2</sup>Chief Kongoli, who lived one day's march north of Rungu (Uelle District), was said to have been named after the bird.

written "whow," changing little in pitch, but increasing in vigor and volume, each note occupying about  $\frac{3}{4}$  of a second, and the whole often lasting 10 or even 15 seconds. This second type of call is not often repeated.

Following up the notes of *olivinus* does not often lead to success. The male birds call as they perch in heavy forest, usually 30 to 60 feet above the ground; but they are even shyer than examples of *mechowi*, become silent when approached, and are all but impossible to find.

So far as I can determine, *Cercococcyx olivinus* does not vary geographically. A word of explanation may here be inserted as to *C. mechowi wellsi*.<sup>1</sup> At Ndala Tando, northern Angola, Dr. Ansorge collected six specimens of *olivinus*; but as Angola was known to be the type locality of *mechowi*, Ansorge's series was not unnaturally regarded as typical material of the latter species. The Cameroon-Uganda series of *Cercococcyx* in the British Museum, including as it did a large proportion of *mechowi*, averaged much darker in color than the half-dozen *olivinus* from Angola. Bannerman's type of *wellsi* is a dark-colored specimen of *mechowi*; but on the whole I cannot separate Cameroon specimens of this species from those of the Congo, Uganda, or northern Angola.

Our knowledge of the breeding habits of these cuckoos is still fragmentary, but it would be surprising if they were other than parasitic. At Avakubi in the Ituri district of the Congo, on September 27, I found a pure white egg in the oviduct of a female *olivinus*. At the same locality, on July 10, my helper Nekuma shot a young *Cercococcyx* in first plumage, the feathers of its head and back, and those of its throat to a less degree, being margined with rufous. He reported that it was being fed by a small brown babbler, *Illadopsis fulvescens ugandæ*. It has not been possible to identify this young *Cercococcyx* with certainty, but I believe it to be *mechowi*, if only because of the conspicuous barring of the remiges and greater wing-coverts. The underparts are thickly barred, and show none of the streaked pattern of which traces are retained by a young bird—presumably *olivinus*—collected by G. L. Bates at Bitye, Cameroon, February 15, 1913, now in the British Museum. Bates' young *olivinus* still shows some feathers on the middle of the throat and the lower breast, remnants of the juvenal plumage, with blackish shaft-streaks 1.5 to 2.5 mm. wide. It has rufous margins on the feathers of crown, back, and upper wing-coverts; but no barring on the greater wing-coverts, although the outer webs of remiges are somewhat barred. The under tail-coverts are light buff with dark chevron-marks.

<sup>1</sup>Bannerman, 1919, Bull. Brit. Orn. Club, XL, p. 7 (type locality: River Ja, Cameroon).

Young birds of *C. mehowi* may show signs of barring on the scapulars, but the banded appearance of the upperparts in the young of both the foregoing species is mainly due to the rufous margins of the feathers. For some years past, however, the museums at South Kensington, Tring, and Vienna have contained ten or more skins of *Cercococcyx* which showed rather distinct rufous-brown barring on the back. These were always regarded as young individuals of *mehowi*,<sup>1</sup> and undoubtedly some of them are immature, with rufous feather-margins on the head and back. Where the juvenal plumage persists, some of the feathers of throat and lower breast show a streaky pattern, due to elongate lunulate marks on the middle of the feathers. All the specimens of which I now speak were secured on the mountains along the eastern border of the Belgian Congo, save one from South Angoniland, southwest of Lake Nyasa. In 1921 these birds puzzled me greatly, for I could not distinguish them from *mehowi*. It now appears that we were all mistaken, that some of the specimens are adults, and that they represent a distinct mountain-dwelling species, heretofore unrecognized.

Late in 1926 I reached the western slopes of the Ruwenzori Range. In the lowland forest between Irumu and Beni (eastern Congo) I had heard the call of *Cercococcyx mehowi* on two or three occasions, but during our stay in the mountain forest of Ruwenzori neither *mehowi* nor *olivinus* was heard. On the other hand, we listened many times to notes which might well be attributed to a *Cercococcyx*. One recalled the triple whistle of *mehowi*, but usually was of four syllables, and could be represented by the words "see-which-fits-best." This phrase, shrill rather than musical, would be repeated again and again, without pause. Occasionally it was lengthened to five syllables; or very rarely shortened to three. At other times, from the same places, came more leisurely notes which had a certain resemblance to the "whow, whow, whow. . . ." of *olivinus*. But the maker was plainly different, for the syllables were soon doubled to "three-cow, three-cow, three-cow . . .," the whole performance lasting for ten or fifteen seconds, and stopping abruptly. Then the "see-which-fits-best" might start up from the same spot. On other occasions a leisurely "you-too, you-too, you-too . . .," not unlike the "three-cow" note, would be repeated an indefinite number of times.

