

COLOR VARIATION IN SHRIKES OF THE
GENUS *CHLOROPHONEUS*

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THE varied phases of two of the smaller green bush-shrikes of Africa have already attracted considerable attention. They are so diverse that several were described as species, others as races of species to which they do not belong. These shrikes are referred to the genus *Chlorophoneus* Cabanis by Sclater in his *Systema Avium Aethiopicarum* (1930), where we find eight species listed. Furthermore, *Laniarius bocagei* Reichenow, though placed by Sclater in the genus *Dryoscopus*, is very closely allied to *Chlorophoneus sulfureopectus*, and differs mainly by the lack of yellow pigment in its plumage.

Pigmentation is unusually variable in this group, and *Chlorophoneus nigrifrons* is known to have one phase in which yellow pigment is so greatly diminished that only the lower back, wings, and tail are greenish, and the breast merely buffy. The eight species admitted by Sclater are now to be reduced, I believe to four; and to these we must add *bocagei*. Three other small species referred by Sclater to *Telophorus* show considerable resemblance to *Chlorophoneus*, but they all have black chest-bands, and *T. quadricolor* is little more than a lighter-colored eastern representative of *T. viridis*. If *viridis* and *dohertyi* are really allied to *Telophorus zeylonus*, the type of the genus, we may yet have to merge the genus *Chlorophoneus* with *Telophorus*.

Chlorophoneus multicolor* and *nigrifrons

The species which first attracted attention to its exceptional color variation is *C. multicolor* of western Africa, and Sclater pointed out that Neumann regarded *melamprosopus* as a mere color phase. Stresemann (1924) had already shown that *nigrithorax* was a mutant of the same species, and now Bannerman (1939) has accepted these conclusions and given additional proof.

In eastern Africa, *C. nigrifrons* was found to show equally diverse coloration. It was long contended that the red-chested *abbotti* and *elgeyuensis* or the buff-breasted *münzneri* could not possibly be conspecific with the golden-breasted *nigrifrons*. But the pattern of the head and the coloration of upper parts were much the same in all of them, and eventually a still more remarkable form with blackish throat and chest was discovered by Moreau and named *nigrescens* by Sclater (1931). The type was a male, taken in company with a yellow-breasted female. Soon afterward, Admiral Lynes (1934) re-

ported mixed pairs of *nigrifrons* and *münzneri* in Tanganyika Territory, and his observations were confirmed by F. Zimmer (1939). As a result, Grant and Mackworth-Praed (1942) came to the very logical conclusion that the four diverse forms of eastern Africa all belonged to the single species *nigrifrons*.

The proportionate numbers of the various phases are not the same in different parts of the range. Black-chested birds so far have all proved to be males, and have been found only in Usambara and on Mount Namuli in Portuguese East Africa. Females as well as males may be reddish on the chest, and such birds are known from the greater part of the range, but not from Usambara. Orange-breasted examples of both sexes are likewise widely distributed. Males of these two bright-colored phases are usually more highly pigmented than females. Buff-breasted birds, of both sexes, are not uncommon in Tanganyika Territory, but extremely rare in Kenya Colony.

Chlorophoneus nigrifrons lives in highland forests scattered from Kenya Colony to the northern Transvaal, and reaches the Upper Katanga. How to divide it into subspecies is a difficult problem, and Vincent (1935) could not find very convincing arguments for upholding *C. n. manningi*. The species does not occupy the highlands of the Kivu District, even though Hartert (1923) described a supposed race, *C. n. conceptus*, from a mountain forest 120 kilometers west of Lake Tanganyika. This locality is on the highland northwest of Baraka. The type, now in the American Museum, is a male with black on forehead and ear-coverts; but it belongs to the species *multicolor*, not to *nigrifrons*. It is not quite adult, and lacks any white on the fore-crown or above the eye. Its green outer rectrices are already more broadly tipped with yellow than those of *nigrifrons*; and some of them are marked with black on the inner webs, proof that the adult rectrices would agree with those of *multicolor* from the same region.

Moreover, the two cotypes of *conceptus*, regarded by Hartert as females, lack the blackish facial markings that are present in adult females of *nigrifrons*. The fully adult male of this same form had been described by Hartert himself as *Laniarius graueri*, from west of Lake Edward, fifteen years earlier; and the type of *graueri* is plainly a golden-breasted representative of *C. multicolor*. Thus *conceptus* is a synonym of *graueri*, and the latter is a valid race of *multicolor*.

