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Daniel J. Lebbin Willow Francois Jorge Brocca Jacob Saucier R. Terry Chesser

Photo: Daniel J. Lebbin

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Daniel J. Lebbin[1,2], Willow Francois[3], Jorge Brocca[2,4], Jacob Saucier[5,6], and R. Terry Chesser[5,7]

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Cover Page: This aberrant euphonia was observed on 6 October 2024 at the Des Cartiers Trail lookout in St. Lucia. Photograph by Daniel J. Lebbin (Macaulay Library ML624617743).

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[1]American Bird Conservancy, 8255 E. Main Street, Suites D and E, Marshall, Virginia 20115, USA; e-mail: dlebbin@abcbirds.org

[2]BirdsCaribbean Endemic and Threatened Species Working Group

[3]St. Lucia Wildlife Ambassadors, Babonneau, Castries, St. Lucia; e-mail: matthewfrancois319@gmail.com

[4]SOH Conservación, Gustavo Mejía Ricart 119b, Ensanche Julieta Apto. 401 10130, Santo Domingo, República Dominicana; e-mail: jbrocca@soh.org.do

[5]National Museum of Natural History, Smithsonian Institution, 10th St. and Constitution Ave. NW, Washington, District of Columbia 20560, USA

[6]e-mail: jacob.r.saucier@gmail.com

[7]e-mail: chessert@si.edu

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Abstract

A likely *Chlorophonia flavifrons* (Lesser Antillean Euphonia) photographed on St. Lucia in 2024 exhibited a bold and previously undescribed plumage pattern characterized by predominantly deep blue upperparts and a bright yellow rump, distinct from the expected sky-blue hood, greenish back and wings, and yellowish-green rump characteristic of this species. In comparing photos of this aberrant individual to museum specimens of this and other species, we describe previously undescribed plumage patterns for immature male *C. flavifrons* and *C. sclateri* (Puerto Rican Euphonia). To interpret the plumage pattern of the aberrant St. Lucia individual, we explore five possible hypotheses where the bird represents (1) an accidental vagrant, (2) an escaped pet bird, (3) a hybrid, (4) a new undescribed species, or (5) a plumage variant of *C. flavifrons*. We reject hypotheses 1, 2 and 4, but cannot test underlying mechanisms that could produce such a plumage pattern under hypotheses 3 and 5.

Keywords

aberrant plumage, ancestral trait, *Chlorophonia flavifrons*, *Chlorophonia sclateri*, Lesser Antillean Euphonia, plumage maturation, Puerto Rican Euphonia

Resumen

Un ejemplar aberrante de eufonia de Santa Lucía, con observaciones sobre la variación del plumaje en dos especies caribeñas de *Chlorophonia* • Un probable individuo de *Chlorophonia flavifrons* (Eufonia de las Antillas Menores), fotografiado en Santa Lucía en 2024, presentaba un patrón de plumaje inusual nunca antes descrito, caracterizado por partes superiores predominantemente azul intenso y una rabadilla amarillo brillante distinto de la capucha azul celeste, el dorso y las alas verdosos, y la rabadilla verde amarillenta característicos de esta especie. Al comparar las fotografías de este individuo aberrante con especímenes de museo de la misma y otras especies, describimos patrones de plumaje no descritos previamente para machos inmaduros de *C. flavifrons* y *C. sclateri* (Eufonia de Puerto Rico). Para interpretar el patrón de plumaje del individuo aberrante de Santa Lucía, exploramos cinco hipótesis posibles sobre si esta ave podría ser: 1) un ave vagabundo accidental, 2) un ave de jaula escapada, 3) un híbrido, 4) una nueva especie aún descrita o 5) una variante de plumaje de *C. flavifrons*. Rechazamos las hipótesis 1, 2 y 4, pero no pudimos evaluar los mecanismos subyacentes que podrían producir dicha variante de plumaje según las hipótesis 3 y 5.

Palabras clave

Chlorophonia flavifrons, *Chlorophonia sclateri*, Eufonia de las Antillas Menores, Eufonia Puertorriqueña, maduración del plumaje, plumaje aberrante, rasgo ancestral