The thick, tangled vegetation and the steepness of the slopes rendered all efforts to see the bird futile, and beyond a doubt the maker of the notes was exceedingly shy. Finally, on December 21, my gun-

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<sup>1</sup>Ogilvie-Grant, 1910, Trans. Zool. Soc. London, XIX, p. 423; Sassi, 1912, Annalen Naturhist. Hofmus. Wien, XXVI, p. 377.

bearer Njómbo brought me a *Cercococcyx* which he had shot without hearing it call. It was an adult male, with slight enlargement of the testes, but differed from both the lowland species in having faint rufous-brown bars on the back, while the outer webs of the remiges were even more broadly barred with rufous-brown than in *mechowi*. On January 3 the same black hunter again secured a similar bird; but as neither was heard to call, my assumption that the notes we heard so frequently were those of a *Cercococcyx* still lacks verification.

No doubt remains, however, as to the specific distinctness of this cuckoo of Ruwenzori, for which I propose the name *montanus*.

#### ***Cercococcyx montanus*, new species**

**SPECIFIC CHARACTERS.**—Allied to *C. mechowi*, Cabanis, but lacking the grayish tinge on crown, back, and rump, where the ground-color is of a dark olive-brown, and there is a faint greenish gloss. Back lightly barred with rufous brown in the adult, crown sometimes showing narrow buffy shaft-streaks, upper tail-coverts with bars of rufous brown, often interrupted in the middle. Rufous barring of the upper surface of rectrices more extensive or more nearly complete; and rufous bars on the outer webs of remiges broader and more conspicuous. Throat and breast barred with blackish, much as in *mechowi*, ground-color of upper chest pale buffy, that of remainder of breast more whitish. Tibial feathering and under tail-coverts buff; tibiae often barred with blackish, and under tail-coverts sometimes unmarked, but often spotted or barred with black.

**DIMENSIONS.**—Wing, 134–149 mm.; tail, 182–201 mm.; exposed culmen, 17–20 mm.

**TYPE.**—Male; No. 1699, Ruwenzori-Kivu Expedition of The American Museum of Natural History; Kalongi, 6900 ft., Butahu Valley, Ruwenzori Range. Its measurements are: wing, 139 mm.; tail, 201; exposed culmen, 18. In this specimen the middle of the crown is without light markings, the under tail-coverts are uniform buff. Colors of naked parts were noted as follows: iris dark brown, rim of eyelids lemon-yellow; gape yellowish green, maxilla blackish, mandible olive-green with blackish tip; feet chrome-yellow with a tinge of ochre, claws dark gray.

**JUVENAL PLUMAGE.**—Among the specimens collected by Grauer, there is one, in the museum at Tring, so young that the wings and tail have not attained their full length, and measure respectively 106 and 68 mm. It was taken in the mountain forest northwest of Lake Tanganyika on July 1, 1908. The feathers of the back are not definitely barred, but the whole upperparts appear to be barred, because each feather has a rufous margin all around, from the forehead to wing-coverts and upper tail-coverts. Likewise on the underparts the juvenal plumage is entirely retained. The pattern here, while it cannot strictly be described as streaked, is very different from the dark barring of adults, or of young which have molted their first (= juvenal) plumage. The throat is dusky, streaked with white, and all its feathers loosely margined with cinnamon-buff or light rufous. The upper breast is still more blackish, the white of the feathers being restricted to an irregular bar, separated from the buff-edged tip by a broad blackish space. On the middle of the lower breast the pattern

again becomes streak-like, though the elongated dark mark on each feather is in reality lunulate. Behind this region all the feathers are generously edged with white, and on the blanks and tibiae the feathers are barred, dusky and white. The under tail-coverts are very pale buff, with a blackish chevron-bar near the tip, and with more directly transverse bars basally.