Over the greater part of its West African range *Chlorophoneus multicolor* inhabits lowland forest. It extends from Sierre Leone

to the southern Cameroon, the northeastern Congo, and the Mpanga Forest in western Uganda where it reaches an altitude of almost 5,000 feet. Dr. Ansorge found it also at Ndala Tando in Angola. In the eastern Congo it follows the edge of the main forest southward and occupies many of the forested highlands along the western margin of the Albertine Rift south to the vicinity of Baraka. But it scarcely ascends above 6,500 feet, and has never been taken in mountain forest on Ruwenzori or the Kivu Volcanoes. Neither has it been found in the central Congo Forest or along its southern margin near the Kasai, though it certainly would be expected in the Gaboon.

This western species is known to have a yellow or orange-breasted phase, to which the types of *melamprosopus*, *zosterops*, *reichenowi*, *ituriensis*, *graueri*, and *conceptus* all belong; and another with brilliant scarlet breast in either sex. The types of *multicolor*, *liberianus*, *preussi*, *batesi*, and *théliei* were all red-breasted. Furthermore, the black-chested phase, named *nigrithorax* by Sharpe, is now known from five specimens, all males and all taken in forested Upper Guinea; so the color variation may be said to parallel that of *C. nigrifrons* in East Africa. Females of *C. multicolor* lack any black about the face, and their loral region changes from gray to whitish as they become adult.

Thus far no color phase of *multicolor* has been recognized which agrees with the *münzneri* form of *nigrifrons* in lacking yellow pigment on its under surface. But when *münzneri* was shown to be a phase of *nigrifrons* and not a geographic race of *C. rubiginosus* of southeastern Africa, doubt arose as to the status of *C. rubiginosus rudolfi* Hartert (1908), which was named from the highland west of Lake Edward. Here again, the type was not an adult male, but had been labeled as a female by its collector. It looks very like an immature example of *C. multicolor*, except that the breast is of a rather rich buff, the throat whitish. A second specimen, sexed as a male but seemingly an immature female, was secured by Rudolf Grauer northwest of Lake Tanganyika, in the same highlands as the type of *conceptus*. In these two examples of *rudolfi* the loral region is not so distinctly whitish as in *C. rubiginosus*, and the tail-feathers are more conspicuously tipped with yellow. All this might have suggested that *rudolfi* is not a race of *rubiginosus*, but just another color phase of *C. multicolor*.

The suspicion should have been strengthened in 1924 when Dr. Moriz Sassi reported that Grauer had collected a fully adult male

of *rudolfi* for the Vienna Museum in the highland northwest of Lake Tanganyika. He called attention to the resemblance in color of its upper parts to the adult male of *multicolor*. But the throat was white, the breast of a delicate salmon color, flanks and under tail-coverts more yellowish and green. We ought to have realized then that *rudolfi* had no close connection with *rubiginosus*.

Fortunately, in 1929, J. Sterling Rockefeller and Charles B. G. Murphy obtained a second adult male of *rudolfi* on the Elila River, near 6,000 feet in the highland west of Uvira. This example is like the one discussed by Sassi, except that even the flanks and under tail-coverts are light salmon-buff. Facial markings, color of upper surface, and the blackish rectrices with broad yellow tips all confirm its specific agreement with *C. multicolor*. It cannot represent a separate geographic race, for golden-breasted individuals have been found in the same district.

So now we can say with certainty that the western species, *Chlorophoneus multicolor*, exhibits four mutant varieties not unlike those of the eastern *nigrifrons*: buff-breasted, golden-breasted, red-breasted, and black-chested. In no one locality, perhaps, will all four be found together; even the proportion of golden-breasted to red-breasted birds may vary geographically.

We may safely conclude that in such cases as this the genes which determine the amount of buff, yellow, red, or black pigment in the plumage are few in number, so that gradual intergradation in color between the various phases is not to be expected. Fertility is apparently not affected by their interbreeding, and the individual bird has no aversion to association with another of widely different color. The chest can be black, it seems, only in males; the character is sex-limited.