Résumé

Présence d'un organiste aberrant à Sainte-Lucie et réflexions sur la variation du plumage de deux espèces caribéennes du genre *Chlorophonia* • Un probable *Chlorophonia flavifrons* (Organiste des Petites Antilles) photographié à Sainte-Lucie en 2024 présentait un plumage particulier jamais décrit auparavant, caractérisé par des parties supérieures principalement bleu foncé et un croupion jaune vif distincts du capuchon bleu ciel, du dos et des ailes verdâtres et du croupion vert jaunâtre caractéristiques de cette espèce. En comparant les photos de cet individu

aberrant aux spécimens de muséum de cette espèce et d'autres espèces, nous décrivons un plumage précédemment non décrit chez les mâles immatures de *C. flavifrons* et *C. sclateri* (Organiste de Porto Rico). Pour interpréter l'aspect du plumage de l'individu aberrant de Sainte-Lucie, nous explorons cinq hypothèses possibles selon lesquelles cet oiseau pourrait correspondre à : 1) un individu erratique accidentel ; 2) un oiseau de cage échappé ; 3) un hybride ; 4) une nouvelle espèce non décrite ; ou 5) un *C. flavifrons* présentant une variante du plumage. Nous rejetons les quatre hypothèses 1, 2 et 4, mais nous ne pouvons pas tester les mécanismes sous-jacents qui pourraient produire une telle variante de plumage dans le cadre des hypothèses 3 et 5.

Mots clés

Chlorophonia flavifrons, *Chlorophonia sclateri*, maturation du plumage, Organiste de Porto Rico, Organiste des Petites Antilles, plumage aberrant, trait ancestral

Chlorophonia flavifrons (Lesser Antillean Euphonia) occurs on the islands of Barbuda, Antigua, Guadeloupe, La Désirade, Dominica, Martinique, St. Lucia, St. Vincent, and Grenada in the eastern Caribbean (Greeney 2023a). *C. flavifrons* was until recently considered conspecific with *C. musica* (Hispaniolan Euphonia) and *C. sclateri* (Puerto Rican Euphonia), but is now treated as a separate monotypic species (Chesser *et al.* 2023). Both *C. musica* and *C. sclateri* show strong differences in plumage patterns between adult males and females, with males having dark blue backs, wings, and tails, whereas those of females are green. *C. flavifrons*, however, is unusual in showing only slight sexual dimorphism in plumage: males appear more like the green females but with dark auriculars, and both sexes show a yellow forecrown and sky-blue crown and nape forming a hood (Greeney 2023a). Both *C. flavifrons* and *C. sclateri* have yellow throats, whereas male *C. musica* have dark throats. A recent phylogeny of Euphoniinae included samples of both *C. musica* and *C. sclateri* but not *C. flavifrons* (Vázquez-López *et al.* 2024); therefore, the sister taxon of *C. flavifrons* is not resolved. In St. Lucia, *C. flavifrons* is known locally in creole as Jacobata because it resembles a small parrot. In this paper, we (1) present photographic documentation of a wild aberrant euphonia observed in St. Lucia, (2) compare observed features with museum specimens, and (3) discuss possible interpretations of our field-based and specimen-based observations, including describing plumage patterns of immature male *C. sclateri* and *C. flavifrons*.

Observations

On 6 October 2024, DJL, WF, and JB observed three euphonias foraging on *Miconia* fruit in the forest understory at the Des Cartiers Trail lookout in St. Lucia (Lebbin and Brocca 2024). Each of the three individuals appeared different. The first showed the plumage pattern expected for an adult female *C. flavifrons*; a second showed similar plumage, but with darker auriculars, which is expected for an adult male *C. flavifrons*. However, the third individual displayed a bold plumage pattern unlike any currently described for this species (Fig. 1). This latter individual had a yellow forehead (expected for *C. flavifrons*), bright yellow rump (unlike the yellowish-green expected in *C. flavifrons*), blackish blue auriculars (expected for an adult male of this species), bright yellow chin and underparts (unlike the green underparts expected in this species), and dark blue crown, nape, back, and wing coverts, and bluish-black remiges and retrices (unlike the sky-blue crown and nape and green back and wings of *C. flavifrons*) (Fig. 1). We also compared the plumage characters observed against those of other euphonias in the region and beyond (Table 1), but all known species differ from the third individual in at least one major character. A search of all images of *C. flavifrons* within Macaulay Library (macaulaylibrary.org) failed to find any similar looking *C. flavifrons* previous to our observation, but a similar-looking bird with a blue back was photographed by L. Burkett at the same eBird hotspot on 23 December 2024 after our observation (Burkett 2024).

DJL, JS, and RTC examined specimens of euphonias on 31 January 2025 at the Smithsonian National Museum of Natural

Fig. 1. Presumed adult male *Chlorophonia flavifrons*, showing a deep indigo color from crown to back and wing coverts, observed in St. Lucia on 6 October 2024. Males of this species typically show a lighter sky-blue crown and nape, and predominantly greenish back and wings. Photo by Daniel J. Lebbin. Additional similar images of this individual can be found on eBird (Lebbin and Brocca 2024).