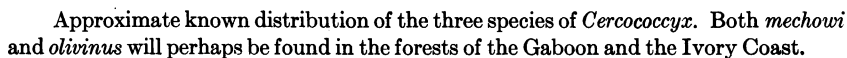
**MATERIAL EXAMINED.**—Fourteen skins of *Cercococcyx montanus* have been examined, distributed among five museums. British Museum (Nat. Hist.): one ♀ from South Angoniland, Nyasaland, Oct., 1900, collected by T. I. Binnie; one ♂ adult from Mubuku Valley, 7000 ft., E. Ruwenzori, Jan. 11, 1906, R. B. Woosnam. Zoological Museum, Tring: an adult ♂, Mountain forest N. W. of L. Tanganyika, June 27, 1908; a young ♂ from preceding locality, July 1, 1908; an adult ♀, Wau Island, Lake Kivu, Nov. 14, 1907; an immature ♂ from West of Ruzizi, E. Congo, Nov., 1908—all four collected by R. Grauer. Vienna Museum: three ♂ and two ♀, all from mountain forest N. W. of L. Tanganyika, 2000 m., Feb.-March, 1910, R. Grauer. American Museum of Natural History: adult ♂ and ♀ from Kalongi, 6900 ft., W. Ruwenzori, Dec. 21, 1926 and Jan. 3, 1927, respectively. Museum of Comparative Zoology: one ♂ adult, Bagilo, 5000 ft., Uluguru Mts., Tanganyika Terr., Sept. 28, 1926, A. Loveridge.<sup>1</sup>

**RANGE OF THE SPECIES.**—Mountain forests above 5000 feet, from Ruwenzori south to Lake Tanganyika and the highlands southwest of Lake Nyasa, also the Uluguru Mountains in eastern Tanganyika Territory. On the western slopes of Ruwenzori we heard the notes which I attribute tentatively to this cuckoo as high as the upper margin of the bamboo zone, close to 9000 feet. On the northwestern slopes of Ruwenzori, near the Luami River, I again heard them as low as 5300 feet. Within 24 hours, descending into the adjacent lowland forest of the Semliki Valley, I listened to the calls of *C. mechowii* and *olivinus* as well.

In early March near a place called Mulu, some twelve miles northwest of Lake Edward, I again heard several birds giving the above-mentioned calls in mountain forest at 8100. to 8300 feet; but as usual they eluded me. Farther south, in the mountains west of Lake Edward, on the Kivu volcanoes, and on the mountains west of the Ruzizi Valley, I failed to hear them; but it is likely that there are certain seasons when the birds seldom call.

The distribution of *Cercococcyx montanus* is certainly discontinuous, because of its habitat requirements; yet it is likely to be discovered in many places within the limits outlined above. Possibly the species may be found divisible into races. For example, the light brownish markings on the upperparts, including wings and tail, of Loveridge's specimen from the Uluguru Mountains are more extensive and conspicuous than in the three known from Ruwenzori, and the dark bars on the breast may be

<sup>1</sup>Reported as *C. olivinus* by Friedmann, 1928, Ibis, p. 78.



more widely spaced. The wing of the Uluguru specimen measures 148 mm. and is exceeded only by that of the Angoniland skin (149 mm.), whereas the three Ruwenzori examples have wings 137, 139, and 140 mm. The longest wing in birds from the eastern Congo measures 145 mm., one of Grauer's specimens (labeled ♂) from the mountains northwest of Tanganyika. Another (labeled ♀) from Wau Island has the wing 134 mm. long, and a ♂ immature from west of the Ruzizi 139 mm.

While the wing apparently increases in length toward the east and south, the tail does not vary correspondingly. The longest tail (201 mm.) is that of the type specimen from Ruwenzori, the skin from Angoniland has a tail of 189 mm., that of the Uluguru Mountains 182 mm. So in this species the proportion of wing to tail-length is less diagnostic than in the lowland members of the genus. Specimens of *C. montanus* from the eastern Congo and Ruwenzori have wings 69 to 76 per cent as long as the tail, and the two from Angoniland and the Uluguru Mts., 79 and 81 per cent, respectively.

In these days of Formenkreis study, it may be wondered whether *Cercococcyx montanus* is not simply a mountain race of one of the older-known species. In the barring of the wings and the relatively long tail of many specimens it resembles *mechowi*, but there is no approach to the grayish coloration of back and rump of that species. If my supposition as to its voice proves correct, it will be clear that in this respect the mountain form differs from both of those in the lowlands. Consequently I prefer to regard the genus as composed of three species.

In conclusion, we may be permitted to indulge in a little speculation as to the possible origin and evolution of the group. Faunal studies in the tropics have demonstrated that mountain forms are not usually to be regarded as ancestral to lowland relatives, and that the reverse is more probable. The way in which some of the color-characters of *mechowi* and *olivinus* are combined in *montanus* may be an argument in favor of the antiquity of the mountain form, which would then have arisen from some primitive lowland-dwelling *Cercococcyx*, and after becoming adapted to life in the cooler mountain forests, would have spread to suitable localities in eastern tropical Africa.