In the recognition of subspecies such extreme color variation cannot be used, unless birds of one phase occupy areas from which the others are virtually excluded. In western Africa this is not the case, and I agree with Dr. Bannerman that *C. m. multicolor* extends from Sierra Leone to the region near Mt. Cameroon, and *C. m. batesi* from the interior of the Cameroon eastward to the northern Belgian Congo, also to northern Angola near Ndala Tando. While the latter race would be expected to occur in the Gaboon or Lower Congo, we have no record from those regions. The blacker rectrices of the adult males of *batesi*, tipped with yellow or red, furnish the most reliable distinction. Males of *C. m. multicolor* have greener tails, though the outer rectrices may become rather blackish, and the tips of all are yellow or orange-red.

Both these races, in fully adult male plumage, have a good deal of white just behind the black forehead and extending back in a line above the eye. One might expect intergradation in tail-color in the vicinity of Mt. Cameroon, and this seems to be shown in at least one of the two red-breasted males which Preuss collected at Victoria and which Neumann (1899) named *preussi*. The same is true of a male from Nkongsamba sent to us by R. H. Drinkwater in 1930. Strangely enough, the two red-breasted males from Victoria and that from Nkongsamba have the crown wholly gray. It might seem that *preussi* were a valid local race, had not Preuss also obtained at Victoria an orange-breasted male with considerable white on the fore-crown. Bannerman mentions a specimen of this same phase from Mt. Cameroon with tail colored as in nominate *multicolor*. Males that are not quite fully adult sometimes lack white on the crown, so the proper name for the race living near Mt. Cameroon is still in doubt. It is not altogether certain that the name *batesi* may not have to give way to *preussi*.

It has often been assumed that *C. m. graueri* must be synonymous with *batesi*, and specimens from the northeastern Congo and western Uganda are certainly not separable. Both red-breasted and golden-breasted examples like those of the Cameroon have been secured in the northeastern Congo, near Medje, to the south of Arebi, in the vicinity of Kilo and near Beni. In Toro, Uganda, Jackson secured two golden-breasted examples. But *graueri* was described from west of Lake Edward, in mountain forest; and all the adult male specimens I have examined from there and southward to the highland northwest of Lake Tanganyika, both golden-breasted and buff-breasted, have had a much narrower whitish border on the fore-crown than *C. m. batesi*. No red-breasted bird is yet reported from that area. The type of *graueri* is golden-breasted, with rectrices all black save for their yellow tips. In 1937 I obtained another male, virtually at the type locality, which agrees entirely with the type. Equally adult males from the region northwest of Lake Tanganyika have somewhat more green on their tails. I am convinced that *graueri* must be upheld, as Hartert argued in 1928, but consider the highland west of Lake Edward as its northern limit. The buff-breasted *rudolfi* is only a color phase of *C. m. graueri*. Of this species there are, therefore, three well-marked races: *multicolor*, *batesi*, and *graueri*, with *preussi*, of doubtful status, in the vicinity of Mt. Cameroon.

Chlorophoneus olivaceus and *rubiginosus*

The variable colors of *Chlorophoneus nigrifrons* and *multicolor* raise another question that should interest South African ornithologists. Is *Chlorophoneus rubiginosus* really a species distinct from *C. olivaceus*? These two shrikes are very closely allied, as shown by the facial markings and the pattern of the rectrices. The principal difference lies in the more abundant yellowish pigmentation of *olivaceus* on the whole under surface and crown. The two birds certainly occur together in the forests of eastern Cape Province and Natal. A supposed race of *olivaceus*, known as *taylori*, and having a buffy throat, is said to occupy Swaziland and eastern Transvaal. In Southern Rhodesia and Nyasaland the yellow-breasted *C. olivaceus* is apparently wanting, and *rubiginosus* is represented by the races *bertrandi* and *makawa*, with the pale temporal stripe greatly reduced. It seems to me quite clear that *rubiginosus* is merely a color phase of *C. olivaceus* of which *bertrandi* and *makawa* are northern races. It may be recalled that Levaillant considered the grayer birds to be the young, and the yellower examples the adults of a single species. But the difference in yellow pigment is already evident in the juvenile plumages.

The oldest name in this whole group is *C. olivaceus* (Shaw) of 1809, and one might well ask why *nigrifrons* and *multicolor* are not reduced to subspecific rank? There are still certain difficulties. In southern Nyasaland, where *Chlorophoneus olivaceus bertrandi* and *C. nigrifrons manningi* live in much the same area, *bertrandi* shows a white loreal spot in both sexes and there is considerable difference in color between the sexes. The red-breasted *manningi* has black lores, its bill is smaller, and the sexes are very much alike. Such differences seem to preclude their being only color phases.