History (USNM; Figs. 2–4) and DJL examined photos of specimens from the Museum of Comparative Zoology at Harvard University (MCZ) to compare against the bird photographed in St. Lucia. In doing so, we noted a *C. flavifrons* specimen from St. Lucia (USNM 356180; Figs. 2 and 4) labeled as male with "t. small" on the tag, indicating small testes. This specimen had green auriculars like a female, lacked the dark auriculars of an adult male, and had a greenish hood with just a little blue, unlike either adult males or females of this species,

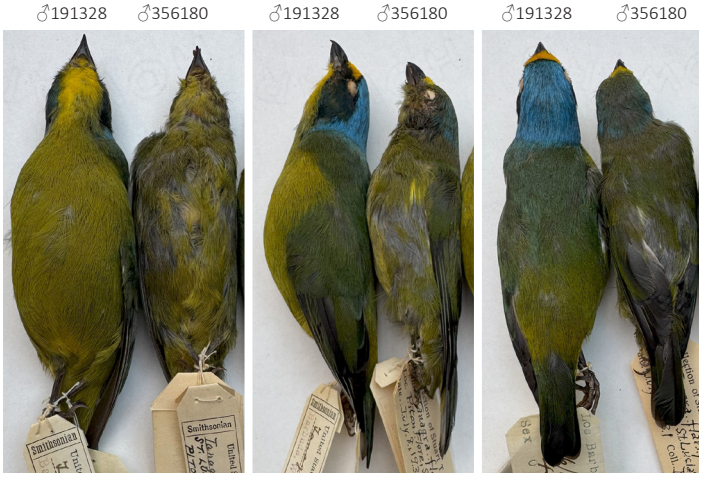

Fig. 2 (above). Representative plumage patterns of male *Chlorophonia flavifrons* specimens showing the ventral, lateral, and dorsal surfaces. In each image, the left bird is an adult male (USNM 191328) from Barbuda and the right bird is an apparent immature male (USNM 356180) from St. Lucia. The immature male appears most like a female but with much less blue in the hood. Also note that the rump on the adult male is yellowish green without strong contrast with the back, which is quite different than the bright yellow rump seen on the bird in Fig. 1 and male specimens of *C. sclateri* (Fig. 3).

Fig. 3 (right). Representative plumage patterns of *Chlorophonia sclateri* specimens showing the ventral, lateral, and dorsal surfaces. Specimens are arranged from left to right as follows: a female (USNM 232024; missing in the dorsal view), two immature males (USNM 238989, USNM 238988), two males with darker hoods (USNM 232685, USNM 232684), and an adult male with sky-blue hood (USNM 238982). Immature males show less blue color in the hood, and dark flecking in the auriculars, back, and wings, representing adult feathers growing in. The two adult males with darker and scaly blue hoods (USNM 232684, USNM 232685) show variation in the contrast between the hood and steely-blue back, compared to the clear contrast between the sky-blue hood and dark back of the typical adult male (USNM 238982). The yellow rump, forecrown, and underparts are more golden or orange-tinged in male *C. sclateri* compared to male *C. flavifrons*, including the boldly patterned individual in Fig. 1, but the overall pattern of dark blue plumage of the individual in Fig. 1 bears more resemblance to male *C. sclateri* with darker hoods (e.g., USNM 232685, center specimen in dorsal view) than specimens of male *C. flavifrons*.

Fig. 4. *Chlorophonia sclateri* and *C. flavifrons* specimens showing forehead and dorsal views. From left to right: *C. sclateri* adult male with sky-blue hood (USNM 238982), two adult males with darker hoods (USNM 232684, USNM 232685), two immature males (USNM 238988, USNM 238989), and a female (USNM 232024). The two specimens at the far right are a *C. flavifrons* immature male (USNM 356180) from St. Lucia and an adult male (USNM 191328) from Barbuda.

and otherwise resembled females of either *C. flavifrons* or *C. sclateri*. We interpreted this specimen to represent an immature male *C. flavifrons* that had yet to molt into adult plumage. Most adult male *C. sclateri* have dark backs and a sky-blue crown and nape forming a hood that strongly contrasts with a blackish back and wings (Greeney 2023b). We examined two specimens (USNM 232684, USNM 232685; Figs. 3–4) labeled as adult males that were both collected 30 April 1912, which had dark backs like other adults, but much darker blue hoods with a scaly appearance. The contrast between hood and back was much reduced in these individuals, and in this way resembled the upperparts of the photographed St. Lucia bird, except that the St. Lucia bird showed no visible scaling. We also examined two *C. sclateri* specimens (USNM 238988, USNM 238989; Figs. 3–4) both collected 3 July 1912 and labeled as immature males. These immature males showed a plumage pattern in transition, characterized by mostly green crowns with less blue color than either adult males or adult females, green backs (like an adult female) with patches of dark feathers (like an adult male), and a mix of (female-like) green and (male-like) orange-yellow plumage in the underparts.