The origin or differentiation of the two lowland forms, which now live side by side in the same forests, is more problematic. Parallel cases are not wanting in Africa; and as such we may cite: *Apaloderma narina* and *aequatoriale*, in the Cameroon-Congo forest; *Scotornis climacurus* and *Caprimulgus fossii*, which are really not generically distinct, and occur together in parts of the Kasai district; *Bæopogon indicator* and *clamans*, in the Cameroon-Congo forest; and *Estrilda nonnula* and *atricapilla*, which occur together in parts of the Cameroon and Upper Congo.

Whether or not such forms arose by mutation is not the main point. Geneticists regard virtually all hereditary characters, whether strongly or slightly marked, as mutational in origin. But how have the mutational characters escaped "swamping" in the mass of population? Some, to be

sure, are of such a kind that they do become established as color-phases, individuals of the different colors interbreeding, while the nature of the "genes" insures the perpetuation of the color-phases. But in the cases cited above, the color differences are relatively slight; the two forms do not interbreed, so far as we know; and their voices are often radically unlike. There is what we may call a sexual indifference or aversion, and this must be the most important factor bearing on the evolutionary development of the forms in question. It is my belief that the sexual indifference arises only through isolation of some sort, and among birds this is usually geographic segregation.

It may of course be argued that sexual indifference results from changes in the voice or in courtship which arise concurrently with the external characters distinguishing two divergent forms. But I cannot recall any observation of such a coincidence within the same area. In the case of a number of birds exhibiting distinct color-phases, we know the reverse to be true.

The ranges of *Scotornis climacurus* and *Caprimulgus fossii*, for the most part, are kept separate by the equatorial forest belt, where neither species of goatsucker is truly at home. But in relatively recent times the long-tailed northern *Scotornis* has found its way across the narrowest part of the forest belt, in the neighborhood of the Sanga River, and has become thoroughly established in the northern Kasai drainage. During the earlier period of isolation, a sexual aversion had been developed, and this now insures the distinctness of the two species.

In the case of the forest-loving trogons of the genus *Apaloderma*, it seems possible that originally only *A. æquatoriale* dwelt in the Congo-Cameroon forest. Meanwhile *A. narina* may have occupied some separate wooded area in eastern or southeastern Africa, where even now it is found alone. Later it spread into the forests that sheltered *A. æquatoriale*. In the present connection it is of interest that we have in Africa another trogon, *Heterotrogon vittatus*, living in mountain forests, and very nearly congeneric with *Apaloderma*.

The comparison between these trogons and the cuckoos of the genus *Cercococcyx* is particularly apt. But where the two distinct forest areas were, in which *mechowi* and *olivinus* might have developed specific distinctness, remains dubious. To-day we have the forests of Upper Guinea and Lower Guinea, each with a number of mutually representative species. Supposing that *C. olivinus* was once restricted to Upper Guinea, and *C. mechowi* to Lower Guinea, we have perhaps an explanation of the apparent absence now of *C. olivinus* from the forests of Uganda,

though *C. mehowi* is found there. That the spread of *mehowi* to Upper Guinea and the invasion by *olivinus* of Lower Guinea were relatively recent might then be inferred from our failure to discover any subspecific differences.

KEY TO THE SPECIES OF *Cercococcyx* (ADULTS)

- 1.—Back more or less distinctly barred with rufous brown on a dark olive-brown ground-color, upperparts with a faint greenish gloss; outer webs of remiges and greater wing-coverts always broadly barred with rufous brown; tail always exceeding 180 mm. in length, wing varying in length from 69 to 81 per cent of tail. . . . . *C. montanus*.

Back not barred, but plain dark gray or olive-brown, often with a faint gloss; outer webs of remiges may be barred or spotted with rufous brown, or uniformly dusky brown; tail, 160 to 206 mm. long. . . . . 2.

- 2.—Outer webs of primaries, secondaries, and greater wing-coverts conspicuously spotted or barred with rufous brown; crown, back, and rump distinctly dark gray in color; wing usually less than 75 per cent as long as tail.

*C. mehowi*.

Outer webs of remiges faintly spotted, if at all, with rufous brown, the greater wing-coverts scarcely so marked; back and rump distinctly dark olive-brown in color, crown little if at all grayer; wing always more than 75 per cent as long as tail. . . . . *C. olivinus*.