Otherwise it would be strange indeed that such competent observers as Swynnerton, Vincent, and Benson have failed to note any mixed pairs. Benson (1941) was convinced that *bertrandi* usually lived at higher levels than *manningi* in Nyasaland. Many observers in southeastern Africa have described the persistent and pleasing songs of "*rubiginosus*," while in eastern Africa *C. nigrifrons* sings less often and varies its soft whistles with clicking or rasping notes. Careful observations on the voices of *bertrandi* and *manningi* were published by Vincent (1935), while in Usambara, Moreau (1933) was unable to find any distinction between the notes of *nigrifrons* and *münzneri*.

Again, in the eastern Congo, *C. multicolor graueri* exhibits marked sexual dimorphism in the color of the face, and the adult male has

black rectrices tipped with yellow. *C. nigrifrons manningi*, occurring a few hundred miles to the southward in the Katanga, differs in both these particulars. If specimens can be obtained in the intervening region, we may learn more about their real relationship. There appears to be a rather wide gap, both in ranges and in coloration, between *C. multicolor* and *C. nigrifrons* in the region of Uganda and Lake Victoria. In East Africa, *nigrifrons* is distinctly a bird of mountain forest; in the Congo and West Africa, *multicolor* is more characteristic of lowlands.

Chlorophoneus sulfureopectus* and *bocagei

Divergences in coloration such as we have been discussing may be shown by individuals of the same subspecies, or they may characterize geographic races or species. In an allied group of shrikes, the genus *Malaconotus*, we find that *M. cruentus cruentus* of the Upper Guinea forests is less washed with red on its breast than *M. cruentus gabonensis* of the Cameroon and Gaboon. Coloration is, of course, a common distinction between species, but then there are usually other differences of pattern and proportions. The yellow-breasted *Malaconotus poliocephalus* inhabits the savanna countries all around the range of *M. cruentus*, and varies geographically in the amount and extent of reddish brown on the breast.

Somewhat the same geographic relations may be observed in the case of *Chlorophoneus sulfureopectus* and *C. bocagei*. The yellower species, *sulfureopectus*, is a wide-ranging savanna bird, its chest orange or light red in most adults. Its distribution extends from Senegal to Abyssinia, and south through eastern Africa to the eastern Cape Province and to Angola, thus encircling the Cameroon-Congo forest, in which *C. bocagei*, shorter-tailed and with no yellow in the adult plumage, takes its place. The young of *bocagei* in barred juvenal dress, rarely collected, have remiges and rectrices lightly washed with greenish on their outer margins, and buffy yellowish tips on most feathers of the upper parts. The lower surface, too, shows at first a strong wash of yellowish.

Anyone acquainted with these two species in life must be struck with the great similarity in their behavior and in their cheerful whistled notes, which might readily be confused if the birds did not live in very different types of country. In the Semliki Valley and in Uganda both occur, *sulfureopectus* in the open acacia and grass country, *bocagei* in the areas of heavy forest. Both species are very apt to use spirally coiled tendrils in building their nests. Both have been divided into subspecies, but those of *bocagei* are even less well marked than those of *sulfureopectus*.

Size, pigmentation, and habitat preferences all serve to distinguish these two as species. But from the vicinity of Entebbe, in a region where both might be expected to occur, a single bird has been described as *Chlorophoneus andaryae* by Jackson (1919). Its sex may be doubtful; its size is small, with wing 79 mm., tail 70 mm., and the upper parts mainly dark blue-gray, with white lores and superciliary stripe. Wing-quills are washed with greenish on the outer webs, outer tail-feathers dusky olive, tipped and edged with pale yellow. The under surface is white with a wash of pale cinnamon on the chest. It should be noted that Bannerman regarded the type as seemingly intermediate between *C. bocagei jacksoni* and *C. rubiginosus*. Jackson and Sclater (1938) have suggested that it may be related to *münzneri*, but no form of *C. nigrifrons* occurs in the lowlands of Uganda. In length of wing and tail, *andaryae* agrees closely with *C. bocagei*, and I feel sure it will prove to be at most an aberrant example—possibly a mutant or hybrid—of the *bocagei-sulfureopectus* group.

SUMMARY

There now appear to be but five species of the African genus *Chlorophoneus*. All have more or less yellow or green in their adult plumage save *C. bocagei*, which must nevertheless be considered a close relative of *C. sulfureopectus* and *C. olivaceus*.