Discussion

The plumage pattern of the aberrant euphonia observed on St. Lucia (Fig. 1) was challenging to interpret. We were reassured that previous descriptions of adult males with predominantly green female-like plumage were accurate, as confirmed by reviewing multiple specimens labeled as adult male from St. Lucia (e.g., USNM 80907, MCZ 32382, MCZ 99923) that match additional specimens of adult males from other islands in the Lesser Antilles (e.g., USNM 191328 in Fig. 2), indicating that the plumage of the individual in Fig. 1 is distinctive.

We considered several hypotheses concerning this aberrant individual: that it is (1) a naturally occurring accidental vagrant of another species, (2) an escaped pet bird, (3) a hybrid, (4) a new undescribed species, or (5) a color morph or other plumage variant of *C. flavifrons*. Below we consider these in turn.

(1) The St. Lucia individual could be a vagrant of a species from another Caribbean island or the South American mainland. We rejected this explanation because the plumage of this individual is unlike that of any currently described species of *Euphonia* or *Chlorophonia*. The most proximate species geographically to St. Lucia are *E. violacea* (Violaceous Euphonia) and *E. trinitatis* (Trinidad Euphonia) of Trinidad and Tobago and the South American mainland, *C. sclateri* of Puerto Rico, and *C. musica* of Hispaniola. The aberrant St. Lucia individual shows multiple major plumage features inconsistent with all the blue-hooded euphonias in the genus *Chlorophonia* and those geographically proximate *Euphonia* species (Table 1).

(2) We considered the possibility that the aberrant individual was an escaped pet bird, since some species of euphonia have been trapped, including *E. trinitatis* (Hilty 2011) and others such as *C. elegantissima* (Elegant Euphonia), *E. violacea*, and *C. sclateri*. This hypothesis suffers from the same problem as the first, namely that the plumage characters of this individual do not match those of any known species of euphonia (Table 1). Furthermore, the bird was behaving normally for a wild bird in its natural habitat away from settled areas, and we observed no indication of unusual feather wear or abrasions to the feet, which might indicate an origin in captivity, although such foot details are not easily observed on free-living birds. Small songbirds are generally not kept as cage birds on St. Lucia (L. John pers. comm.).

(3) We also considered that the individual could be a hybrid between *C. flavifrons* and one of the species discussed above, either a vagrant or an escaped bird. Hybrid ancestry is not testable from our photos, but this scenario seems highly unlikely as neither of the two birds it was with displayed unusual plumage patterns; all species in the region are expected to be resident; there are no records of other naturally occurring or escaped euphonia species in eBird on St. Lucia; and St. Lucia is separated from both Trinidad and Tobago and Puerto Rico by approximately

Table 1. Comparison of major plumage characters of the aberrant St. Lucia individual (Fig. 1) to those of typical adult males of other species as observed in specimens, images at Macaulay Library, and descriptions in Hilty (2011). The table includes all blue-hooded *Chlorophonia* species: *C. flavifrons*, *C. sclateri*, *C. musica*, *C. cyanocephala cyanocephala*, and *C. elegantissima*; as well as two regional *Euphonia* species from Trinidad: *E. violacea* and *E. trinitatis*. Breast color is difficult to discern in Fig. 1, but appears yellow. Note that male *C. cyanocephala insignis* from the east slope of Ecuador have a yellow-orange forehead band, unlike the nominate subspecies.

	Body Region								
Species and Geographic Region	**Rump**	**Back**	**Crown/Nape**	**Auriculars Contrast with Nape**	**Throat**	**Breast/Belly**	**Forehead Band Extent**	**White Tail Spots**	**Forehead Band Color**
St. Lucia bird (Fig. 1)									
Lesser Antilles	yellow	dark blue	dark blue	yes	yellow	yellow	before eye	not observed	yellow
C. flavifrons									
Lesser Antilles	greenish-yellow	green	light blue	yes	yellow	greenish-yellow	before eye	absent	yellow
C. sclateri									
Greater Antilles	yellow	dark blue	light blue	yes	yellow	yellow, tinged orange	before eye	absent	yellow, tinged orange
C. musica									
Greater Antilles	yellow	dark blue	light blue	yes	black	orange-yellow	before eye	absent	orange-yellow
C. cyanocephala cyanocephala									
South America	yellow	dark blue	light blue	yes	black	orange-yellow	before eye	absent	black
C. elegantissima									
Central America	dark blue	dark purple	light blue	yes	black	orange	before eye	absent	orange
E. violacea									
Trinidad and Tobago, South America	dark blue	dark blue/ purple	dark blue	no	yellow	yellow	to eye	large	yellow
E. trinitatis									
Trinidad and Tobago, South America	dark blue	dark blue	dark blue	no	dark blue	yellow	past eye	small	yellow