Two species of *Chlorophoneus*, *nigrifrons* and *multicolor*, are represented by distinct color phases, four in each case, in which the yellow or red pigment may be present or absent over large areas, or replaced in part by buff or even black.

C. "nigrifrons" conceptus is not a race of *nigrifrons*, but a synonym of *C. multicolor graueri*; and *C. "rubiginosus" rudolfi* is merely a color phase of *C. m. graueri*.

C. olivaceus appears to have two color phases, differing by the abundance or the reduction of yellow pigment, so that *rubiginosus* cannot be regarded as a separate species.

C. andaryae is apparently a mutant or a hybrid, closely related to *C. bocagei*.

SPECIES AND RACES OF *Chlorophoneus* CABANIS.

1. *C. bocagei* (*Laniarius bocagei* Reichenow, 1894: Yaunde, Cameroon). The nominate race occupies the forests of southern Cameroon, Spanish Guinea, and northern Gaboon, extending eastward probably to the Upper Congo. Tail of the male black, that of female somewhat grayish. *C. b. jacksoni* (Sharpe) is closely similar, except that the tail is black also in the female. It occupies forests

of the eastern Congo, Uganda, and the Nandi District. *C. b. ansorgei* (Sclater) has the back and rump lighter gray, and extends from northern Angola to the Lower Congo. These races are very slightly differentiated, their limits not at all clear.

2. *C. sulfureopectus* (*Tschagra sulfureopectus* Lesson, 1831: West Africa; restricted type locality, Senegal). *C. s. sulfureopectus*, with auriculars black in males, ranges from Senegal to Uganda and western Kenya Colony. In most of East Africa the reddish band across the chest becomes deeper in color, and the auriculars are not so black. These birds have been called *C. s. suahelicus* (Neumann), but they differ little from the South African *C. s. similis* (Smith). In Angola and the southern Congo, the reddish color on the breast is said to be paler, and *C. s. modestus* (Bocage) has sometimes been recognized. *C. s. fricki* Friedmann of southern Abyssinia and northern Kenya Colony is like *suahelicus*, but seems to have more green on the crown. All these characters are shown well only by adult males, and the geographic variation is not clear-cut. This is the only species living among the larger trees in savanna country.

3. *C. olivaceus* (*Lanius olivaceus* Shaw, 1809: Algoa Bay, S. Africa). Sundevall's *rubiginosus* is only a color-variant, and *C. o. olivaceus* extends from Knysna to Natal and the Transvaal. The supposed race, *taylori* Roberts, needs further study, being based on yellow-breasted birds with buffy throats. *C. s. bertrandi* (Shelley) and *makawa* Benson are found in Southern Rhodesia and southern Nyasaland, where yellow-breasted examples are still unknown, save that Swynnerton (1908) reported "*olivaceus*" as well as *bertrandi* from the Melsetter District.

4. *C. nigrifrons* (*Laniarius nigrifrons* Reichenow, 1896: Marangu, Kilimanjaro). The red-breasted phase was also described from Kilimanjaro as *abbotti* Richmond, and later from Marakwet, Kenya Colony, as *elgeyuensis* van Someren. No satisfactory basis has yet been found for subspecific distinction among the birds from Kenya Colony, Usambara, or the more southern highlands of Tanganyika Territory, where the buff-breasted phase was first discovered and named *münzneri* Reichenow. So aside from *C. n. nigrifrons* with its four color phases, only *C. n. manningi* (Shelley) is admitted as valid, because of the rather dull red of its breast and the small yellow terminal spots on its remiges. No golden-breasted individuals have been reported from the range of *manningi*, though two black-breasted males were secured there by Jack Vincent. The range extends from northern Transvaal and the Melsetter District to Nyasaland, the Katanga, and Mwinilunga in Northern Rhodesia.

5. *C. multicolor* (*Laniarius multicolor* Gray, 1849: West Africa; restricted type locality, Accra Plains). Nominate *multicolor* ranges from Sierre Leone to the base of Mt. Cameroon; *C. m. batesi* Sharpe, with more black on the rectrices, from there eastward along the northern edge of the equatorial forest to the Ituri and Toro in western Uganda. The latter race has also been found in northern Angola. In the highlands of the eastern Congo, from near Lake Edward south to the country west of Uvira, lives *C. m. graueri* (Hartert), with less white on the forehead. No red-breasted or black-chested example of *graueri* is known, and it seems to be the only race with a buff-breasted phase.

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