320 and 675 km of open ocean, respectively. Hybridization would require two unlikely events: the presence of a different species of euphonia, and hybridization of this species with *C. flavifrons* to produce the observed plumage pattern.

(4) We considered whether the aberrant individual could represent a new undescribed species and rejected as extremely unlikely the possibility that two species of euphonia could co-occur on such a small island (no Caribbean island has two species of euphonia) and that a second diurnal species could exist unobserved on such a small island with an avifauna well represented in museum collections.

(5) The aberrant individual could represent a previously unknown color morph or variant of *C. flavifrons*, although to our knowledge no regularly occurring color morphs are described for Euphoniinae, and no other individuals like this one have been observed in this species to our knowledge based on the literature, museum specimens examined, and available images online at Macaulay Library. We can only speculate about the possible underlying genetic mechanisms that could produce such a plumage pattern. The Caribbean blue-hooded *Chlorophonia*

species (*C. musica*, *C. sclateri*, and *C. flavifrons*) are estimated to have diverged from *C. cyanocephala* (Golden-rumped Euphonia) of South America 1.4 mya, which is relatively recent in the Euphoniinae (Imfeld *et al.* 2020). Perhaps this boldly patterned St. Lucia individual was expressing ancestral traits as the dark upperparts, bright yellow or orange underparts below the throat, and bright yellow or orange rump more closely resemble characters shared by adult male *C. sclateri*, *C. musica*, and *C. cyanocephala*. Although the darker blue hood of the St. Lucia bird is not generally shared among these species, we found two male specimens of *C. sclateri* with darker hoods, as indicated above.

Last, we noted that back coloration of male *C. flavifrons* varied from green to blue-green in museum specimens (but none nearly as dark blue as the aberrant individual from St. Lucia). We describe the plumage pattern of an immature male *C. flavifrons* from a specimen collected in St. Lucia: it is similar to the plumage of an adult female, but with a much more olive-green hood lacking most of the blue seen in both adult males and females. Greeney (2023a) found no prior information available on molt or juvenile/immature plumage for *C. flavifrons*. Wetmore (1916) noted that most adult *C. sclateri* had finished molting by August, and this is the only information on molt for *C. sclateri* cited by Greeney (2023b). It is possible *C. flavifrons* are also done molting by August; there is no obvious indication of molt in our photos of *C. flavifrons* observed on St. Lucia on 6 October 2024.

For male *C. sclateri* specimens with darker scaled hoods, we note that the feathers were shorter than the sky-blue hood feathers of other *C. sclateri* males, and one specimen (USNM 232685) showed greenish plumage on the breast like the immature males. The darker and scaly hood pattern could represent crown molt or feather wear. Perhaps these were nearly adults, representing a nearly mature stage of plumage, which would make sense as the two darker-hooded birds differed in their breast coloration, with one (USNM 231685) more closely resembling the green color of immature specimens and the other (USNM 232684) more closely resembling the orange-yellow of the adult male specimen. Greeney (2023b) did not include a description of plumage patterns for juvenile or immature *C. sclateri*, but immature male *C. sclateri* specimens (and an image of a wild bird by Mikko Pyhälä in Greeney 2023b) show female-like green auriculars, green back and wing coverts, at least some male-like golden yellow plumage on the belly, and darker blackish adult feathers molting into the auriculars, back, and wings in an irregular splotchy pattern. Similar splotchy transitional patterns mixing dark blue and green plumage have been observed in immature male *C. musica* (Cory 1881) and other species of *Euphonia* in Central America and South America.

We encourage observers to be alert to and photograph variation in plumage patterns of male *C. flavifrons* and *C. sclateri* to document whether more individuals have the patterns described here. We also encourage researchers to investigate any additional plumage variation or genetic variation among island populations of *C. flavifrons*.

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Author Contributions

WF guided DJL and JB in the field, and all three contributed field observations. DJL drafted the manuscript and provided the photographs. DJL, JS, and RTC examined specimens at the National Museum of Natural History, Smithsonian Institution, discussed interpretations of the field observation in the context of museum specimens, and edited the manuscript.

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